

YEAR BOOK

2022-23



Ministry of Science & Technology
GOVERNMENT OF PAKISTAN

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Government of Pakistan
Islamabad**

ACRONYMS

CDWP	Central Development Working Party
COMSATS	Commission on Science and Technology for Sustainable Development in the South
COMSTECH	Organization of Islamic Countries Standing Committee on Scientific and Technological Cooperation
CUI	COMSATS University, Islamabad
CWHR	Council for Works & Housing Research
DDWP	Departmental Development Working Party
DEA	Deputy Electronics Adviser
DSA	Deputy Scientific Adviser
DTA	Deputy Technological Adviser
ECNEC	Executive Committee of National Economic Council
ECO	Economic Cooperation Organization
EDB	Engineering Development Board
EEZ	Exclusive Economic Zone
FAO	Food & Agriculture Organization
GIKI	Ghulam Ishaq Khan Institute
HRD	Human Resource Development
IDB	Islamic Development Bank
IIEE	Institute of Industrial Electronics Engineering
JEA	Joint Electronics Adviser
JSA	Joint Scientific Adviser
JTA	Joint Technological Adviser
MIRDC	Metal Industry Research & Development Centre
MoST	Ministry of Science and Technology
MoU	Memorandum of Understanding
NAM	Non Aligned Movement
NCST	National Commission for Science & Technology
NEECA	National Energy Efficiency & Conservation Authority
NIE	National Institute of Electronics
NIO	National Institute of Oceanography
NODC	National Oceanographic Data Centre
NMIP	National Metrology Institute of Pakistan

NUST	National University of Sciences & Technology
NUTECH	National University of Technology
OIC	Organization of Islamic Conference
PC-I	Planning Commission 1: (Standard Format for Preparing Project Proposals)
P&C	Policy and Coordination
P&D	Planning & Development
PASTIC	Pakistan Scientific & Technological Information Centre
PCRET	Pakistan Council of Renewable Energy Technologies
PCRWR	Pakistan Council of Research in Water Resources
PCSIR	Pakistan Council of Scientific & Industrial Research
PCST	Pakistan Council for Science & Technology
PEC	Pakistan Engineering Council
PHA	Pakistan Halal Authority
PMNH	Pakistan Museum of Natural History
PNAC	Pakistan National Accreditation Council
PSDP	Public Sector Development Programme
PSF	Pakistan Science Foundation
PSQCA	Pakistan Standards and Quality Control Authority
PSTC	Pak-Swiss Training Centre
QCC	Quality Control Centre
R&D	Research & Development
S&T	Science & Technology
SAARC	South Asian Association for Regional Cooperation
SDC	Standards Development Centre
SME	Small & Medium Enterprises
SMEDA	Small & Medium Enterprises Development Authority
STEDEC	STEDEC Technology Commercialization Corporation of Pakistan (Pvt.) Ltd.
TBT	Technical Barriers to Trade
TSC	Technical Services Centre
UNIDO	United Nations Industrial Development Organization



Dr. Khalid Maqbool Siddiqui, Federal Minister for Science and Technology

Message from Dr. Khalid Maqbool Siddiqui Federal Minister for Science and Technology

It is a great pleasure for me to give this Message for the Year Book 2022-23, which highlights the activities of Ministry of Science and Technology and its Organizations during the year.

This Ministry coordinates with National and International Organizations, both inland and abroad to promote bilateral and multilateral cooperation in Science and Technology with the objectives to enable Pakistani researchers to get access to technologies produced elsewhere in the world, to enhance R&D capacity of national institutions to the mutual benefits and sharing of resources in areas of Science & Technology having excellence at home and abroad.

Science & Technology Parks have emerged as essential tools for stimulating startups and growth of technologically intensive, knowledge-based business, in line with the National S&T Policy documents.

Training Programmes for MoST & its organizations were designed in consultation with the Chambers of Commerce & Industries, sector specific Trade Associations, SMEs and other stakeholders for the capacity building of SMEs personnel. In this regard, 54 Non examination based sessions against 19 certification courses and five (05) training sessions of (examination based) lead auditor courses against 05 certification / accreditation standards were delivered by M/s Bureau Veritas Pakistan.

National University of Science & Technology (NUST) and National University of Technology (NUTECH) are performing their best in R&D and implementation of new ideas. During the current financial year 2022-23, NUST is executing 05 projects for the purpose of enhancing the capabilities of the institution which includes Establishment of Additional Production Lines for Research and Development of Indigenously developed Electromedical Devices, Establishment of Centre for International Peace and Stability, Strengthening and Upgradation of R&D facilities, Establishment of Chip Design Centre and Accreditation of Laboratories in Accordance with international standards. Ventilator has been developed by NUTECH under the Establishment of Additional Production Lines project. Software validation is under progress. Two prototypes of Powered Air Purifying Respirator (PAPR) have been approved by Pakistan Engineering Council.

PCSIR supports industry in various sectors by providing cost-effective technology solutions to improve their economic performance. PCSIR provides services in energy, food, advance and composite material, leather, textile, food safety and value addition, herbal medicines and products. The council is providing testing & certification services to almost entire industry and most of the exportable products are being tested by its ISO-17025 accredited labs. PCSIR laboratories are also providing technical services to SMEs to enhance their industries for Cluster Based Development. Technical training centers of PCSIR at Karachi, Lahore, Peshawar, Quetta and Daska are providing 3-4 years diploma certificates. More than 300 students are awarded diplomas/ degrees annually and most of them got jobs immediately.

MoST is undertaking the project "titled Establishment of a Center for Artificial Intelligence in Health Sciences" in HEJ, University, Karachi. Construction of labs and installation of ICT, Hardware equipment related to Artificial Intelligence have been completed under this Project. In-House training has been started and project-based assignments have been given to select Scholars. One Research Scholar has completed his one year foreign training. Three research scholars were sent to Austria for their international training at the Software Competence Center Hagenberg, Austria.

Establishment of Planning, Monitoring & Evaluation Cell in MoST is underway. This cell will enhance the capability of processing of PC-1s by and reducing the work load.

Up-gradation of Overall R&D infrastructure of the Labs and Facilities of MoST Organizations is being continued to enhance the internal research capability of these organizations.

The Government is spending a substantial amount to promote scientific and technological research activities. The Ministry of Science and Technology would continue these initiatives, to promote Research & Development and to make its contribution towards socio-economic development of the country.

Foreword

The Year Book 2022-23 is an official document of Ministry of Science and Technology which indicates the activities and achievements of the Ministry and its Organizations during the period.

Knowledge has now become the main driving force. Increasing application of knowledge at various stages of value chain and in every sector of economy will only be attained by giving due priority to Education, R&D and Industry. Ministry of Science and Technology has initiated and launched Scientific and Technological programs and projects.

MoST is guiding and supporting Small & Medium Enterprises (SMEs) for exploring and adopting new trends and requirements of international competitiveness, improved industrial productivity and quality according to the requirements of internationally recognized Standards and Guidelines. A total of 967 out of 1642 applicant firms have been approved for award of the Incentive Grant amounting to Rupees 312.300 Million.

For Capacity Building and HRD in S&T Sector, Science Talent Farming Scheme (STFS) is being implemented to groom the selected youth and support them all the way to highest degree by progressively exposing them to advanced topics in science with application of inquiry based approach to learning. Under the scheme selection of 5 batches of students (1500 total) completed. Financial assistance to 13 universities in total @ Rs. 1.00 million provided to approved universities. Honorarium to total 60 mentors @100,000 for supervision of STFS students in their research projects. Approximately 350 Research projects received by STFS 1st, 2nd, 3rd, 4th and 5th batch students in the form of Posters/Reports.

Upgradation of Overall R&D infrastructure of the Labs and Facilities of MoST Organizations was continued to be upgraded to enhance the internal research capability of these organizations. These laboratories at various locations will not only create jobs but will also play a vital role in the economic development by providing testing facilities to the local industries in food safety and security, building materials, minerals, water testing, fisheries and chemicals. Under PCSIR's projects related to upgradation of Labs, 80 % Lab Equipment as per PC-I has been procured, installed /commissioned and fully functional. These included GCMS, HPLC, Atomic absorption, UV spectrometry, trainers and general Lab equipment of IIEE, Library management system for Libraries of IIEE and PSTC, Purchase of Licensed software for PCs. Medicinal, Botanical Garden with 300 plants/species/flora/ commercially important has been established. Analytical and Testing Services to different industries have been initiated. Capacity Building/ trainings on seed collection/Cultivation/processing of herbs has imparted to university students of different disciplines like botany, horticulture, agriculture, biotechnology etc.

PCSIR is currently working on experimental cultivation of cannabis for medicinal and experimental fields. It is a multibillion industry globally and it will create new opportunities for Pakistan to generate capital. It will also boost the medical industry's output and reduce the cost of manufacturing. Research, Development and Technology transfer of selected active pharmaceutical ingredients (APIS) for impact substitution (PCSIR). This project aims to establish a capability of producing Active Pharmaceutical Ingredients (APIs) through biocatalytic technologies/ metabolic engineering techniques, for use in manufacturing selected anti-cancer drugs, antibiotics, immunomodulatory agents and vitamin B12.

MoST is undertaking the Establishment for Industrial Production of Nanomaterials in Latif Ebrahim Jamal Nanotechnology Center and a beautiful building of Nano-technology Center is fully functional with respect of civil works. Laboratory equipment, I.T equipment have been purchased and successfully installed in respective labs. Faculty members and research scholars are actively involved in research work related to different field of nanotechnology. Purchase of Chemicals / consumables and other reagents for research and development activities of the project have been completed.

During the period, Ministry has initiated important initiatives in various fields. Policy focus of the Ministry is to ensure that Pakistan acquires world-class expertise during the coming years, in line with the priorities of the present government. Besides Human Resource Development and Capacity Building of Labs Infrastructure & Pilot Plants, R&D activities were carried out in priority areas like, Quality Assurance and Standards, Oceanography, Information Technology, Health, Food, Water, Renewable Technologies etc. All these efforts are dedicated to socio-economic uplift through application of S&T in all sectors of the economy for a better & prosperous future.

I am confident that these efforts will pay dividends in the near future and contribute towards acceleration of socio-economic development of Pakistan.

Mr. Ali Tahir
Secretary
M/o Science & Technology

Table of Contents

	Page No.
1 Science & Technology Division (S&T Division)	01
Administration Wing	03
i. Table-1: Federal Ministers of State & Advisers to Prime Minister/President, Science & Technology	05
ii. Table-2: Federal Secretaries Science & Technology	06
iii. Table-3: Strength of Ministry of Science and Technology	07
a) International Liaison (IL) Wing	08
b) Technology Wing	11
c) Policy and Coordination (P&C) Wing	13
d) Finance and Accounts Wing	16
e) Electronics Wing	22
f) Public Sector Development Programme	25
2. National Institute of Electronics (NIE)	28
3. Pakistan National Accreditation Council (PNAC)	30
4. STEDEC Technology Commercialization Corporation of Pakistan	32
5. Pakistan Standards and Quality Control Authority (PSQCA)	34
6. Council for Works and Housing Research (CWHR)	49
7. National University of Sciences and Technology (NUST)	55
8. COMSATS University, Islamabad (CUI)	61
9. National Institute of Oceanography (NIO)	69
10. Pakistan Council for Science and Technology (PCST)	87
11. Pakistan Council of Renewable Energy Technologies (PCRET)	93
12. Pakistan Science Foundation (PSF)	97
13. Pakistan Council of Scientific and Industrial Research (PCSIR)	115
14. Pakistan Engineering Council (PEC)	118
15. Pakistan Halal Authority (PHA)	129
16. National University of Technology (NUTECH)	132
17. National Energy Efficiency and Conservation Authority (NEECA)	135
18. National Metrology Institute of Pakistan (NMIP)	138

Science and Technology (S&T) Division

The Scientific and Technological Research Division was established in 1964. The Division was administratively responsible for National Science Council, the Council of Scientific and Industrial Research, the Atomic Energy Commission and the Space and Upper Atmospheric Research Committee. The Ministry of Science & Technology (MoST) has been functioning since 1972. It is the national focal point for planning, coordinating and directing efforts; to initiate and launch scientific and technological programs and projects as per national agenda for sound and sustainable S&TR base for the socio-economic development.

The Day-to-day business assigned to this Division under Schedule-II of the Rules of Business 1973 is undertaken by four technical Wings each headed by BS-20 level officers, while the Administration and Finance & Accounts Wings are being headed respectively by the Joint Secretary (I) & Joint Secretary (II) and Chief Finance & Accounts Officer (CF&AO). The Planning & Development Cell is also operating in the Ministry with specific objectives and functions.

The operational business shall be distributed as specified herein below: -

Additional Secretary

Responsible for monitoring of all wings of MoST and submission of Policy matters to Secretary, MoST for approval.

TECHNOLOGY WING:

- Promotion and development of industrial technology.
- Formulation of National Industrial Hemp & Medicinal Cannabis Policy.
- Monitoring and evaluation of research and development works.
- Pakistan Council of Scientific & Industrial Research (PCSIR).
- Pakistan Standards & Quality Control Authority (PSQCA).
- Pakistan National Accreditation Council (PNAC).
- Pakistan Engineering Council (PEC).
- Pakistan Halal Authority (PHA).
- Pakistan Council of Renewable Energy Technologies (PCRET).
- National Energy Efficiency & Conservation Authority (NEECA)
- National Metrology Institute of Pakistan (NMIP)

Only technical matters relating to these organizations.

ELECTRONICS WING:

- Establishment of Science cities.
- Monitoring and evaluation of research and development works.
- Processing of Draft Bills of MoST Organizations established through Resolutions/Ordinances.
- Processing of the amendment Bills proposed in the existing Acts of MoST Organizations.
- Preparation of Finance Minister's Budget Speech.
- Processing of NEPRA cases.
- Processing of minutes/working papers of the Board meetings of AEDB, NCEAC and STEDEC.
- Provision of comments on issues related to Electronics and Renewable Energy Technologies at different forums.
- Processing/circulation of NTISB's advisories regarding IT security issues.
- Processing of minutes/working papers of the Board of Governors (BoG) meetings of Bahria University, Air University, PMEB, NIE and PIEAS.
- National Institute of Electronics (NIE).
- Council for Works & Housing Research (CWHR).
- STEDEC Technology Commercialization Corporation (STEDEC) of Pakistan.

Technical matters relating to these organizations.

PLANNING, DEVELOPMENT AND COMMERCIALIZATION (PD&C) CELL

- Processing of PSDP Projects through DDWP/CDWP/ECNEC.
- Processing of release of funds of Development Budget.
- Preparation of Development Budget.
- Monitoring of Development Budget
- Processing of release of funds of Development Budget.

- Monitoring of Development Budget
- Technical matters relating to Scientific & Technological Development Corporation of Pakistan (STEDEC).
- PSDP related work of National Energy Efficiency & Conservation Authority (NEECA)

PROJECT MANAGEMENT & MONITORING CELL

- Projects Appraisal/Projects Review
- Organizing DDWP meetings in MoST and coordination with M/o PD&SI for CDWP/ECNEC consideration.
- Processing of PSDP Projects through DDWP/CDWP/ECNEC.
- Preparation of Development Budget.
- Monitoring of Development Projects.
- Provision of material to M/o PD&SI on S&T sector for preparation of Annual Plans, Five Year Plan, Vision exercise etc.
- Processing of development fund releases in coordination with the M/o PD&SI and Finance.
- Managing of foreign aid for development projects through Economic Affairs Division.
- Preparation of replies to DAC, PAC and Senate/National Assembly regarding questions related to development activities.

COMMERCIALIZATION CELL

- Guide, support and facilitate R&D organizations of MoST for:-
 - Developing linkages with industry & academia;
 - Undertaking demand driven R&D;
 - Development of import substitutes;
 - Entrepreneurship development;
 - Transfer of technology to the local industry;
 - Effective Publicity and marketing.

POLICY & COORDINATION (P&C) WING:

OBJECTIVES & FUNCTIONS:

- Establishment of S&T/R&D institutes and laboratories for research and development in the scientific and technological fields.
- Formulation and Implementation of Science, Technology and Innovation Policy and Action Plan.
- Monitoring and evaluation of research and development work.
- Dealing with technical matters of Pakistan Council for Science and Technology (PCST), Pakistan Science Foundation (PSF), Pakistan Museum of Natural History (PMNH), Pakistan Scientific and Technological Information Centre (PASTIC), National University of Sciences and Technology (NUST) and National University of Technology (NUTECH).
- Coordination with Federal and Provincial S&T Councils/Departments/Organizations/ Strategic Organizations and NGOs dealing with S&T.
- Matters related to National Commission for Science and Technology (NCST) and its Executive Committee (ECNCST).
- Civil Awards for Scientists and Technologists.
- Miscellaneous matters.

REGULAR ACTIVITIES:

- Regular activities of P&C Wing include:
 - S&T Policy related issues and coordination on technical matters of MoST's Organizations and other Ministries.
 - Coordination with Defence R&D organizations.
 - Civil Awards for Scientists and Technologists.
 - Technical matters of PCST, PSF, PMNH, PASTIC and NUST.
 - Matters relating to Environmental Pollution/Bio-safety and Bio-security in coordination with Ministry of Climate Change.
 - Scientific NGOs.

INTERNATIONAL LIAISON (IL) WING:

- Bilateral Cooperation in S&T through Agreements / MoUs with friendly

countries including Pak US Cooperation.

- Multilateral cooperation in S&T through SCO, JICA, TKA, SAARC, UN, UNCSTD, UNESCAP, UN APCTT, ECO, RISCAM, NAM S&T Center, IDB, ADB, World Bank etc.
- Liaison with International Organizations
- Monitoring and evaluation of research and development works, including scrutiny of development projects.
- Establishment of science universities as specifically assigned by the Federal Government. (CUI)
- National Institute of Oceanography (NIO).
- OIC Standing Committee on Scientific & Technological Cooperation (COMSTECH).
- Commission on Science & Technology for Sustainable Development in the South (COMSATS).
- Economic Cooperation Organization Science Foundation
- Foreign trainings/conferences/visits/scholarships etc.

Only technical matters relating to these organizations.

FINANCE & ACCOUNTS WING:

- All financial, accounts and audit matters relating to non-development budget of the Ministry.
- All financial, accounts and audit matters relating to Public Sector Development Programme Projects of this Ministry and its attached Organizations.
- Maintenance and Reconciliation of Accounts.
- Coordination and Scrutiny of Budget: Expenditure and Receipts.
- Consolidation of Public Sector Development Programme (PSDP).
- Advice in Delegated Field.
- Processing of Cases in Non-Delegated Field.
- Public Accounts Committee (PAC) and Department Accounts Committee (DAC).
- Compliance with Rules, Regulations and Orders.
- Internal Control / Internal Audit.

ADMINISTRATION WING:

- Support services to operational wings of MoST.
- Primarily responsible for personnel management.
- General administration of the Ministry as well as of its S&T organizations.
- National Assembly and Senate business.

Joint Secretary (Admin):

All administrative matters of the Ministry.

Deputy Secretary (Admn):

- Administrative and Personal Management.
- HRD, Training issues and cases.
- Maintenance / Security.
- Work Pertaining to year book of the Ministry.
- Miscellaneous work.

Section Officer (Estt):

- Recruitment, Promotions, Transfer/Postings and Pension cases of officers/officials of the Ministry of Science & Technology.
- Provision of miscellaneous information to President/Prime Minister's Office, National Assembly/Senate Secretariat and Ministries/ Divisions about the Ministry of Science and Technology.
- Local training of officers/officials of the Ministry.
- National Internship Programme.
- Rules of Business, Secretariat Instructions, etc.

Section Officer (General):

- Maintenance of office building(s).
- Maintenance of vehicles, office equipment and machinery (including telephone, fax computer and photo-stat machines etc.).

- Purchase of Stationery etc.
- Security measures.
- Hiring of accommodation for officers/official of the Ministry.
- Record room and connected matters.
- Receipt & Issue (R&I) matters.
- Miscellaneous assignments not assigned elsewhere.
- MoST Library.

Section Officer (Council)

- National Assembly and Senate Secretariat Business.
- Miscellaneous matters.

Section Officer (Coord):

- Coordination between Ministry and its organizations.
- Preparation and uploading of Year Book of MoST.

Joint Secretary (Org):

All administrative and personnel matters of Organizations of MoST.

Deputy Secretary (Organizations):

Administrative matters of S&T Organizations.

Section Officer (Org-I):

Administrative and personnel matters relating to:-

- Pakistan Engineering Council (PEC).
- Pakistan Council of Scientific & Industrial Research (PCSIR)
- Pakistan Council for Science & Technology (PCST) including Pakistan Technology Board (PTB).
- Scientific & Technological Development Corporation (STEDEC).
- Council for works and Housing research (CWHR).
- National Metrology Institute of Pakistan (NMIP)
- National University of Technology (NUTECH).

Section Officer (Org-II):

Administrative and Personnel matters relating to:

- Pakistan National Accreditation Council (PNAC).
- Pakistan Science Foundation (PSF) including
 - Pakistan Scientific & Technological Information Centre (PASTIC)
 - Pakistan Museum of Natural History (PMNH)
- National Institute of Electronic (NIE).
- Pakistan Council of Renewable Energy Technologies (PCRET).
- National University of Science and Technology (NUST).
- Pakistan Halal Authority (PHA).

Section Officer (Org-III):

Administrative and Personnel matters relating to:

- Pakistan Standards & Quality Control Authority (PSQCA).
- National Institute of Oceanography (NIO).
- OIC Standing Committee on Scientific & Technological Cooperation (COMSTECH).
- Commission on Science & Technology for Sustainable Development in the South (COMSATS).
- COMSATS University, Islamabad (CUI).
- National Energy Efficiency & Conservation Authority (NEECA)
- Closure of Petroman Institute.
- Specific Projects assigned from time to time.

CHIEF FINANCE & ACCOUNTS OFFICER (CF&AO):

- Maintenance and Reconciliation of Accounts.
- Coordination and Scrutiny of Budget: Expenditure and Receipts.
- Consolidation of Public Sector Development Programme (PSDP).
- Advice in Delegated Field.
- Processing of Cases in Non-Delegated Field.
- Public Accounts Committee (PAC) and Department Accounts Committee (DAC).

- Compliance with Rules, Regulations and Orders.
- Internal Control / Internal Audit.

Section Officer (F&A):

- Budget preparation and coordination with other Wings, ST&RD organizations and the Finance Division etc.
- Re-conciliation of accounts and expenditure of the Ministry and its ST&RD organizations.
- Liaison with DAC/PAC including appropriation of accounts, and related audit matters of the Ministry & its organizations.

Accounts Officer (Development Budget):

- Preparation of NIS of all development projects.
- Release of funds to all development projects.
- The AGPR matters including timely release of funds.
- Monthly PSDP expenditure statements for FA's organization.
- Maintenance of Assignment Account of different projects.
- External audit/Public Accounts Committee/Departmental Accounts Committee matters.
- Administrative/financial matters of employees of Project Staff including arrangements for logistic support i.e. Telephone, Stationery and CNG/POL, repair of Govt. Vehicle of Development Projects etc.

Federal Ministers/Ministers of State & Advisers to Prime Minister / President,

S.No.	Name	From	To
1.	Mr. Habibur Rahman, Federal Minister for Education, Re-designated as Minister of Education & Scientific Research	17.02.1960	17.04.1961
2.	Mr. Akhtar Husain, Federal Minister for Education & Scientific Research	17.04.1961	01.03.1962
3.	Lt. Gen. W. A. Burki, Federal Minister for Education & Scientific Research	02.03.1962	08.06.1962
4.	Mr. Ghulam Faruque, Federal Minister for Scientific and Technological Research	01.01.1966	15.07.1967
5.	Vice Admiral S.M. Ahsan, Deputy Chief Martial Law Administrator, Incharge M/o. Scientific & Technological Research	05.04.1969	06.05.1969
6.	Air Marshal M. Nur Khan, Deputy Chief Martial Law Administrator, Incharge Scientific & Technological Research	07.05.1969	03.08.1969
7.	Mr. Muhammad Shamsul Huq, Federal Minister for Education and Scientific Research	04.08.1969	22.02.1971
8.	Mr. Khurshid Hasan Meer, Minister without portfolio (looked after work of the Ministry)	17.08.1973	22.10.1974
9.	Mr. Abdul Hafiz Pirzada, Federal Minister for Education, Science and Technology and Provincial Coordination	22.10.1974	05.02.1976
10.	Mr. Hafeezullah Cheema, Minister of State	22.10.1974	09.01.1975
11.	Shahzada Saeed-ur-Rashid Abbasi, Minister of State	10.01.1975	05.02.1976
12.	Malik Muhammad Jaffer, Minister of State	05.02.1976	24.01.1977
		26.01.1977	28.03.1977
13.	Mr. Niaz Muhammad Wassan, Federal Minister	30.03.1977	05.07.1977
14.	Mr. Mohammad Arshad Chaudhri, Federal Minister	27.08.1978	21.04.1979
15.	Mr. Hamid Nasir Chatta, Federal Minister	28.01.1986	31.05.1986
16.	Mir Haji Tareen, Federal Minister	28.09.1986	20.12.1986
17.	Malik Muhammad Naeem Khan, Federal Minister	15.05.1988	29.05.1988
18.	Chaudhry Nisar Ali Khan, Federal Minister	09.06.1988	01.12.1988
19.	Mr. Jahangir Badr, Federal Minister	04.12.1988	20.09.1989
20.	Mr. Javed Jabbar, Federal Minister	20.09.1989	06.08.1990
21.	Mir Hazar Khan Bijarani, Federal Minister	13.08.1990	06.11.1990
22.	Choudhri Hamid Nasir Chatta, Federal Minister	09.11.1990	10.09.1991
23.	Mian Muhammad Zaman, Minister of State	09.06.1991	18.07.1993
24.	Mr. Illahi Bukhsh Soomro, Federal Minister	10.09.1991	09.06.1993
25.	Lt. Gen. (R) Muhammad Shafiq, Federal Minister	23.07.1993	19.10.1993
26.	Haji Muhammad Nawaz Khokhar, Federal Minister	31.07.1996	05.11.1996

27.	Syeda Abida Hussain, Federal Minister	05.11.1996	15.12.1996
		10.09.1997	10.04.1999
28.	Prof. Atta-ur-Rahman, Federal Minister	14.03.2000	23.11.2002
29.	Prof. Atta-ur-Rahman, Adviser to the Prime Minister	24.11.2002	25.08.2004
30.	Ch. Nouraz Shakoora Khan, Federal Minister	03.09.2004	15.11.2007
31.	Dr. Shams Kassim Lakha., H.I., S.I., Federal Minister	16.11.2007	25.03.2008
32.	Ms. Tehmina Daultana, Federal Minister	31.03.2008	12.05.2008
33.	Mr. Mohammad Azam Khan Swati, Federal Minister	29.01.2009	14.12.2010
34.	Pir Aftab Hussain Shah Jilani, Federal Minister	14.12.2010	12.02.2011
35.	Mir Changez Khan Jamali, Federal Minister	12.02.2011	16.03.2013
36.	Ms. Rahela Baloch, Minister of State	18.04.2012	16.03.2013
37.	Dr. Sania Nishtar, S.I., Federal Minister	03.04.2013	05.06.2013
38.	Engr. Khurram Dastgir, Minister of State	07.06.2013	22.06.2013
39.	Mr. Zahid Hamid, Federal Minister	22.06.2013	21.11.2014
40.	Rana Tanveer Hussain, Federal Minister	17.12.2014	31.05.2018
41.	Sheikh Muhammad Yusuf, Federal Minister (caretaker)	06.06.2018	17.08.2018
42.	Mr. Mohammad Azam Khan Swati, Federal Minister	05.10.2018	05.12.2018
43.	Mr. Fawad Hussain Chaudary, Federal Minister	19.04.2019	17.04.2021
44.	Mr. Sibli Faraz, Federal Minister	17.04.2021	10.04.2022
45.	Agha Hassan Baloch, Federal Minister	22.04.2022	To date

Ministry of Science & Technology

Federal Secretaries Ministry of Science & Technology:

S.No.	Name	From	To
1.	Dr. I. H. Usmani	Feb.1972	30.08.1972
2.	Mr. Manzoor Ahmed	31.08.1972	22.08.1973
3.	Dr. A. Q. K. Afghan	23.08.1973	30.03.1976
4.	Sheikh Manzoor Ahmed	31.03.1976	28.02.1978
5.	Prof. Dr. Nisar Ahmad	01.03.1978	30.07.1979
6.	Maj. Gen. Shafiq Ahmed	30.07.1979	21.02.1980
7.	Sheikh Manzoor Ahmed	22.02.1980	18.08.1982
8.	Mr. M. Masihuddin	19.08.1982	18.01.1989
9.	Mr. Tariq Mustafa	18.01.1989	18.12.1990
10.	Mr. Pervez Ahmed Butt	27.02.1991	27.11.1994
11.	Dr. S.M. Qureshi	27.11.1994	02.05.1996
12.	Lt. Gen. (R) Javed Ashraf	05.05.1995	04.05.1998
13.	Mr. Javed Masud	05.05.1998	30.04.2001
14.	Mr. Ashfaq Mahmood, (Secretary, IT & Telecom Division (Additional Charge of Secretary (MoST))	30.04.2001	09.09.2001
15.	Mr. Shahzad Hassan Pervez	10.09.2001	26.05.2004
16.	Kh. Zaheer Ahmed	01.07.2004	26.11.2005
17.	Mr. Farrukh Qayyum (Secretary, IT & Telecom Division (Additional Charge of Secretary (MoST))	27.11.2005	05.04.2006
18.	Mr. Parvez Butt	06.04.2006	05.04.2008
19.	Mr. Sharif Ahmed	07.04.2008	11.10.2008
20.	Mr. Saifullah Khan Sherwanee Additional Secretary Incharge	13.10.2008	17.01.2009
21.	Mr. Muhammad Kashif Murtaza	17.01.2009	10.12.2009
22.	Mr. K. B. Rind	11.12.2009	04.10.2010
23.	Mr. Irfan Nadeem	04.10.2010	14.07.2011
24.	Mr. Akhlaq Ahmad Tarar	16.07.2011	26.08.2013
25.	Mr. Kamran Ali Qureshi	26.08.2013	08.07.2015
26.	Mr. Fazal Abbas Maken	09.07.2015	13.09.2017
27.	Mrs. Yasmin Masod	14.09.2017	12.04.2019

28.	Mr. Nasim Nawaz	12.04.2019	20.01.2021
29.	Dr. Arshad Mahmood	21.01.2021	18.05.2021
30.	Mr. Nadeem Irshad Kayani	18.05.2021	28.07.2021
31.	Dr. Akhtar Nazir	28.07.2021	14.01.2022
32.	Ms. Humaira Ahmed	18.01.2022	07.06.2022
33.	Mr. Ghulam Muhammad Memon	07.06.2022	To-date
34.	Mr. Muhammad Abdullah Khan Sumbal [<i>Additional Secretary (Incharge)</i>]	18.05.2023	21.08.2023
35.	Mr. Ali Raza Bhutta	21.08.2023	To date

Strength of Ministry of Science & Technology as on 01.07.2022

Nomenclature of the Post	BS	Sanctioned posts
Secretary	22	1
Additional Secretary	21	1
Joint Secretary	20	2
Joint Technological Adviser	20	1
Joint Electronics Adviser	20	1
Joint Scientific Adviser	20	2
Chief Finance & Accounts Officer	20	1
Deputy Technological Adviser	19	1
Deputy Electronics Adviser	19	3
Deputy Scientific Adviser	19	4
Deputy Secretary	19	2
Science Counsellor, Beijing	19	1
Assistant Technological Adviser	18	2
Assistant Scientific Adviser	18	6
Assistant Electronics Adviser	18	3
Accounts Officer	18	1
Section Officer	17/18	8
Private Secretary	17/18/19	4
Assistant Accounts Officer	17	2
Scientific Officer	17	1
Admin. Officer (Legal)	16	1
Superintendent	16	2
Assistant Private Secretary	16	26
Assistant	15/16	27
Sub-Librarian	15	1
Stenotypist	14	21
Upper Division Clerk	11	4
Lower Division Clerk	9	9
Technician	6	1
Bearer	6	1
Staff Car Driver	4	13
Dispatch Rider	4	2
Daftary	2	2
Qasid	2	2
Naib Qasid	1	49
Electrician-cum-Plumber	1	1
Chowkidar	1	5
Frash	1	2
Sweeper	1	4
	Total:	144
	Grand Total:	220

International Liaison (IL) Wing

Introduction

International Cooperation in Science & Technology constitutes an integral function of the Ministry of Science and Technology (MoST) under Schedule-II [Rule 3 (3)]-28 (9)] of Rules of Business-1973. It provides opportunities to S&T organizations of MoST and Pakistani Scientists / Engineers to interact with international counterparts to enhance individual as well as institutional capacities on the principles of equality, reciprocity and mutual benefits. International Liaison Wing, MoST is responsible for enabling S&T organizations in Pakistan to develop linkages and pursue cooperation with friendly countries relevant international organizations.

The Main Functions of International Liaison Wing:

- To manage matters pertaining to bilateral and multilateral cooperation in Scientific & Technological fields under the umbrella of Bilateral Agreements/MRAs/PoCs/MoUs, Joint Economic Commissions (JECs), Joint Ministerial Commissions (JMCs) and Working Groups (WGs) on Science & Technology.
- Negotiations and subsequent signing of Bilateral, Tri-lateral, Multilateral Agreements/MoU, Programs & Protocols on Scientific & Technological Cooperation with friendly countries and other countries at regional, international levels with intergovernmental agencies and bodies.
- Soliciting the approval of the Prime Minister/President/Cabinet of Pakistan to initiate and signing of S&T Cooperation Agreements/MoUs/Programmes of Cooperation (PoC)/Protocols/Executive Programs, etc.
- Providing briefs/inputs on Science & Technology to Economic Affairs Division, Ministry of Foreign Affairs, Ministry of Planning, Development & Reforms and other Ministries /Departments.
- Interaction for Cooperation with the international organizations like UN Agencies, UNESCO UNESF, Economic Cooperation Organization, regional organizations like (ECO), South Asian Association for Regional Cooperation (SAARC), Organization of Islamic Cooperation (OIC), and intergovernmental bodies Centre for Science and Technology of the Non-Aligned and other Developing Countries (NAM S&T Centre), United Nations-Asian and Pacific Centre for Transfer of Technology (UN-APCTT), COMSTECH Committee on Scientific and Technological Cooperation, International Center for Theoretical Physics (ICTP) to facilitate participation in their Projects/Programs in the fields of Science & Technology and benefit from their assistance (technical and financial) of S&T Organizations.
- Dealing all matters of COMSTS University Islamabad (CUI) including the soliciting approval of President of Pakistan as Rector CUI.
- Preparation of Reports/Briefs for high level Pakistan delegations & Missions to facilitate their purposeful participation in International Meetings, Conferences etc. on Scientific & Technological Research matters.
- All Technical/Semi Technical matters/works related to NIO, CUI, NTS, COMSTECH, COMSATS/CIS and ECO-SF.

Bilateral & Multilateral Fora

During the financial year 2022-2023, International Liaison Wing has been undertaking coordination focusing on the following activities within the framework of bilateral cooperation and multilateral cooperation with Regional, International organizations.

• Bilateral Cooperation:

○ International MoUs signed during the report period

- Memorandum of Understanding (MoU) on Scientific and Technological Cooperation between Pakistan Council for Renewable Energy Technologies and Hangzhou Regional Center (ASIA-PACIFIC) for Small Hydro Power, Ministry of Water Resources, **China**.
- Memorandum of Understanding (MoU) between COMSATS University, Islamabad (CUI), Pakistan and University Tun Hussein Onn, **Malaysia**.
- Memorandum of Understanding (MoU) between COMSATS University Islamabad, Pakistan and Federal University of Juiz De Fora, **Brazil**.

- Agreement between the Agency of Standardization Metrology, Certification and Trade Inspection under the Government of the Republic of Tajikistan and Pakistan Standards and Quality Control Authority (PSQCA), Ministry of Science and Technology, **Pakistan**.
- Memorandum of Understanding (MoU) between Gdansk University of Technology, **Poland** and National University of Sciences & Technology, Islamabad, Pakistan.
- Memorandum of Understanding (MoU) Between COMSATS University Islamabad (CUI), Pakistan and Cardiff Metropolitan University, **United Kingdom**.
- **International MoUs under Process**
 - Non-Government Observer Agreement between COMSATS University Islamabad, Pakistan and Digital Cooperation Organization (DCO), Saudi Arabia for Becoming Basic Observer Member of the DCO.
 - Consortium Collaboration Agreement between COMSATS University Islamabad, Pakistan and Universiti Teknologi Malaysia (Network Host).
 - Ratification of Memorandum of Understanding (MoU) between the Ministry of Science and Technology and Research, Government of Sri Lanka and the Ministry of Science and Technology of the Government of Pakistan on Science and Technology and Innovation Cooperation.
 - Memorandum of Understanding (MoU) Between Institute of Metrology of Bosnia & Herzegovina and National Metrology Institute of Pakistan (NMIP), Pakistan for Cooperation in the field of Metrology.
 - Mutual Recognition Agreement (MRA) Between Pakistan Standards and Quality Control Authority (PSQCA) and Sudanese Standards and Metrology Organization (SSMO).
 - Memorandum of Understanding (MoU) between Tubitak National Metrology Institute, Ministry of Industry and Technology of the Republic of Turkey, and National Metrology Institute of Pakistan (NMIP) Ministry of Science and Technology of the Islamic Republic of Pakistan on the Establishment of Legal Metrology Infrastructure.
 - Strategic Partnership Agreement between NUST University of Sciences and Technology, Pakistan, and Southwest Jiaotong University (SWJTU), China.
 - Document of Understanding (DoU) Between COMSATS University Islamabad (CUI), Pakistan, and University of Applied Sciences and Arts, Dortmund, Germany.
 - Memorandum of Understanding (MoU) between Pakistan Science Foundation (PSF) Pakistan and Children & Youth Science Centre of CAST, China.
 - Agreement between the Center for the Development of the Halal Industry under the Ministry of Economy and Commerce of the Kyrgyz Republic and Pakistan Standards and Quality Control Authority (PSQCA), Islamic Republic of the Pakistan.
- **The Young Scientists Program (TYSP):**
MoST has been actively facilitating Pakistani young scientists and researchers for participation in the capacity building programs offered by the Chinese Government at China Science and Technology Exchange Centre (CSTEC). Only 02 scientist have availed this Programme during the Financial Year 2022-23 due to COVID restrictions from Chinese Government.
- **Cooperation at Multilateral Forum**
MoST, is the Focal Ministry for the following Intergovernmental and Regional Organizations and facilitates them in the activities mentioned below:-
- **Shanghai Cooperation Organization:**
IL-Wing, MoST participated in SCO 7th Meeting of Ministers of Science and Technology of the SCO Member States and Expert Group Meeting for the Preparation of the Meeting of Ministers of Science and Technology dated 15-16 May, 2023 held in New Delhi, India (virtual format).
- **Participation in Meetings / Training Workshops and Seminars abroad:**
During the FY 2022-23, many Scientists / Engineers and officers from MoST and its S&T organizations participated online whereas, 51 officers visited physically for participation in various scientific activities as a result of interactions at bilateral and multilateral levels.
- **S&T Organizations of MoST**
IL-Wing, MoST facilitated the following R&D/S&T organizations in their technical, semi-technical and administrative matters during the year 2022-2023:
 - National Institute of Oceanography (NIO)
 - COMSATS University, Islamabad (CUI)
 - Economics Cooperation Organization- Science Foundation (ECO-SF)

- COMSATS Headquarter/COMSATS Internet Service
- National Testing Service (NTS)
- COMSTECH
- Participation in joint Ministerial Commission between Iran and Pakistan held on 2nd August 2023 in Islamabad.
- 8th Session of Pakistan-Russia Intergovernmental Commission on Trade, Economic, Scientific and Technical Cooperation on 18-20 January 2023 in Islamabad.
- **Pakistan annually contributes to the following Organizations:-**
 - UN-Asia Pacific Centre for Technology Transfer (UN-APCTT),
 - The Centre for Science and Technology of the Non Aligned and other Developing Countries (NAM S&T Centre),
 - AS- ICTP- Abdus Salam International Center for theoretical Physics (AS-ICTP).
- Under CPEC, 11th Joint Cooperation Committee held on 27th October, 2022.
- A project entitled “**Establishment of Joint Research Center on Earth Sciences at Quaid-e-Azam University Islamabad**” approved by CDWP on 14-09-2022 amounting to Rs. 7.384 Billion. (Chinese Share (Grant) Rs. 4.152 Billion & PSDP Share Rs. 3.169 billion)
- To further collaborate **Establishment of the China-Pakistan Belt and Road Joint Laboratory on Smart Disaster Prevention of Major Infrastructures (under JWG)**, MOST Pakistan in coordination with the S&T wing of the Pakistan Embassy China has been arranging a visit of three Professors of the Joint Lab from the Southeast University Nanjing to Pakistan.
- The China-South Asia Technology Transfer Center (C-SATTC) established in 2017 in PCSIR organized the 2nd China-Pakistan Matchmaking Workshop on “Deepening China-Pakistan Cooperation on STI for CPEC- 16th December 2021. A Memorandum of Understanding between PCSIR/MoST and China-South Asia Technology Transfer Center (C-SATTC) will be signed in September 2023.
- The signing an MOU for Training and Capacity Building of Policy-makers and decision-makers on S&T Ecosystem and S&T Parks has been finalized and scheduled during the “**China- Pakistan STI Cooperation Conference - Shared Journey to a digital era**” expected in **September 2023**.
- Finalization of Strategic cooperation framework on semiconductors between STZA and MOST China is in progress.
- **The MoU on STEM Education between the Pakistan Science Foundation (PSF) and Chinese Association of Science and Technology (CAST) has been signed in Jan. 2023.**

Technology Wing

Introduction

Technology Wing has been entrusted the responsibility to oversee a range of initiatives aimed at advancing technology and promoting industrialization within the country. Additionally, this wing serves as a bridge between different government ministries and both national and international organizations that work towards advancing science and technology. This wing also acts as liaison between various ministries and national and international bodies for the development of Science Technology. The leadership of this wing is comprised of a Joint Technological Adviser, supported by a Deputy Technological Adviser and two Assistant Technological Advisers.

Objectives & Functions

- Promotion and development of industrial technology
- Promotion of Metrology, Standards, Testing and Quality Assurance System
- Establishment of Accreditation system in the country.
- WTO / TBT affairs relating to PSQCA
- Technical matters of PCSIR, PNAC, PSQCA, PEC, PHA and NEECA.

Activities carried out by Technology Wing:

- **National Industrial Hemp and Medicinal Cannabis Policy**
 - Summary for the Cabinet regarding National Industrial Hemp and Medicinal Cannabis Policy was routed through Ministry of Narcotics Control, Ministry of National Food Security, Ministry of Commerce and Cabinet Division. Cabinet Division forwarded Summary to Prime Minister Office for its approval.
 - A summary was submitted for the approval of Prime Minister regarding role of Ministry of Narcotics Control (MoNC), Ministry of Science and Technology and to constitute a Committee under the Chairmanship of Federal Minister for Narcotics to review the Hemp Policy and subsequently, the final draft of the policy shall be submitted by MoNC.
 - The Prime Minister's Office approved the roles of the Ministry of Narcotics Control (MoNC) and the Ministry of Science and Technology (MoST), and a committee was established to evaluate the hemp policy. MoST conveyed this approval to MoNC for appropriate follow-up and implementation.
- **Pakistan Council of Scientific and industrial Research (PCSIR)**
 - Initiated the project with PCSIR to enhance its Testing Facilities to support the local trade and export
 - Project proposals for funding regarding to enhance Testing facilities for the Fruits and Vegetables and Surgical Instruments in the PCSIR laboratories, Karachi and Lahore respectively were sent to Export Development Fund , Ministry of Commerce
- **National Energy Efficiency and Conservation Authority (NEECA)**
 - SRO has been issued to prohibit the manufacture, sale and import of incandescent lamps and compact florescent lamps (CFLs) with effect from the 1st day of July, 2023.
 - National Energy Efficiency & Conservation (NEEC), Policy 2022 formulated by NEECA has been submitted to Cabinet Committee on Energy for approval before its submission to CCI.
 - Draft NEECA Energy Label Regulations for fan have been drafted and under process of approval of BoD of NEECA and further approval of Federal Cabinet.
 - Tariff Policy Board in its meeting approved the proposal of this Ministry regarding removal of Regulatory duty on import of Silicon steel sheet used in the manufacturing of electric fans.
- **Pakistan Standard and Quality Control Authority (PSQCA)**
 - Inclusion of quality standards in mandatory list of PSQCA.
 - Minimum Energy Performance Standards (MEPS) for electric fans has been included in the mandatory list of PSQCA after approval of the Federal Cabinet.
 - National Security Standards has been included in the mandatory list of PSQCA after approval of the Federal Cabinet.
- **Pakistan Engineering Council (PEC)**
 - Obtained Legal opinion from Ministry of Law and Justice regarding jurisdiction to issue standard Bidding Documents. Ministry of Law and Justice in its comments stated that PEC as per its Act 1976 has authority/mandate to establish standards for bidding and tender documents

- for Engineering works/contract, cost and services. The same mandate cannot be exercised by any other Authority.
- Proposed amendments regarding in PEC construction and operation of Engineering Works Bye-Laws , 1987 was processed and sent to Cabinet Committee for Legislative Committee (CCLC) for its approval
 - **Pakistan Halal Authority (PHA)**
 - The Pakistani Halal Authority has registered 10 Halal Certification Bodies, and they have also commenced the establishment of Memorandums of Understanding (MoUs) among various organizations.
 - **Miscellaneous Activities**
 - **Exemption Certificate from custom duty to R&D organizations**
Ministry of Science and Technology has been issuing certificates of exemption from custom duty in favor of different R&D organizations, including Pakistan Council of Scientific and Industrial Research (PCSIR), National Institute of Electronic (NIE), National Metrology Institute of Pakistan (NMIP) etc.
 - **Pakistan Regulatory Modernization Initiative (PRMI)**
Working as focal person for Pakistan Regulatory Modernization Initiative (PRMI)
Actively participated in Pakistan Single Window (PSW) initiative for ease of doing business.
 - **Membership of the Committees**
Technology Wing is a member of following various committees of within different organizations and actively participates in their core meetings:
 - Pakistan Engineering Council, Governing Body
 - Auto Industry Development Committee (AIDC), EDB
 - National Technology Council (NTC)
 - High Level Committee between Civil and Military organizations
 - National Energy Efficiency & Conservation Authority (NEECA)
 - National Bio-Safety Committee (NBC), Ministry of Climate Change
 - National Computing Education Accreditation Council
 - National Vocational and Technical Training Commission
 - PEC Rain Water Harvesting Committee

POLICY AND COORDINATION (P&C) WING

Introduction:

Policy & Coordination Wing is headed by Joint Scientific Adviser (JSA), assisted by a Deputy Scientific Adviser (vacant) and Assistant Scientific Adviser (vacant) and is responsible for dealing with matters related to National Science, Technology and Innovation Policy initiatives and identifies areas for S&T research to respond national requirements in emerging technologies.

OBJECTIVES & FUNCTIONS:

- Establishment of S&T/R&D institutes and laboratories for research and development in the scientific and technological fields.
- Monitoring and evaluation of research and development work.
- Dealing with technical matters of the Pakistan Council for Science and Technology (PCST), Pakistan Science Foundation (PSF), Pakistan Museum of Natural History (PMNH), Pakistan Scientific and Technological Information Centre (PASTIC) and National University of Sciences and Technology (NUST).
- Coordination with Federal and Provincial S&T Councils/Departments/Organizations/ Strategic Organizations and NGOs dealing with S&T.
- Matters related to National Commission for Science and Technology (NCST) and its Executive Committee (ECNCST).
- Civil Awards for Scientists and Technologists.
- Miscellaneous matters.

REGULAR ACTIVITIES:

- S&T Policy-related issues and coordination on technical matters of MoST's Organizations and other Ministries.
- Coordination with Defense R&D organizations.
- Civil Awards for Scientists and Technologists.
- Technical matters of PCST, PSF, PMNH, PASTIC and NUST.
- Matters relating to Environmental Pollution/Bio-safety and Bio-security in coordination with the Ministry of Climate Change.
- Scientific NGOs.

ACTIVITIES PERFORMED DURING THE YEAR UNDER REPORT

• Civil Awards for Scientists & Technologists

Nominations for different categories of Civil Awards are processed in the Cabinet Division. The Ministry of Science and Technology is the focal point for the evaluation of credentials of scientists and technologists. Federal Minister for Science and Technology is the chairman of the Awards Sub-Committee on Science, Engineering and Education. R&D organizations, Pakistan Academy of Sciences and different universities of the country have forwarded nominations for consideration of Civil Awards – 2023. Ministry of Science and Technology examined credentials of the 41 nominees as per approved Quantified Criteria and recommended 16 nominees. Civil Awards in different categories of Science, Technology, Education, Medical Sciences and Engineering have been bestowed upon following 12 scientists/technologists/researchers and educationists.

