

YEAR BOOK

2021-22



Ministry of Science & Technology
GOVERNMENT OF PAKISTAN

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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
NPSL	National Physical and Standards Laboratory
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



Agha Hassan Baloch, Federal Minister for Science & Technology

Message from Agha Hassan Baloch Federal Minister for Science and Technology

It is a great pleasure for me to highlight the activities of Ministry of Science and Technology and its organizations including three Universities for Year Book 2021-2022.

Ministry of Science and Technology has elevated its vision to become a strategic collaborator for industry through research, technology transfer, technology incubation and skill development. The research organizations under the administrative control of this Ministry, are now diverting more resources towards the development and implementation of projects and plans in close collaboration with their relevant stakeholders, including both, the public and private sector.

The scientists and technologists of S&T organizations are developing sound projects that ensure need-based research and development necessary for conservation and harnessing of our natural resources. A number of impactful projects are in the process of preparation and approval under the PSDP programme. These projects cover various sectors inter alia affordable & sustainable energy, testing laboratories, health, manufacturing and engineering, environment, agriculture, mineral, food technology and food processing, etc. Research and Development organizations are encouraged and supported to commercialize their products and services to become sustainable over a period of time.

Pakistan Standards & Quality Control Authority (PSQCA) has membership with International Organization For Standardization (ISO) Geneva, Switzerland, International Electrotechnical Commission (IEC) Geneva, Switzerland, International Organization for Legal Metrology (OIML) Paris, France, (IECEE) Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components & also represented Pakistan in World Trade Organization (WTO) on TBT agreement.

Pakistan Council of Scientific and Industrial Research (PCSIR) supports industrial sector in various fields for providing cost-effective technology solutions to improve 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.

Science Talent Farming Scheme (STFS) is being implemented expose youth to advanced topics in science with application of inquiry-based approach to learning. Under the scheme selection of 4 batches of students (1200 total) has completed, while Pakistan Science Foundation has paid monetary benefits to 600 students. 1st, 2nd and 3rd batch students completed 144 research projects under university mentors.

Pakistan Science Foundation (PSF) has recently launched a PSDP “Launching of STEM in Pakistan, Phase-I” to give impetus to Pakistan’s preparations for developing a workforce for the Fifth Industrial Revolution. Following initiatives have been taken under this project:-

- Training Modules are being developed for the grade 9th to grade 12th in consultation with national stakeholders including NCC, FDE and Agha Khan Foundation and in this regard a tender for the Development of Training Modules on STEM is in process and expected to be completed by December 2022. PSF also collaborates with Children Youth Science Centre (CYSC) of CAST, China for development of experiments and training modules for STEM schools.

- Fifty (50) top Higher Secondary Schools (HSSs) / Cadet Colleges have been selected in which Mini STEM FABLABs are being developed for which payment of Rs.1 million to each school is made, in addition to Teacher Training Programs and Module Development on STEM Education.
- IT equipment were purchased and installed in STEM PSF Academy during FY 2021-2022

Pakistan and China are focusing on the following areas in Science and Technology Cooperation under CPEC:-

- To intensify cooperation in frontier areas and advanced fields of S&T and emerging technologies and to promote innovation and entrepreneurship;
- To encourage people to people exchanges;
- To establish technology Parks to jointly promote the development of high-tech industries and emerging technologies in CPEC;
- To establish Joint Research Laboratories and Research Centres;
- To facilitate technology transfer initiatives through China-Pakistan Technology Transfer Centres.

It is the aim of this Ministry to develop human resource, enhance infrastructure and upgrade research potential at research institutes and universities 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 economic development of the country.



Mr. Ghulam Muhammad Memon, Secretary, Ministry of Science & Technology

Foreword

The Year Book 2021-22 is an official document of Ministry of Science and Technology that highlights the activities and achievements of the Ministry, its organizations and three Universities during the said period.

The engine of growth for any Nation is fueled by Research & Development in Science & Technology, leading to modernization of the industry, which contributes towards socio-economic development. Technological advancement holds the potential to turn around any nation's economic crisis, while supporting social and societal progress.

This Ministry is focusing on rapid changes in technology and industry for bringing about the 4th Industrial Revolution of the country by using smart technologies. Ministry of Science & Technology (MoST) is also taking initiatives for implementation of emerging technologies in different fields. The 4th industrial revolution will have a huge impact on the country's economy that will positively affect macro variables including GDP, investment, consumption, employment and trade. This Ministry aspires to implement the globally successful models for modernization of industries. MoST is now moving from the triple helix model i.e. interactions between academia, industry and government, to foster economic and social development innovation, towards penta helix model where citizens and non-profit associations are included with Academia, Industry & Government to ensure impactful legislation & innovation.

Foundation work for the establishment of Pak-Korea Testing Facility for Solar & Allied Equipment to facilitate the Introduction of Quality Standards for Imported and locally developed solar PV Panels in Pakistan has been completed. China-Pakistan Joint R&D Center on Key Technologies of Small Hydel Power and Rural Electrification and Adaptation of Photovoltaic, Biogas Technologies and Establishment of Renewable Energy Labs in Pakistan for Climate Change Mitigation under Green Climate Fund are also a significant step towards development.

The experimental cultivation of cannabis for medicinal and experimental fields is a multibillion industry globally and it will create new opportunities for Pakistan by generating capital & boosting the medical industry's output while reducing the cost of manufacturing. Research, Development and Technology transfer of selected active pharmaceutical ingredients 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, immuno-modulatory agents and vitamin B12.

MoST is guiding and supporting Small & Medium Enterprises (SMEs) for exploring and adopting new trends according to the requirements of Internationally recognized Standards and Guidelines. This year, 657 SMEs have been awarded the Incentive Grant amounting to Rupees 225 Million.

Gems & Mineral Cutting and Polishing Centre has been established at PCSIR Skardu, Gilgit Baltistan for facilitation of gemstone miners to curb the precious and semi-precious stones wastage at mining level.

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 and renewable technologies. All these efforts are dedicated to socio-economic uplift through application of Science & Technology in all sectors of the economy for a prosperous future.

I am confident that these efforts will reap benefits in the near future and accelerate the socio-economic development of Pakistan.

Mr. Ghulam Muhammad Memon

Secretary
M/o Science & Technology

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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)

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, PMEBA, 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) including National Physical & Standards Laboratory (NPSL).
- Pakistan Council for Science & Technology (PCST) including Pakistan Technology Board (PTB).
- Scientific & Technological Development Corporation (STEDEC).
- Council for works and Housing research (CWHR).
- 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,
Ministry of Science & Technology**

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

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, I T & 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

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
Total:		76

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 2021-2022, International Liaison Wing has been undertaking coordination focusing on the following activities within the framework of bilateral cooperation with different countries and multilateral cooperation with Regional, International organizations.

- **Bilateral Cooperation:**

International MoUs signed during report period

- Document of Understanding between COMSATS University Islamabad and General Sir John Kotelawala Defence University (KDU) Ratmalana **Sri Lanka.**

- Declaration of Partnership between Centre for International Peace and Stability (CIPS), National University of Science and Technology (NUST) Islamabad of the Islamic Republic of Pakistan and Korea International Peace Operations Centre (KIPOCENT), **Korea**.
- Protocol on Establishment of Ground Station for Marine Remote Sensing between the State Oceanic Administration of the People's Republic of **China** and the Ministry of Science and Technology of the Islamic Republic of Pakistan.
- Agreement between the National University of Technology, (NUTECH), Islamabad and the Rainbow Cooperative Society, **Japan**.
- Memorandum of Understanding (MoU) between The **United Nations** Entity for the Gender Equality and the Empowerment of Women & Centre of International Peace and Stability at National University of Science and Technology for training and development of peacekeepers on gender equality and protection of women.
- Agreement between the Government of the Islamic Republic of Pakistan and **Economic Cooperation Organization Science Foundation** (ECO-SF).
- Memorandum of Agreement between Pakistan Museum of National History (PMNH), Pakistan and Department of Zoology Comenius University, Bratislava **Slovakia**.
- Memorandum of Agreement between National University of Science and Technology (NUST), Pakistan and University of Electronic Science and Technology (UESTC), Chengdu, China.
- **International MoUs under Process**
- Memorandum of Understanding between Department of Science Service Thailand and Pakistan Scientific and Technological Information Centre (PASTIC) the Islamic Republic of Pakistan.
- Memorandum of Understanding between Pakistan Standards and Quality Control Authority of the Islamic Republic of Pakistan and Thai Industrial Standards Institute, Kingdom of the Thailand.
- Memorandum of Understanding between COMSATS University Islamabad, Pakistan and Curtin University, Australia is in process of signing.
- Memorandum of Cooperation in the field of basic research between the National Academy of Sciences of the Republic of Tajikistan and the Pakistan Council of Research in Water Resources Government of the Islamic Republic of Pakistan.
- Memorandum of Understanding between National University of Technology (NUTECH) Islamabad, the Islamic Republic of Pakistan and University of Rome Tor Vergata Rome (UoRTV), the Italian Republic.
- Memorandum of Understanding between Pakistan Science Foundation (PSF) Pakistan and Children & Youth Science Centre of CAST, China.
- Memorandum of Understanding on Scientific and Technological Cooperation between PCRET and Hangzhou Regional Center (ASIA-PACIFIC) for Small Hydro Power, Ministry of Water Resources, China.
- Memorandum of Understanding between COMSATS University Islamabad (CUI), Islamabad, Pakistan and University of Vienna (UV), Austria is under process.
- Memorandum of Understanding between University of the Gambia and COMSATS University Islamabad has approved for signing.

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 01 scientist has availed this programme during the Financial Year 2020-21 due to Covid restrictions from Chinese Government.

Cooperation at Multilateral Forum

MoST, is the Focal point/ Ministry for the following Intergovernmental and Regional Organizations and facilitates them in the activities mentioned below:-

- **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).

Shanghai Cooperation Organization: IL-Wing, MoST has successfully organized the 6th Meeting of the Permanent Working Group on Scientific-Technical Cooperation of the Member States of the Shanghai Cooperation Organization in Virtual format on 16th March, 2022 under the chairmanship of Pakistan.

Participation in Meetings / Training Workshops and Seminars abroad:

During the FY 2021-22, many Scientists / Engineers and officers from MoST and its S&T organizations participated online, because of Covid19 travel restrictions, only nine 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 2020-21:

- 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
-
- Successfully held the 2nd meeting of Joint Working Group (JWG) on April 20, 2022 through video link under the chairperson Secretary MoST.
 - Under CPEC 3 Key Projects shortlisted by Prime Minister Office which has been submitted to the Planning Commission for further processing.
 - Successful implementation of 13 projects under the 18th protocol on scientific and technological cooperation between Pakistan and China.
 - 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 near future during Pak-China 11th Joint Coordination Committee (JCC) meeting.

Technology Wing

Introduction

Technology Wing has been entrusted to initiate and monitor various programmes for technology development and industrialization in the country. This wing also acts as liaison between various ministries and national and international bodies for the development of Science & Technology. The wing is headed by a Joint Technological Adviser, assisted by one Deputy Technological Adviser and two Assistant Technological Advisers.

Objectives & Functions

- Promotion and development of industrial technologies
- Promotion of Metrology, Standards, Testing and Quality Assurance System
- Promotion of mechanism and procedures to provide for effective conservation and efficient use of energy
- Establishment of accreditation system for testing laboratories and certification bodies across the country
- WTO / TBT affairs relating to PSQCA
- Technical matters of PCSIR, PNAC, PSQCA, PEC, PHA and NEECA

MAJOR ACTIVITIES CARRIED OUT BY TECHNOLOGY WING:

- **Formulation of National Industrial Hemp & Medicinal Cannabis Policy**
As per the direction of Prime Minister's Office, the following initiatives have been taken:
 - Constitution of the Committee for the formulation of National Industrial Hemp and Cannabis Policy
 - National Industrial Hemp and Cannabis Policy has been formulated with consultation of relevant stakeholders including government and private sectors. Prime Minister's Office conveyed the approval of National Industrial Hemp & Medicinal Cannabis Policy.
 - National Industrial Hemp and Cannabis Policy has been submitted to Cabinet Division for approval of the Federal Cabinet.
- **Formulation of Pakistan National Quality Policy**
 - Pakistan National Quality Policy (PNQP) has been formulated and duly approved by the Federal Cabinet for implementation across Pakistan.
- **Development of Minimum Energy Efficient Standards (MEPS)**
 - Standard with star rating for energy efficient Geyser has been developed by PSQCA / Ministry of Science & Technology for the conservation of natural Gas. This initiative will save 21.5 MM CFD of natural gas
 - Electric fans consumes 50% of electricity for space cooling in Pakistan. Traditional electric fans consumes approximately 120 watts. Ministry of Science & Technology has included electric fans in Mandatory Certification Scheme of PSQCA. This will prohibit the manufacturing and sale of electric fans, consuming more than 80 watts. This initiative will save huge amount of electricity
- **Pakistan Regulatory Modernization Initiative (PRMI)**
In light of the Pakistan Regulatory Modernization Initiative Strategy (PRMI), the following initiatives have been taken:
 - Elimination of multiple inspections of PSQCA for grant of license (from 3 inspections to 1 inspection during preliminary inquiry, then formal inspection and finally a verification visit by Senior Officer)
 - Amendments made in Conformity Assessment Rules for online filing and processing of licensing applications, fixing timeframe for inquiry, inspection and grant of license
 - Ministry of Science & Technology took the lead in harmonization of food standards and resolution of constitutional and legal ambiguities amongst Federal and Provincial Authorities. With approval of CCI, the formulation of Pakistan standards rests with PSQCA while the role of enforcement is assigned to Provincial authorities. As a result, all the provinces have adopted the national standards.
 - Inclusion of electric fan in the mandatory list of PSQCA
 - Actively participated in Pakistan Single Window (PSW) initiative for ease of doing business
- **Inclusion of items in the Mandatory list of PSQCA**
 - 63 more Food & Non-Food items have been included in the Mandatory list of PSQCA

Memorandum of Understanding / Agreement

The following MoU / Agreement has been vetted and approved:

- MoU between PCSIR and M/S Agrizone(SMC-Pvt. Ltd.) for Leasing PCSIR-Fuel Research Center (FRC's) Developed Product to M/S Agrizone(SMC-Pvt. Ltd.)

Membership of the Committees

Technology Wing is the member of following committees of different organizations and actively participates in their core meetings:

- Auto Industry Development Committee (AIDC),EDB
- High Level Committee between Civil and Military organizations
- National Energy Efficiency & Conservation Authority (NEECA), Technical Committee
- National Bio-Safety Committee (NBC), Ministry of Climate Change
- Pakistan Engineering Council, Governing Body
- National Technology Council (NTC), HEC
- National Computing Education Accreditation Council
- National Vocational and Technical Training Commission

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 Physical Standard Laboratories (NPSL) etc.

POLICY AND COORDINATION (P&C) WING

Introduction:

Policy & Coordination Wing is headed by Joint Scientific Adviser (JSA), assisted by a Deputy Scientific Adviser and Assistant Scientific Adviser 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 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 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. This year credential of 86 scientists were evaluated and forwarded to Cabinet Division for Awards Sub-Committee meeting on Science, Engineering and Education.

Formulation of Draft National Science, Technology and Innovation Policy-2022

- Draft National Science, Technology and Innovation Policy was forwarded to Federal Ministries/Organizations, Provincial Departments/Organizations and Universities for their comments/input on the Draft National Science, Technology and Innovation Policy-2022.
- National Science, Technology and Innovation Policy got approved from the Cabinet on 11th January, 2022.
- Federal Ministries/Organizations, Provincial Departments/Organizations were requested for their input as a process of Consultation with Stakeholders for Preparation of Action Plan of National Science, Technology and Innovation (STI) Policy-2022.

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.
- Performance Report of MoST and its attached organizations was prepared for onward submission to Prime Minister's Office.
- Provided input on draft National Vaccine Development Policy prepared by COMSTECH.

Coordination with other Ministries/Participation of P&C Wing

- Provided input to the Ministry of Planning, Development and Special Initiatives on Stakeholders Consultations to Formulate Policy Reforms / Actions Under the Three-Year Rolling Growth Strategy (3 YRGS), that included:
 - (i) Action Matrix (ces)
 - (ii) Comprehensive report/chapter
- Provided information to National Defence University, Islamabad on Research Topics -2022-2023
- Provided input on High Impact Initiatives of Performance Agreements 2021-2022 and 2022-2023 for onward submission to Prime Minister's Office.
- Provided a list of potential experts in the Science & Technology Sector and its role in the socio-economic development of the country to M/o Planning, Development & Special Initiatives for holding the Turnaround Pakistan (TAP) Conference.
- Provided information on Revival of Composition of National R&D Architecture to JSHQ, Rawalpindi.
- Coordinated with National Center for Cyber Security for expert opinion/comments on Draft National Policy on Cyber Security-2021.
- Forward the Briefing Material on the National University of Science and Technology (NUST) to the President's Secretariat (Public), Islamabad.
- Forward the Briefing Material & Minutes of Follow-up Briefing on the National University of Science and Technology (NUST) to the President's Secretariat (Public), Islamabad.

Workshops, Conferences and Meetings

- Monthly Progress Reports Review meetings of Organizations of MoST.
- Organized a consultative meeting/discussion on 12th July 2021 in the Committee Room of the Ministry of Science and Technology, Islamabad chaired by the honorable Federal Minister for Science and Technology.
- Organized meetings on the Action Plan of National Science, Technology and Innovation Policy-2022 under the chairmanship of Secretary, MoST in the Committee Room of MoST.
- A meeting on 28th October 2021 in the Committee Room of the Ministry of Science and Technology to integrate the Ministry of Science and Technology's priorities with the Three-Year Rolling Transformation Strategy proposed by the Planning Commission under the chairmanship of Secretary, MoST.
- To organize a meeting on 03-1-2022 regarding "Investing in Sustainable Futurist Catalysts Propellers" for the preparation of the Three Years Rolling Growth Strategy (3YGRS) under the chairmanship of the Secretary, MoST in the Committee Room of MoST.
- Attended the meeting on 13.1.2022 Three Years Rolling Growth Strategy: Operationalization of Strategic Trade Policy Framework (STPF) 2020-2025 under the chairmanship of Secretary at Ministry of Commerce, Islamabad
- "Investing In Sustainable Futuristic Catalysts/ Propellers of Growth for Preparation of Three-Year Rolling Growth Strategy (3YGRS)", the first meeting of the Working Group was organized on Zoom on 17.1.2022 in the Committee Room of MoST, attended by representatives of organizations of MoST, Strategic Planning Division, M/o Planning Development & Special Initiatives, S&T, P&D Departments of all provinces.
- To organize the Second meeting of the Working Group on "Investing In Sustainable Futuristic Catalysts/Propellers of Growth for Preparation of Three-Year Rolling Growth Strategy (3YGRS)" on Zoom on 7th February 2022 in the Committee Room of MoST under the chairmanship of Secretary, MoST.

- Attended the meetings on Review and Comments on Draft Regulations on “the Pakistan Environmental Protection Agency, Review of IEE and EIA Regulations, 2021” at Pakistan Environmental Protection Agency, Islamabad.
- Attended the workshop for the project on “Strengthening of National Legislation and Capacity Building of Stakeholders for Sound Chemicals and Hazardous Waste Management in Pakistan” on 6.1.2022 under the chairmanship of Minister of State, Ministry of Climate Change at Ministry of Climate Change, Islamabad.
- Attended the 12TH Defence Production Research & Development (DP R&D) Board Meeting on 17th May 2022 at Gen. Sharif Hall, JSHQ.
- Attended the Consultative Meeting on 18.11.2021 at National Security Division, Prime Minister’s Office Islamabad under the chairmanship of Secretary, National Security Division.
- Attended the meetings of the Main Awards Committee and Awards Sub-Committee for Science, Engineering and Education at Cabinet Division for Civil Awards 2021 and 2022.
- Attended the meetings of the Expert Committee to discuss the Draft Inception Report and Questionnaires for the Project Titled, “Need Assessment of S&T Human Resources for Driving Innovation and Achieving Vision 2025” at PCST.
- Attended the meeting on projects of PCST (i) “Need Assessment of S&T Human Resources for Driving Innovation and Achieving Vision 2025” and (ii) First Industrial National Innovation Survey (FINIS) on 9.7.2021 under the chairmanship of Secretary, MoST at Secretary Office, MoST.
- Attended the meetings to discuss the draft agenda for the upcoming 7th meeting of the Executive Committee of the National Commission for Science & Technology (ECNCST) at PCST.
- Attended the meeting to discuss the Draft Science and Technology Trust Fund Act 2021 on 14.7.2021 in the Committee Room of MoST.
- Attended the meetings of Selection Board COMSATS University from 28.7.2021 to 11.8.2021 at COMSATS University, Islamabad.
- Attended meeting to discuss/finalized the panel of Scientists/Technologists for the member of NCST on 12.8.2021 at PCST.
- Attended Programme of Cooperation between PCRWR & FGEHA on water issues, MoU signing ceremony held at MoST on 12.8.2021.
- Attended meetings of the National Agriculture Education Accreditation Council (NAEAC) at Higher Education Commission, Islamabad.
- Attended Meetings of the Coordination Committee regarding National Electronic Policy (NEP) under the chairmanship of Joint Electronics Adviser at MoST.
- To organize a Meeting of the committee regarding National Startup Policy 2021 on 25.11.2021 in the committee room of MoST.
- Attended meeting on National Consultation for Pakistan Clean Air Action Plan on 17.12.2021 in the Committee Room at Ministry of Climate Change, Islamabad.
- Attended Interactive Session with Stakeholders to develop an understanding of Halal Certification Bodies to make Pakistan Halal Products globally acceptable on 24.12.2021 at Islamabad Club.
- Attended ceremony on a study visit of 300 students of Science Talent Farming Scheme (STFS) on 23.12.2021 at Best Western Premier Hotel, Islamabad.

- Attended a Meeting on Post Induction and In-Service Training for Ex-Cadre and Non-cadre Officers on 27.12.2021.
- Attended Consultative Meeting on WaterAid-PCRWR on Water Resource Legislation in Islamabad on 13.1.2022 at PCRWR Head Office, Islamabad.
- Gave a presentation on National Science, Technology & Innovation Policy-2022 on 21.1.2022 in the Committee Room of MoST.
- Attended meetings of the Project Execution Committee under PSDP Projects Titled “Data Repository of Scientific Instrumentation in the committee room of PCSIR under the chairmanship of chairman PCSIR.
- Attended Meetings of the Natural Sciences Linkage Programme (NSLP) Fund Management Committee at PSF, Islamabad.
- Attended meeting on Elective implementation of the Action plan of National Science, Technology and Innovation Policy 2022 on 16.3.2022 under the chairmanship of Honorable Federal Minister for Science and Technology in the committee room of MoST.
- Attended meeting on Formulation of Joint Working Group of MoST and STZA for future collaboration on 31.3.2022.
- Attended meetings on “First Industrial National Innovation Survey (FINIS)” at PCST.
- Attended launching seminar for Developing National Productivity Master Plan on 13.4.2022 (on zoom).
- Attended 27th Executive Committee Meeting (ECM)-2022 on 23.5.2022 under the chairmanship of Rector, NUST at NUST, Islamabad.
- Attended Turnaround Pakistan (TAP) Conference on 28.6.2022 at Jinnah Convention Centre, Islamabad.

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 2021-2022:

S.#	DATE	SUBJECT
1.	6-7-2021	DAC meeting was held to discuss the Audit Report (Civil) for the years 2010-11 & 2011-12 on the account of Ministry of Science & Technology, Islamabad.
2.	6-7-2021	DAC meeting was held to discuss the Appropriation Accounts for the years 2010-11 & 2011-12 relating M/O: Science & Technology, Islamabad
3.	6-7-2021	DAC meeting was held to discuss the Proposed Draft Paras for the years 2010-11 & 2011-12 on the accounts of Pakistan Science Foundation (PSF), Islamabad.
4.	23-8-2021	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Civil) for the year 2010-11 & 2011-12 on the accounts of MoST.
5.	23-8-2021	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Commercial Audit) for the year 2010-11 & 2011-12 on the accounts of MoST (PSF).
6.	15-12-2021	DAC meeting was held to discuss the Audit & Inspection Report on the Accounts of Up-gradation & Modernization of Building of PCSIR lab Complex, Karachi for the year 2007-2017 (Audit Year 2017-18) and Audit & Inspection Report on the Accounts of Balancing & Modernization & Refurbishment (BMR) of PCSIR, Lahore for the year 2007-2017 (Audit Year 2017-18) (Works Audit).
7.	10-1-2022	DAC meeting was held to discuss the Appropriation Accounts for the year 2018-2019 relating M/O: Science & Technology, Islamabad
8.	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.
9.	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.
10.	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 2018-19 on the accounts of MoST.
11.	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.
12.	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.
13.	13-4-2022	DAC meeting was held to discuss Special Audit Report on MoST Building for the year 2017-18.

Non-Development Allocation and Expenditure for the Year 2021-22:

S.NO.	NAME OF ORGANIZATION	FINAL GRANT 2020-2021	EXPENDITURE
1	MINISTRY OF SCIENCE & TECHNOLOGY INCLUDING SCIENCE COUNSELLOR OFFICE AT BEIJING (CHINA)	334.639	300.466
2	PAKISTAN COUNCIL FOR SCIENCE & TECHNOLOGY.	86.935	86.922
4	PAKISTAN SCIENCE FOUNDATION.	342.498	342.490
5	PAKISTAN MUSEUM OF NATURAL HISTORY.	178.685	178.679
6	PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE.	209.400	209.400
7	NATIONAL INSTITUTE OF ELECTRONICS.	244.000	243.984
8	NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY.	3,343.542	3,343.542
9	PAKISTAN NATIONAL ACCREDITATION COUNCIL.	50.880	50.879
10	PAK: COUNCIL OF RENEWABLE ENERGY TECHNOLOGY.	123.573	115.850
11	PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES.	480.000	479.340
12	NATIONAL PHYSICAL STANDARD LABORATORY.	244.800	244.800
13	PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH.	3,150.750	3,150.749
14	NATIONAL UNIVERSITY OF TECHNOLOGY.	871.000	871.000
15	NATIONAL INSTITUTE OF OCEANOGRAPHY.	202.780	199.819
16	COUNCIL FOR WORKS AND HOUSING RESEARCH.	126.410	126.410
17	PAKISTAN HALAL AUTHORITY	21.004	19.984
18	COMSTECH.	200.000	200.000
19	COMSATS	40.300	40.300
20	ECO-SF.	24.000	24.000
21	COMSATS University Islamabad.	109.090	109.090
	GRAND TOTAL:-	10,384.286	10,337.704

Electronics Wing (2021-22)

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.
- Data regarding preparation of Year Book of MoST 2020-21 was collected from organizations/wings of MoST, examined/vetted/finalized and uploaded it on website of MoST after approval of competent authority for the information of general public.

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, presently working as National Physical and Standards Laboratory (NPSL)**

A Bill for the establishment of National Metrology Institute of Pakistan, presently working as NPSL was passed by the National Assembly on 13.01.2022. The same was passed by the Senate on 28.01.2022 with minor amendments and referred to National Assembly in terms of Article 70(2) of the Constitution of Islamic Republic of Pakistan.

- **Pakistan Engineering Council (Amendment) Bill**
As per the recommendation of the Senate Standing Committee on Law & Justice, the PEC Amendment Bill is under consideration at MoST, as per the Rules of Business, 1973.
- **Pakistan Standards and Quality Control Authority (Amendment) Bill**
As per the recommendation of the Senate Standing Committee on Law & Justice, the PSQCA Amendment Bill is under consideration at MoST, as per the Rules of Business, 1973.
- **Amendment Bills of PNAC, NIE, PCSIR & PSF**
As per the Judgement of the Supreme Court of Pakistan for substituting the word “Federal Government” with appropriate authority(ies) in the Acts/Rules of the respective organization of the Ministries/Divisions, the PNAC, NIE, PCSIR and PSF Amendment Bills were initiated and circulated for inter-ministerial consultation, as per the Rules of Business, 1973. Comments received till 30.06.2022 were compiled and forwarded to the relevant organizations for their consideration and incorporation in their respective Bills.
- **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 are assessing the current status of industry, academia and research, based on the available data of Electronics Industry in the country, as per the prescribed questionnaire to identify issues/problems being faced by the Electronics Industry and will propose short, medium and long term goals and suggest measures to achieve these goals.

E-Government

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.

Alternative Energy Development Board (AEDB)

- Joint Electronics Adviser, MoST participated in the 55th BoG meeting of the Alternative Energy Development Board (AEDB) on behalf of Secretary, Ministry of Science & Technology.
- Deputy Electronics Adviser, MoST attended the 56th BoG meeting of AEDB on behalf of Secretary, Ministry of Science & Technology.
- Additional Secretary, MoST attended the 57th BoG meeting of AEDB on behalf of Secretary, Ministry of Science & Technology.