1.	Prof. Dr. Shahid Mahmood Baig	Hilal-i-Imtiaz
2.	Dr. Jamshed Iqbal	Sitara-i-Imtiaz
3.	Prof. Dr. Amjad Siraj Memon	Sitara-i-Imtiaz
4.	Prof. Dr. Faisal Shafait	President's Award for Pride of Performance
5.	Prof. Dr. Bushra Mirza	President's Award for Pride of Performance
6.	Prof. Dr. Bilquis Shabbir	President's Award for Pride of Performance

7.	Dr. Haider Abbas	Tamgha-i-Imtiaz
8.	Dr. Muhammad Usman Akram	Tamgha-i-Imtiaz
9.	Dr. Tahir Masood	Tamgha-i-Imtiaz
10.	Dr. Salman Raza Naqvi	Tamgha-i-Imtiaz
11.	Dr. Hammad Omer	Tamgha-i-Imtiaz
12.	Syeda Arooba Bilal Hussain Gillani	Tamgha-i-Imtiaz

- **Coordination with MoST's organizations**
 - Coordination regarding BOGs/BODs/BOTs of PCST, PSF & NUST on various technical matters.
 - Review Monthly Progress Reports of PCST, PSF, NUST, PASTIC and PMNH and provided technical support for research activities.
- **Coordination with other Ministries/Participation of P&C Wing**
 - Research Topics-2023-2024 related to Science, Technology and Innovation forwarded to National Defence University, Islamabad.
 - Follow up of Committees/Task Forces/Sub-Committees etc. constituted under the directions of the Prime Minister submitted to the Prime Minister's Office.
 - Provided information to Ministry of Planning, Development and Special Initiatives on Mid Term Review Summit on Sustainable Development Goals.
 - Provided report on Performance of the Government related to Science, Technology and Innovation to Ministry of Information and Broadcasting.
 - Provided information to Prime Minister's Office (Internal) on International Biomedical & Digital Health Conference (IBDC-2022) held on Tuesday 22nd and Wednesday 23rd November, 2022 at Karachi.
 - On the occasion of Pakistan Day – 23rd March, 2023 provided material regarding latest development in STI for projection abroad to Ministry of Information and Broadcasting, Islamabad
 - Views/comments forwarded to Ministry of Climate Change on the Feasibility Study & First Prototype Test Report of Smoke Density Reduction (SDR) Device for BTK Brick Kilns Technology
 - Provided projects from R&D organizations of MoST to Ministry of Climate Change on Call for Proposals for GEF-8 (2022-26) Star Allocation for Pakistan
 - Expert views and comments provided to Ministry of Information Technology and Telecommunication on Draft National Artificial Intelligence Policy
- **Workshops, Conferences and Meetings participated**
 - The meetings of the Main Awards Committee and Awards Sub-Committee for Science, Engineering and Education at Cabinet Division for Civil Awards 2022 and 2023.
 - Organized meetings on the Action Plan of National Science, Technology and Innovation Policy-2022 in the Committee Room of MoST
 - Interim Review Workshop for Developing National Productivity Master Plan on 24.8.2022 at Serena Hotel, Islamabad.
 - The First meeting of Technical Committee on Hazardous Waste held on 3.11.2022 under the chairmanship of Senior Joint Secretary (International Cooperation), Ministry of Climate Change Islamabad
 - Project evaluation meeting of "First Industrial National Innovation Survey (FINIS) project completed by PCST
 - The meetings of Higher Education Commission Selection Board for Project Funded Positions under the chairmanship of Chairman, HEC, Islamabad
 - Meetings of the National Agriculture Education Accreditation Council (NAEAC) for standardization of Agriculture Education at Higher Education Commission, Islamabad. Meetings of the Natural Sciences Linkage Programme (NSLP) Fund Management Committee at PSF, Islamabad for evaluation of projects and approval of funds
 - Executive Committee Meetings (ECM)-2022 and 2023 under the chairmanship of Rector, NUST at NUST, Islamabad.

- Organized meeting on Funding Mechanism for Tech Start-Ups on 03.03.2023 in the Committee Room of Ministry of Science and Technology to discuss various options of funding Tech Start-ups specifically through Competitive Research Program of Pakistan Science Foundation.
- Meetings of the Advisory Committee of Pakistan Science Expo under the chairmanship of Additional Secretary in committee Room of MoST.
- Meetings of Prioritization Committee to Prioritize Project for Allocation of R&D Funds under the chairmanship of Additional Secretary, MoST in committee Room of MoST.
- Meeting on Building Capacity to Advance National Adaptation Plan Process in Pakistan Consultation on “Climate Projections and Climate Risk Assessment and Institutional Capacity Assessment and Climate Information System” on 18.08.2022 organized by Ministry of Climate Change
- Meetings of Departmental Development Working Party (DDWP) under chairmanship of Secretary, MoST in committee room MoST
- Consultation on Priority Adaption Measure for Vulnerable Sector Meeting on 2.9.2022 at Serena Hotel, Islamabad organized by Ministry of Climate Change, Islamabad.
- Meetings of the Project Execution Committee under PSDP Projects Titled “Data Repository of Scientific Instrumentation in committee room of PCSIR under chairmanship of chairman PCSIR
- 5th Green Climate Fund (GCF) Board Pakistan Meeting on 26.09.2022 under chairmanship of Secretary, Ministry of Climate Change
- Inter-Ministerial Meeting on 7th Session of Japan Pakistan Joint Government Business Dialogue on 27.9.2022 under the chairmanship of Additional Secretary (Trade Diplomacy) at Ministry of Commerce, Committee Room, Block-A, Pak-Secretariat, Islamabad
- National Consultative Workshop to lay out a Strategic Roadmap for Preparations & Implementation of NAP Process on 13.10.2022 at Margalla Hotel, Islamabad organized by Ministry of Climate Change, Islamabad.
- Pakistan Cooling Action Plan (PCAP) Working Group Meetings at Serena Hotel, Islamabad organized by Ministry of Climate Change, Islamabad.
- Meetings of PCSIR Departmental Working Party (DWP) in the Committee Room of PCSIR Head Office, Islamabad
- First meeting of Technical Committee on Hazardous Waste on 03.11.2022 under the chairmanship of Senior Joint Secretary (International Cooperation), Ministry of Climate Change, Islamabad
- Delivered a lecture on Science, Technology and Innovation Policy “Flagship Regional Course on International Economic Agenda” organized by the Advisory body of United Nations Conference on Trade and Development (UNCTAD) Foreign Service Academy on 1.12.2022 at Ministry of Foreign Affairs, Islamabad
- Meetings of Impact of Research Organizations PCSIR-Infrastructure and HR Audit of PCSIR in committee room of PCSIR
- Consultative Session on Joining Lisbon Agreement for International Registration of Geographical Indication (GIs) on 22.12.2022 under the chairmanship of Director General IPO-Pakistan at IPO-Pakistan Headquarters, Ministry of Commerce, Islamabad
- National Science Bee X (STEM Expo) event held on 10th to 12 February, 2023 at NUST.
- Interactive Workshop on Green Climate Fund (GCF) Working Modalities and Accreditation Process on 10.03.2023 at Marriott Hotel, Islamabad organized by Ministry of Climate Change Islamabad.
- 2nd National Steering Committee Meeting on Improving Access to Assistive Technology, Islamabad on 22.03.2022 at Conference Room, Pakistan Baitul Mal Head Office, Islamabad
- 41st Meeting of the Higher Education Commission on 15.04.2023.
- Consultative Session on 08.05.2023 at IPO-Pakistan Head Office, Islamabad on “International Instrument on Intellectual Property, Genetic Recourses and Associated Traditional Knowledge” .
- Consultative Session on Food Security and Nutrition on 25.5.2023 under chairmanship of Minister for Planning, Development and Special Initiatives.

Finance and Accounts Wing

Introduction

This Wing is headed by Chief Finance & Accounts Officer (CF&AO) assisted by an Accounts Officer (Development Budget), Section Officer (F&A) and Assistant Accounts Officer (F&A).

According to System of Financial Management and Power of Principal Accounting Officer Regulation, 2021, S.R.O.285(I)/2021, dated 8-3-2021 in each Ministry/Division, there shall be a Chief Finance and Accounts Officer (CFAO) under supervision of the Secretary of a Ministry or Division (Principal Accounting Officer) shall be as under:-

- **In respect of budgeting**, the chief finance and accounts officer shall:—
 - undertake the budget planning and execution. He shall coordinate the entire budgeting activity in the Division and departments, sub-ordinate offices, organizations under the Division;
 - take into consideration the revenues and receipts, generated by various organizations or departments or Division concerned. He shall also take into consideration all accrued liabilities of previous years;
 - assist the administrative Secretary (principal accounting officer) for the estimation of resources, determination of financial implications of various operations or on-going activities and new schemes or programs or initiatives and budget for repair and maintenance of assets in the Division or departments;
 - ensure that budget estimates are realistic, finalized after due deliberations and exercise and prepared in accordance with canons of propriety and all relevant enactments, regulations, rules and instructions issued on the subject by the Finance Division;
 - assist principal accounting officer in submission of information to the Finance Division regarding mid-year report. On receipt of indicative budget ceilings (IBC), assist administrative Secretary (principal accounting officer) in proper distribution and allocation of funds under various heads of expenditures in accordance with the instructions and guidelines contained in budget call circular and report to Finance Division as per time lines given therein;
 - oversee and authenticate the preparation of budget order or new item statement (BOs/NIS) pertaining to the Division and all departments, sub-ordinate offices and organizations, to ensure that the same are prepared according to applicable instructions and sent to Finance Division for incorporation in budget estimates in time; and
 - examine all the budgetary proposals and estimates including development and non-development budget, received from heads of the departments or sub-ordinate offices or autonomous bodies or organizations and furnish advice with the approval of principal accounting officer.
- **In respect of revenues estimation** shall—
 - assist the principal accounting officer in policy and administration of laws governing non-tax revenue receipts;
 - examine budget estimates of revenue receipts of Divisions and organizations or departments or offices under the Division in the light of previous collections with justification of variance, relevant enactments, regulations, rules and instructions;
 - ensure that such revenues estimates are budgeted, reported and reconciled under correct head of accounts. Initiate action as well as inform Finance Division for the recoveries of any outstanding dues, whether revenues or otherwise. Be part of the team that will prepare case for filing in any court of law or defend any case in any court of law regarding revenues or dues;
 - ensure at source adjustment of non-tax revenue receipts where applicable; and
 - monitor the collection and reconciliation of non-tax revenues receipts by any or all departments, sub-ordinate offices and organizations under the jurisdiction of principal accounting officer, except in case of Federal Board of Revenue.
- **In respect of economic forecasting**, shall be examining the budget requirements and revenue estimations and shall also analyze financial strengths and weakness and other related aspects. He shall assist the principal accounting officer in economic forecasting through which the Division or department or office concerned shall be able to map its financial future and role in overall economic picture;
- **In respect of financing or loan**, shall—
 - assess the financial needs of the Division or department and plan, for obtaining domestic and foreign loans and grants, in coordination with all concerned officers;

- maintain appropriate record of receipt and payment schedules, and shall submit periodic need based reports to the Secretary or principal accounting officer and in case of organizations or departments or offices under the administrative control of the Division, guide or supervise on behalf of the Secretary or principal accounting officer;
- assess financing needs as indicated by principal accounting officer or communicated by other offices in the light of Government laws, rules, regulations and instructions and prepare a comprehensive proposal for approval of principal accounting officer. He shall also follow up the matters with relevant agencies and keep the principal accounting officer informed of progress;
- **In respect of investment**, shall proactively identify potential investment opportunities where applicable for the departments, sub-ordinate offices and organizations under the administrative control of the Secretary (principal accounting officer). He shall propose investments as per Government rules or instructions on the subject after thoroughly examining risks involved and provide solution to cover all the risks to safeguard public money. In case of entities under the Division, the chief finance and accounts officer's role shall be that of providing guidance on behalf of the Secretary or principal accounting officer;
- **In respect of development planning**, shall—
 - work with all officers to plan and implement development programs for the Division or department or organization. Under guidance of the principal accounting officer, he has to engage with the Planning and Development Division or Planning Commission regarding the development budget or Public Sector Development Programme (PSDP). Support the planning teams with information regarding assets and resources, modes of financing, cost estimation details, operational cost after completion and on any other financial or accounting matter for which support is required;
 - be a part of the team especially for the financing and accounting aspects and assess the impact on project or cost due to various variations or delays during the implementation phase. In case of departments, sub-ordinate offices and organizations under a Division, coordinate with the Planning and Development Division or Planning Commission and on behalf of Secretary or principal accounting officer, assist them if required; and
 - follow rules and instructions issued by the Planning and Development Division and Planning Commission. Assist in firming up proposal, especially cost, financial analysis as per available frameworks, monitor related financial progress to actual and physical progress;
- **In respect of cash management including Treasury Single Account System**, shall—
 - assist the principal accounting officer in cash management including implementation of the Cash Management and Treasury Single Account (TSA) Rules, 2020 with reference to Division, departments, sub-ordinate offices and organizations. Report on the implementation and progress of Treasury Single Account to principal accounting officer and Finance Division. Closure of commercial bank accounts of the Ministry or Division and transfer of funds into Federal Consolidated Fund; and
 - implement Government laws, rules and regulations including Cash Management and Treasury Single Account Rules and especially with reference to the procedure issued by Finance Division regarding operation of the assignment account, and other accounts with the banks;
- **In respect of maintenance, reconciliation and reporting of accounts**, shall:-
 - assist the principal accounting officer in the monitoring and reporting on financial performance of the Division, departments, sub-ordinate offices and organizations especially those linked to strategic objectives;
 - monitor and report to principal accounting officer about the availability of funds in all heads of accounts especially employee related expenditure and ensure that there shall be no shortfall or excess. He shall supervise maintenance of accounts and their timely reconciliation with the actual figures of the Accountant General of Pakistan Revenue or the banks or Finance Division or Economic Affairs Division or development partners or others, as the case may be, on monthly basis;
 - examine the progress of the expenditure and receipts and furnish monthly statement to principal accounting officer and Finance Division and reconciled statements of expenditure and receipts each month. He shall watch trend of excess and saving of expenditure, the trend of receipts and report to principal accounting officer as well as to Finance Division on quarterly basis;

- **In respect of asset protection** shall—
 - collaborate and cooperate with the officers of the Division, departments, sub-ordinate office and organization so that all assets including the financial assets of the Division or department are properly recorded and guarded. Coordinate and cooperate with other offices in recording, maintaining and safeguarding all other assets in accordance with rules, regulations and instructions on the subject; and
 - be a part of team or supervise annual assets stocks taking and report to Secretary or principal accounting officer annually or as may be required, regarding the status of the assets. In case of organization or departments or offices under the Division, his responsibilities shall be limited to overseeing the reporting on assets to the principal accounting officer;
- **In respect of budget execution or operations,** shall—
 - assist the principal accounting officer and provide guidance to the officers of the Divisions or departments or organizations in processing all matters relating to releases, re-appropriations, supplementary grants, technical supplementary grants, surrenders, adjustments, creation of posts, appointment of contingent paid staff. In accordance with applicable budgetary release policy, rules and regulations;
 - under the direction of principal accounting officer, assist the concerned officers in processing the claims and bills of expenditure, as per financial powers delegated to Ministries or Divisions;
 - help the principal accounting officer and other officers in keeping the expenditure within allocated budget for the quarter in accordance with fund release strategy issued by Finance Division. Monitor the budget execution including clearance of all outstanding or accrued liabilities and commitment control in all organizations, departments and offices under the jurisdiction of the principal accounting officer; and
 - submit cases to the principal accounting officer along with remedial measures taken or required to correct any excess expenditure or incorrect bookings, or shortage of resources well in time. Ensure that no payment due is missed despite availability of resources or budget. Process the anticipated saving, surrender and excess in accordance with rules, regulations and instructions on the subject ;
- **In respect of internal audit,** shall cooperate with chief internal auditor (CIA) and audit committee in making annual internal audit plan. Ensure that requisite records are provided to external or internal audit and response to audit observations or queries pertaining to his role and functions are submitted in time. He shall also follow-up on behalf of Secretary or principal accounting officer, in case the actions are required by others, on the internal audit recommendations;
- **In respect of internal controls,** shall—
 - extend assistance to the chief internal auditor for reviewing of internal control in the Ministry or Division, and organizations or departments or offices under the Division, pertaining to areas of budget, revenue, expenditure and finance, under the guidance and supervision of principal accounting officer. He shall also assist the principal accounting officer in enforcing the internal controls and for preventing irregularities, waste, fraud, etc. and shall exercise internal checks and balances; and
 - inform principal accounting officer about deviations from applicable laws, rules, regulations and instructions in matters relating to his area and follow up the orders of the principal accounting officer. To improve the internal control, work with chief internal auditor and other officers of the Division in firming up suggestions for improvement;
- In respect of risk management,** shall—
 - assist the principal accounting officer and the chief internal auditor in undertaking annually, an exercise to assess or evaluate risks faced by the Division or department, maintain a risk register and cause a similar activity in the entities under the Division. He shall also initiate risk response measures with the approval of Secretary or principal accounting officer regarding risks faced by the Division and organizations or departments or offices under the Division's risk profile; and
 - monitor risk response measures and keep the Secretary or principal accounting officer informed periodically. With the help of the chief internal auditor, he shall form a team from amongst the officers of the Division concerned, and may include officers from subordinate offices, to review the objectives, business processes as well as laws, rules, regulations, resources, achievements of objectives and remove obstacles in achieving these objectives;

- **In respect of coordination with Public Accounts Committee or Departmental Accounts Committee, shall—**
 - on behalf of the principal accounting officer, be responsible for coordinating all matters relating to Public Accounts Committee, Departmental Accounts Committee and audit observations on appropriation accounts and audit reports, ensuring compliance with the Public Accounts Committee and Departmental Accounts Committee directives and recommendations;
 - render advice to principal accounting officer and assist in preparation of replies to audit observations submitted by other officers if desired by principal accounting officer. Assist the principal accounting officer in preparing necessary briefs for the Public Accounts Committee or Departmental Accounts Committee and attend the meetings of the Public Accounts Committee and Departmental Accounts Committee along with the principal accounting officer, or as advised by principal accounting officer; and
 - submit advice to the principal accounting officer for compliance of rules, regulations, prescribed in the light of the Act by the Finance Division from time to time;
- **In respect of disbursements, payments and pre-audit functions under the Controller General of Accounts (Appointment, Function and Power) Ordinance, 2001 (XXIV of 2001), shall—**
 - under the supervision of principal accounting officer, deal with all cases of payments in respect of goods, services, personnel's, fees, charges, fines, loans and others according to delegated powers given to the officers; and
 - extend assistance and cooperation for timely payments, monitoring, reporting and conflict resolution. In case of other organizations under the Division, chief finance and account officer's role shall be restricted to only those cases or transactions that are referred to the Division or chief finance and account officers have been tasked to intervene by the Secretary or principal accounting officer; and
- **In respect of representation of the Division concerned on committees, shall—**
 - represent the Division concerned at various committees, including Public Accounts Committee, Departmental Accounts Committee and Departmental Development Working Party under the guidance of principal accounting officer; and
 - with approval of the principal accounting officer, be part of various committees of the Ministry or Division or departments or sub-ordinate offices concerned and shall proceed as per nomination and mandate of the committee concerned; and
- **Perform any other duty, role or responsibility** assigned by Government or Secretary of Division or principal accounting officer concerned to discharge functions in accordance with the Constitution of Pakistan, the Act, other statutory rules and regulations.
- **Devising of Financial Rules:** Secretary/PAO, MoST assigned to devising of Financial Rules of All S&T Organizations.
- **Venture Capital:** Formation of policy of Venture Capital.
- **Delegation of Financial Powers:** Delegation of Financial Powers to Officers of MoST, Head of all S&T Organizations and Projects,

The following five Department Accounts Committee meetings were held during financial year 2022-2023:-

S.#	DATE	SUBJECT
1.	10-1-2022	DAC meeting was held to discuss the Appropriation Accounts for the year 2018-2019 relating M/O: Science & Technology, Islamabad
2.	10-1-2022	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Civil) for the year 2019-2020 on the accounts of MoST.
3.	4-2-2022	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Civil) for the years 2004-05, 2006-07 & 2008-09 on the accounts of MoST.
4.	24-2-2022	DAC meeting was held to discuss the Audit Report printed in the

		Auditor General of Pakistan Report (Civil) for the years 2010-11 to 2018-19 on the accounts of MoST.
5.	24-2-2022	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Commercial Audit) for the years 2010-11 to 2018-19 on the accounts of PSF.
6.	24-2-2022	DAC meeting was held to discuss the Appropriation Accounts for the years 2013-14, 2015-16 and 2017-18 on the accounts of MoST.
7.	13-4-2022	DAC meeting was held to discuss Special Audit Report on MoST Building for the year 2017-18.
8.	6-9-2022	DAC meeting was held to discuss Audit Reports for the year 2010-11 to year 2017-18 (Federal Audit).
9.	6-9-2022	DAC meeting was held to discuss Appropriation Accounts for the years 2013-14-, 2015-16 & 2017-18 (Development Grants only).
10.	7-9-2022	DAC meeting was held to discuss Special Audit Report on MoST Building for the year 2017-18.
11.	7-9-2022	DAC meeting was held to discuss Audit Reports for the year 2010-11 to year 2017-18 (Commercial Audit).
12.	19-10-2022	DAC meeting was held to discuss Audit Reports for the year 2019-20 (Federal Audit).
13.	6-12-2022	DAC meeting was held to discuss Audit Reports for the years 2017-18 & 2018-19 (Federal Audit). Total No. Paras-4
14.	6-12-2022	DAC meeting was held to discuss Audit Reports for the years 2017-18 & 2018-19 (Commercial Audit). Total No. Paras-10
15.	6-12-2022	DAC meeting was held to discuss Special Audit Report on MoST Building for the year 2017-18. Total No. Paras-25
16.	6-12-2022	DAC meeting was held to discuss Appropriation Accounts for the year 2017-18 (Development Grants only).
17.	13-1-2023	DAC meeting was held to discuss Audit Reports for the years 2017-18 & 2018-19 (Commercial Audit). Total No. Paras-10
18.	13-1-2023	DAC meeting was held to discuss Special Audit Report on MoST Building for the year 2017-18. Total No. Paras-25

Non-Development Allocation and Expenditure for the Year 2022-23:

S.NO.	NAME OF ORGANIZATION	FINAL GRANT 2022-2023	EXPENDITURE
1	MINISTRY OF SCIENCE & TECHNOLOGY (MAIN SECRETARIAT)	368.148	358.071
2	SCIENCE COUNSELLOR OFFICE AT BEIJING (CHINA)	24.728	23.094
3	PAKISTAN COUNCIL FOR SCIENCE & TECHNOLOGY.	95.233	95.211

4	PAKISTAN SCIENCE FOUNDATION.	443.969	443.968
5	PAKISTAN MUSEUM OF NATURAL HISTORY.	217.356	217.353
6	PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE.	224.553	224.553
7	NATIONAL INSTITUTE OF ELECTRONICS.	261.825	258.749
8	NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY.	3,744.411	3,744.411
9	PAKISTAN NATIONAL ACCREDITATION COUNCIL.	57.573	57.573
10	PAK: COUNCIL OF RENEWABLE ENERGY TECHNOLOGY.	124.342	123.210
11	NATIONAL PHYSICAL STANDARD LABORATORY.	259.256	259.256
12	PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH.	3,612.708	3,612.707
13	NATIONAL UNIVERSITY OF TECHNOLOGY.	855.000	855.000
14	NATIONAL INSTITUTE OF OCEANOGRAPHY.	205.150	204.966
15	COUNCIL FOR WORKS AND HOUSING RESEARCH.	133.675	133.670
16	PAKISTAN HALAL AUTHORITY	23.723	23.025
17	COMSTECH.	284.240	284.240
18	COMSATS	112.200	112.200
19	ECO-SF.	67.015	67.015
20	COMSATS University Islamabad.	152.000	152.000
21	NATIONAL ENERGY EFFICIENCY AND CONSERVATION AUTHORITY.	150.000	150.000
22	NATIONAL ENERGY CONSERVATION CENTRE	36.739	36.290
	GRAND TOTAL:-	11,453.844	11,436.562

Electronics Wing (2022-23)

Introduction

Electronics Wing is providing supervision, guidance & evaluation of research and development works and scrutiny/monitoring of development projects in the fields of Electronics & Renewable Energy Technologies. The Electronics Wing also coordinates development programs in the fields of Electronics and Renewable Energy Technologies. Technical matters/ affairs of National Institute of Electronics (NIE), Pakistan Council of Renewable Energy Technologies (PCRET), Council for Works and Housing Research (CWHR), STEDEC Technology Commercialization Corporation of Pakistan (Private) Limited and National University of Technology (NUTECH) are dealt by this Wing.

Electronics Wing has been assigned the task for the preparation and processing of the draft Bills, for providing legal cover to the organizations under MoST, which were created through Resolutions / Executive Orders etc. and other legislative matters/issues related to the S&T Sector/organizations.

Processing, coordination, implementation and trainings related to the IT and E-Government in the S&T Division.

Electronics Wing also provides necessary technical opinion on standardization of electronic components, devices, processes and attended meetings of National Standards Committees (NSCs) and Technical Committees (TCs) on Electronics organized by Pakistan Standard and Quality Control Authority (PSQCA).

Functions of Electronics Wing

- Dealt with the technical affairs of National Institute of Electronics (NIE), Pakistan Council for Renewable Energy Technologies (PCRET), Council for Works and Housing Research (CWHR), STEDEC Technology Commercialization Corporation of Pakistan (Private) Limited and National University of Technology (NUTECH). In particular, provided necessary guidance for the completion of extension plans of NIE, PCRET, CWHR, STEDEC and NUTECH, which have been planned to enhance their technical activities.
- Drafted and processed Bills for the enactment of organizations under MoST, created through Resolutions/Executive Orders etc.; which have no legal status and other related legislative issues.
- Implementation of E-Government initiatives and IT Security instructions in S&T Division, as directed by the Cabinet Division.
- Pursued the decisions taken in the meetings of the Standing Committees of the National Assembly and Senate on S&T and actions taken for their implementation, related to PCRET, NIE, CWHR, STEDEC and NUTECH.
- Dealt with the matters of National Electric Power Regulatory Authority (NEPRA) and necessary technical opinions/views were conveyed to NEPRA, for awarding Power Generation Licenses/Licensee Proposed Modifications (LPM) to different Organizations/Companies.
- Cases of National Telecommunication and Information Technology Security Board (NTISB), Cabinet Division regarding different security threats were examined and circulated to all organizations of MoST for awareness, precautionary measures and strict compliance.
- Miscellaneous matters assigned to Electronics Wing on regular basis by the competent authority.

Details of the Activities

- **Evaluation and Monitoring of NIE, PCRET, CWHR, STEDEC and NUTECH:**
Progress reports of National Institute of Electronics (NIE), Pakistan Council of Renewable Energy Technologies (PCRET), Council for Works and Housing Research (CWHR), STEDEC Technology Commercialization Corporation of Pakistan (Private) Limited and National University of Technology (NUTECH) were expedited, evaluated and necessary guidance provided to the above said organizations.
The bottlenecks pointed out by NIE, PCRET, CWHR, STEDEC and NUTECH regarding implementation of their projects and administrative matters were taken up with the concerned Ministries/departments for consultancy/solutions.
- **Legislation:**
In pursuance to the instructions of the Establishment Division, the draft Bills of the following organizations are under process at MoST. Details of which are as under:-
 - **National Metrology Institute of Pakistan Bill, 2022**
National Metrology Institute of Pakistan Bill has been passed and Gazette notified on 03.09.2022.

- **Pakistan Engineering Council (Amendment) Bill**
PEC Amendment Bill was circulated for inter-ministerial consultation. The comments received from stakeholders are being compiled.
- **Pakistan Standards and Quality Control Authority (Amendment) Bill**
PSQCA Amendment Bill was forwarded to Law and Justice Division for vetting. The queries raised by Law and Justice Division are under consideration.
- **Amendment Bills of PNAC & PCSIR**
PCSIR and PNAC Amendment Bills have been vetted by the Law and Justice Division and summaries are being prepared.
- **Meetings on Standardization**
Meetings on standardization of electronic components and devices/processes were attended and technical opinions were provided for the finalization of standards.

National Electronics Policy (NEP)

Electronics Wing initiated the task for formulation of National Electronics Policy (NEP). The objective of National Electronics Policy is to identify the issues/problems being faced by the Electronics Industry in the country and address these issues for enhancing and promotion of Electronics Industry in Pakistan. The Coordination Committee for the said task was constituted to identify the Experts in the field of electronics and related fields. The Coordination Committee obtained nominations of relevant experts from industry, academia, R&D organizations etc. for formulation of Expert Groups and Working Groups in sub-sectors of electronics namely: Micro-Electronics, Consumer Electronics, Opto-Electronics and Power Electronics. The Coordination Committee has also prepared a Questionnaire for collection of data from these Working Groups for drafting of Policy document.

These Groups have assessed the current status of industry, academia and research, based on the available data of Electronics Industry in the country, to identify issues/problems being faced by the Electronics Industry. The draft write-up on Consumer Electronics and Power Electronics have been submitted by their respective Working Groups. The draft write-up on Micro-Electronics and Opto-Electronics is under process. The draft write-ups of all four Working Groups will be included in the first draft of NEP.

Establishing Research Infrastructure for Quantum Technologies

Keeping in view the importance of Quantum Technologies, Electronics Wing of MoST has initiated the task for the establishment of Research Infrastructure for Quantum Technologies in the Country. Organizations of MoST (NIE, NUST, CUI and NUTECH) prepared proposal/strategy for the development of Quantum Technologies in the country through Capacity Building, R&D and establishment of necessary infrastructure. The task is under progress.

Establishing Centre on 3-D Printing Technology

Electronics Wing of MoST has initiated the task for the establishment of Centre on 3-D Printing Technology at NIE. Electronics Wing is in the process of preparing a strategy/proposal for the establishment of 3-D Printing Technology for research & development of the technology and its indigenization. In this regard, a committee was constituted. Two meetings of the committee were held at MoST. Further progress on the initiative is under process.

E-Office

Electronic Filing system has been launched in the Ministry of Science and Technology (MoST) in coordination with Ministry of Information Technology and Telecommunication (MoIT&T) to establish paperless environment in the Ministry. It not only improved the archaic system of filing, but also speed up the disposal of official business.

E-Office is a software application developed to automate functions common to all the Federal Ministries/Divisions, in order to enhance efficiency and delivery of the Government services in a transparent and efficient manner. E-Office application has been implemented in all sections of MoST and almost all files have been moved through e-Office application. The Ministry of Science & Technology has achieved level IV of E-Office implementation.

IT Section of MoST, working under the Administrative Control of Electronics Wing, has implemented and launched the new version of E-Office at MoST.

Board Meetings

Electronics Wing processed the Working Papers/Minutes and participated in the meetings of following Boards to represent Ministry of Science & Technology:

- Alternative Energy Development Board (AEDB)
- Bahria University
- Air University

- Pakistan Institute of Engineering and Applied Sciences (PIEAS)
- Karachi Tools, Dies & Moulds Center (KTDMC)
- National Information Technology Board (NITB)
- COMSATS Internet Services (CIS)
- Sir Syed-Center for Advanced Studies in Engineering (CASE)-Institute of Technology (SS-CASE-IT)

STEDEC Technology Commercialization Corporation of Pakistan (Pvt.) Ltd.

- Secretary, Ministry of Science and Technology is Chairman of the Board of Directors of STEDEC. Working papers/minutes of the BoD meetings and Annual General Meetings of STEDEC are processed in Electronics Wing.

Activities of Electronics Wing during the Period

- Electronics Wing provided valuable comments/input of MoST on the draft State-Owned Enterprises (SOEs) Policy to the Ministry of Finance.
- Joint Electronics Adviser is the focal person of Ministry of Science & Technology in the National Project Steering Committee (NPSC) of Growth for Rural Advancement and Sustainable Progress (GRASP).
- Deputy Electronics Adviser has been nominated as member of the Committee on National Animation Incubation Project under MoIT&T and submitted the requisite information to MoIT&T for the said project.
- Electronics Wing has prepared a draft IT Security Policy of MoST on the directions of NTISB, Cabinet Division and submitted the same to P&C Wing of MoST for vetting.
- Deputy Electronics Adviser is the Focal Person (Technical) for Prime Minister Delivery Unit (PMDU) and processed the assigned cases related with MoST and its organizations.
- Joint Electronics Adviser, MoST has been nominated as resource person for the information session on greening digital transformation in a circular economy for electronics to be held by MoIT&T.
- Deputy Electronics Adviser, MoST attended the meeting on indigenizing the components of EVS Framework on 08.12.2022 to represent Secretary, MoST.
- Deputy Electronics Advisers, MoST participated in the Advanced Electronics Meetup conducted by Special Technology Zones Authority (STZA).
- Processed the case for nomination of potential candidates for the annual Aziz-UI-Haq Rural Development (AHRD) Medal 2023 to be awarded by Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP).
- Task for Formulation of National Start-up Policy was assigned to the Electronics Wing. Electronics Wing/PCST prepared a draft National Startup Policy and circulated the same for inter-ministerial consultation. Final Draft of the National Start-up Policy has been prepared after incorporating the input of relevant Federal/Provincial Organizations/Divisions. The same was submitted to P&C Wing, MoST for comments.
- Deputy Electronics Adviser, MoST is focal person for authentication of credentials of MoST's employees for Basic IT Course of NITB.
- Deputy/Assistant Electronics Adviser attends the Inter-Ministerial Committee meetings of National Electric Vehicle Policy (NEVP). Standards for Electric Vehicle Charging Station were adopted by PSQCA while formulation of standards for Electric Vehicles is under process.
- Deputy/Assistant Electronics Adviser coordinated with PSQCA for drafting of Standards on Electric Vehicles Battery Safety, Recycling and Disposal (EVBSD). A meeting, in this regard, was held at MoST on 03.08.2022 under the Chair of Joint Electronics Adviser, MoST.

Parliamentary Business

Electronics Wing forwards replies for the National Assembly and Senate questions related to National Institute of Electronics (NIE), Pakistan Council of Renewable Energy Technologies (PCRET), Council for Works and Housing Research (CWHR) and National University of Technology (NUTECH). This wing is also pursuing aggressively, for the implementation of the decisions made by the said Standing Committees related to NIE, PCRET, CWHR and NUTECH.

Public Sector Development Programme 2022-23:

Introduction

The Ministry of Science and Technology (MoST) is the national focal point and enabling arm of Government of Pakistan for planning, coordinating and directing efforts to initiate and launch scientific and technological programs and projects as per national needs necessary for rapid socio-economic development of the country.

Achievements in 2022-23

Following are some of the key highlights of the progress made on the development side by MoST during 2022-23:

- **MoST is guiding and supporting Small & Medium Enterprises (SMEs)** for exploring and adopting new trends and requirements of international competitiveness, improved industrial productivity and quality according to the requirements of Internationally recognized Standards and Guidelines. A total of 1642 applications have so far been received and considered from SMEs of various sectors operating across the country for the award of Incentive Grant against various Certification schemes. Out of 1642 applicant SMEs, a total of 967 applicant firms have been approved for award of the Incentive Grant amounting to Rupees 312.300 Million. Out of 1642 applicants, 230 applications have been rejected on account of non-fulfillment of prescribed criteria. Rest of the applications are under process for the purpose of verification of Certifications and on-site verification of other details of the applicant firms.
- **For the capacity building of SMEs personnel**, MoST & its organizations, Training Programmes were designed in consultation with the Chambers of Commerce & Industries, sector specific Trade Associations, SMEs and other stakeholders before the finalization of the PC-1. The Training Programme element of the project was outsourced to M/s Bureau Veritas Pakistan (Pvt.) Ltd. through open bidding. Under the contract M/s Bureau Veritas Pakistan (Pvt.) Ltd. has conducted / delivered Fifty-four (54) sessions of 2-Day (non-examination based) training courses against 19 certification standards. Five (5) training sessions of 5-Day (examination based) lead auditor courses against 05 certification / accreditation standards have also been delivered / conducted. To maximize the training benefit, all of the Training sessions were delivered / conducted at most appropriate places / locations, especially in the vicinity of Industrial hubs / clusters across the country.
- **For Capacity Building and HRD in S&T Sector**, Science Talent Farming Scheme (STFS) is being implemented to groom the selected youth and support them all the way to highest degree by progressively exposing them to advanced topics in science with application of inquiry based approach to learning. Under the scheme selection of 5 batches of students (1500 total) completed. Financial assistance to 13 universities in total @ Rs. 1.00 million provided to approved universities. Honorarium to total 60 mentors @100,000 for supervision of STFS students in their research projects. Approximately 350 Research projects received by STFS 1st, 2nd, 3rd, 4th and 5th batch students in the form of Posters/Reports.
- **National University of Science & Technology (NUST) and National University of Technology (NUTECH)** are performing their best in research and implementation of new ideas. During the current financial year (2022-23) NUST is executing 05 projects for the purpose of enhancing the capabilities of the institution which includes Establishment of Additional Production Lines for Research and Development of Indigenous Electromedical Devices, Establishment of Centre for International Peace and Stability at NUST and Strengthening and Upgradation of Research and Development facilities Accreditation of Laboratories in Accordance with ISO and Establishment of NUST Chip Design Centre.

Under the Establishment of Additional Production Lines for Research and Development of Indigenous Electromedical Devices project the first Indigenous developed Ventilator is completed. Software validation is in progress. Two prototypes of Powered Air Purifying Respirator (PAPR) are approved by Pakistan Engineering Council. Further refinement in the prototype is underway

- **Upgradation of Overall R&D infrastructure of the Labs and Facilities of MoST Organizations** was continued to be upgraded to enhance the internal research capability of these organizations. These laboratories at various locations will not only create jobs but will also play a vital role in the economic development by providing testing facilities to the local industries in food safety and security, building materials, minerals, water testing and fisheries and chemicals. Under PCSIR's projects related to upgradation of Labs, 80 % Lab Equipment as per PC-I has been procured, installed /commissioned and fully functional. These included GCMS, HPLC, Atomic absorption, UV spectrometry, trainers and general Lab equipment of IIEE, Library management system for Libraries of IIEE and PSTC, Purchase of Licensed software for PCs. Medicinal, Botanical Garden with 300 plants/species/flora/ commercially important has been established. Analytical and Testing Services to different industries have been initiated. Capacity Building/ trainings on seed collection/Cultivation/processing of herbs has imparted to university students of different disciplines like botany, horticulture, agriculture, biotechnology etc.
- **Industry Focused R&D is the prime impetus at Pakistan Council of Scientific and Industrial Research (PCSIR).** with a network of 17 research laboratories/ units including 06 training institutes located all over the country. PCSIR supports industrial sector in various sectors for providing cost-effective technology solutions to improve their economic performance. PCSIR provides services in energy, food, advance and composite material, leather, textile, food safety and value addition, herbal medicines and products. The council laboratories are providing testing & certification services to almost entire industrial sector and most of the exportable products are being tested by its ISO-17025 accredited labs. For Cluster Based Development, PCSIR laboratories are also providing technical services to the industrial sector particularly to SMEs to enhance or establish their industries. Technical training centers of PCSIR at Karachi, Lahore, Peshawar, Quetta and Daska are providing 3-4 years diploma certificates. More than 300 students are awarded diplomas/ degrees annually and most of them get jobs immediately.
- **Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields**
PCSIR is currently working on experimental cultivation of cannabis for medicinal and experimental fields. It is a multibillion industry globally and it will create new opportunities for Pakistan to generate capital. It will also boost the medical industry's output and reduce the cost of manufacturing. Research, Development and Technology transfer of selected active pharmaceutical ingredients (APIS) for impact substitution (PCSIR). This project aims to establish a capability of producing Active Pharmaceutical Ingredients (APIs) through biocatalytic technologies/ metabolic engineering techniques, for use in manufacturing selected anti-cancer drugs, antibiotics, immunomodulatory agents and vitamin B12.
- **In Health Sector,** MoST is undertaking the project titled Establishment of a Center for Artificial Intelligence in Health Sciences in HEJ, University of Karachi. Under this project, construction of labs is complete, ICT and Hardware equipment for labs related to Artificial Intelligence have been Purchased, installed and commissioned. In-House training has been started and project-based assignments have been given to selected Scholars. One Research Scholar has completed his one year foreign training. Three research scholars have been sent to Austria for their international training at the Software Competence Center Hagenberg, Austria.
- **In Nano Technology Sector,** MoST is undertaking the Establishment for Industrial Production of Nanomaterials in Latif Ebrahim Jamal Nanotechnology Center and a beautiful building of Nanotechnology Center is fully functional with respect of civil works. Laboratory equipment, I.T equipment have been purchased and successfully installed in respective labs. Faculty members and research scholars are actively involved in research work related to different field of nanotechnology. Purchase of Chemicals / consumables and other reagents for research and development activities of the project have been completed.
- **Establishment of Planning, Monitoring & Evaluation Cell in MoST:** MoST is underway the in the establishment of PM&E cell. This will enhance the capability of processing of PC-1s and reduce the work load.

Budgetary Overview of Development Activities

Initially under Public Sector Development Programme PSDP 2022-23, an amount of **Rs. 5716.394 Million was allocated** to Ministry of Science & Technology. This allocation included **34 on-going projects of MoST and 01 new project**. However, this allocation was capped to the tune of Rs. 3365.628 Million during PSDP 2023-24. There were 13 projects planned for completion but due to lesser funds released, austerity measures and ban on purchase of scientific equipments, only 02 projects could be completed.

National Institute of Electronics (NIE)

Introduction

National Institute of Electronics (NIE) is an R&D organization, under the Ministry of Science & Technology. It was established through Presidential Ordinance No. III of 1979. The aim of the Institute is to undertake design & development work in emerging areas of electronics and to acquire advanced level know-how in major disciplines of electronics.

The general administration of the affairs of the Institute and the formulation of its policies vests in the Governing Body which is headed by Director General of the Institute, whereas, the Executive Committee is responsible for the day-to-day functioning of the Institute.

Functions

- To carry out design and development work in vital areas of electronics.
- To develop know-how in advanced electronics techniques and exchange of knowledge/impart advanced training in electronics.
- To establish close liaison with other organizations engaged in R&D, academic and production activities.
- Undertake design and development projects on contract with user organizations.
- To establish small scale production line of specialized electronics equipment.
- To arrange seminars & conferences.

Performance Outcomes

Target-I: To carry out design and development work in vital areas of electronics.

- Prototype conversion of Mehran to Electric Vehicle.
- Design and tape-out of Processor Chip
- Design & development of IoT based automation solutions.
- Design and development of different ratings of smart LED lights.

Target-II: To develop know-how and exchange of knowledge / impart advanced training in electronics.

- Training provided to 38 officials of 505 EME Army Workshop.
- Advanced industrial training on programmable logic control (PLC) Human Machine Interface (HMI) and supervisory control and data acquisition (SCADA) provided to nine (09) professionals.
- Semiconductor Chip Design Training program provided to eight (08) Engineers.
- Renewal of accreditation audit/ assessment on ISO/ IEC 17025:2017 standards for its electrical testing facilities.
- Training provided to public sector organization on measurement uncertainty for implementation and maintenance of ISO/IEC 17025: 2017 accreditation.
- Provided a number of services including electrical testing and electrical calibrations to a number of customers from public and private sector organizations.
- Advance training provided to fifty (50) students under PM Skill development Program.
- Mechanics have been trained on latest automotive diagnostics technology.
- General Internship/ training provided to two hundred (200) engineers from different universities of Pakistan.
- 14 Industrial visits conducted for different engineering universities of Pakistan.
- 05 Final Year Projects (FYPs) of engineers from different universities are in process at NIE.

Target-III: To establish close liaison with other organizations engaged in R&D academic and production activities.

- Memorandum of Understanding (MoUs) signed with Research & Development Establishment (RDE) for joint R&D collaboration on 13th June, 2023.
- Memorandum of Understanding (MoUs) signed with PAF- KIET (EDCAS) & NIE for Collaborative Research and Development Arrangements (CRADA) on 8th September, 2022.

Target-IV: To provide PCB, SMT and testing services to different public and private Sector organizations.

- SMT assembly and rework services provided to multiple customers and Public and private sector universities.

Target-V: To Conduct Seminars/Conferences and Workshops in the field of Electronics

- 3rd International Conference on Communication, computing and Digital Systems (C-CODE'23) on 17th May, 2023 jointly organized by NIE and Bahria University E-8 Campus, Islamabad.
- Conference on role of academia and Industry for Promotion of Semiconductor Chip design Technology was held on 7th December, 2022.

Budget Allocation for R&D during F/Y 2022-23

A total of 02 Million has been allocated for Research and Development work during financial year 2022-23. NIE started different projects related to defence, commercial and Human Resources Development nature. New technology have been initiated. e.g. Design and development of various digital integrated circuits, Development of smart automation systems, Artificial Intelligence (AI) based vehicle detection system and smart LED lights.

Furthermore, NIE has also provided training to professional and engineers in advanced fields like semiconductor chip design, ISO standards and different advance courses in electronics.

**NATIONAL INSTITUTE OF ELECTRONICS, ISLAMABAD
PICTURES FOR YEAR BOOK 2022-23**



Communication Lab



Advance training on PLC,HMI & SCADA



Pakistan National Accreditation Council (PNAC)

Introduction:

Pakistan National Accreditation Council (PNAC) established in 1998 under the administrative control of Ministry of Science & Technology has the mandate to accredit all kinds of conformity assessment bodies such as: laboratories (testing/calibration/medical), Inspection Bodies (IBs), Systems, products, personnel, halal Certification Bodies (CBs).

PNAC works according to **ISO/IEC 17011** which is the international standard for accreditation bodies accrediting conformity assessment bodies (CABs). It has achieved and is maintaining its signatory status with:

- International Laboratory Accreditation Cooperation (ILAC)
www.ilac.org
- International Accreditation Forum (IAF)
www.iaf.nu
- Asia Pacific Accreditation Cooperation (APAC)
www.apac-accreditation.org

PNAC is an active member of other similar organizations such as:

- International Halal Accreditation Forum (IHAF)
<http://ihaf.org.ae>
- Standards and Metrology Institute for the Islamic Countries (SMIIC)
<https://www.smiic.org/en>
- South Asia Association for Regional Cooperation (SAARC) and is an active member and Chair for the year 2022 in SAARC Expert Group for Accreditation (SEGA)
- ECO Regional Institute Standards Conformity Accreditation and Metrology (RISCAM) PNAC is playing a very active role in ECO RISCAM.

Functions of PNAC:

- **Accreditation Services;**
 - Testing & Calibration Laboratories (ISO/IEC 17025)
 - Certification Bodies (ISO/IEC 17021)
 - Inspection Bodies (ISO/IEC 17020)
 - Medical Laboratories (ISO 15189)
 - Halal Certification bodies (PS 4992)
 - Proficiency Testing Scheme (ISO/IEC 17043)
 - Product Certification bodies (ISO/IEC 17065)
 - Personnel certification bodies (ISO/IEC 17024)
- **Trainings**
PNAC is also providing trainings to conformity assessment bodies (CABs) on different National and International standards.

S. No	Activity	Date
1	Assessor training course based on ISO 15189	25-29 July, 2022
2	Assessor training Course based on ISO/IEC 17025	28 Nov to 2 Dec, 2022
3	Two Day Training Course as per ISO 15189	30-31 August, 2022
4	Assessor training Course based on ISO/IEC 17025	26-30 December, 2022
5	Assessor training Course based on ISO/IEC 17025:2017	27 Feb-03 Mar 2023
6	Assessor training Course based on ISO/IEC 17025:2017	23-27 January, 2023
7	World Accreditation Day 2023	9 th June 2023

Contribution to Economic Growth

According to the OECD Report, 80% of the world trade worth trillions of dollars involves standards, conformity, accreditation and metrology. PNAC has achieved Mutual Recognition Arrangement (MRA) and Multilateral Recognition Arrangements (MLA) signatory status with ILAC, IAF and APAC which facilitates trade, promotes exports and reduces influx of sub-standard products if used effectively. The certificates / tests reports issued by the accredited organizations are acceptable all over the world. Accreditation builds confidence of the exporter that whatever they export conforms to the international requirements. The regulators and Consumer Rights Associations of other countries also accept certificates and tests reports issued by Conformity Assessment Bodies (CABs) accredited by PNAC. Accreditation by PNAC facilitate to remove the technical barrier to trade with a goal of “certified once – accepted everywhere.”

Accredited Conformity Assessment Bodies (2022-23):

In the past two years the trend of getting accreditation has increased tremendously.

ACCREDITATION SCHEMES (Indicators)	Total Accreditations Achieved So far
	2022-23
ISO/IEC 17025:2017 (General requirements for the competence of testing and calibration laboratories)	251
ISO/IEC 17020:2012 (Conformity assessment -- Requirements for the operation of various types of bodies performing inspection)	14
ISO/IEC 17021-1:2015 (Conformity assessment -- Requirements for bodies providing audit and certification of management systems -- Part 1: Requirements)	10
ISO 15189:2012 (Medical laboratories -- Requirements for quality and competence)	34
PS: 4992 Pakistan Standard Halal Certification Bodies	11
SO/IEC 17043:2010 (Conformity assessment -- General requirements for proficiency testing)	04
ISO/IEC 17065:2012 (Conformity assessment -- Requirements for bodies certifying products, processes and services)	02
ISO/IEC 17024:2012 (Conformity assessment -- General requirements for bodies operating certification of persons)	02

World Accreditation Day

Pakistan National Accreditation Council (PNAC), Ministry of Science and Technology has celebrated World Accreditation Day on 9th June 2023 and organized a seminar at Avari Tower Karachi. There were more than 125 participants from Conformity Assessment Bodies (CABS), Regulators, Manufacturers and consumers. The theme of the seminar was “Accreditation: Supporting the future of Global Trade”. This seminar also highlighted the Role of the Pakistan National Accreditation Council, Need and Importance of Accreditation for Pakistan Economy. PNAC also celebrate its silver jubilee on the occasion of World Accreditation Day.

The seminar was started with the recitation of Holy Quran. The guest of Honor Dr. Abdul Bari Khan, CEO Indus Hospital and Healthcare Network (IHHN) appreciate the efforts of PNAC to promote the quality culture in the country and emphasized on the awareness of accreditation. During the session welcome address was given by DG PNAC Ms. Ismat Gul Khattak who highlighted the importance of how accreditation supports the global trade. Mr. Azhar Iqbal, Director PNAC gave a presentation on “25 Years of PNAC”. Participants also give their feedback to the management of PNAC.



STEDEC Technology Commercialization Corporation of Pakistan (Private) Limited (STCC)

Introduction

STEDEC Technology Commercialization Corporation (STCC) of Pakistan (Private) Limited was established in 1987 under the Companies Ordinance 1984 for the primary objective of commercializing PCSIR's products, processes and technologies. Subsequently, the scope was broadened to assist other R&D institutions, specifically those of MoST, in their commercialization efforts. The Board of Directors comprises of nominees by the Ministry of Science and Technology with Secretary, MoST as the Chairman of the Board. STEDEC generates revenues through its commercial activities and no development or non-development budgetary allocations are made to STEDEC in the Federal Government budget.