Bahria University

- Deputy Electronics Adviser attended the 45th and 46th BoG meetings of Bahria University to represent Ministry of Science & Technology.

Air University

- Secretary, Ministry of Science & Technology is member of the BoG of Air University. Joint Secretary (Admn.) attends the meeting on behalf of Secretary, MoST. Working papers/minutes are processed in Electronics Wing.
- Processed the case for approval of Balance Sheet and Profit/Loss Statement for FY 2019-20 of Air University and Fazaia Medical College & Endowment Trust Deed of AU and NCCS through circulation as the meeting of the BoG could not be held.

Pakistan Institute of Engineering and Applied Sciences (PIEAS)

- Secretary, Ministry of Science and Technology is Member of the Board of Governors of PIEAS. Deputy Electronics Adviser attends the meeting on behalf of Secretary, MoST. Working papers/minutes are processed in Electronics Wing.

Karachi Tools, Dies & Moulds Center (KTDMC)

- Joint Electronics Adviser attended the 54th, 55th, 56th and 57th BoD meetings and respective Human Resource and Audit Committee meetings of Karachi Tools, Dies & Moulds Center (KTDMC) on behalf of Secretary, MoST.

COMSATS Internet Services (CIS)

- Joint Electronics Adviser attends the meeting of Board of Management of CIS to represent MoST. Working papers/minutes are processed in Electronics Wing.

Activities of Electronics Wing

- Prime Minister Office assigned the tasks under Performance Agreement 2020-21 to MoST. The Electronics Wing coordinated with STEDEC for completion of the assigned tasks on given timelines.
- Task for Formulation of National Start-up Policy was assigned to the Electronics Wing under Prime Minister's Ehsaas Program. 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.
- 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 for formulation of Restructuring Plan of STEDEC.
- Electronics Wing was assigned the task to develop an indigenous Electronic Voting Machine (EVM) by the Prime Minister of Pakistan to be used by Election Commission of Pakistan (ECP) to make the electoral process transparent, secure and impartial. The technical team has developed a prototype of EVM as per the given timelines.
- Assistant Electronics Adviser has been nominated as focal person for coordination with National Telecom and Information Technology Security Board (NTISB), Cabinet Division for IT Security Audit of MoST.
- 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.
- Assistant Electronics Adviser is working on proposals for Tech Tsunami in collaboration with STZA and Kamyab Jawan Program.
- Attended meetings with FinTech American Company for creation of e-Learning platforms and online jobs for local graduates.
- Assistant Electronics Adviser attended the 2nd Inter-Ministerial Committee meeting 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.
- Assistant Electronics Adviser coordinated with PSQCA for drafting of Standards on Electric Vehicles Battery Safety, Recycling and Disposal (EVBSD).
- Deputy Electronics Adviser has been nominated as focal person of MoST for consultation for the "Development of Digital Health Framework" with Azad Jammu & Kashmir, Gilgit Baltistan and Islamabad Capital Territory, a project initiated by Ministry of National Health Services Regulations and Coordination.

Parliamentary Business

Electronics Wing forwarded 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 2021-22:

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 2021-22

Following is some of the key highlights of the progress made on the development side by MoST during 2021-22:

- 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 1062 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 1062 applicant SMEs, a total of 657 applicant firms have been approved for award of the Incentive Grant amounting to Rupees 225.000 Million. Out of 1062 applicants, 150 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 Sixty two (62) 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 4 batches of students (1200 total) completed. Monetary benefits to 282 Students of 5th batch for one year made. Local study visit for 300 students of 4th batch has been arranged successfully from 20 – 25 December, 2021. Under the scheme, Pakistan Science Foundation has paid monetary benefits to 600 students. 650 Laptops have been distributed among 1st and 2nd batch whereas another 300 Laptops are in pipeline for 3rd batch students. 1st, 2nd and 3rd batch students completed 144 research projects under university mentors. 5th batch students have been allocated to Mentors.
- **COMSATS University, Islamabad (CUI)** has produced more than 11,000 publications in the previous years. Both the teaching and research quality standards have earned 2nd place for CUI among 134 universities/ degree awarding institutes in the country. It is satisfying to note that, in its specialized category of education

viz ‘Information Science & Technology’ the university ranks at No.1 in the country. The CUI has signed some 185 Memoranda of Understanding with leading universities of the world, like University of Illinois at Urbana-Champaign, USA, Karlsruhe Institute of Technology, Germany, Tampere University, Finland, Lancaster University, UK for promoting exchange of students, and many more. The current enrollment is over 36,000 in 100-degree programs. It has an alumni base of over 68,991 including 700 PhDs whose number is growing by each passing semester. The heartwarming fact is that the graduates are not only gainfully employed, but a good number of them are entrepreneurs creating jobs themselves. The full-time faculty strength is more than 2,600 including 1,077 holding PhDs.

- **National University of Science & Technology (NUST) and National University of Technology (NUTECH)** are performing their best in research and implementation of new ideas despite the Covid-19 situation. During the current financial year (2021-22) NUST has started 3 new 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 and Accreditation of Laboratories in Accordance with ISO. These projects will be completed in the next two financial years and will create new opportunities and research facilities for the NUST.
- **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. Establishment of Precision Systems Training Centre (PSTC) and PCSIR Laboratories at Gwadar, Balochistan, is also underway and will be completed in CFY. These laboratories at Gwadar 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. Land (5 acres) acquired from Gwadar Development Authority (GDA) and construction of building is almost complete. Now furniture and fixture is being purchased.
- **Up-Gradaation of Polymers and Plastics Laboratory at PCSIR Laboratories Complex, Lahore** have purchased Eight laboratory equipment (FTIR, Density Meter, TGA, Viscometer, Oven, Furnace, pH Meter, Gloss Meter, Water Bath and 49 Items of Laboratory Apparatus and 18 Items of Chemicals/Solvents have been purchased. 75% of released funds have been utilized for purchase of Chemicals / Solvents, Glassware.
- **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, immune-modulatory agents and vitamin B12. A downstream processing facility for producing APIs will also be established in the PCSIR Labs. Furthermore, technology transfer will result in enhanced capability within PCSIR to carryout R&D in this area.
- **In Health Sector**, MoST is undertaking the project Establishment of Center for Advanced Technologies in Biomedical Materials which is underway at CUI Lahore Campus. Being a relatively smaller market for specialist equipment and chemicals/consumables, their procurement in Pakistan is time intensive and often subject to several additional processes such as 3rd party export/import approvals etc. The project is going to be completed in the CFY 2021-22. At Establishment of a Center for Artificial Intelligence in Health Sciences under Dr. Panjwani Center for Molecular Medicine and Drug Research, University of Karachi The renovation is completed and labs are assigned. The networking for the hi-speed internet and other amenities is in installation phase. This project is also going to be completed in current financial year. MoST is undertaking Up gradation of Medicinal Botanic Center as National Center for Herbal Medicine at PCSIR Peshawar and it has Procured 11 No. of equipment, Chemicals & glassware as per demand, Tender for Civil Works floated, opened, evaluated and submitted.
- **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 Nano-technology Center is fully functional with respect of civil works (HEJ Contribution). Purchased equipment have been installed in respective labs. Procurement of major laboratory equipment are in progress. Most of the items have been finalized and recommended for purchase by the Technical Committee of the Institute
- **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 2021-22, an amount of **Rs. 3,047.131 Million was allocated** to Ministry of Science & Technology. This allocation included **34 on-going projects of MoST and 10 projects of Task Force on S&T**. Out of this, Rs. 3030.693 Million have been released and utilized so far. During this financial year 04 projects have been completed and one Project on Knowledge Economy titled “Pak University of Engineering and Emerging Technologies (PUEET)” is transferred to Higher Education Commission (HEC) on the directions of PM Office.

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.

- Research & Development on Electric Vehicle conversion kits has been initiated.
- Design & analysis of various Integrated Circuits using Cadence Design Tools.
- Development of Artificial Intelligence based vehicle detection system.
- Design & development of IoT based automation solutions.
- Design and development of different ratings smart LED lights.

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

- Advanced training on PLC, HMI & SCADA provided to 10 professionals.
- Training provided to 28 officials from public sector organizations on measurement uncertainty for implementation and maintenance of ISO/IEC 17025: 2017 accreditation.
- Advance training provided to 75 students under PM Kamyab Jawan Program.
- Advanced training on Integrated Circuit (IC) design provided to 07 engineers.
- Short courses in different areas of electronics conducted for 130 students.
- 10 mechanics have been trained on latest automotive diagnostics technology.
- General Internship/training provided to 113 engineers from different universities of Pakistan.
- 23 Industrial visits conducted for different engineering universities of Pakistan.
- 03 Final Year Projects (FYPs) of engineers from different universities are in progress 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 following universities for promotion of indigenous product development and joint R&D programs:
 - National University of Modern Languages (NUML), Islamabad.
 - Dr. A.Q Khan Institute of Computer Sciences and Information Technology, Kahuta Campus.

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

- A total number of 300 Printed Circuit Boards (PCBs) developed for following universities and R&D organizations:
 - NESCOM, Islamabad
 - Pakistan Telecommunication Company Ltd. (PTCL)
 - National University of Sciences & Technology (NUST)
 - COMSATS
 - Air University
 - EME College
 - Pakistan Aeronautical Complex (PAC) – Kamra
 - COMCEPT (Pvt.) Ltd.
 - RWR (Pvt.) Ltd.
 - UET Taxila, Peshawar
 - Intercon Systems
 - CUI, Sahiwal Campus

- More than 98 quality testing and calibration services have been provided to multiple customers.
- 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

- IEEE International Conference on Microwave, Antennas & Circuits was jointly organized by NIE & NUST on 20-21st December, 2021.
- Seminar on opportunities & challenges in semiconductor chip design industry was organized on 28th March, 2022.

Budget Allocation for R&D during F/Y 2021-22

A total of Rs. 10 Million was allocated for Research and Development work during financial year 2021-22. NIE started different projects related to defence, commercial and Human Resources Development. Work on new technologies was initiated i.e. 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.

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

- **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	02-day Training Course Documentation based on ISO/IEC 17025:2017	05-06 August, 2021
2	3-day Training Course on Laboratory Management System and internal auditing	1-3 September 2021
3	3-day Training Course on Laboratory Management System and internal auditing based on ISO/IEC 17025:2017	12-14 September 2021
4	3-day Training Course based ISO/IEC 17021-1:2015	15-17 September 2021
5	5-day Training Course on Laboratory Management System Implementation based on ISO 15189	20-24 September 2021
6	3-day Training Course on Laboratory Management System and internal auditing based on ISO/IEC 17025:2017	28-30 September 2021

7	Assessor Training Course based on ISO 15189:2012	04-08 October 2021
8	04 days Training Course based on ISO/IEC 17065:2012 and Global GAP	26-29 October, 2021
9	2-day workshop on ISO 15189	22-23 February 2022
10	03 days Training Course based on ISO/IEC 17065:2012, ISO/IEC 17067, Organic Certification and Global GAP	15-17 March 2022
11	2-day Training Course on Documentation Requirements based on ISO/IEC 17025:2017 in Karachi	30-31 March 2022
12	Harmonization Meeting PNAC Technical Assessors/Experts (Testing and Calibration Labs) (Remotely)	12 th April 2022
13	Harmonization Meeting PNAC Technical Assessors/Experts (Medical Labs) (Remotely)	13 th April 2022
14	Training Course on ISO/IEC 17065 and ISO/IEC 17067 including GlobalGAP and Organic Certification (Remotely)	30-31 May 2022
15	2-day Training Course on Documentation Requirements based on ISO/IEC 17025:2017 in Lahore	21-22 June 2022
16	2-day Training Course on Documentation Requirements based on ISO/IEC 17025:2017 in Islamabad	27-28 June 2022

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 (2020-21)

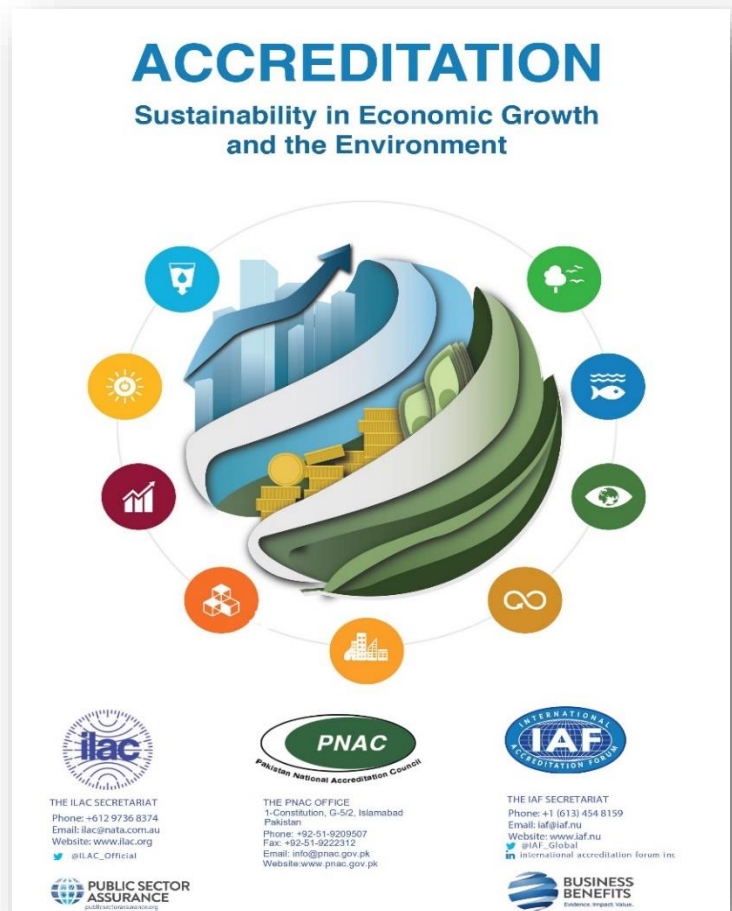
In the past two years the trend of getting accreditation has increased tremendously.

ACCREDITATION SCHEMES (Indicators)	Total Accreditations Achieved So far
	2021-22
ISO/IEC 17025:2017 (<i>General requirements for the competence of testing and calibration laboratories</i>)	228
ISO/IEC 17020:2012 (<i>Conformity assessment -- Requirements for the operation of various types of bodies performing inspection</i>)	14
ISO/IEC 17021-1:2015 (<i>Conformity assessment -- Requirements for bodies providing audit and certification of management systems -- Part 1: Requirements</i>)	10
ISO 15189:2012 (<i>Medical laboratories -- Requirements for quality and competence</i>)	26
PS: 4992 Pakistan Standard Halal Certification Bodies	08
ISO/IEC 17043:2010 (<i>Conformity assessment -- General requirements for proficiency testing</i>)	04
ISO/IEC 17065:2012 (<i>Conformity assessment -- Requirements for bodies certifying products, processes and services</i>)	01
ISO/IEC 17024:2012 (<i>Conformity assessment -- General requirements for bodies operating certification of persons</i>)	01

World Accreditation Day:

Pakistan National Accreditation Council (PNAC), Ministry of Science and Technology has celebrated World Accreditation Day on 9th June 2022 and organized a seminar at Peral Continental Hotel Lahore. There were more than 200 participants from Conformity Assessment Bodies (CABS), Regulators, Manufacturers and consumers. The theme of the seminar was “Accreditation: Sustainability in Economic Growth and the Environment”. This seminar also highlighted the Role of the Pakistan National Accreditation Council, Need and Importance of Accreditation for Pakistan Economy.

The seminar was conducted in two sessions. The inaugural session started with the recitation of Holy Quran followed by the National Anthem. The guest of Honor Engr. Javed Saleem Qureshi appreciate the efforts of PNAC to promote the quality culture in the country and emphasized on the awareness of accreditation. During the inaugural session welcome address was given by DG PNAC Ms. Ismat Gul Khattak who highlighted the importance of accreditation towards the implementation of Sustainable Economic Growth and the Environment. Mr. Azhar Iqbal, Director PNAC gave a presentation on “The Role of Accreditation in Economic Growth”.



6.0 8th Meeting SAARBC EXPERT ROUP ON ACCREDITATION (SEGA):

The 8th SEGA meeting was hosted this year by PNAC remotely on 30th June & 1st July. Director General PNAC Ms. Ismat Gul Khattak was the Chairperson for the meeting. The meeting was conducted in with collaboration of PTB Germany and SAARC secretariat. Current countries update and future plan to facilitate the trade in SAARC region were discussed.



Picture: SEGA meeting 30 June-1st July 2022.

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 (SMIIC), 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
- Halaal
- Information Technology (IT) & Information Communication Technology (ICT)
- Management Standards System (MSS)
- Mechanical
- Textile
- Weights & Measure

Summary of Pakistan Standards Published

Adopted ISO/IEC/Others standards as Pakistan Standards	= 323
Developed National Standards	= 105
Total Technical Committees	= 144
National Standards Committees	= 08
Total No of Revision Standards	= 351
Total No of Standards Developed/Adopted	= 428

Note :

Some of the Standards have also been adopted / Harmonized from ASTM, ASME, OIML, BS, SARSO, SMIC, Codex Alimentarius.

S. No .	Division	Automobile			Civil			Electrical			Electronics			IT&ICT			Mechanical			G. Total
	Activities	1			2			3			4			5			6			
1	Technical Committee (TC) meeting held	28			10			08			20			11			09			86
2	National Standards Committee (NSC) meeting held	06			02			01			03			03			01			16
3	Participation in balloting of ISO/IEC	00			54			776			513			-			-			1343
4	No. of draft standards finalized in TCs (Revised/Direct Adopted/New)	R*	DA	New	R*	DA	New	R*	DA	New	R*	DA	New	R*	DA	New	R*	DA	New	172
		01	-	08	12	-	31	-	37	-	21	54	-	05	34	02	10	06	-	
5	No. of draft standards approved in NSC	R*	DA	New	R*	DA	New	R*	DA	New	R*	DA	New	R*	DA	New	R*	DA	New	282
		01	-	08	27	149	30	-	33	-	16	53	-	05	34	02	10	07	-	

S. No .	Division	Agri & Food			Chemical			Halaal			MSSD			Textile			W & M			G. Total
	Activities	1			2			3			4			5			6			
1	Technical Committee (TC) meeting held	08			09			14			40			-			10			81
2	National Standards Committee (NSC) meeting held	01			03			02			02			-			08			16
3	Participation in balloting of ISO/IEC	20			20			03			74			-			01			118
4	No. of draft standards finalized in TCs (Revised/Direct Adopted/New)	R*	D A	Ne w	R*	D A	Ne w	R *	D A	Ne w	R *	D A	Ne w	R*	D A	Ne w	R*	D A	Ne w	115
		117	04	59	-	05	01	02	06	02	-	29	01	-	-	-	-	08	-	
5	No. of draft standards approved in NSC	R*	D A	Ne w	R*	D A	Ne w	R *	D A	Ne w	R *	D A	Ne w	R*	D A	Ne w	R*	D A	Ne w	112
		117	04	59	04	-	03	02	08	02	-	30	-	-	-	-	01	06	-	

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 stage 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 PSOCA DURING FINANCIAL YEAR 2021-2022

SL. NO.	TITLE	ACHIEVEMENT
01	Application received	861
a.	New	215
b.	Renewal	646
02	Total Licenses Issued	862
a.	New	197
b.	Renewal	665
03	Quality Assurance Activities:	
a	Inspection	918
b	Sample Collected	2483
c	Test Report Received	1655
D	Conformity	1538
E	Non-conformity	117

DIRECTORATE OF IMPORT & EXPORT, PSOCA:

The progress for the Directorate of Import & Export for the year 2021-22 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: 20910
- No. CAR issued: 15747
- No. of NOC / RC issued: 1589
- No. of Sample sent to Labs.: 21272

QUALITY CONTROL CENTRE (SOUTH), PSQCA, KARACHI

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 (2021-2022):

- New testing facilities established for New added Products
- 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 around **60** Students of different universities, like NED, Jinnah and Karachi University.
- Inclusion of New Mandatory Items upto 166.
- Implementation of Pakistan Single work (PSW) with update new testing facilities in all Labs of QCC.
- Increase in number of samples to be test and for increase in revenue as compare to last year.

Applied for Accreditation For Seven labs Of QCC PSQCA, Karachi

Total No. of parameters Accredited 241,
Total No. of products covered under the accreditation 296.

- **Food Lab**
- **Building Material Laboratory**
- **Water & beverages Laboratory**
- **Water Microbiology**
- **Food Microbiology**
- **Oil & Fat**
- **Sugar Testing Laboratory**

DIRECTORATES OF LEGAL

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

ACHIEVEMENTS / ACTIVITIES

- Out of Court settlement with All Pakistan Cement Manufacture Association regarding outstanding marking fees dues was done and the meeting with the representatives of Cement Industry was held under the Chairmanship of Director Legal at Karachi regarding payment of outstanding dues to the Cement Industry. PSQCA has sent various letters to APCMA regarding recovery of marking fee as per decision of the meeting.
- Four (04) cases of Cement Industry were pending before District & Session Judge, Lahore, Lahore High Court & Honorable Supreme Court of Pakistan at Lahore Registry, Lahore since 2008. The cases were fixed wherein Honorable Supreme Court of Pakistan passed the order in favour of PSQCA.
- As per request by the Three Cement manufacturers for personal hearing, the Competent Authority constituted a committee comprising below mentioned officers:

• Director Legal, PSQCA	(Convener)
• Director Finance, PSQCA	(Member)
• Director CA-Lahore, PSQCA	(Member)
• Director CA-Karachi, PSQCA	(Member)
• Dy. Director Legal, PSQCA	(Member)
• Dy. Director Audit, PSQCA	(Member)
- Three Cement Industries appeared before the above notified Committee, statements were recorded before the above notified Committee and matter finalized in the light of Court Order and personal hearing of Cement Industries.
- PSQCA issued Speaking Order to Four Cement Industries (DG Khan, Gharibwal, Maple Leaf & Dandot) on 21-09-2021.
- M/s. Tapal Tea was in Court of Law since 2009 but the present management of PSQCA took up the matter of marking fee and it has been settled successfully through Sindh High Court vide order with direction to Civil Nazir to release amount of marking fees to PSQCA account deposited by the manufacturer (M/s. Tapal Tea).
- Seventy Four (74) including Food & Non-Food cases have been disposed off.
- **CONFLICT BETWEEN PSQCA AND ALL PROVINCIAL FOOD AUTHORITIES:**

The CCI has issued their decision which gives certain powers to PSQCA being a Federal Entity. CCI decision is at is reproduced below:

“The CCI decided that in order to further improve the Ease of Doing Business and harmonize quality and standards across the Country, the Provinces shall adopt National Standards formulated by Pakistan Standards & Quality Control Authority (PSQCA), Labelling and Certification Marks logo shall also remain with Federal Government/PSQCA. It was also decided that the Registration of business for sale of Food Products, Licensing

of factory establishment for foods products, Enforcement and Monitoring of Food Products shall remain with the Provincial Governments. It was further decided that the Agenda stands implemented and shall not be placed before CCI regarding information of its implementation status.

DIRECTORATE OF WTO-TBT NATIONAL ENQUIRY POINT-PSQCA

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 2021-22
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.	1852 in Nos.
05.	Circulation of TBT Notifications issued by the WTO member countries among the stakeholders.(total in Nos.11, 130).	1852 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.	38 in Nos.
08.	Handling of enquiries (International) on technical regulations, standards and conformity assessment procedures.	07 in Nos.

SYSTEM CERTIFICATION CENTRE (SCC)-SDC, PSQCA, LAHORE



SYSTEM CERTIFICATION CENTER (SCC)
Pakistan Standards & Quality Control Authority (PSQCA)
Ministry of Science & Technology
Government of Pakistan

Overview of System Certification Center
Pakistan Standards & 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 certifications certify that a management system, manufacturing process, service, or documentation procedure has all the requirements for standardization and quality assurance.

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-Good Manufacturing Practice for Cosmetic (GMP)

Member of International & Regional Standardization Bodies

ISO IEC OIML ASTM MADE IN PAKISTAN

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.

- 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 training courses 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

DIRECTORATE OF INTERNATIONAL AFFAIRS AND TRAINING (IATR)

Technical Cooperation Program Between Saudi Standards, Metrology and Quality Organization (SASO) And Pakistan Standards & Quality Control Authority (PSQCA)

Technical Cooperation Program (TCP) between the Saudi Standards, Metrology and Quality Organization (SASO) and Pakistan Standards and Quality Control Authority (PSQCA) was signed by the Honourable Makhdoom Shah Mahmood Qureshi, Minister for Foreign Affairs, Pakistan and Dr. Majid Abdullah Al-Qasabi, Chairman of Saudi Standards, Metrology and Quality Organization (SASO), KSA during visit of His Excellency Crown Prince Mohammad Bin Salman, Kingdom of Saudi Arabia at Prime Minister Secretariat, Islamabad on 17th February 2019 in English/Arabic version. To initiate the Technical Cooperation Program (TCP), an Action-plan on TCP also signed during the sideline meetings of SMIIC-General Assembly on 02nd November 2021 at Makkah Al-Mukarramah-KSA.

Under the framework of Technical Cooperation Program (TCP), bilateral activities on standardization, technical assistance have important and significant role in the steady economic through trade-facilitation.

Photo Gallery





Ambassador of Belarus Mr. Andrei Metelitsa & Mr. Ilya Kanaoplion meet Abdul Aleem Memon Director General PSQCA During his visit on 22-6-2021



PS Mark of Conformity



For the purpose of Conformity Assessment for Voluntary Certification in accordance with the related Pakistan Standard(s) or a standard of any other country recognized by the Authority. [SRO.3(12)/2005-PSQCA(IL)]

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. CWHR was transferred to the Ministry of Science and Technology in June 1971.

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, 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 of technology.

Performance/Outcomes

• Non-Destructive Testing, Contract Research and Consultancy Services

International Research Paper has been published in American Journal of Engineering Research (AJER) with IF 7.2 on 03.06.2022 titled “Reliability of Non-Destructive Test Results for Assessment of Concrete Using Cut and Pull out Test and Rebound Hammer Test (A Case Study)”

The Non-Destructive Testing team successfully investigated the building and conducted NDT testing w.e.f. 08-07-2021 to 30-07-2021 & 02-08-2021 to 11-08-2021 for structural strength, integrity & fitness of Government Building of the Directorates of Electronic Media and Publications at Dadabhoy Housing Society, Karachi at the cost of Rs 737,500/-. NDT team formulated and submitted comprehensive testing report including the following scope:

- Review of historical background of the building
- Preliminary information on the type of building
- Visual inspection of the existing building
- Assessment by basic engineering judgement
- Strength assessment of different structural members by using non-destructive testing viz Cut & Pullout Test (CAPO) Method and Rebound Hammer test in accordance with ASTM Standards.
- Observation of Structural elements including foundations, wall masonry, columns, beams, roof slabs, general environment related to sewage lines, septic tank and etc.

The NDT team of CWHR conducted testing on complementary basis w.e.f. 16-09-2021 to 17-09-2021 to investigate the store old building of PCSIR Laboratories Complex, Karachi and submitted its report to Director General, PCSIR Laboratories Complex, Karachi. The scope of this report was to inspect the store building to find out its structural adequacy in light of structural defects with engineering judgement and suggested possible recommendation with data of CAPO test.

The NDT Section of CWHR has drafted a letter for following stakeholders (both public and private) to create awareness about the scope of Non Destructive Testing in Construction Sector:

- DG, Sindh Building Control Authority, Karachi
- DG, Malir Development Authority, Karachi
- DG, Layari Development Authority, Karachi
- DG, DHA Karachi
- Bahria Town, Karachi
- ABAD, Karachi
- Chairman, CDA, Islamabad
- MD, LDA Lahore
- DG, PDA Peshawar
- DG, QDA Quetta
- DG, Archeology Department KP
- NESPAK, Pakistan
- DESCON, Pakistan
- DG, FWO

• 1st Session of Skill Development and Training to Organizations

The NDT Section of CWHR trained 02 Engineers and 02 Principal Technicians of National Centre for Non-Destructive Testing, Pakistan Atomic Energy Commission, Islamabad at CWHR, Karachi from 1st November to 10th November, 2021 as per CWHR's plan at the cost of Rs. 400,000/-.