Functions

Following are the core functions of STEDEC in national perspective:

- Functioning as National Technology Commercialization Entity.
- Leveraging national economy through boosting the indigenous technology sector.
- Achieving import substitution through locally developed technology solutions.
- Commercializing the technology, process and products in the open market.
- Synergizing the relevant stakeholders in the realm of R&D, Industry and Technology Business.

Mandate

STEDEC is a Federal Government entity working under administrative control of Ministry of Science and Technology. STEDEC is mandated to assist all national R&D organizations/institutions towards commercialization/marketing of their indigenously researched products, processes and technologies. The underline purpose is also to promote Industry-Academia-R&D linkages; through seeking inputs from the industry and academia as well as extending firm support towards adapting state of art foreign technologies in the local market, so as to boost industrial development. Ultimately reducing country's dependence on foreign technologies and resources as well as enhancing import substitution.

Goals & Targets

- To facilitate public sector R&D organizations towards commercialization of their researched products, processes and technologies
- To facilitate public sector R&D organizations towards commercialization of their projects/services
- To facilitate public sector R&D organizations in market-driven research projects
- To promote adapting and adopting of foreign technologies to reduce dependency on them through indigenization
- To undertake marketing studies and Industrial interactions, Linkages building, Joint Ventures etc.
- To impart Marketing and Counseling on industrial requirements
- To identify need based R&D and work on its indigenization
- To identify industrial requirements and their respective technological resolutions

Activities

During the FY 2020-21, STEDEC carried out the following activities:

• Planning Documents

Following four strategy documents were developed to set the future direction of the company and to define the company's vision, mission statement and commercialization operations as a whole:

- Proposed Repositioning of STEDEC: A Template of Business case
- Role of STEDEC: Towards Challenges in the National R&D
- STEDEC Business Plan: Proposed Revenue Streams through Repositioning of STEDEC
- Strategy and Plan with Targets to Encourage Private Sector investment in Innovation and Technology.

• Commercialization/Marketing Platforms

Industrialized nations are revamping their technology infrastructures in response to major shifts in the scope as well as the content of their growth strategies. Government plays varied but important role in providing the diverse technology infrastructure that supports a modern, competitive economy. There is a dire need to make such shift in Pakistan as well in line with aspirations of reducing foreign dependencies and to create the enabling environment/technology infrastructure in the country which would make national commercialization of indigenous technologies possible. For this purpose, following commercialization/marketing platforms were created at STEDEC which would not only

promote promising technologies, products and processes but will also help encourage private sector investment in the innovation and technology domains:

- Public Call
- Technology Commercialization Help Desk (TCHD)
- Technology Audit
- Exhibition and Demos

These platforms are functional and receiving proposals from R&D organizations, Academia, Individual Researchers, Industry and Investors for Commercialization on STEDEC's prescribed format.

- **New Initiative 2021**

R&D organizations of Ministry of Science & Technology were requested to furnish their most feasible indigenously developed technologies/products/services/ processes for commercialization and marketing by STEDEC. Suitable technologies/products/services/processes were shortlisted on the basis of following criteria:

- Technical and Market Viability
- Scalability
- Sustainability & Green Footprint

STEDEC also created the following Commercialization Committee to analyze long term economic impact of the proposed technologies/products/services having sustainability and green footprint:

- Economic expert
- Industry expert (to which the technology/product/service is targeting)
- MoST representative
- R&D organization developer (whose technology/product/service is being reviewed)
- STEDEC Commercialization representative

- **Expansion of Sectors**

In line with Government's vision, STEDEC has expanded its focus from technologies developed by MoST R&D organizations to pro-industrialization technology sectors having massive potential for commercialization i.e. 1. Health sector 2. Agriculture 3. Renewable Energy, Energy Efficient Products 4. Environment Technologies 5. Sustainable Development 6. Manufacturing 7. Industrial and Urban Development 8. Construction 9. ICT. New list of technology proposals received consist of technologies, products, services and processes having strong market viability, competitive edge and sizeable demand. STEDEC portfolio is being updated continuously.

Pakistan Standards and Quality Control Authority (PSQCA)

Introduction

The PSQCA Act 1996 of the Parliament empowers Pakistan Standards & Quality Control Authority (PSQCA), to act as the sole Standard Body of Pakistan under the administrative control of Ministry of Science & Technology. The PSQCA Act VI of 1996 and the functions performed by PSQCA fall within the ambit of Article: 143 and 70(4) Federal Legislative List Entry No.03, 27,32,39,54 and 59 of Part I and entry No.6, 12 and 15 of Part II, of the Constitution of Islamic Republic of Pakistan, 1973.

PSQCA is a self-financed organization. PSQCA provides one window services for Standardization and Conformity Assessment. PSQCA is designated as National Standard Body (NSB) of Pakistan and National Enquiry Point (NEP) of Technical Barriers to Trade (TBT) of World Trade Organization (WTO). The main function of PSQCA is to promote and engage stakeholders in Standardization activities i.e. development of Pakistan Standards and ensuring that consumer and industrial goods are produced as per Pakistan Standards for human health and safety, animal health, protection of environment, protection of consumers and prevention of deceptive practices. PSQCA play an important role in removing technical barriers to trade through standardization, certification and testing. PSQCA with more than 132 technical officers including 04 PhDs to execute its technical activities. The other main activities of PSQCA are:

- Publication of WTO recognized International Standards as Pakistan Standards to meet the national requirements and to facilitate the trade.
- Licensing of locally manufactured products as per international practices to provide the market access of quality products within Pakistan
- Certification of Imported products as per international practices to provide the market access of quality products in Pakistan
- Accredited testing of locally manufactured and imported product as per Pakistan Standards.
- Bilateral and Multilateral Technical Cooperation with counterpart in other economy in the area of Standards, Conformity Assessment Procedures, Technical Regulations, Capacity Building, Acceptance of testing and inspection report for facilitation of trade.
- Registration of 3rd party Inspection agencies ensuring inspection services of locally manufactured and imported products as per applicable Standards.
- Securing membership at International and Regional level i.e. International Organization for Standardization (ISO), International Electrotechnical Committee (IEC), International Organization for Legal Metrology (OIML), Standards and Metrology Institute for Islamic Countries (SMIC), South Asian Regional Standards Organization (SARSO). PSQCA takes part in policy and technical activities in the above international and regional standards organizations.

DIRECTORATE OF STANDARDS

The Directorate of Standards of PSQCA is responsible for the development of Pakistan Standards through process of consultation and building consensus by involving Stakeholders (Consumers, Manufacturers, Government & Regulatory Bodies, Technologists, Scientists, Experts and Academia) through its following technical divisions;

Technical Divisions:

• Agriculture and Food	• Automobile
• Civil	• Chemical
• Electro technical	• Electronics
• Management Standards System (MSS)	• Information Technology (IT) & Information Communication Technology (ICT)
• Halaal	• Mechanical
• Textile	• Weights & Measure

Sr. #	Description	A & F	Auto	Civil	Chem	Electric	Electronics	Halal	IT/ICT	Mech	MSS	Textile	W & M	Total
1	Total Number of NSC Meeting organized	0	03	0	01	00	02	0	01	0	0	0	0	1
2	Total Number of TC Meeting Organized	0	02	1	19	02	20	1	12	0	1	0	1	108
3	Total Number of Draft Pakistan Standards	3	00	8	17	05	32	0	25	0	0	0	0	217
4	Total Number of draft Pakistan Standards	2	07	2	36	05	36	0	25	0	1	0	0	174
5	Total Number of votes/Ballots participated at International/re	217	00	7	00	00	567	0	00	0	120	0	0	980
6	Any others /specific activities organized	0	02	0	01	01	02	0	02	0	0	0	0	0
	Details of Sr # 6 (If any):		Stakeholders special Meeting for Mandatory Items (08) recommendation.		Workshop on Reducing Lead in Paints held on 17-05-2023 at Lahor	WORKSHOP ON PS-ISO 5000 1 ENERGY MANA GEMEN	1- Participated in Webinar on OSD, Asia Pacific 2- ISO GSP Training		Participated in Webinar & online Session on AI and Quantum IT Standardization					

STANDARDS DEVELOPMENT WORKS (PROGRESS 2022-23)

BRIEF ABOUT STANDARDS DEVELOPMENT CENTRE (SDC) / CONFORMITY ASSESSMENT (C.A)

After establishment of PSQCA through an Act of parliament i.e. PSQCA Act VI of 1996, Standards Development Centre (SDC) was bifurcated into Standardization (for formulation of standards) and Conformity Assessment (to regulate the quality of products and certifications).

The offices of Conformity Assessment (C.A) are enhanced in major industrial cities throughout the Pakistan to facilitate the industry.

Directorate Karachi Zone:

- Regional Office, Karachi
- Liaison office, Hyderabad
- Liaison office, Hub

Directorate Quetta Zone

- Regional Office, Quetta
- Liaison Office, Sukkur
- Liaison Office, Gawadar

Directorate Lahore Zone

- Regional Office, Lahore
- Liaison Office, Gujranwala
- Liaison Office, Faisalabad

Directorate Multan Zone

- Liaison Office, Multan
- Liaison Office, Bahawalpur

Directorate Islamabad Zone

- Regional Office, Islamabad
- Liaison Office, Rawalpindi

Directorate Peshawar Zone

- Regional Office, Peshawar
- Liaison Office, Hattar

Pakistan Conformity Assessment Rules 2011 were formulated based on ISO 17065 and ISO 17067 Standards. Conformity Assessment (C.A) working as a third party certification body. Industries are allowed to use PS Mark for their certified product to gain the confidence of consumers at local as well as at export stage.

CA-PSQCA regulates the quality of mandatory products notified by Federal Government of Pakistan as Technical regulation (105 products so far). The Technical Regulations are based on national / international standards as good regulatory practices (GRP) as per WTO – TBD guidelines. The same Technical Regulations are applicable at local stag as well as at import stage in compliance with the article 2.1 of TBT-WTO agreement. Furthermore, all the regulations (105) are also notified at WTO – TBT partial.

Schemes for Conformity Assessment

Certification Marks (CM) license scheme for the local manufacturers of mandatory product. In this scheme local manufacturers get the license for their product notified by the Federal government as Technical Regulations.

Voluntary Conformity Assessment (VCA) license Scheme for the local manufacturers of non-mandatory product. In this scheme local manufacturers get the license for their non-mandatory product against Pakistan Standard to gain the confidence of consumer on the quality of their product.

DIRECTORATE OF CONFORMITY ASSESSMENT PSQCA

SL. NO.	TITLE	ACHIEVEMENT JULY 2022 TO JUNE 2023
01	Application received	1959
02	Total Licenses Issued	1802
a.	New	596
b.	Renewal	1206
03	Quality Assurance Activities:	
a	Inspection	4366
b	Sample Collected	6923
c	Test Report Received	5640
D	Conformity	5443
E	Non-conformity	206

DIRECTORATE OF IMPORT & EXPORT, PSQCA

The progress for the Directorate of Import & Export for the year 2022-23 is as under:

- In compliance Government vision for providing facilitation to the business community under National Single Window Programme online application processing system has been developed.
- Established web based / online test report system with QCC, Karachi and with all outsourced laboratories i.e. NED University Karachi, Intertek Pakistan (Pvt.) Ltd., PCSIR, Karachi Shipyard &

Engg. Works for incorporation of CAR / NCR ultimate benefits / facilitation of clients minimizing the time requirements and facilitating the trade.

- After detailed deliberation and consultation with Ministry of Commerce, FBR and appointed consultant by Pakistan Customs, list of PCT's / HS Codes against the mandatory items of PSQCA has been updated, finalized and submitted to Ministry of Commerce for inclusion in Appendix-N of Import Policy Order on Dated: December 31, 2020.
- Directorate of Import & Export has completed pre-requisite i.e. Quality Manual, Procedures and required documentation for obtaining accreditation as Inspection Body as per ISO/IEC 17020 and submitted request to PNAC.
- Introduced / established E-reporting system alongwith coding system without any consignee detail for sampling to ensure transparency, minimizing the human interaction and reducing time for ultimate benefit of business community.
- No. of Cases Processed: 19357
- No. CAR issued: 15760
- No. of NOC / RC issued: 1196
- No. of Sample sent to Labs.: 19431

QUALITY CONTROL CENTRE, PSQCA

INTRODUCTION:

- Quality Control Centre, PSQCA, undertake testing of industrial raw material, and finished products and Import Items to establish their quality, grade with respect to National as well as International Standards (i.e. PSS/IEC, BSS, ASTM, ISO etc.) according to recommended guidelines in the field of Chemical, Microbiology, Physical & Engineering (Electrical, Mechanical, Gas Home Appliances), Building Material and Textile etc.
- QCC Labs. Are well equipped with modern testing facilities to facilitate Govt. and Pvt. Sector, Industrial Units and Importers / Exporters in monitoring the quality of items referred through Conformity Assessment for food and non-food products.

OBJECTIVES & FUNCTIONS:

- Provision of quality testing services to our customers to meet their technical requirements.
- To provide quality assurance service according to laid down standard methods.
- Enforcement of Compulsory Certification Marks Scheme of PSQCA through testing of Mandatory Items (domestic or foreign).
- Accreditation of Labs. for more transparent and reliable data being produced by these Labs.

ACHIEVEMENTS / PROGRESS (2022-2023):

- Quality Control Centre is currently the only ISO 17025:2017 Accredited Lab within PSQCA.
- QCC Labs has upgraded its Fan Testing Lab in Electrical Section, which has been inaugurated by Honorable DG and appreciated at all levels. QCC plans to add its Fan Lab in accreditation scope as per Ministry's efforts of Energy Star Labelling Scheme and to promote energy efficient motors and fans.
- The building structure of the lab is in continuous improvement phase with only constraint of regular budgets.
- QCC believes in the capacity building of its young officers and recently a batch of Assistant Directors from QCC cleared the PNAC Assessor Course ISO 17025:2017 and are certified Technical Assessors with PNAC.
- QCC has also conducted a number of training sessions for general public awareness which is benefitting many small and medium size enterprises in their business.
- QCC launched its Graduate Internship Program in 2022, which facilitates university students in getting hands on laboratory testing and accreditation experience. A number of interns graduated from QCC Labs so far have benefitted from this program by getting better employment options in the industry.
- Internal Trainings Conducted :on ISO 17025 2017 revised standard
- Participate and Qualify International Proficiency Test in seven Labs and achieve excellent Z score.
- Provide Internship Training to the many Students of different Universities

Applied for Accreditation For Seven labs Of QCC PSQCA, Karachi

- **Food Lab**
- **Building Material Laboratory**
- **Microbiology Laboratory**
- **Food Microbiology**

- Oil & Fat
- Sugar Testing Laboratory
- Water & Beverages Laboratory

Period	No of Samples Tested
July 2022 to June 2023	21131

DIRECTORATES OF TECHNICAL SERVICES CENTER PSQCA

Major Verifiable Achievement of TSC

Technical Services Center PSQCA Lahore has scope of testing mandatory and voluntary products as per PS and International standards.

Core Objective of TSC

TSC support the implementation and strengthening of PSQCA regulatory role, TSC is providing the testing services of mandatory items such as:

- Two / Three Wheeler Auto Vehicle
- Plain and Deformed Steel Bars
- Structural Steel Products (as per PS standard)
- Stainless Steel for General Purpose
- Tin Plate Container
- Billets & Ingot
- Safety Razor & Blade
- Skin Creams
- Toilet Soap
- Hair Dyes and etc.

Testing and evaluation of engineering products according to National and International Standards

To assist the engineering industry comprising of both private and public sector through technical assistance in product improvement, technological advancement and increase productivity

Consultancy services to the industry in the field of product improvement, selection of material and Quality Control / Quality Assurance

The major revenue achievements for year 2022-2023 are as follows

Year 2022-2023	Total Jobs	Revenue Mandatory Testing	Revenue Voluntary Testing	Total Revenue
July	144	0.300	1.037	1.337
August	231	0.488	2.312	2.800
September	263	0.802	0.498	1.300
October	193	0.698	0.048	0.746
November	245	0.443	0.718	1.161
December	504	0.718	0.681	1.399
January	241	1.557	0.463	2.020
February	188	0.628	0.395	1.023
March	112	0.548	0.586	1.134
April	190	0.455	0.495	0.950
May	266	0.513	0.803	1.316
June	204	0.875	0.403	1.279
Total	2781	8.025	8.439	13.258

In Future TSC has plan to set up paint testing lab for the mandatory testing of paint.

DIRECTORATES OF LEGAL, PSQCA

INTRODUCTION

The Legal Directorate is sub-department of PSQCA which performs the following work for the Authority.

- To address the Legal side and safe guard the interest of the Authority.
- To deal corporate and services legal cases.
- To provide Legal advice as and when required for MoUs, agreements, and other legal matters to PSQCA.
- To prepare draft, rules and regulations and Act amendments as well as SoP's for purchase, Accounts etc.

- To ensure active presence in Courts on dates of hearing.
- To protect legal rights of PSQCA and to initiate correspondence with MoST and other concerned Authorities.
- To file cases against unscrupulous manufacturers during the campaign.
- To prepare comments and provide other legal support to PSQCA counsels for PSQCA cases.
- Scrutiny for CM Licences and their renewals.
- Scrutiny of Registration of Inspection Bodies.
- Any Other assignment assigned by the DG PSQCA.

ACTIVITIES/ACHIEVEMENT & DEVELOPMENT OF LEGAL DEPARTMENT

- The Legal Directorate has proposed (15) food & Non-Food items for including in the mandatory list of PSQCA, which are as under:

S. No.	Title of Standard	PS No.
1	PAKISTAN SECURITY STANDARD FOR CRYPTOGRAPHIC & ITSEC DEVICES-ITSEC GUIDE BOOK.	PS: 5543-2021
2	PAKISTAN SECURITY STANDARD FOR CRYPTOGRAPHIC & ITSEC DEVICES-ITSEC GUIDE BOOK.	PS: 5543-2021
3	Potassium Chloride (Muriate of Potash(Fertilizer Grade) (1 st Rev)	1517-2013
4	Mono ammonium Phosphate (1 st rev)	4991-2017
5	Planth Growth Promotion Bacteria Fortified Fertilizers (PGPB-FF)	5329-2014
6	Bioactive Nutrient Fortified Fertilizer (BNFF)(3 rd Rev)	5336-2022
7	Sulphur	5449-2022
8	Liquid Nutrient Supplement	5469-2020
9	Nitrophos Fertilizer	1873-2022
10	Calcium Ammonium Nitrate (CAN)	229-1980
11	Rigid Poly (Vinyl Chloride) (PVC) Siding	5600-2023
12	Rigid Poly(Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors	5601-2023
13	Resilient Flooring in Modular Format with Rigid Polymeric Core	5602-2023
14	Unplasticized polyvinyl chloride foam boards —Part 2: Celuka extrusion process	5603-2023
15	Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)	5347-2015

DETAIL OF COMPLAINTS FILED BY PSQCA AGAINST MANUFACTURERS / UNITS

SL:#	TITLE OF CASE	NAME OF COURTS	STATUS
1	Complaint No. _____/2023 PSQCA V/s M/s. Hafiz & Company	The Court of Judicial Majistrate Lahore	PENDING
2	Complaint No. _____ 2023 PSQCA V/s M/s. Umer Draz Steel Re-Rolling Mills	The Court of Judicial Majistrate Lahore	PENDING
3	Complaint No. _____/2023 PSQCA V/s M/s. Barkat Steel Mills	The Court of Judicial Majistrate Lahore	PENDING
4	Complaint No. _____/2023 PSQCA V/s M/s. Madina Steel	The Court of Judicial Majistrate Lahore	PENDING
5	Complaint No. _____/2023 PSQCA V/s M/s. Pak Sufi Steel Re Rolling Mills	The Court of Judicial Majistrate Lahore	PENDING
6	Complaint No. _____/2023 PSQCA V/s M/s. Ghausia Steel Mill Shadipura Lahore	The Court of Judicial Majistrate Lahore	PENDING
7	Complaint No. _____/2023 PSQCA V/s M/s. Super Steel	The Court of Judicial Majistrate Lahore	PENDING
8	Complaint No. _____/2023 PSQCA V/s M/S. AL-SHAikh STEEL	The Court of Judicial Majistrate Lahore	PENDING
9	Complaint No. _____/2023 PSQCA V/s M/s.. RASHID STEEL	The Court of Judicial Majistrate Lahore	PENDING
10	Complaint No. _____/2023 PSQCA V/s. M/s. SHALIMAR SON	The Court of Judicial Majistrate Lahore	PENDING
11	Complaint No. _____/2023 PSQCA	The Court of Judicial Majistrate	PENDING

	V/s. M/s. GULZAR-E-MADINA	Lahore	
12	Complaint No. _____/2023 PSQCA V/s. M/S. MAHER ILYAS STEEL	The Court of Judicial Majistrate Lahore	PENDING
13	Complaint No. _____/2023 PSQCA V/s. M/S RAFIQ BROTHER	The Court of Judicial Majistrate Lahore	PENDING
14	Complaint No. _____/2023 PSQCA V/s. M/S.HUSSAIN ATTARI	The Court of Judicial Majistrate Lahore	PENDING
15	Complaint No. _____/2023 PSQCA V/s. M/s. Liaqat Steel Industry	The Court of Judicial Majistrate Lahore	PENDING
16	Complaint No. _____/2023 PSQCA V/s M/s. Karim Steel	The Court of Judicial Majistrate Lahore	PENDING

- Twelve (12) cases were disposed off.

2022	2023	TOTAL
05	07	12

DIRECTORATE OF WTO-TBT NATIONAL ENQUIRY POINT-PSQCA

PSQCA has been designated as the WTO-TBT National Enquiry Point on Technical Barriers to Trade (TBT) of Pakistan under the TBT Agreement (Article 10.1, 10.2 and 10.3) and established WTO-TBT National Enquiry Point at PSQCA Head Office, Karachi to facilitate the exporters/traders/ manufacturers in the country and also other WTO member countries. This enquiry point is responsible to disseminate information on TBT-Notifications, deals with queries regarding Standards, Technical Regulations, Rules & Regulations and Conformity Assessment Procedures.

WTO-TBT National Enquiry Point

In accordance with article 10.1 of the World Trade Organization Agreement on Technical Barriers to Trade each member shall ensure that an enquiry point exist, which is able to answer all reasonable enquiries from other members and interested parties in other members as well as to provide the relevant information.

Functions of National Enquiry Point

- Answer to all reasonable enquiries from other member countries of WTO-TBT and interested parties, and provide the relevant document to other member countries related to Standards, Conformity Assessment and Technical Regulations.
 - **Related to PSQCA.**
 - **Related to other Regulatory Body.**
(It Depend on concern Ministry/ Department Reply)
- Collection of Technical Regulations of other members of WTO and disseminate to stakeholders. (Time Frame Every 10 Days)
- Notifications of Technical Regulations to WTO TBT Secretariat Geneva.
 - **Related to PSQCA.**
 - **Related to other Regulatory Body or Ministry/Department after receiving of complete documents.**
- Providing full text Standards, Conformity Assessment and Technical Regulations related to stakeholders on request.
 - **In Original Language.**
 - **Translate in English Language.**
(If providing by members countries of WTO TBT).
- Update the Standardization Work Programme on PSQCA website on quarterly basis.

ACTIVITIES

- Collection of TBT Notifications issued by the WTO member countries through WTO Secretariat, Geneva.
- Circulation TBT Notifications among the stakeholders for their review and comments.
- Collection of Standardization work programme and placed on PSQCA website as per TBT agreement requirement.
- Collection of Federal/Provincial Technical Regulations and placed them in WTO section of PSQCA website.
- Facilitate the federal/provincial chambers, trade promotion organizations, trade associations,
- Provide information to Industries and Academia regarding technical regulations in compliance of WTO-TBT Agreement.

- Updating of website portal on WTO-TBT National Enquiry Point-PSQCA in compliance of TBT agreement.
- Reply to all enquiries raised by member states of WTO regarding Standards, Conformity Assessment Procedures and Technical Regulations.

ACHIEVEMENTS

S #	Activities	Achievements 2022-23
01.	Updation of website portal on WTO-TBT National Enquiry Point-PSQCA in compliance of TBT agreement.	100% for correspondence period
02.	Update the information of WTO-TBT National Enquiry Point to Incharge KPK PSQCA regularly.	100% for correspondence period
03.	Collection of Standardization work programme and placed on PSQCA website as per TBT agreement requirement.	100% for correspondence period
04.	Collection of TBT Notifications issued by the WTO member countries through WTO Secretariat, Geneva.	2,696 in Nos.
05.	Circulation of TBT Notifications issued by the WTO member countries among the stakeholders.(total in Nos.11, 130).	2,696 in Nos.
06.	Pakistan TBT Notifications notified through WTO Secretariat, Geneva.	100% for correspondence period
07.	Handling of enquiries (local) on technical regulations, standards and conformity assessment procedures.	21 in Nos.
08.	Handling of enquiries (International) on technical regulations, standards and conformity assessment procedures.	-NIL-

SYSTEM CERTIFICATION CENTRE (SCC)-SDC, PSQCA

- **Overview of System certification center, Pakistan Standards and Quality Control Authority SCC-PSQCA**

Pakistan Standard and Quality Control Authority is a National Standard body of Pakistan issues management system certification license under PSQCA Act 1996. ISO's committee on conformity assessment (CASCO) has published the management system standards. SCC's technical experts are actively participating in CASCO's standard development work. SCC's ISO certify that a management system, manufacturing process, service or documentation procedure has all the requirements for standardization and quality assurance.

- **ABOUT US**

System Certification Center (SCC) Is an Independent third party certification body working under PSQCA, Ministry of science & Technology, Government of Pakistan. We offer assessment services to wide range of management systems Including PS/ISO 9001, PS/ISO 14001, PS/ISO 45001, PS/ISO 22000 & PS/ISO 22716 GMP for Cosmetics for all industrial sectors. System Certification Center PSQCA has well qualified & trained pool of auditors. These technically competent people with relevant experience & expertise help you to improve quality of product / service thereby increasing your market share. Member of International & Regional Standardization Bodies i.e.,ISO, IEC, OIML, ASTM SARSO

Systems Under Certification

- ✓ PS/ISO 9001 – Quality Management System (QMS)
- ✓ PS/ISO 14001 – Environmental Management System (EMS)
- ✓ PS/ISO 22000 – Food Safety Management System (FSMS)
- ✓ PS/ISO 45001 – Occupational Health & Safety Management System (OHS)
- ✓ PS/ISO 22716 – Goods Manufacturing Practice for Cosmetic (GMP)

Development of Quality Management System as per PS ISO 17021-1 of SCC-PSQCA

- ISO Certification Process: Any organization engaged in doing business in manufacturing, assembly or service, having legal entity in Pakistan or abroad can apply with the documents authenticating name and address of the organization
- SCC-PSQCA Lahore has established and implemented QMS as per PS ISO 17021-1 at PSQCA office Lahore as a separate legal identity (separate block of Rooms allocated to SCC- PSQCA)

since April 2021 (approval by the competent authority). Now, SCC-PSQCA is receiving applications for system certification and processing as per documented procedures.

- SCC-PSQCA Management System Manual describes the policies, structure, procedures and methodologies for operating and maintaining effective Management Systems Certification activities in line with ISO/IEC 17021-1:2015. Management system has been implemented.
- SCC-PSQCA Scheme describes the general principles and policies of the PSQCA' management systems certification activities and their supporting documented system. It provides the rules governing the certification activities to ensure that SCC operates these activities in a competent, consistent and impartial manner, thereby facilitating a wide recognition and acceptance of its certificates. The value of the certification is the degree of public confidence and trust by in an impartial, objective and competent assessment by a third party.
- Improves the ability of consumers, buyers, sellers, regulators and other interested parties to have confidence in the processes of providing Certification services.
- Promote and achieve global acceptance of products and services through system certification activities

Quality Objectives of SCC-PSQCA

- Quality System: The pace of decrease in nonconformities observed during internal or Pakistan National Accreditation Council audits is monitored and used as a tool to continuously improve the quality system.
- For Commercial Success: Growth and profitability are measured and goals are set according to these measurements.
- Business Growth Activities: New business fields and markets are searched, and activities are forwarded to those areas.
- Personal Development of Employees; Trainings are planned, held and evaluated to develop communicational and technical skills of employees.
- All PSQCA-SCC activities are designed and performed in accordance with regulations, standards and guiding documents about its accreditations and authorizations. Monitoring/inspections of all activities are realized through internal audits.
- PSQCA-SCC customers are the company's reason for existence. Therefore, customer demands and needs are taken seriously, and dealt with in the shortest time possible. All processes related to customers are managed effectively, and customers are treated fairly and equally in a way to make them feel valued.
- Objections to decisions taken in conformity assessments are analysed effectively and candidly. Within the framework of the principle of being customer-focused, it is specifically emphasized to customers that they are being served in line with their long term interests.
- Our competent employees, our ability for objective evaluation, our impartiality and independence are our most valuable assets for our customers. We are well aware of the importance of our objective and independent services for our customers provided under the current competitive economic conditions

Our Vision

To become the world's premier ISO Certification and training services provider.

Our Mission

To create value for our clients by providing conformance to standards and assistance in securing ISO certification.

Quality Policy

SCC PSQCA's Top Management and Employees committed to Carry out all certification activities as per ISO/IEC 17021 1/12 & Pakistan National Accreditation Council requirements based to good professional practice and technical application within the framework of management standards i.e., PS/ISO 9001, PS/ISO 14001, PS/ISO 22000, PS/ISO 45001 and PS/ISO 22716. (Complete Quality Policy, Visit our website)

Scope of Services (Certification & Training)

Anywhere in the Pakistan & Abroad, you can easily access our network to receive exceptional ISO certification and training services. We are providing trusted Certification & Training services as per PSQCA's Act-1996 for your compliance need against the following standards. SCC-PSQCA has conducted more than 40 trainings of management system standards as mentioned below. SCC-PSQCA has received more than 10 number of application for certification due to close down of 80 percent of industry since last 3 years.

- PS/ISO 9001 Quality Management System
- PS/ISO 14001 Environmental Management System

- PS/ISO 22000 Food Safety Management System
- PS/ISO 45001 Occupational Health and Safety Management Systems
- PS/ISO 22716 Good Manufacturing Practice (GMP) for Cosmetics
- IMS Integrated Management System

Why Choose System Certification Center (SCC)

- 1st National 3rd Party Certification Body of PSQCA, Ministry of Science & Technology, Government of Pakistan.
- Professional Management, Quality Auditing and Expertise as per ISO 17024
- National and International recognition through MoU's/MRA's signed by PSQCA with National Standardization and Certification Bodies.
- Governed by Independent Assessment Committee
- Reliable Certificates recognized Internationally
- Cost effective and timely solution Concerns
- One Window Solution for Exporter, SME's, Public Sector and Service and Manufacturing

Importance of ISO Certification

- Remove Technical trade barrier
- Full Public, Private and Regulatory requirement
- Processes are evaluated and standardized
- Enhanced customer satisfaction/confidence
- Reducing costs of doing business
- Improved image of your company
- Improve participation of employees
- Create Market Uniqueness

PS/ISO 9001-Quality Management System (QMS)

PS/ISO 9001 applies to any organization which is interested to organize and formalize a management system - to assure its consistent product/service quality to customers, as well as to improve its management performance. PS/ISO 9001 is a Quality Management System (QMS) that is designed to help organizations ensure that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to the product.

PS/ISO 14001-Environmental Management System (EMS)

PS/ISO 14001 sets out the criteria for an Environmental Management System (EMS) to show compliance with environmental law & regulation. PS/ISO 14001 certification can be used by any organization that wants to validate its improvement of resource efficiency, waste reduction, and drive down costs.

PS/ISO 22000- Food Safety Management system (FSMS)

This standard specifies the requirements for a food safety management system where an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. PS/ISO 22000 incorporates HACCP principles and various preventive plans in ensuring food safety.

PS/ISO 45001–Occupational Health & Safety Management System (OHS)

OH&S management system standard to enable global bench marking and to raise the bar for health and safety in the workplaces have developed an international standard PS/ISO 45001 that will be applicable to organizations of any size, sector or location. OHSAS 18001 will be withdrawn with the publication of PS/ISO 45001 and there will be a three-year migration period from the date of publication

PS/ISO 22716- Good Manufacturing Practice (GMP) for Cosmetics

SCC provides certification of Good Manufacturing Practice (GMP) management systems for cosmetics manufacturers. The EU Regulation 1223/2009 (Cosmetics Regulation) has been in force since 11 July 2013 and requires all cosmetics manufacturers to implement good hygienic practice in the manufacture of cosmetics. Certification to ISO 22716 is one way to demonstrate compliance with these requirements.

Training

At SCC, we believe that in order for an organization to adapt to the quality management system procedures, there should be an individual who has the full capability to implement the International business protocols & standards. With our Certified Trainers and experts we can support our client by providing training courses that offer In-depth knowledge required for specific business types and ISO standards to equip your team with the knowledge and skills to deliver sustainable quality.

SCC-PSQCA has been launched more than 74 training courses/seminar/Zoom training on following system certification standards to industry, academia etc:

PS/ISO 9001 – Quality Management Systems Awareness | Internal Auditor | Transition | Lead Auditor

PS/ISO 14001 – Environment Management System Awareness | Internal Auditor | Transition | Lead Auditor

PS/ISO 45001 – Occupational Health & Safety Management Systems Awareness | Internal Auditor | Lead Auditor

PS/ISO 22000 – Food Safety Management System Awareness | Internal Auditor | Lead Auditor

HACCP – Hazard Analysis & Critical Control Points Awareness | Internal Auditor

PS/ISO 22716 – GMP-Cosmetics Awareness | Internal Auditor

PS/ISO 27001 – Information Security Management System Awareness | Internal Auditor

PS/ISO 50001 – Energy Management System Awareness | Internal Auditor

PS/ISO 37001 – Anti-Bribery Management System Awareness | Internal Auditor

OUR STRENGTH

- One-stop solution
- Industry experts
- Worldwide experience in casco
- Partnering with the world's top standardization bodies
- Building long term client relations
- Global reach, local service

OUR SECTORS

- Agriculture
- Public Enterprises
- Pharmaceuticals
- Cosmetic
- Engineering & Consultancy
- Food & Consumer Goods
- Technical & Auto
- Information Technologies
- Schools & Education
- SME's
- Construction
- Transport & Logistics
- Chemical & Textile
- Electrical Instrumentation
- Hospitality Industries
- Services
- Hospital & Medical
- Others

SCC-PSQCA Risk Based Management Certification:

- Organizations today are often scrutinized and asked to demonstrate performance of their own operations and activities. Combined with best-practice auditing techniques and options for remote delivery, SCC-PSQCA Risk Based Certification methodology adds value to your audit and business.
- A well-functioning management system certified to ISO or other international standards is a great start to build business resilience and sustainable performance. It helps you identify, assess and manage risk and ensure that business processes are working effectively for you, your customers and other stakeholders.
- The Risk Based Certification methodology was developed by SCC-PSQCA to improve your management system and its ability to support your business goal. It tailors part of the audit delivery focusing on specific risks or other topics you consider important and that are relevant to the audit standard and scope.
- Risk Based Certification and the use of such Focus Areas is unique to SCC-PSQCA's delivery. It facilitates a deeper assessment of areas impacting your business objectives. Focus Areas are identified and agreed before the audit.
- SCC-PSQCA's Lead Auditor will work with you to **formulate** what to assess during the audit in terms of activities and processes. It structures the audit so that auditor can focus on what matters most, in addition to checking your management system's compliance with the standard(s) requirements.

- This is done without adding cost or time. The immediate output is the audit **report** which includes a summary of audit findings and Focus Area performance. It provides a quick insight into areas of importance for you and your management team.
- What you learn from the audit helps you improve your management system. It helps you identify mitigating actions to a broader set of challenges, whether it be operational issues today or hurdles to reach long-term objectives. Risk Based Certification helps lay the foundation to improve your ability to identify and respond to stakeholder expectations and build sustainable business performance over time.
- It is submitted that posts of two assistant directors have been approved (sanctioned strength). Presently, SCC-PSQCA has been working with Director and deputy director and recently posted one assistant director in April 2023. SCC-PSQCA essentially require 3 more assistant directors to fulfil the requirements of SCC-PSQCA Quality Management System

DIRECTORATE OF INTERNATIONAL AFFAIRS AND TRAINING (IATR)

Details of Signed MoUs / MRAs and Technical Cooperation Program

S No.	Country	Organization	Instruments
1.	China	Standards Administration of China	Memorandum of Understanding Signed: 28 January-2022
2.	Tajikistan	Agency of Standardization, Metrology, Certification and Trade Inspection (Tajikstandart) under the Government of Rep. of Tajikistan	Agreement on cooperation in the field of Standardization, Metrology, Conformity Assessment Signed on 14.12.2022



International Memberships



The **International Organization for Standardization (ISO)** is an international standard-setting body composed of representatives from various national standards organizations. It was established on February 23, 1947 and have headquarter in Geneva, Switzerland.

The PSQCA is full member of ISO and has 205 TC Participation i.e (Participating Member in 60 TC's of ISO, Observing Member in 145 TC's of ISO). PSQCA has adopted 9243 ISO Standards so far.



The **International Electrotechnical Commission (IEC)** was established on June 26, 1906

in [London, United Kingdom](#) and have headquarter in Geneva, Switzerland. IEC is the leading global organization that publishes consensus-based International Standards and manages electric and electronic products, systems and services, collectively known as electro technology.

The PSQCA is full member of IEC and has 73 TC Participation i.e (Participating Member in 48 TC's of IEC and Observing Member in 25 TC's of IEC. PSQCA has adopted 6315 Standards of IEC.



Regional Memberships



The **Standards and Metrology Institute for the Islamic Countries (SMIIC)**, as a sound mechanism for harmonization of standards among the Organization of Islamic Cooperation(OIC) countries and for preparation of new ones, aims at realizing harmonized standards in the Member States and eliminating technical barriers to trade and thus developing the trade among themselves.

It shall establish expediting exchange of materials, manufactured goods and products among Member States beginning with mutual recognition of certificates.

It was established on August 2010. SMIIC is an affiliated organ of the OIC and its Headquarters is located in Istanbul, Republic of Turkey.

Holds vice Chairmanship of Board of Director of SMIIC
Holds Chairmanship of Standards Management Council
Holds Chairmanship and Secretariat of two Technical Committees for development of International Standards on Textile and Leather & Tanning Materials

Photo Gallery



An Agreement signed Pakistan Standards & Quality Control Authority (PSQCA) and its Tajik counterpart Agency of Standardization metrology, certification and trade inspection (TAJIKSTANDART)



An Agreement signed between Ministry of Science & Technology, Government of Pakistan and Federal Republic of Ethiopia to increase cooperation in Science, Technology, Engineering and Education.



The Director General, PSQCA Mr. Zainul Abidin visited Deputy Commissioner, Chaman Office and the trend of Increased cross-border as an important economic development



PSQCA team cracked down against Illegal / Sub-Standards and Non-License Products at Imtiaz Super Market, Near Gulshan Chowrangi, Karachi

**Industry Facilitation Regarding Energy Efficient Fans, (Seminars & Trainings)
At Lahore –Pakistan.**





DG PSQCA meeting with the Associations (Steel & Cosmetics etc.) Meeting with Small Steel



Manufacturer Association at Lahore-Pakistan



PS Mark of Conformity

Council for Works and Housing Research (CWHR)

Introduction

Council for Works and Housing Research (CWHR) was established through a Resolution in 1964 as an autonomous organization under the aegis of the Ministry of Rehabilitation and Works, Government of Pakistan. In June 1971, CWHR was transferred to the Ministry of Science and Technology.

CWHR was established to create and strengthen necessary infrastructure for Research and Development (R&D), activities in the field of housing and works. Presently CWHR is the only organization at National level involved in quality testing of construction materials and carries out R&D and contract research for the construction sector.

Major Functions and Objectives of CWHR:

- To conduct/sponsor/organize, co-ordinate and promote R&D , in all fields of civil engineering works, including construction of model structures and demonstration units and to collaborate with regional, National and International Institutes/organizations.
- To arrange seminars, symposia, open houses, exhibitions, trainings and other extension activities to promote technology relevant to housing and works.
- To undertake commercialization of R&D activities, including transfer to technology.

Activities of CWHR (2022-23):

GOAL SPECIFIED FOR FY-2022-23	TARGETS SET FOR FY-2022-23	OUTCOMES AS PER MTFD	OUTPUTS AS PER MTFD	NON-DEVELOPMENT BUDGET FY-2022-23	REMARKS
1- Non Destructive Testing , Contract Research and Consultancy Services	<p>The NDT Section is optimistic to achieve the following targeted/KPI's goal at the end of financial year 2022-23.</p> <p>i. 02. Consultancies Services Reports</p> <p>ii. Publications of 02 Research Papers</p> <p>iii. 01 Exhibition / Conference / Seminars Organized</p> <p>iv. 01 Workshop/Training Organized</p> <p>v. Marketing strategy regarding awareness of NDT importance in the field of Infrastructure departments.</p> <p>The GT & RR Section is optimistic to achieve the following targeted/KPI's goal at the end of financial year 2022-23.</p> <p>i. 05 Client</p>		<p>i. This section has provided 01 Consultancy Services to M/S PCSIR Laboratories Complex, Karachi. The task was to investigate the Old Admin/Account Section at PCSIR Laboratories Complex Karachi on complementary basis. The NDT team conducted testing w.e.f 01.02.2023 to 02.02.2023.</p> <p>The pictorial view of building testing site are attached at Appendix-I.</p> <p>ii. The NDT section has presented a 2nd Research paper entitled” Impact of covercrete on durability of concrete by measurement of permeability coefficient and corrosion analysis in concrete” in the 2nd International Conference on Recent Advances in Civil Engineering and</p>		

GOAL SPECIFIED FOR FY-2022-23	TARGETS SET FOR FY-2022-23	OUTCOMES AS PER MTFD	OUTPUTS AS PER MTFD	NON-DEVELOPMENT BUDGET FY-2022-23	REMARKS
	<p>Consultancies Services to Contractor in Construction field for basic soil testing only limited to classification of soil and other field test.</p> <p>ii. Arrange training courses.</p> <p>iii. Increase awareness about basic soil testing of CWHR.</p> <p>The LTES Section achieved the following targeted /KPI's goal at the end of financial year 2022-2023.</p> <p>i. 05 Client Consultancies Services to Contractor in testing of cylinder / cubes / steel testing.</p>		<p>Disaster Management (ICCEDM-2022) held on 15th to 16th December-2022 at UET Peshawar.</p> <p>Pictorial View of publications are attached at <i>Appendix-II</i>.</p> <p>iii. As per marketing strategy this NDT Section gave Presentation about CWHR Functions and NDT Consultancy Facilities to the Office of Sindh Mass Transit Authority (SMTA), at Karachi Mobility Project (Yellow BRTS), Government of Sindh, Karachi on 14.02.2023. To create awareness about the role of Non-destructive testing in Infrastructure Monitoring, Quality Control and Quality Assurance, Share success case study of some mega projects in Pakistan. Give knowledge of construction material testing available at CWHR and their used in construction industry.</p> <p>Pictorial View of presentation at office of Sindh mass Transit Authority (SMTA) are attached at <i>Appendix-III</i>.</p> <p>As interaction with academia, NDT laboratory provide internship to the final year student of Civil Engineering Department of Mehran University of</p>		

GOAL SPECIFIED FOR FY-2022-23	TARGETS SET FOR FY-2022-23	OUTCOMES AS PER MTFD	OUTPUTS AS PER MTFD	NON-DEVELOPMENT BUDGET FY-2022-23	REMARKS
			<p>Engineering and Technology (MUET) in June, 2023 on the basis of brief detail of Non-Destructive Testing & Consultancy Services with operation and methodology of Stat-of-The Art NDT equipments available in NCRC/NDT Section. This section has provided 01 Testing Services at Construction of Project W&S-0317 at Mauripur Site, Karachi to M/S Maritime Technology Complex (South). The task was to investigate the Density of Soil In-Place by the Sand Cone Method with compliance AASHTO T 191-02(2005). The team conducted testing of 02.02.2023.</p>		

Appendix-I

Pictorial View of Non-Destructive Testing Site of Old Admin/Account Section at PCSIR Laboratories Complex, Karachi.



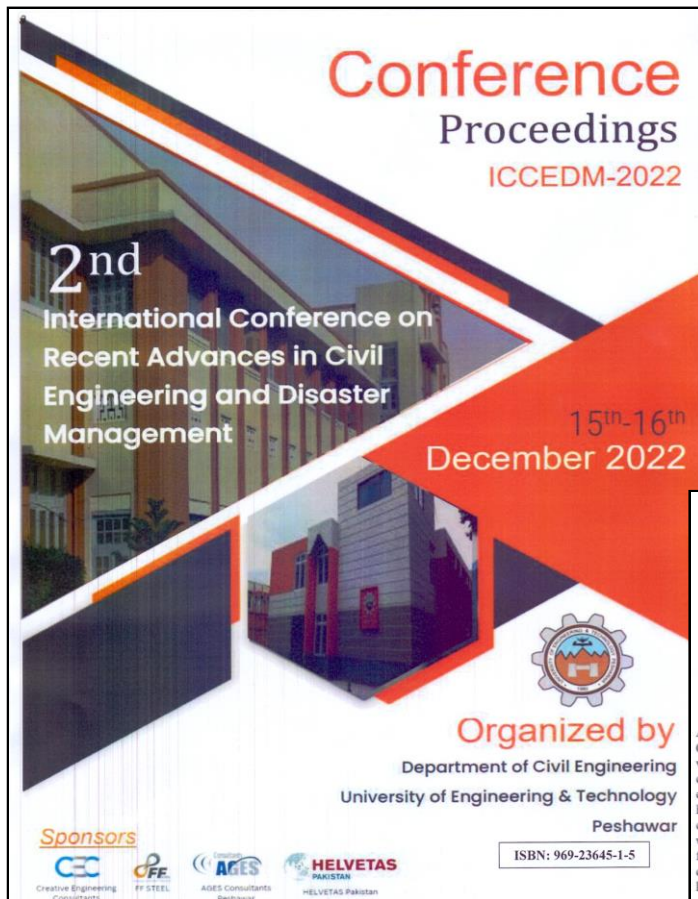
Figure-01: Drilling for cutting 0.5" dia concrete core prior to Capo Test at Location

Figure-02: Capo Test in progress at Location -01 on



Figure-03: Peak Value of Compressive Strength is shown on Capo Gun in KN at Location -02 on

Figure-04: Figure shows written details of Capo Test at Location -02



Appendix-II

2nd Research paper entitled "Impact of covercrete on durability of concrete by measurement of permeability coefficient and corrosion analysis in concrete" in the 2nd International Conference on Recent Advances in Civil Engineering and Disaster Management (ICCEDM-2022) held on 15th to 16th December-2022 at UET Peshawar.

Proceedings of the 2nd International Conference on Recent Advances in Civil Engineering and Disaster Management
Arranged by: Department of Civil Engineering, UET Peshawar.

Impact of covercrete on durability of concrete by measurement of permeability coefficient and corrosion analysis in concrete

Zubid Ullah¹, Ruksana Rahooja², Muhammad Ashraf³, Bushra Sarfaraz¹

¹Council for Works and Housing Research, F-40, SITE, Hub River Road, Karachi-75730 Pakistan,

E-mail : researchengineer.ndt@gmail.com

²Individual Consultant (NDT), Pakistan

³Department of Civil Engineering, GIK Institute of Engineering Sciences and Technology, Topi, Pakistan

ABSTRACT:

Concrete is a composite material mixed in different ratios for achieving desired properties. The properties of concrete change due to various factors one such property is permeability coefficient i.e. air permeability of covercrete. This greatly affects the durability and changes in the potential of corrosion in concrete that effects overall structural integrity. This paper discusses the impact of permeability coefficient of covercrete on the potential of corrosion at columns of a high-rise building constructed by EMMAR in DHA Phase-VIII Karachi. The Council for Works and Housing Research (CWHR) was assigned to conduct Non-Destructive Testing of 17 numbers columns located in the North and South Tower Buildings. A total of 120Nos. permeability tests and 31 tests for potential of corrosion were performed at both the towers. Probability for potential of corrosion was statistically calculated by determining cumulative frequencies from multiple readings taken on four faces of each column tested. It was concluded that in majority of the columns where quality of covercrete was good or normal, the percentage of cumulative frequency for occurrence of potential for corrosion was within permissible limits holistically indicating that there was 90% probability of no corrosion. A few columns located in the South Tower that showed bad or very bad covercrete, uncertainty of corrosion potential was deduced from occurrence of low percentage of cumulative frequency for potential of corrosion above the upper limits. Thus, it was concluded that durability of concrete could be assessed by measurement of its permeability coefficient and corrosion analysis in concrete.

KEY WORDS: Air Permeability Co-efficient, Potential of Corrosion, Cumulative Frequencies.

1.0 INTRODUCTION

The concrete durability is of great importance in the field of building construction and it depends on dynamic environmental conditions. Durability of coastal (concrete) structures is a challenging job all over the world; and millions of dollars are spent in inspection and rehabilitation of existing structures. The reaction of each structure to environment is different because of its building material properties in building element. The durability has many factors in which air permeability Co-efficient of covercrete is most catastrophic in nature. The causing agent of concrete destruction starts with the air permeability and other chemicals intrusion inside the concrete. The weakness of covercrete creates problem of corrosion potential in structure, which affects the structural integrity in the form of major and minor cracks.

Council for works and housing Research (CWHR) Karachi was approached by M/S Paragon Consultants (Pvt.) Ltd. as one of their projects namely EMAAR Towers, constructed on the coastal beach of facing the Arabian Sea in Karachi was facing the problems arising due to proximity of sea environment.

CWHR was hence approached by the consultants for conducting Non-Destructive testing of 145 Nos. columns (about 145 per square meter (SQM) of test area) at one of their projects namely EMAAR Towers located in DHA Phase-VIII Karachi.