The following were the objectives of the training:

- To reinforce the participant's understanding of the importance of quality assurance and quality control (QA/QC) procedures in concrete construction.
- To improve the quality of construction in the field.
- To develop better understanding of NDT techniques.
- As result of this training, the NCNDT engineers/technical staff is expected to be more aware of quality issues and the testing techniques available to ensure that construction meets specified standards.
- To obtain better test results in the field for effective retrofitting/demolishing cases at sites.
- **National Level Research Publication**
A research paper of titled "Reliability of Non-Destructive Test Results for Assessment of Concrete Using Cut and Pull out Test and Rebound Hammer Test (A Case Study)" is on peer review with experts. On finalization, it will be forwarded to HEC recognized Engineering Journal for its publication.
- **2nd Session of Skill Development and Training to Organizations**
NDT section will float a marketing advertisement of NDT Skills in National Daily newspaper for arranging a 2nd session of training plan. Different public sector universities and technical colleges will also be invited to participate in the said training at minimal fees.
- **Key Performance Indicators (KPIs) in respect of Non-Destructive Testing Section**
Over all Achievements of Non-Destructive Testing Section
 - NDT section provided 02 Consultancies/Technical Reports to DEMP, Ministry of Information and Broadcasting and PCSIR Laboratories Complex, Karachi.
 - 01 National Level Paper is under Peer Review with experts.
 - 01 workshop/training was provided to NCNDT-PAEC, Islamabad.
 - Draft letter has been prepared for interaction with more than 17 Clients about awareness of NDT in the field of Construction Sector.
 - 90 services were provided to different clients.
 - Revenue of Rs. 1.1375 Million was generated.

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 Specified Against Which Performance Can be Measured.

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	11905	15442
MS / MPhil	5675	9503
PhD	821	1503
Total	19280	26448

Faculty State

	Present Status	Targets for 2029-30
PhD	747	1400
MS / BS	561	400
Total	1308	1800

Academic Programmes

	Present Status	Targets for 2029-30
UG	41	59
MS	90	114
PhD	63	70
Total	194	243

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

Description	KPIs
(a) To emerge as a leading International University in Higher Education and Research.	<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.
(b) Relevance of education and research with the needs of country's economy & society.	<ul style="list-style-type: none"> i. Become Pakistan's first full scale 3rd Generation University that has greater entrepreneurial international stature / footprint with focus on sustainability to transform it to 4th Generation University. ii. Promote Research & Innovation with focus area that are aligned with national vision, needs and priorities, having greater societal impact and industrial relevance thus contributing towards knowledge economy of Pakistan. iii. Become an SDG-Engaged University with University Academics, Research, Operations & 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.
(c) Establish ecosystem to contribute towards National Innovation System and enhance entrepreneurial character and commercialization of the research output by building a strong Academia – Industry Collaboration (including Defence Industry).	<ul style="list-style-type: none"> i. Encourage entrepreneurial culture at the University through annual Finding Innovative & Creative Solutions for society (FICS) program (In partnership with industry), a grassroot technology scouting initiative to contribute to National Innovation System. ii. Strengthening of Innovation eco-system of NUST and country through Technology Incubation Center and National Science and Technology Park (NSTP) that houses 100+ private sector companies, knowledge workers, researchers, scientists and government reps. iii. Award of Zone Enterprise status to 25 companies of NSTP for concessions / exemptions on taxes and custom duties (Ease of doing business) iv. 8 x SME / Start-up clusters of national importance aligned with the academic strengths of NUST including defense-tech v. 21 x IPs filed, 50 tech transfers, 230 products developed and PKR 30 M joint research projects conducted at NSTP vi. Pre-Incubation program (Hatch-8) produced 16 x no of successful start-ups this year. 16 x will be graduated by end of this year
(d) Inter-disciplinary academic programs & Research and Innovation in teaching & learning.	<ul style="list-style-type: none"> i. Introduce multidisciplinary subjects to achieve diversification. ii. Enhance soft skills of students for their career development and market acceptance.
(e) Empathy for society & community service.	<ul style="list-style-type: none"> i. Lay emphasis on having discernable positive impact on society. ii. Institutionalizing the community services and community development.
(f) Building Endowment Fund and Financial Self-Reliance.	<ul style="list-style-type: none"> i. Raise endowment fund. ii. Enhance registration of alumni. Over the last year, 2000+ new alumni have signed up on the alumni portal, bringing the overall number of registrations to 25,300, which represents more than 70% of all graduates to date. The Alumni portal provides a single, dedicated platform for alumni from all NUST constituencies to connect with their alma mater
(g) Develop NUST into a green university.	<ul style="list-style-type: none"> i. Grow plants / trees ii. Maximum use of re-cycled water for watering plants. iii. Use of solar power.

- **Clear-cut Performance Outcomes Instead of Routine Activities**
- **“QS” World University Ranking**

Year	World Rank	Pakistan Rank
2021-22 (QS 2023)	334	1 st

- **“QS” World University Ranking by Subject**

Year	By Subject	World Rank	Pakistan Rank
2021-22 (QS 2022)	Electrical & Electronic Engineering	151-200	1 st
	Computer Science & Information System	131	1 st
	Mechanical, Aeronautical and Manufacturing Engineering	251-300	1 st
	Chemical Engineering	201-250	1 st
	Civil Engineering	151-250	1 st
	Chemistry	401-450	3 rd
	Mathematics	201-250	1 st
	Physics & Astronomy	301-350	2 nd
	Material Sciences	301-350	1 st
	Environmental Sciences	401-450	4 th
	Business & Management	251-300	2 nd
	Biological Sciences	501-550	3 rd

- **“QS” Asian University Ranking**

Year	Overall Ranking	Pakistan Rank
2020-21 (QS 2022)	74	1 st

- **“QS” Young University Ranking**

Year	World Rank	Pakistan Rank
2019-20 (QS 2021)	41	1 st

- **“QS” Engineering & Technology Ranking by Faculty**

Year	World Rank	Pakistan Rank
2021-22 (QS 2022)	179	1 st

- **“THE” Impact Ranking**

Year	World Rank	Pakistan Rank
2021-22	101-200	1 st

- **Research Projects**

○ Research Projects Approved for Funding	148
○ Research Projects in Progress	355
○ Research Projects Completed	103

- **Research Papers**

○ Research Papers Presented in Conferences	44 (33 online + 10 travel)
○ Conference Proceedings Published	158
○ Research Papers Publications	1488

- **Intellectual Property Rights**

○ Patents filed	98
○ Patents Approved	56

- **Commercialization**

○ Technologies Licensed to the Industry	9
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- **Companies Incubated / Graduated**

○ Number of Incubatees	67
○ Number of Companies Graduated	16
○ Number of Jobs Created (Graduated Incubatees)	1200+

- **Innovation Promotion and Marketing**
 - Industrial Problems Identified 343
 - Consultancy Projects Identified 21
 - R&D Projects Identified 97
- **Professional Development Centre**
 - Number of Internal Trainings Conducted 39
 - Number of External Trainings Conducted 50
- **Corporate Advisory Council (CAC)**
 - CAC Partner Companies 400
 - CAC – NUST Partner Schools/ Institutes 19
 - Student Visits by CAC Team to Industry 100+
 - CAC Sector Committees Member Companies 80
- **NUST Placement Office**
 - Students Placed on Jobs 1539 out of 2130 (313 pursuing Higher education, 124 seeking employment and 154 unemployed by choice)
 - Industrial Linkages Established with top Recruiting Companies 1650
 - Number of Recruitment Drives 285
 - Number of Industrial Talk Sessions Organized 90
- **Career Development Centre**
 - Career Development Plan 31
 - Resume writing 28
 - Professional Employability Skills 41
 - Interviewing Techniques 29
- **Develop NUST into a Green University** In line with Government's initiative, progress on plantation is as under:-
 - Last 10 Years Sapling Count - 104128
 - Year 2018-19 - Planted Saplings 13000
 - Year 2019-20 - Planted Saplings 23000
 - Year 2020-21 - Planted Saplings 3128 & Seed Balls thrown 5000
 - Year 2021-22 - Planted Saplings 3000 (Planting still in progress)

Budget Details

(Rs in Million)

Outputs	Actuals		Budget Allocation	Forecast	
	2020-21	2021-22	2023-24	2023-24	2023-24
Promotion of Higher Education in the field of Science and Technology	3,180.311	3,343.542	5,773.064	5,773.064	6127.816

Demand	Demand No.	Shown in the Demand of:	Actuals	Budget Allocation
Non-Development Budget	140	IB 0959	3,180.311	2020-21
	082	IB 3372	3,343.542	2021-22
	087	IB 3372	3,746.748	2022-23

Inputs – Object Classification	Actuals		Budget	Forecast	
	2020-21	2021-22	2022-23	2023-24	2024-25
A01 Employee Related Expenses	2927.164	3,130.000	3,645.000	5,212.501	5,838.001
A02 Project Pre-Investment Analysis	-	-	-	-	-

A03 Operating Expenses	203.147	163.542	46.748	475.468	546.788
A04 Employee Retirement Benefits	50.000	50.000	55.000	85.096	102.115
A06 Transfers	-		-	-	-
A09 Physical Assets	-		-	-	-
A13 Repairs & Maintenance	-		-	-	-
Total	3180.311	3343.542	3746.748	5773.065	6486.904

Performance Details

Selected Performance Indicators	Outcomes 2020-2021
UG Programmes	
2 New Programmes Introduced	41
1366 Additional Students Enrolled	11905
MS / M.Phil Programmes	
8 New Programmes Introduced	90
818 Additional Students Enrolled	5675
PhD Programmes	
7 New Programmes Introduced	63
243 Additional Students Enrolled	821
Enhancing Research Support System	
Proposals Submitted for Approval as Planned	449
Joint Research Projects Approved as Planned	94
Papers Published as Planned	1488
Research Articles Presented in Conferences as Planned	44

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 following its strategic Vision 2020 with specific goals and objectives outlined for the next 15 years, 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 top 100 universities in the developing countries and top 500 universities in the world in 5, and 10 years' time respectively. The preparation on 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 101 degree programs are on offer in which around 33,172 students are enrolled. CUI has become the first Higher Education Institution in Pakistan to offer hybrid teaching from Fall 2017 semester. There are 2100+ faculty members working in CUI with 1,137 + faculty members and academic managers have PhD qualification. 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 trainings of the newly recruited faculty at CUI. Till now 129 convocations have been organized in which degrees were conferred on 85,000+ graduates including 650 PhDs.

- **CUI Rankings:**

In TIMES Higher Education (THE) World Universities Rankings 2022, CUI was placed among 801-1000 world best universities 2022. Besides, it was also ranked at:

- #401-500 in THE Engineering & Technology
- #401-500 in Computer Science,
- #251-300 in Business & Economics
- #601-800 in Life Science
- #501-600 in Physical Sciences subject rankings 2022

- **CUI was also ranked at:**

- #201-250 in THE Asian University Rankings 2022
- #251-300 in THE Emerging Economies Rankings 2020, and 159th in 2021

- #251-300 in THE Young University Rankings 2022
- **In addition, CUI was ranked in the QS World University Rankings 2022 as under:**
 - #1001-1200 in QS World University Rankings 2021
 - #137th in QS Asia for 2022 146th for 2021.
- **CUI was also ranked in QS World University Rankings by subject 2022 as under;**
 - #250 in THE Engineering & Technology
 - #251 in Natural Sciences,
 - #451-500 in Social Sciences and Management subject rankings 2022
- **THE University Impact Rankings 2022**
 - CUI is ranked amongst 401-600 and 4th in Pakistan in 17 Sustainable Development Goals overall in year 2022 globally among the universities working to improve the UN's Sustainable Development Goals in TIMES Higher Education (THE) University Impact Rankings 2022 and also ranked 4th in Pakistan. CUI was ranked in 17 SDG's out of 17. These are given as under:

SDG's	Position in world	Position in Pakistan
SDG 1 No Poverty	85	3rd
SDG 2 Zero Hunger	201-300	6
SDG 3 Good Health and Wellbeing	801-1000	24
SDG 4 Quality Education	301-400	15
SDG 5 Gender Equality	401-600	15
SDG 6 Clean Water and Sanitation	101-200	1
SDG 7 Affordable and Clean Energy	201-300	4
SDG 8 Decent Work and Economic Growth	401-600	7
SDG 9 Industry, Innovation and Infrastructure	401-600	7
SDG 10 Reduced Inequalities	201-300	1
SDG 11 Sustainable Cities and Communities	301-400	1
SDG 12 Responsible Consumption and Production	401-600	8
SDG 13 Climate Action	201-300	4
SDG 14 Life Below Water	201-300	2
SDG 15 Life on Land	101-200	1
SDG 16 Peace, Justice and Strong Institutions	401-600	2
SDG 17 Partnerships for goals	301-400	2

- **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**
 - Centre for Policy Studies, CUI successfully organized a panel discussion on “Artificial Intelligence: applications and implications” on December 21, 2021. The aim of the activity was to highlight the significance of artificial intelligence and how it influences our social, political, and economic spheres of life.
 - Centre for Climate Research & Development (CCRD) and Centre for Policy Studies (CPS) organized one day workshop entitled ‘Gaming Climate Change’ on December 23, 2021 The workshop comprised of card-based activity about climate change in an interactive way

- ORIC-Professional Development at CUI, Islamabad, organized a 3- Day Training Workshop on "Data Analysis & Machine Learning (ML)" on February 8– 10, 2022.
- Prof. Dr. Athar Hussain, Head CCRD, presented an invited talk in International Conference and Workshop on “Changing Climate and Dengue Fever in the era of COVID-19”, held at COMSATS University Islamabad, on 10th February 2022.
- The Department of Chemistry, CUI organized First International Conference on General Chemistry, from February 10-11, 2022 at Islamabad Campus.
- Center for Climate Research and Development (CCRD) organized a One day seminar on “The Risk Factors for Adverse Outcomes with COVID-19 Infections & Its Management” February 17, 2022
- ORIC-Professional Development at CUI, Islamabad organized a Workshop on Personality Development & Leadership Skills in BIC building on March 03, 2022. Mr. Hammad Omer, Associate Professor of the Department of Electrical and Computer Engineering was the speaker in the workshop.
- The Department of Computer Science, National Center for Artificial Intelligence organized 05 Day Hands-on Workshop on Predictive Analytics on March 03-07, 2022.
- CPS organized a seminar titled “Iqbal and Jinnah’s Vision of National Education and our Education Policy” on March 10, 2022. The fundamental theme of the program was that Communities’ rise and fall is organically linked to their intellectual foundations i.e. vision of education. Iqbal.
- ORIC-Professional Development at CUI, Islamabad, organized a 2-Day Hands-on Training Workshop on Next Generation Sequencing (NGS) Data Analysis on March 16-17, 2022.
- The Department of Mathematics organized a One-day Conference on Recent Developments in Applied and Computational Mathematics on May 31, 2022, in the EE seminar Hall. The conference was jointly organized by the Department of Mathematics and the society for industrial and applied mathematics (SIAM-CUI) student chapter.
- Centre for Policy Studies (CPS), COMSATS University, Islamabad Held a seminar titled “Was Pakistan Means to an End or End Itself? What State Policy Portray?” on June 13, 2022.
- Centre for Policy Studies (CPS) Islamabad organized a seminar on June 28, 2022, titled “Pakistan’s being on the Cusp of South Asia, Central Asia and Middle East: Pearl, Perils and Pitfalls; crisis and Opportunities
- The Department of Art and Design Islamabad conducted B.Design Thesis Degree Show 2022 from July 04-06, 2022.

- **Abbottabad Campus**

- The Department of Management Sciences CUI Abbottabad Campus conducted a Job Fair on June 23, 2022.

- **Wah Campus**

- A one-day workshop on “Career Counseling” was organized by the IEEE CUI Wah Student Chapter on October 26, 2021. The guest speaker was Engr. Waqas Idress working as Technical Consultant at German Development Bank.
- The Student Startup Business Center (SSBC), CUI Wah Campus organized a seminar on "Entrepreneurship: Opportunities and Challenges" on November 3, 2021
- CUI and College of Underwater Acoustic Engineering, Harbin Engineering University (HEU), China jointly organized the 3rd China-Pakistan Marine Information Workshop on November 16, 2021 as a part of One Belt One Road initiative under China Pakistan Economic Corridor (CPEC). Prof. Dr. Shahid Baig, Chairman, Pakistan Science Foundation (PSF) was the Chief Guest.
- CUI organized two days International Conference on Frontiers of Information Technology (FIT-2021) held on December 14, 2021 at COMSTECH Secretariat, Islamabad.
- The Department of Electrical and Computer Engineering organized a workshop on “Introduction to Python” conducted by Assistant Professor, Engr. Muhammad Kamran Fiaz on December 16, 2021.
- The Department of Computer Science invited Dr. Ashiq Anjum, Professor, University of Derby, UK on December 17, 2021 to deliver a talk on “Edge Intelligence: The Next Stop in the Evolution of Distributed AI”.
- The Student Startup Business Centre (SSBC), CUI Wah Campus organized a seminar on "Entrepreneurship: Freelancing Success Stories" on December 30, 2021.
- The Department of Mechanical Engineering in collaboration with ASHRAE arranged a seminar, titled “Heat Transfer Assessment of Micro Channel Heat Sinks with Different Shape Ribs” for undergraduate students in university campus on March 17, 2022.
- CUI Wah Campus arranged a mega event “VISIOSPARK 2022” on March 26, 2022. Around 1000 students from 30 renowned universities/institutes across Pakistan participated in this event.
- The Department of Mechanical Engineering (CUI Wah) in collaboration with AIAA CUI Wah society arranged a seminar, titled “Introduction to Solid Works for Mechanical Engineer” for graduate and undergraduate students on March 30, 2022.
- The Student Startup Business Center (SSBC), CUI Wah Campus organized a seminar on “Entrepreneurship: opportunities and Challenges” on March 31, 2022
- The office of Research, Innovation & Commercialization conducted a Roundtable Discussion & Devising Future Research Activities with Pakistan Ordnance Factories (R&D) Division on April 01, 2022 for establishing Industry academia collaboration.
- The Department of Civil Engineering organized a CPD seminar on “Shear Strength of High Performance Concrete”, on May 18, 2022.
- The Department of Civil Engineering organized a CPD seminar on “Earthquake Risk Reduction in Pakistan: Issues and Challenges” on June 14, 2022.

- American Society for Mechanical Engineers Wah chapter (ASME CUI Wah) successfully conducted “MechFest 2022” event on June 16, 2022. The MechFest 2022 event consisted of Design Competition and Line-Tracking Robot Competition.
- CUI Wah Campus organized a training seminar on 4MAT on June 23, 2022. Eminent Professor, scholar and 4MAT certified trainer Dr. Mohammad A. Irfan enlightened the dynamics of 4MAT learning, its significance, applications, and outcomes
- **CUI Lahore Campus**
 - Energy Research Centre, CUI-Lhr held a symposium on November 4, 2021 at Nishat Hotel, Lahore, on Emerging Microgrids Technologies in Pakistan, attended by prominent energy related industry, academia, and government organizations.
 - The Department of Humanities, CUI Lahore Campus organized a 01 day International Conference on Trajectories and Discourses on English Studies on May 26, 2022.
 - The Department of Management Sciences, CUI Lahore Campus organized a seminar on Managing Mental Health and Stress on June 09, 2022.
 - The Department of Management Sciences, CUI Lahore Campus organized a seminar on Entrepreneurship and Time Management on June 09, 2022.
 - **CUI Attock Campus**
 - CUI Attock Campus organized a Session on "Introduction to Freelancing" with Yousuf Baloch on December 03, 2021.
 - Student Affairs Office arranged a talk session for graduating students of CUI Attock on December 08, 2021 on "Challenges & Opportunities for fresh graduates in Pakistan"
 - Department of Computer Science organized "ARTFEST 2021" on December 17, 2021 for college students of district Attock. Students competed in five different categories, Photography Competition, E-Gaming, Doodle Art, Paper Tower Challenge and Quiz Competition.
- **CUI Sahiwal Campus**
 - CUI Sahiwal Campus organized National Eid Melad-ul-Nabi ﷺ Celebrations 1443 AH on October 25-26, 2022.
 - Seerat-un-Nabi (S.A.W.W.) conference was held at Sahiwal Campus on November 04, 2021.
 - Student Week Fall 2021 was organized by Sahiwal Campus on December 06, 2021. Prof. Dr. Nazir Ahmad Zafar, Director COMSATS Sahiwal was the Chief Guest.
- **CUI Vehari Campus**
 - The Department of Management Sciences organized an E-Commerce Awareness Session on June 01, 2022

- CUI Vehari Campus in collaboration with District Commissioner organized Pigham e Pakistan a National Narrative of Islamic Republic of Pakistan on March 15, 2022.
- Further **Faculty Development Academy (FDA)** has been organizing series of activities for the CUI teachers 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 brief summary of the activities conducted by the FDA during the year 2021-2022, is given below:
 - Skills Enhancement and Employee Development (SEED) Program at Islamabad campus was arranged on September 23, 2021.
 - A similar SEED Program was held on Campus from August 10 – 12, 2021 for admin personnel of CUI, Abbottabad campus.
 - FDA arranged a seminar program regarding "Changing Tomorrow" for CUI Academic Heads on November 29, 2021.
 - FDA arranged a training on “Enhancing Instructional Design Through Educational Technology” from March 1-2, 2022.
 - A seminar on ‘Assessment for Online Learning, held on March 15, 2022 at CUI Islamabad Campus where in the training was delivered by Dr. Shazia Awan, Assistant professor LUMS, Lead Instructor NFDP with HEC and NAHE, Pakistan.
 - A seminar on Entrepreneurship: Business Startups a Hands-on Approach was conducted by FDA on June 21, 2022. Mr. Umer Akmal a renowned Entrepreneur delivered the talk.
 - FDA Organized a 3-Day workshop on Enhancing Teaching Excellence from July 18-20, 2022 at Islamabad campus.
- **Research and Commercialization:**
 - a. Faculty members at CUI are actively engaged in research in their respective fields. As of December 2021, 20,000+ research papers have been published by CUI faculty whereas during the year 2021, the number stands at 3077 (Data extracted from Web of Science). Further, there are around 257 enrolled companies at its Business Incubation Center till date, and presently incubated across BIC's are 34. Over 92 companies have been graduated from Cubator 1ne. Also filed 93 patents for registration out of which 38 (22 US, 16 Pak) are granted. For the financial year 2021-22, Economic footprint of CUI Incubation Companies was PKR 400 Million along with 450 jobs and 164 paid internship opportunities were created by CUI Incubated Companies.
- **Visits:**
 - b. During the reporting period, 01 international collaboration with General Sir John Kotelawala Defence University Srilanka has been established..

In addition of the above, 03 active international linkages collaborations were continued with some of the most reputed Universities/institutions.
- **Alignment of outcomes and outputs with the medium term budget estimate for service delivery.**
- **Development Activities:**
 - a. The COMSATS University Islamabad (CUI) until June 2022, CUI has completed 50 projects having capital cost of Rs. 89599.385 Million. For the Financial Year 2021-22, CUI was allocated Rs 114.060 Million for three (2) development projects. During the said period, Rs 33.211 million have been released.
 - b. **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 pursuing 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. For the reporting period 33 scholar joined back the CUI Post completion of their studies.

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

- a. The performance of each section/attached department are being measured at CUI,s keeping in view the goals and objectives, the targets, vision, mission of the University.
- b. Some of highlights of CUI's major research/internationalization centers are outlined below.
 - The Center for Advance Drug Research (CADR) CUI, Abbottabad Campus has been involved in innovative and applied research projects till year 2022, and has filed two patents and published 320 articles in the high impact factor journals with an impact factor of 1250. CADR is working on the invention of drugs for the treatment of cardiovascular diseases. 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 France government. Several PhD students working in CADR went to Germany and France for the advanced training in latest research equipments. CADR has successfully awarded Higher Education Commission of Pakistan research grants to combat the diabetes.
 - The Interdisciplinary Research Center in Biomedical Materials (IRCBM), CUI Lahore Campus is Pakistan's only centre focussing dedicatedly on translational research and development in the fields of materials in orthopaedics, dentistry, skin and wound repair, tissue engineering and regeneration and sensors and biosensors. Established in 2008, today IRCBM houses 20+ PhD scientists from interdisciplinary backgrounds in engineering, science and clinically linked disciplines. Concurrently, CUI has licensed three core technologies of IRCBM linked to wound repair and food toxin detection to national and international companies, respectively, for commercialization. As a subsequent, 3 products licensed to a national company were approved (in 2021) by the Drug Regulatory Authority of Pakistan for local production. These efforts stem from IRCBM strong translational research portfolio which includes 39 awarded and filed patents (both international and national) and more than 705 international peer reviewed publications (with 100+ publications in 21-22). Through a knowledge economy initiative linked funding of Ministry of Science and Technology, IRCBM has further developed its translational ability and developed core facilities in material assessment, for animal trials and biological assessments. In 2021-2022 under the same project IRCBM visited, undertook trainings and developed strong collaborations with universities in Germany, UK and Turkey focussing not only on research but also towards joint intellectual property development and commercialization. Through the same funding IRCBM also hosted 4 international researchers from Nigeria, Iran, Iraq and Germany and 15 national researchers from all over Pakistan in order to develop sustainable linkages within the country. IRCBM is also CUIs nominated Centre of Excellence for the D-8 Network of Pioneers for Research and Innovation (D-8 NPRI) and it remains engaged in relevant activities.
 - Centre for Climate Research and Development (CCRD), CUI is involved in the different climate research projects, capacity building and climate change awareness related activities, given the fact that Pakistan is one of the most climate vulnerable country in the world. CCRD is addressing these issues through detailed scientific studies addressing various aspects of pure and applied climate science as it pertains to Pakistan till year 2022. CCRD had completed 13 research projects and currently 3 projects are ongoing with a total worth of more than 70 million PKR. The project partners include

European Union, Climate and Development Knowledge Network (CDKN), UNDP, Swiss Development Cooperation (SDC), D-8 Commission, as well as PCWR, CDA, CCCS, NARC and HEC. The CCRD is actively conducting climate awareness campaigns in the form of walks, round table discussions, scientific seminars, and symposia to highlight issues related to climate science. CCRD have published over 100 research articles, 16 book chapters and several newspaper articles, and blogs, for raising awareness about climate change among the respective communities.

- 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 2021-2022 following major activities were undertaken by IO:
 - 124 international students from 13 different nationalities joined CUI. These include 7 PhDs, 23 MS, 87 BS students, 5 visiting scholars under TWAS, 1 scholar under CUI-COMSTECH and 1 scholar under Queen Elizabeth Scholarship Program through Association of Commonwealth Universities.
 - Four (4) students of CUI went on student's semester exchange program to "Middle East Technical University, Turkiye. In addition, a delegation of five (5) staff members of CUI went on mobility to attend 6th International Staff Week organized by Middle East Technical University, Turkiye. Further a two (2) member staff delegation of CUI participated in 3rd 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 from Syndicate of CUI in its 8th meeting. This will help CUI to become a 'University of Choice' as well as to become more welcoming institution and equally more outward looking institution.
 - The COMSATS University Islamabad has inked three (3) Erasmus+ Inter Institution Agreements with International universities naming Marmara University Turkiye, OSAK University, Turkiye and Tuscia University, Italy. Further CUI has signed MoU with two universities namely General Sir John Kotelawala Defence University, Sri Lanka, and Harbin Engineering University, China in year 2021-22.
 - CUI received nine (9) inbound official visits of international universities around the globe during 2021-22. In addition, CUI received inbound visit of officials from different embassies in Pakistan such as Palestine embassy, Sri Lankan embassy, Azerbaijan embassy, Qatar embassy, French embassy, etc. CUI sent thirteen (13) official delegations to different universities/ research centers of different countries like Dubai, Sri Lank, United Kingdom, Turkey, etc. CUI also organized training sessions for members of the partner universities of an EU funded project named B-International Project.