2.0 SCOPE OF THIS PAPER

The scope of work was to measure potential fields of corrosion over the surface of concrete in accordance to ASTM C-876. This work included taking approximately 16 readings per SQM and recorded. In addition, the permeability test of concrete was to be carried out to assess the depth of water ingress in concrete from the surface of concrete and to be tested for air permeability by torrent method. For these tests, 02 readings per SQM were to be taken and recorded. After visual inspection of the tower buildings by NDT team from CWHR, most affected columns were selected in mutual consultation with M/S Paragon. The test site was divided into two-parts e.g. North and South Towers. A total of 118 Nos. permeability tests and 31 tests for potential of corrosion were performed at both the towers.

This paper describes the testing methodology for Torrent Permeability Test and Half-Cell Corrosion potential test conducted on 17 Nos Columns. Observations and results are tabulated followed by discussion on the results with respect to the stipulations and limitations specified in the relevant ASTM.

3.0 METHODOLOGY ADOPTED.

Two test methods have been used for this work i.e Half-Cell potential for investigating probability of corrosion and determining air permeability co-efficient of the covercrete with an aim to determine the quality of covercrete in the structural concrete. These tests were considered important for assessing the durability of concrete, as corrosion damage is predecessor to high air permeability in concrete. The details of the tests are as follows:

3.1 Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete

This technique is mostly used for assessment of the durability of reinforced concrete members where reinforcement corrosion is suspected. The application of test includes the location of areas of high reinforcement corrosion risk in sub structure of building, marine structures, bridge decks and abutments. Used in conjunction with other tests, it has been found helpful when investigating concrete contaminated by salts and other chemical intrusion of water and water additive.

(See Figures 3.1.1 and 3.1.2)



Figure 3.1.1: Components of the Potable Equipment used for Testing

502

Pictorial View of presentation at office of Sindh mass Transit Authority (SMTA)



National University of Sciences and Technology (NUST)

Introduction

National University of Sciences and Technology (NUST) is a premier national institution with international standing. In a relatively short span of time since it was granted the Charter in 1993, it has earned a reputation for quality education, innovation and excellence in research and learning. As a comprehensive university, NUST comprises of 18 schools/colleges/institutes (13 at Sector H-12 Campus, Islamabad, 02 at Rawalpindi, 02 at Risalpur and 01 Campus at Karachi) offering 39 undergraduate, 82 MS & 56 Ph.D. academic programmes including Engineering, IT, Biotechnology, Biosciences, Art & Design, Management and Social Sciences. As of 30.06.2021, the University has faculty strength of 1250 with 686 Ph.Ds. and student strength of 19280. The university through forward planning and consistent efforts has earned a name for itself at both the national and international levels. The university is based on a multi-disciplinary concept and its colleges and institutes are located in six campuses across the country, with its Central Campus in Islamabad.

Vision

To evolve NUST into a world class Centre of Excellence among Higher Education Institutions, leading the transformation of Pakistan towards a rapidly developing Knowledge Economy and to realize the national objective of a progressive and prosperous country among comity of nations.

Mission

In pursuance of its vision, NUST strives to achieve following goals:

- Develop NUST as a Comprehensive, Academic and Research-led university with a focus on Creativity, Innovation and Entrepreneurship so as to amicably negotiate Social, Economic and Environmental challenges faced by the country.
- Nurture talent by providing equal opportunity to all segments of polity, with foundations based on principles of Merit, Transparency and Fair Play.
- Empower students to develop their full potential, acquiring leadership and social skills, to act as agents of change within the society.
- Improve global visibility by enhancing mutually beneficial linkages with international organizations and partner universities.
- Strengthen NUST financially to enable the university to achieve its goals by raising awareness among local and international Pakistani diaspora including Alumni base around the world.
- Ensure conducive learning and working environment for students and staff at par with international standards.

Goals and Targets

The following targets were set in the NUST 10 Years Development Plan 2020-30 (Approved by NUST BoG in 2020):-

• **Students' Strength**

	Present Status	Targets for 2029-30
UG	11098	15442
MS / MPhil	5233	9503
PhD	898	1503
Total	17229	26448

• **Faculty State**

	Present Status	Targets for 2029-30
PhD	792	1400
MS / BS	550	400
Total	1342	1800

• **Academic Programmes**

	Present Status	Targets for 2029-30
UG	45	59
MS	95	114
PhD	68	70
Total	208	243

• **Other Goals / Objectives and Key Performance Indicators (KPIs)**

Description	KPIs
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<p>(a) To emerge as a leading International University in Higher Education and Research.</p>	<ul style="list-style-type: none"> i. Improve overall International Ranking. ii. Improve Ranking in Engineering and Technology, Natural Sciences and Computer Sciences. iii. Enhance international linkages and visibility by securing memberships in various international associations related to Science Parks, joint Research platforms and academic leagues.
<p>(b) Relevance of education and research with the needs of the country's economy & society.</p>	<ul style="list-style-type: none"> i. Become Pakistan's first full-scale 3rd Generation University that has greater entrepreneurial international stature/footprint with a focus on sustainability to transform it into 4th Generation University. ii. Promote Research and innovation with focus areas that are aligned with the national vision, needs and priorities, having greater societal impact and industrial relevance thus contributing towards the knowledge economy of Pakistan. iii. Become an SDG-Engaged University with University Academics, Research, Operations and governance, fully aligned with SDGs and measurable outcomes iv. Enhance research, commercialization and technology transfer to the industries. v. Outreaching the industry for R&D projects of industrial and societal needs vi. Enhance research funding. vii. Building University-Industry Linkages aimed at full spectrum engagement with multi-sectoral industries.
<p>(c) Establish an ecosystem to contribute towards the National Innovation System and enhance the entrepreneurial character and commercialization of the research output by building a strong Academia-Industry Collaboration (including the Defence Industry).</p>	<ul style="list-style-type: none"> i. Encourage entrepreneurial culture at the University through the annual Finding Innovative & Creative Solutions for Society (FICS) program (In partnership with industry), an international technology scouting initiative to contribute to the Global Innovation System. ii. Strengthening of Innovation eco-system of NUST and country through Technology Incubation Center and National

Description	KPIs
	<p>Science and Technology Park (NSTP) that houses 100+ private sector companies, knowledge workers, researchers, scientists and government reps.</p> <p>iii. Award of Zone Enterprise status to 25 companies of NSTP for concessions/exemptions on taxes and customs duties (Ease of doing business)</p> <p>iv. 8 SME / Start-up clusters of national importance aligned with the academic strengths of NUST including defence tech.</p> <p>v. 21 IPs filed, 50 tech transfers, 230 products developed and PKR 30 M joint research projects conducted at NSTP.</p> <p>vi. Pre-Incubation program (Hatch-8) produced 16 no successful start-ups this year. 16 will be graduated by the end of this year</p>
(d) Inter-disciplinary academic programs and research and Innovation in teaching & learning.	<p>i. Introduce multidisciplinary subjects to achieve diversification.</p> <p>ii. Enhance the soft skills of students for their career development and market acceptance.</p>
(e) Empathy for society & community service.	<p>i. Lay emphasis on having a discernable positive impact on society.</p> <p>ii. Institutionalizing community services and community development.</p>
(f) Building Endowment Fund and Financial Self-Reliance.	<p>i. Raise endowment fund.</p> <p>ii. Enhance registration of alumni.</p>
(g) Develop NUST into a green university.	<p>i. Grow plants/trees.</p> <p>ii. Maximum use of recycled water for watering plants.</p> <p>iii. Use of solar power.</p>

Clear-cut Performance Outcomes Instead of Routine Activities

- “QS” World University Ranking

Year	World Rank	Pakistan Rank
2022-23 (QS 2024)	367	2 nd

- “QS” World University Ranking by Subject

Year	Subject	World Rank	Pakistan Rank
2022-23 (QS 2023)	Electrical & Electronic Engineering	140	1 st
	Computer Science & Information System	148	1 st
	Mechanical, Aeronautical and Manufacturing Engineering	201-250	1 st
	Chemical Engineering	201-250	1 st
	Civil and Structural Engineering	201-230	1 st

	Material Sciences	251-300	1 st
	Mathematics	201-250	2 nd
	Physics & Astronomy	301-350	2 nd
	Chemistry	351-400	2 nd
	Environmental Sciences	351-400	2 nd
	Business & Management	251-300	2 nd
	Biological Sciences	501-550	4 th

• **“QS” Asian University Ranking**

Year	Overall Ranking	Pakistan Rank
2021-22 (QS 2023)	67	1 st

• **“QS” World University Ranking by Broad Category**

Year	By Faculty	World Rank	Pakistan Rank
2022-23 (QS 2023)	Engineering & Technology	160	1 st
	Natural Sciences	451-500	2 nd
	Social Sciences and Management	451-500	2 nd

• **“THE” Impact Ranking**

Year	World Rank	Pakistan Rank
2022-23	201-300	1 st

• **Research Projects**

- Research Projects Approved for Funding 66
- Research Projects in Progress 317
- Research Projects Completed 44

• **Research Papers**

- Research Papers Presented in Conferences (25 Online + 14 Travel) 39
- Conference Proceedings Published 164
- Research Papers Publications 1606

• **Intellectual Property Rights**

- IPs filed 177
- IPs Approved 12

• **Commercialization**

- Technologies Licensed to the Industry 10

• **Companies Incubated / Graduated**

- Number of Incubatees 70
- Number of Companies Graduated – 2022-23 18
- Number of Jobs Created 1714

• **Innovation Promotion and Marketing**

- Industrial Problems Identified 300
- Consultancy Projects Identified 33
- R&D Projects Identified 40

• **Professional Development Centre**

- Total Number of Training 71
- No. of Customized Training 32
- No. of Open Enrolment Programs 39

• **Corporate Advisory Council (CAC)**

- CAC Partner Companies 450
- Number of CAC – NUST Partner Schools/ Institutes 19
- Student Visits by CAC Team to Industry 300+
- CAC Sector Committees Member Companies 200

• **NUST Placement Office**

- Students Placed on Jobs 1919 out of 2442 (277 pursuing Higher education, 154 seeking employment and 92 unemployed by choice)
- Industrial Linkages Established with Top Recruiting Companies 2113
- Number of Recruitment Drives 216
- Number of NUST Career Talk Series 20
- **Career Development Centre**
 - Career Development Plan 45
 - Resume writing 27
 - Professional Employability Skills 20
 - Interviewing Techniques 12
- **Develop NUST into a Green University** In line with the Government's initiative, progress on plantation/ number of trees is as under:-
 - Last 10 Years Sapling Count 1088828
 - Year 2018-19 Planted Saplings 13000
 - 2019-20 Planted Saplings 23000
 - The year 2020-21 Planted Saplings 3128 & Seed Balls thrown 5000
 - The year 2021-22 Planted Saplings 3700 & Seed Balls thrown 3000
 - The year 2022-23 Planted Saplings 4000 (Still planting in progress)

Alignment of Outcomes and Outputs with the Medium-Term Budget Estimates for Service Delivery

● **Budget Details**

(Rs in M)

Outputs	Actuals		Budget Allocation	Forecast	
	2021-22	2022-23	2023-24	2024-25	2025-26
Promotion of Higher Education in the field of Science and Technology	3343.542	3744.411	3831.942	6526.250	7505.188

Demand	Demand No.	Shown in the Demand of:	Actuals	Budget Allocation
Non-Development Budget	082	IB 3372	3343.542	2021-22
	087	IB 3372	3744.411	2022-23
	087	IB 3372	3831.942	2023-24

Inputs – Object Classification	Actuals		Budget	Forecast	
	2021-22	2022-23	2023-24	2024-25	2025-26
A01 Employee-Related Expenses	3130.000	3645.000	3569.782	5787.545	6655.677
A03 Operating Expenses	163.542	46.748	262.160	636.705	732.712
A04 Employee Retirement Benefits	50.000	55.000	-	102.000	117.000
Total	3343.542	3744.411	3831.942	6526.250	7505.188

● **Performance Details**

Selected Performance Indicators	Outcomes 2020-2021
UG Programmes	
4 New Programmes Introduced	45
250 Additional Students will be added to the intake	11348
MS / M.Phil Programmes	
6 New Programmes Introduced	95
169 Additional Students Enrolled	5402
PhD Programmes	

Selected Performance Indicators	Outcomes 2020-2021
5 New Programmes Introduced	68
243 Additional Students Enrolled	872
Enhancing Research Support System	
Proposals Submitted for Approval as Planned	445
Joint Research Projects Approved as Planned	18
Papers Published as Planned	1606
Research Articles Presented in Conferences as Planned	39

COMSATS University, Islamabad (CUI)

Introduction

COMSATS University Islamabad (CUI) is the fast-growing research-based university in Pakistan, with a wide range of academic programs, ranging from basic sciences to cutting edge emerging technologies and a network of inter-disciplinary research centers making it an ideal place for higher studies leading to MS and PhD degrees. Established in 1998 as COMSATS Institute of Information Technology (CIIT) and later granted status of Degree Awarding Institute (DAI) by Federal Government of Pakistan on August 12, 2000, it has been upgraded to a Federally Chartered University in April 2018 under the COMSATS University Islamabad Act 2018.

The CUI functions under the governance of the Senate which is chaired by the Chancellor of the university. The President of Islamic Republic of Pakistan is the Chancellor of the University. Besides Islamabad, it has campuses in Lahore, Abbottabad, Wah, Attock, Sahiwal, Vehari and a Virtual campus as well.

Goals and targets specified against which performance can be measured.

CUI has developed and expanded upon its strategic Vision with specific goals and objectives outlined for the next 15 years (till 2035), including physical, quality assurance, promotion of research, industrial infrastructure, major areas of academic growth, expansion and specialization, faculty and staff development and international linkages, student service facilities and funding requirements. CUI sees itself as a self-sustaining state-of-the-art academic institute with the purpose of bringing enlightenment, empowerment, and enrichment through advancement of learning, expansion of knowledge, and development by its application.

CUI envisions having its presence in all provinces of the country. It sees for itself a position among the top 100 universities in the developing countries and top 500 universities in the world in 5-, and 10-years' time, respectively. The preparation for the CUI Vision 2035 is under process. By 2030, CUI envisions to have its presence among the top 50 universities in Asia.

Clear-cut performance outcomes instead of routine activities.

The CUI currently comprises of six faculties, 22 departments and 08 research centers. Presently about 106+ degree programs are on offer in which 33,193+ students are enrolled. There are 2,093 faculty members working in CUI with 1,137 + faculty members and academic managers have PhD qualifications. More than 400+ faculty and staff members are undergoing advanced education leading to MS and PhD degrees. The Faculty Development Academy of CUI is also quite active in the training of the newly recruited faculty at CUI. Till now, 134 convocations have been organized in which degrees have been conferred on 93,000+ graduates, including 795 PhDs.

CUI Rankings:

In TIMES Higher Education (THE) World Universities Rankings 2023, CUI was placed among 601-800 world best universities 2023. Besides, CUI was also ranked in its various subject rankings 2023 i.e:

- #301-400 in THE Engineering & Technology
- #301-400 in Computer Science,
- #301-400 in Business & Economics
- #501-600 in Life Science
- #401-500 in Physical Sciences

CUI was also ranked at:

- #251-300 in THE Emerging Economies Rankings 2023
- #151-200 in THE Young University Rankings 2023

In addition, CUI was ranked in the QS World University Rankings 2023 as under:

- #651-660 in QS World University Rankings 2024
- #142nd in QS Asia for 2023
- #301-360 in World University Rankings Sustainability 2023
- #18 in QS Asia University Rankings 2023, Southern Asia
- In 14 subjects in QS World University Rankings by Subject 2023

THE University Impact Rankings 2023

CUI has been ranked # 1 in Pakistan and among 201-300 in the world in TIMES Higher Education (THE) University Impact Rankings 2023. Moreover, it was also ranked in each of the 17 SDG's. Further, the CUI's position in UN's 17 SDGs in world and its number in Pakistan, for THE University Impact Rankings in 2023, is tabulated below:

SDG's	Position in world	Position in Pakistan
SDG 1 No Poverty	101-200	-
SDG 2 Zero Hunger	84 th	2 nd
SDG 3 Good Health and Wellbeing	601-800	-
SDG 4 Quality Education	401-600	-
SDG 5 Gender Equality	601-800	-
SDG 6 Clean Water and Sanitation	26 th	1 st
SDG 7 Affordable and Clean Energy	3 rd	1 st
SDG 8 Decent Work and Economic Growth	301-400	-
SDG 9 Industry, Innovation, and Infrastructure	401-600	-
SDG 10 Reduced Inequalities	201-300	3 rd
SDG 11 Sustainable Cities and Communities	201-300	1 st
SDG 12 Responsible Consumption and Production	201-300	3 rd
SDG 13 Climate Action	101-200	1 st
SDG 14 Life Below Water	69 th	16 th
SDG 15 Life on Land	101-200	2 nd
SDG 16 Peace, Justice, and Strong Institutions	401-600	-
SDG 17 Partnerships for goals	101-200	1 st

Conferences/Workshops Held:

During the reporting period, CUI organized different conferences / trainings and workshops at various campuses. Some of the important ones are listed below:

Islamabad Campus

- Three-day workshop on Enhancing Teaching Skills was held at CUI Islamabad Campus from July 18-20, 2022.
- Two one day workshops on Noting & Drafting for Staff & Officer Grade Employees were held at CUI Islamabad Campus on July 25-26, 2022.
- A seminar on Disability Equality Training for Faculty and Officers of CUI, was held at Islamabad Campus on July 27, 2022.
- A one-day workshop on basic social media tools for administrative staff of CUI Islamabad Campus was held on June 8, 2023.
- BIC signed an MoU with Transformatics (Pvt.) Ltd., for organizing conferences, seminars, and career networking events on August 2, 2022.
- 2nd Meeting of the D-8 Network of Pioneers for Research and Innovation (D8- NPRI) was organized by IRCBM on 8-9 March, 2023, held at Islamabad Campus.
- IRCBM organized a Workshop on Conducting Clinical Trials in Pakistan – Design and Data Interpretation, January 23-25, 2023, at Islamabad Campus, CUI

Abbottabad Campus

- The Department of Environmental Sciences organized the World Environmental Day on June 05, 2022.
- A Seminar on “Fundamentals & practices of Islamic Banking,” in collaboration with Bank Islami Pakistan Limited, was held at CUI, Abbottabad on June 15, 2022.
- The Department of Management Sciences conducted a Job Fair on June 23, 2022, organized by Management Sciences.
- An MoU was signed with the Water and Sanitation Services Company, Abbottabad (WSSCA) on Friday, July 29, 2022.
- An awareness session was conducted on the Role and Functions of the Federal Tax Ombudsman Secretariat on August 26, 2022.

- National Rehmat-UI-Lil Almeen Celebrations were organized on October 26, 2022.
- A seminar on mental health and its awareness was organized on November 1, 2022.
- A seminar on “International Perspective of Academic Research” was organized on December 7, 2022.
- A training workshop was organized by the (PITAC), in collaboration with ACUI Abbottabad campus, on December 19, 2022.
- An E-commerce Workshop was conducted by the IT Center on Jan 5, 2023.
- An event was organized on Jan 22, 2023, in connection with the Lunar Year celebrations for Chinese students.
- Workshops organized by Faculty Development Academy (FDA) were conducted from May 8-11, 2023.
- A Job fair was organized on June 21, 2023.

Wah Campus

- The Department of Electrical & Computer Engineering conducted a training session for faculty including class counselors/student advisors regarding course allocation, student counseling, new grading system, timetable, and related academic matters on Sept 29, 2022.
- Two-day training for CUI Wah Campus Library Staff was conducted from September 21 – 22, 2022, led by Mr. Rehan Aslam, Master Trainer on Insignia ILS from CUI Islamabad Campus.
- The Department of Electrical & Computer Engineering arranged a workshop on “LabView and Software Defined Radios for Engineers” on Oct 6, 2022, under the supervision of Dr. Zeeshan Kaleem.
- Training on Complex Engineering Problems and Open-Ended Labs: The Outcome Based Educational training on “Complex Engineering Problems and Open-Ended Labs” was conducted on Oct 19, 2022, by the Department of Mechanical Engineering.
- The fourth China Pakistan Marine Information (CPMI-2022) was held on Nov 16, 2022, jointly organized by academic and research institutions from China and Pakistan.
- A two-day 19th International Conference on ‘Frontiers of Information Technology’ (FIT-2022), was organized by CUI, which kicked off on Dec 12, 2022, at COMSTECH Secretariat, Islamabad.
- The Department of Management Sciences arranged a workshop on "Engaging University Faculty for the Mental Well-Being of Students" on Dec 1, 2022.
- The UNESCO Chair on Knowledge Systems for Integrated Water Resources Management (IWRM) organized a one-day workshop on Hydrological Modelling Application of SWAT on Feb 28, 2023, in collaboration with the Department of Civil Engineering.
- The Department of Electrical & Computer Engineering arranged a workshop on Latex on March 16, 2023 for undergraduate final year project-related students. It was conducted by Dr. Rameez Naqvi, Assistant Professor, Electrical & Computer Engineering.
- The Department of Civil Engineering arranged a Curriculum Vitae (CV) writing training session for final-year students on May 16, 2023. The resource person for the session was Dr. Khalid Ibrahim, Electrical Engineering Department, CUI Wah.

CUI Lahore Campus

- The Dept. of Economics, in collaboration with the Sustainable Development Policy Institute (SDPI), organized a ‘policy dialogue’ on improving the effectiveness of plastic bag ban in Pakistan on July 5, 2023.
- The department also organized a research writing workshop titled “How to write a Literature Review” on Dec 27, 2022, which was a part of the series of skill development components of the research project awarded to Dr. Muhammad Khan (Associate Professor/PI) under the HEC Grand Challenge Fund (GCF) program.
- An informative session on "Digital marketing strategies and business growth" was held on Oct 17, 2022. The focal person was Ms. Ayesha Rasheed, CEO of AshTech24 company.
- The Department of Computer Science organized final year projects, posters exhibitions and recruitment drive on Feb 7, 2023, and July 7, 2023.
- Eleven faculty members from the Department of computer science participated in the Training of Faculty for Entrepreneurial Coaches under the TAKEUP Project. The training lasted one week from July 17-21, 2023.
- A delegation from Italy visited the Computer Science department on Nov 4, 2022. They delivered a lecture on soft robotics and discussed about scholarship opportunities in Italy.

- A workshop was organized by the Computer Science department industrial liaison committee with the collaboration of Cogent Labs on “How to build a basic CRUD app with React” on Nov 28, 2022.
- The Department of Computer Science organized a seminar on Dec 26, 2022, on AI/Machine Learning in Digital Healthcare: Opportunities and Challenges, delivered by Prof. Dr. Naeem Ramzan from the University of West Scotland, UK.
- The Department of Humanities organized a seminar on “Introduction to Research Methodology” on June 2, 2022.
- The Department of Humanities organized a seminar on “Neuropsychological problems related to lead poisoning and its management” delivered by Dr. Farhan Abdul Rauf.
- The Department of Chemical Engineering organized a competition CHEM E THON 2023, All Pakistan Chemical Engineering Students competition on June 1, 2023.
- The Department of Media & Communication Studies organized a workshop on Electronic Media as a tool of mass communication on May 31, 2022. Mr. Babar Ali, GM at Television Network, Virtual University, was the guest speaker.

CUI Sahiwal Campus

- The Department of Computer Sciences organized a training session on Exam Paper Settings Training on Aug 31, 2022. Dr. Qamar Uz Zaman Malik, Assistant Professor, Department of Management Sciences, CUI Sahiwal Campus, was the facilitator.
- A Training Session on Game Development Training was held on Sept 2, 2022. Mr. Shahab Mirza, C.T.O., SabaSoft Gaming Software House, Lahore, was the trainer.
- A training session on Outcome Based Education (OBE) Training was held on Aug 30, 2022. Dr. Javed Ferzund, Associate Professor, CS Department, CUI Sahiwal Campus, was the trainer.
- A Web Development Boot Camp Session Day was organized on April 11, 2023. Mr. Ahmad Ghani was the Lead Instructor.
- The Department of Mechanical Engineering conducted a training session on the preparation of E-course folders. The session was conducted by Syed Khawar Hussain Shah.
- Dr Junaid Mughal, the director of the CUI Attock Campus, conducted a training session on Outcome Based Education (OBE) on 27 Feb 2023, for the faculty of Engineering at CUI Sahiwal Campus.
- A training session related to outcome-based education (OBE) was conducted on Nov 14, 2022 by the Mechanical Engineering Department of CUI, Sahiwal Campus. Dr. Saqib Saleem, former HoD Electrical Engineering, was the trainer.
- The Department of Mechanical Engineering conducted a Seminar on "How to Write a Professional Document; Report/Thesis Writing with LaTeX" on Nov 10, 2022.
- The Department of Mechanical Engineering conducted a Seminar on End Note-A promising referencing Tool was held on Oct 27, 2022. Dr. Muhammad Rafi Raza, HoD Mechanical Engineering, was the resource person for the event.

CUI Vehari Campus

- The Department of Environmental Sciences organized a seminar for faculty, students, and farmers on Feb 23, 2023. A delegation of German professors, including Prof. Dr. Gerold Rahmann from the University of Kassel, Dr. Daniel Bernhard Neuhoff from the University of Bonn, and Mrs. Klaudia Katharina Rahmann, gave presentations on organic agriculture and farming systems.
- The Career Counseling Cell (CCC) of Department of Environmental Sciences, CUI Vehari Campus, has organized a seminar entitled "Future Preparedness and Planning for Graduates" for last semester students of BS and MS programs of all the departments on June 15, 2023.
- Center for Islamic Finance organized a one-day seminar on May 25, 2023, sponsored by Meezan Bank, addressed by experienced banking professionals, and attended by over 150 students.
- An awareness seminar on startups and entrepreneurship was organized by the Center for Islamic Finance, Department of Management Sciences on March 16, 2023.
- An awareness seminar on fundamentals and practices of Islamic banking was organized by the Center for Islamic Finance, Department of Management Sciences Nov 22, 2022.

CUI Attock Campus

- The Department of Electrical and Computer Engineering organized an IOT Robot Raceon June 14, 2023, in the Industrial Electronics Lab, highlighting integration of robotics and IoT for automation revolution.

- The Department of Electrical & Computer Engineering organized a seminar on Power Transmission Network in Pakistan on June 6, 2023. The speaker, Engr. Syed Mustafa Shah, Deputy Manager NTDC, talked about challenges and opportunities in enhancing transmission networks, emphasizing modernization, expansion, and integration for stable power supply.
- The Department of Electrical and Computer Engineering organized the UN SDG Workshop on June 13, 2023.
- The Department of Electrical & Computer Engineering organized a seminar on Outcome Based Education (OBE) System on May 29, 2023. The speaker, Dr. Ali Mustafa, described principles and implementation of Outcome-Based Education Benefits, assessment strategies, quality assurance and shared best practices and case studies.
- Another seminar on Entrepreneurship for Engineers, was organized by the Department on March 17, 2023. The speaker, Dr. Faiza Nawaz, focused on fostering entrepreneurial mindset among engineers and shared insights on starting and running successful ventures.
- Another seminar on Role of ChatBots in Education was organized by the Department on May 30, 2023. The speaker, Mr. Akbar Ali Khan, talked about the application and benefits of chatbot technology in education. He also showcased case studies, research findings, and demonstrations.

Further **Faculty Development Academy (FDA)** has been organizing series of activities for CUI faculty members along with teachers from local universities, to equip them with latest knowledge, proactive instructional strategies, and an active social interest to foster quality education. A summary of the activities conducted by the FDA during the year 2022-2023, is given below:

- Three-day workshop on Enhancing Teaching Skills was held at CUI Islamabad Campus from July 18-20, 2022.
- One day workshop on Noting & Drafting for Staff Grade Employees was held at CUI Islamabad Campus on July 25, 2022.
- One day workshop on Noting & Drafting for Officer Grade Employees was held at CUI Islamabad Campus on July 26, 2022.
- A seminar on Disability Equality Training for Faculty and Officers of CUI, was held at Islamabad Campus on July 27, 2022.
- A Skill Enhancement & Employee Development Program (SEED) was organized at CUI Vehari Campus from July 26-28, 2022.
- Workshop on Noting & Drafting for Officer & Staff Grade Employees CUI, Islamabad Campus, was held on July 29, 2022,
- EQUIS Accreditation training for Campus Directors, QEC and P&D Department was held on August 23, 2022.
- A three-day workshop on Development of MCQs based Testing System for Instructors / Officers of Command and Staff College Quetta, was held from Aug 30 - Sept 1, 2022.
- A one-day workshop on Engaging University Faculty for Mental Health of Youth was held on Oct 25, 2022.
- A seminar on the Importance of Developing Skills besides University Education was organized on Dec 9, 2022.
- An advance level course / 3-day workshop on Effective Communication Skills (Noting & Drafting) was held from Dec 21-23, 2022.
- Outcome Based Education (OBE) Training for faculty of CUI Sahiwal Campus was held on Feb 27, 2023.
- Outcome Based Education (OBE) Training for faculty of CUI Vehari Campus was held on Feb 28, 2023.
- Outcome Based Education (OBE) Training for faculty of CUI Lahore Campus was held on March 20-21, 2023.
- A one-day workshop on basic social media tools for administrative staff of CUI Islamabad Campus was held on June 8, 2023.

Research and Commercialization (ORIC):

- Business Incubation Center (BIC) has enrolled 297 companies since its inception. During the year 2022-23, 22 student startups have been enrolled at SSBC and eight female entrepreneurs have been enrolled under the United States project, OREGON, RAIN, whereas seven companies have been enrolled in Cubator-1ne. Furthermore, BIC companies have generated more than 50 million rupees in revenue and created 50 internships/jobs during the year. Moreover, BIC has signed two MoU's - one MoU was signed on August 2, 2022, with Transformatics (Pvt.) Ltd.,

for organizing conferences, seminars, and career networking events. BIC also signed another MoU with MetaPi (Pvt.) Ltd. to promote industry-academia linkages.

- The total publications of CUI from the year 2005 to 2023 are 24,889 as on Aug 9, 2023. In the calendar year 2022 the figure was 2,731 as per data collected from CUI researchers individually and in the year 2023 it was 1,514. Total publications for FY 2022-23 were 2,560.

Visits:

CUI received twenty-eight (28) inbound official visits of international universities around the globe during 2022-23. In addition, CUI received inbound visits of officials from different embassies and High Commissions in Pakistan, such as the Palestine Embassy, Sri Lankan Embassy, Azerbaijan Embassy, Qatar Embassy, Romania Embassy, French Embassy, the Embassy of the Republic of China, the High Commission of Maldives, etc. CUI sent twenty-nine (29) official delegations to different universities research centers of different countries, like the UAE, Sri Lanka, the United Kingdom, Türkiye, France, Malaysia, Spain, etc. CUI also organized Vice Chancellor Forum During March 2023.

Alignment of outcomes and outputs with the medium-term budget estimate for service delivery.

Development Activities:

COMSATS University Islamabad (CUI) has completed 50 projects with a total capital cost of Rs. 895.99 million until June 2023. For the financial year 2022-23, CUI was allocated Rs. 100 million for a single development project. However, no funds were released during FY 2022-23.

Human Resource Development:

During the preceding decade and half, over three hundred and sixty (360) fully funded scholarships have been awarded to the faculty/staff to allow them to pursue studies in high-ranking universities of the world. Among them nearly 160 MS and over 200 PhD scholars have successfully completed studies. These scholarships were awarded through meritorious criteria, open to candidates already serving or willing to serve CUI upon completion of studies.

The performance of each section/attached department should be ascertained keeping in view key performance indicators.

- The performance of each section/attached department are being measured at CUI, keeping in view the goals and objectives, the targets, vision, mission of the University. Some highlights of CUI's major research/internationalization centers are outlines below:
 - The Center for Advance Drug Research (CADR) CUI, Abbottabad Campus is the finest and only drug research centre of Pakistan that is carrying out applied research at an advanced level. It has been involved in innovative and applied research projects and has filed five patents and published 370 articles in high impact factor journals with an impact factor of 1,450 till 2023. CADR is working on the invention of drugs for treatment of cardiovascular diseases.
 - Recently, two druggable compounds, discovered by the CADR are being marketed by a USA-based top-rated chemical company which has offices globally. In the last year, two research grants were awarded from the German funding agency (Academic Exchange Service, DAAD). Another research grant was awarded by the Government of France.
 - CADR has collaborations with international universities of top 200 ranking. Several PhD students, working in CADR, went to Germany and France for advanced training in handling latest research equipment. CADR has been awarded the Higher Education Commission of Pakistan (HEC) research grants to combat diabetes. A faculty member of CADR has been awarded *Tamgha-e-Imtiaz*, Gold Medal by the Pakistan Academy of Sciences, Fellow of Pakistan Academy of Sciences, HEC Outstanding Research Award at the National level.
 - The Interdisciplinary Research Centre in Biomedical Materials remained engrossed in translational R&D in the field of Biomedical Materials, Tissue Engineering, Regenerative Medicine and Sensors/Biosensors. Its publications crossed the 800 and the past year saw IRCBM actively pursuing 3rd party toxicity trials of its advanced wound care product and applying for regulatory approvals for an advanced wound dressing aimed at healing diabetic foot ulcers. Its wound healing technologies licensed to a national company have been soft launched by the licensee in the Pakistani market. IRCBM has co-published with personnel from more than 60 countries during its active tenure - putting CUI and Pakistan strongly on the world map of science and technology.
 - Building Sustainable Relationships for Translational R&D and Commercialization, 19th June 2023 – held at University of Sargodha, Sargodha.

- 2nd Symposium on Advancements in Dental Materials (Translational R&D in Pakistan) – 21st March 2023 – held at CUI Lahore Campus
- Stall and Interactive Exhibition of IRCBM Prototypes, Lahore Science Mela – October 2023, held at CUI Lahore Campus.
- The Centre for Climate Research and Development (CCRD), at CUI is engaged in the different multi-disciplinary climate research projects, capacity building and climate change awareness related activities, given the fact the Pakistan is one of the most climate vulnerable country in the world. It is pertinent to mention that CCRD is addressing these issues through detailed scientific studies, addressing various aspects of pure and applied climate science as it relates to Pakistan till year 2023. CCRD has completed 15 research projects and currently four projects are ongoing, with a total worth of Rs.107 million.
- CCRD's recent project partners include UK-based 'The DEGREE Initiative,' USA-based Resources for Futures (RFF), International Union of Conservation of Nature (IUCN), Swiss Development Cooperation (SDC), UNDP, D-8 Commission, CABI, as well as Ministry of Climate Change and Environmental Coordination, PSF, Muslim Hands, HEC, PCRWR and Meezan Bank. CCRD is actively conducting climate advocacy and awareness campaigns in the form of round table discussions, walks, seminars, symposia, as well as on-demand capacity building trainings in the discipline of renewable energy, in partnership with the private sector and industry such as CREECO (Bio-gasifier), flood relief camp with *Alkhidmat* Foundation and drought-resistant crop study, to highlight issues related to applied climate science.
- So far, CCRD has published over 100 research articles, 16 book chapters, several newspapers articles, blogs and produced over 10 video clips based on project outcomes, for raising awareness about climate change among respective communities. As of now, CCRD can address 11 out of 17 SDGs.
- The International Office of CUI is working with a vision to facilitate students, faculty, and staff to create international academic and research opportunities with universities and research centers around the world. During the year 2022-2023, the following major activities were undertaken by IO:
 - 357 international students from 22 different nationalities joined CUI. 28-PhDs, 38-MS, 286-BS students, two PhD Sandwich and three for Postdoctoral studies.
 - Three (3) students of CUI went on student semester exchange program to the Middle East Technical University, Turkiye. In addition, a delegation of two (2) faculty and staff members of CUI went on mobility to attend International Staff Week, organized by Tuscia University, Italy.
 - Furthermore, a two (2) staff member's delegation of CUI also participated in the International Staff Week, organized by USAK University, Turkiye.
 - The International Office has prepared Internationalization Strategy of COMSATS University Islamabad, under the mentorship of University of Salamanca, Spain, to promote internationalization in CUI. The strategy got approved by the Syndicate of CUI in its 8th meeting. This will help CUI become a 'university of choice' as well as a more welcoming institution and more outward looking institution.
 - During the reporting period, CUI has inked one (01) Erasmus+ Inter Institutional Agreement with an International University, namely Alanya Alaaddin Keykubet University, Turkiye. CUI has also signed an MoU with six (06) universities, which are as follows:
 - ❖ Ajman University, UAE.
 - ❖ James Cook University, Australia.
 - ❖ Federal University of Juiz de Fora, Brazil.
 - ❖ Cardiff Metropolitan University, United Kingdom.
 - ❖ Curtin University, Australia.
 - ❖ Universiti Tun Hussein Onn Malaysia, Malaysia.

Furthermore, six (06) MoUs are already in process at MoST/HEC for inter-ministerial codel formalities and cabinet approval.

Linkages with budget to better reflect performance.

CUI's resources, activities and outputs are aligned with the Governments' objectives to achieve desired outcomes and for the maintenance of its aggregate fiscal discipline.

Relevant Statistics Properly Tabulated

Strengths	Statistics (Period 2022-23)
Campuses	7
Faculties	6
Academic Programs	106
Departments	22
Centers	08
Faculty Members	2,093+
Research Papers	2,560
Students	33,193+
Graduates	93,000+
PhD's	77 (during 2022-23)

National Institute of Oceanography (NIO)

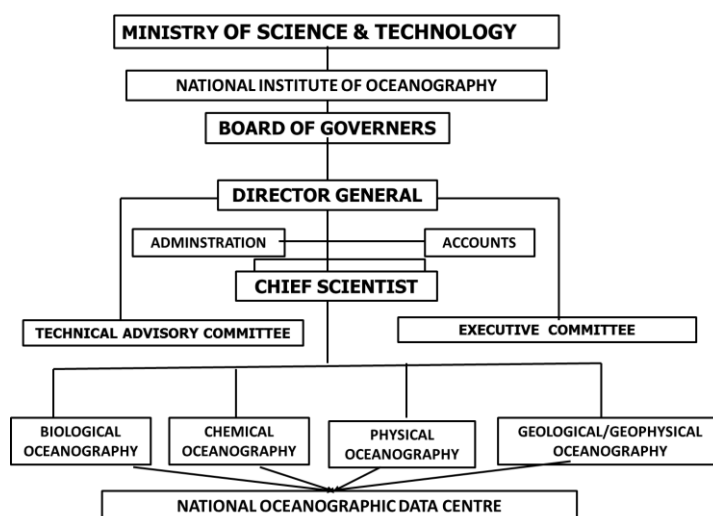
Introduction

National Institute of Oceanography (NIO) is the only pivotal research organization in Pakistan for multidisciplinary oceanographic research with experienced and well qualified team of scientists holding Ph.Ds from national and international universities. Almost 95% of the scientific team has received specialized training from well reputed national and international institutions. Since the establishment of NIO, efforts are made to enhance the R&D capabilities in the field of oceanography, and a number of national and international projects have been undertaken. The laboratories are continuously upgraded with state-of-the-art instruments/equipment and software to strengthen the capacity of the Institution. NIO has grown to carryout world class oceanographic research and surveys. The R&D activities undertaken by NIO are to meet the objectives of the Institute include Marine Geological & Geophysical surveys and studies in the deltaic, coastal and deep sea; Bathymetric Surveys and Mapping of the sea floor, Water Mass studies; Evaluation of living and non-living resources; biogeochemical studies in the Arabian Sea, impact of global warming and Sea Level Rise; Impact assessment of El-Nino and Upwelling phenomena in the open sea; acoustic characterization of water column and subsurface strata.

OBJECTIVES & FUNCTIONS

- To undertake mission oriented multi-disciplinary research in Physical, Chemical, Biological and Geological Oceanography in Pakistan's maritime zones;
- To undertake oceanographic surveys at the national, international, regional and sub-regional levels;
- To undertake training programmes in various fields of oceanography for the development of indigenous manpower and expertise;
- To establish a National Oceanographic Data Centre (NODC), to serve as a national repository for all oceanographic data/information concerning Pakistan's maritime areas;
- To provide necessary advice to, and collaborate with, Government and other national agencies engaged in maritime activities;
- To coordinate and maintain liaison with international organizations/institutes for: arranging training/experts services; procurement of specialized instruments and equipment; transfer of marine technology and development of cooperative research programmes;
- To hold Seminars/Workshops/Symposia at national, international, regional and sub-regional levels.

ORGANOGRAM/ORGANIZATION CHART OF NIO



BUDGETARY ALLOCATIONS

The details of the Budget Allocations during the last Financial Year
(NON-DEVELOPMENT)

(Rs. In Million)

S. No.	Year	Allocation/ Approved Budget	Supplementary Grant	Amount Surrendered	Released Amount
i.	2021-2022	212.50	0.00	9.720	202.780
ii.	2022-2023	192.844	16.00 (R&D)	3.694 (4 th Qtr R&D not released)	205.150

(DEVELOPMENT)

(Rs. In Million)

S. No.	Year	Allocation/Approved Budget	Released Amount
i.	2021-2022	250.00	186.279
ii.	2022-2023	518.413	174.058

During the year 2022-23, NIO continued to progress as per its objectives and functions assigned under the NIO Act of 2007.

PROMOTION OF OFFICERS (BS 17 AND ABOVE)

Departmental Promotion Committee led by the Secretary MoST promoted the Principal Coastal Engineer (BS-19) to Chief Scientific Officer (BS-20) on the 16th March 2023. The Senior Research Officer (BS-18) to Principal Scientific Officer (BS-19) on the 09th March 2023, and Research Officer (BS-17) promoted to Senior Research Officer (BS-18) on the 10th March 2023.

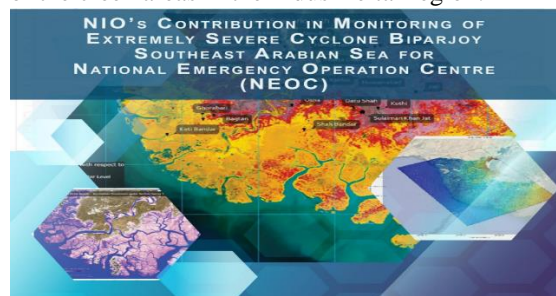
RESEARCH ACTIVITIES DURING FINANCIAL YEAR JULY 2022- JUNE 2023

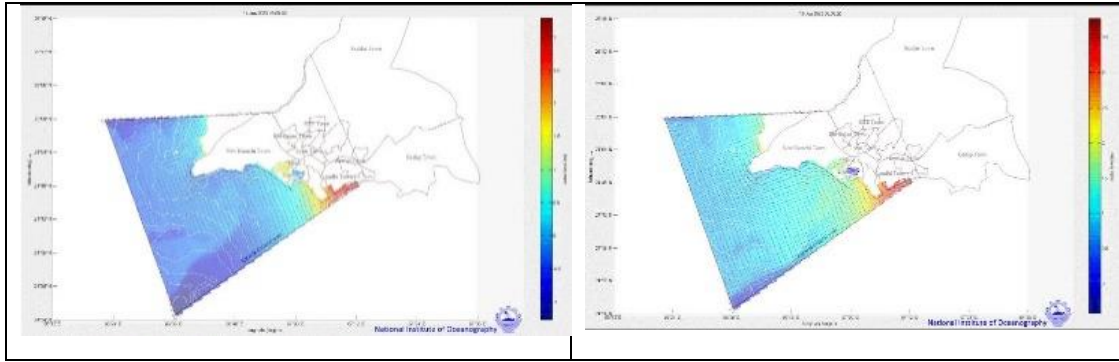
NIO's contribution on Monitoring of Extremely Severe Cyclone "BIPARJOY" Southeast Arabian Sea for National Emergency Operation Center (NEOC)

Cyclone "BIPARJOY" emerged in Arabian Sea as a Tropical disturbance on 6th June 2023. This low-pressure cell developed into Extremely Severe Cyclonic Storm on 10th June 2023. A special National Emergency Operation Centre (NEOC) was established by Government of Pakistan to monitor and assess the prevailing situation of Cyclone "BIPARJOY" and its possible impacts on Pakistan's coastal areas. National Institute of Oceanography was called into the special NEOC session on 11th June 2023 at 16:00 hrs. NIO established a special monitoring cell comprising GIS Analyst, Physical Oceanographers and Data Scientists at Integrated Physical Oceanography Lab to assess, monitor and model different scenarios of the multifarious impacts Tropical Cyclone (TC) "BIPARJOY" and its likely impact on Pakistan's coast. Different inundation scenarios were modelled using Numerical Modelling under multivariate wind speed scenario as conveyed by PMD advisory. NIO's Storm Surge Inundation simulation scenario model helped National Disaster Management Authority (NDMA) officials to delineate areas in need of immediate evacuation and establish a disaster relief system for vulnerable areas. NIO remained a focal participant of all the meetings headed by NDMA on TC "BIPARJOY", in-person and online. NIO also provided tide tables and relevant scientific basis to Pakistan Meteorological Department in publication of Cyclone alert advisory. The data of tide gauge and Weather Station of NIO established in Indus Delta Region was significant in assessing the pre-landfall meteorological impacts of TC "BIPARJOY". Alongside providing facilitation to NDMA, NIO continuously assisted the COMCOAST office in creek areas from Pakistan Navy and Headquarter COM 5 from Pakistan Army, in gauging the vulnerability of prevailing situation on highly strategic areas through running scenario-based simulations. NIO played a vital role in providing a vulnerability profile of the creek areas in the Indus Delta Region.



Islamabad, June 12, 2023: Chairman NDMA Lt. General Inam Haider Malik Presiding over Meeting for Update on Cyclone BIPARJOY today





NIO’s Webinars/Seminars/Symposium/Outreach Activities

“Launching of the Young Researcher’s Awareness Program Webinar Lecture Series 2022-2023”

Dr. Samina Kidwai, Director General, NIO and Dr. Muhammad Ashraf, Chairman, PCRWR jointly announced the Young Researchers Awareness Program (YRAP) on 29th November 2022. The program will have changing themes and within each theme there will be a set of talks from experts on the subject, followed by an interactive session with the expert.



- Webinar-1 | Issues & Challenges of the Freshwater Ecosystem of the Indus Delta and Opportunities in View of Changing Climate, guest Speaker Dr. Muhammad Ashraf, Chairman, PCRWR on 28th December 2022.
- Webinar-2 | Biogeochemistry, River & Delta, guest Speaker Professor Zhang Jing from State Key Laboratory of Estuarine and Coastal Research, East China Normal University, China on 17th January 2023.



- Webinar-3 | Physical Oceanography of Indus Deltaic Coast of Pakistan, Speaker Dr. Ibrahim Zia, PSO, NIO on 17th January 2023.



- Webinar-4 | Climate Change: Floods & Mitigation in Pakistan, guest Speaker Prof. Dr. Syed Imran Ahmed, NED University on 31st March 2023.

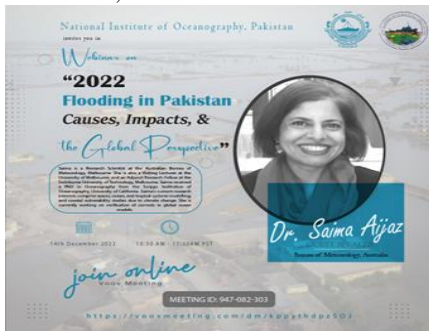
Webinar on Integrated Marine Biosphere Research (IMBeR)

Professor Gi Hoon Moon, Guest Speaker from State Key Laboratory of Estuarine and Coastal Research, East China Normal University, China 3rd January, 2023.



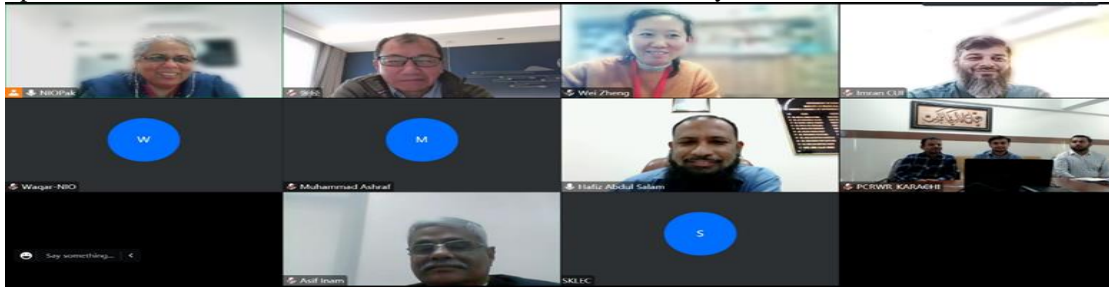
Webinar on “2022 Flooding in Pakistan causes, Impacts & the Global Perspective”

Dr. Saima Aijaz, Guest Speaker Senior Researchers Bureau of Meteorology, Australia 14th December, 2022.



Virtual Symposium on “River Indus Delta: Pakistan-Future Reassessed”

Speakers from NIO, PCRWR, SKLEC and Bahria University 29th & 30th November, 2023.



Seminar “World GIS Day” on 14th November, 2022.

World GIS Day was celebrated at National Institute of Oceanography on the theme of “GIS for Ocean Science”. The Guest Speakers included Prof. Dr. Jamil H. Kazmi, Ms. Afia Saleem. Speakers

from NIO included Dr. Samina Kidwai, Mr. Mohsin Tabrez, Dr. Ibrahim Zia and Mr. Khalid Mehmood.



Selected Visits to NIO

- Mr. Ghulam Muhammad Memon, Secretary, MoST visited NIO on 7th July, 2022.
- Pakistan Navy officers of Navigation and Hydrography School, PNS Bahadur visited NIO on 28th July, 2022.
- Mr. Raza Samad, CEO, Vurke Inc visited NIO on 21st December, 2022.
- Vice Admiral Ahmed Saeed HI(M), Director General National Institute of Maritime Affairs (NIMA) visited NIO on 18th November, 2022.
- Mr. Agha Wasif Abbas, Secretary, Climate Change and Director General, Climate Change, Government of Sindh visited NIO on 19th September, 2022.
- Professor Gi Hoon, State Key Laboratory of Estuarine and Coastal Research, East China Normal University, China visited NIO from 27th December, 2022 to 3rd January, 2023.
- Professor Zhang Jing, State Key Laboratory of Estuarine and Coastal Research, East China Normal University, China visited NIO from 21st December, 2022 to 22nd January, 2023.
- Mr. Kazim Jatoi, Secretary Fisheries, Balochistan and Mr. Rohail Baloch, Ex-Secretary Fisheries, Balochistan visited NIO on 16th January, 2023.
- Professor Wu Ying East China Normal University (ECNU), Shanghai visited NIO on 15th February, 2023.
- Cmdr. Hassan Khalid, MD Platform Design, Pak Navy visited NIO on 21st February, 2023.
- Capt. (R) Umar Khayam, Chief Maritime, MoD visited NIO on 2nd May, 2023.



- Mr. Muhammad Abdullah Khan Sumbal, Additional Secretary (Incharge), Science and Technology Division visited NIO on 21st June, 2023.



- Rear Admiral Saleem Ahmed, COMKAR, Hydrographer Pakistan along with Capt. Waseem Ahmed, Hydrographer, Pak Navy visited NIO on 31st May, 2023.



Selected Trainings of NIO Scientists

- Two months “Python Programming Course” organized by NED University of Engineering and Technology, commencement from 20th May, 2023.
- Online “Leadership in Public –Sector Organization, Japan” from 29th May, 2023 to 1st June, 2023.
- Experimental Workshop on “Python for Data Science”, organized by LUMS from 10th to 12th May, 2023.
- Online 25 hours “Determination of the outer limit of the continental shelf”, jointly organized by the Specialized Training Centre-Argentina and the UNESCO/IOC Project office for IODE on 28th October, 2022.
- Online First International China-Pakistan training course for “Marine Science” organized by Guangzhou Marine Geological Survey from 28th to 29th September, 2022.
- “Design of Digital Integrated Circuits” organized by Department of Electrical Engineering, Syed Babar Ali School of Sciences & Technology, LUMS University from 29th August to 2nd September, 2022.

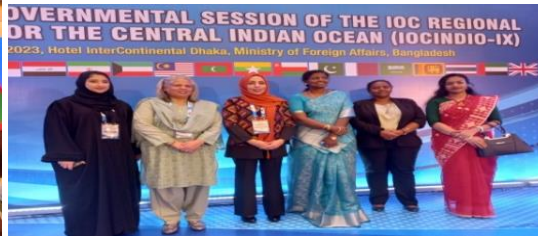
PARTICIPATION IN SEMINAR/ SYMPOSIUMS/ WORKSHOP/ CONFERENCES/ EXHIBITION

- Director General, NIO participated in the “3rd International Symposium on Indian Ocean Earth Sciences” at Shenzhen, China from 6th to 12th June 2023.





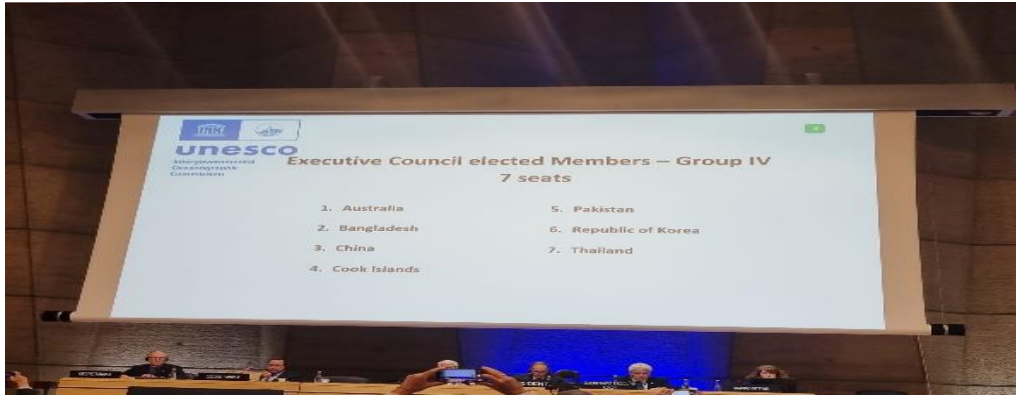
- Director General, NIO visited the COMKAR, Hydrographer Pakistan Office on 11th May 2023.
- Director General, NIO participated in the Ninth Intergovernmental Session of the IOC Regional Committee for the central Indian Ocean (IOCINDIO-IX), at Dhaka, Bangladesh from 28-31 March 2023.



- Director General, NIO participated in the one-day seminar as Keynote Speaker on “Biodiversity: Conservation, Issues & Challenges” at Botany Department, University of Karachi on 22nd February 2023.
- Director General, NIO participated as Moderator and Speaker in the Pakistan International Conference (IMC-2023) on “Ocean Research Priorities in the NW Indian Ocean, regional and global and its contribution to the blue Economy and Maritime Development” in Pakistan International Conference (IMC-2023), organized by Pakistan Navy from 10-12 February 2023 at Expo Centre Karachi.



- Director General, NIO is appointed as a member of the IOC Group of Experts on Capacity Development on 25th November, 2022.
- Director General, NIO delivered a n online lecture on Applications of Acoustics Technologies in research at NIO, North Arabian Sea for the Fourth China-Pakistan Marine Information (CPMI) workshop organized by Harbin Engineering University, China on 16th November, 2022
- Director General, NIO attended online the Implications of IMO conventions (Particularly HKC) in National and International context, and the way forward organized by National Institute of Maritime Affairs (NIMA) on 27th October, 2022.
- Director General, NIO elected as member of the Executive Council of UNESCO IOC Group-IV representing Pakistan from 2023 to 2025. Director General NIO is also Pakistan’s representative to the Subsidiary body IOCINDIO and member of the OEWG for elevating the status of the IOCINDIO from a sub committee to a sub commission at the UN GA Session in June 2023 in Paris France.



- Director General, NIO addressed online as keynote speaker for the China Workshop on Ocean and Climate Change organized by UNESCO and Fuzhou Municipal Government, China on 16th September, 2022.
- Dr. Ibrahim Zia addressed as keynote speaker for the Seminar to celebrate World Ocean Day 2023 on the theme “Planet Ocean: Tides are Changing” organized by National Institute of Maritime Affairs (NIMA) on 8th June, 2023.
- Participation in “3rd International Symposium on Indian Ocean Earth Sciences” at Shenzhen, China from 6th to 12th June, 2023.
- Validation Workshop on World Bank Analytical Study on “Tapping Blue Economy Potential of Pakistan: Challenges, Opportunities and Way Forward” at Marriott Hotel, Karachi on 31st May, 2023.
- Stakeholder Consultation Workshop under World Bank Study “Development of Coastal and Marine Recreational Areas for Supporting Coastal Livelihoods” at Marriott Hotel, Karachi on 26th May, 2023.
- Workshop on “Sound Management of Chemicals and Hazardous Waste” at Avari Tower Hotel, Karachi on 22nd May, 2023.
- National Consultative Workshop on Pakistan Country Framework for Green Climate Fund (GCF) organized by Ministry of Climate Change at Marriott Hotel Karachi on 15th February, 2023.
- Three-day specialized workshop on latest PPRA “e-Procurement Regulations 2023”, organized by Tender Management at Marriott Hotel, Karachi from 11th to 13th May, 2023.
- Online “The First International Symposium of CSK-2” on the 2nd Cooperative Study of the Kuroshio and Adjacent Regions, organized & conducted by the Laoshan Laboratory WESTPAK from 20th to 22nd February, 2023.
- Participated in Pakistan International Maritime EXPO & chaired a session in International Maritime (PIMEC-2023)/IMC-2023, organized by Pakistan Navy from 10-12 February, 2023 at Expo Centre Karachi.



- Regional Forum Accelerating Marine Spatial Planning in the Western Pacific organized by UNESCO on 16th December, 2022 via zoom link.
- Closing ceremony of Four Day International Training on Bridging the Critical Data GAP Sustainable Water Resources Management using Satellite Altimetry Data, organized by US-Pakistan Center for Advanced Studies in Water (USPCAS-W), MUET, Jamshoro on 25th November, 2022.
- Workshop on “Maritime Law Enforcement Workshop (MARLEW), organized by Pakistan Maritime Security Agency at Avari Tower Hotel, Karachi on 24th November, 2022.

- 3rd International Conference on Marine/Maritime Spatial Planning organized by UNESCO, European Commission from 22nd to 23rd November, 2022 (online).
- Live Career Counselling webinar organized by Bahria School of Maritime & Applied Sciences, Bahria University, Karachi on 21st November, 2022 (online).
- Webinar on World Fisheries Day-2022 theme: “Protecting Marine Fisheries Resources of Pakistan-Way Forward Towards Sustainable Fisheries” organized by NIMA, Bahria University on 21st November, 2022 via zoom link.
- Webinar: Tour of Asian Marginal Seas organized by Integrated Marine Biosphere Research (IMBeR), China on 14-15 November, 2022.
- Online workshop on “Ocean Acidification”, conducted by INIOAS (IR. Of Iran) & IIM-SCIC (Spain) joint on 17th & 18th October, 2022.
- Environmental Monitoring Workshop organized by XYLEM at Dubai, UAE from 3-5 October, 2022.
- Online seminar on “Enhancing Pakistan Fish Gold Chain: Energy Efficiency Analysis”, conducted by World Bank on 15th September, 2022.
- Inauguration Ceremony of Bahria School of Maritime and Applied Sciences (BSMAS) at Bahria University Karachi Campus on 13th September, 2022.
- Five days workshop on “Design of Digital Integrated Circuits”, organized by Lahore University of Management Sciences from 29th August, 2022 to 2nd September, 2022.
- “Stories from the Coast” a collaborative project by KOEL Gallery and the British Council at Karachi on 12th August, 2022.

Scientific Publications

Peer Review Publications

- **Ahmed W.**, Wu Y., **Kidwai S.**, Li X., Mahmood T., Zhang J. Do Indus Delta mangroves and Indus River contribute to organic carbon in deltaic creeks and coastal waters (Northwest Indian Ocean, Pakistan)?”. *Continental Shelf Research*. 2021 Oct 30:104601.
- Basit, A., Khalil, R.Z., Khan, I.A., **Zia, I.**, Sadiq, S. and Majeed, S., 2023. Comparing Radiative Transfer Equation Method (RTEM) and the Generalized Single-Channel Method (GSCM) for retrieving sea surface temperature along the Karachi coast, Pakistan. *Fuuast Journal of Biology*, 13(1), pp.27-37.
- Tasakka A. C. M. A. R., Latama G., Hidayani A. A., Parenrengi A., Tenriulo A., Relatami A. N. R., Moore A. M. and **Shaheen A.** “Variability of White Spot Syndrome Virus (WSSV) Envelope Protein Vp28 from Diseased Shrimp (*Litopenaeus vannamei*) in Indonesia”. *Sains Malaysiana*. 51(9) (2022):2777-2790.

Book Chapter / Report

- Inam.A., Clift. P.D., Giosan. L., Zai. A. A., **Kidwai. S.**, Shahzad. M. I., **Zia. I.**, Nazeer. M., Khan. M. J., Ali. S. S., **Shaheen. A.**, Qari R., and **Kehkashan. S.** Chapter-17: “The Geographic, Geological and Oceanographic Setting of the Indus River-an Update”, Book: Large Rivers: Geomorphology and Management, Second Edition. edited by Avijit Gupta, 2021, *John Wiley & Sons Ltd*, 1: 1-33
- Report on NANO Global Project (NANO-DOAP) A global study of Deoxygenation, Ocean Acidification and Productivity at selected sites 2022-2023.

Ph.D Thesis of NIO officers

- **Dr. Waqar Ahmed** “Preliminary study of biogeochemical and ecological dynamics of Indus River Delta and its nearshore waters — spatio-temporal variation and flux estimation. PhD Degree awarded. Co-Supervised by Dr. Samina Kidwai, NIO
- **Dr. S M Rehan Ullah**: “Potential of Seashells as Biosorbents for Waste Material Remediation” Ph.D Degree awarded.

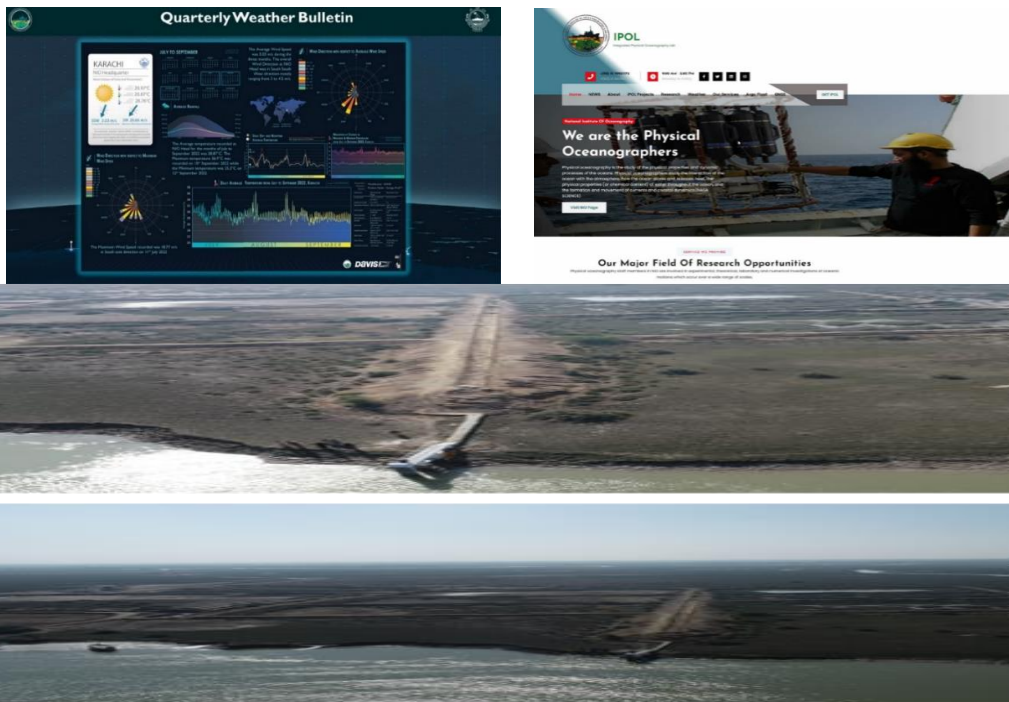
NIO PSDP PROJECTS

On-going

Monitoring the Sea Water Intrusion, Sea Level Rise, Coastal Erosion & Land subsidence along Sindh and Balochistan Coast

- A tidal observation jetty was constructed at Ghorabari Station under the project to facilitate the collection of tidal data.
- Sub bottom profiling was conducted at Khobar and Sonmiani to study the sediment and geological structure beneath the seabed.
- Bathymetric surveys were carried out in Khobar Creek and Sonmiani Bay to map the underwater topography.

- High-resolution satellite imagery was acquired as part of the SUPARCO component of the project.
- Continuous data retrieval from piezometers was performed to monitor groundwater levels and quality.
- A quarterly weather bulletin was launched, derived from the data collected by the Automatic Weather Stations installed along the Pakistan coast under the SWI Project.
- The project launched an IPOL webpage to provide information and updates on the ongoing activities and findings.
- Drone Survey for High-Resolution Digital Elevation Model is being carried out by SUPARCO, which involves high resolution data acquisition.
- The Pakistan Council of Research in Water Resources (PCRWR) completed a socioeconomic survey under the project.
- GIS and numerical modeling techniques were utilized to provide risk assessment of provided locations to the Pakistan Navy.
- GLSMS Site Survey was conducted for installation of GNSS Stations.
- The project offered assistance to the National Disaster Management Authority (NDMA) in monitoring the tropical cyclone "BIPARJOY" using GIS and numerical modeling. A report on the NIO's contribution in monitoring the extremely severe cyclone in the Southeast Arabian Sea was prepared for the National Emergency Operation Centre (NEOC).



Fields & Boat Surveys

- Extensive field surveys were carried out to acquire data on Current Metering, Acoustic Doppler Current Profiling, and CTD (Conductivity, Temperature, and Depth) measurements. These surveys focused on the creeks of the Indus Delta Region, as well as the bays of Gwadar and Sonmiani. Additionally, data retrieval from Tide Gauges and Automatic Weather Stations installed at the NIO Substations of Gwadar, Sonmiani, and Ghorabari was performed as part of these surveys.
- A GLSMS (Global Sea Level Monitoring System) survey was conducted to facilitate the installation of GNSS (Global Navigation Satellite System) on selected sites. This survey was a collaborative effort involving a team of scientists from SUPARCO and NIO.



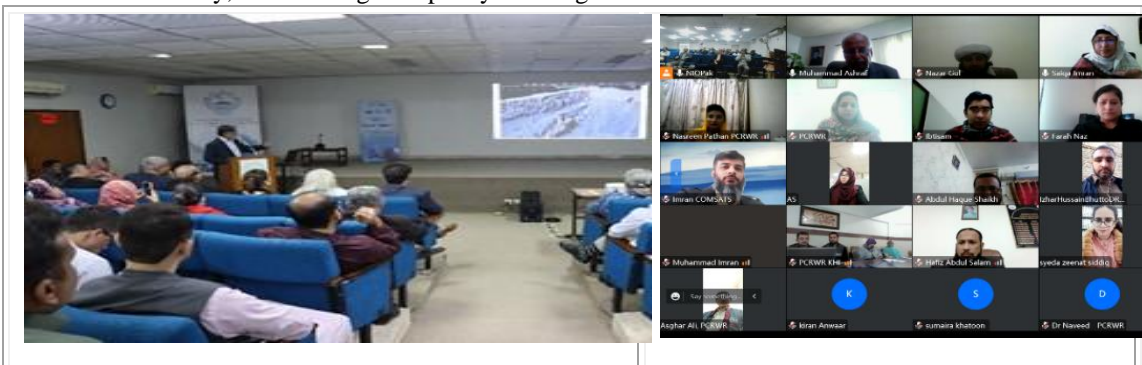
Trainings/Conferences

During July 2022 to June 2023, the officers and staff of the SWI Project and NIO were selected to attend a series of training programs to enhance their capacity and expertise. Among the listed training opportunities, two programs are currently in progress. Additionally, 05 students were provided Internship Opportunity at Integrated Physical Oceanography Lab under the project.

S.No	Title	Organizer	Date	Type	Participants
1.	Training Course on “Remote Sensing of Environment & Climate Change”	SUPARCO NCRG – Karachi	13-17 February 2023	Training	03 Officers
2.	Training on Python Programming	NED University	In Progress	Training	04 Officers
3.	Data Science with AI	NED University	In Progress	Training	01 Officer
4.	Taxation Law of Pakistan	Pakistan Institute of Management		Training	01 Officer 02 Staff

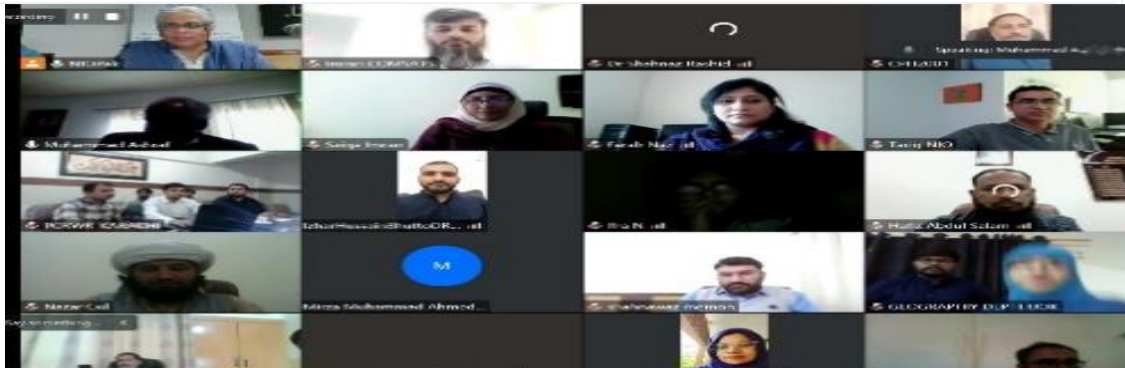
Events

Under the PSDP SWI, several events were organized to demonstrate the ongoing work and accomplishments of the project. These events served as platforms to engage and collaborate with the marine community, contributing to capacity building efforts.



Hybrid Seminar on “GIS for Ocean Science” World GIS Day 2022 on 14th November 2022 at National Institute of Oceanography.

Webinar on “2022 Flooding in Pakistan, Causes, Impacts & the Global Perspective’ was organized on 14th December 2022. Dr. Saima Aijaz from Bureau of Meteorology, Australia was the Guest Speaker



Virtual Symposium on The River Indus Delta – Pakistan Future Reassessed – 29-30th November 2022

Distinguished representatives from esteemed national and international organizations have visited NIO and the Integrated Physical Oceanography as part of the SWI project.



DG Maritime Security Agency
Foad Amin Baig – 04 July 2022



Federal Secretary MOST – 07 July 2022



Chinese & Bahria
University team – 5
December 2022



Prof Jing Zhang from SKLEC,
ECNU -17 January 2023



COMKAR and HPN Pakistan
Navy-31 May 2023



Federal Secretary
MoST – 21 June 2023

Strengthening of Oceanographic Research Sub Station Gwadar Pakistan



Final Plan after the construction/ renovation of oceanographic labs at Oceanographic Research Sub Station, Gwadar

Recruitments (PPS-1 to PPS-5)

NIO conducted recruitment tests for vacant posts from PPS-03 to PPS-06 on 5th March, 2023 at Karachi and interviews from 16th to 17th March, 2023 at Gwadar. All the successful candidates have joined the duty at Gwadar Station

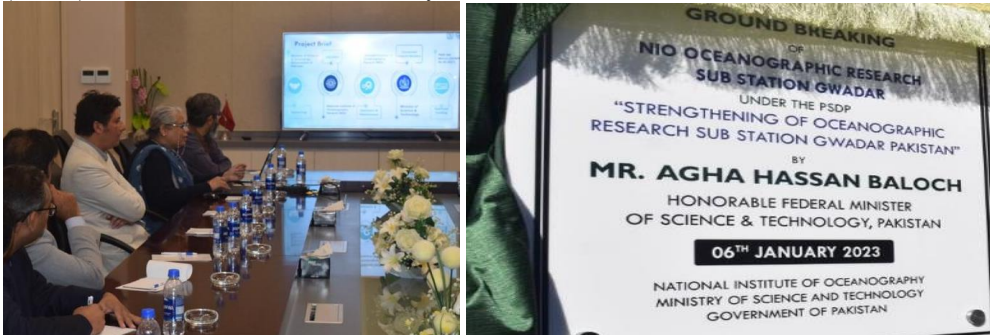
Tenders

- Tender was floated for the Procurement of Oceanographic Research Boat after the technical and financial evaluation tender was cancelled due to imposed import ban as austerity measures for financial year 2022-23 and extended up to June 2024. Visited Naval Research and Development Institute at PNS Jauhar, Karachi for meeting with platform Design Wing and Korangi Fish Harbor in order to inspect the boat building facility of M/s. Business & Engineering Trends for the tender “Procurement of Oceanographic Research Boat” under the PSDP along with DG NIO.
- Construction of Boundary wall at Gwadar Station has been completed under the tender “Construction of Boundary Wall at NIO Oceanographic station”



Construction/ Renovation of boundary wall at Gwadar Sub Station has been completed.

- Honorable Federal Minister for Science and Technology inaugurated the Extension work of the Labs at NIO Oceanographic Station at Gwadar for the tender “The extension works of the biogeochemical and physical oceanography laboratory’s & spaced at Oceanographic Sub Station (ORSS)”. Construction work has already been started.



- Extension works of the Biogeochemical & Physical Oceanography Laboratories and Spaces at Oceanographic Research Sub Station (ORSS), Gwadar

Meetings/Workshop/Trainings

- One day specialized workshop on “Public Procurement Rules”, organized by Institute of Tender Management on 10th May, 2023 at Marriott Hotel, Karachi
- Three-day specialized workshop on latest PPRA “e-Procurement Regulations 2023”, organized by Institute of Tender Management at Marriott Hotel, Karachi from 11th to 13th May, 2023.
- Training on “Intermediate to Advanced MS Excel & Word” at NIO from 23rd to 26th May, 2023.
- Professional Diploma in “Administrative Skills” at Pakistan Institute of Management (PIM) from 7th June to 4 September, 2023.

PROJECTS UPLOADED ON INTELLIGENT PROJECT AUTOMATION SYSTEM (IPAS)

- Construction of Ground Station for Marine Remote Sensing at Ghora Bari/Dhabeji, District Thatta.

- Feasibility study on Reactivation of Pakistan Antarctic Research Program.
- Establishing Ocean Bio-Geographical Information System for Mapping Bio-Resources in the Maritime Area of Pakistan.
- Refurbishment And Modernization of National Institute Of Oceanography Head Office Building, Karachi.
- Assessment of Potential Fishing Zones in the EEZ of Pakistan Arabian Sea.

IN-HOUSE RESEARCH ACTIVITIES AT NIO

Environmental and Ecological Monitoring Program: Coasts and waters (Continuous activity of NIO).

- To determine/ record the physico-biogeochemical characteristics of coastal and offshore waters and different beaches along Pakistan coastline. Productivity of the area will be assessed by studying the primary and secondary producers.
- Continuous coastal area monitoring in order to determine changes as a result of anthropogenic activities along the Sindh and Makran site.
- Determination of sewage pollution extent in the study area by evaluating pathogenic bacterial contamination such as coliform bacteria (optional).
- Development of a database with morphodynamics and physico-biogeochemical characteristics gather through continuous one year monitoring will provide support (as base-line) for future studies.

The Results of this research will support scientists as well as policy makers, coastal & strategic planners and general public for better future planning in development and management of activities along coastal areas.

The output through the activity can become part of achieving / contributing in Oceanographic Research targets i.e., **Sustainable Fishery, Marine Pollution, Climate Related Impacts on the Ocean, Marine Protected Areas (MPAs)** or at least stepping towards attaining the goal in 2030 set by UN. This will serve as NIO's contribution towards conserving and sustainable utilization of ocean living resources as planned under the National Science, Technology & Innovation Strategy and Action Plan- 2016.

It will also contribute to our international collaboration of POGO-NANO project, "NANO global study of Deoxygenation, Ocean Acidification and Productivity (NANO-DOAP) 2022-2023", which has a global 13 countries participation.

Under this project the field survey of Karachi coastal area stations (Off-shore only) were carried out during March 2023. During the survey recording of observations, information and collection of samples (seawater, biota and sediment) were carried out as per plan and respective section after analysis have submitted the field reports accordingly.

Sonmiani Sub-Station- current and forthcoming R&D and PSDP activities.

- Sonmiani is an anchoring site for the collection of R&D and PSDP ocean scientific observations.
- Weather station installed by the Physical Oceanography Section is working to collect the daily observations.
- The demarcation of Sonmiani land is in process which will be carried out by the settlement department winder.
- After demarcation the fencing will be built for the safety of the building.
- Location for GNSS station has been selected within premises of Sonmiani Sub- Station under PSDP SWI project.
- GNSS station will be built under SWI project to collection ocean scientific data.
- Some of the maintenance work of laboratory has been done and rest will be completed in forthcoming R&D activities.
- More renovation of Sonmiani station and laboratory is required to facilitate and improve scientific activities.

Monitoring of Hydrodynamics of Sonmiani Bay.

The NIO team went for a field trip for data retrieval and current metering activity under the R&D project "Monitoring of Hydrodynamics of Sonmiani Bay". Tied Gauge and ADCP were deployed at Sonmiani lagoon to collect the data.

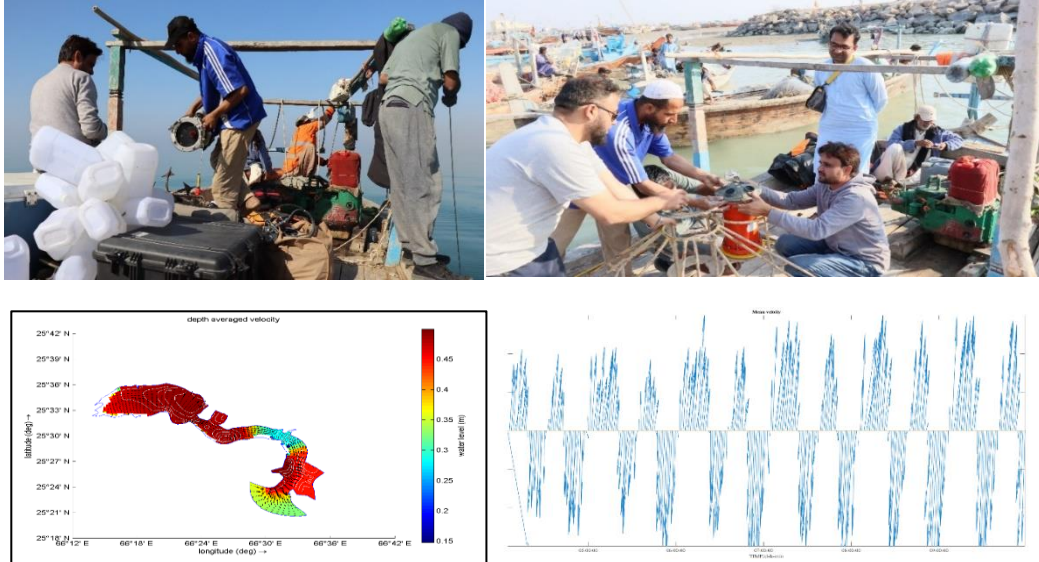
- Successful deployment and retrieval of ADCP data from the 31-01-2023 to 06-02-2023 at Sonmiani Bay
- Data retrieval from the automatic weather station installed at Sonmiani Station.

- Successfully Data submitted to concerned authority.
- Hydrodynamics model has been developed.

The following result are obtained by Hydrodynamic model:

- The model was developed for water level vs depth average velocity with respect to time.
- The model showed the direction of water during high and low tide.
- The red part indicates maximum water level while direction of water current is shown by arrows.
- The snap of the model showing results during high tide.

Hydrodynamic model



Jubilee Year Commemorations- 40 Years of Oceanographic Research in NIO-Pakistan

On 2nd Jan 2023, the National Institute of Oceanography (NIO) celebrated its 40 Years commemoration, inviting both serving and retired scientists, researchers, and staff members. The program began with the recitation of the Holy Quran and the National Anthem of Pakistan. Dr. Ibrahim Zia from NIO welcomed the guests. The event featured notable figures, including DG NIO and several former researchers and scientists to name the few Dr. M.M. Rabbani, Dr. Shahid Amjad, and Dr. Asif Inam. Mr. Moazzam Khan (former DG Marine Fisheries Department), and Brigadier Akram also participated online. A video showcasing NIO's major achievements in the last four decades was released, and Dr. Samina Kidwai shared the vision of NIO 2040, unveiling the soft launch of IPOL web page and weather bulletin. Souvenirs were presented to national and international guests.

The program included a variety of presentations by senior scientists and researchers:

- Dr. M.M. Rabbani, former DG NIO, recounted his experiences and challenges during Pakistan Antarctic Expeditions. He played a crucial role in leading National Scientific expeditions to Antarctica in NIO's first decade from 1982 to 1990.
- Dr. Shahid Amjad, former DG NIO, highlighted NIO's achievements in the North Arabian Sea Environment and Ecosystem Research (NASEER) project. The project was supported by the Ministry of Science and Technology, Government of Pakistan, and the US Office of Naval Research (ONR). Dr. Amjad also shared his 30 years of research and management experience at NIO.
- Dr. Asif Inam, former DG NIO, shared the success story of Pakistan's Continental Shelf Program, which significantly expanded the Economic Zone by adding 50,000 sq.km.
- Mr. Moazzam Khan, CEO of the Fisheries Development Board and Project Director of Gwadar Fisheries Training Centre, joined the program online.
- Mr. Brig Akram shared his experiences with NIO during various research and development projects via video message.
- Dr. Ibrahim Zia, Principal Scientific Officer from NIO, showcased the research capabilities of the Integrated Physical Oceanography Lab.

The program concluded with a presentation on NIO Vision 2040 by Dr. Samina Kidwai, the current DG NIO, during presentation, she launched the "Weather Bulletin" and the "Integrated Physical

Oceanography Lab (IPOL) Webpage." The event ended with a Vote of Thanks from Dr. Samina Kidwai, followed by the distribution of souvenirs to the NIO Alumni and foreign delegates.



Reactivation of Pak-Antarctic Program – A Consultative Dialogue

A consultative dialogue on the “Reactivation of the Pak Antarctic Program” took place on 4th May 2023 at the National Institute of Oceanography Auditorium. An open discussion commenced leading to some key discussions, recommendations were shared with the MOST.



Water Quality and Marine Pollution Risk Assessment on the Ecosystem of Ambro and Dabbo Creeks, Indus Delta-Sindh, Pakistan

The only higher concentrations of Silicates (μM) found near the study sites was from a station A-1 in Ambro creek than Dabbo Creek during Northeast Monsoon (NE monsoon), March 2023. Erosion of the riverbank catchment area, weathering, and anthropogenic activities are the major sources of elevated SiO_3^{2-} . Concentrations of Nitrites (μM) and Phosphates (μM) were lower in Ambro and Dabbo creeks due to agricultural runoff input. In Dabbo creek, the salinity was higher than in Ambro creek due to the addition of water from agriculture farmlands.

The study approves that natural sources (river/terrestrial runoff and geomorphological factors) and anthropogenic factors (use of fertilizers, manure, construction of dams, and industrialization) significantly influenced the nutrients and chlorophyll *a*.

Study of Physico-Chemical Environment of Indus Deltaic Estuarine System of the Left bank of Indus River

To understand the hydrodynamic processes of coastal waters and impacts of agricultural wastage on the water quality on the Left bank of Indus River.

Hydrodynamic data showed a strong spatial and spring/neap variation in water circulation. The tides were semi-diurnal in nature, but diurnal tidal asymmetric was found in all observations. The observed SSC data show that erosion rate is higher in Tidal Link Canal due to the strong water currents. The salinity values were higher in lakes due to the evaporation, whereas water quality parameters were in permissible limit. The maximum amplitude of the spring tide 3.24 m was observed during the survey period. In Tidal link canal during spring tide the maximum current intensities were 1.444 m s⁻¹ and 1.968 m s⁻¹ during flood and ebb phases, respectively. However, during neap tide, the maximum current velocities were 0.96 m s⁻¹ at the ebb and 0.88 m s⁻¹ at the flood phase. Whereas in Rohro creek maximum current intensities were 1.005 m s⁻¹ and 1.425 m s⁻¹ during flood and ebb phases, respectively.

Water samples were collected at 10 stations from the creeks on the left bank coastal area of the Indus River for the determination of salinity and suspended load. Salinity varied from 34.2 to 37.8 ppt at the surface. The maximum salinity 37.8 ppt was observed in lakes near tidal link canal LBOD. DO values varied from 6.2 to 7.8 mg/L. DO values were lower in lakes near Tidal Link canal. The lower levels of DO indicate presence of higher quantities of organic related impurities. The pH value ranges from 7.62 to 8.23 in the coastal waters. SSC values varied from 0.0075 to 0.0285 gm/L, maximum concentration was observed at 15km upstream in Tidal Link canal, which shows the erosion rate higher in Tidal Link canal.

Ghorabari Sub-Station current and forthcoming R&D and PSDP activities

- NIO's substation building was repaired linked from main road to NIO's sub-station building and Automatic weather observatory was installed.
- Furthermore, permanent tidal observatory station was constructed in Ambro creek for continuous tide monitoring.

Field and Laboratory Observations for River Indus deltaic creek ecosystem for Biological Productivity, Biogeochemistry and DNA barcoding/eDNA for wild shrimp identification

- Institutional capacity enhancement for pigment analysis of phytoplankton and Next Generation Sequencing & metagenomics barcoding.
- Establishment of standard methodology (SOPs).
- Assessment of biological productivity and biogeochemistry of Indus delta.
- Identification, distribution patterns and population size estimates of wild shrimp in study area by DNA barcoding.

eDNA samples from seawater samples were also collected, DNA extracted and analyzed at SKLEC.

Religious and National Celebrations

National Eid Millad un Nabi 1444 AH

The National Institute of Oceanography Pakistan celebrated Eid Milad-un-Nabi on 7th October 2022 to delve into the sacred life of our beloved prophet Prophet Muhammad (SAW), the advent of Prophet hood and to highlight the fact that the Prophet (SAW) has been sent in this world as the epitome of mercy for all mankind till the end of this universe.

The staff members recited beautiful and heartening naats to praise the attributes of our beloved Prophet Muhammad (SAW) as the best of all humans and the miracles that are bestowed to him by the Almighty Allah.

The event concluded with the comprehensive Special prayers for all the deceased NIO employees and their relatives, for promising future of NIO and to follow the footstep of Prophet Muhammad (SAW) which is the essence celebration of the 12th Rabbi Awwal every year.



Independence Day Celebration 14th August 2022

NIO commemorated a half-day celebration on 14th August 2022 at NIO Auditorium of NIO with the singing of the National Anthem, National songs, speeches, remembrance of the sacrifices of our ancestors and planting of fruit trees by the officer of NIO.



Pakistan Council for Science and Technology (PCST)

INTRODUCTION

Pakistan Council for Science and Technology (PCST) is one of the oldest institutions of the Ministry of Science and Technology; established to provide advice to the government on science and technology policy issues. To achieve this objective, it evaluates the research of scientists, carries out studies on important S&T issues and publishes the results in the form of S&T indicators, reports and articles. Besides this, for seeking expert opinion and advice regarding the development and application of science and technology in different S&T areas, the Council constitutes “Think Tanks” and “Expert Committees” as and when needed.

PCST is also the designated secretariat of the National Commission for Science and Technology (NCST) - the highest S&T Policy forum headed by the Prime Minister. PCST prepares the agenda for the meetings of NCST and its Executive Committee (ECNCST) in consultation with federal ministries, provincial departments and all other major stakeholders of S&T.

FUNCTIONS

- Advise the Federal Government on all matters relating to the development of science and technology in Pakistan;
- Undertake policy research, organize study groups or task forces, formulate policy proposals, monitoring and evaluation of science, technology and innovation policy for achieving targets for the overall development of science and technology in the country;
- Identify priority areas for research and development keeping in view futuristic developments of science and technology;
- Constitute expert committees in various disciplines for preparation of reports on policies and issues of national importance in respect of science and technology;
- Collect, update statistics and maintain a database on the science and technology potentials of the country;
- Take measures for effective collaboration among academia, research and development organizations and industry for the development of indigenous products or technologies;
- Evaluation of national research and development activities including the output of individuals and institutions and to grant research productivity awards or incentives thereof;
- Promote collaboration among national and international organizations for capacity-building and other policy initiatives in the field of science and technology and to enter into memoranda of understanding, contracts etc., following the Rules of Business, 1973;
- Participate in national science and technology planning and development activities and provide advice on the selection of projects;
- Act as Secretariat of the National Commission for Science and Technology (NCST); and
Perform any other functions as may be assigned to it by the Federal Government.

BUDGET DETAILS

(In Million Rupees)

Budget	Non-development			Development		
	Allocation	Release	Expenditure	Allocation	Release	Expenditure
2022-23	106.644	95.233	95.211	29.321	29.321	25.002

PERFORMANCE INDICATORS FOR 2022-23 & FUTURE PLAN

Output (s)	Selected Performance Indicators	Planned Targets	Targets Achieved	Planned Targets		Forecast Targets
		2022-23	2022-23	2023-24	2024-25	2025-26
Advice to Government on S&T Policies and Plans	i) National Commission for Science & Technology (NCST) meetings	1	-	1	1	1
	ii) Executive Committee of NCST meetings	1	-	1	1	1
	iii) S&T policies/ Strategies or					
	a) Science and Technology Action Plan	1	-	1		-
	b) STI Policy	-	-	-		-

	Research Agenda	2021					
		c) Startup Policy	-	-	-	-	-
		b) S&T Strategy	-	-	-	-	-
	e) STI Indicators	1	1	-	1	-	
	iv) Meetings on S&T-related issues	5		5	5	5	
	v) Review of S&T policies	1	-	1	1	1	
	vi) Sectoral Policy Review	-	-	-	-	-	
	vii) S&T Policy studies / Technical Reports	5	3	5	5	5	
viii) Advice/comments/briefs on S&T issues	5	4	5	5	5		

S&T Planning & Development and Futuristic studies	i) Technology Foresight studies	a) No. of Expert panel meetings	3	-	3	3	3
		b) No. of Technology Foresight Reports	1	1	1	1	1
	ii) S&T Planning & Development	a) Meetings	5	5	5	5	5
		b) Proposals	5	-	5	5	5

Evaluation of Scientific Research	i) Evaluation of Individual Research of Scientists (No. of Scientists evaluated)	3000	-*	3000	3000	3000
	ii) Research Productivity Award (incentive given to several Pakistani Scientists)	250	-*	250	250	250
	iii) Evaluation of Scientists for Medals & Awards, etc (No. of Scientists evaluated)	50	-*	50	50	50

S&T Databases	i) Development and maintenance of S&T databases	2	2	5	5	5
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Capacity Building	i) Workshops & Conferences (No. of Events)	1	-#	1	1	1
	ii) Workshops & Conferences, in collaboration (No. of events)	1	-#	1	1	1
	iii) Lectures/presentations on S&T issues	2	2	2	2	2

Cooperation in Science and Technology	Proposals submitted on S&T Cooperation	a) International	5	8	5	5	5
		b) National	5	-	5	5	5

y							
Publications	i) Quarterly Journal “Science Technology and Development”	4	-	4	4	4	4
	ii) PCST STI Policy Briefs	4	3	4	4	4	4

*Targets could not be achieved due to non-revision of evaluation criteria for the year 2022-23

Targets could not be achieved due to the vacant position of Chairman, PCST in FY 2022-23

• **SALIENT ACHIEVEMENTS AGAINST PERFORMANCE INDICATORS FOR THE YEAR 2022-23**

A brief review of some of the major activities carried out by PCST from July 2022 to June 2023 is as under:

• **First Industrial National Innovation Survey (PSDP Project)**

This first-ever national-level industrial innovation survey was launched by the Pakistan Council for Science and Technology (PCST) at a time when the fourth industrial revolution is rapidly advancing, and it is being speculated that it will change everything; the way we live, play, work and do business. Innovation is considered one of the main pillars of economic growth and development in the age of our industrial revolution. Unfortunately, Pakistan is lagging way behind other nations in Innovation as depicted by Pakistan’s position in the Global Innovation Index 2022, where Pakistan is ranked 87th out of a total of 132 countries that have been included in the Index. Many of the Central and Southern Asian countries like India (40th), Iran (53rd), Kazakhstan (65th) and Sri Lanka (85th) are ranked above Pakistan.

This benchmarking innovation survey has been conducted using a comprehensive questionnaire which has been designed to obtain information about the innovation rate, types of innovation activities (product, process, management, marketing), reasons & motivations for carrying out innovation activities, sources of ideas and information for undertaking innovation activities, the extent of cooperation and collaboration among firms, relationship between innovation and performance of the firm, diffusion of ICTs across different industrial sectors, industry perspective on government support to innovation and barriers to innovation in different industrial sectors. The survey will benchmark the innovation status of various industrial sectors which would help in assessing the level of success of future innovation policies of the government.

During the period under report, under the project titled “First Industrial National Innovation Survey” data from 5000 industrial units was collected, compiled, tabulated and analyzed to assess the extent of innovation in the industrial sector, and identify barriers and motivations for innovation in industry.

• **Need Assessment of S&T Human Resources for Driving Innovation and Achieving Vision 2025 (PSDP Project)**

The Government is committed to transforming from a resource-based economy to a knowledge-based economy. Knowledge is globally recognized as the driver of productivity & economic growth; therefore investment in education (particularly higher education), is critical for progress. The role of highly qualified individuals in the production, application and transmission of knowledge has become even more important. The GOP has also put great emphasis on education, knowledge creation, production of highly qualified manpower, and increasing higher education coverage.

PCST under MoST executed a project entitled, “Need Assessment of S&T Human Resources (HR) for Driving Innovation and Achieving Vision 2025”. The objectives of the project were to review and update the current status of highly qualified S&T human resources (PhDs, M.Phil/MS etc.) and carry out future need assessments of human resources. A national-level survey study was conducted and the scope of the study includes a collection of S&T HR data from more than 220 higher education institutions, around 220 R&D/S&T Organizations and 200 selected industrial units in the federal capital and four provinces.

It was found that in the last five years, large numbers of Ph. D.s have been produced by Pakistani universities both in the public sector and private sector. The number of female PhD students is slightly greater than male PhD students; however, the job opportunities and employability of women are lower than their male counterparts. The vast majority of highly qualified S&T HR is employed in higher education institutions, followed by technical

organizations and a very small (negligible) number in the industry. The survey showed that universities are 20% short of the required number of staff with PhD and MPhil/MS degrees.

It was also observed that there is a huge gap in the demand and supply of highly qualified human resources and it is recommended that relevant stakeholders may actively engage with academia and industry to bridge the gap by creating demand for human resources and also introducing new subjects in academia to meet the demands of the market. It is recommended that organizations like PCST should carry out such surveys periodically to provide updated data on highly qualified human resources and advise the government accordingly.

- **National Science, Technology and Innovation (STI) Indicators**

Science and Technology (S&T) Indicators are Statistical data that are used to measure progress in S&T, thus providing a mechanism for proper assessment and management of S&T. Pakistan Council for Science and Technology (PCST) as part of its functions collects the S&T Statistic on R&D expenditure and researchers from universities and R&D organizations through National S&T Statistics Survey. This is a postal survey carried out after two years and the data collected is forwarded to the UNESCO Institute of Statistics (UIS) which is the custodian agency.

During the period under report, a nationwide survey of HEI and R&D organizations was conducted to collect the statistics related to input STI indicators i.e. human resources and financial resources. Based on this data, National STI indicators have been developed and forwarded to the UNESCO Institute of Statistics (UIS).

- **Technology Foresight Report on Mineral**

Pakistan's mining and mineral industries sector lags far behind other sectors of the national economy despite the country's rich minerals inventory. The government through PCST took the initiative of conducting a Technology Foresight exercise for modernizing and developing the country's mineral sector. The purpose of the TF exercise was to bring the attention of the relevant stakeholders to this important yet neglected sector and accordingly enhance its share in the economy and development of the country.

The scope of the study included the assessment of the present status of mineral wealth; identifying sub-sectors, strengths weaknesses and particularly key issues to achieve sustainable development and to suggest a way forward for the sector. The expert panel methodology of TF was used to conduct the study and leading experts from the mineral sector including geoscientists, mining engineers, geologists, entrepreneurs, and people from the mineral industry participated in the said study. A report on Technology Foresight on minerals was published and shared with the relevant stakeholders.

- **25th Annual Session of the United Nations Commission on Science & Technology for Development (CSTD)**

Prepared the draft material for the Federal Minister's Speech on Technology and Innovation for cleaner, more productive and competitive production, Eco-Innovation / Green Technologies, ensuring safe water and sanitation for all: a solution through, technology and Innovation for 25th Annual Session of the United Nations Commission on Science & Technology for Development (CSTD) held from 28th March till 1st April 2023 in hybrid format.

- **Recommendations on Enhancing the Role of Science Technology and Innovations in Societal Development**

A draft Plan / Input on the prescribed format was provided for the "Recommendations on Enhancing Role of Science Technology and Innovations in Societal Development" received from the MoST/ Planning Commission and finalised during the Turn Around Pakistan Conference. The brief plan/input included information about the organisation responsible for the implementation of the action/recommendation, the potential bottlenecks/issues, the way forward, the expected time for implementation etc., and was drafted and shared with P&C Wing MoST.

- **Nanotechnology development and ecosystem in Pakistan**

Presented a country presentation 'Nanotechnology development and ecosystem in Pakistan' on the Hybrid Session on 'D-8 Countries Nano-Technology Development And Ecosystem' in conjunction with Malaysia National Nano Programme (NANOKEB), 2022 on 7th September, 2022. The meeting was also attended by representatives of other D-8 countries including Turkey, Iran, Nigeria, Malaysia, Egypt

- **Inter-Ministerial Meeting of ASEAN- PAKISTAN Joint Sectoral Cooperation Committee (APJSCC)**

The project proposal titled "*Bilateral short-term visits between Science, Technology and Innovation (STI) Policy Professionals of Pakistan and ASEAN-Countries*" was prepared for inter

ministerial meeting of ASEAN- PAKISTAN Joint Sectoral Cooperation Committee (APJSCC) and submitted to MoST.

- **Collaboration with International Organizations**

- The following project proposals, prepared for cooperation with APCTT member States and submitted to MoST;
 - *Exchange visits for Capacity building in the field of Science, Technology, and Innovation & Policy Research.*
 - *One-Day Workshops on Creating Enabling Environment for University-Industry Technology Transfer.*
 - *Capacity building of PCST for evaluation of R&D organizations for enhancing their efficiency and effectiveness.*
- The following project proposals, prepared for Pakistan–China Science Technology and Innovation Cooperation and submitted to MoST;
 - *Bilateral short-term visits between Science Technology and Innovation (STI) Policy Professionals of Pakistan and China.*
 - *Series of One-Day Workshops on Creating Enabling Environment for University-Industry Technology Transfer.*
- A proposal titled, “Science, Technology and Innovation (STI) for Sustainable Development Goals and Socio-economic Development” was prepared for ‘KOICA’s Country Specific Training Programme for the Year 2024’ in the prescribed format of KOICA.
- The following project proposals, prepared for Cooperation in Science Technology and Innovation and submitted to MoST;
 - *Cooperation in the field of STI Policy between Pakistan and Lebanon*
 - *Cooperation in the field of STI Policy between Pakistan and the UK*

- **Country report on “Scientific and Technological Development in Pakistan” for 7th High Council Meeting of D-8 Countries**

A country report on “Scientific and Technological Development in Pakistan” was prepared for the 7th High Council Meeting of D-8 Countries held in Tehran, Iran in hybrid mode on 27-28 February 2023 and shared with MoST and Engineering Development Board (EDB) for onwards submission to D-8 Secretariat.