- **Linkages with budget to better reflect performance.**

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

• **Relevant Statistics Properly Tabulated**

Strengths	Statistics (Period 2021-22)
Campuses	7
Faculties	6
Academic Programs	101
Departments	22
Centers	08
Faculty Members	2100+
Research Papers	3077
Students -Intake	4,718
Graduates	3500
PhD's	55
<u>Campaigns/CSR Initiatives</u>	<p><u>Tree Plantation Drive Spring 2022</u> The Tree Plantation Drive at CUI, Wah Campus was started and inaugurated by the Member of the Provincial Assembly Punjab (MPA), Malik Taimoor Masood Akbar on February 4, 2022. Tree Plantation Drive was also conducted in CUI Attock Campus on March 21, 2022.</p> <p><u>Trash Free COMSATS Awareness Campaign</u> The Department of Management Sciences, CUI Wah Campus arranged a campaign "Trash Free COMSATS" consisting of different events/activities.</p> <ul style="list-style-type: none"> • Play Card Painting Competition "Eco-Friendly" on November 4, 2021 • Lecture on "Trash and its effect on environment, campus and personal health" on November 5, 2021 • Dustbin Décor and Trash Free Awareness Walk on December 9, 2021 <p>The theme of the whole program activities was to spread awareness on the importance of a clean and green environment and to motivate all stakeholders to adopt healthy habits by keeping themselves and surroundings clean.</p> <p><u>Project for safe drinking water</u> A joint research project "feasibility study for the provision of safe drinking water through water conservation (SWDC) has been awarded to CUI by D-8 secretariat in collaboration with Egypt National Research Centre (NRC) and Nigeria's Imo State University. Dr Toqeer Ahmed, Assistant Professor, Centre for climate research and development (CCRD), CUI is principal investigator for this 01 year project which aims to provide safe drinking water through water conservation along with GIS mapping of water supply.</p>

National Institute of Oceanography (NIO)

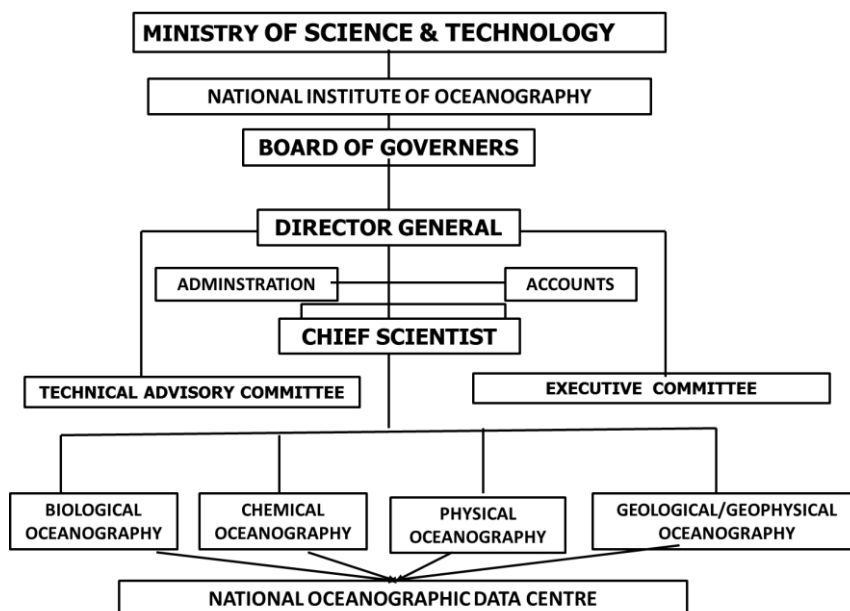
Introduction

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 from national and international universities, technicians and supporting staff. Almost 95% of the scientific team has received specialized training from well reputed national and international institutions. Since the establishment of NIO, efforts are being made to enhance the R&D capabilities in the field of oceanography and a number of national and international projects have been undertaken. The research laboratories are equipped with state-of-the-art instruments/equipment and software. NIO has grown up at international level for pursuing oceanographic research and surveys. The R&D activities being undertaken by NIO 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

(NON-DEVELOPMENT)

(Rs. In Million)

S. No.	Year	Allocation/ Approved Budget	Supplement-ary Grant	Amount Surrendered	Released Amount
i.	2020-2021	198,902.0	0.00	33,581.0	165,321.0
ii.	2021-2022	212.50	0.00	9.720	202.780

(DEVELOPMENT)

(Rs. In Million)

S. No.	Year	Allocation/ Approved Budget	Released Amount
i.	2020-2021	81.00	81.00
ii.	2021-2022	250.00	186.279

During the year 2021-22, NIO continued to progress as per its main objectives and functions assigned under the NIO Act of 2007.

PROMOTION/TIME-SCALE UPGRADATION OF OFFICERS (BS 17 AND ABOVE)

Departmental Promotion Committee meeting conducted for the promotion of Principal Scientific Officer (BS-19) to Chief Scientific Officer (BS-20), Research Officer (BS-17) to Senior Research Officer (BS-18), Senior Coastal Engineer (BS-18) to Principal Coastal Engineer (BS-19) and Admin Officer (BS-17) to Deputy Director (Admin/Finance) (BS-18) on 17th November, 14 and 22 December 2021 respectively. The DPC for promotion of Computer Programmer (BS 17) to Assistant System Analyst (BS 18) was held on 30 April 2022.

RECRUITMENTS (BS 16 AND ABOVE)

NIO conducted recruitment tests for vacant posts from BS-16 to BS-18 from 10th to 11 July 2021 and interviews from 25th to 30th April 2022 at Karachi and Islamabad.

NIO conducted a recruitment interview for PPS 01 to 06 in the PSDP Project “Strengthening of Oceanographic Research Sub Station Gwadar Pakistan”.

RESEARCH ACTIVITIES DURING FINANCIAL YEAR JULY 2021- JUNE 2022



MEMORANDUM OF UNDERSTANDING (MOU) AND AGREEMENTS

The Memorandum of Understanding with Lasbella University of Agriculture, Water and Marine Sciences Uthal, Balochistan was renewed for another five years



Dr. Samina Kidwai, DG NIO and Dr. Dost Mohammad Baloch VC, LUAWMS signing the renewal document



Dr. Samina Kidwai DG NIO and R. Adm. Foad Amin Baig SI (M) on the occasion of LoA signing between NIO and PMSA

Director General, NIO visited Pakistan Maritime Security Agency (PMSA) Headquarters to discuss areas of mutual interest, an agreement was also signed between National Institute of Oceanography and Pakistan Maritime Security Agency in July 2022. Insignia were exchanged on the occasion. Director General, NIO visited COMCOAST Pakistan Navy and briefed on the Seawater Intrusion project, NIO's activities in the Indus deltaic creeks and other marine coastal areas and discuss matter of mutual interest.

Director General, NIO visited Pakistan Coast Guards Head Quarters and discussed matters on collaboration and support between both the institutes.

Director General, NIO visited PCRWR Tando Jam along with NIO Scientists to discuss matters related to the PSDP project Seawater

Director General, NIO along with Scientists visited Mehran University of Engineering & Technology, Jamshoro on 11th October, 2021 to discuss the areas of mutual interest.

The Federal Secretary MoST visited NIO, Director General briefed him on overall progress and research activities. The Secretary assured the DG of his full support in the organizations matters.



Vice Admiral (Retd) Abdul Aleem HI (M) Director General National Institute of Maritime Affairs (NIMA) Bahria University, Islamabad Campus and Faculty members visited NIO on 1st October 2021.





DG, NIO with a group of officers from Government of Balochistan visiting NIO

A group of officers from Government of Balochistan, visited NIO on 13th October 2021. The presentation was given on various activities of NIO, they walked around the Institute and interacted with the scientists.

A Group of 70 Students of Balochistan Residential, Khuzdar along with three Professors visited NIO on 2nd November 2021.

Officers of the 3rd Principal Warfare Officer (ADQUAL) course comprising 6 x officers of Underwater Warfare School, PNS Bahadur, Pakistan Navy, Karachi visited NIO on 18th January 2022.



DG, NIO with the ADQUAL course officers on an orientation visit to NIO

TRAININGS OF NIO SCIENTISTS AND STAFF

Three-Days online Regional Training Course on “Data Analysis and Ocean Observing Instruments organized by the Iranian Institute of Oceanography and Atmospheric Science, UNESCO RCOWA & IOC Regional Committee for the Central Indian Ocean (IOCINDIO) and United Nations Decade of Ocean Science for Sustainable Development, held on 29th to 31st August 2021.

One-day training on "Multilateral Environmental Agreements in context of GSP+ status of Pakistan" was organized by the World-Wide Fund for Nature (WWF) in collaboration with International Labour Organization (ILO) on 27th October 2021 in Karachi.

Training of the Total Station held at NIO on 1st June 2022 under R&D Activities.

Training to Fly Drone held at NIO's Sub Station Ghora Bari and Sajwal on 2nd June 2022 under R&D Activities.

Nine Days International Training on "Mangrove Monitoring International Training 2021 through Learning Management System (LMS)" was organized by National Research and Innovation Agency (BRIN)-AIS Secretariat, UNESCO/IOC Regional Office for the Western Pacific (WESTPAC), UNESCO/IOC RTRC MarBEST, Archipelagic & Island States, CORE MAP-CTI, The World Bank and UNDP from 29th October to 6th November 2021.

Online "Regional Training Course on Data Analysis and Ocean" in August 2021.

Regional online training course on "Coastal Desalination in Earth and Brine Disposal Sustain-Planning Design and Implementation" was held from 27th to 29th October 2021, INIOAS (Iranian National Institute for Oceanography Atmosphere Science) Tehran.

Three days Regional online Training course on "Coastal Desalination Seawater intake and Brine Disposal System-Planning, Design and Implementation" was organized by the UNESCO Category 2 Regional Education and Research Centre on Oceanography for West Asia (RCOWA). From 27th to 29th October 2021.

One-Day Webinar for Under-Graduate students on "Introductory Session of Marine Biology", held on 17th November 2021 at NIO Karachi.

• PARTICIPATION IN SEMINAR/ SYMPOSIUMS/ WORKSHOP/ CONFERENCES/ EXHIBITIONS

2nd Maritime Gala (Exhibition of Posters, models and project) organized by the department of Maritime Sciences, on 16th December 2021 at Bahira University, Karachi

Second meeting of Technical Committee 4 on "Environmental Performance Evolution" on 13th January 2022 at PSQCA Complex Karachi.

Workshop on "Computational Fluid Dynamics" from 07th to 11th February 2022 at Pakistan Institute of Engineering and Applied Sciences, Islamabad.

International Conference on "Climate Change: Impacts and responses" from 8th to 9th March 2022 organized by the Department of Geology, University of Karachi.

Conference on "Pakistan Climate Conference 2022" on 16th March 2022 at Unilever Pakistan, Head Office, Karachi.

Seminar "Survey of User Requirements for PSNP FSDS" on 30th March 2022 in Karachi.

2 Days Pakistan Science Expo from 28th to 29th January 2022 at Pakistan-China Friendship Center, Garden Avenue Shakarparian, Islamabad.

Workshop at Islamabad on UNEP's Capacity Building workshop through reporting tool from 23rd to 25th May 2022.

Online Seminar "Academia industry linkages: a fresh approach amidst Covid pandemic" on 23rd September, 2021 organized by the University for Industry.

Online webinar "Sea-level rise and coastal climate risks in Pakistan" on 8th September 2021.

Online INOC Seminar on "Advanced Technologies for Marine Sciences" by Dr. Bertan TEZCAN, was held on 1st October 2021 and organized by Inter-Islamic Network on Oceanography (INOC).

Online International Seminar on the "Latest developments on marine sciences-III" on 29th March 2022 organized by the Inter-Islamic Network Oceanography (INOC).

Hybrid seminar on the "UN Ocean Conference side event: Developing the Capacity we need for the Ocean we Want" held on the 29th June 2022 organized by the SCOR along with POGO, IODE of the IOC of UNESCO, and ISC.

• SCIENTIFIC PUBLICATIONS

Tingting Wu; Xiguang Deng; Jiangong Wei; Huiqiang Yao; Bin Liu; Jinfeng Ma; Syed Waseem Haider; Zongze Yu; Lifeng Wang; Miao Yu; Jianfei Lu; Naimatullah Sohoo; Noor Ahmed Kalhorn; Sanobar Kahkashan, Jiangong Wei. 2021. "Distribution and development of submarine mud volcanoes on the Makran Continental Margin, offshore Pakistan", Journal of Asian Earth Sciences,

vol 207, 104653 has been published. This research work was carried out with CGS China Pakistan Cruise 2018-2019 (Journal of Asian Earth Sciences, impact Factor: 3.059)

Asif Inam, Peter D. Clift, Liviu Giosan, Anwar Alizai, Samina Kidwai, Muhammad I. Shazad, Ibrahim Zia, Majid Mazeer, Muhammad J. Khan, Syed S. Ali, Aneela Shaheen, Rashida Qari, Sanobar Kahkashan 2022. The Geographic Geological and Oceanographic setting of the Indus River-An Update, Chapter 17, Book Large Rivers: Geomorphology and Management, Second Edition, 1-33, Edited by Avijit Gupta, John Wiley & Sons Ltd.

Liu Bin, Syed Waseem Haider, Chen Jiangxin, Deng Xiguang, Yang Li, Azevedo Leonardo, Duan Minliang, Wu Tingting, Ma Jinfeng, Li Keliang. 2021. Distinct BSRs and their implications for natural gas hydrate formation and distribution at the submarine Makran accretionary Zone. Journal of Oceanology and Limnology; V.39; No.5; p 1871-1886. DOI: 10.1007/s00343-021-0293-9, Impact factor:1.265.

Jiagong Wei, Tingting Wu, Xiguang Deng, Syed Waseem Haider, Sanobar Kahkashan, Shengxiong Yang, 2021. Seafloor methane emission on the Makran continental margin. Science of The Total Environment; 801(2021)149772; p 1-10, DOI: 10.1016/j.scitotenv.2021.149772, Impact factor:7.963.

Zhen Zhang, Xiguang Deng, Huiqiang Yao, Miao Yu, Haifeng Wang, Gaowen He, Bin Liu, Tingting Wu, Sanobar Kahkashan, Syed Waseem Haider, Naimatullah Sohoo, Noor Ahmed Kalhoro, 2021. A preliminary study on geomorphological characteristics and genetic mechanism of pockmarks in the Makran accretionary prism, northern Arabian Sea. Geo-Marine Letters; V.41; No.3. DOI: 10.1007/s00367-021-00704-9, Impact factor:1.429.

Jian-ming Gong, Jing Liao, Yu-xi Zhang, Jie Liang, Jian-wen Chen, Syed Waseem Haider. 2021. Characteristics of major and trace elements in surface sediments of the Makran accretionary Prism and their implications for natural gas hydrates. China Geology; V.2; p 299-310, DOI:10.31035/cg2021020.

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

Ahmed W, Wu Y, Kidwai S, Li X, Zhang G, Zhang J. Spatial and temporal variations of nutrients and chlorophyll a in the Indus River and its deltaic creeks and coastal waters (Northwest Indian Ocean, Pakistan). Journal of Marine Systems. 2021 Jun 1;218:103525.

Measuring land deformation in a mega city Karachi-Pakistan with Sentinel SAR Interferometry Gomal Amin, Muhammad Imran Shahzad, Sundas Jaweria & Ibrahim Zia , Geocarto International, DOI: <https://doi.org/10.1080/10106049.2021.1903572>

Assessing the spatial distribution and impacts of recent oil spill along the western coast of Karachi, Pakistan. Gomal Amin, Muhammad Imran Shahzad, Majid Nazeer, Ibrahim Zia, Sundas Jaweria & Irfan Mehmood Geocarto International, DOI: 10.1080/10106049.2021.1899307

Remote Sensing of Narrowing Barrier Islands along the Coast of Pakistan over Past 30 Years. Shamsa Kanwal , Xiaoli Ding, Muhammad Sajjad , Majid Nazeer and Ibrahim Zia J. Mar. Sci. Eng. 2021, 9, 295. doi.org/10.3390/jmse9030295

• **3RD CHINA-PAKISTAN JOINT INTERNATIONAL MARINE SCIENTIFIC EXPEDITION IN THE EEZ AREA OF PAKISTAN**

The Scientists from NIO participated in the 3rd China-Pakistan Joint International Marine Scientific expedition conducted during 26th November 2021 to 9th January 2022 in EEZ area of Pakistan. The detailed surveys were conducted in the Indus offshore basin for the oil and gas exploration with the help of well know geophysical survey methods such as multi-channel Seismic survey, Multi-beam survey, Magnetometer survey, Sub bottom profiler and Gravity survey the EEZ area of Pakistan.



R/V “HAI YANG DI ZHI JIU HAO”

Syed Waseem Haider, geophysicist as observer on the 3rd China Geological Survey Expedition in the Swatch area off Indus delta

- **NIO PSDP PROJECTS**

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

- **MAIN ACTIVITIES**

- Inauguration of IPOL Laboratory PSDP Project “Seawater intrusion, sea level rise and coastal erosion along Balochistan and Sindh Coast”



Honorable Minister of Science and Technology inaugurated the IPOL Laboratory

- **Meetings/workshop/Trainings**

Workshop on “Application of Remote Sensing Data and Hazard Modeling” from 28- 30 March 2022 at SUPARCO, Islamabad.

Training on “Civil Servant (Appointment, Promotion and Transfer” from 29-30 July 2021 at Pakistan Institute of Management (PIM), Karachi.

Training on “New PPRA Rules 2021”, from 2-4 September 2021 organized by the Institute of Tender Management.

Training workshop on “New Standard Bidding Documents Notified by PPRA & Amendment in PPRA/SPPRA Rules” from 26 -28 May 2022 at Pearl Continental Hotel.

Online training course on Tide Predictor software from 12- 14 April 2022.

Online “Tide prediction report and export” predictor training by General Acoustics Germany via Zoom Meeting on 13th April 2022. organized by TechnoSmart

Online “The Gather own Experience (user) with the Software” predictor training by General Acoustics Germany via Zoom Meeting on 14 April 2022. organized by Techno Smart

- **Oceanographic Field Trips**

A number of field surveys were carried out in Gwadar from 19th to 27 January 2022, Wari/Khor creek Indus delta from 31 December 2021 to 16 January 2022, Sonmiani on 29 March 2022, and Gwadar from 8 - 13 April 2022.

- **Assessment of Tidal Energy Potential of Four Major Creeks of the Indus Delta along the Sindh Coast. (Completed in June 2022)**

- **MAIN ACTIVITIES**

Trainings

Training on “New PPRA Rules 2021” organized by the Institute of Tender Management from 2 – 4 September at Pakistan Institute of Management (PIM), Karachi.

Online training course on Tide Predictor software from 12-14 April 2022.

Training course” In SAR Application for Coastal Monitoring, Hydrologic Modeling Using HEC-RAS, Sea level rise and Shifting Shorelines, Hydrologic Modeling Using HEC-RAS” from 16 - 19 and 23 - 27 May 2022.

Training course “Hydrodynamic Modeling & Simulation using DELFT3D and ANN in Renewable Energy Resources” from 23 - 27 May 2022.

- **Oceanographic Field Trips**

Tidal observation & Deployment of Tide Wave & Current Recorder at Dabbo on 10 November 2021 and 5 staff members from 10 – 25 November 2021.

Tidal observation & Deployment of Tide Wave & Current Recorder at Dabbo Creek on 20th November 2021 and 3 staff members from 20th to 30th November 2021.

Field surveys was carried out Indus Delta, Thatta on 25th December 2021; deployment of Tide wave & current recorder at Dabbo Creek from 05 November 2021 – 05 January 2022; Ibrahim Haydri on 01December 2021 to check the instruments (Echo Sounder & DGPS), field/boat trips the Dabbo Deltaic Creek, Waddi Khuddi Deltaic Creek from 12th to 29th April 2022; Dabbo Creek from 10 to 15 June 2022.

- **National Seminar for sharing Final Project Results and Report**

The National Institute of Oceanography Organized a Seminar and presented the findings of PSDP Project “ASSESSMENT OF TIDAL ENERGY POTENTIAL ALONG INDUS DELTA” on 21st June 2022 at Marriot Hotel Karachi. The seminar proposed the blue energy initiatives along Sindh Coast, to increase the renewable energy production of Pakistan. Experts spoke on the occasion and opened Project finding indicated that estimated tidal energy output from Daboo, Korangi, Wadi Khuddi, Hajamro and Patiani creeks is approximately 727 Mw altogether with multiple number of turbines. The Seminar ended by the distribution of certificates of service to the key officers and staff of the project.

The seminar was attended by dignitaries from national institutions, scholars and researchers from academia, and representatives from research organizations.



Stakeholders and Dignitaries attend the result dissemination National Seminar, 21 June 2022

- **Strengthening of Oceanographic Research Sub Station Gwadar Pakistan**

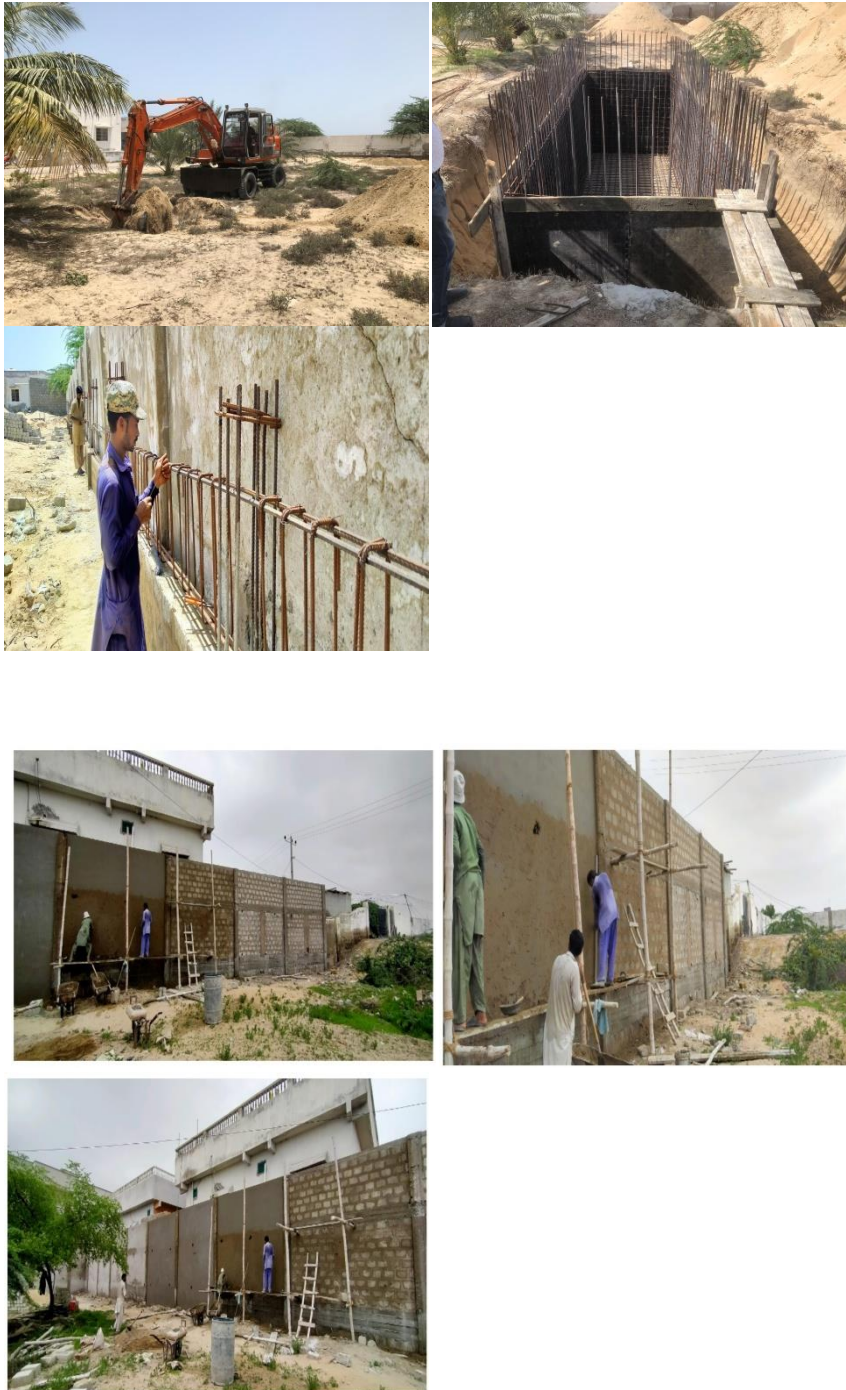
The brief scope/ objective

Strengthen the Gwadar Sub-Station adding 1 more laboratory (2 labs in total-refurbish the existing), computer lab /library Seminar room, field and laboratory instruments and facilities.

Improve the living accommodation for out of station scientist and technician.

Repair of boundary wall, walking paths, store room, covered vehicle garage maintenance of ground fresh water storage tanks (underground & overhead).

Strengthening the human resource (scientific and non- scientific manpower) at Gwadar substation.



IN-HOUSE RESEARCH ACTIVITIES AT NIO

Shrimp Hatchery/Base Station at Sonmiani, Balochistan

The station is the potential GNSS installation site under the PSDP project and needs to be secured, the property of NIO is being secured with a fencing to avoid encroachment process at the property of NIO. The restoration of the water connection, electricity connection is currently being taken



- **Numerical Modelling study of hydrodynamic and sediment transport in Indus River Estuary (continuing)**

This project has field observations and numerical simulation to study the complicated dynamic processes of tides and impacts of River discharge seasonality on hydrodynamics and sediment transport in Indus River Estuary (IRE).

Field observations will be conducted to obtain the detailed information during wet and dry seasons and understanding of the interactions between tidal forcing and river discharges and their impacts on sediment suspension.

To study the physical processes of IRE, the tidal dynamic processes, and coastal inundation during southwest monsoon by carry out field investigation for hydrologic and hydrodynamic parameters including tidal levels, currents, salinity, temperature, sediment concentration, etc.

- To fully understand the sea water intrusion and ETM into the IRE.
- To better understand the sub-tidal and intra-tidal flow patterns and sediment transport processes.
- To evaluate sediment budget and sediment fluxes within main channel of IRE.
-
- Changes in sediment fluxes during wet and dry season
- contribute in Coastal Zone Management and estuarine ecosystem

- **Environmental and Ecological Monitoring Program: Coasts and waters (continued)**

The output through the activity can become part of achieving this larger target or at least a step 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.

- **Objective**

- 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.
- Development of a database with morphodynamics and physico-biogeochemical characteristics gathered through regular and continuous monitoring will provide support (as base-line) for future studies and is the mandate of NIO.

The data acquired in the above project contributes to the NANO Global Project (NANO-DOAP) *A global study of Deoxygenation, Ocean Acidification and Productivity at selected sites*

Environmental conditions throughout the world ocean are changing in response to fossil fuel emissions and greenhouse warming in the atmosphere. Climate change and high carbon dioxide levels in the atmosphere are causing a domino-like series of changes in ocean conditions, including increased temperature, decreased oxygen content and acidification.

Since the beginning of the Industrial Revolution, oceanic absorption of carbon dioxide (CO₂) originating from human activity has increased surface seawater acidity (as measured by the increase in hydrogen ion concentration) by about 26% [1]. If CO₂ emissions continue to increase at the present rate, model projections suggest that surface seawater acidity will increase by an additional 100–150% by the end of this century [2].

Dissolved oxygen observations of sufficient accuracy are available in the ocean since 1903 and the first basin-wide surveys were done in the 1920s. Observations show ongoing regional changes in oceanic oxygen, and provide partial confirmation of climate models that predict an overall decline in oceanic oxygen concentrations, or ‘deoxygenation’, and a subsequent expansion of the mid-depth oxygen-minimum zones (OMZs) under global warming conditions. Declining oxygen concentrations have also been found in coastal regions, leading to more abundant and growing regions of very low concentrations, known as “dead zones”. Coastal changes have mostly been fuelled by riverine runoff of fertilizers, but in some cases may have been affected by larger-scale changes in oxygen. Dissolved oxygen loss has potentially broad impacts on pelagic and benthic fisheries, tourism, ocean nutrient cycling, and on the oceanic source of nitrous oxide (N₂O), a potent greenhouse gas [3].

Continuous time-series measurements at fixed locations are pre-requisites for forecasting and warning operations as well as for a variety of basic and applied research studies. This would also enable the establishment of an ecosystem model for the coastal waters and supplement potential fishing zone advisories leading to better coastal zone management.

The main focus of the present project is to contribute to the global effort of observing levels of productivity, acidification and oxygenation, especially in coastal and nearshore areas where data are meager and where the so-called coastal dead zones exist on a global scale.

- The general objectives of NANO-DOAP are:

- Support *in-situ* measurements of selected Essential Oceanographic Variables (EOVs) at participant study sites.
- Compile data submitted by the participants into a NANO global database of selected EOVS and support comparative analyses among study sites, focusing on levels of productivity, acidification and deoxygenation.
- Provide capacity building opportunities to the project participants on marine data management and observation and data analysis methods through workshops and webinars.

- Initiate and promote outreach and citizen-science activities to raise awareness about the importance of the marine environment and the threats facing it.

- **Study of the air-sea temperature interaction near the Karachi, Gwadar and Sonmiani coastal waters**

Air-sea interaction means that the atmosphere and oceans of the world are interlinked by the dynamic, thermodynamic, and biogeochemical processes [1]. The thermodynamic linking has made the Oceans and seas as the earth's and atmosphere's temperature regulator [2] but the ever-growing concern of climate change has been noted as impacting intensely on the air temperature and sea surface temperature [6] due to the fact that air and sea exchange heat and momentum flux [3]. The heat from the incoming solar radiations is absorbed by the sea surface for a longer duration than the atmosphere [9], whereas, the momentum is contributed by the air blowing over the surface of the ocean water [1,7]. This further drives the circulation pattern of the ocean /seas that is commonly known as the thermohaline circulation and the wind driven circulation causing seasonal up-welling and downwelling in the ocean [1,4,5].

From the past years, NIO has collected the physical parameter data and observed the circulation pattern along the coast and OFF-Indus Delta. This circulation pattern varies with the passage of time due to climate impact and the anthropogenic activities, therefore, the collection, update and analysis of data with respect to physical oceanographic research and analysis is required on monthly and yearly basis.

This project aims to collect meteorological data from the automatic weather station AWS and Conductivity, Temperature and Depth (CTD) data of the coastal waters at the study areas / stations located on Karachi, Gwadar and Sonmiani Coast. The collection will be for the 2-3 days every month for one year.

This data will be process to study the air-sea temperature interaction and the calculation of heat budget index of the coastal water.

- **Assessment of Water Quality and Identification of Pollution Risk Locations in Ambro Creek, Indus Delta-Sindh, Pakistan (Continued)**

Due to these activities the risks of coastal pollution are increasing. This project envisages the environmental pollution and water flow pattern which will have both scientific and socio-economics aspects.

- The detail objectives are:
 - To provide a more comprehensive assessment of the Ambro Creek water quality and identify pollution hotspots based on physico-chemical.
 - Sources and impacts of anthropogenic activities on the coastal water quality, fishery, biological productivity and hydrodynamics parameters.
 - Water flow pattern and sediment dynamics along the creek.

SPECIAL DAYS AND NATIONAL DAYS CELEBRATIONS

- **World Ocean Day, 8th June 2022,**

The UN World Ocean Day provides a valuable opportunity to unite the ocean communities around the world to rejuvenate the ocean and replenish its bounty and health. The Ocean Day Theme 2022 “**Theme: Revitalization Collective Action for the Ocean**” aims to brings together and synergize the efforts for revitalization of the marine sector. The webinar aimed to bring distinguished leaders from the global ocean science community together to deliberate on actions to be taken in the light of the UN Decade for Ocean Science for Sustainable Development 2021-2030, on national, regional and global tiers.

The National Institute of Oceanography Pakistan organized a dialogue with distinguished scientists and global leaders in ocean science. The event was endorsed by the UN Ocean Decade 2021-2030 and MegaDeltas Program with presentations by Executive Secretary, IOC UNESCO

Prof. Vladimir Ryabinin; Executive Director Scientific Committee of Ocean Research (SCOR) Prof. Patricia Milosovic; Prof. Qing He, Director State Key Laboratory of Estuarine and Coastal Research (SKLEC), East China Normal University, Shanghai, China; Mr. Justin Ahanhanzo, Program Coordinator IOCINDIO and IOCAFRICA, IOC UNESCO; Dr. Saima Aijaz, Research Scientist, Bureau of Meteorology (BoM), Australia; Mr. Muhammad Tahir, Ex-researcher NIO, senior marine geophysicist and Pak-Antarctic veteran. Director General Dr. Samina Kidwai was the moderator of the program. The program was widely attended MoST with representatives of PMSA, NIMA, WWFP, Marine Industry, Consultants, Academia, Media persons and NIO Alumni, other national and International community attended widely virtually via zoom.



- Independence Day Celebration 14th August 2021**

NIO commemorated a half-day celebration on 14th August 2021 at NIO Auditorium on 13th August 2021.



- **Eid Millad un Nabi 1443 AH**

On the directives of the Ministry of Science and Technology MoST, the National Institute of Oceanography Pakistan celebrated Eid Milad-un-Nabi on 20th October 2021 to delve into the sacred life of Prophet Muhammad, the advent of Prophethood and to highlight the fact that the Prophet 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 qualities of Prophet Muhammad as the best of all humans and the miracles that are bestowed to him by the Almighty Allah.

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

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 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 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 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 database on science and technology potentials of the country;
- Take measures for effective collaboration among academia, research and development organizations and industry for development of indigenous products or technologies;
- Evaluation of national research and development activities including 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., in accordance with the Rules of Business, 1973;
- Participate in national science and technology planning and development activities and providing advice on 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

Budget	Non development			Development		
	Allocation	Release	Expenditure	Allocation	Release	Expenditure
2021-22	110.900	89.969	86.922	48.387	33.953	20.308

(In Million Rupees)

SALIENT ACHIEVEMENTS AGAINST PERFORMANCE INDICATORS FOR THE YEAR 2021-22

A brief review of some of the major activities carried out by PCST from July, 2021 to June, 2022 is as under:

Formulation of new Science, Technology and Innovation (STI) Policy

For formulation of the new Science, Technology and Innovation (STI) Policy a Coordination Committee, comprising members from PCST and MoST with JSA (P&C) as convener, was constituted. In this regard, the committee studied national STI policies of some of the other countries to acquaint with recent international trends in the national STI policies. More than 18 national sectoral policies of Pakistan were also studied, and various initiatives under these policies were identified where Science, Technology and Innovation can contribute in implementation of these initiatives.

A Working Group was also constituted with approval of the Secretary, Ministry of Science and Technology (MoST) to provide support and guidance for formulation of draft STI Policy-2022. For first meeting of the Working Group, 55-pages background working paper for facilitation of the Working Group was prepared by the Coordination Committee which included brief information about the *Ministry of Science and Technology, Background (for formulation of new STI Policy)* and relevant points from Manifesto of the ruling party. The background paper also included information about basic / important elements addressed in the five international STI Policies, and initiatives mentioned in the 18 national sectoral policies where Science, Technology and Innovation can contribute in implementation of these initiatives.

The Coordination Committee for the National Science, Technology and Innovation (STI) Policy-2022, held a number of meetings and prepared draft outline of the Policy, which was circulated among the Working Group members for their input and comments. In consultation with the Working Group, draft of the National Science, Technology and Innovation (STI) Policy-2022, was prepared which included following chapters:

- Vision, Mission and Objectives
- Introduction
- Enhancing Role of Science, Technology and Innovation in the Societal Development
- Adopting 21st Century Approach to STI Governance and Management
- Invigorating Human Capital for Driving Innovation
- Transforming Knowledge into Product
- Promoting Technology based Innovation and Entrepreneurship
- Focusing Emerging and Frontier Technologies
- Revitalizing Science Diplomacy
- Ensuring Policy Implementation

Draft of STI Policy was finalized in the light of comments /feedback received from stakeholders. After approval of the Federal Minister for S&T, the draft STI Policy was submitted to the Cabinet for approval, which was approved by the Cabinet on 11-01-2022.

Action Plan of STI Policy-2022

The initial work for Preparation of Action Plan of STI Policy-2022 has been started. Action Plan regarding six (06) policy actions pertaining to PCST was prepared and submitted to MoST. Project titled “Digitalization of evidence based Science, Technology & Innovation (STI) policy advisory process at PCST” in line of Policy Action was prepared and submitted to MoST for consideration. The updated action plan has been prepared covering more than 100 Policy Actions under various Policy statements and input received from different Ministries, departments, organizations.

2nd meeting of BoG of PCST

2nd meeting of BoG of PCST was held on 17th November, 2021 at Ministry of Science and Technology (MoST), Islamabad. Dr. Akhtar Nazir, Federal Secretary (MoST), Vice Chairman BoG chaired the meeting. The following major decisions were made during the meeting:

- Approval of minutes of the 1st meeting of BoG.
- Approval of the procedure for meetings of BoG
- Examination & vetting of draft PCST Employees Services Regulation, 2021

• Collaboration with International Organizations

The following collaboration proposals were prepared and submitted to MoST:

- Project proposal titled “Cooperation in the field of STI Policy between Pakistan and Saudi Arabia”.
- Proposals titled “Cooperation in the field of STI Policy between Pakistan and Uzbekistan” for 6th session of Joint Ministerial Commission (JMC), between Pakistan and Uzbekistan Trade, Economic and Scientific Technical Cooperation.
- Collaboration proposal titled “Cooperation in the field of STI Policy between Pakistan and Russia”
- The following proposals were prepared under China-Pakistan Joint Committee on S&T Cooperation:
 - *One-Day workshop on Creating Enabling Environment for University-Industry Technology Transfer.*
 - *Bilateral short-term visits between Science Technology and Innovation (STI) Policy Professional of Pakistan and China.*
- Proposal titled “Capacity building in the field of Science, Technology, Innovation & Policy Research” between Ministry of Civil Affairs, Government of Bosnia and Herzegovina & Ministry of Science & Technology, Government of Pakistan.
- The proposal for S&T Cooperation titled “Cooperation in the field of STI Policy between Pakistan and Syria” is prepared for 6th Session of Pak-Syria Joint Ministerial Commission (JMC).

Technology Foresight Report on Automotive, Robotics & Minerals

The Technology Foresight on Automotive Sector was carried out & completed by PCST during the year under report. The Panel was constituted having representation of top level experts from academia, R&D organizations, industry and private sector. The Panel was headed by Mr. Suhail P. Ahmed, Chairman, Pak-Japan Business Forum. After several meetings and brainstorming sessions, the panel finalized the report having a detailed overview of automotive sector, key issues, strengths, areas of technological intervention, policy guidelines, focused areas of research and recommendations. The report was finalized, published and disseminated among the relevant stakeholders.

3rd meeting of Technology Foresight on Robotics was held online on 12th October, 2021 at 12:00 pm to discuss and finalize the draft report on robotics. The meeting was chaired by the Prof. Dr. Abdul Ghafoor, Pro-Rector, Foundation University, panel chair and co-chaired by the Dr. Dr. Yasir Ayaz, Director center for excellence in AI, members from academia, R&D organizations and industry participated in the meeting. During the meeting, it was decided that 2, 3 additional members from industry will be co-opt for the panel. The finalization of report is under process.

The final draft of the Technology Foresight Expert Panel Report on Mineral Sector was shared with the Panel members for any final suggestion/input before publishing the documents. Input received from the Panel Chair & members on the draft report were incorporated in report. The report of Technology Foresight on Mineral Sector has been completed and under process of printing.

Views/ Comments on documents

- ❖ Views/comments on draft outcome documents of OIC STI Agenda 2026 for 1st OIC Summit on Science & Technology held in 2017 in Astana, Republic of Kazakhstan was papered and submitted to MoST.
- ❖ Views/comments were prepared on the draft “Declaration of the Council of Heads of Member States of the Shanghai Cooperation Organization on Strengthening in Science, Technology and Innovation” and submitted to MoST.
- ❖ Views/Comments on Collaboration with International Institute for Applied System Analysis (IIASA) was prepared and submitted to MoST.
- ❖ Provided inputs for the ratification of the Statute of the NAM S&T Center by the member countries to MoST.
- ❖ Provided views/comment on visit of Pakistani Ambassador to European Spallation Source (ESS), Sweden to MoST.
- ❖ Views/comments on Draft Text of the UNESCO Recommendation on Open Science was papered and submitted to MoST.

- ❖ Views & comments on the following thematic areas for further coordination with United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) was prepared and submitted to MoST:-
 - *Follow up and Review of 2030 Agenda/Sustainable Development Goals*
 - *Leaving No one Behind*
 - *Building Resilience to Risk*
 - *Greening Economics Recovery and Development*
 - *Financing and Investment for Development*
 - *Strengthening Trade, Transport and Digital Connectivity*
 - *Data and Statistics for Policy Making*
- ❖ Provided Recommendations on Duty and Tax Free Import of LED Lighting Products Determination of Local Manufacturing Status of Led Lighting Products on the proposal received from Ministry of Energy, Government of Pakistan.
- ❖ Views & comments on Public Procurement Regulatory Authority's draft Standard Bidding Document (SBD) for procurement of Information Systems (supply & installation) and submitted to MoST.

Development Projects of PCST

❖ First Industrial National Innovation Survey

Request for provision of basic data was sent to PBS from PCST to provide list of total manufacturing industries in Pakistan. PBS provided some basic information regarding manufacturing industries in the country for drawing sample that was insufficient to draw sample frame work for the survey. The hired firm submitted revised inception report on the basis of list of industries provided by the provincial industrial department of Pakistan to form sample frame for the FINIS project. FINIS project committee approved the revised Inception Report.

Meetings

Project team visited chamber of Commerce and Industry and trade associations Karachi Quetta and Peshawar to raise awareness about the importance of this survey.

Data collection/Survey

Pilot study (100 Samples) was conducted by the hired firm and report was submitted to PCST along with dully filled Questionnaires. Pilot study report was evaluated by cross verification through telephone by Project FINIS Team and results were shared with M/S UHY Hassan Naeem and Co., Chartered Accountants. Fortnightly action plan submitted to MoST. Hired firm has submitted data of 5000 industrial units as per Fortnightly action plan. Quality check and scrutiny of proformas (4000 industrial units) received back from UHY has been completed. Random quality check/ verification of proformas (4000 industrial units) received back from UHY has been completed. Quality check and scrutiny of remaining proformas (1000 industrial units) received back from UHY is in progress. Preliminary survey draft report has been submitted by hired firm. The planned project activities will be completed in the financial year i.e. 2022-23.

❖ Need Assessment of S&T Human Resources for Driving Innovation and Achieving Vision 2025. (NAHR)

Pilot Survey

Pilot Survey was completed and Data was collected from 18 Universities, 12 R&D/S&T Organizations, and 09 Industrial Units.

Meetings/ Workshops/Focal Group Discussions

- Meetings/ Workshops/ Focal group discussions were held at Islamabad, Lahore, Peshawar and Karachi to facilitate the data collection process. Stakeholders from HEIs, R&D/ S&T organizations & industry participated in the meetings.

Facilitation to firm

- Authorization letter was provided to firm to facilitate the firm in data collection.
- Reminder letters were also sent to R&D/ S&T organizations to expedite the data collection process.

Data collection/ Survey

Fortnightly action plan submitted to MoST. Till now 17 fortnightly progress reports have been received from the firm according to which hired firm has submitted data of 421 target Units out of 625 target units. All the received proformas have been evaluated. An initial working draft of Report including initial pages, Introduction and Research Methodology was received from MDC. Verification/ Validation were completed of the received proformas. Weekly and Monthly review meetings were also arranged to expedite the project activities. Draft Interim Report has also been received and finalization of the same is in process. The planned project activities will be completed in the financial year i.e. 2022-23.

Database/ Software

An initial version of database/software was developed by M/s Management & Development Center, for entering, storing data, and its retrieval for analysis. Tabulation plan and database manual for the database was finalized. Data entry of received data in database was done for further analysis.

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.

Functions/Objectives

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.

Performance/Outcomes

- **R&D in the field of Third and Fourth generation solar cell materials such as; perovskite, quantum dot etc.:**

- Upgraded labs and induction/operation of lab equipments.
- Efficiency of 5-6% achieved in new solar cell materials such as perovskite, quantum dot etc. Further efficiency improvement is in progress.
- 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:

- Phase 1 of the appointment of the project staff completed in January, 2021 and Phase 2 is expected to be completed by June, 2022.
- Project site cleared of bushes, leveled and Geotechnical / topographical survey of the project site completed.
- The Korean side hired consortium of three Korean firms to act as Project Management Company (PMC) for this project.
- Architectural plan for the project site prepared and got approved from the CDA through the hired local architectural firm.
- NOC for the project obtained from Pak-EPA through hired local consultant firm.
- All the CDA dues against the project site cleared.
- The representatives of KOICA Project Management Consultancy (PMC) – KCL Consortium visited PCRET in September, 2021 to finalize the project implementation plan.
- Local contractor hired for construction of project building.
- The building layout and excavation for foundation lane of the project building has been completed.
- The water and electricity connections are provided for the project site.

- **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 Hydel Power and Rural Electrification:

S. No	Objectives	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 will be installed soon.
ii.	Formulation of Small Hydropower Standards System for Pakistan	The task is under progress at PSQCA.
iii.	Human Resource Development in Small Hydropower (10 trainings each having 6 months duration will be held in China)	6 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 kw 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.	Establishment of a 100 kW 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.
vi.	Hydropower Development Planning of a selected river/canal in Punjab	This mandate was also given to Energy Department Punjab.

- 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.

- Talent Cultivation Program:

- Online training of 6 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 titled “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. HRC, China was requested by PCRET to give the schedule for MoU signing ceremony. Meanwhile both parties are drafting agreements to be discussed for the initiation of Projects under the premise of MoU.

Outcomes/Service Delivery

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

- Coordinated 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 equipment” 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 and 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 skills development in the field of renewable energies.
- **Research and Development for Socio Economic Development:**
 - Upgraded Advance PV lab which is 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 solar cells.
 - 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 prototypes of Renewable Energy Products for socio-economic development and their commercialization for revenue generation. 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/Department

- **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 Ph.D. and 2 MS students supervised.
- **Solar Testing/QC Lab:**
 - Provided testing services 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 (on going project):**
 - **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
 - **Project Name:** Joint Research on Small Hydropower Technology between China and Pakistan
Funding: USD 600,000 (~Rs. 102 million), Chinese Government's Grant in terms of equipment, trainings and seminars + Rs. 20 million GoP Local Share
 - **Project Name:** Talent Cultivation Program (Completed)

Purpose: Online training of 6 engineers and officials of PCRET will be conducted by Hohai University China on Small Hydropower Development. The duration of the training is 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:**

- Upgraded Solar Thermal product development workshop at PCRET, HQ, Islamabad.
- 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 Desalinators and Solar Dryers.
- Upgraded Solar Thermal product development workshop at PCRET, HQ, Islamabad.

Linkages with budget for R&D Activities.

Total budget allocated to PCRET for the year 2021-22 for R&D/Non-development activities was Rs. 10 Million. An amount of Rs. 3 Million was re-appropriated to COMSTECH and Rs. 1.227 M re-appropriated to the other heads of PCRET to meet the liabilities. The final budget was Rs. 5.773 Million, out of which Rs. 5.011 Million was utilized against R&D activities and the remaining amount of Rs. 0.763 Million was lapsed during FY 2021-22.

Pakistan Science Foundation (PSF)

Introduction:

Pakistan Science Foundation was established on June 30, 1973 under the Pakistan Science Foundation Act No. III of 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 following three broad categories:

- Science Promotion supports basic and 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 endeavoring to image scientific ideas to grasp the concept of fundamental science.
- Science Centers to encourage all segments of society in thinking, understanding and exploring science.

Some of these activities pertaining to above mentioned categories are undertaken by 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 of Pakistan Science Foundation

Under the Act, the Foundation has been entrusted to carry out the following functions:

- Establishment of comprehensive scientific and technological information and dissemination centers.
- Promotion of basic and 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 centers, clubs, museums, herbaria and planetarium.
- 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 of 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 evaluates the results of such research.
 - Maintain a National Register of highly qualified and talented scientists/engineers and doctors both in and outside Pakistan, and to assist them in collaboration with concerned agencies to seek appropriate employment.
 - Establish liaison with similar bodies in other countries.

Goals & Targets Specified against which Performance can be measured:

- Establishment of Scientific and Technological Centers
- Promotion of Basic and Fundamental Research
- Promotion of R&D Research in the country
- Establishment of science centers, 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 of 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

• **Clear-cut Performance Outcome Instead of Routine Activities:**

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 Pakistan Science Foundation. Under the action plans of various S&T Policies, the task of popularization of science at grass roots level in the country has also been assigned to PSF. Popularization of science plays a vital role in the socio economic, cultural, and environmental development across the country. In this regard, a number of activities was initiated to develop science culture in the country. Under the action plan of the New National Science, Technology & Innovation Policy-2022, the Government has emphasized on strengthening and expansion of PSF programs for popularization of science at grass roots 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 to enhancing/improving the critical sense of the population, by increasing its involvement in decision-making and contributing to sustainable development. In this regard, Pakistan Science Foundation undertakes a number of 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 study of science. Science Caravan consists of three major components; firstly demonstrate the exhibits & display items, secondly 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 2021-22, a total 95371 students from 81 Schools visited Science Caravan Exhibitions as detailed below;
 - Federal unit: 6159 students from 19 schools visited the exhibitions.
 - Sindh units: 44690 students from 239 schools visited the exhibitions.

- Punjab units: 24688 students from 133 schools visited the exhibitions.
 - Khyber Pakhtunkhwa units: 12464 students from 59 schools visited the exhibitions.
 - Baluchistan units: 7370 students from 44 schools visited the exhibitions.
- **30th Annual Intra and Inter Board Science Essay and Poster Competitions** remained under process during this period.
 - Donation of **Popular Science Magazines and Books** is one of the regular and important activities for science popularization. 8000 copies of Quarterly “Urdu Science Magazine” were distributed to 2000 schools during the report period.
 - **World Science Day for Peace and Development (WSDPD):** PSF in collaboration with Commission on Science and Technology for Sustainable Development in the South (COMSATS), the Organization of Islamic Cooperation Standing Committee on Scientific and Technological Cooperation (COMSTECH), the Economic Cooperation Organization Science Foundation (ECOSF), and the Pakistan Academy of Sciences (PAS), celebrated World Science Day for Peace and Development, at the COMSTECH Secretariat, Islamabad. Since 2001, the World Science Day for Peace and Development, is celebrated to highlight the important role of science in society and the need to engage the wider public in debates on emerging and important contemporary issues relevant to science. In 2021, PSF celebrated World Science Day on November 10, 2021 on the theme “Building Climate Resilient Communities”. Federal Minister for Science and Technology highlighted the importance of plastic waste management for a nation. Award distribution to journalists was also made on celebration of world science day.
 - **Popular Science Lectures:** Pakistan Science Foundation arranges series of lectures where eminent Scientists and Educationists express their views for the benefit of the audience comprising scientists, scholars, students and the general public as one of its mandatory functions. During the current year, 07 Popular Science Lectures were organized on different scientific themes.
 - **Participation of Pakistani Students in International Junior Olympiad:** PSF, being a focal organization for IJSO, coordinated with the organizers for participation of Pakistani students in IJSO-21. This year International Science Olympiad was held on 12-21 December 2021 at UAE. The advertisement for “call for applications” published in different national newspaper, selection of students was made and winner students participate in the event.
 - **Prize distribution ceremony of Poster, Essay and Plastic waste models competitions:**
 - In collaboration with United Nations Educational, Scientific and Cultural Organization (UNESCO), Pakistan Science Foundation (PSF) planned to organize a Prize distribution ceremony of Poster, Essay and Plastic waste models competitions. This event was held on November 25, 2021 and PSF also completed Plastic Waste Management in collaboration with UNESCO, UNDP Pakistan, New World Programme and Coca Cola Foundation successfully.
 - **Science Communication Workshop in Collaboration with Peshawar University:**
 - Pakistan Science Foundation is striving to popularize the science among the masses through the Mass Media. In connection with the popularization of science, PSF Organized Science Communication workshops for capacity building of Science Journalists and communicators for the better coverage of Science in National and International Media. Science Communication Workshops organized in Islamabad, Khairpur and Quetta, Next workshop is planned in Peshawar.
- **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 on the basis of technical merit and relevance to the socio-economic needs of the country. The progress of research is monitored through evaluation of semi-annual and annual progress reports. Multi-disciplinary research projects in areas of economic significance to Pakistan are accorded special priority for award of financial support.

During 2021-22, a total of 141 research projects in 10 scientific fields namely Agricultural Sciences, Biological Sciences, Biotechnology & Genetic Engineering, Chemistry, Computer Sciences/Math's, Earth Sciences, Engineering Sciences, Health Sciences, Environmental Sciences and Physics remained under active consideration. Among these, 72 were under process, of which, 27 projects costing Rs.95.537 million were approved and an amount of Rs.25.672 million was released to 17 new projects on account of 1st installments. Total 54 projects were on-going and an amount of Rs.5.607 million was released on account of due installments and evaluation fee of these projects.

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of 06 completed projects, 09 research papers were published in national/international journals.

• **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, no case was entertained due to shortage of funds.
- **Conferences/Seminars/Symposia/Workshops:** Another function of the Foundation is to provide funding for holding conferences/seminars/ symposia/workshops etc. During the year 2021-22, the organization of 46 conferences, seminars and workshops on important scientific topics were financially supported at different universities and R&D organizations across the country.
- **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 on the basis of research results achieved under the PSF supported research projects over a period of 10 years. It carries a cash award of Rs.100,000/- along with appreciation certificate. Each year one scientist is awarded with Gold Medal and cash prize. This activity has encouraged the scientific community to conduct quality research, perform well and produce fruitful outcome. During the year, no case was entertained due to shortage of funds.

R & D INDUSTRY PROGRAMME

Focusing on collaborative research and strong industrial linkages, R & D industry Programme is bringing together researchers, end-users and the funding institutions at one platform to create an environment of a unified approach to identify and solve industrial problems through applied research and technology transfer mechanism.

During 2021-22, a total of 8 concept papers/project proposals were registered in 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. Seven of these projects processed for peer review. Total Rs. 9.86 million were released on account of due installments of 03 ongoing projects being executed in NUST, COMSATS and Ibn-e-Sina Institute of Technology. At present, there are 10 on-going projects in R & D Industry Programme in different research organizations and academic institutes.

PSDP PROJECT “COMPETITIVE RESEARCH PROGRAMME”

The Competitive Research Programme (CRP) is the PSDP awarded to 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 at a total cost of Rs. 1964.500 million. The project was revised on 24th September 2021 without any change in its cost for extended period of implementation upto 30th June 2026.

During 2021-22, a total of 770 concept proposals received under two calls (4th Call and Smog Call). A total of 41 projects worth Rs. 259.65 million approved for funding after completion of peer review and technical evaluation through different execution committees. Out of these approved projects, first installment of 16 projects amounting to Rs.75.832 million was released. Due installments on account

of 53 ongoing projects amounting Rs.11.7 million was also released. The project is executed through different Committees (8 meetings of Scrutiny Committee, 16 meetings of Technical Committees, 4 meetings of Project Award Committee and 01 meeting of Steering Committee) for review and award of the research projects/grants.

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

18TH PROTOCOL

Ministry of Science & Technology (MoST), Pakistan has signed S&T protocol with China. MoST under 18th Protocol, first time launched a joint Call for proposals. Total 119 research projects were received and through 02 meetings of the Technical Committee and detailed discussion with China, total 22 research projects were shortlisted.

In the meeting Chaired by the Federal Secretary MoST, total 13 research projects were shortlisted for joint funding under this Call. These 13 projects amounting Rs.96.234 million were approved in CRP 4th Steering Committee. Out of these approved projects, first installment amounting Rs. 49.584 million was released.

- **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 Ministry of Science and Technology and United State 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 Pakistan Science Foundation. It is being managed by the Foundation through the Board of Governors (BOG) and Fund Management Committee (FMC). The Chairman, PSF is the Chief Executive of the Programme/Fund. Main objective of this fund is to enhance the 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 2021-22, a total 164 concept papers in the fields of natural sciences were received for processing. All were passed through 06 meetings of the PSF Screening Committee and 93 concept papers were shortlisted for further processing. A total of 32 project proposals costing Rs.108.67593 million were approved and amount of Rs.44.6287 million was released to these new projects on account of 1st installment. During the year, 89 projects were on-going and an amount of Rs.13.0207 million was released on account of due installments and evaluation fee of these on-going projects.

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of 13 completed projects, 14 research papers were published in national/international journals.

- **SCIENCE TALENT FARMING SCHEME (STFS)**

- **Brief Progress of the STFS Project**

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 revised at total cost of Rs.1517.071 million by DDWP forum on 14.01.2022 till 30.06.2025 with some changes in 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 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 disable students the Scholarship is @18,000/- per month
- Tuition fee @Rs.10,000/- per year for each student
- Additional interventions and activities mainly include (but not limited to) the following:
 - Research projects are developed by each student every year, duly supervised by a university teacher/researcher. Science graduates also provide guidance to the students
 - Science lectures, Presentations, Film/ Planetarium Shows and Hands on activities through Mobile Science Labs
 - 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 Year 2021-22: 100.00 million
Expenditure incurred: 99.420

- **Information on progress of the project**

Cumulative Physical Progress	62.5 %
Cumulative financial Progress	80%

Details of activities, achievements and progress during the preceding financial year (2021-22)

- **Targets (Out Puts):**

- Monetary benefits to 4 batches completed (total 1200 students)
- Monetary benefits to 299 students of 5th batch for one year made.
- Local study visits for all batches of STFS i.e. 1st, 2nd, 3rd, 4th and 5th (300 students each) were arranged successfully in 2016, 2017, 2020, 2021 and 2022 respectively.
- International study visits of STFS 1st and 2nd batch were arranged in 2016 and 2017 respectively. The activity were 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.
- Financial assistance to 11 approved universities at total @Rs.1.00 million was provided for undertaking research activities of STFS students.
- Honorarium to total 60 mentors @100,000 for supervision of STFS students in their research projects. In total 339 posters/ research reports from 5 batches have been received

- **Outcome/Impacts:**

The project outcomes are;

- Scholarship to 3000 students in total.
- The project outcomes is 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 report period, International Linkages activities of Pakistan Science Foundation were further expanded and fortified. Effective linkages were developed with international counterparts to benefit the scientific community of Pakistan.