- **Country report on “Status of Science and Technology in Pakistan” for Secretary, MoST to Iran**

A country report on the Status of Science and Technology in Pakistan was prepared for the Secretary of, the Ministry of Science and Technology, concerning his visit to Iran. The report covered the following points: science and technology infrastructure (R&D organizations & higher education sector), R&D in industry, R&D manpower, R&D expenditure and science and technology policies.

- **Mid-Term Ministerial and Provincial Reviews of SDGs**

About Mid-Term Ministerial and Provincial Reviews of SDGs, information regarding the programmes of PCST i.e. First Industrial National Innovation Survey, Need Assessment of S&T Human Resources and Science & Technology Indicators of human and financial resources was provided to MoST. The information comprised Index Value, Outcomes / Impact, Challenges / Issues / Bottlenecks and Proposed Plan of Action regarding these initiatives.

- **Memorandum of Understanding “MoU” for Collaboration**

A MoU between the Pakistan Council for Science and Technology (PCST) and the Association of Southeast Asian Nations (ASEAN) Secretariat for collaboration in the field of Science, Technology and Innovation Policy was prepared and submitted to MoST.

- **Presentation / Lecture**
 - Participated in and delivered a presentation in a webinar on “Human Resources in Science and Technology: Challenges and Opportunities for Japan and Pakistan”, which was held on Jan 17, 2023 and Organized by MUET-GRIPS.
 - Participated in the International Conference on Mineral and Ore Processing (ICMP) held in Haripur on 15-17 March 2023. The two-day international event on the mineral processing industry was jointly organized by the Society of Economic Geologists and Mineral Technologists (SEGMITE), Pak-Austria Fachhochschule Institute of Applied Science & Technology and Pakistan Science Foundation in collaboration with the Abbottabad University of S&T. Two number of Abstracts were submitted and presentations were made in the said conference which was published the Abstract Volume of the Conference.
- **Miscellaneous**
 - Views /comments on “PAK-UAE Comprehensive Economic Partnership Agreement (CEPA)” prepared and submitted to MoST.
 - View/Comments prepared for “8th Multi-Stakeholder Forum on Science Technology and Innovation for the Sustainable Development Goal New-York 3-4, MAY, 2023” and submitted to MoST.
 - Views/comments on the “Proposal for the Proclamation by the United Nations of 2025 as the International Year of Quantum Sciences and Technologies” proposed by Mexico were submitted to MoST.
 - Prepared a document for discussion during Turn-Around Pakistan (TAP) and participated in (TAP) conference, held on 28th June 2022 at the convention centre in Islamabad.
 - Material for the Coffee Table Book titled “75 Years Celebration of Pakistan” is prepared and submitted to MoST
 - Participated and delivered a presentation in a webinar on “Human Resources in Science and Technology: Challenges and Opportunities for Japan and Pakistan”, which was held on Jan 17, 2023, and Organized by MUET-GRIPS
 - Provided a panel of scientists deduced from Productive Scientists of Pakistan (PSP) to the Ministry of Science and Technology for nomination to the Board of Trustees (BoT) of PSF.
 - Reply to National Assembly Starred Question No.35 moved by MS. SHAMS-UN-NISA, MNA was prepared and submitted to MoST.
 - Response has been provided to MoST on the Implementation of the Action Plan of the Prime Minister Inspection Commission (PMIC) on Monitoring, Evaluation & Inspection of PSDP.
 - Prepared and submitted to MoST, a Presentation on technical initiatives (PSDP and non-PSDP) on the directives of the Public Account Committee meeting held on 19th January 2023, by M/O Science and Technology.
 - Prepared rooftop net-metering-based Solar PV System Design proforma and budgetary commitment letter shared by the Alternative Energy Development Board.
 - Prepared a draft of electricity consumption of PCST, Power load calculation, rooftop area available with PCST and the tentative number of 530 Wp solar panels required to cope with the load of PCST was prepared & submitted for consideration.
 - Prepared Material for “Pakistan Day-March 23, 2023 Projection Abroad” and submitted to MoST.
 - Prepared information for the formulation of PSDP for the year 2023-24 for Senate Business of the project titled “Digitalization of Evidence-based Science, Technology and Innovation (STI) Policy Advisory Process at Pakistan Council for Science and Technology (PCST)” and submitted to MoST.
 - Prepared & submitted a list of Research Topics for the year 2023-24 to MoST for onward submission to the National Defence University (NDU), Islamabad.
 - Prepared Public Sector Development Programme (PSDP) for the year 2023-24 and projection for 2024-25 and 2025-26 of the new proposed project titled “Digitalization of Evidence-based Science, Technology and Innovation (STI) Policy Advisory Process at Pakistan Council for Science and Technology (PCST)” and submitted to MoST.

Pakistan Council of Renewable Energy Technologies (PCRET)

Introduction

Pakistan Council of Renewable Energy Technologies (PCRET) was established in 2001 by merging the National Institute of Silicon Technology (NIST) and Pakistan Council for Appropriate Technology (PCAT). PCRET is the prime institution in the country for coordinating R&D and promotional activities in different Renewable Energy (RE) Technologies. PCRET is involved in indigenous production, system design, implementation and quality control of RE products/technologies. PCRET also collaborates at National/International level for development and application of Renewable Energy Technologies.

PCRET is committed to research, develop, promote, disseminate and create renewable energy culture with the following objectives:

- To Act as National Focal Point in the Field of RE Technologies
- R&D, Indigenous Production, System Design and Implementation
- HRD for Capacity building, Awareness, Promotion and Dissemination
- Collaboration at National/International Level for Development and Application of RE Technologies
- Testing, Qualification & Quality Control of RE Products

Goals & Targets

- R&D in the field of Third and Fourth generation solar cell materials such as; perovskite, quantum dot etc.
- Establishment of National Testing Laboratory for PV and allied equipments as per International Standards.
- International projects in collaboration with National Research Institute of Rural Electrification Hangzhou Regional Center (NRIRE HRC), Ministry of Water Resources of China.
- MoUs with International donor companies for projects funding and Technology Transfer, in collaboration with their respective Governments institutes.

Clear-cut performance / outcomes

- ***R&D in the field of Third and Fourth generation solar cell materials such as; perovskite, quantum dot etc:***
 - Upgraded labs/equipments.
 - Research conducted by various students from academia.

Establishment of National Testing Laboratory for PV and allied equipments as per International Standards:

- At present, foundation work for construction of the solar panel testing laboratory is completed after completing the following tasks:
 - The solar panel testing laboratory under this project is being constructed in Islamabad.
 - The construction phase is almost completed.
 - Five (05) PCRET officials have completed six (06) months training in Korea for operation of testing laboratory.
 - The project is expected to be completed by December 2024.
 - The project is being completed under the grant aid of 9.5 Million USD from Korea International Cooperation Agency (KOICA) and Rupees 71.629 million under PSDP Project via local support.
- **International Projects in collaboration with National Research Institute of Rural Electrification Hangzhou Regional Center (NRIRE HRC), Ministry of Water Resources of China.:**
 - Establishment of R&D Center on Key Technologies of Small Hydrel Power and Rural Electrification:

S. No	Obj ctive s	Current Status
i.	Up-gradation of China – Pakistan Joint Research Center for Small Hydropower at PCRET Islamabad.	Up-gradation Equipment arrived at PCRET from China and its installation is in progress.

ii.	Formulation of Small Hydropower Standards System for Pakistan	This mandate was given to PSQCA and it is in progress.
iii.	Human Resource Development Hydropower (10 trainings each having 6 months duration will be held in China)	6 x engineers (4 from PCRET, 1 from Energy Department Punjab and 1 from PSQCA) obtained 6 months training on design and development of Small Hydro Power (SHP) plants.
iv.	Addition of 10-15 Solar PV and Wind Energy on a selected hydropower plant for hybrid power generation	Discussion for site selection in KPK and Gilgit-Baltistan is in progress.
v.	International Seminar on Small Hydropower and Rural Electrification	Completed. It was held in Islamabad in January 2020.
vi.	Establishment of a 100kW hydropower plant on a canal in Punjab	Project site i.e. IRI, Nandipur, Gujranwala has been finalized by Energy Department Punjab, for establishment of 100 kW SHP plant, which has been withdrawn by ED, Punjab due to shortage of funds.
vii.	Hydropower Development Planning of a selected river/canal in Punjab	This mandate was also given to Energy Department Punjab.

o Joint Research on Small Hydropower Technology between China and Pakistan:

S. No	Objectives	Current Status
i.	Research on the standard framework system of small hydropower technology in South Asia.	In Progress
ii.	Research on the mechanism of Small Hydropower talents cultivation in South Asia.	In Progress
iii.	Joint Research on the centralized control technology for optimal operation of multiple Small Hydropower stations in Pakistan.	In Progress
iv.	Joint research on the technology of Small Hydropower oriented off- grid multi-energy complementary power generation.	In Progress
v.	Trial production and demonstration of Small Hydropower and other renewable energy equipment.	In Progress
vi.	Construction of Joint Laboratory for Small Hydropower Technology	In Progress.

o Talent Cultivation Program:

- Online training of 6x engineers and officials of PCRET has been successfully conducted by Hohai University China on Small Hydropower Development. The duration of the training was 3 months.

• **MoUs with International donor companies for projects funding and Technology Transfer, in collaboration with their respective Governments institutes:**

MoU on Scientific and Technological Cooperation between PCRET and Hangzhou Regional Center-HRC (Asia-Pacific) for Small Hydro Power, Ministry of Water Resources, China”, between PCRET and HRC China was submitted to Ministry of Science & Technology. The said MoU has been approved by the Cabinet Division on 18th July 2022. HRC China has been asked to give the schedule to PCRET for MoU signing ceremony. Meanwhile both parties are drafting agreements to be discussed for the initiation of Projects under the premise of MoU.

Alignment of outcomes:

• **Promotion of Standards and Quality Assurance:**

- o Coordination with NRIRE/HRC China for formulation and development of Pakistan standards for Small/Micro Hydro technology/projects as per **International IEC standards.**

- The project for “*Establishment of National Testing Laboratory for PV and allied equipments*” as per International Standards i.e. IEC 61215, IEC 61730, was approved by KOICA-Korea. The project will help in Implementation of International safety & quality standards, Availability of quality and certified solar products in the country, Awareness of Quality/ Safety Standards among masses, Transfer of technology for capacity building etc.

- **Promotion of Alternate Energy:**

Students from different Universities across the country conducted visits of PCRET Labs. The visits aimed for promotion/awareness and to enhance skill development in renewable energy field.

- **Research and Development for Socio Economic Development:**

- Upgraded Advance PV lab, which is now fully functional. The said lab is utilized for R&D in Silicon Technologies & Solar Cell Materials to conduct R&D in 3rd and 4th generation solar cells such as; perovskite, quantum dot, thin film etc and to achieve high efficiency.
- Research on thin films, perovskite and organic cell materials carried out by PhD and Master’s students and published two impact factor journal publications.
- Development of prototype Renewable Energy Products for socio-economic development, commercialization for revenue generation for the Government. Substitution of import of different renewable energy products through indigenization and transfer of technology (ToT) for the development of quality and economical products utilizing the local material and capability.

Liaison with International Organizations for the Development of Science and Technology:

Sr#	Project Name	Collaborating Entity	Project Cost
1.	Establishment of PAK-KOREA Testing Laboratory for PV Modules & Allied Equipment	KOICA-Korea	Rs. 1391.179 Million <ul style="list-style-type: none"> • Foreign Grant: USD 9.5 M • GoP Share: Rs 71.629 M
2.	China-Pakistan Joint R&D Center on Key Technologies of Small Hydel Power and Rural Electrification	NRIRE HRC MWR China	Estimated: 6.4 Million CYN
3.	Green Climate Fund: Adaptation of Photovoltaic, Biogas Technologies and Establishment of Renewable Energy Labs in Pakistan for Climate Change Mitigation	GCF	USD 40 M

Performance of each section

- **Solar PV Department:**

- **R & D of low cost, high efficiency Polycrystalline silicon Solar Panel**
- Cost-effective and high efficient PV modules produced. (Efficiency 16.5%).
- **R & D of low cost, high efficiency Mono-crystalline silicon Solar Panel**
- Cost-effective and high efficient PV modules produced. (Efficiency 18.0%).
- **R&D facility for 3rd and 4th generation solar cell materials**
- Efficiency of 5-6% achieved
- **Research collaboration established with Academia**
- 4 PhD and 2 MS students supervised

- **Solar Testing/QC Lab:**

- **Testing of locally developed and imported PV modules, solar cells and allied equipments**
 - Testing services provided and issued test certificates to different Public/Private sector organizations/companies for Solar Cells, PV Modules, Charge Controllers, LED Lights and Batteries etc.

- **Micro Hydro Power Section:**

- **Project Name:** China Pakistan Joint R&D Center on Key Technologies of SHP and Rural Electrification
Funding: CYN 6.4 million Chinese Government’s Grant in terms of equipment, trainings and seminars + GoP Local Share
Current Status: In-progress
Place of Execution: PCRET Head Office Islamabad, Punjab and Gilgit-Baltistan
- **Project Name:** Joint Research on Small Hydropower Technology between China and Pakistan

Tentative Date of completion: 2023

Funding: USD 600,000 (~ Rs. 102 million) Chinese Government's Grant in terms of equipment, trainings and seminars + Rs. 20 million GoP Local Share

Current Status: In-progress

Place of Execution: PCRET Head Office Islamabad, KPK and Gilgit-Baltistan

- **Project Name:** Talent Cultivation Program

Current Status: Completed

Purpose: Online training of 6x engineers and officials of PCRET was conducted by Hohai University China on Small Hydropower Development. The duration of the training was 3 months.

- **Wind Energy Section:**

- **Design and development of prototypes of Wind Energy products**

- Conducted Analysis and optimization of Wind energy farms and topologies.
- Gathered data and generated report from the installed Wind energy data logger at PCRET, HQ, Islamabad.

- **Solar Thermal Section:**

- **Up gradation of Solar Thermal product development workshop.**

- Upgraded Solar Thermal product development workshop at PCRET, HQ, Islamabad.
- **Design and development of prototypes of Solar Thermal products**
- Designed and upgraded following Solar Cookers:
 - Panel/Foldable
 - Parabolic Dish Type Solar Cooker with Glass Reflecting Material
- Designed and developed Solar Oven (Wooden Type for Indoor Cooking),
- Designed and developed Solar Desalinator and Solar Dryers.
- Upgraded Solar Thermal product development workshop at PCRET HQ Islamabad.

Pakistan Science Foundation (PSF)

Introduction:

Pakistan Science Foundation was established on June 30, 1973, under the Pakistan Science Foundation Act No. III of the National Assembly as an autonomous body to promote and finance scientific and technological activities having a bearing on the socio-economic needs of the country. The tasks undertaken by the Foundation for the performance of its statutory functions are divided into the following three broad categories:

- Science Promotion supports fundamental as well as applied research involving researchers/academia at universities and R&D organizations focusing socio-economic needs/development of the country.
- Science Popularization endeavours to image scientific ideas to grasp the concept of fundamental science.
- Science Centers encourage all segments of society to think, understand and explore science.

Some of these activities about the above-mentioned categories are undertaken by the Pakistan Museum of Natural History (PMNH) and Pakistan Scientific and Technological Information Centre (PASTIC), the two subsidiary organizations of PSF, while others are performed by PSF Science Wing:

Functions

- Under the Act, the Foundation has been entrusted to carry out the following functions:
 - Establishment of comprehensive scientific and technological information and dissemination centres.
 - Promotion of fundamental research in universities and other institutions on scientific problems relevant to the socio-economic development of the country.
 - Utilization of the results of scientific and technological research including pilot plant studies to prove the technical and economic feasibility of processes found to be promising on a laboratory scale.
 - Establishment of science centres, clubs, museums, herbaria and planetaria.
 - Promotion of scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular.
 - Organization of periodical science conferences, symposia and seminars.
 - Exchange of visits of scientists and technologists with other countries.
 - Grant awards, prizes and fellowships to individuals engaged in developing processes, products and inventions of consequence to the national economy.
 - Special scientific surveys not undertaken by any other organization and collection of scientific statistics related to the scientific efforts of the country.
 - The Foundation shall also:
 - Review the progress of scientific research sponsored by it and evaluate the results of such research.
 - Maintain a National Register of highly qualified and talented scientists/engineers and doctors both in and outside Pakistan, and assist them in collaboration with concerned agencies to seek appropriate employment.
 - Establish liaisons with similar bodies in other countries.

Goals and targets:

- Establishment of Scientific and Technological Centers
- Promotion of fundamental Research
- Promotion of R&D Research in the country
- Establishment of science centres, clubs, museums, herbaria and planetaria
- Promotion of scientific societies
- Organization of periodical science conferences, symposia and seminars
- Exchange of visits of scientists and technologists with other countries

- Grant awards, prizes and fellowships to individuals engaged in developing processes
- Special scientific surveys
- Review the progress of scientific research
- Maintain a National Register of highly qualified and talented scientists/engineers and doctors
- Establishment of International Liaison with similar institutes/Organizations

Performance / Outcome:

Pakistan Science Foundation (PSF) has various sections and programs to achieve the prescribed goals and targets. Details of these sections and activities are as follows;

- **SCIENCE POPULARIZATION ACTIVITIES**

Popularization of science, increasing science awareness and development of scientific culture in the society are major functions entrusted to the Pakistan Science Foundation. Under the action plans of various S&T Policies, the task of popularization of science at the grassroots level in the country has also been assigned to PSF. Popularization of science plays a vital role in the socioeconomic, cultural, and environmental development across the country. In this regard, several activities were initiated to develop science culture in the country. Under the action plan of the National Science Policy 1984 and STI Policy 2012, the Government has emphasized strengthening and expanding PSF programs for the popularization of science at the grassroots level. These programs are organized outside the formal education system particularly for the students to motivate them towards science education. PSF also seeks to collaborate with International Scientific Organizations for this purpose. It also helps in enhancing/improving the critical sense of the population, by increasing its involvement in decision-making and contributing to sustainable development. In this regard, the Pakistan Science Foundation undertakes several programs; a brief of the activities is given below;

- **REGULAR ACTIVITIES**

- **Science Caravans (Mobile Science Labs)** is a Mobile Science Exhibit that has been designed to increase public awareness about science and to motivate the younger generation of the country towards the study of science. Science Caravan consists of three major components; first, demonstration of the exhibits & display items, second, screening of science films/documentaries and lastly the Star Lab Planetarium system. Microscopes, computers, laser holograms and working models reflecting various phenomena of physics, chemistry, mathematics and biology are included in Caravan Exhibitions. At present, 09 Science Caravan units are in operation, 02 for each of the 04 provinces and 01 for Federal and adjoining areas. During the year 2022-23, a total of 82712 students from 351 Schools visited Science Caravan Exhibitions as detailed below;
 - Federal unit: 20,289 students from 78 schools visited the exhibitions.
 - Sindh units: 25,756 students from 148 schools visited the exhibitions.
 - Punjab units: 15,275 students from 41 schools visited the exhibitions.
 - Khyber Pakhtunkhwa units: 17487 students from 50 schools visited the exhibitions.
 - Baluchistan units: 3905 students from 34 schools visited the exhibitions.
- *Glimpses of a PSF Caravan Exhibition*
- **Donation of Popular Science Magazines** is one of the regular and important activities for science popularization. A total of 4,000 copies of “Urdu Science Magazine” were distributed to 2000 schools during the report period.
- **Commemoration of World Science Day for Peace and Development, 2022**
Commemoration of World Science Day for Peace and Development (WSDPD), was organized on 16th November 2022 jointly by The United Nations Educational, Scientific and Cultural Organization (UNESCO), the Standing Committee for Scientific and Technological Cooperation (COMSTECH), the Commission on Science and Technology for Sustainable Development in the South (COMSATS), Pakistan Academy of Sciences (PAS), ECO Science Foundation (ECO-SF) and Pakistan Science Foundation (PSF) on the theme of the importance of “Basic Sciences for Sustainable Development”. The theme of the WSD -2022 decided by UNESCO for the celebrations of the year 2022 as the “International Year of Basic Sciences” started on July 8, 2022.
- **Strengthening of High Schools Laboratories**

PSF also helps the schools in the strengthening of the Laboratories. Most of the high schools working in the government sector in rural areas have an acute shortage of laboratory equipment for performing science experiments and practicals. During this period, financial assistance was granted to the following 06 Government High Schools of Balochistan for the strengthening of scientific labs to promote and popularize science at the grassroots level:

S. #	School Name	Amount
1.	Divisional Public School, Loralai	150,000
2.	Govt. High School, Kachi Baig, Quetta	100,000
3.	Govt. High School, Kuchlak	100,000
4.	Govt. High School, Hazara Town, Quetta	100,000
5.	Govt. Model High School, Noshki	80,000
6.	Govt. Girls High School Postal Colony Quetta	100,000

○ **Youth Space Maker Camp 5th Belt and Road Teenager**

The Memorandum of Understanding (MoU) was signed on 6th December 2022 between the Pakistan Science Foundation (PSF) and the Institute of Space Technology (IST) for the promotion and popularization of science, STEM / STEAM education in general and space science, technology and its applications in particular, in the country.

○ **Popular Science Lecture on “Phenomena and Causes of Floods and Indus River System”.**

Climate change is impacting adversely to most of the countries as per their geographic and ecological conditions including Pakistan, which is on the verge of unfavourable effects of climate change like increased monsoon rains, melting of Himalayan glaciers, and reduced agricultural productivity. This was disclosed by Prof. Dr. Shahid Mahmood Baig, Chairman, PSF while addressing the mixed gathering of students, teachers and science managers on the occasion of a popular science lecture on “Phenomena and Causes of Floods and Indus River System” organized at PSF Auditorium.

Renowned Climate Change Expert, Prof. Dr. Imran Hashmi from NUST in his lecture discussed that floods are caused usually by high water levels in rivers, lakes, or along the coasts, which exceed their natural or man-made boundaries. Flash floods are brought by heavy rain, storm surges, typhoons, broken dams, glacial lake outbursts, or tsunamis. Flood damage is triggered by encroachment and unplanned urban development along streams and in floodplains.

He stressed the dire need to evaluate technological, institutional, and regulatory solutions since the Indus Basin floods contain valuable freshwater reserves that, if managed well, may be put to good use.

A large number of students, teachers and science managers attended the lecture. At the end, a quiz competition related to the topic was organized for the participating students and prizes were distributed among the winners.

○ **Descriptive Letter Writing Competition**

Science and Technology cooperation between China and Pakistan was started in the early sixties and since then, it has been increasing day by day and encompassing almost all scientific fields. The China-Pakistan cooperation saw the heights of mutual collaboration, when seeds of medicinal plants were sent to space by the Chinese “Shenzhou XIV Manned Spacecraft” which was launched on 5th June, 2022.

PSF in collaboration with the Embassy of China, Islamabad, organized a Descriptive Letter Writing Competition in September 2022 for the Chinese Astronauts, who were a member of the Chinese team responsible for this space

experiment. Forty-nine school/college students submitted their entries, which were evaluated by a Committee constituted by the Competent Authority for the purpose. The winning students were awarded Prizes and certificates.

○ **Production of Documentary on Science and Technology Cooperation between China and Pakistan**

PSF, MoST and the Embassy of China, Islamabad jointly produced a documentary titled “Sowing the Seeds of Friendships”. The video is on the story of seeds, a showcase of China-Pakistan relations, from traditional tea transplantation in the 1980s to the Hybrid varieties of rice and wheat, then the Genetically Modified Cotton till the current space experiment of medicinal seeds, all highlight the achievements of China-Pakistan science and technology innovation cooperation. PSF team visited Lahore, Karachi, Multan, Peshawar, Shinkiari, Pakpattan, and Islamabad for picturization and video recording of various ongoing projects in various Pakistani universities and facilities with the support of the Chinese Ministry of Science and Technology. The documentary was screened in a Seed handing-over ceremony held in February 2023.

PROMOTION OF BASIC AND FUNDAMENTAL RESEARCH

● **RESEARCH SUPPORT PROGRAMME**

Research support is the principal programme of the Foundation, which provides funding for research projects in natural and physical sciences. Project proposals submitted to the Foundation are evaluated initially by subject experts in relevant fields and then by Technical Committees based on technical merit and relevance to the socio-economic needs of the country. The progress of research is monitored through the evaluation of semi-annual and annual progress reports. Multi-disciplinary research projects in areas of economic significance to Pakistan are accorded special priority for the award of financial support.

During 2022-23, a total of 281 research projects/concept papers in 10 scientific fields namely Agricultural Sciences, Biological Sciences, Biotechnology & Genetic Engineering, Chemistry, Computer Sciences/Maths, Earth Sciences, Engineering Sciences, Health Sciences, Environmental Sciences and Physics remained under active consideration. Among these, 101 were under process, of which, 29 projects costing Rs.89.201 million were approved and an amount of Rs.52.066 million was released to 28 new projects on account of 1st instalments. A total of 81 projects were ongoing and an amount of Rs.14.653 million was released on account of due instalments and evaluation fees of these projects.

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based on the results of 23 completed projects, 39 research papers were published in national/international journals and 01 patent was registered under these completed projects. In addition, 10 Ph.D. and 21 M.Phil./M.Sc. (Hons)/MS students secured their respective degrees while working as Research Associates in these completed projects.

● **Other Science Promotion Activities:**

- **Institutional Support Programme:** One of the functions of the Foundation is to support the less developed R&D Organizations/Universities to strengthen their laboratories. During the year, **01** case of Institutional Support was approved for an amount of Rs. 0.05 million and an amount released accordingly.
- **Conferences/Seminars/Symposia/Workshops:** Another function of the Foundation is to provide funding for holding conferences/seminars/symposia/workshops etc. During the year 2022-23, the organization of **52** conferences, seminars and workshops on important scientific topics were financially supported at different universities and R&D organizations across the country.
- **Financial Support for Journals:** The Foundation provides funds for publications of scientific journals in various disciplines. During the period, no request was received.
- **Awards and Fellowships:** PSF provides a limited number of research fellowships to those M.Phil and Ph.D. scholars who do not have any other source of income. During the year, no request was entertained due to paucity

of funds.

- **Scientific Survey:** The Foundation also provides funds for scientific surveys to collect data on important scientific issues/problems. During the year, no case was entertained due to a shortage of funds.
- **Dr. Z. A. Hashmi R&D Gold Medal:** PSF instituted a prestigious award of “Dr. Z. A. Hashmi R&D Gold Medal” in the name of its founding Chairman. The Medal is awarded to the best researcher selected based on research results achieved under the PSF-supported research projects over 10 years. It carries a cash award of Rs.100,000/- along with an appreciation certificate. Each year, one scientist is awarded with Gold Medal and a cash prize. This activity has encouraged the scientific community to conduct quality research, perform well and produce fruitful outcomes. During the year, no case was entertained due to a shortage of funds.

- **PSDP Project “Competitive Research Programme”**

The Competitive Research Programme (CRP) is the PSDP awarded to the Pakistan Science Foundation to finance research projects under 04 streams viz., Individual Research, Consortium Research, Triple Helix Model and International Linkages.

This project was approved by CDWP in its meeting held on December 04, 2017, and the authorization was issued by the Ministry of Planning, Development and Reforms (MoPDR) vide Office Memorandum No. 27(186) PIA-IV/PD/2017 dated March 06, 2018. The administrative approval from the Ministry of Science & Technology (MoST) was received vide F. No. 4(66)/2017-DEA (P&D) dated June 20, 2018, at a total cost of Rs. 1964.500 million. The project was revised on 24 September 2021 without any change in its cost for an extended period of implementation up to 30 June 2026.

During 2022-23, a total of 1,393 concept proposals were received under two calls (6th Call for Energy and 7th Call for AI, Material and Nanotechnology). A total of 15 projects worth Rs. 75.332 million were approved for funding after the completion of peer review and technical evaluation through different execution committees. Among approved projects, the first instalment of 31 projects amounting to Rs. 130.995 million was released. Due instalments on account of 27 ongoing projects amounting to Rs. 19.058 million were released. The project is mostly executed through different committees (7 meetings of the Scrutiny Committee, 7 meetings of Technical Committees, 2 meetings of the Project Award Committee and 01 meeting of the Steering Committee) for review and award of the research projects/grants.

CPR projects are mostly of applied nature and result in the development of new products/technologies/processes/techniques. Some short-term projects resulted in the development of prototypes of some equipment like indigenous Ventilator machines, Diagnostic catheters and automatic Syringe Pumps for Intravenous Infusion of COVID-19 Patients in ICU

- **R & D INDUSTRY PROGRAMME**

Focusing on collaborative research and strong industrial linkages, the R & D industry Programme is bringing together researchers, end-users and funding institutions at one platform to create an environment of a unified approach to identify and solve industrial problems through applied research and technology development. During 2022-23, a total of 12 concept papers/project proposals were registered in the R & D Industry Programme after passing them through In-house Economic Feasibility checks. Full-length proposals for some of the concept papers were invited for more accurate scientific and commercial analysis. Nine of these projects were processed for peer review. A total of Rs. 15.31 million was released on account of due instalments of 02 ongoing projects being executed in COMSATS Islamabad and COMSATS Institute of Information Technology, Lahore. At present, there are 09 ongoing projects in the R & D Industry Programme in different research organizations and academic institutes.

NATURAL SCIENCES LINKAGE PROGRAMME (NSLP)

- **Funding of Projects under PAK-US Natural Sciences Linkage Programme (NSLP) Endowment Fund:**

The Natural Sciences Linkage Programme (NSLP) was agreed upon between the Ministry of Science and Technology and the United States Department of Agriculture (USDA) under the MoU signed in November 2002 on the “Joint Operating Arrangement for Cooperation in the Field of Natural Sciences”. However, the funds were released in 2005-06 and the activity began in 2007. The NSLP Endowment is an important component of the Pakistan Science Foundation. It is being managed by the Foundation through the Board of Governors (BOG) and Fund Management Committee (FMC). The Chairman, of PSF is the Chief Executive of the Programme/Fund. The main objective of this fund is to enhance agricultural production through effective research carried out by Pakistani scientists. Besides, other science promotion activities like Workshops and Conferences etc are also entertained by this section.

During the year 2022-23, a total of 120 concept papers in the fields of natural sciences were received for processing. All were passed through 04 meetings of the PSF Screening Committee and 47 concept papers were shortlisted for further processing. A total of 32 project proposals costing Rs.136.968 million were approved and an amount of Rs.31.656 million was released to these new projects on account of 1st instalment. During the year, 89 projects were ongoing and an amount of Rs.21.710 million was released on account of due instalments and evaluation fees of these ongoing projects. Based on the results of 08 completed projects, 10 research papers were published in national/international journals. In addition, 03 PhD and 12 M. Phil. /M.Sc. (Hons.) students secured their respective degrees while working as research associates in these completed projects.

SCIENCE TALENT FARMING SCHEME (STFS)

- **Brief Progress of the STFS Project**

The development project “Science Talent Farming Scheme (STFS) for Young Students, Phase-I, Component-I (Revised)” was conceived by the Pakistan Science Foundation (PSF). The original PC-I was approved by the CDWP in June 2015, however, the PC-I was revised and approved by the CDWP on July 6, 2017 at a total cost of Rs.1,285.361 million for a period of 5 years (December 2015 – December 2020). The project was revised at a total cost of Rs.1517.071 million by the DDWP forum from 14.01.2022 till 30.06.2025 with some changes in the scope of the project.

Objectives of the Project:

- To support and groom the talented but less privileged science students from government schools, in their studies and groom them to become productive scientists.
- To groom and support the selected students by progressively exposing them to advancements in science and mathematics through an inquiry-based learning approach.
- To arrange training sessions for students on Inquiry Based Science Education (IBSE).
- Promotion/Popularization of S&T through different platforms including but not limited to social, print and digital media for teenagers, young adults and specifically out-of-school children.
- To establish a database/tracking system of all the beneficiary students of the project.

Implementation Strategy

The project objectives are achieved through the following processes and activities:

- Selection of 500 students, each year, through evaluation by a specialized testing agency
- E.g. NTS, CTS etc. Scientific aptitude test is conducted in 03 phases:
- Specialized written/screening test
- Paper-Based IQ Test
- Presentation on innovative ideas/Interview
- Scholarships @Rs.15,000/- per month to each successful student for 02 years. For disabled students, the Scholarship is @18,000/- per month
- Tuition fee @Rs.10,000/- per year for each student
- Visits to universities and S&T organizations
- Participation in Summer Colleges and National Youth Science Forums
- Computer/android-based learning through laptops/tablets.
- Online meetings and Interaction with eminent scientists through Mobile Science Labs

- Budgetary allocation for the initiatives, programmes or projects undertaken:
 - Fund allocation for the Years 22-23: ○ 300.00 million
 - Revised allocation ○ 120.00 million
 - Expenditure incurred: ○ 119.69 million
- **Information on the progress of the project**
 - Cumulative Physical Progress: 75%
 - Cumulative financial Progress: 47%
- Details of activities, achievements and progress till the preceding financial year (2022-23)
 - **Targets (Out Puts):**
 - Monetary benefits to 5 batches completed (total 1500 students)
 - STFS 6th batch (500 students) has been provisionally selected.
 - Complete Monetary Benefits to 233 students of STFS 6th batch were paid amounting to Rs.88.54 million.
 - For the arrangement of the Summer Camp/Local Study Visit of the STFS 6th batch, financial bids were invited from the pre-qualified tour operators. Advertisement was floated in the daily newspapers for hiring of testing agency for selection of the STFS 7th batch.
 - International study visits of STFS 1st and 2nd batch were arranged in 2016 and 2017 respectively. The activity was deleted from the revised PC-I of the project.
 - Laptops/internet connectivity devices were distributed among 1st and 2nd batch students. The activity was deleted in the revised PC-I of the project.
 - As per the revised PC-I, 06 new universities were selected to undertake research activities of STFS students. Financial assistance amounting to Rs.3.645 was paid to 04 universities for the provision of lab facilities to STFS students to undertake research activities. In total, 350 posters/ research reports from 5 batches were received.
 - **Outcome/Impacts:**
 - The project outcomes are;
 - Scholarship to 3000 students in total.
 - The project outcomes are to develop inquiry and critical thinking in the young generation, who will become future scientists and researchers. This will also provide a way to avert the extremism, which is based on blind dogma and creed.
 - Direct Employment as per revised PC-I: 14
 - **INTERNATIONAL LINKAGES (IL) PROGRAMME**

During the reporting period, the International Linkages activities of the Pakistan Science Foundation were further expanded and fortified. Effective linkages were developed with international counterparts to benefit the scientific community of Pakistan.

 - PSF launched the first joint call for proposals on the Joint Scientific Exchange Program (JSEP) with the National Natural Science Foundation (NSFC), China under which 18 Mobility grants to the researchers were awarded.
 - 75 projects remained ongoing under 04 calls with NSFC, 03 with TUBITAK, two with MSRT and 06 with NSF, Sri Lanka. 33 technical reports (semi-annual and annual) of ongoing projects were received and an amount of Rs. 59.6 million was released on account of due instalments of already ongoing projects and first instalments of newly initiated projects with NSFC-China.
 - During the reporting period, 18 projects were completed. As a result, 03 patents, and 85 publications were accomplished in these projects. While 84 MPhil/Ph.D. students completed their degrees.
 - In addition, 18 projects of IL remained ongoing funded under the PSDP project Competitive Research Program. 08 technical reports (semi-annual and annual) of ongoing projects were received and an amount of Rs. 50.8 million was released on account of the due instalment of already ongoing projects and the first instalment of newly initiated projects with TUBITAK-Turkey.
 - An online Joint Technical meeting with NSFC authorities was held on 7th Dec 2022 at PSF. In the meeting, there was a formal exchange of results of the PSF-NSFC joint call on the Joint Scientific Exchange Program (JSEP) besides this, the two sides also exchanged gratitude on existing collaboration and modalities to launch joint 5th calls were also discussed.

PSF has developed PC-I titled “Establishment of STEM Schools in Pakistan”, which is focused on enhancing the capacity of public sector schools by establishing STEM-FAB labs and teacher training

programs on modern teaching techniques mainly teaching science subjects in an integrated and interdisciplinary way. In connection, the China Association for Science and Technology (CAST) will provide assistance and training material to undertake the activities of this novel STEM project. In this regard, the cheque distribution ceremony was held under the headship of Mr Agha Hassan Baloch, Federal Minister for Science and Technology at MoST. At the occasion, Secretary MoST, Mr. Ghulam Muhammad Memon, Chairman PSF, Prof. Dr. Shahid Mahmood Baig and other Top Officials of MoST and PSF were present. Mr. Agha Hassan Baloch distributed the cheques of Rs. 1.0 million on the account of enabling the labs among the Principals of Schools.

PLANNING & DEVELOPMENT (P&D) SECTION

Since 1973, PSF has provided financial support to Scientists / Technologists for the presentation of their research papers at International science conferences, seminars, workshops, and symposia and to undertake a part of research work in the laboratories of advanced countries for which facilities are not available within the country.

Development Activities:

There are 37 Scientific Societies registered with PSF under the Societies Act 1860. A PSDP project entitled “Financial Support to Scientific Societies in Pakistan (Phase-II)” was initiated in April 2020 with the scope to provide financial assistance to scientific Societies as well as provision of travel grants to the Society Members and Ph.D. Scholars. It was estimated that 15-20 societies will be funded under the project in FY 2022-23.

Non-Development Activities:

During the year 2022-23, an amount of Rs.3.30 million was released/spent for the provision of travel grants to scientists/technologists. A total of 93 requests were received from scientists and technologists in the country. After comprehensive scrutiny as per eligibility criteria, these requests were presented in 08 meetings of the Travel Grant Award Committee (TGAC). Out of the total requests presented to the TGAC, 21 were recommended whereas, 18 scientists/technologists availed of the grant and 03 could not proceed abroad due to visa problems and other reasons. However, 68 requests were not recommended by the Committee. TGAC recommended/ funded 03 cases from NSLP funds.

Development Activities:

Under the development project titled “Financial Support to Scientific Societies in Pakistan (Phase-II), the following are the main achievements;

- Grant-in Aid provided to 17 registered Scientific Societies. The following activities were undertaken by the societies,
 - Forty-two (42) International / National Science Conferences / Workshops / Seminars/ Symposia were financially assisted.
 - Thirty-three (33) issues of eleven (11) Scientific Journals were partially funded.
 - Annual Linkages Fee paid to five (05) International Federations.
- Ten (10) travel grants were provided to the Ph.D. scholars and PSF registered Society Members for their participation in International Science Conferences/ Seminars / Workshops and Training Abroad.
- Three (03) new societies namely Pakistan Biological Safety Association (PBSA), Society of Mechatronics Engineers (SOME) and Pakistan Society of Nuclear Medicines (PSNM) were registered.
- Four (04) events were physically monitored by PSF staff.

Alignment of outcomes and outputs with the medium-term budget estimates for service delivery:

- The targets set for the provision of travel grants for participation/presentation of research papers at International forums were 30-35. However, due to the budget constraints only 21 cases were recommended. Out of which, 18 scientists availed the grants.
- The targets set for the support of Scientific Societies were financial support to 15-20 societies. Whereas, 17 societies were supported.

Performance of each section/ attached department should be ascertained keeping in view key performance indicators.

Implementation and processing of 05 ongoing development projects were undertaken as per KPIs assigned to the P&D section.

Linkages with budget to better reflect performance:

An amount of Rs 24.75 million was utilized on the Scientific Societies PSDP project while Rs. 3.30 million expense was made on travel grant activity from the non-development budget.

Pakistan Museum of Natural History (PMNH)

Introduction:

Pakistan Museum of Natural History (PMNH), the only Natural History Museum in the country established in 1976 under the patronage of the Pakistan Science Foundation (PSF), Ministry of Science & Technology according to the dire need of time faced by the researchers that time with the prime objective not only to discover the country's fossilized wealth but also to preserve the natural history specimens of animals, plants, rocks, fossils and minerals discovered by the national and international researchers. Pakistan Museum of Natural History (PMNH) has the following four principal divisions namely;

- i. **Botanical Sciences Division (BSD)** (Engaged in collection and research on all types of lower and higher plants)
- ii. **Earth Sciences Division (ESD)** (Engaged in collection and research on all types of Rocks, Fossils, Minerals and Gemstones)
- iii. **Zoological Sciences Division (ZSD)** (Engaged in collection and research on all types of animal species of birds, reptiles, amphibians, mammals, fishes, insects etc.)
- iv. **Public Services Division (PSD)** (Dealing with public affairs including the management of PMNH displays and all types of educational activities.)

Scientists of PMNH regularly execute extensive field works from the Coast of the Arabian Sea to the Alpine Regions, roaming through barren areas for the collection of Flora and fauna, Rocks, Fossils and minerals for collection, research, publication and education. Due to the collective efforts of the scientific and technical staff of PMNH and collaborations with other research institutions, PMNH has 1.5 million natural history specimens in its repositories. Research outcomes of these field works and National and International projects are published in the form of research papers in reputed national and international journals. Scientific and Technical staff of PMNH also facilitate the students of BS., M. Phil./MS., and Ph. D. scholars belonging to the various universities of Pakistan and research institutes by providing help in their research in the form of information, technical assistance, specimens as a loan and guidance in their research work. Providing informal education is one of the main objectives of PMNH. For this purpose, PMNH regularly organizes trainings, workshops, seminars, symposia and other educational interactive activities related to the natural history, environment and biodiversity of Pakistan. International days are also observed. As per the mandate “*To establish liaison with similar institutions both within and outside Pakistan for sharing of knowledge and expertise*”, PMNH established many national and international liaisons with the other research institutes in the country and abroad. PMNH is not only researching Flora and fauna, Rocks, Fossils and Minerals of Pakistan but also educating the students of Pakistan along with the common people with the help of informative, interactive, educative 3-dimensional dioramas and exhibits. Students of schools, colleges and universities from all over Pakistan visit PMNH as a part of their educational tours.

Budget allocation for 2022-23

Regular: **147.630.000 million** (Non-Development) allocated for the research and other related activities as defined in Key Performance Indicators.

Goals and Targets:

- **Field Work:**
 - To arrange expeditions for the study and collection of natural history specimens i.e., Rocks, Minerals, Fossils, Higher plants, Lower plants, Herbs, Reptiles, Birds, Mammals, and Fish by the scientists of PMNH.
 - To research the biological and geological resources of Pakistan.
 - To interpret our natural resources and environment in the light of the past and plan for future courses of action.
- **Collection, Cataloguing, Digitization:**
 - To collect, identify and catalogue the natural history specimens through field studies for developing a national repository of plants, animals, rocks, minerals and fossils for further scientific studies.
 - To document and display specimens in the form of attractive exhibits/films/documentaries to educate the masses about the natural wealth of Pakistan.
- **Presentations/Lectures:**

- To address all the issues related to biodiversity, conservation, environment, wildlife and ecology.
- **Research Publications:**
 - To publish natural history books, research articles, field guides, monographs, popular articles, technical reports, bulletins, brochures, pamphlets etc. for the promotion of scientific research and public awareness.
- **Collaboration/MoUs:**
 - To establish liaisons with similar institutions both within and outside Pakistan for the sharing of knowledge and expertise.
- **Education/pieces of training/ Workshops and Seminars:**
 - To provide training facilities in natural history research, education, conservation, collection, preservation, identification, curation and exhibit designing including taxidermy, modelling and casting to interested individuals and groups.
 - To provide research facilities and incentives to scientists from within and outside the country to work at the Museum.
- **Displays Activities:**
 - Development of New and Maintenance of Existing Dioramas/Displays for Public Education.
- **Public Visits:**
 - No. of Schools/Colleges/Universities and General Public Visits in PMNH.

PERFORMANCE AGAINST SPECIFIED GOALS AND TARGETS:

- **Training Courses Held/Attended:**
 - Scientists of PMNH participated in Pakistan’s second national communication on “**Climate Change to United Nations Framework Convention on Climate Change (UNFCCC)**” on August 5, 2022, held in Serena Hotel, Islamabad.
 - The researcher of PMNH attended 5 days of training on “Project Life Cycle Management” held on 12-16 Sep 2022 at the PPMI office in Islamabad.
 - Scientists of PMNH participated in Universiti Teknologi PETRONAS (UTP) Energizing Futures Webinar Series 2022 with the United Kingdom’s edition. “Future Playbook of Complementary University-Industry Linkages”.
 - Scientists of PMNH participated in a week’s mentorship and cultural exchange program in Silicon Valley, Bay Area and Washington DC, USA from 21st Sep.2022 to 27th Oct. 2022.
 - Scientists of PMNH participated in the training on “PC-I preparation” organized by the Pakistan Planning and Management Institute (PPMI), Islamabad from 7th to 9th November 2022.
 - Scientists attended the “Stakeholders Workshop on Biological Control of *Parthenium hysterophorus* in Pakistan using the stem borer weevil (*Listronotus setosipennis*)” as invited stakeholders from PMNH in Ramada Lahore organized by CABI Pakistan from 17-18 Nov 2022.
 - Scientists of PMNH participated in the National Consultation on establishing the “International Geoscience and Geoparks Programme” in Pakistan on 7th December 2022 initiated by UNESCO.
 - Scientists of PMNH attended the seminar on International Biodiversity Day at MAJU, Islamabad on 22nd May, 2023.
 - Scientists of PMNH celebrated the “Annual Fungal Day” on Zoom on 25th May 2023 <https://www.fungi.egyp.com/25th/Index.HTML>.
 - Scientists of PMNH attended a training workshop for capacity building of Caravan Units on 14th – 16th June 2023 held at the Pakistan Science Foundation auditorium.
 - Scientists of PMNH participated in World Science Day for Peace and Development organized by UNESCO in collaboration with COMSATS and Pakistan Science Foundation at COMSATS Auditorium.
 - Scientists PMNH participated in the training entitled “**Project Formulation Workshop**” organized by the museum from the 17th and 18th of October 2022.
- **Trainings Conducted**
 - Researchers of PMNH organized an event of Worlds Wetlands Day 2023 with the theme “**Restoration of Wetlands**” with the collaboration of PIWEFF & MPCEN at PMNH on Feb 2nd 2023 at PMNH as convener of the event. The event was attended by scientists, researchers, students and media people from different organizations.
 - Researchers of PMNH conducted training on Kitchen Gardening held for students and teachers of Al-Huda International Foundation, Islamabad.

- Researchers of PMNH conducted a special training session for the farmers in Larkana district, Sindh to train them on rice fungal diseases.
- **Research Outcomes: -**
 - **Field Works:**

As per the mandate of the collection of natural history specimens, scientists of PMNH executed numerous field excursions from the coastal areas of Pakistan towards the Alpine regions of Pakistan. During FY 2022-23 for collection of natural history specimens of animals, plants, rocks, fossils, minerals and gemstones, researchers of Botanical Sciences Division (BSD), Earth Sciences Division (ESD) and Zoological Sciences Division (ZSD) conducted 12 field expeditions in the areas of Kathore, Sona Pass along with coastal line of Karachi near Mubarak Village, Abbottabad, Kohistan (Jijal, Pattan and Duber), Kallar Kahar, Hub River estuary, Ibrahim Haidri Creek and Hawk’s Bay beach in Karachi. A team of PMNH researchers carried out a special field trip in response to a request made by the GDA (Gawadar Development Authority) and the Baluchistan Wildlife Department to preserve 36 feet long *Blue Whale* that came on the shore of Jiwani, Gwadar, Balochistan.
 - **Collection, Cataloguing, and Digitization of Natural History Specimens:**

In the results of geological field works during the FY 2022-23 and lab work activities, **92,788** natural history specimens of animals, plants, rocks, fossils minerals and gemstones were collected, catalogued and preserved in the repositories of the Pakistan Museum of Natural History (PMNH);

Scientific Divisions	Activities								
	Collection	Catalogued	Digitized	Thin Section Prepared	Curator/ Poisoning/ of Higher and Lower Plants	Stuffing of Animals Skins	Skeleton & Skull prepared	Specimens repaired and study skins prepared	Photography of Plants
Botanical Sciences Division	13,211	13,500	4,012	---	15,500	---	---	---	1100
Earth Sciences Division	6,117	7717	335	66	---	---	---	---	---
Zoological Sciences Division	2,751	28,399	---	---	---	03	43	34	---
Total	22079	49,616	4,347	66	15,500	03	43	34	1100
				Total					92,788

- **Research Publications:**

Scientists of PMNH remain engaged in the research on specimens of plants, animals, rocks, fossils and minerals. The outcome of this research was published in national and international journals in the form of research papers & articles, natural history books, monographs, technical reports and popular articles etc. In 2022-23, a summary of the research outcome published by the scientists of PMNH is as follows;

Sr. No.	Research Activity	QTY
1.	Research Publications in National and International Research Journals on various topics	25
2.	Popular Science Articles published in print and electronic media	08
3.	Posters presented on National and international forums	03
4.	Book published entitled “Wonders of some plants and species” as a Collector, Contributor and Plant Taxonomist.	01
5.	Research Papers reviewed as an “Expert Reviewer”	05

- **Research Projects (National & International):**
Researchers of PMNH developed mutual collaboration for joint research on National and International levels. As a result of these joint ventures, scientists of PMNH successfully initiated the following research projects;
- **National Projects:**
Scientists of PMNH submitted **14 National level research projects** to the Pakistan Science Foundation (PSF) for financial assistance as per the details below:

Sr. No.	Project Title	Submitted by	Status
1.	Exploring Aquatic Plant Biodiversity of Wetlands of Punjab, and Monitoring Genetic Resources through DNA Bar-coding	Scientist of BSD as Co.-PI.	under the process review
2.	Phenological assessment of family Lamiaceae / Labiatae of herbarium specimens: Case studies from various eco-regions of Pakistan.	Scientist of BSD as Co.-PI.	under the process review
3.	PSF/NSLP/C-PMNH (990) Entitled Formulation of Eco-Friendly Trichoderma Based Indigenous Bio-Fertilizer for Management of Plant Diseases.	Scientist of BSD as PI.	Awarded
4.	PSF/NSLP/C-PMNH (1000) Entitled "Conservation, Propagation and Research on Native Desert Plants In PMNH Islamabad."	Scientist of BSD as PI.	under the process review
5.	PROJECT NO. PSF/RES/CP/KPK-SBBU/AGR (29) entitled: Cultivation/ Processing of Mushrooms at High Altitude Research Centre at Shringal, Dir Upper under the Shaheed Benazir Bhutto University, Shringal, Dir Upper (Technology Transfer)	Scientist of BSD as Co.-PI	under the process review
6.	"Birds / Wildlife Aircraft Strike Hazards & Prevention's".	Scientists of ZSD as PI. & Co.-PI.	Awarded
7.	"Establishment of Fabricated Lab"	Scientists of ZSD as PI & Co.-PI.	Awarded and in the execution phase.
8.	"Establishment of Fabricated Lab" under STEM Programme.	Scientists of ZSD as PI & Co.-PI.	Awarded and in the execution phase.
9.	"Establishment of a DNA bar-code reference bank for the Marine and freshwater fishes of Pakistan".	Scientist of ZSD as PI	In the final phase for approval.
10.	Up-gradation of the repository at ZSD under the Institutional Support Programme/PSF	Scientists of ZSD as PI	In the final phase for approval.
11.	"Conservation/Restoration of the Reference Collection of Earth Science Division, Pakistan Museum of Natural History by Utilizing the Modern Techniques"	Scientists of ESD as PI & Co.-PI	Approved by the Screening Committee for further processing
12.	"Exploration of Sediment-Hosted Zinc-Lead Mineral Deposits in the Lasbela and Khuzdar Area, Baluchistan, using Geological and Geochemical Techniques"	Scientists of ESD as PI. & Co.-PI	Approved by Screening Committee and invited full-length proposal.
13.	"Extension of display galleries, collection repositories improvement and research facilities enhancement at Pakistan Museum of Natural History.	Scientist of ZSD	In the execution phase.
14.	As part of the PSF PSDP project STEM (Science, Technology, Engineering, and Mathematics) initiative, scientists of ESD are involved in reviewing experiment		In the execution phase at PSF.

modules designed for matriculation and intermediate levels. The project aimed to enhance the quality and effectiveness of science education, focusing on subjects related to science, technology, engineering, and mathematics.