- Fourth joint call for proposals was launched with NSFC, China, NSFC-China and 3rd joint call with TUBITAK-Turkey. The calls were highly appreciated by the scientific community.
- 95 projects remained ongoing under 03 calls with NSFC, 02 with TUBITAK, and 02 with MSRT. While 06 projects awarded under “PSF-NSF, Sri Lanka first call were also ongoing. A total, 45 technical reports (semi-annual and annual) of ongoing projects were received and an amount of Rs.38 million was released on account of due installments of already ongoing projects and first installment of newly initiated projects with and NSFC-China.
- An online Joint Technical meeting with NSFC authorities was held on 16th March, 2021 at PSF. The meeting was chaired by PSF, Dr. Shahid Mahmood Baig, Chairman, PSF. In the meeting, there was formal exchange of results of the PSF-NSFC joint call. Besides this, two sides also exchange gratitude on existing collaboration and modalities to launch joint 5th calls were also discussed.
- Another online Joint Technical meeting with TUBITAK authorities was held on 22 June, 2021 at PSF. The meeting was chaired by Prof. Hasan Mandal, President, TUBITAK, while from PSF, Dr. Shahid Mahmood Baig, Chairman, PSF chaired the meeting. In the meeting, there was formal exchange of results of the PSF-TUBITAK call. Besides this, two Heads also discussed expansion of PSF-TUBITAK cooperation to new horizons for Researchers and Scientists to capitalize and learn from each other in science and technology.
- A Letter of Intent was signed between Pakistan Science Foundation and “Children & Youth Science Centre of CAST” on 20 May, 2021 through Zoom/online at PSF. The event was commemorated at 70th anniversary of Sino-Pak diplomatic relationships. Through the collaboration, CYSC will help PSF in capacity building of science teachers and students for a successful execution of STEM (Science, Technology Engineering and Mathematics) project by PSF throughout Pakistan.
- PSF and NSFC China launched call for proposals for Joint Scientific Exchange programme, which first of its kind launched bilaterally with the aim for long term and short term capacity building /HRD/Internship/Apprenticeships.

- **PLANNING & DEVELOPMENT (P&D) SECTION**

- **Non-Development Activities:**

Since 1973, PSF provides financial support to Scientists / Technologists for presentation of their research papers in international science conferences, seminars, workshops, symposia and to undertake a part of research work in the laboratories of the advanced countries for which facilities are not available within the country. PSF used to support this activity from its annual non-development budget with meager allocations. Therefore, in order to meet the requirement of Scientists, PSF continued this activity from development budget with successful completion of two PSDP projects from Year 2000 to 2016.

During the FY 2021-22, the above activity was financed through non-development budget under the title “**Exchange of Visits of Scientists and Technologists**”. An amount of Rs. 3.75 million was allocated for this activity. During the year, only 06 travel grant Award Committee meetings were arranged where twenty two (22) travel grant requests, duly received from Public Sector R&D Institutions and Universities were presented for consideration of the committee. After thorough evaluation, 16 applicants were recommended but only 12 applicants availed the facility.

- **Development Activities:**

There are 34 Scientific Societies registered with government of Pakistan as well as with PSF under Societies Act 1860. However, after the lapse of 07 years between approval of Phase-I and Phase-II, most of the societies became inactive. A total 20 societies were funded under the project in FY 2021-22.

Under the development project titled “Financial Support to Scientific Societies in Pakistan (Phase-II), the activities were mainly hampered due to COVID-19 pandemic. However despite the fact the registered scientific societies were able to manage and continue their activities. Main achievements made under the project during FY 2021-22 are:

- Grant-in Aid provided to 15 registered Scientific Societies.
- Total 20 International / National Science Conferences / Workshops /Seminars/ Symposia were partially financially assisted.
- Total 42 issues of 11 Scientific Journals were partially funded.
- Linkages Fee paid to 04 International Federations annually.
- Total 05 events physically monitored by PSF staff.
- PSF also commenced Travel Grant Activity from the same PSDP project for Ph.D. scholars and Society members.

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

The targets for various functions and activities performed by the Foundation were set accordingly keeping in view the medium term budget estimates.

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

Implementation and processing of all Development projects and other science promotion activities were undertaken as per assigned KPIs to each section.

- **Linkages with budget to better reflect performance.**

All functions and activities are performed as per allocated budget ensuring proper utilization of government funds.

Pakistan Museum of Natural History (PMNH)

Introduction:

Pakistan Museum of Natural History the only Natural History Museum in the country was established in 1976 as an attached organization of the Pakistan Science Foundation, Ministry of Science & Technology, Government of Pakistan. Pakistan Museum of Natural History (PMNH) has four principal divisions namely Botanical Sciences Division, Earth Sciences Division, Zoological Sciences Division and Public Services Division. First three scientific divisions are engaged in the collection, identification and research activities pertaining to plants, animals, fossils and mineral resources of Pakistan, while the fourth one is responsible for mass education and popularization of natural history through various displays, exhibits and dioramas. Researchers of PMNH carried out extensive field works from the Coast of Arabian Sea to the Alpine Regions, roamed through barren areas for the collection of Flora & Fauna, Rocks, Fossils and minerals not only for research work but also for the purpose of education because education is also one of the main objectives of PMNH. For this purpose, PMNH regularly organizes trainings, workshops, seminars, symposia and other educational interactive activities related to natural history, environment and biodiversity of Pakistan. International days are also observed. PMNH has formed many national and international liaisons with the other research institutes in the country and abroad. Due to these collective efforts of scientific and technical staff of PMNH and collaborations with other research institutions, PMNH has 1.4 million natural history specimens in its repositories. Research outcome of these field works and National and International projects are published in the form of research papers in reputed national and international journals. PMNH is not only conducting research on the natural resources of Pakistan which exists in the form of Flora & Fauna, Rocks, Fossils and Minerals 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 the Pakistan visit PMNH as a part of their educational tours. Scientific and Technical staff of PMNH also facilitate the students and researchers from the other universities and institutes by providing help in their research in the form of information, technical assistance, specimens as a loan and guidance in their research work.

➤ Total Budget allocation for 2021-22	:	Rs.178.679 million
➤ Non-Development for Research activities	:	Rs.9.00 million
➤ Establishment size	:	136

- **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, Fishes by the scientists of PMNH.
 - To carry out research on biological and geological resources of Pakistan.
 - To interpret our natural resources and environment in the light of the past and plan for future course of action.

- **Collection, Identification, Cataloging, Qigilization:**

- 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.
 - To deliver lectures to students/researchers of different schools, colleges and universities by PMNH scientists.

- **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 liaison with similar institutions both within and outside Pakistan for sharing of knowledge and expertise.
- **Education/Trainings/ Workshops and Seminars:**
 - To provide training facilities in natural history research, education, conservation, collection, preservation, identification, curation and exhibit designing including taxidermy, modeling 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:**
 - Visits of Schools/Colleges/Universities and General Public to PMNH Displays.
- **PERFORMANCE AGAINST SPECIFIED GOALS AND TARGETS:**
 - **Training Courses/Workshops Held/Attended:**
 - Officers of BSD attended two days training entitled “Plant Nutrition and Its management” organized by University of Agriculture and NIAB, Faisalabad collaboratively.
 - ESD scientists attended and successfully completed training/course on “Project Preparation (PC-I and PC-II)” by Pakistan Planning and Management Institute Working.
 - ZSD scientists attended Indus Dolphin Field Survey training session, under WWF Pakistan, from 25th March to 16th April 2022.
 - PMNH scientists attended the workshop from 23rd-25th May, 2022 on “UNEP’s Capacity Building Workshop through Data Reporting Tool (DaRT)” under Ministry of Climate Change, Islamabad.
 - The PMNH officers/scientists attended world Environment Day at Pakistan Museum of Natural History, Islamabad.
 - PMNH scientists attended a lecture entitled “Nitric Oxide Nasal Spray for COVID-19 Treatment and Breath Test for COVID-19 Diagnosis” by Dr. Isaac John from University of London on 11th May, 2022 at PSF Auditorium.
 - BSD scientist attended one day workshop with title “ Artificial Intelligence & Machine Learning in Life Sciences” organized by COMSTECH Islamabad on 24-03-2021.
 - BSD scientist attended inaugural session of Three days short term and six weeks attachment training courses for LIS professionals organized by PASTIC Islamabad.
 - BSD scientist attended two days online certificate course entitled “Basic Plant Tissue Culture Techniques” jointly organized by COMSTECH (the Ministerial Standing Committee on Scientific and Technological Cooperation of the Organization of Islamic Cooperation), ICCBS and PABIC, Karachi held on February 16-17, 2021.
 - BSD scientist attended as Expert facilitator in one day mushroom cultivation organized by Zarai Taraqiyati Bank Islamabad.
 - Officer BSD attended two days training entitled “Plant Nutrition and Its management” organized by University of Agriculture and NIAB, Faisalabad collaboratively.
 - BSD scientist attended webinar on “Training Program STI Policy and Instrument for the Sustainable Development in the Belt and Road Countries.

- **Trainings Courses / Workshops Conducted:**
 - ZSD organized Taxidermy Training Workshop in collaboration with KPK Wildlife Department under 10BTTP, from 20th to 24th June, 2022.
 - Training entitled “Pinning and preservation of different groups of Beetles (Coleoptera)” were provided to 11 students of B.Sc. (Hons) Agriculture Entomology, PMAS Arid Agriculture University, Rawalpindi, at Insect repository, ZSD, PMNH.
 - BSD scientist conducted 05 days training in collaboration with Shaheed Zulfiqar Ali Bhutto Agricultural College, Dokri Larkana on mushroom cultivation. 30 students of college trained. Vice Chancellor of SAU Tandojam attended closing session of the training.
- **Research Outcomes:-**
 - **Field Works:**
 - BSD scientist conducted a one day field visit to Dunga Gali forest area on 15-09-2021 and collected a medium sized *Cedrus deodara* tree for the preparation of the new diorama at PMNH display gallery along with field visit to merged districts of KP area for the 10BTTP. Worked on the baseline studies of the floral diversity of the different areas of the merged districts. The areas included Bajour area, Mohmand area, North Waziristan, South Waziristan, Orakzai area, Kurram area and Khyber area as vegetation/plant expert from PMNH.
 - BSD scientist conducted fieldwork in Gilgit Baltistan and surroundings areas in collaboration with the University of California, Davis along with Mr. Muhammad Mufakheri dated 14-25 December, 2021.
 - The geological field work carried out from 14th September, 2021 to 29th September, 2021 in Skardu, Shaigar, Khaplu, Khurmang, Yaseen, Nagar valley and adjacent areas. To observe petrochemical, biostratigraphic investigation in perspective of metal mineralization for further investigation.
 - ESD scientist along with Dr. Anwar Qadir (University of Haripur) went for fieldwork for the SRGP-Project entitled “Assessment of Shale Gas Potential of the Cretaceous Chichali Formation, Hazara Basin, and Lesser Himalaya, Pakistan” at Abbottabad area.
 - ZSD team conducted field work on the biodiversity of coastal areas of Sindh (keti Bandar, Bamboor and Karachi) and Baluchistan (Hub river estuary and Maini Hor) from 07th September 2021 to 22nd September 2021.
 - ZSD researcher participated in baseline survey on the biodiversity of Ex-FATA agencies of KPK in collaboration with 10 Billion Tree Tsunami Project of Wildlife Department KPK.
 - ZSD researchers conducted Markhor population estimation survey at District Chitral, Swat and Kohistan in collaboration with KPK wildlife department from 25th Dec, 2021 to 5th Jan, 2022.
 - ZSD team participated into Indus Dolphin Survey, conducted by WWF Pakistan from 25th March to 16th April 2022.
 - ZSD arranged PSF-NSFC project tour for sampling of specimens from 24th May to 10th June, 2022 from Gilgit-Baltistan.
 - ZSD arranged PSF-NSFC project tour for sampling of specimens from 19th to 29th June from Peshawar and adjoining areas.
 - **Collection, Cataloguing, Digitization of Natural History Specimens:**
 - **Collection & identification**
 - **6118** Natural History specimens collected from different regions of Pakistan and identified for PMNH herbaria/labs.
 - **Curation/ Preservation/ Poisoning / Mounting / Arrangement**
 - **37829** specimens/samples of plants, animals, rocks, minerals and fossils curated.
 - **Cataloguing**
 - **5693** specimens/samples catalogued.
 - **Digitization/Database**
 - **7695** specimens/samples digitized.
 - **Laboratory Work:**

- Microphotography of the pollens of important higher plant species from different regions of Pakistan.
- Maintain fungi cultures and spawn of (*Cordyceps*, *Trichoderma*, *Metarhizium*, *Beauveria*, Milky, Oyster, King Oyster) in the BSD laboratory along with production and maintenance of mushroom spawn of milky, oyster and *Cordyceps spp.* (mushrooms) in the laboratory of BSD
- Overall curation, preservation, microscopy and identification of Algal herbarium specimens and their classification up to species level.
- **Research Publications:**
Scientists of PMNH remain engaged in the research on specimens of plants, animals, rocks, fossils and minerals. Outcome of this research published in the national and international journals in the form of research papers & articles, natural history books, monographs, technical reports and popular articles etc. In **2021-22**, a total **47** Research publications, **09** technical reports, **14** popular articles, **01** book and **02** abstracts on Botany, Geology and Zoology were published in National & International Journals/magazines/books by PMNH researchers.
- **Research Projects (National & International):**
Researchers of PMNH developed mutual collaboration for joint research on National and International level. As a result of these joint ventures, scientists of PMNH successfully initiated following research projects;
 - International Projects (On-going)
 - A bilateral research project proposal selected for funding under PSF-NSFC programme. The project title is “Cooperative development of an innovative auto-ID platform for the beetles from China and Pakistan”.
 - National Projects (In process)
 - Project proposal approved at PSF. Titled: Birds / Wildlife Aircraft Strike Hazards & Preventions on 1st April, 2022.
 - Submitted Research Project to Pakistan Science Foundation, titled: “Establishment of DNA barcode reference Bank for the marine and freshwater fishes of Pakistan on 20 June, 2022.
 - Three scientific research proposals submitted by the BSD/PMNH scientist to the PSF/NSLP for funding and the Screening Committee for Research Proposals have approved the following:
 - PSF/NSLP/C-PMNH (990) Entitled Formulation of Eco-Friendly *Trichoderma* Based Indigenous Bio-Fertilizer for Management of Plant Diseases. (As PI under review process)
 - PSF/NSLP/C-PMNH (1000) Entitled “Conservation, Propagation and Research on Native Desert Plants In PMNH Islamabad.” (As PI under write-up process)
 - PROJECT NO. PSF/RES/CP/KPK-SBBU/AGR (29)
Project Title: Cultivation/ Processing of Mushrooms at High Altitude Research Centre at Sheringal, Dir Upper under the Shaheed Benazir Bhutto University, Sheringal, Dir Upper (Technology Transfer). (As Co. PI under review process)
- **NATIONAL & INTERNATIONAL LIAISON:**
PMNH established liaison with similar institutions both within and outside Pakistan for sharing of knowledge and expertise. PMNH is already developed liaison with the following National and International Institution for joint venture;
 - a. Ozone Cell, Ministry of Climate Change, Government of Pakistan
 - b. National Institute of Folk & Traditional Heritage (Lok Virsa)
 - c. University of Sindh, Jamshoro
 - d. University of Haripur, Hazara
 - e. National Museum of Natural History, Paris, France
 - f. Beijing Museum of Natural History, Beijing China
- **SERVICES TO OTHER ORGANIZATIONS**

In the financial year of 2021-22, services were provided to the students of BS, MS, M. Phil. belonging to the various universities of Pakistan in their research and thesis work and also supervised their research activities. Students were provided assistance as a co-supervisor in their research work from the different universities including Quaid-i-Azam International University, Islamabad, University of Haripur, Hazara, Bahria University, Islamabad, National Center of Excellence in Geology, University of Peshawar, National University of Science and Technology, Supernova Education System, Department of Forestry and wildlife Management, from University of Haripur, University of Karachi Herbarium, Govt. Postgraduate College No.1, Abbottabad, Islamabad and Pakistan Institute of Engineering & Applied Sciences (PIEAS), Islamabad

- Completion of two weeks internship activity with BSD scientist, student of Supernova Education System, 16, Nazimuddin Road, F-8/1, Islamabad, completed on Mushroom Tissue Culture, Spawn Production and Cultivation and Preservation Techniques.
- One student from PMAS Arid Agriculture University Rawalpindi worked as Internee on micro fungi for the period of three months under the guidance of BSD scientist in March 2021.
- One student from University of Sargodha completed one month internship activity in Mycological section of BSD under the supervision BSD scientist including the completion of internship activity on “Extraction of Plant parasitic and beneficial nematodes from soil, funnel method, microscopy, identification and managements” from PMAS Arid Agriculture University, Rawalpindi.
- Two students from PMAS Arid Agriculture University, Rawalpindi, completed three months internship under supervision of BSD scientist.
- Delivered presentation and briefing to the faculty representative of Zoology Department, Agriculture University, Faisalabad on the preparation and maintenance of catalogue register on 20th May, 2022.
- **No of Students Supervised: 09 (3 PhD and 06 M.Phil)**
 - PMNH scientists facilitated Dr. Muhammad Ather Rafi (Ex-Director, National Insect Museum, NARC) regarding his work on identification of Butterflies.
 - PMNH scientists facilitated M.Phil student from Arid Agricultural University, Rawalpindi, working on hair analysis of mammalian species.
 - Mrs. Misbah Kausar, PhD student /Internee from Department of Zoology, PMAS Arid Agriculture University, Rawalpindi; worked as internee for the identification of her research specimens.
- **SEMINARS/SYMPOSIA/PRESENTATIONS/WEBINARS/CONFERENCES**
 - More than **20** conferences, congresses, seminars, webinars were attended by PMNH researchers/scientists.
- **DESIGN AND DISPLAY ACTIVITIES OF PMNH FOR INFORMAL EDUCATION:**
 - **Design & Display Activities:**
 - Prepared a new diorama "National Symbols of Pakistan", which creates awareness to all age group of people.
 - "Gems and Minerals of Pakistan" diorama completed and displayed.
 - "Climate Change diorama" completed and opened for public.
 - Wooden structure work of ocean diorama completed.
 - New diorama on Animal Skeletons and Ocean World are in process.
 - Renovation of Paleo gallery completed.
 - Renovate information board of Rock Garden.
 - "Invertebrate Fossils of Pakistan" gallery is in progress.
 - Designed Souvenirs of PMNH.

Educational Activities:

- PMNH organized one day seminar and Art competition on this year theme/slogan “Building a shared future for all life” regarding celebration of International Day for Biological Diversity day.
- PMNH celebrated “World Environment Day” by conducting Panel Discussion on the theme “Only one Earth” and held Photography Contest among different schools of

Rawalpindi and Islamabad inside PMNH premises to give awareness to school children about the importance of this day.

- PMNH organized five days Taxidermy workshop in which more than 25 employees of KPK Govt. participated.
- "Stakeholders Consultation Meeting" regarding PSDP Project Extension of Display Galleries, Collection Repositories Improvement and Research.
- Six specimens including Asiatic Black Bear, Puma, Lioness, Common Leopard & Mouflon Sheep has been stuffed and shifted to Ungulate Carnivore Diorama.
- In the said reporting period (2021-2022) total 1, 97,829 people visited museum galleries including 67171 students and 474 foreigners.

Information Technology Services:

Public Services Division (PSD) is also providing I.T. services to the Scientific Divisions of the PMNH. Some are as under:

- Managed Official Email Management portal".
- Managed security Cameras of PMNH.
- Worked for Social Media (on daily bases).
- Managed "Biometric Attendance".
- PMNH started Digital ticketing for visitors of display galleries.
- Changed Web data of Botanical Science Division.
- Uploaded news on website related to events conducted
- Shared News and information regarding PMNH through Social Media (face book).
- Interview to Roze TV on preparation of documentary of PMNH.

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 own 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 National Science Reference Library through resource sharing and Inter-library 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 2021-22 (Rs. in million):

Non-Development Budget	Development Budget
209.400	10.000

Regular Activities:

Literature Search & of Documents Supply Service

- 24715 S&T documents and 1649 bibliographies were supplied to 1362 researchers belonging to R&D Organizations, Universities, Professional Colleges, Hospitals & Industry.

Technology Information Services:

- 6 Issues of "Technology roundup" a Trade & Technology News-e-bulletin were brought out electronically
- Query based Information on Patents were provided to 57 Users under Technology and Innovation Support Centre (TISC) Desks TISC.
- Following seminars/workshops/expo were organized during the fiscal year:

- A training Workshop on "Amazon Web Services (AWS)" was organized on 26th August, 2021 in collaboration with R&D Cell of Sargodha Chamber of Commerce and Industry (SCCI).
- A One day Expo on Stem & IT Innovations: Innovative Trends in Science Technology, Engineering Mathematics (STEM) and ICTs was organized in collaboration with University of Agriculture (UAF) was organized on 25th November, 2021.
- One day seminar on "Intellectual Property Rights (IPRs) was organized at University of Lahore on 10th December 2021.
- One day Training Workshop on "Research Innovation and Entrepreneurship for Women Scientists" was organized in collaboration with Women University Multan on 23rd February, 2022.
- Two Days Training Workshop on "Research Innovation and Business - Bridging the Gap b/w Academia and Industry" was organized at Khwaja Fareed University of Engineering & Information Technology (KFUEIT) R.Y. Khan on 8th -9th February, 2022.
- One Day Workshop on "IP Licensing and Patent Writing/Filing" was organized at the University of Faisalabad on 30th March, 2022.
- Two Days Training Workshop on "First Aid during Disaster Management &

Research Lab Accidents” Bridging the Gap between Academia and Industry was organized at Federal Urdu University of Arts Science & Technology Karachi on 4th -5th April, 2022.

- One day seminar on "Entrepreneurship: Opportunities & Challenges for Young Generation" was organized at the University of Haripur on 14th June 2022.

Total no. of participants were 800.

PASTIC Publications:

3 Abstract Books and 1 Book was published as follows:

- Abstract Book of “*First International Conference on Applied Physics & Engineering (ICAPE 2021)*” organized by NED University, Karachi on 16-17th September, 2021 was published.
- Abstract Book of “*Second IEEE International Conference on Digital Futures and Transformative Technologies*” organized by NUST on 24th-26th May, 2022 was published.
- A Scientific Book in Urdu Language titled “*Pashtunoo ka Geneati Mutala*” was published in May 2022.
- Abstract Book of “*Sixth International Conference ‘Earth Sciences Pakistan’*” Baragali Summer Campus, Abbottabad organized by Gomal University Dera Ismail Khan on 25th -27th June, 2022 was published.

Human Resource Development (Training Workshops/ Seminars):

36 Training workshops were organized across Pakistan for the capacity building of Researchers in the area of Data analysis (SPSS, R), reference management (Mendeley, Zotero, EndNote), literature search, research methodology and writing skills enhancement (2077 participants).

- 6 Seminars/webinars were organized for creating awareness on COVID, Hepatitis, Breast cancer & sustainable environmental practices (700 participants).
- 5 seminars were conducted at various universities across Pakistan to create awareness about PASTIC’s online digital tools for researchers (370 participants).

Total no. of participants were 3147.

IT Support Service & Strengthening of S&T/R&D Databases:

Following databases were strengthened during the period.

Name of database	No. of records entered
Pakistan Science Abstracts	11500
Industry of Pakistan	9000
R & D Projects	8000
Pakistani Scientists	9000

International Liaison:

- A training workshop on “Data Literacy & Journalism: Step towards Interpreting & Drafting Data Driven Stories” in collaboration with Technology Times, was organized on 17th November, 2021 at PASTIC National Centre, Islamabad under UNESCO- Information for All Programme (IFAP).
- MoU with DSS Thailand remained under-progress.
- Project Proposal in collaboration with BTBU China under joint Exchange Program was submitted to PSF/NSFC.
- An online Zoom meeting entitled “Digital Platform for Technology Exchange” between PASTIC and Beijing Association for Science and Technology (BAST), Beijing Technology & Business University (BTBU), Beijing International Science and Technology Exchange Center (BISTEC) and ZGC Tianhe Promotion Center for S&T Achievement Translation was held on 22 September, 2021 under China Pakistan Science Communication network.

PASTIC Science Reference Library:

- A Training Workshop on PASTIC Koha Cloud” was organized on March 24-25, 2022 at Sir Sadiq Muhammad Khan Library, Baghdad ul Jadeed Campus, The Islamia University of Bahawalpur (IUB) for empowering Library professionals.
- 5342 researchers were served by PASTIC Library.
- 12 issues of the Fresh arrivals were published and 181 Journal issues, 24 documents & 38

newsletters were received from different national and international organizations.

Reprographic / Printing Services:

- 75 different Printing jobs pertaining to 15 Organizations were completed during the FY 2021-22.

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 mandate, abstracting and Indexing of scientific material published in Pakistani journals are being carried out by PASTIC (Hard Copy/online Database) since its inception (1957). Looking onto the dire need of scientific community to access indigenous scientific knowledge through single online forum and to fill the research gap in line with the national needs, PASTIC has taken the initiative to collect, preserve and disseminate indigenous research published in S&T Journals through development of 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 Journal's.
- Capacity building of publisher's/researchers toward software application utilization.

Achievements:

During the FY 2021-22, Consortium of Scientific Journal Publishers of Pakistan was launched during the Project awareness activities organized in different regions of the country. 132 Scientific Research Journals of Pakistan got registered to the project consortium.

Name of Activity	Location	Date	No. of participants
Project Consortium/ Awareness Activity	Peshawar	25 th September 2021	50
	Karachi	8 th January 2022	70
	Faisalabad	19 th March 2022	60
	Lahore	11 th June 2022	57
Total participants			237

Pakistan Council of Scientific & Industrial Research (PCSIR)

Introduction

Pakistan Council of Scientific and Industrial Research (PCSIR) was established in 1953 as an autonomous body to build a strong scientific and technological base of the country for the development of knowledge economy. 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. The mandate of PCSIR is to utilize indigenous resources by promoting scientific & technological research in order to support industrial sector of Pakistan for sustainable development. PCSIR provides cost effective technology solutions to the industries for performance enhancement. The broad-based activities of the PCSIR include technology development, human resource development, quality control/ quality assurance services and consultancy/ trouble-shooting services. The council laboratories are providing testing & certification services to the industrial sector and most of the exportable products are being tested/ certified by its ISO-17025 accredited labs.

- **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).

- **National Level Recognition of the Research Achievements:**

Dr. Syed Hussain Abidi, Chairman PCSIR has been decorated with Sitara-e-Imtiaz in recognition of his outstanding performance and achievements in the field of Molecular Genetics and Biotechnology. The award ceremony was held at President House, Islamabad on March 23, 2022.

- **Science Wing**

- **Research & Development:**

Progress & Performance (Outcome) and Targets of PCSIR in Key Performance Indicators (KPIs):

S. No.	Performance Indicators	2021-22	
		Targets	Progress
1.	Number of Process developed	248	224
2.	Number of Process leased-out	107	80
3.	Number of Patents filed/ obtained	79	23
4.	Research Papers / Publications (International)	161	123
5.	Students supervised	802	916
6.	Feasibility / Technical reports prepared	317	276
7.	Analytical Equipment Developed	209	223
8.	MoUs signed with industries/ academia	52	31
9.	Exhibition/ Conferences/ Seminars organized	78	103
10.	Workshops/ Training organized	123	143
11.	Consultancy provided to the industry	654	669
12.	Interaction with Industries/ Industrial visits	2371	1987
13.	No. of Clients Served	17050	16099
14.	No. of technical/ calibration services provided to the industry	48160	47258

- **Major Initiatives**

- **Eestablishment of PCSIR Laboratories, Islamabad**

As a part of its continuous excellence, PCSIR has marked another historic day on January 14, 2022 by getting approval for the establishment of PCSIR Laboratories, Islamabad. These laboratories have been established in Sector H-9, Islamabad to undertake Research and Development (R&D) and provide analytical testing services to the industrial sector in the Islamabad, Rawalpindi and Azad Jammu & Kashmir region. PCSIR Laboratories Islamabad is currently providing testing/ analytical and advisory services to clients from public and private sectors in the disciplines of food, material, environmental monitoring, halal testing etc. Being a

premier R&D and testing organization, these laboratories would also provide research facilities to M.Sc., M. Phil and PhD students.

- **Federal Minister for Science & Technology inaugurated the following initiatives of PCSIR on February 05, 2022 at PCSIR Labs Complex Lahore:**

- Cannabis Processing Pilot Plant for development of value-added products from Cannabis.
- Precision Green House for Ginger Cultivation- Smart Production as Import Substitution and Technology Transfer.
- Technology Transfer and Capacity Building Centre and Technology Innovation Support Centre.
- Up-gradation of Polymer and Plastics Laboratory.
- Motor Testing Lab-ISO 17025 Accredited Services for Energy Efficacy of Electric Motors.

- **Development of Hemp/ Cannabis products**

A development project “Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields and Establishment of Testing and Product Development Facilities (PCSIR & Arid Agriculture University)” is ongoing. Under the project cannabis will be cultivated and processed to develop medicinal/ industrial products. This project is expected to increase the revenue manifolds.

- **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.

- **Installation of Aquaculture (Biofloc)**

Aquaculture (Biofloc) is being installed at PCSIR Labs Complex, Lahore for farming of imported fish breeds of high economic importance.

- **Greenhouse innovative farming**

Greenhouse for innovative farming is being installed at PCSIR Labs Complex, Lahore to grow important crops.

- **Gene editing of biological agents for nutritional, biochemical and therapeutic purposes**

PCSIR in collaboration with the University of Agriculture, Faisalabad has started project for gene editing of biological agents for nutritional, biochemical and therapeutic purposes to enhance crop yields.

- **Development of a system for the removal of Ammonia from fish pond water**

Ammonia accumulation in fish ponds is of a serious concern for fish farmers which is continuously produced in the fish pond due to excretions of the animal and degradation of feed. It is toxic for fish and should be efficiently removed from a pond for healthy fish farming. Scientists of PCSIR Laboratories Complex Karachi have developed an efficient system for removal of Ammonia from fish pond. The automated system can be backwashed periodically to improve performance and extend operating life. It can remove up to 2,500 Liters of Ammonia rich water per hour.

- **Strengthening the Linkages with Academia**

Keeping in view the strengths & weaknesses of PCSIR, the focus is also given to the listed below activities while establishing the linkages with academia:-

- Sharing of Human & Material Resources with the Public & Private Sector recognized Universities for the utilization the services of their Business & Media Schools Young Graduates to supplement the marketing & commercialization activities of PCSIR's Products/ Technologies
- Sharing of PCSIR's Technical Infrastructure with Science Departments of the Universities. Through this arrangement, PCSIR can overcome the absence of marketing

& media professionals, whereas, the Universities could have easy access to R&D infrastructure of PCSIR.

- **Strengthening the Linkages with Industry**

To strengthen the linkages with Industry/ SMEs and to curtail the trust deficit with the industry, the following activities are undertaken on regular basis: -

- Extensive visits to the Chambers of Commerce & Industries and Sector-Specific Trade Associations.
- Constitution of Technical & Marketing Teams for conducting industrial visits and holding of Focus Group Meetings
- Inviting business/ industrial delegates in PCSIR Laboratories for the awareness of PCSIR's Technical Facilities & Capabilities and to augment the "Seeing is believing" thought.
- Effective publicity campaigns & promotion of interactions with industries/ SMEs through organizing Seminars, Workshops, Technology Exhibitions, etc.

- **Major activities of PCSIR also include:**

- Supply of strategic chemicals to the Defense sector as per their demand.
- Supply of indelible ink vials and stamp pads to the Election Commission of Pakistan (ECP) from time to time.

- **Technology Wing**

- **Key Objectives:**

- To utilize the indigenous resources for the development and promotion of Industrial sector leading to import substitution and export enhancement and to carry out self-sustaining and marketable research.
- To contribute in the industrialization and economic growth of country and human resource development through organized training courses.

To achieve these objectives, PCSIR Technology Wing has been engaged in managing two main portfolios mentioned as under:

- a. PSDP projects in 04 different Streams
- b. Technical Training Centers (TTCs)

For CFY PSDP portfolio is 14107.325 Million with budgetary allocation 2395.082 Million. Out of these 15 PSDP Schemes: 04 are PSDP Schemes (ongoing) (2017-20) with capital cost **1811.845 Million** & 07 are PSDP (Regular) Schemes (2021-22) with cost 6456.45 Million. While 03 are knowledge Economy (Task Force) (2021-22) with 4089.118 Million & 01 PSDP project is in Civil / Military Stream with approved cost 1981.607 Million.

- The Brief of each project is **detailed below:**

- **PSDP Projects (On Going) 2021-2022**

S #	Title of the Project	Major Objectives	Estimated Cost (In Millions)	Allocation/ Releases (2021-22)	Utilization as on 30 th June, 2022
1.	Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields and Establishment of Testing and Product Development Facilities (PCSIR & Arid Agriculture University)	To develop experimental fields/ land for cultivation of industrial cannabis testing and analysis of industrial cannabis.	1896.82 (323.0 FEC)	300.00	300.00
2.	Research, Development and Innovation in PCSIR	Establish an RD&I Programme facility for a variety of purposes in the domain of scientific/ technological/ industrial research such as new	1500.0	43.168	43.168

		technology initiatives, cutting-edge/ advanced R&D, commercialization, digitalization, marketing, industrial-business linkups/partnerships, etc. leading to indigenous commercial/industrial ecosystem.			
3.	Up gradation of Calibration Centre Capabilities at PCSIR Peshawar	To enhance the existing capabilities of Calibration Centre for the facilitation of Local Manufacturers and Public / Private Organizations. in the fields of Mass, Dimensional, Temperature, Electrical/Electronics, Mechanical, Chemical metrology .	35.00	15.00	15.00
4.	Establishment of PCSIR Laboratories Complex, Multan (PC-II Feasibility Study)	To promote quality and excellence in the fruits processing, textile and material science industries, to introduce the post harvest techniques to minimize post harvest losses of fruits like mangoes, citrus and dates.	30.0	0.00	0.00
5.	Up gradation of Halal Authentication Labs at PCSIR Laboratories Complex, Lahore, Karachi and Peshawar	To develop new analytical methods for identifying Haram ingredients adulterated in expected Halal food and non-food items and to conduct Research and Development on new Halal food production To provide state-of-the-art analytical services to importers of processed food and additives. To help local industry to gain Halal certification and build export potential.	722.98 with FEC 563.66	0.00	0.00
6.	Digital transformation, strengthening and automation of PCSIR	Leverage and implement new digital and information technology and systems, such as enterprise-wide information systems, data analytics, knowledge repository, and make PCSIR hardware and network infrastructure ready for implementation of e-office services to be acquired from NITB To develop Key software/ applications with data driven management dashboards to make a digital automated system for PCSIR to increase transparency, productivity, efficiency and revenue	960.710	210.00	210.00

		generation			
7.	Establishment of Material Resource Center and Development of Additive Manufacturing & Reverse Engineering Center at PCSIR	<p>To establish / enhance the facilities for Research and development, materials characterization, Analytical Testing and Quality assurance of materials in the area of Advanced Engineering Material, Electrical / Electronic Materials, Magnetic Materials, Optical / Spectroscopic Materials, Nano technology, Building Materials</p> <p>To establish the Additive Manufacturing Units in PCSIR PLC for development of prototypes and end products.</p>	1750.00 / Revised 1951.68 3 (9.5 FEC)	250.00	250.00

• **PSDP Knowledge Economy (Task Force) (2021-22)**

8.	Data Repository of Scientific Instrumentation	<p>To provide funds for instrumental access to the research institutions, universities, R & D organizations, and to facilitate faculty and research staff of newly developed, as well as existing institutions for conducting their research through the above cited grant.</p> <p>To create an online data base of scientific instruments available in research centers, institutes, and industries of Pakistan and to design a nationwide mechanism for enabling ease of access to instrumentations facility present in different R & D, and academic institutions of the country.</p> <p>To facilitate the Strategic Plans Division (SPD) institutions of Pakistan.</p>	300.0	25.00	25.00
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9.	Gene Editing of Biological Agents for Nutritional Biochemical and Therapeutic purpose	To develop Indigenous strain development/genetic engineering capability in terms of R&D, design, development and subsequent commercial production of bio foods, biochemical, biopharmaceuticals, bio fertilizers, bio pesticide, etc. Including enzymes, single cell proteins, and poultry feed additives. Develop testing facilities for the quality assurance of developed bio- products.	1799.60 plus 100 FEC	400.00	400.00
10	Medical Equipment & Devices Innovation Center (MEDICen)	<ul style="list-style-type: none"> To Assist Pakistani Medical and Surgical Manufacturers in research and development of Medical equipment not only to cater for local market demand but also for export. 	1989.52	4.48 (27.05.22)	4.48

• **PSDP (Civil Military Stream) (2021-22)**

11.	Development of Computer Controlled Fermenters and Production of Bio-chemicals & Bio-products	<ul style="list-style-type: none"> Establish a design and manufacturing facility for computerized automated fermenters, Develop indigenous metabolic engineering capability in terms of R&D, design, development and subsequent commercial production of biochemical, biopharmaceuticals and bioproteins etc 	1981.607	80.333	80.333
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• **PCSIR -Technical Training Centers:**

○ **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 Programmed. Moreover, these Technical Training Centers carry out short terms tailor made/ demand driven training program for industries and professionals for skill development and capacity building.

- **Human Resource Development:**

- **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 automobile, surgical, sanitary, agriculture tools, cutlery sectors.

- **TTC Summary of Achievements (Pass Outs 2017-2022)**

- B.SC Engineering: 420 Students graduated as Engineers
- DAE 2507 students passed out
- Short Courses: 2116 students completed short courses.

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	

Composition of PEC Governing Body.

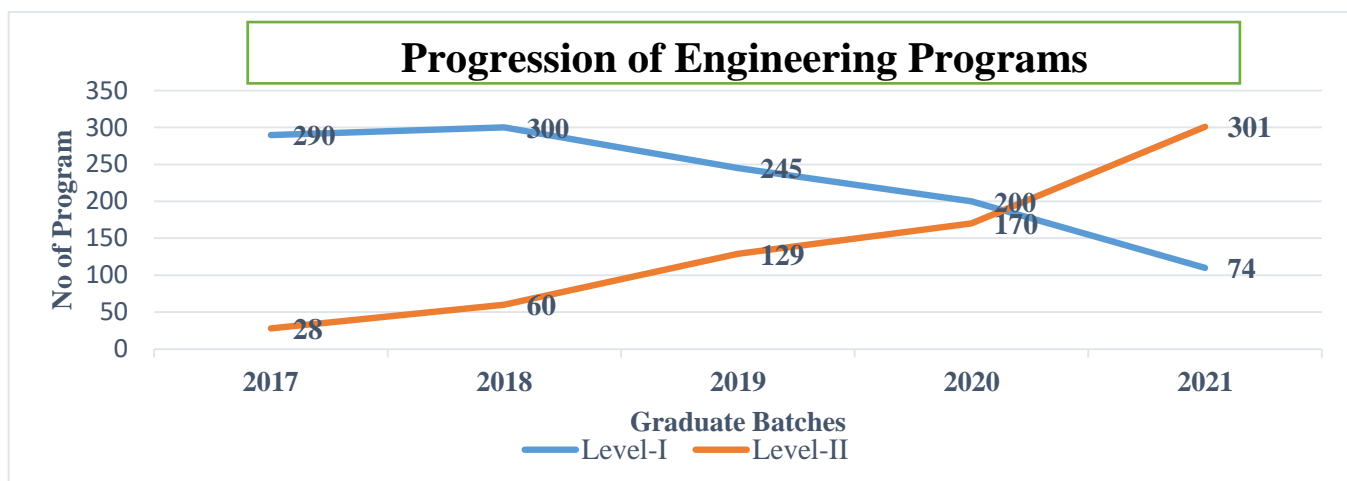
Major Functions:

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)

PEC is the apex body for accreditation and licensing/registration within its jurisdiction. The Council is carrying out process of accreditation for the 1st cycle (undergraduate level) of engineering education so far. As of June 2022, total number of engineering programs being offered in the country in public and private sectors are more than 385 in 133 HEIs based on four years Bachelor program after 12 years of schooling/education.



Sr.No	Region	Total HEIs	Level - I Engg. Programs	Level-II Engg. Programs	Total Accredited Engg. Programs
1.	Islamabad	20	8	46	54
2.	Punjab	56	40	124	164
3.	Khyber Pakhtunkhwa	19	2	44	46
4.	Sindh	33	26	71	97
5.	Balochistan	2	6	10	16
6.	AJ&K	3	2	6	8
Total		133	84	301	385
Level-II (OBE System): Programs accredited under Washington Accord.					
Level-I: Programs under transition towards OBE System and to be shifted to Level-II till June 2023					

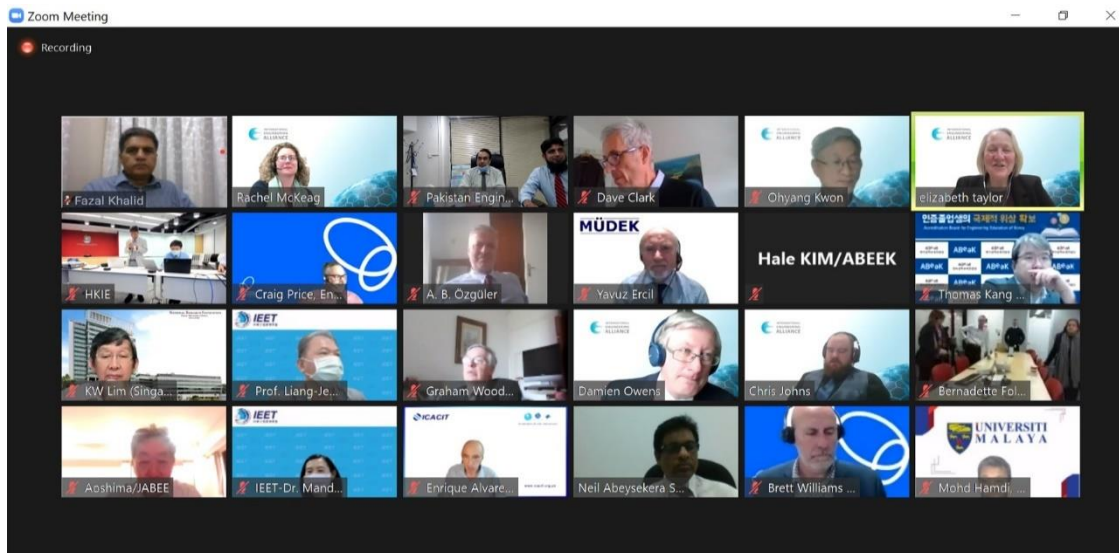
The accreditation process has been practiced in-line with international best practices as per the Washington Accord/IEA guidelines through the Accreditation Manual 2019 (Outcome Based Education and Assessment System of Accreditation OBE/OBA) developed in line with national and international practices. The Engineering Accreditation Department of PEC has been involved in execution of the accreditation related policies and procedures in accordance with the PEC Regulations for Engineering Education and the Accreditation Manual.

In order to promote engineering education, PEC has been involved in various national and international activities. Few of the major activities are as under:

○ **International Engineering Alliance Meetings (IEAM) Held On June 29-July 08, 2022**

Pakistan, represented by PEC, is full signatory of the Washington Accord (WA) and authorized member of International Professional Engineers Agreement (IPEA) under the umbrella of International Engineering Alliance (IEA). The annual IEA Meetings is a regular activity of this forum. Until 2019, the IEAMs were held physically at various destinations, whereas, due to the outbreak of COVID-19 pandemic, the first virtual/ online IEAM was held in 2020, followed by IEAM-2021. This year, IEAM 2022 was again held online from June 30 - July 8, 2022.

PEC actively participated and contributed to all sessions and used its voting right along with other signatories to make required decisions and reforms regarding WA, IPEA and IEA. The sessions were attended by ICC Convener, Registrar PEC, Head of EAD and his International Linkages (IL) team as per the stipulated timeline during day and night.



- **30TH FEIAP General Assembly & Standing Committees Meetings – (July 27-29, 2022)**
 The Federation of Engineering Institutions of Asia and the Pacific (FEIAP) is an international non-profit professional organization founded in 1978 under the umbrella of UNESCO. Pakistan, represented by PEC is a Full Member of FEIAP since 2015 and has been contributing to all relevant professional forums of FEIAP including Engineering Education and Environmental Engineering Standing Committees etc. The FEIAP General Assembly (GA) is a regular annual activity of various Standing Committees. This year the FEIAP 30th General Assembly meetings were held at Cebu City, Philippines from July 27 – July 29, 2022 where Engr. Zahid Arif (Convener International Collaborations Committee) and Engr. Dr. Nasir Mahmood Khan (Registrar, PEC) attended the General Assembly meeting on behalf of PEC.



- **Mentoring of Engineering Board Kenya (EBK) & Saudi Arabia (ETEC-NCAAA)**
 PEC became a Full Signatory of WA) in June, 2017, which pertains to substantial equivalence to programs accredited by WA signatories. Maintaining its signatory status, PEC has been ensuring quality engineering education within Pakistan and its indigenous contributions towards WA forums and events gained it a credibility of a competent Mentor towards potential signatories. In this regard, Engineers Board of Kenya (EBK) approached PEC through WFEO for their mentoring towards WA Signatory Status. EBK got accepted by WA as provisional signatory with the mentoring efforts of PEC during WA Closed session of IEAM 2022 held on June 1, 2022. Simultaneously Saudi Arabia also approached PEC their mentoring and nomination as a provisional signatory. Therefore, PEC held several mentoring sessions with Kenya and Saudi Arabia towards attaining WA provisional signatory status.



WG2: Capacity Building in Engineering Education Nov 2019 – September 2021

Deep appreciation for support for this important project to:

Em. Prof. Elizabeth Taylor, Chair of the Washington Accord and the IEA Signatories that have generously agreed to provide mentoring support:

- Pakistan Engineering Council – Dr Nasir Khan, Dr Ashfaq Ahmed Sheikh, Dr Fazal Khalid and others
- Board of Engineers Malaysia
- National Board of Accreditation others
- Engineering Council of India

The Myanmar Engineering Council Chair CEIE, Secretary meeting and secretariat for

I have personally attended the mentoring program and the collaboration with IEA to establish

Engineering for Sustainability



○ 3rd PEC International Deans' Conference Of Engineering Institutions: Engineering Education - Reshaping The Economy Held On 7-8 April 2021 (Online/ Virtual Mode)

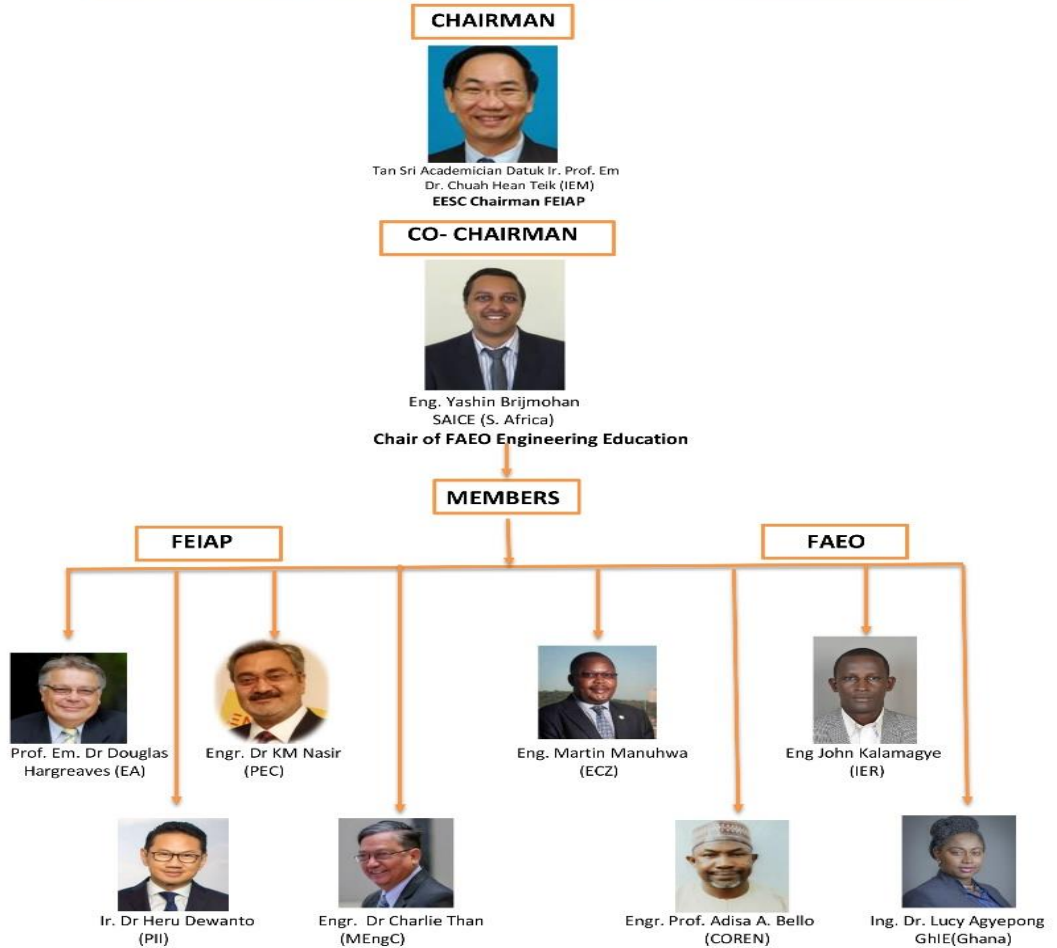
After successful conduction of 1st and 2nd Deans' Conference in 2018 and 2019 respectively PEC had the honor to organize 3rd International Deans Conference of Engineering Institutions, with the main theme: "Engineering Education: Reshaping the Economy" with four sub-themes covering online TLA challenges and opportunities, integration of GAs with SDGs in Engineering Profession and capacity building on Smart TLA (Pedagogy/ Andragogy) and industry perspective and OBE. The conference provided an opportunity to share best practices, identify issues and propose possible solutions as per the theme of the conference.



○ Africa & Asia Pacific (AAP) Accord/ Council

Federation of African Engineering Organizations (FAEO) and Federation of Engineering Institutions of Asia Pacific (FEIAP) collaborated and signed the AAP Accord for mutual recognition and to promote international best practices of engineering education and profession between Asia and Africa on 4th May 2021. The AAP Engineering Education Council was also established during the event for the implementation of the Accord and to set up the procedures to facilitate the recognition of substantial equivalence of Accreditation Systems between the two regions. PEC was also included as a member of the AAP Council for a tenure of 3 years. Thereafter, PEC has been regularly attending the AAP Engineering Council meetings to discuss Rules & Regulations of the Accord and develop a roadmap for training sessions on OBE accordingly.

AFRICA, ASIA AND THE PACIFIC COUNCIL (AAP)



○ Saudi Council Of Engineers (SCE), Saudi Arabia Meeting With PEC Regarding Integration Of Engineers Registration Database

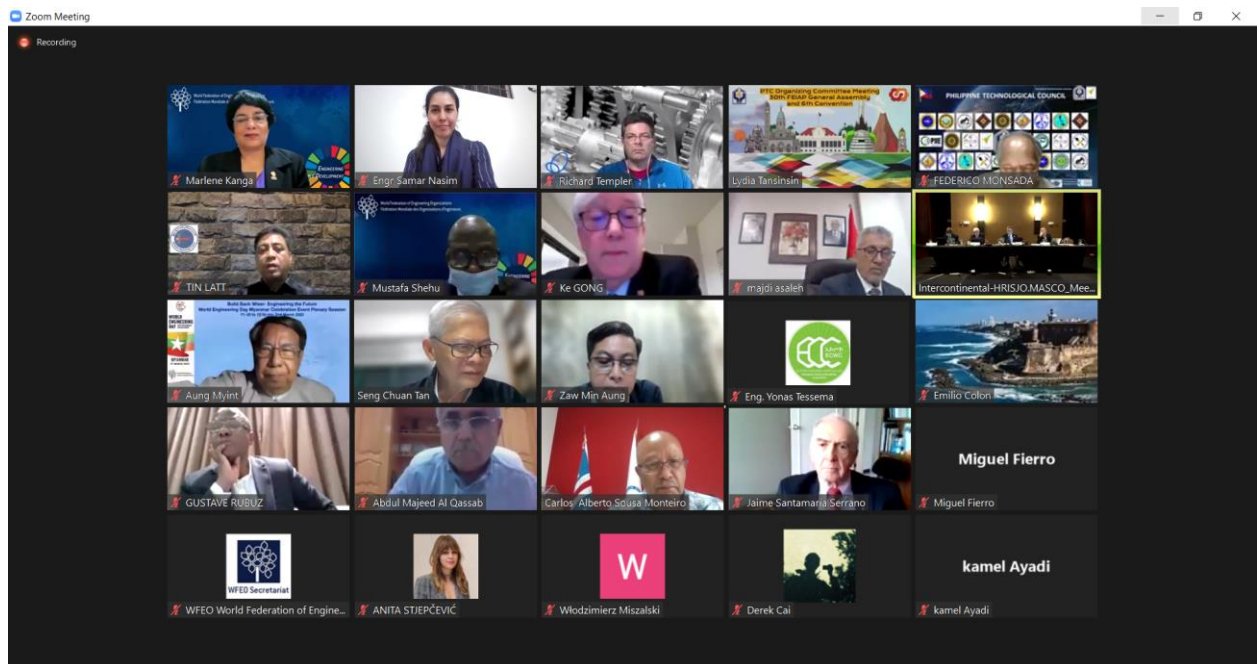
The Saudi Council of Engineers (SCE) approached EAD, PEC to hold a meeting on June 22, 2022 via Zoom. SCE apprised EAD that they had initiated a world-wide plan of integrating databases of engineering registration bodies. According to their database, among two other countries, Pakistan was the third country as per their ranking whose skilled labor (engineers, technicians) work in the Kingdom of Saudi Arabia (KSA).

Typically it takes 15 to 30 days for SCE to verify PEC registration of any Pakistani applicant at their portal, whereas with the implementation of integration, the process can be curtailed to one (01) minute. It was also mentioned that SCE had successfully integrated databases of two other countries and now plans to take up the project with PEC to integrate their Registration portal with PEC registration database in order to improve their own registration process as well as facilitate Pakistani applicants at SCE, KSA.

Afterwards, a meeting between PEC & SCE IT Officials was held on Friday, July 22, 2022 (3:00 pm) and technical specifications regarding integration of two data base systems were discussed in detail. Further working in this regards is in progress.



- **PEC Affiliate Membership Of World Federation Of Engineering Organizations (WFEO)**
PEC had been an Associate Member of the World Federation of Engineering Organizations (WFEO) from 2012 till 2016. Based on the active role and contribution of PEC, applied to elevate its status to Affiliate Membership of WFEO to directly contribute and participate in WFEO activities more effectively. PEC is honored to become an Affiliate Member of WFEO during the WFEO GA 2022 on March 9, 2022.



- **OBE/OBA Based Training Of Newly Approved PEVs**
Pakistan Engineering Council has been conducting trainings/ workshops for capacity building of faculty and quality directors from HEIs on Outcome based education and assessment (OBE/OBA) system of accreditation in line with PEC accreditation manual-2019. In this regard a five days training for the region Islamabad and KPK was conducted from July 04-07, 2022 at PEC HQ, Islamabad.



○ **PEC On-Job Training (OJT)/Paid Internship Program For Fresh Engineers**

Pakistan Engineering Council (PEC) since its inception has taken various initiatives and achieved international recognitions/ milestones for quality standards in engineering education, accreditation and professional practice by prestigious regional and global professional forums. PEC in its 43rd Governing Body has approved “Trainee Engineers” Program for fresh graduates. Under this scheme 2,000 fresh engineers who have completed their engineering degree during years 2020 and 2021 will be engaged in various sectors. The prime objective of this scheme is to provide fresh graduates with hands-on exposure, working knowledge, skill enhancement and professional competence to handle latest techniques and technologies.

Graduates who have not availed any other training/ Internship Program under any Government Program/ scheme or not Employed in any Government or Private Organization or not a full-time student of any Public or Private Institution and possess degree from an accredited engineering program in any discipline within last 02 years (Jan 2020 to Dec 2021), registered with PEC as Registered Engineer and bear 50% marks or 2.5 CGPA in final degree are advised to submit their application on Trainee Engineers’ Portal link (www.ojt.pec.org.pk). In this regard 600, Students have been issued on-the Job training Internship letter



○ **PEC Annual Award Of Final Year Design Project (FYDP)**

The final year design project (FYDP) is a compulsory requirement during the undergraduate degree program which aims to demonstrate innovative, creative, technical, management and communication skills along with the knowledge earned during the program. Nevertheless, there is need to promote innovative/inter-disciplinary FYDPs by solving complex problems of society/industry.