- **International Projects**

Through bilateral collaboration, the following **02 International research projects** are in progress;

Sr. No.	Project Title	Executed by	In collaboration with	Status
1.	“Cooperative development of an innovative auto-ID platform for the beetles from China and Pakistan”	Researcher ZSD/PMNH	of National Natural Science Foundation (NSFC), Beijing China	In the phase of completion
2.	“Evolution of convergent plate margin from Subduction to collision. A case study of Kohistan Island Arc’	Researcher ESD/PMNH	of Frankfurt Isotope & Element Research Center (FIERCE), Goethe Universität Frankfurt, Germany	In the process of approval for execution

- **NATIONAL & INTERNATIONAL LIAISON:**

In 2022-23, the following activities were performed for collaborative research and cooperation;

- Scientists of ZSD worked on fish taxonomy with the collaboration of MARBEC, Université de Montpellier, France.
- Scientists of ZSD worked on herpetofauna taxonomy with the collaboration of COMENIUS University, Czech Republic.
- Scientists of ZSD prepared a “National Red data list of mammals” in collaboration with the Ministry of Climate Change.
- Scientists of ZSD prepared “ToRs regarding Red Data Book of Pakistan” in connection with a meeting with the National Strategic Support Unit (NSSU), Islamabad NSSU/Ministry of Climate Change and Environmental Coordination (MoCC).
- Scientists of ESD guided Dr Faye Davis, a geologist from Glasgow University, UK. Faye visited ESD laboratories and held meetings with the scientists of ESD for mutual collaborative opportunities in the field of Earth Sciences.
- Discussion for collaborative research work is in progress between ESD, PMNH and the Department of Earth & Environmental Sciences Hazara University, Mansehra and with the Department of Earth Sciences, The University of Haripur regarding the renewal of the existing MoU.

PMNH also established liaisons with similar institutions both within and outside Pakistan for the sharing of knowledge and expertise. PMNH has already developed liaisons with the following National and International Institutions for joint ventures;

- Ministry of Climate Change, Government of Pakistan
- National Institute of Folk & Traditional Heritage (Lok Virsa)
- University of Sindh, Jamshoro
- University of Haripur, Hazara
- Kohat University, Kohat
- University of Poonch, AJK
- Organizations MPCEN & PIWEFF
- National Natural Science Foundation (NSFC), Beijing China
- National Museum of Natural History, Paris, France
- Frankfurt Isotope & Element Research Center (FIERCE), Goethe Universität Frankfurt, Germany
- COMENIUS University, Czech Republic

SERVICES TO OTHER ORGANIZATIONS

In 2022-23, services were provided to the students of BS, MS, M. Phil. and PhD belonging to the various universities of Pakistan in their research and thesis work and also supervised their research activities. Students from the following universities were assisted by a Co-supervisor in their research work;

- Quaid-e-Azam International University, Islamabad

- University of Sargodha, Sargodha
- Abbottabad University of Science & Technology, Abbottabad
- University of Haripur, Hazara
- Bahria University, Islamabad
- National Center of Excellence in Geology, University of Peshawar
- Women University, Rawalpindi
- National University of Science & Technology (NUST), Islamabad
- Pakistan Institute of Engineering & Applied Sciences (PIEAS), Islamabad
- COMSATS University

Summary of services provided;

Sr. No.	Assistance Provided	Students	Institute/University
1.	Identification of the medicinal plants	BS students and Ph. D. students working on Higher and lower medicinal plants	COMSATS campuses from Nagar and Phander area (GB)
2.	Therapeutic effects of Alzheimer's disease in humans by using <i>Fagonia indica</i> plant, medicinal value plants, and Cashew nut.	BS., and Ph.D., levels students of Biosciences	from ASAB, Atta Ur Rehman School of Biological Sciences NUST University
3.	completion of the research work on the <i>Morchella species</i> in Pakistan	Students from Bio-Engineering and Mycology and Phycology Herbaria, Department of Plant Sciences	PIAS University and Quaid-i-Azam University Islamabad
4.	Spirulina: identification and culture,	Students from the Department of Biotechnology and Genetic Engineering	University of Kohat
5.	Herbarium tools and techniques and commercial importance of flora	students from the Department of Botany	University of Poonch, Rawlakot, AJK
6.	Identification of the floral diversity and guidance in the completion of BS and Ph. D.	BS., and Ph. D. level students from the Department of Genetic Engineering	PMAS-Arid University, Kohat University University of Azad Kashmir Muzaffarabad
7.	Collection and identification of freshwater microalgae	Research Scholars	Kohat University of Science and Technology, Kohat.
8.	Taxonomic studies	Ph. D. Scholar	Department of Botany, Hazara University, Mansehra
9.	Completion of research work	MS. Student	Department of Botany Kohat University
10.	Identification of the Rubus plant species in the research of Ph. D.	International Ph.D. students	University of Poonch, Rawlakot, AJK
11.	Hair analysis of mammalian species	M. Phil. student	PMAS- Arid Agricultural University, Rawalpindi

As a Subject Specialist Provide Services during FY2022-23

Services	BSD	ESD	ZSD
1. Supervised	----	----	02 students (COMSATS) 08 students PMAS-Arid Agriculture University
2. Co-supervised	07 MS students from (COMSATS), (Mohi-Ud-Din Islamic University), University of Poonch, Rawlakot, AJK	03 BS student from the University of Haripur & Bahira University (Islamabad)	-----
3. Internship provided	14 BS students from Women University, Rawalpindi, International Islamic University,	26 BS (Geology) students	14 BS students PMAS-Arid Agriculture University 07 MS students from Karakorum International University, Baltistan University and Skardu

			University	
4.	Evaluation of Thesis	01M.Phil. Student from Quaid-e-Azam University	02 MS (Geology) Students Bahria University (Islamabad)	-----
5.	Examined	01M.Phil. Student from Quaid-e-Azam University	01 M. Phil. (Geology) Student University of Peshawar	-----
6.	Assistance Provided	03 BS from Students COMSATS Campuses from Nagar and Phander area (GB) 06 Ph. D. Scholars from PMAS-Arid University, Kohat University University of Azad Kashmir Muzaffarabad	-----	-----

DESIGN AND DISPLAY ACTIVITIES OF PMNH FOR INFORMAL EDUCATION:

The Public Services Division (PSD) is involved in the public educational aspects of the Pakistan Museum of Natural History. The scientific information and research are made understandable to the general public through fascinating exhibits and displays. This Division is responsible for the preparation and designing of PMNH science publications such as books, pamphlets and brochures in association with other scientific divisions of PMN. During the year **2022-23**, in addition to the maintenance of existing Displays/Exhibits/Diorama at PMNH, PSD provided design and display services to the scientific divisions and as a result following **05** new Displays/Exhibits/Dioramas were completed;

- Invertebrate Fossils of Pakistan (newly established)
- Volcano (newly established)
- Ocean Diorama (newly established)
- Corpse Flower/World's largest flower (repainted)
- Model of Brachiosaurus ((repainted)

The establishment of the following **06** new Displays/Exhibits/Dioramas is in progress;

- Skeleton Diorama
- STEM Fabricated Lab
- Dendrochronology display
- Upgradation of Trophy wall, PMNH.
- Up-gradation of Elephant display/ diorama, PMNH
- Establishment of Unique/ Reference collection diorama

Educational Activities:

PMNH also facilitates visitors, National and International delegations and groups of students of schools, colleges and universities during their visit to the PMNH display galleries by providing guided tours. A large number of people including students of schools, colleges and universities belonging to the various regions of Pakistan visited PMNH display galleries. In **2022-23**, **161,477** people visited the museum including **51203** students, **97749** general public, **621** foreigners and **11904** children below 5 years of age.

As part of educational activities, scientists of all Scientific Divisions also facilitated National and International delegations from research institutes, universities and various organizations during their visit to the PMNH. Following are brief of some important educational activities and visits to PMNH display galleries and repositories;

- Scientists of PMNH participated in the Khwarzami Lahore Science Mela from 29th to 30th October 2022 held at Divisional Public School (DPS), Lahore.
- Scientists of PMNH prepared Urdu and English write-ups for the following;
 - Igneous, Sedimentary and Metamorphic rocks displayed in ECO Gallery,
 - "Invertebrate Fossils of Pakistan" display
 - For a short video on the Gems and Minerals of Pakistan in Urdu
 - Brief of PMNH
 - For STEM education
- PMNH celebrated the "Polar Bear Week" Quiz Competition was conducted among the students and a Documentary film was also shown to the students to create awareness about the life of Polar Bear.

- PMNH celebrated “International Biodiversity Day” by conducting a Quiz competition on the theme “From Agreement to Action: Build Back Biodiversity”.
- “International Museum Day” was celebrated among different schools of Rawalpindi and Islamabad inside PMNH premises to give awareness to school children about the importance of this day.
- World Environment Day was celebrated on 5th June 2023 in PMNH.
- World Water Week was celebrated by conducting a quiz from 24 to 28 October 2022 among the students of different schools who visited PMNH.
- Dino Week was celebrated in December 2022; a documentary movie was arranged for visitors free of cost.
- Guided 50 students of BS. Biological Sciences and Faculty members of COMSATS University during their visit to the PMNH display galleries on 5th December 2022.
- Guided a group of 150 students of Civil Engineering from the National University Science and Technology (NUST), Islamabad and faculty members during their visit to the PMNH display galleries on 5th December 2022.
- Guided a group of 25 students and teachers from Gilgit-Baltistan during their visit to the PMNH display galleries on 1st February 2023.
- Guided a group of 40 students from Fatima Jinnah Women's University, Rawalpindi during their visit to the display galleries on 22nd March 2023.
- Guided a group of 19 students and faculty members from Taxila Institute of Asian Civilization, Quaid-e-Azam University, Islamabad during their visit to the PMNH Display galleries on 26th May 2023.
- Guided Participants of the Training Workshop for PSF Sciences Caravan Units staff and other members during their visit to the PMNH display galleries on 16th June 2023.

Important Visits to the PMNH Display Galleries

In 2022-23, PMNH Scientists guided the visitors, delegations, students and faculty members from various universities and dignitaries during their visit to the PMNH display galleries. Brief of some special visits are as follows;

- Guided Mr. Cao Zhouhua, Science Commissioner in the Chinese Embassy in Pakistan along with Chairman, PSF during his visit to PMNH Display Galleries on 29.08.2022.
- Assisted during the visit of the Deputy Project Director along with 02 Engineers of the School Infrastructure Development (SID-II) Project Office. School Education and Literacy Department, Government of Sindh to the PMNH display galleries.
- Guided Mr. Ghulam Muhammad Memon, Federal Secretary for Ministry of Science and Technology (MoST) and delegation from MoST along with the Chairman, PSF during their visit to PMNH display galleries on November 4th, 2022.
- Guided Media persons from Mass Communication Channel during their visit to the PMNH Display Galleries on 1st December 2022.
- Guided a Turkish delegation along with 03 members of the Pakistan Horticulture Society during a visit to the PMNH display galleries on 20.02.2023.
- Guided Foreign Delegation comprising Scientists from the Maldives along with two faculty members of Arid Agriculture University, Rawalpindi during their visit to the PMNH display galleries on 9th March, 2023.
- Guided 20 member delegations from the Election Commission of Pakistan (ECP) during their visit to the display galleries on 17th March 2023.
- Guided Mr. Shehzad Iqbal Rana, CFAO, Ministry of Science and Technology and other members during their visit to the PMNH display galleries on 4th May 2023.
- Guided delegation from NUST University comprising two foreign officials from Benoni, South Africa and Poland along with faculty members of NUST University during their visit to the PMNH display galleries on 17.05.2023.
- Guided 140 special student and faculty members from the National Training Center for Special Persons, Islamabad during their visit to the PMNH Display galleries on 18th May 2023.
- Guided group of 40 Malaysian Tourists including 02 representatives during their visit to the PMNH Display galleries on 21st September, 2022.
- Guided team of Associated Press of Pakistan (APP) during their visit to the PMNH display galleries on 20.06.2023.

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

Introduction

Pakistan Scientific and Technological Information Centre (PASTIC), an affiliate of Pakistan Science Foundation is a national S&T information dissemination agency serving as a gateway for access to and delivery of S&T information and catering to the information needs of the scientists, engineers, researchers, academicians, entrepreneurs and the industry. PASTIC National Center is housed in its building at Quaid-i-Azam University Campus, Islamabad with a comprehensive collection of information resources in science and technology. PASTIC has sub-centers in Karachi, Lahore, Peshawar, Quetta, Faisalabad and Muzaffarabad. Its sanctioned strength is 164 including Technical and Administrative Staff.

Objectives:

- Develop a National S&T/R&D Information Repository of indigenous S&T information resources (databases).
- Disseminate S&T/R&D information through contemporary information services & tools.
- Strengthen the National Science Reference Library through resource sharing and Interlibrary collaborations (consortium) and empowerment of information professionals.
- Promotion of R&D-based industrial development.
- Develop collaborations with national and international information networks.
- Facilitate printing of S&T/R&D Publications.
- Capacity/skill development of researchers & entrepreneurs

Allocation for F.Y 2022-23(Rs. in million):

Non-Development Budget	Development Budget
224.553	4.651

Regular Activities:

- **Literature Search & of Documents Supply Service**
18031 S&T documents and 1256 bibliographies were supplied to 1066 researchers belonging to R&D Organizations, Universities, Professional Colleges, Hospitals and industry.
- **Technology Information Services:**
 - Six Issues of "Technology Roundup" a Trade & Technology News-e-bulletin were brought out electronically
 - Query-based Information on 4266 Patents was provided to 99 Users under the Technology and Innovation Support Centre (TISC) Desks TISC.
 - Five seminars/workshops on Intellectual Property Rights (IPRs) and Digital Marketing were organized during the fiscal year.

PASTIC Publications:

One Book titled "*In Quest of Knowledge*" and 07 Abstract Books of the following Conferences were published (IFNC-22, ICRSO-22, SPI 2022, GSTM-23, ICC 23, RAPS-23, ICLS-23)

Capacity Building/Skill Development (Training Workshops/ Seminars etc.):

- 1444 researchers were trained in the area of Data analysis (SPSS, R), Reference Management (Mendeley, EndNote), literature search, research methodology and writing skills enhancement by carrying out 23 Training workshops across Pakistan.
- 1846 researchers benefitted from 18 awareness seminars/symposia/webinars on Monkey Pox, Artificial Intelligence, Breast cancer, Geophysical Imaging and research skill enhancement.
- 53 awareness seminars and 13 stalls were conducted/installed at various universities across Pakistan to create awareness about PASTIC's online digital tools/databases for researchers.
- Collaborated with UET, Peshawar, Gomal University, D.I. Khan, NED UET, Karachi, RWU, Rawalpindi, IUB, Bahawalpur, UoE, Lahore, USWAT, Swat for holding of the National Conferences on S & T themes.

Strengthening of S&T/R&D Databases:

The following databases were strengthened during the period:

Name of database	No. of records entered
Pakistan Science Abstracts	11107
R & D Projects	2221
Pakistani Scientists	3815

International Liaison:

PASTIC DG attended meetings on Digital Technology of the Asia-Pacific Information Superhighway (APIS) under ESCAP (Economic and Social Commission for Asia and the Pacific) & IFAP (Information for All Program), UNESCO

PASTIC National Science Reference Library:

- 24 Library professionals were empowered on Integrated Library System Software on Koha in AJK.
- PASTIC Library services were provided to 3435 researchers.
- 12 issues of the Fresh Arrivals were published
- 145 Journal issues, 42 documents, 1 book & 20 newsletters were added to the Library holdings which were received from different national and international organizations.

Reprographic / Printing Services:

- 51 different Printing jobs and about 11 Organizations were completed.

PSDP Projects by PASTIC (Approved/Ongoing Project):**Title of the Project: Development of National Digital Archive of Research published in Pakistani Journals****Background:**

As per the mandate, Abstracting and Indexing of scientific material published in Pakistani journals have been carried out by PASTIC (Hard Copy/online Database) since its inception (1957). Looking at the dire need of the scientific community to access indigenous scientific knowledge through a single online forum and to fill the research gap in line with national needs, PASTIC has taken the initiative to collect, preserve and disseminate indigenous research published in S&T Journals through the development of the national digital repository.

Objectives:

- Development of National Digital Repository of Pakistani S&T Journals through ICT's infrastructure expansion
- Development of National Consortium of Publishers of Pakistani S&T Journals
- Online federated search of digital repository of S&T Journals.
- Capacity building of publishers/researchers toward software application utilization.

Achievements:

- During the FY 2022-23, the following activities were undertaken:
 - 17 new Scientific Research Journals of Pakistan were registered to the project consortium.
 - A contract agreement was made with Mercurial Minds (Private) Limited (MM) for software development, and integration and a cloud service was signed on May 8, 2023, at Pakistan Science Foundation (PSF).
 - Four (4) Project awareness/Consortium launching activities and one Training workshop on the Open Journal System (OJS) for Scientific Journal Publishers of Pakistan were organized in different regions of the country (Details are provided in the following table).

Name of Activity	Location	Date	No. of participants
Project Consortium/ Awareness Activity	Bahawalpur	20-Sep-22	60
	Quetta	09-Mar-23	81
	Gilgit	26-May-23	50
	Skardu	29-May-23	50
OJS Training Workshop	Peshawar	17-Jun-23	80
Total Participants			321

Pakistan Council of Scientific & Industrial Research (PCSIR)

Introduction

PCSIR is the premier public sector R&D organization of the country with a network of 17 research laboratories/ units including 06 training institutes located all over the country. PCSIR laboratories are ISO-17025 accredited having state-of-the-art equipment and highly skilled manpower. PCSIR supports industrial sector in various fields for providing cost-effective technology solutions to improve their economic performance. The broad-based activities of the PCSIR include technology development, human resource development, quality control/ quality assurance services, consultancy/ trouble shooting and industrial linkages/ WTO obligations. The council laboratories are providing analytical testing/ calibration services to almost entire industrial sector through its accredited laboratories. The charter of PCSIR activities, in general terms, relates to providing a broad base to the industrial sector, through better utilization of indigenous resources.

VISION STATEMENT

To re-align PCSIR as a cost-effective technology solution provider for public and private sectors, especially for Small and Medium Enterprises (SMEs).

- **RESEARCH & DEVELOPMENT:**

- **Key Performance Indicators (KPIs) in comparison to the previous year:**

S. No.	Performance Indicators	Progress	
		2021-22	2022-23
1.	Number of Process developed	231	248
2.	Number of Process leased-out	80	95
3.	Number of Patents filed/ obtained	23	25
4.	Research Papers published	159	172
5.	Students supervised	917	1587
6.	Feasibility / Technical reports prepared	276	468
7.	Analytical Equipment Developed	223	68
8.	MoUs signed with industries/ academia	31	16
9.	Exhibition/ Conferences/ Seminars/ workshops organized	103	224
10.	Consultancy provided to the industry	669	1065
11.	Interaction with Industries/ Industrial visits	1991	2191
12.	No. of Clients Served	16114	15258
13.	No. of technical/ calibration services provided to the industry	47560	48336

- **Major Initiatives**

- **Research, Development and Innovation (RD&I) in PCSIR**

Keeping in view the acute shortage of funds for the execution of R&D projects, a PSDP project titled “Research, Development and Innovation in PCSIR”, approved by the DDWP with a cost of PKR 1500.00 millions, is being executed under which, funds are being provided for the execution of innovative R&D projects.

The programme also provides a platform and service message to the private sector to utilize lab space/ facilities and technical expertise of PCSIR through collaborative research projects. The objectives of the programme also include the development of linkages to facilitate cooperation between research and development facilities at PCSIR, industrial businesses, technology producers and investment platforms. Presently, 12 projects amounting to PKR 226.97 million are being executed under the financial assistance of the programme.

- **Automation of ILO System (Digitization of PCSIR)**

For the automation of processes/ systems within PCSIR, a development project “Digital Transformation and Automation of PCSIR” is under execution. The project plans to digitalize and implement information systems in all facilities of PCSIR and automate business processes to enable a holistic picture of the activities for improved decision-making by the top management. Around 40% of physical progress has been made including Data center, Ethernet cabling, inception report and business process, etc.

- **Instrumental Access (Financial Support for Students)**

A PSDP project titled “Data Repository of Scientific Instrumentation” is being executed under which the available instrumental facility of well-equipped research centers and universities from

all over the country is being used to facilitate the researchers by paying a reasonable amount of analysis cost.

- So far, 242 students/ researchers of different universities/ institutes have been provided access to analytical services against an amount of PKR 51.60 million.
- Since May, 2022 (tenure of the present Government), 92 students/ researchers of different universities/ institutes have been provided access to analytical services against an amount of PKR 21.49 million.

- **Gene Editing of Biological Agents for Nutritional, Biochemical and Therapeutic Purposes**
PCSIR in collaboration with the University of Agriculture, Faisalabad has started a project for gene editing of biological agents for nutritional, biochemical and therapeutic purposes to enhance crop yields.
- **Installation of Aquaculture (Biofloc)**
Aquaculture (Biofloc) has been installed at PCSIR Labs Complex, Lahore for farming of imported fish breeds of high economic importance. Similar installations are under process at PCSIR Labs Complex, Karachi and Peshawar. Future Plan includes the installation of similar facilities at PCSIR Labs, Quetta.
- **Computer Controlled Fermenters**
A development project entitled “Development of Computer Controlled Fermenters and Production of Biochemicals & Bioproducts” is ongoing under civil-military framework. Under the project PAEC will develop computer-controlled fermenter (bioreactor) and PCSIR will manufacture (pilot scale) microbial strains & bioproducts.

PSDP PROGRAMME

S. No	Name of Project	Total Cost (million)
On-going Schemes		
1.	Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields and Establishment of testing and product development facilities at PCSIR Laboratories Complex, Lahore, Peshawar and Karachi	1896.820
2.	Data Repository of Scientific Instrumentation	300.000
3.	Development of Computer Controlled Fermentors and Production of Biochemical's & Bioproducts	1981.607
4.	Digital Transformation, Strengthening and Automation of PCSIR	960.710
5.	Establishment of Material Resource Centre and development of additive manufacturing and Reverse Engineering Centre at PCSIR	1951.683
6.	Gene Editing of Biological Agents for Nutritional Biochemical and Therapeutical purpose	1799.598
7.	Medical Equipment & Devices Innovation Center (MEDICen)	1989.520
8.	Research, Development and Innovation Program in PCSIR	1500.000
9.	Up gradation of Calibration Centre Capabilities at PCSIR Peshawar	35.000
10.	Up gradation of Machinery, Equipment and Renovation of Buildings of IIEE & PSTC Karachi.	125.000
11.	Up gradation of Medicinal Botanic Centre as National Centre for Herbal Medicine, PCSIR Labs. Complex, Peshawar	286.000
New Schemes (2023-24)		
12.	Establishment of Medical Cannabis Greenhouses for Biotechnology Derived Bio-Products, National Hemp & Cannabis Analytical Laboratory and National Industrial Hemp & Medicinal Cannabis Authority	1946.04
13.	Research, Development and Technology Transfer of Selected Active Pharmaceutical Ingredients (APIs) for Import Substitution (PCSIR)	1067.639
14.	Indigenous Development and Pilot Scale Production of Human Vaccines	1740.70
15.	Indigenous Development and Pilot Scale Production of Diagnostic Kits and Antisera for Priority Biological Agents	1454.992
16.	Establishment of Balochistan Forensic Science Laboratory (BFSL) and Federal Forensic Science Laboratory (FFSL).	1410.689
17.	Establishment of Analytical Laboratory and Fiber Boat Research Unit	1774.463

S. No	Name of Project	Total Cost (million)
	at PCSIR Gwadar to Support Blue Economy	
18.	Establishment of Mineral Resource Center in District Dukki Baluchistan for Product Design, Development and Value Addition to Enhance Export	949.73

• **HUMAN RESOURCE DEVELOPMENT**

List of Technical Training Institutes:

- Institute of Industrial Electronics Engineering (IIEE), Karachi
- Pak-Swiss Training Centre (PSTC), Karachi
- Precision Systems Training Centre (PSTC), Lahore
- Precision Systems Training Centre (PSTC), Quetta
- Precision Systems Training Centre (PSTC), Peshawar
- Dimension Stone Centre (DSC), Peshawar
- Cast Metal & Foundry Technology Centre, Daska.
- Precision Systems Training Centre (PSTC), Gwadar

Objectives:

- To produce professionals endowed with technical competence & leadership qualities.
- To provide quality technical education up to degree level as per international standards.
- To infuse thorough knowledge and impart industry-oriented practical training to make the student a breed apart.
- To serve as a link between design engineers and skilled workers.
- To arrange customize technical courses as per requirement of Industry.

Disciplines:

PCSIR has established Technical Training Centers in disciplines of Industrial Electronics Engineering, Precision Mechanics and Instrument Technology, Dies and Mould, Design and Manufacturing, Mechanical and Cast Metals & Foundry Technology. These Technical Training Centers are located at Karachi, Lahore, Peshawar, Quetta and Daska respectively. The main feature of all these technical training is that 70% emphasis is laid on practical training and 30% on theoretical training. The Engineering and Training Centers conduct 4 Years degree and 3 years Diploma of Associate Engineering Program. Moreover, these Technical Training Centers carry out short terms tailor made/ demand driven training programs for industries and professionals for skill development and capacity building.

Courses Offered: Engineering, DAE and Short Courses:

- B.E. Industrial Electronics (4 Years)
- PMIT Precision Mechanical and Instrument Technology (3 Years)
- D& M Dies & Mould Technology (4 Years)
- IPCT Instrumentation & Process Control Technology (3 Years)
- DIT Diploma in Information Technology (1 Year)
- Short Courses 03-06 months

Success factors of PCSIR Technical Institutes:

- 70: 30 training approach (70% Practical, 30 % Theory).
- High demand of trained technical manpower in the industry.
- TEVET/NAVTTTC recognized curriculum.
- Contribution in national economy particularly boosting the automobile, surgical, sanitary, agriculture tools and cutlery sectors.

Pakistan Engineering Council (PEC)

Introduction

Pakistan Engineering Council (PEC) is a statutory regulatory body established under PEC Act-1976 enacted by the Parliament. Its main statutory functions include registration of engineers, consulting engineers, constructors/operators and accreditation of engineering programs offered by universities/institutions, ensuring and managing of continuing professional development, assisting the Federal Government as Think Tank, establishing standards for engineering products and services besides safeguarding the interest of its members.

Vision

To regulate the engineering profession with the vision that it shall function as a key driving force for achieving rapid and sustainable growth in all national, economic and social fields.

Mission

To set and maintain realistic and internationally relevant standards of professional competence and ethics for engineers, and their licensing to promote and uphold the standards; and shall function as an apex body to regulate the quality of engineering education and the practice of engineering and technology.

PEC maintains a very lean secretariat at its Head Quarter, regional and branch offices in various cities. The main administrative control of the Council rests with its Governing Body (GB) which is composed of sixty-six professional engineers registered with the Council, having more than 20 years of professional standing and are elected for term of three years. Composition of the PEC Governing Body is given under:-

Designation	No. of Positions	Mode of Selection
Chairman	1	Elected
Sr. Vice Chairman	1	Elected
Vice Chairmen	4	One Elected From Each Province
Members	40	Elected
Members	19	Nominated
Registrar	1	Ex-Officio
Total	66	

Major Functions Of The Council:

As per Section 8 of PEC Act-1976, major functions of the Council are as under:

- **Accreditation** of Engineering Qualification;
- **Registration** of Engineers;
- **Registration** of Constructors, Operators & Consultants;
- **Continuing Professional Development (CPD)** of Engineers;
- **Think Tank Assistance** to Federal Government on engineering and national development plans;
- **Establishing Standards** for engineering contracts, cost and services;
- **Facilitation** of Engineering sector industries;
- **Arbitrations Forum** on disputes in construction/ consultancy contracts;
- **Promotion** of engineering profession in totality.

ENGINEERING ACCREDITATION DEPARTMENT (EAD)

- **Goals and Targets (Accreditation)**
 - Washington Accord (WA) 1st Periodic Review to be held during October-November 2023 for extension of the global recognition/equivalence of engineering qualifications through WA/ IEA.
 - Opening of Int.PE (Pak) Register under International Professional Engineers Agreement (IPEA).
 - Continuous capacity building/ trainings of the PEC Program Evaluators (PEVs) and Faculty from HEIs on Outcome-Based Education and Accreditation as per PEC Accreditation Manual 2019 and in-line WA guidelines and international best practices.
 - Curriculum Development/ Review by PEC Engineering Curriculum Review & Development Committee (ECRDC) in-line with WA of IEA guidelines.
 - Working on implementation of revised Graduate Attributes & Professional Competencies (GAPC) version 4 roadmap as per IEA requirement.

- Mentoring and subsequent nomination of Kenya and Rwanda for attaining WA Provisional Signatory status.
- 4th PEC Deans' International Conference of Engineering Institutions to be held in October 2023 at Karachi.
- MoU and Mutual Recognition Agreement (MRA) between PEC and Engineers Australia (EA) for mutual cooperation regarding registration/ placement of Pakistani engineers in Australia.
- **Precise Performance Outcomes**
 - Attainment of Member of Commonwealth Engineering Council (CEC).
 - Attainment of Membership of World Federation of Engineering Organizations (WFEO).
 - Successfully mentored and nominated Nigeria (COREN) and Saudi Arabia (ETEC) for Provisional Signatory status of WA
 - MoU between PEC and Pakistan Academy of Engineers (PAE) for professional development of engineers
 - Established PEC IPEA Section and Int.PE (Pak) Register for global recognition under IPEA among the Member countries for professional practice and cross-border mobility
 - Executed region-wise training plan and successfully trained a total of about 1200 Faculty Members and PEVs throughout the country.
 - Professional contribution at relevant IPEA/ IEA forum through participation at IEA Workshops held at Killarney, Ireland in October 2022.
 - The ECRDC reviewed curricula of 13 disciplines in-line with Outcome Based Education System approach.
 - PEC International Collaborations Committee (ICC) held successful dialogues with Engineers Australia (EA) for mutual cooperation regarding registration/ placement of Pakistani engineers in Australia.
- **Performance of Accreditation Department**
 - The Engineering Accreditation Department (EAD) is responsible for accreditation of engineering programs offered by HEIs in the country. An overview of Engineering Programs and accreditation in Pakistan is given below:

(June 2023)

Sr.#	Status of Programs	No. of Programs
i.	Accredited Engineering Programs till date	409
ii.	Under Process Engineering Programs (Programs initially granted permission to start)	80+
iii.	Accredited Engineering Programs as per OBE Manual 2019	337
iv.	Engineering Universities/HEIs	156
v.	Engineering Disciplines accredited so far	30

REGISTRATION DEPARTMENT (ENGINEERS)

- **Introduction**
 - As per PEC Act -1976, registration is mandatory to practice engineering profession across country. A person possessing an accredited engineering qualification is eligible to be registered with the Council as Registered Engineer (RE), however, he/she may apply for the title of Professional Engineer (PE) after five years of experience along with requisite CPD points and passing Engineering Practice Examination (EPE).

From 1st July 2022 to 30th June 2023, PEC registered **19,508** engineers of various engineering disciplines of different universities.

Data of Engineers From 1st July 2022 - 30th June 2023

Sr. #	Description	Count
1	Engineers Registered as RE.	19,473
2	Engineer Registered as PE.	35
3	Male Engineers Registered.	17,175
4	Female Engineers Registered.	2299
5	Total Engineers Registered	361,680

- **Goals & Targets Achieved/Performance Outcomes**
 - Online Registration (New/Renewal) as per international standards and best practices.
 - Complimentary Registration for fresh engineering graduates only.
 - Archiving of engineers data.
 - Registration of International Professional Engineer (Int.P.Eng.) with fee waiver of US\$200, for one year to further applying for Engineers Registration.

REGISTRATION DEPARTMENT (CONSTRUCTORS/OPERATORS & CONSULTANT)

Pakistan Engineering Council, a statutory body constituted under Pakistan Engineering Council Act-1976, is entrusted to regulate engineering profession in the country. One of its main functions is registration and regulation of activities of Constructors, Operators, Consulting Engineers, Professional and Registered Engineers.

As per PEC Construction and Operation of Engineering Works Bye-laws 1987, all Constructors/Operators firms (Pakistani and foreign) are required to obtain licence from the Pakistan Engineering Council. Foreign firms are not eligible to participate in bidding individually. Initially, provisional license is issued to foreign firms for participation in bidding. After award of work, they are issued standard license. However, foreign Consulting Engineering firms are granted specific projects or consultancy works which need expertise and specialized technology, not available with Pakistani Consultants as per Conduct & Practice of Engineers Bye-laws 1986.

Status of Firms (as on June 30, 2023)

Sr.#	Facilities	Total Registration	Active Firms (As on 30 th June 2023)
1	Constructors	104,458	23,611
2	Operators	1,127	213
3	Consultants	2,491	839
4	Foreign Firms	210	43

- **Goals & Targets Achieved/Performance Outcomes**
 - Reforms in Constructors and Consulting Engineering Byelaws are underway to facilitate the Construction Industry for overall economic growth in the Country
 - Registration/ Renewal along with a variety of miscellaneous cases pertaining to 25000 active constructors/ operators and consultants firms/ companies.
 - Extending relief packages to alleviate the difficulties of constructor/ operators and consultants being faced in terms of financial constraints/inflation.
 - Holding regular meetings of Enrolment Committee for disposing of the contractor cases.
 - Fully online system through simplification of Application Forms and reduction in documentation related with registration/ allied cases of contractors, assuring ease of business as a major focusses to attract foreign investment.
 - Extension in validity of contactors licenses for a period over 02 months thus, addressing financial constraints/inflation.

CONTINUING PROFESSIONAL DEVELOPMENT (CPD) DEPARTMENT

Pakistan Engineering Council (PEC) under PEC Act and CPD-Byelaws, is earnestly working for the professional growth and skill enhancement of ever growing engineering community. Under PDE Byelaws, the CPD activities and Engineering Practice Examination (EPE), are two distinct parts of professional growth and thereby assessment to get the title of “PE” for Registered Engineers “RE”. Since July 2010, continued professional development of engineers in their respective domain is also mandatory for renewal of existing professionals as well as for newly registered engineers.

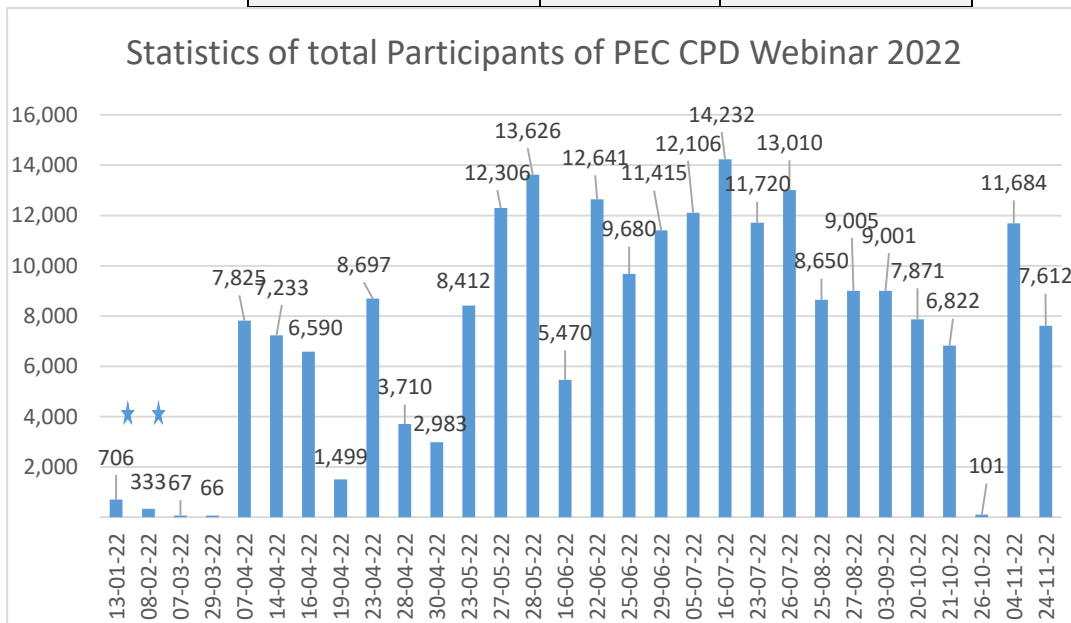
With these objectives, CPD framework of PEC sets parameters through number of developmental activities (short courses, training, workshops, research publications, professional memberships, Member of any Technical Committee, etc.) for the ultimate benefit of engineers in their career development and at the same time renewal of PEC registration

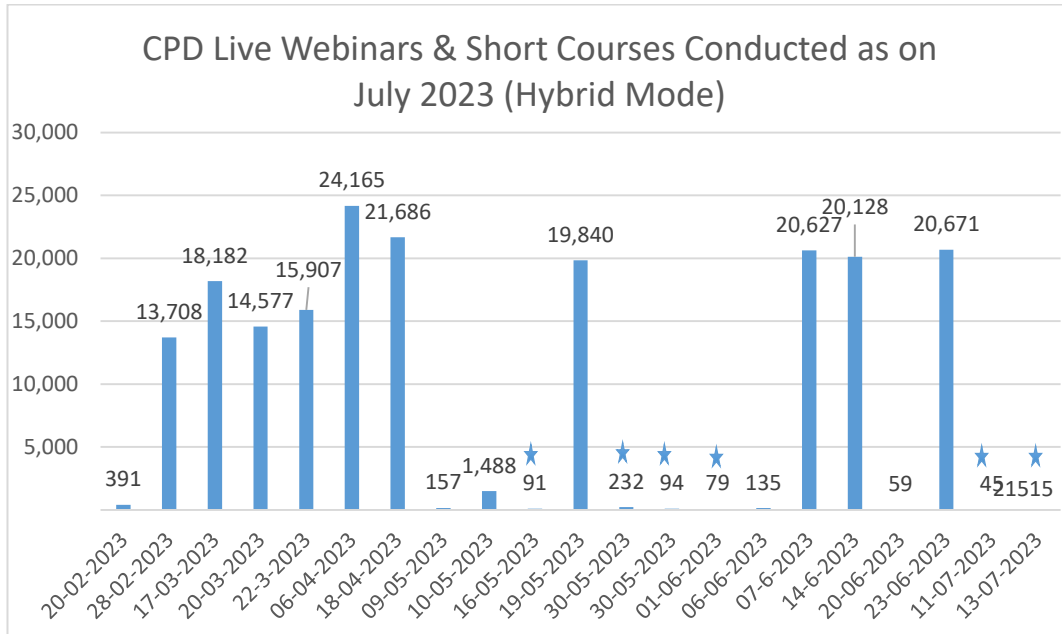
Under New Vision of CPD, specialized job-oriented and global certification courses are being introduced to enhance employability and on-job performance. For wider coverage and remote outreach, webinars and video-conferencing facilities have been integrated. This Vision envisages 100,000 jobs for fresh engineers in next 5-years not only in national but international job-markets ensuring cross-border mobility.

For the professional growth and skill development of engineers in the country, PEC has implemented a two-pronged strategy as:

- PEC regularly conducts CPD activities for its growing engineering community.
- CPD activities through PEC accredited Engineering Universities/ institutions and Professional Bodies and Technical Organizations registered with PEC as Professional Engineering Bodies (PEBs).
- **CPD Activities Conducted by PEC**
 - CPD activities includes short courses (refresher courses, management, leadership etc.); workshops; seminars; expert lectures etc.
 - PEC regularly conducts CPD activities for its Members through PEC approved Resource Persons.
 - All CPD activities carry credit points as defined in the CPD Byelaws.
 - PEC announces yearly calendar of CPD activities through its website (www.pec.org.pk) and also through newspapers for information of the engineers.
 - Nominations are also sought from potential organizations.

Statistics of CPD Live Webinars & Short Courses Conducted from January 2022 to July 2023			
Sr. No.	Year	No. of Courses	No of Participants
1	2022	30	601,716
2	2023	21	192,217
Total		51	793,933





Physically conducted CPD courses.

- **Conduct of CPD Activities by Professional Engineering Bodies (PEBs)**
 - Under PDE Byelaw 16, PEC administers the professional development activities
 - Professional institutions and associations, CPD academies, engineering universities or colleges and private institutions, registered by the Council may impart CPD activities according to criteria and guidelines by the Council.
 - All these institutions, associations and other bodies known as Professional Engineering Bodies
 - PEC ensures that the responsibilities outsourced to these bodies are carried out in a fair, equitable and responsible manner without any profit motives.
 - The Council retains the right to withdraw any outsourced responsibility if the circumstances so require.

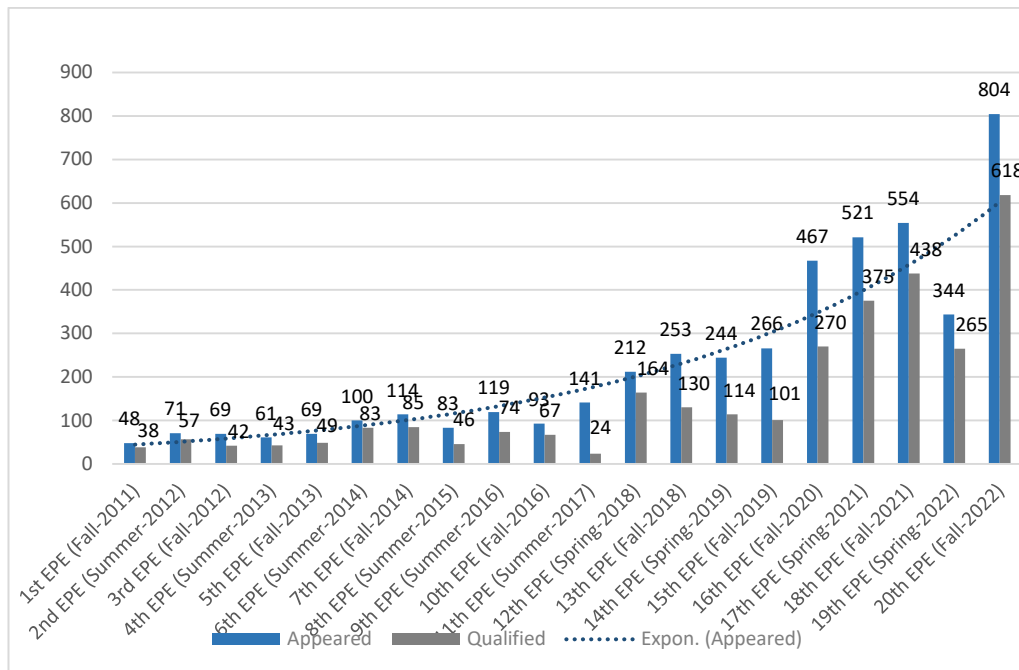
Sr. #.	Professional Engineering Bodies (PEBs)	Nos.
1	Engineering Institutions	119
2	Professional Bodies	16
3	Technical Organizations	52
Total		187

Statistics of CPD Activities Conducted by PEBs			
Sr. No.	Year	No. of Courses	No of Participants
1	2012	73	2005
2	2013	80	2572
3	2014	211	6388
4	2015	175	6070
5	2016	178	7212
6	2017	237	4782
7	2018	213	7610
8	2019	341	10501
9	2020	386	10355
10	2021	488	13632
11	2022	416	11007
12	2023	48	1722
Total		2846	83856

- **Engineering Practice Examination (EPE)**

- The MCQ-based examination comprises of two parts:
- Part-I(2 hours) common to all Engineering Disciplines.
- Part-II (3 hours) discipline-based breadth & depth - open book.
- Qualifying marks for each Part = 60%.
- Qualifying both parts is mandatory to become eligible for PE Title.
- Not-qualifying in any part, may appear in next three consecutive exams, otherwise shall have to appear in both parts.
- PEC developed EPE Curriculum for all registered engineering disciplines in Pakistan during 2008-10.
- EPE Curriculum along with sample MCQs are available on PEC Website (www.pec.org.pk).
- 1st EPE held in Dec 2011.
- So far 20 EPE's has been conducted.
- The average qualifying percentage = 64.83%.
- The EPE Exam is held twice a year.

Sr. #	EPE	Appeared	Qualified	% age Qualified
1	1 st EPE (Fall-2011)	48	38	79.17
2	2 nd EPE (Summer-2012)	71	57	80.28
3	3 rd EPE (Fall-2012)	69	42	60.87
4	4 th EPE (Summer-2013)	61	43	70.49
5	5 th EPE (Fall-2013)	69	49	71.01
6	6 th EPE (Summer-2014)	100	83	83.00
7	7 th EPE (Fall-2014)	114	85	74.56
8	8 th EPE (Summer-2015)	83	46	55.42
9	9 th EPE (Summer-2016)	119	74	62.18
10	10 th EPE (Fall-2016)	93	67	72.04
11	11 th EPE (Summer-2017)	141	24	17.02
12	12 th EPE (Spring-2018)	212	164	77.36
13	13 th EPE (Fall-2018)	253	130	51.38
14	14 th EPE (Spring-2019)	244	114	46.72
15	15 th EPE (Fall-2019)	266	101	37.97
16	16 th EPE (Fall-2020)	467	270	57.82
17	17 th EPE (Spring-2021)	521	375	71.98
18	18 th EPE (Fall-2021)	554	438	79.06
19	19 th EPE (Spring-2022)	344	265	77.03
20	20 th EPE (Fall-2022)	804	618	76.87



- EPE Curriculum Development and Review**
 - PEC developed 1st EPE Curriculum during 2008-10 for all engineering disciplines in Pakistan.
 - MCQ Development for EPE is a continuing Process.
 - MCQs developed through Area/Field Expert from Industry and Academia and Honoria paid as per PEC policy.
 - More than 25000 MCQs exist in EPE MCQ Databank.
 - EPE curricula to be reviewed through Committees of Experts both from Industry and Academia.
- Development and Publication under New Dimensions of CPD Framework**
 - Launched “**WEBINAR AND VIDEO-LINK BASED CPD COURSES**” to enhance the coverage over the entire country.
 - Introduced “**CERTIFICATION PROGRAMS AND COURSES**” to enhance the employability and mobility.
 - More Focused on “**MARKET-BASED COURSES**” enhancing management skills of the engineers (presentation kills, time management, project management, leadership etc.).

VoE Web Channel

For wider dissemination of efforts and providing a knowledge platform for the engineers and professionals, PEC has launched a non-political non-commercial YouTube channel/Web channel “Voice of Engineers (Voe.).

Establishment of “VoE Studio”

VoE studio was established in November 2020 through which eminent engineers and renowned experts will share their professional experience and knowledge. This platform would not only be a source of information but also for engineering professionals, researchers and industrial experts to share their knowledge, best practices, innovation, engineering problems and solutions besides success stories and achievements towards national development.

THINK TANK DEPARTMENT

- Memorandum of Cooperation (MoC) between PEC and PANCOLD**
 - Pakistan is a member of the International Commission on Large Dams (ICOLD) since 1952. Pakistan National Committee on Large Dams (PANCOLD) shares technical data relating to large dams including general liaison with all concerned national and international Organizations in particular with ICOLD. The Chairman /Chief Engineering Adviser, Federal Flood Commission (FFC), Ministry of Water Resources Persuaded PEC to join hands to make PANCOLD more active and vibrant.

On **January 19th, 2023** the Pakistan Engineering Council and the Office of Chief Engineering Adviser/Chairman Federal Flood Commission (FFC), Ministry of Water Resources Islamabad, signed a Memorandum of Cooperation (MoC) with the aim of Strengthening the Pakistan National Committee on Large Dams (PANCOLD). The agreement involves both parties working collaboratively to enhance the value, sustainability and effectiveness of PANCOLD with the goal to make PANCOLD a dynamic entity that can effectively represent Pakistan Water related issues, particularly those related to the planning, design, construction, operation and management of large dams.



In order to oversee the implementation of MoC, a Joint Working Committee of PANCOLD with the following ToRs, has been constituted:

- To oversee the implementation of MoC.
- Chalk out action plan for 2023 i.e. seminars, awards of professional excellence, project site visit etc.
- Devise criteria for selection of participants for Annual ICOLD meetings/events as well as the events organized by the National Committees of ICOLD members.
- Promote results/recommendations of ICOLD publications with Universities and research organizations.
- Instigate and pursue Universities & Research organizations to submit research papers for publication in the ICOLD Journal.
- To work out financial modalities including endowment fund, expenditure approval.
- Submit report to PANCOLD Secretariat within a month for approval and subsequent implementation.

Furthermore, A Core Committee of PANCOLD having membership of relevant PANCOLD has also been constituted with the ToRs given as under:

- To review PANCOLD constitution.
- Suggest Modification or any change for improvement of PAN COLD working.
- Submit report to PANCOLD Secretariat within a month for approval



Development of 1st Green Building Code of Pakistan-2023

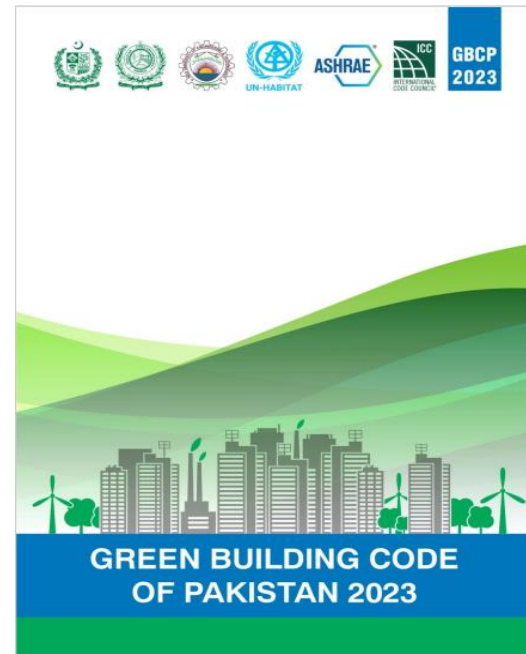
Since, Pakistan is going through a transnational phase in its history and there are many indicators that shows there will be a huge development boom in the coming years in the country. There are multiple reasons, such as growing population, housing shortfall and most significant is its geostrategic location which will make it a global trade hub. There is also a focus on the IT/E-commerce industry and export-oriented manufacturing as well. All the aforementioned activities call for huge investment into the infrastructure development and construction sectors in the coming years. All this sounds good but such activities have tremendous environmental implications if not done the right way. This scale of development would also require a huge amount of energy to run its day-to-day operations. Unfortunately, in Pakistan, we do not have proper codes or standards which can address the issues related to energy consumption and environmental concerns of the construction development projects in an integrated way.

In this regard, Engr. Dr. Sarosh Hashmat Lodi, has mentioned that the World Bank has an ongoing dialogue with the Government of Pakistan for a policy support program focusing on climate change reforms. As a part of this program, the Government of Pakistan (GoP) through the Ministry of Climate Change has agreed to develop and implement a Green Building Code (GBC) for Pakistan. He has emphasized that Pakistan Engineering Council being Statutory Body for setting and maintaining internationally relevant building codes in Pakistan may lead the process for development and adoption of a Green Building Code for Pakistan in close coordination with the Ministry of Climate Change and all relevant stakeholders.

PEC in collaboration with the Ministry of Climate Change, IJN Habitat, NED-University, Karachi and the World Bank, notified a PEC Technical Committee, for development of first-ever Green Building Code of Pakistan (GBCP)-2023. The Technical Committee in its first meeting held on May 13, 2022 selected the "International Green Construction Code (IgCC-2021)" as base/guiding document for development of Green Building Code of Pakistan-2023. In this regard expert groups were formulated to perform derivative work/ review and inputs/adding the local values etc on the allocated chapters of GBCP-2023.

Accordingly the Draft Green Building Code of Pakistan -2023 has successfully developed by the committee which mainly covers the following salient features.

- **Passive solar design:** Passive Solar Design uses the sun's energy to heat and cool buildings. It involves the placement of windows, walls, and floors in a way that maximizes natural light and minimizes the need for heating and cooling systems as integrated advanced green technologies.
- **Green roofs:** Green roofs or bio-roofs are special roofs that are covered with vegetation or bio-films. They help to reduce the urban heat island effect, improve air quality, and provide insulation.
- **Energy Efficient lighting:** Energy-efficient lighting uses less electricity and lasts longer than traditional lighting. This includes LED and compact fluorescent bulbs as per global competitiveness towards LEED certified buildings.
- **Renewable energy:** Renewable energy sources such as solar, wind, and geothermal power, bio-gas, waste to energy and allied alternates form of Alternate and Renewable energy (ARE) technologies, which can be used to build energy efficient buildings.
- **Water-saving technologies:** Water-saving technologies include low-flow toilets, faucets, and showers, as well as rainwater harvesting systems, reuse of grey water by maintain a balance between groundwater extraction and recharge technologies etc.
- **Sustainable materials:** Sustainable materials such as bamboo, recycled steel, reclaimed wood and fly ash can be used in construction to reduce the adverse environmental impacts.



- **Building information modeling:** Building Information Modeling (BIM) or automation systems can help to optimize energy usage and reduce waste. These systems can control lighting, heating, cooling, and ventilation systems based on occupancy and environmental conditions. Overall, green construction technologies offer a range of benefits, including reduced energy costs, improved indoor air quality, and a smaller carbon foot print.

The draft Green Building Code of Pakistan -2023 was placed in 46th PEC Governing Body meeting for approval. The competent forum approved the draft code for the publication/Gazette Notification and dissemination to the stakeholders at Federal/Provincial Levels with the directions to develop roadmap for capacity building of the relevant Development Authorities/Departments to help them for smooth implementation and benefit

Development of Rain Water Harvesting Provisions for Building Code of Pakistan-2023

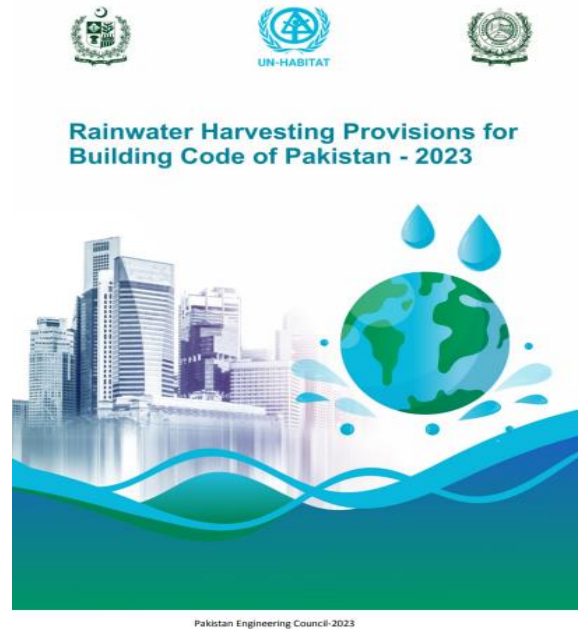
Groundwater is the principal source accounting for 90% of municipal (residential) and 100% of industrial water, which is causing rapid depletion of the aquifers. Apparently, the daily water consumption of 61 liters per capita is assumed in urban centers across Pakistan. Considering average family size of 5 persons (Population Census 2017), the annual water consumption of average family is estimated as 111,235 liters. In Pakistan, the average annual rainfall pattern is ranging between 50 - 1200 mm as per rainfall data recorded by Pakistan Metrological Department (PMD) across the country. It is estimated that the RWH potential through building's rooftop can meet 50% of water requirements in rain-fed regions and up to 20% in areas with abundant rainfall intensity in summers.

The PEC Water Resources Development Committee diligently evaluated the huge potential of rainwater harvesting in Pakistan. Many countries in the world have developed the Rainwater Harvesting (RWH) homogenized systems include (Rooftop, Surface and Recharge) techniques and supplementing their potable and non-potable water availability and storage capacities. Our neighboring countries like India, China, Bangladesh, Sri Lanka and Iran have largely adopted RWH systems particularly for their rain-fed areas. Additionally, large number of countries developed RWH regulations, standards specifications and codes worldwide.

As per strong recommendations laid down in the National Action Plan-2015, Pakistan Water Charter-2018, and National Water Policy-2018 that "RWHS shall be adopted as key resource of IWRM to overcome the shortage of water". Accordingly, the Senate Standing Committee on Science and Technology in its meeting dated January 19, 2019, directed for adoption of innovative technologies in the country. In this regard, the Ministry of Science and Technology directed PEC for development of Rainwater Harvesting for commercial and residential buildings in the country on war-footing basis. PEC Water Resources Development Committee under convenorship of Engr. Raghib Abbas Shah in its 10th meeting dated 15 October, 2022 recommended the development of Rainwater Harvesting Provisions for Building Code of Pakistan (RWHP-BCP-2023), which shall be included as an integral part of building design with a proper techno-legal framework for its effective implementation by Authorities Having Jurisdictions (AHJs). Accordingly, PEC notified a technical committee of experts for fast-track development of Rainwater Harvesting Provisions for Building Code of Pakistan-2023 in line with well recognized standards and best practices of worldwide.

The Committee selected the Rainwater Harvesting Systems CSA B805-18/ICC 805-2018 as base document for the development of Rainwater Harvesting Provisions for Building Code of Pakistan 2023. Accordingly, a draft of the first-ever Rainwater Harvesting Provisions for the Building Code of Pakistan-2023 has been developed by the expert committee.

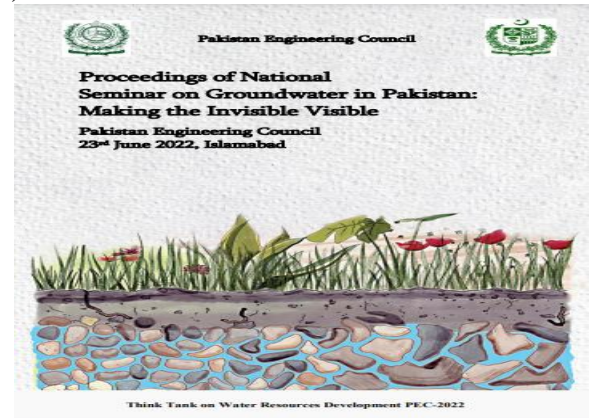
The Rainwater Harvesting Systems shall be adopted as a key resource of Integrated Water Resources Management (IWRM) to overcome the looming shortage of water in the country. RWHS is providing two-fold benefits for the safe collection of harvested rainwater from rooftops and surface runoff for



onward augmenting the groundwater recharge and other alternate potential uses by residential, commercial, and industrial applications. RWHS are globally accepted and very effective methods used for controlling massive Urban Flooding. It segregates the safe collection of rainwater for potential uses. The final draft was tabled in 46th Governing Body for principal approval wherein it was principally approved by the competent forum with the direction to consult with all the relevant stakeholders by their valued feedback and expert comments.

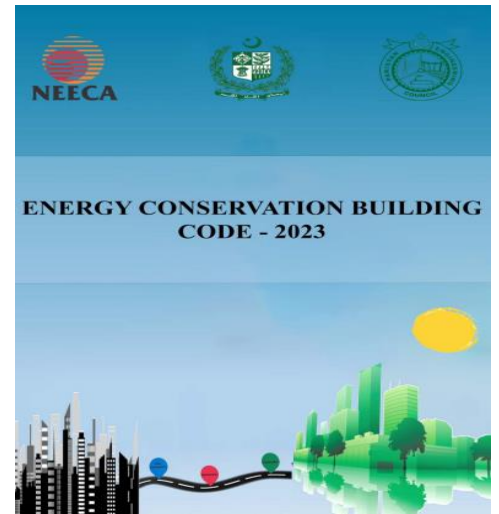
Development of Proceedings of National Seminar on Groundwater in Pakistan: Making the Invisible Visible Pakistan Engineering Council 23rd June 2022, Islamabad

A brief report was prepared on the proceedings of National Seminar on Groundwater in Pakistan: Making the Invisible Visible Pakistan Engineering Council 23rd June 2022, Islamabad. The report had been launched in September 2022 that was uploaded on the PEC Website that consisted of technical findings of eminent speakers from all provinces and organizations on groundwater depletion in Pakistan that is an issue of national importance. This report consists of policy recommendations of this seminar all of provincial irrigation and allied agriculture departments to develop sustainable groundwater strategies for both formal and informal sectors within the given timelines for effective groundwater development and management in Pakistan.



Energy Conservation Building Code 2023

The Honorable Prime Minister of Pakistan, chaired a strategic meeting on energy conservation measures on February 1, 2023, where Pakistan Engineering Council (PEC) and National Energy Efficiency and Conservation Authority (NEECA) were directed to revise the Energy Provision Building Code of Pakistan within two months. The successful development of this Code is greatly indebted to the dedicated efforts and contributions of the Technical Committee and Advisory Committee. Both the organizations extended the heartfelt appreciation to the thirty-five-member strong Technical Committee, comprising representatives from Federal and Provincial departments/ministries, private sector entities, universities, and Builder Associations across the country. Their valuable technical expertise and collaborative efforts were instrumental in providing crucial support throughout the entire code development process.



Overall, PEC and NEECA were responsible for the development of this Code with administrative support from the Ministry of Science & Technology.



Pakistan Halal Authority (PHA)

Introduction

Pakistan Halal Authority (PHA) is established under Ministry of Science and Technology (MoST) through an Act of the Parliament No. VIII of 2016 of the Islamic Republic of Pakistan with the mandate to promote trade and commerce in Halal articles and processes. PHA is responsible for ascertaining the Halal Status of the products, process and services maintained and monitored at all time in local market as well as products being imported/ exported.

Vision

- Gate way to Halal Assurance

Mission

- To make Pakistan trend setter in Global Halal Industry through Continuous Improvement and innovations by assuring Global Community trust and confidence in Halal Products and Services

Rules and Regulations of Pakistan Halal Authority

- PHA has drafted and placed the following rules for approval:
 - PHA Financial Rules;
 - PHA Medical Attendance Rules.

The Expanding Global Halal Market and Importance of PHA as Regulatory Body

- With estimated 1.9 billion Muslims worldwide (expected to reach 2.2 billion by 2030), the demand for halal products and services extends beyond the traditional food sector to encompass cosmetics, pharmaceuticals, finance, travel, media, and more. The food industry alone amounting to about 793 billion dollars growing at 7.6% through 2022. Halal trade has potential of trillion dollars worth in international market. It is observed that most of the leading countries in this emerging Halal trade are Non-Muslim countries.
- Countries leading in the Halal products exports are Brazil, Australia, Malaysia, Indonesia, Thailand, China, Korea, South Africa, America etc. 85% of the Halal Food imports by Organization of Islamic Cooperation (OIC) Nations are from Non-Muslim countries. Pakistan being a Muslim country is taking a nominal share from this emerging trade. Regions of Halal market include America, Africa, Middle East, North Africa, South Asia, East Asia, Central Asia and sub-Saharan Africans spends billions of dollars on food and beverages.

Recruitments of Officers in PHA for Effective Functioning

- PHA has conducted recruitments of dedicated officers to ensure the effective functioning and operationalization of organization and organized trainings and workshops for newly recruited officers from relevant departments.

Registration of Local Halal Certification Bodies (LHCBS):

- PHA has developed procedures and forms for the registration of Local Halal Certification Bodies (LHCBS). At present, PHA has registered 09 LHCBS.

Registration of Foreign Halal Certification Bodies (FHCBS):

- Policies and procedures for registration of FHCBS have been developed and registration will be started soon.

Recognition/ Up-Gradation of Slaughter Houses:

- PHA developed policy and procedures for recognition/ up-gradation of slaughterhouses in line with international practices so that meat and meat products being exported from Pakistan meet the international Halal requirement. The recognition/ up-gradation of slaughter houses will be started soon.

Recognition of Halal Authentication Laboratories:

- Process on recognition of Halal authentication laboratories duly accredited by national/international accreditation body has been initiated to ascertain Halal ingredients products and articles.

International Mutual Understandings and Recognition Agreements

- Keeping in view the significance of mutual Halal trade with foreign countries, PHA has taken futuristic initiative for devising a mechanism for recognizing bilateral Halal articles/ products to be imported and exported by signing Memorandum of understanding (MoUs) and Mutual Recognition Agreements (MRAs) with counterpart Regulatory Authorities of Muslim and Non-Muslim countries. This will remove barrier in imports and exports of Halal articles and products which will ultimately open new horizon for Halal sector among Muslim Countries.

At present, correspondence with many OIC and non-OIC countries are in pipeline by PHA. Apart from already in-process MoUs with State of Qatar, United Arab Emirates, Kingdom of Morocco, Kingdom of Jordan, Republic of Turkiye, Malaysia, and Kingdom of Saudi Arabia, MoUs have been proposed with the following Muslim countries for bilateral cooperation in the field of Halal and mutual recognition:

Sr.	Country	Concerned Authority
1	Krygyz Republic	State Center for the Development of the Halal Industry
2	Indonesia	Badan Penyelenggara Jaminan Produk Halal (BPJPH), Indonesia
3	Brunei Darussalam	Ministry of Religious Affairs, The State of Brunei
4	Egypt	ISEG Halal

Similarly, MoUs by counterpart organizations of the following Non-Muslim countries are also proposed with PHA.

Sr.	Country	Concerned Authority
1	Belarus	Bel Halal
2	Singapore	Majlis-e-Ulama Islamia Singapore (MUIS)
3	South Africa	South African National Halal Authority (SANHA)
4	Argentina	Argentine Association of Suppliers of Food Industries (ADEPIA)
5	European Union	EU-Pakistan Sub-Group on Trade
6	Brazil	Centro Halal da America Latina (CHAL)

AKSITAN HALAL AUTHORITY (PHA)

Observance and implementation of Principles of Policy 2021-22 – POP (Articles 29 to 40 of the constitution).

Article No	Contents of the Articles	Extent and Scope of the implementation of the Article of POP
29	Principles of Policy	<ul style="list-style-type: none"> Pakistan Halal Authority (PHA) is established under Ministry of Science and Technology (MoST) through an Act of parliament of Islamic Republic of Pakistan in 2016 to promote imports and exports, trade and commerce with foreign countries and inter-provincial trade in Halal articles and processes. PHA is mandated in ascertaining the Halal status of the products, processes and services maintained and monitored at all times in local market as well as Halal products being imported and exported.
30	Responsibility with respect to Principles of Policy	<ul style="list-style-type: none"> Promoting trade in Halal articles, and processes.
31	Islamic way of life	<ul style="list-style-type: none"> Prayer times have been allocated during duty, so that the employees can perform their Holy worship. Religious attire/ Shalwar Qameez is encouraged on Friday. Employees from the minorities are facilitated on the occasion of their religious celebrations. Knowledge of Halal Regime is preferred in recruitments process.

		<ul style="list-style-type: none"> • Candidates for Technical/Halal Standards wing, Regulations wing and Field Inspector in PHA shall be Muslims.
32	Promotion of Local government institutions	<ul style="list-style-type: none"> • Possible collaboration with local authorities in future.
33	Parochial and other prejudices to discourage	<ul style="list-style-type: none"> • PHA employees consist of various sects, sex and provinces as per approved quota system. • All the employees are treated on equitable basis to ensure providing congenial environment. • No discriminations.
34	Full participation of women in the national life	<ul style="list-style-type: none"> • PHA is an equal opportunity employer. • Women are encourage to apply in all disciplines on merit as well as separate seats are reserved in women quota.
35	Protection of family life	<ul style="list-style-type: none"> • Not such facility is available for PHA employees till now i.e. group insurance, provident fund. Whereas, medical attendance rules are in pipeline for approval of the competent authorities.
36	Protection of minorities	<ul style="list-style-type: none"> • In the recruitment process quota policy for minorities is observed. • Advance salaries were paid and holidays allowed to the minorities on the occasion of their religious celebrations.
37	Promotion of social justice and eradication of social evils	<ul style="list-style-type: none"> • PHA is dedicated to the promotion of social justice and the eradication of social evils that hinder progress and equality. • All employees are treated on equal basis at all levels. • There is zero tolerance policy against defaulter without any discriminations.
38	Promotion of social and economic wellbeing of the people	<ul style="list-style-type: none"> • By empowering individuals and businesses to adhere to halal principles, PHA contribute to the overall welfare of society, fostering a more prosperous and harmonious environment where everyone can thrive while upholding their faith and values.
39	Participation of people in arm forces	<ul style="list-style-type: none"> • Continuous
40	Strengthening Bond with Muslim Words.	<ul style="list-style-type: none"> • PHA believes in mutual cooperation with Muslim world and Memorandum of Understanding (MoU) has been proposed with Muslim countries for bilateral cooperation in the field of Halal and mutual recognition.

National University of Technology (NUTECH)

Introduction

NUTECH is a federally chartered Higher Education Commission (HEC) recognized Islamabad based university, under Ministry of Science & Technology (MoST). NUTECH is envisioned to be an internationally acclaimed university destined to produce future leaders of character for national and international industry. The National University of Technology (NUTECH) is established as a pioneer 'University for Industry' to create, develop, implement and promote emerging technologies for the country. The University's curricula and academic systems are based on the best international practices of world's leading technology universities of USA and EU. The undergraduate applied engineering programs of NUTECH satisfy Washington accord, ABET and Bologna Process.

- **Launch of New Academic Programs.** NUTECH was offering under graduation (UG) programs in 06 different fields however, Bachelors in Artificial Intelligence and MS programs in 02 fields i.e. Computer Science and Civil Engineering started from Fall 2022 whereas NUTECH has planned to launch BS Software Engineering and MS Computer Engineering from Fall 2023.
- **NUTECH Convocation 2022.** NUTECH held its first convocation for Batch 2018 students on November 08, 2022. The President of Pakistan and Chancellor of the University, Dr. Arif Alvi graced the occasion as chief guest and conferred medals & degrees to successful graduates. A total of 116 Undergraduate students were conferred degrees in the disciplines of Civil, Electrical, Mechanical, Computer Engineering and Computer Science.
- **Open House/ Job Fair.** NUTECH held its first ever "Open Hose and Job Fair" on August 30, 2022 to connect graduate students with employers from leading industries across Pakistan. The Job Fair hosted 40 companies representing Corporate, Engineering, Finance, IT, Banking, and social Sectors. Chairman Pakistan Engineering Council (PEC) Engr. Muhammad Najeeb Haroon graced the occasion as Chief Guest. The event served as an opportunity for all NUTECH students to interact with potential employers and become aware of prerequisites for joining the corporate sector. It also provided a platform to prospective employers and leaders in business and Industry to select fresh graduates for employment in their organizations. The second Open Hose and Job Fair is planned on August 04, 2023.
- **Structured & Supervised Internship.** In view of internship being a mandatory requirement of undergraduate programs, detailed plan of internship for batch 2019 was chalked out by all departments of NUTECH and organizations like FWO, HIT, Attock Refinery Oil Ltd, NECOP, SNGPL etc. were selected. The internship of students batch 2019 commenced in September 2022 for 8 weeks and completed in October 2022.
- **Faculty Development Program.** CPD Office for faculty development program duly approved by PEC has been established at NUTECH. Moreover, a number of HEC coursera licenses acquired for our faculty in this regard.
- **PEC Accreditation Visits.** Re-Accreditation visit for BS Electrical Engineering was conducted in June 2023.
- **NCEAC Visits.** NCEAC team conducted zero visit for BS Artificial Intelligence in January 2023 whereas NCEAC team visited NUTECH in June 2023 for conducting zero visit for BS Software Engineering and change of scope visit for BS Computer Science.
- **Skills Courses at NUTECH Institute of Vocational and Technical Skills (NIVATS).** A Total number of 40 x Technical and Vocational courses have been conducted in the Year 2022/23. Number of skills graduates were enhanced to 922 in different Hi-Tech (AI, IoT, Robotics, Mob App Development Cloud Computing), Vocational (Industrial Stitching, Fashion Designing, Hospitality Operations) and Technical (Computer Graphics (Print/Motion/UI/UX, Digital Marketing) courses.
- **Business Expos for Training "On the Job" / Internship for Skills Graduates in the Relevant Industry.** NUTECH conducts expos to invite relevant industries for interaction with the trainees of skills courses. An encouraging number of industries participated in these expos. The first expo was held in June 2022 whereas the second expo was held on January 24, 2023 where 22 industry reps from different industries attended and interviewed 73 students of Computer Graphics (Motion + Print) and Fashion Designing & Machine Embroidery.
- **Export of HR to Japan under TITP Initiative.** NUTECH has become the first University in Pakistan which has been awarded the status of Sending Organization for placement of HR in the international industry. In this context as landmark achievement the first group of six (06) internees successfully joined industry at Japan for five (05) years on January 13, 2023, second

group of three (03) internees reached Japan on July 15, 2023 whereas interviews of twenty seven (27) interns are being conducted on August 03, 2023 and will be leaving soon for Japan. NUTECH signed MoU with six (06) more Japanese Supervisory Organizations on March 06, 2023 for exporting more interns to Japan.

- **NUTECH Joins Hand with Finland to get recognized in the EU Hospitality Industry.** Finland (FINESH) Vocational and Technical education system is one of the best TVET education systems in the world. As a first step of the cooperation, a joint certificate in the field of Hospitality Operations and Management has commenced at NUTECH. 1st Batch of Hospitality Operations and Management (HOM) course concluded its training in Oct 2022 whereas 2nd Batch has also commenced at NUTECH from December 05, 2022.
- **Launching of Sino-Pak Dual Diploma Program with China.** NUTECH has entered into an agreement with Tang China for launching Sino-Pak Dual Diploma and Vocational & Technical Joint Education Program from September 2023 for Pakistani students with 2 years in Pakistan and 1 year at an Institute in China. The purpose of this agreement is to provide quality technical manpower to local economic zones and CPEC Industry Special Economic Zones (SEZs). The program will introduce China modern industrial technology and investment to promote Sino-Pak related industries investment locally, especially in ICT, Smart Manufacturing and other emerging and High Tech sectors. Based on industry demand NUTECH has planned to launch two new 3 years DAE courses in the field of Electrical Engineering and Information Technology (IT).
- **PM's Youth Skills Development Program (PMYSDP) Batch-4.** NUTECH being an active partner of PMYSDP has successfully graduated three batches. The goal of the program is to provide young people with market-driven, conventional, and high-tech skills necessary for career advancement, with the aim of bringing their capacity to international standards. After successful completion of three batches, NUTECH has entered into Batch 4 of PMYSDP with effect from May 23, 2023. Prime Minister of Pakistan graced the launching ceremony of PMYSDP Batch 4 on July 14, 2023.
- **Establishment of State of the Art Language Lab.** NUTECH established State of the Art Language Lab for fulfilling the language requirement of international job market.
- **NuVent.** In response to the Covid crisis, NUTECH engineers started working on developing technologies to meet the critical requirement of mechanical ventilators named as NUTECH Ventilator (NuVent). Significant features of NuVent comprise a powerful graphical user interface, ten ventilation modes, safety alarms and incorporation of features to be used in Intensive Care Units. NuVent has cleared all tests & trials conducted at PEC according to ATP and clinical trials are in progress at CMH Rawalpindi & Jinnah Hospital Lahore. Final approval for local production with industrial partner NRTC will commence in due course.
- **NUPRINT.** As part of indigenous development efforts, NUTECH has also developed 3D industrial printer prototype (NUPRINT) and has received orders for production of 40 units from Pakistan Science Foundation (PSF).
- **Advanced Ballistic Calculation System (ABS).** The innovative minds at NUTECH developed Advanced Ballistic Solver (ABS) – a firer aid system for precision based shooting. ABS calculates ballistic trajectory for the selected bullet and rifle to attain high hit probability on the target. The project was completed in close collaboration with related organization through exchange of key insights and related knowledge with the developing team. Moreover, ten units of ABS were handed over to Pakistan Army.
- **Distributed Wind Direction and Assessment System.** NUTECH has developed Distributed Wind Direction and Speed Assessment System (DWDSAS) at NUTECH Innovation Centre (NIC) Lab to cater for wind assessment requirements of various national scientific and professional organizations. It is an advanced multi terrain system that can send and receive weather data at a target deployed at an extended range of upto 2000 meters.
- **Industrial Collaboration.** In the realm of industrial collaboration, following activities were undertaken by NUTECH:
 - RCCI Artificial Technology Conference & Expo – 2022.
 - Engagement with HESSA: Visit of 'Pakistan Institute of Development Economics (PIDE).
 - Engagement with B-International Project Event: A Collaboration between the UK, France, Italy, Spain and Pakistan.
 - Workshop on Intellectual Property (IP) Rights for Faculty / Researchers of NUTECH.
 - Patent filing of Multicaliber and Modular Assault Firearm with novel metallurgical and industrial coatings to enhance performance parameters.

- Engagement with HESSA regarding Career Readiness and Alumni Engagement.
- Engagement with KN International, regarding NUTECH Ventilator (NuVent) Commercialization.
- Engagement with Islamabad Diagnostic Center (IDC) for MoU.
- **Participation in National Idea Bank (NIB) Competition.** NUTECH emerged as the big winner and the only university in Pakistan at the NIB competition, with four award-winning ideas that impressed judges and industry experts alike. The final national-level award ceremony was held at Sir Syed University of Engineering and Technology (SSUET), Karachi on March 20, 2023. Dr. Arif Alvi graced the occasion as the chief guest. NUTECH won the NIB National Level Competition in Manufacturing Sector securing both Winner and Runner-Up positions. Similarly, in Automotive Sector, NUTECH innovators and young entrepreneurs had the honour to secure both 1st and 2nd Runner-Up positions.
- **Participates in Engineering Capstone Expo 2023.** Pakistan Engineering Council (PEC) organized a one-day Engineering Capstone Expo at Pak China Friendship Centre on 12 Jan 2023 in which institutions from across the country exhibited their products. All NUTECH engineering departments participated in the expo and displayed 13 projects securing 1st position in Computing and Allied category whereas 2nd position in Electrical and Allied category. NUTECH as the youngest among the other universities in the Expo received great appreciation from the public and higher dignitaries.
- **NUTECH Flood Relief Camp.** To help the flood victims, the National University of Technology organized a flood relief camp on its campus from 5-9 September 2022, during which the students, faculty, support staff and all the NUTECH employees participated whole heartedly. NUTECH employees donated cash and required items.
- **NUTECH Participation in International Rankings.** NUTECH participated in 06 SDGs of Times Higher Education (THE) Impact Rankings - 2023 and earned a respectable place among National / International universities. In addition to this, NUTECH secured a respectable place among top innovative universities of the world in World University Rankings for Innovation (WURI) - 2023. NUTECH is among the top 100 universities of the world in "Industrial Application" in WURI - 2023 Rankings.
- **Establishment of NUTECH Main Campus.** Main objective of the project is to establish / strengthen National University of Technology (NUTECH), Islamabad'' Campus to provide platform for higher education in the light of NUTECH Act. Existing facilities of NUTECH are insufficient to meet the academic requirements of already initiated programmes. Project was approved by the CDWP on October 17, 2019 with an estimated cost of Rupees 2851.231 Mn. However, against the approved cost, Rupees. 1350.00 Mn has been released till todate. Due to economic constraints and slow funding this pending project could not be finalized in time. MoPD&SI has been approached through HEC to ensure maximum funding requirement during current financial year so as to complete the project at the earliest.
- **Establishment of NUTECH Railway Engineering, Technologies and Skills School (NURETSS) at National University of Technology (NUTECH) – Part 1.** The project was conceived on the request of Pakistan Railway to develop HR capable high-tech skills to upgrade O&M of railway system. Considering high value of the project, CDWP approved the project on 25th August 2021 amounting to Rs. 2937.126 Mn. Planning Commission promised to provide funding during mid year 2022-23 but the project could not be funded despite number of requests due to financial instability.
- **NUTECH Karachi Campus.** Establishment of NUTECH Karachi Campus (NKC) is an exports enhancement project of Karachi Chamber of Commerce & Industry (KCCI). Airport Security Force Foundation (ASFF) will provide 50 Acres of land to NUTECH for world-class R&D for the industry to create, develop, implement and promote emerging technologies and allied skills for imports substitution, technology upgradation, value-addition and exports enhancement. Campus development would be through public-private partnership model whereas all academic and research facilities would be tailored to technology & skill development needs of industry. The project envisages enhancement of exports including textile products, industrial IT products & industrial machinery. It is worth highlighting that KCCI & allied industry at Karachi will bear the development cost of NKC project including recurring budget for initial five years through EDF.

National Energy Efficiency & Conservation Authority (NEECA)

Introduction

National Energy Efficiency & Conservation Authority (NEECA) serves as a federal focal agency mandated for initiating, catalyzing, and coordinating all Energy Conservation activities in different sectors of economy.

Goal/Functions

- NEECA commits to serve for establishment of institutions and enunciation of procedures to provide mechanisms for effective conservation and efficient use of energy. The main functions of NEECA include: -
 - To formulate energy conservation policy, and programs in all the potential energy consuming sectors.
 - To plan and initiate energy conservation actions on a nation-wide basis.
 - To develop a comprehensive database on opportunities for energy conservation.
 - To support training activities on energy conservation applications.
 - To undertake field research and pilot demonstration activities on specific energy conservation options and technologies
 - To monitor the implementation of conservation programs by other public and/or private sector entities.
 - Coordinate with national (especially provinces) and international stakeholders for implementation of EE&C measures.
 - To serve as a focal organization about the information & data about EE&C at national level and conduct awareness, education & capacity building activities.

Performance Outcomes for FY 2022-2023

- A brief detail of projects and initiatives undertaken by NEECA in the year 2022-23 are;
 - **Approval of National Energy Efficiency & Conservation Policy (NEEC) 2022 by Cabinet**

The Cabinet has approved the NEEC Policy 2023. Policy has been developed with a vision to create a culture of conservation and efficient use of energy resources in the country. NEEC Policy-2023 aims to double the rate of energy by 2030 with a target of 9 MTOE energy saving leading to 35 MTCO² emissions reduction.

The draft of the National Energy Efficiency & Conservation Policy (NEEC) 2023 was presented to national stakeholders in 08 national stakeholders' consultations in major cities of the country (including Muzaffarabad and Gilgit) with participation of more than 500 individuals from different organizations. The approved policy incorporates all the comments and inputs of federal and provincial stakeholders.

National Action plan 2023-30

- Energy efficiency is a key pillar of goal seven of the Sustainable Development Goals. It is a cross cutting area which complements the national efforts for sustainable energy for all. NEECA has developed a National Energy Efficiency and Conservation Action Plan (2023-30) which is a comprehensive and holistic long-term plan, aligned with Pakistan Vision 2025 and integrated with national energy policies. The plan ensures overall sector-wide coherence and synergy of the collective efforts toward doubling the rate of improvement of energy efficiency to be achieved by 2030. In total, the energy efficiency sector offers an investment potential of \$8 billion to achieve the SDG-7 objectives in Pakistan.
- In this first draft of NEEC Action Plan, 27 actions have been defined across 6 categories namely industry, buildings, transport, agriculture, energy, and cross-cutting areas. The NEEC Action Plan 2023-2030 also projected to achieve savings of 9 Mtoe cumulatively by 2023, for which 8 billion USD of investment potential has been mapped. The cumulative financial savings by 2030 will be 6.4 billion USD at 2022 prices, where the effect of certain savings will continue through to 2050 in terms of economic transition towards net-zero emissions if the government chooses so in next 8years. The average payback period for the prioritized actions is less than 8 years.

Energy Conservation Building Code- 2023

- The Energy Conservation Building Code 2023 (ECBC-2023) is developed with the purpose of improving energy efficiency in buildings. This code provides minimum requirements for energy-efficient designs and construction of buildings and includes international best practices appropriate to Pakistan's environment. It covers a broad range of factors, including energy-efficient and low-emission construction materials, passive building design, energy appliance

monitoring devices, electric vehicle charging points, energy management systems, building insulation, and renewable and geothermal energy.

- Energy Conservation Building Code 2023 is an important step forward in promoting energy efficiency and sustainable building practices in Pakistan. With the promulgation of energy-efficient building design and construction, the Energy Conservation Building Code 2023 will play a pivotal role in reducing energy consumption, minimizing costs, enhancing the safety & economic health of communities, and building industry in Pakistan.
- NEECA Board has approved the Energy Conservation Building code and summary is under process to get the ECBC-2023 approved by Cabinet for mandatory implementation across the country.

Rainwater Harvesting Provisions for Building Code of Pakistan 2023

- Pakistan is categorized as a water-stressed country, with water availability per capita decreasing over the years. Rapid population growth, urbanization, industrialization, and inefficient water management practices have led to a significant gap between water supply and demand. To address the water issue Pakistan Engineering Council has taken lead and develop Rainwater Harvesting provisions for Building Code.
- NEECA, being the member of the technical committee constituted for the development of code, drafted two critical chapters i.e water quality and rainwater system tests and inspection. Rainwater harvesting will help in conserving water, especially in regions facing water scarcity or where there is limited access to freshwater sources. By collecting rainwater, the dependency on the traditional water sources like rivers, lakes, and groundwater will be reduced, which are often overexploited.

Inter-Ministerial committee on Fluorescent Bulbs and Fan Industry under the chair of Federal Minister for Defence

- An inter-Ministerial Committee on Fluorescent Bulbs and Fan Industry was established, with Khwaja Muhammad Asif, Federal Minister for Defence, assuming the role of its Chairman. For the implementation of tasks assigned to the said committee, National Energy Efficiency and Conservation Authority (NEECA) has played a pivotal role by actively engaging in the committee's meetings and facilitating the implementation of the committee's resolutions. Notably, the NEECA has made significant contributions, and the key highlights of its endeavors are outlined as follows:

Ban on manufacture, sale and import of Incandescent bulbs, CFLS and inefficient fan S.R.O.

- Incandescent bulbs and Compact Fluorescent Lamps (CFLs) are outdated, and energy inefficient lighting appliances as compared to LED lamps. The committee, in consideration of this fact, banned the manufacture of incandescent bulbs and CFLS and inefficient fans. In view of the above decisions, NEECA actively participated and took the lead in the stock taking activity at the only two incandescent bulb manufacturing factories in Pakistan for the purpose of clearing the existing stock of incandescent bulbs. During the stock taking activity, an assessment of the existing stock of bulbs and raw materials was done. Based on the report submitted by NEECA, the committee decided to ban the manufacture, sale and import of incandescent bulbs and CFLs from 1st February 2023. NEECA drafted a summary for the Federal Cabinet and an SRO under NEECA Act (Clause 7u) to prohibit the manufacture, sale and import of incandescent bulbs and CFLs. The SRO has been issued by Ministry of Science and Technology.
- The committee further decided to make the PS-1 Standard mandatory for fans which includes the Minimum Energy Performance Standards (MEPS) prescribed by NEECA. In this regard, an SRO has been issued prohibiting the manufacture of inefficient fans, not compliant with the PS-1 standard w.e.f. 1st July 2023. This is an important step given the fact that fans are the biggest consumers of electricity in the summers.

Common stamping facility for SME industry of fan manufacturing and Removal of RD

- The energy consumption of the fan mainly depends upon the manufacturing quality of its motor which in turn depends upon the quality of the metal sheet used to manufacture the fan motor. The recommended practice is to use Electrical Silicon Steel (ESS) Sheet to manufacture efficient fans. However, a large segment of the fan industry consists of small/cottage industry and instead of using the Electrical Silicon Steel Sheet uses CRC Sheet, Scrap steel and discarded drums due to the high capital cost of the former., This affects performance and results in the production of substandard, high energy consuming fans. The govt. provides quota for the import on Regulatory Duty (RD) exempted ESS sheet, but it only benefits large manufacturers having in-house motor manufacturing facilities. The SME sector on the other hand, faced hurdles in getting the quota of

ESS sheets and had to pay the RD which makes them commercially uncompetitive in the market against large scale manufacturers.

- In a bid to remove barriers in the production of efficient fans, the committee in consultation with PEFMA suggested that a RD exempted Common Stamping Facility may be operationalized to support small fan manufacturers. NEECA along with EDB, FBR and Further with efforts of NEECA, the Ministry of Commerce, in its 47th Board Meeting on Tariff Policy PEFMA visited the Common Stamping Facility Gujranwala on 27th January 2023 and a report was presented to the committee. Further with efforts of NEECA, the Ministry of Commerce, in its 47th Board Meeting on Tariff Policy decided to remove RD on the import of Electrical Silicon Steel (ESS) Sheet. This decision will not only benefit the fan industry but also the manufacturers of other electrical equipment such as motors, and transformers, etc.

Development of Energy Information House

- NEECA is collecting energy related data from different public and private organizations to create a national Energy Information House. EIH consolidates and presents this data in an organized and structured way on a single platform. The System is designed to use advanced data analysis techniques and tools to create meaningful.
 - Data tables
 - Dashboards
 - Visualizations
 - Projections / Forecasts
- EIH is currently under development phase with several datasets and dashboards already integrated into the system (RISE, State of Industry etc). More data from PITC, SNGPL, SSGC is being gathered and will be integrated soon.

Development of Product Registry System (neers.com.pk):

- NEECA, keeping in view the ease of business and availability of information on Energy Efficient appliances and products for the public has developed a Product Registry System for its labelling program. Implementing a product registry system for labeling offers several advantages. The key benefits of NEERS will be:
 - **Consumer Safety:** A product registry system will enhance consumer safety by ensuring accurate and up-to-date information about the EE products they purchase.
 - **Regulatory Compliance:** A product registry system simplifies compliance with NEECA appliance regulations by providing a centralized platform where manufacturers can input and update necessary information.
 - **Supply Chain Transparency:** A product registry system can track a product's journey from its source to the end consumer. By capturing and recording data at each stage of the supply chain, it becomes easier to verify the authenticity, origin, and handling of a product.
 - **Efficiency and Cost Savings:** Adopting a centralized product registry system will streamline the processes, eliminating manual data management and reducing paperwork. This automation will lead to cost savings in administrative tasks and minimize errors associated with manual data entry.
 - **Market Insights and Analytics:** A registry system can generate valuable data and insights related to product performance, consumer preferences, and market trends. By analyzing this information, manufacturers can make informed decisions, optimize their product offerings, and target their marketing efforts more effectively.
 - **Sustainability and Environmental Impact:** A product registry system will facilitate sustainability efforts by providing information about a product's environmental impact, such as carbon footprint, recyclability, or use of sustainable materials.

National Art and Painting Competition

- NEECA has launched an EE&C Competition to encourage and motivate the manufacturers, importers, academia and research & development institutes or individuals to come forward with EE&C ideas and most energy efficient and economical model(s) of their product. The following competitions were organized in April 2023 for EE competitions.
 - Writing (Essay & Story) competition for EE&C in Pakistan in all regional languages
 - Documentary/Short Film competition in all regional languages
 - Art (handmade painting & digital paintings) competition in all regional languages

NATIONAL METROLOGY INSTITUTE OF PAKISTAN (NMIP)

INTRODUCTION

The National Metrology Institute of Pakistan (NMIP) is the country's premier organization responsible for maintaining a national measurement infrastructure that ensures the reliability and accuracy of measurements in various fields such as science, commerce, and industry.

Established in 2022 (Reference: The NMIP Act No. XIX of 2022 and MoST Notification No.3(8)2011-NPSL-EW dated Oct. 14, 2022; and initially as a project under PCSIR in 1974), NMIP works under the Ministry of Science and Technology, and it is nationally and internationally recognized for its contribution to the development of the country's metrology setup.

Metrology is fundamental pillar of the quality infrastructure system and essential for most Sustainable Development Goals (SDGs) including prosperity, good health and well-being, climate action, industry, innovation and infrastructure. Thus, the quality infrastructure is required for the effective operation of domestic markets, and its international recognition is important to enable access to foreign markets. It is a critical element in promoting and sustaining economic development, as well as environmental and social wellbeing. It is dependent upon the pillars of Quality infrastructure i. e. metrology, standardization, accreditation, conformity assessment and market surveillance.

MISSION & VISION

The institute's **mission** is to promote and maintain the highest standards of measurement in support of prosperous and healthy Pakistan, with a **vision** to become one of the leading metrology institutes in the region.

NATIONAL AND INTERNATIONAL RECOGNITION

- NMIP is a member of
 - International Bureau of Weights and Measures (**BIPM**) since 1987
 - Asia Pacific Metrology Program (**APMP**) since 1998
 - Economic Cooperation Organization – Regional Institute for Standardization, Conformity Assessment and Metrology (**ECO - RISCAM**); Technical Management Board (TMB) on Metrology
 - Signatory of **CIPM MRA** (degree of equivalence for testing & calibration results) in 2011 for global acceptance.
- NMIP has actively participated in South Asian Association for Regional Cooperation – National Metrology Institute of Republic of Germany (**SAARC - PTB**) activities:
 - Regional Proficiency Testing (PT) / Inter-Lab Comparison (ILB) in fields of Metrology
 - SAARC-PTB regional cooperation about best practices on Legal Metrology (2019)
 - Strengthening Regional Infrastructure and Co-operation in the field of Quality Infrastructure (2018)
- Asia Pacific Economic Cooperation Proficiency Testing (**APEC - PT**) Program
NMIP is the country's only lab having successful participation in all participated parameters of PT regarding quality of drinking water in Asia-Pacific region (2022-23)
- Memorandum of understanding regarding cooperation in various field of Metrology (Draft) with
 - Institute of Metrology of Bosnia and Herzegovina (**IMBiH**)
 - The Scientific and Technological Research Council – National Metrology Institute (**TUBITAK - UME**), Turkiye
 - Standards and Metrology Institutes for the Islamic Countries (**SMIIC**)
 - In this regard the Director General, NMIP has attended 12th SMIIC metrology Council meeting held on April 26-27, 2023 in Istanbul, Turkiye

National Recognition

- NMIP is the first national laboratory (Lab-001) in Pakistan accredited by PNAC for ISO/IEC 17025 compliance (Since 2004).
- PTP NMIP is proficiency testing provider accredited by PNAC for ISO/IEC 17043 (Since 2016).
- NMIP has played a key role in the development of Pakistan National Quality Policy (PNQP 2021) along with other Quality Infrastructure related stake holders PNAC and PSQCA

MANDATE / FUNCTIONS AND OFFERED SERVICES

- **National Metrology Institute of Pakistan (NMIP):**
 - provides calibration and measurement services in various fields of Metrology including Electrical, Mass, Volume, Thermal, Time and Frequency, Volume, Length & Dimension, Pressure, as well as Chemical Metrology. NMIP offers calibration services to industries, research institutes, universities, and other organizations that require accurate measurements,
 - provides training to professionals in the fields of metrology and LQMS. NMIP regularly runs training courses in the fields of Metrology and Quality Management Systems (QMS) in compliance with ISO/IEC 17025 and ISO/IEC 17043.
 - provides testing and analytical services for water, wastewater, minerals, materials, chemicals and food using state of the art equipment (XRF, AAS, C-S Analyzer etc.),
 - is Proficiency Testing Provider in the field of Calibration, Chemistry and Microbiology,
 - has the mandate to develop CRMs, RMs and standards.

ACHIEVEMENTS

- **TECHNICAL / TASK SPECIFIC ACCOMPLISHMENTS**
 - Chemical Metrology Division (CMD) is the only testing laboratory of Pakistan among 23 Economies of World, which has successful participation in Asia Pacific Economic Cooperation Proficiency Testing Scheme coordinated by Government of HKSAR, Hong Kong, China (Report published in May 2023)
 - “TRACE ELEMENTS IN NATURAL WATER (APEC PT 2022)”
 - Calibration of Scientific Equipment in two batches (21 equipment in 2021 and 19 equipment in 2023) for intact chain of measurement traceability in Pakistan
 - PTP NMIP has completed 43 rounds of proficiency testing (27 rounds of Microbiology; 15 rounds of Chemical Analysis and a round of Calibration Schemes). Thus, PTP NMIP is the first and only proficiency testing provider in public sector to provide PT schemes of Microbiology, Chemical analysis and Calibration

CUSTOMER-RELATED ACCOMPLISHMENTS

- **Human Resource Development** of following Public and Private organizations offering training courses in the fields of Metrology and Quality Management Systems (QMS)
 - M/S KRL, Rawalpindi
 - M/S IEEE, I-8 Islamabad
 - M/S ARL, Rawalpindi
 - M/S Bahria International Hospital, Rawalpindi
 - M/S CNPGS, Chashma
 - M/S Fauji Foundation Hospital, Rawalpindi
 - M/S HMC3, Taxila

MOU between NMIP and following National Strategic and other public sector organizations

- **PAEC** (Chashma Nuclear Power Generation Station, Mianwali) Calibration Services in Various fields of metrologies renewed till 30-06-2024.
- **Directorate of Industries Commerce & Labor Directorate**, Govt. of Azad Jammu & Kashmir Muzaffarabad for the Establishment of Weight & Measures Laboratory at Mirpur AJK.
- **Pakistan Navy Karachi** renewed till 30-06-2024.
- **National Institute of Vacuum Science and Technology (NINVEST)** for the cooperation in the field of Vacuum and Pressure Metrology.

ADMINISTRATIVE ACCOMPLISHMENTS

- Approval of National Metrology Institute of Pakistan (NMIP) Act through Parliament after 23 years
- Successful conduction of 1st BOG meeting within 8 months after enactment of NMIP Act
- Framing of NMIP Service & Financial Rules - 2023 and forwarded to Establishment Division through Ministry of Science and Technology.
- Approval of NMIP Financial Rules.
- Recruitment of personnel after 17 years; from BPS-01 to BPS-15 in two steps (especially observing Baluchistan Quota)

KEY PERFORMANCE INDICATORS

To address the Sustainable Development Goals (SDGs) following is the Key Performance Indicators (KPI) detail which show the achievements:

Sr. No.	Key Performance Indicators (KPIs)	Achieved Targets 2022-23
1	Tests and Calibration (including on-site calibrations)	2530
2	No. of Public / Private sectors Customers Served	350
3	Physical Working Standards Fabricated / Calibrated and Reference Materials Developed	12
4	Training / Workshop Organized	07
5	PT Program Organized	06
6	International Traceability of Equipment	19
7	MoUs signed	04
8	Revenue generated (millions PKR)	18.00

Organization Chart