PEC has therefore launched PEC Award of Final year Design Projects (FYDP) to boost up the quality education and competency among engineering graduates through competition of their respective FYDP/Capstone projects in the final year. PEC, therefore, would lead by providing a platform towards academia-industry linkages to take up real life problems solving approach from target audience/organization/industry, to be addressed and the HEIs can take those further for promoting innovation and entrepreneurship towards product development. This opportunity will not only help the HEIs to gain local market exposure but will also provide a platform to make network with diversified world-class manufacturers of engineering products. Following FYDPs of different provinces have been submitted:-

FYDP Submitted by Punjab HEIs	FYDP Submitted by KPK HEIs	FYDP Submitted by Sindh HEIs	FYDP Submitted by Islamabad HEIs
102	45	60	112

○ **Engineering Curriculum Development By PEC**

PEC in its efforts towards quality engineering education, took up the challenge of curriculum review and development for engineering programs after due consent of HEC in 2018. PEC Governing Body constituted a high-level Committee namely Engineering Curriculum Review and Development Committee (ECRDC) with defined ToRs. In this regard, PEC has reviewed/developed following thirteen Engineering Curricula and further are in process encompassing market needs, latest trends global dynamics in line with sustainable development goals as part of WA requirements:

- Aerospace Engineering
- Agricultural Engineering

- Automotive Engineering
- Avionics Engineering
- Building & Architectural Engineering
- Computer Engineering
- Geo informatics Engineering
- Geological Engineering
- Polymer Engineering
- Software Engineering
- Telecommunication Engineering
- Textile Engineering
- Transportation Engineering



Curriculum Review/ Development inline with International Standards – OBE (2019-2022)



- OBE based revised curricula for engineering disciplines = 13 (out of 31 disciplines)
- Emerging disciplines : 06 (Energy Systems, Cyber Security, Geo-informatics, Naval Architecture, Food, Railway)

23

○ MISCELLANEOUS

Apart from all the development done in year 2021-22, EAD held several meetings with various local and international entities to develop strong linkages for the betterment of engineering education and profession in Pakistan.

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 2021 to 30th June 2022*, PEC registered **21,496** engineers of various engineering disciplines of different universities.

Data of Engineers From 1st July 2021 - 30th June 2022

Sr.#	Description	Count
1	Total No of Engineers Registered with PEC	21,496

2	Engineers Registered as RE	21,424
3	Engineer Registered as PE	72
4	Male Engineers	19,204
5	Female Engineers	2,292

REGISTRATION DEPARTMENT (CONSTRUCTORS/OPERATORS & CONSULTANT)

Introduction

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 license 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 (Data from 1st July, 2021 to 30th June, 2022)

Constructor	New	4612	23027
	Renew	14916	
	Upgrade	3499	
Operator	New	53	201
	Renew	129	
	Upgrade	19	
Foreign	New	11	62
	Renew	51	
Consultant	New	129	789
	Renew	660	
Total			24079

CONTINUING PROFESSIONAL DEVELOPMENT (CPD) DEPARTMENT

Introduction

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).

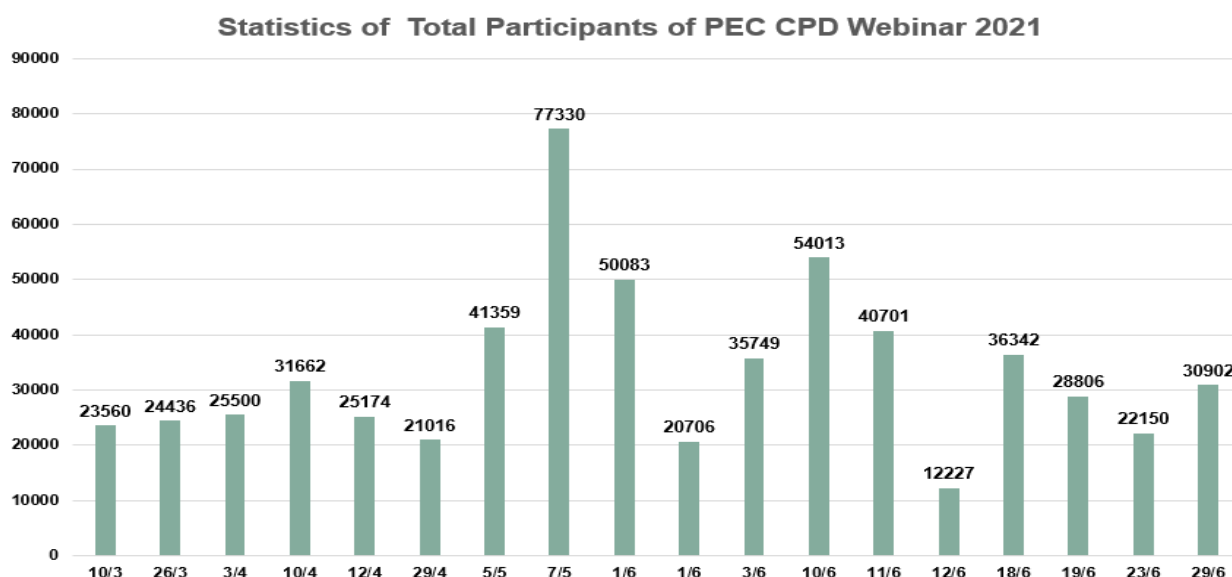
CPD Activities Conducted by PEC

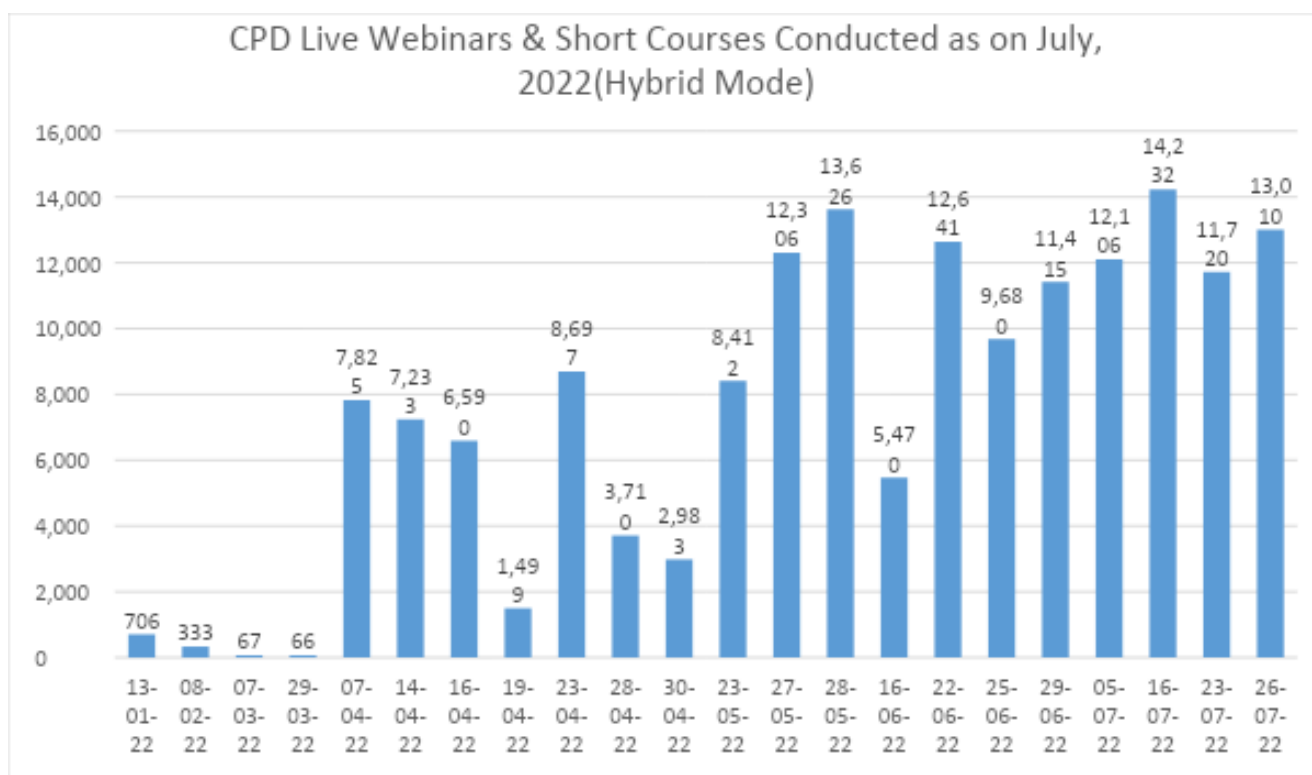
- CPD activities includes short courses (refresher courses, management, leadership etc.); workshops; seminars; expert lectures etc.
- PEC regularly conducts CPD activities for its Members through PEC approved Resource Persons.
- All CPD activities carry credit points as defined in the CPD Byelaws.
- 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.

Strategies adopted during COVID to achieve targets

- Online Course Facilities provided for the engineers as Live webinars, Recorded Webinars, Self-learning webinars and free course from COURSERA
- Convinced PEBs for online actives and PEBs managed free online webinars free of cost for engineers
- Motivated, registered and encouraged Professional Bodies already managing online courses

Statistics of CPD Live Webinars & Short Courses Conducted			
Sr. No.	Year	No. of Courses	No of Participants
1	2021	18	601,716
2	2022	22	164,327





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	116
2	Professional Bodies	16
3	Technical Organizations	50
Total		182

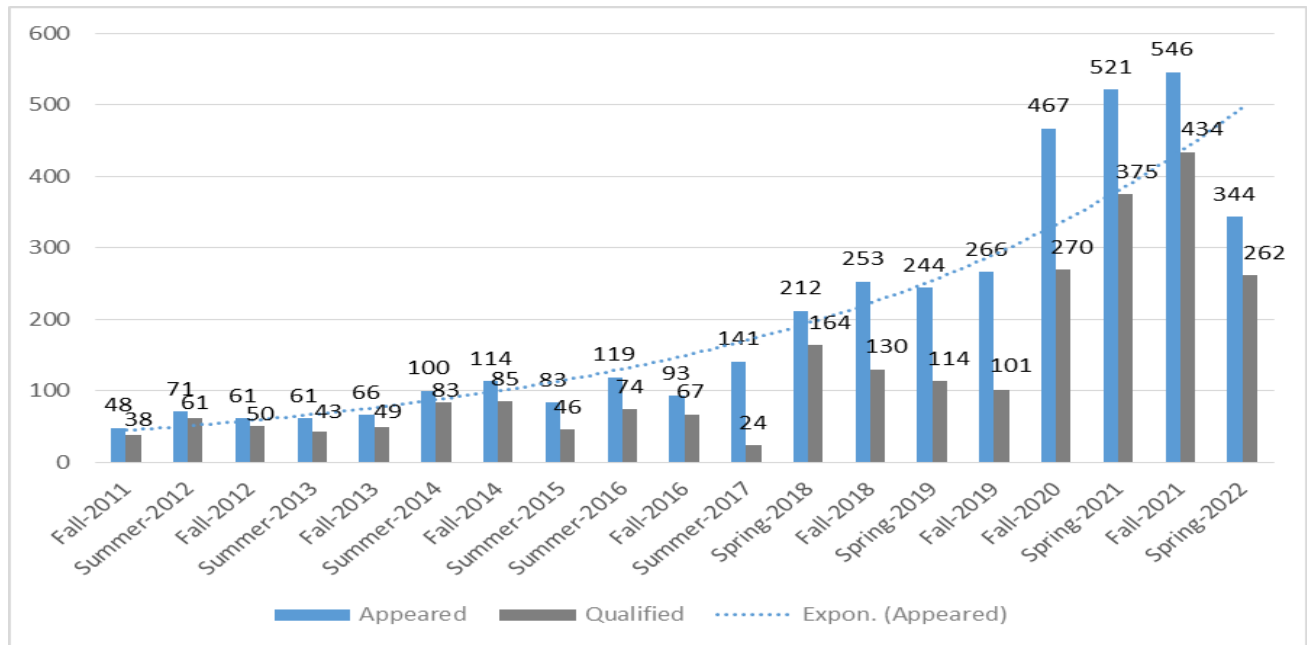
Statistics of CPD Activities Conducted by PEBs			
Sr. No.	Year	No. of Courses	No of Participants
1	2012	73	2005
2	2013	80	2572
3	2014	211	6388
4	2015	175	6070
5	2016	178	7212
6	2017	237	4782
7	2018	213	7610
8	2019	341	10501
9	2020	386	10355

10	2021	106	3246
11	2022	47	945
Total		2047	61686

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 19 EPE has been Conducted.
- The average qualifying percentage = 64.83%.
- The EPE Exam is held twice a year.

Statistics of EPE				
S.#	EPE	Appeared	Qualified	% age Qualified
1	Fall-2011	48	38	79.17
2	Summer-2012	71	61	85.92
3	Fall-2012	61	50	81.97
4	Summer-2013	61	43	70.49
5	Fall-2013	66	49	74.24
6	Summer-2014	100	83	83.00
7	Fall-2014	114	85	74.56
8	Summer-2015	83	46	55.42
9	Summer-2016	119	74	62.18
10	Fall-2016	93	67	72.04
11	Summer-2017	141	24	17.02
12	Spring-2018	212	164	77.36
13	Fall-2018	253	130	51.38
14	Spring-2019	244	114	46.72
15	Fall-2019	266	101	37.97
16	Fall-2020	467	270	57.82
17	Spring-2021	521	375	71.97
18	Fall-2021	546	434	79.49
19	Spring-2022	344	262	76.16
Total/ Average		3810	2470	64.83



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.

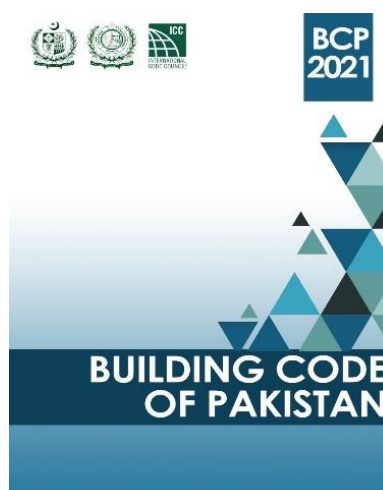
PROGRESS OF PEC THINK TANK DEPARTMENT

- **Building Code of Pakistan -2021**

It has more than 13 years passed to Building Code of Pakistan Seismic Provisions (2007) and during this period various seismic studies are conducted and new data generated to improve/ update Building Code of Pakistan as mandatory practice. In fact, the global construction trends, structural engineering design and practices have been gradually transformed into seismically safe buildings. Hence, it is very essential that further analysis of already recorded seismic data, risk assessment, design & structural safety of new buildings and retrofit of existing built would also be carried out along with updating seismic hazards maps to update/ revise the said code. Keeping in view the mandatory revision of the Code was very much needed in view of seismic-resilient design with durable structural strength, modern technologies of building construction and safe practices.

PEC notified high profile national level committee comprising of eminent professional having national level multi-disciplinary representation and after rigorous exercise of two years committee developed Building Code of Pakistan (2021). For the purpose, PEC joined hands for international assistance obtained from International Code Council (ICC), NDRMFC & US in this regard, PEC and ICC inked five international agreements from 2017 to 2021 and final international publishing agreement signed on 12 August 2021. After a robust exercise, PEC successfully developed “*Building Code of Pakistan (BCP-2021)*”, which is based on “2021 International Building Code”.

The latest building code of Pakistan 2021 provided minimum benchmark to ensure seismic resilient building design with mandatory structural strength for all new buildings and also covering the E&M Components.



- **National Seminar on “Groundwater In Pakistan Making Invisible Visible” held on 23rd June 2022 at Pakistan Engineering Council HQ Islamabad**

PEC Think Tank on Water Resources Development has been working on Impact of Climate Change on our Groundwater in Pakistan. The National Water Policy-2018 and National Climate Change Policy-2012 both devised an integrated action plans and strategies against the adverse impact of climate change on water resources of Pakistan. In fact, at first census of Pakistan after independence in 1951, the population was about 34 million, which has increased to estimated current population of (220) million and is expected to touch 216 million by 2030. Moreover, as per global standards, 1000 m³ per capita is the threshold value for water scarcity. Pakistan’s per capita water availability fallen from 1700 m³ in 1992 to 1090 m³ in 2012, at present 1032 m³ of water is available per capita, which will further be reduced to 751 m³ per capita till year 2030.

In fact, PEC first-ever published a comprehensive national report on *Ground Water Development and Management in Pakistan in 2016* developed by PEC Think Tank on Water Resources Development. The report revealed that “*the expansion of groundwater use for irrigation in Pakistan during past five decades has played a fundamental role in increase of agriculture production. Groundwater is also the source of drinking water for over 70% of the population of Pakistan and a considerable number of industries use groundwater for their process requirements*”. There are large numbers of incidents of rapidly depleting groundwater, saline water intrusion, point and non-point sources of water-pollution, deterioration of urban aquifers, concerns on sodification and arsenic contamination due to deep extraction almost in all metropolis cities of Pakistan. There are

several meaningful policies, programs and procedures that can be pursued to counter rapidly depleting and contamination of ground water resources in Pakistan. The national level actions are very essential to be taken at experts' level for devising integrated national strategy. With this motivation, the PEC Think Tank Committee on Water Resources Development organized a **National Consultative Seminar on Groundwater in Pakistan: "Making Invisible Visible"** on 23rd June 2022 at PEC HQ, Islamabad. The main objective of the seminar was to provide a platform to the policy makers and the experts to devise strategies based on implementable action plans with set targets and timelines focusing the following, but not limited to:

- Prepare/update hydro-geological mapping of groundwater.
- Investigate point and non-point sources, which polluting groundwater.
- Examine sampling frame, design of tube wells and reasons of variations in depths of water table and aquifer characteristics.
- Suggest groundwater recharge schemes/methods for urban and rural areas.
- Analysis of sectoral use of groundwater footprint of residential, commercial, industrial and agriculture etc.
- Alternate use of saline water and methods applied for different regions.
- Groundwater subsidence.
- Guidelines for development of manual of recharging groundwater.

The event was attended by Mr. Agha Hassan Baloch, Federal Minister for Science & Technology & Syed Khursheed Ahmed Shah, Federal Minister of Water Resources and a large number of eminent professionals/experts.

Engr. Dr. Muhammad Ashraf, Chairman, PCRWR along with representatives from Provincial Irrigation Departments, WAPDA, Ministry of Water Resources, Ministry of Planning, Development and Special Initiative, Pakistan Metrological Department, International Water Management Institute (IMWI)-Pakistan, U.S. Pakistan Center for Advanced Studies in Water, gave detailed presentations to highlight the issue of Ground Water in Pakistan.



- **Green Building Code-2022**

The Government of Pakistan through Ministry of Climate Change has agreed to develop

aswell as implement a Green Building Code for Pakistan. Pakistan Engineering Council (PEC) being the statutory regulatory body has been entrusted for the development and adoption of various Codes in Pakistan.

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.

The development of the Green Building Code for Pakistan can bridge this gap for any future developments which is also the need of the hour. 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.

Furthermore, PEC notified a Technical Committee for the Development of Green Building Code of Pakistan headed by Engr. Dr Sarosh Hasmat Lodi on March 31, 2022 which is in process of development of this Code.

Bidding Documents-2020

As per international practice and based on new developments with emerging procurement trends, for necessary revision/ updation of PEC Bidding Documents, PEC once again notified “Bidding Documents Committee”, the PEC experts after a robust exercise of several years taken onboard **76 stakeholders** and shared revised “**Pakistan Standard Form of Bidding Documents (2020)**”, which were harmonized with “PPRA Rules” to Federals, Provincials Departments, Funding Agencies, Regulatory Authorities, AGP Office and Planning Commission etc. for feedback/ comments. Following revised PEC Bidding Documents were already shared with PPRA vide PEC letter No. PEC/TT/BD/2020 dated 30 July 2020 and finally approved by **39th PEC Governing Body dated 24th December 2020** as under:

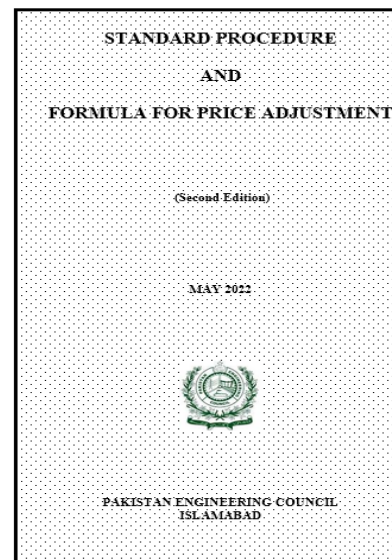
- Pakistan Standard Form of Bidding Documents (Civil Works)
- Pakistan Standard Form of Bidding Documents for Procurement of Works (E & M)
- Pakistan Standard Form of Bidding Documents for Procurement of Works for Smaller Contracts.
- Pakistan Standard Form of Contract for Engineering Consultancy Services (Time Based Assignment)
- Pakistan Standard Form of Contract for Engineering Consultancy Services (Lump Sum Assignment)
- Pakistan Standard Form of Contract for Engineering Consultancy Services for Smaller Projects
- Pakistan Standard Procedure and Formula for Price Adjustment.



Standard Procedure and Formula for Price Adjustment (2nd Edition May-2022)

The construction sector has become a victim of the unprecedented inflation and recession of economy in the country, coupled with the pandemic COVID-19 outbreak. The exorbitant price hike since February, 2020, has crippled the construction activities in the country and the cost of construction materials and machinery has also increased drastically and projects have come to a grinding halt.

Major proportion of Construction Contracts relates to public sector. In public sector development projects, normally two parties are involved. The Public Sector owner department is called the "Employer/ Client/ Execution Agency/ Procuring Agency (PA)" and the "Contractor", the party that is given the responsibility of completing a project for a certain cost.



A construction contract is a mutually agreed and legally binding agreement between two parties to perform construction on a project according to certain terms and conditions; the major conditions being, Scope, Time and Cost. Another aspect of Construction Contracts is the Scheme of Risk Allocation between the contracting parties. Out of numerous risks, Price variation is one of the major risks. Like all other risks, the contracting parties identify, assess and manage (mitigate) the price variation risk to limited extent.

It may also be clarified that since the Construction sector is a service-sector; the contractors are to be paid adequately and regularly because no contractor is expected to spend a fortune on a project. The theme is to pay a contractor adequately and regularly in order to receive a product worth the money spent. The world has changed its mindset from master-slave relationship between the Employer and the Contractor, to the Partners in Development. Clause for smaller contracts valuing up to PEC Constructor's registration category C-5 (Rs.65 million). The PEC SOP for Price Adjustment as circulated in 2009 states that:

"The Price Adjustment shall be applicable only for the contracts having contract price exceeding financial limit of P EC Contractors Registration Category C-5 as amended from time to time. Contracts having value equal to or less than this limit will be considered as fixed price contracts."

Due to absence of the Price Adjustment provisions in the contracts awarded on the format of PEC "Standard Form of Bidding Documents for Procurement of Works for Smaller Contracts" have had grave financial problems because the Employers would not pay any price adjustment simply because the provisions for Price Adjustment and any mechanism thereof is not available to them, under the contract provisions.

Whereas, the fact of the matter is that since 2020, construction activities have crippled because the cost of construction in terms of construction material, machinery and labor has increased exponentially owing to the unprecedented inflation, recession in economy and turbulent market situation in the country because of multiple factors, bringing the construction projects to a grinding halt.

The situation described above has naturally created unrest among Employers and Contractors. As a result the works have been completely halted and it is feared that further delay in execution of projects is likely to worsen the affairs. There are no chances for resumption and completion of the works unless the Government provides a remedy to the issue.

A separate document of PEC, titled PEC "Standard Procedure and Formula for Price Adjustment (First Edition), March, 2009"; provided the mechanism for use of the price adjustment in Construction Documents of PEC. This document was applicable up to June 28, 2022.

Now PEC has revised this document and uploaded "Pakistan Standard Procedure & Formula for Price Adjustment (2nd Edition)-2022", available on website of Pakistan Engineering Council: www.pec.org.pk issued on 29th June 2022, applicable to the projects to be executed.

PAKISTAN INNOVATION AND ENTREPRENEURSHIP DEVELOPMENT CENTRE (PIEDC)

○ Introduction

PEC established Pakistan Innovation and Testing Centre (PITC) as a constituent organ of PIEDC to act as a creative hub for the linkage of Innovators, researchers, academia, and industrial setups for promoting local manufacturing of engineering products and goods to enhance contribution of engineering sector in the overall export of the country.



PEC/ PIEDC would facilitate startups, young entrepreneurs, researchers, designers, local developers, and academic researchers through bridging between academia and industry for which ORICs would be a potential hub in this framework. Accordingly, PEC intends to collaborate with ORICs through HEIs to enhance their vibrant role to facilitate and promote innovation and thereby local manufacturing of products towards commercialization. PITC under PIEDC would also facilitate ORICs and Industries in engineering design validation, capacity building, and regulatory approvals.

Appointment of Head PITC

Engr. Dr. Ashfaq Ahmed Sheikh was designated as Head of Department by the new Management of Pakistan Engineering Council (2021-2024).

Formulation of Innovation/ Entrepreneurship Committee (ICE)

The PEC Management (2021-2024) constituted Innovation/ Entrepreneurship Committee (ICE) under the leadership of Engr. Dr. Samreen Hussain, Convener ICE for promotion and facilitation of Innovation, Entrepreneurship in Engineering and allied sectors of engineering practices.

Scope Enhancement: Innovation to Entrepreneurship

The PEC Innovation and Entrepreneurship Committee (ICE) keeping in view of current economic challenge in the country decided that the platform of PITC must be broadened where not only it provides engineering design validation but also seeks and creates avenues for promotion of creativity and development of an entrepreneurial culture to nurture potential and future entrepreneurs. Hence, **Pakistan Innovation and Entrepreneurship Development Centre (PIEDC)** was formed. To retain the mandate for facilitation of engineering design validation PITC was made a constituent organ of PIEDC.

Revision of PEC Byelaws for Innovation and Advertisement of Head PIEDC

With a broadened scope, the existing PITC Byelaws were required to be updated to reflect the scope enhancement. The PEC ICE Committee therefore updated the Innovation Byelaws which are currently under process for approval by relevant PEC forum.

In the light of enhanced scope, the ICE Committee also decided that for PIEDC to function as conceived, an experienced and enthusiastic leadership was required. Therefore the ToRs of Head PIEDC were also defined in the revised Innovation Byelaws and subsequently the post for Head PIEDC was also advertised.

Initiatives for Promotion of Creativity, Innovation, and Entrepreneurship

PEC ICE Committee has made concerted efforts for promotion and development of entrepreneurial culture among young and aspiring Engineers.

Collaboration with SMEDA

PEC Innovation/ Entrepreneurship Committee (ICE) visited SMEDA (Small and Medium Enterprise Development Authority) on 15th March 2022 to explore mutual areas of interest and promoting entrepreneurial and start-up initiatives.

Mr. Hashim Raza, CEO SMEDA, apprised PEC delegation about functions, key stakeholders and services provided by SMEDA including one window services, industrial support, linking with financial sources, training and legal guidance.

Engr. Dr. Samreen Hussain, Convener ICE, highlighted that SMEDA was on the right path and in order to achieve tangible outcomes and avoid duplication, PEC intended to utilize SMEDA platform especially for engineering start-ups. She further added that a follow-up plan of this visit be chalked to synergize the efforts of both organizations. She requested SMEDA to share the statistics of engineering start-ups facilitated by their organization.

Both the organizations identified areas of further working such as PEC to share data of newly registered engineering firms to SMEDA for facilitation services and training for contracts including JVs, financial and legal guidance. Linking PEC Match-Making Portal to SMEDA website. Potential projects from National Idea Bank Competition be identified for support.

Meeting with Federation of Pakistan Chambers of Commerce & Industry

A meeting was held between PEC Innovation/ Entrepreneurship Committee and President Federation of Pakistan Chambers of Commerce & Industry (FPCCI) and his team along with Chairman PEC, ICE Members and Governing Body Members.



The Founder Aspire Pakistan and IdeaGist, Mr. Hassan Syed was also in the attendance. The primary purpose was to break the ice between the two organizations especially highlighting the role of PEC ICE. Following four points were agreed in principal:

- To provide exclusive space for PEC pavilion in the upcoming event to be jointly organized by FPCCI, and National Idea Bank (NIB) on 31st July, 2022 to showcase top 30 to 50 ideas of engineering business ideas and startups.
- Selection of top five projects by Joint Committee/ jury for subsequent support for investment through relevant forums and PEC.
- Continued collaboration between PEC and FPCCI to promote entrepreneurship as a tool to eradicate issue of Engineers unemployment hence encouraging engineers' role in knowledge based economic development.
- To provide PEC "Entrepreneurship Support Offices" in all regional offices of FPCCI after formal agreement between the two parties.

Aspire Pakistan signed the MoU with FPCCI to follow after their legal vetting. ICE had also proposed FPCCI to identify sick or close to bankrupt industrial units so that they could be assigned to skilled unemployed engineers to make them up & running with due shareholding.

PEC & Aspire Pakistan Showcase for Innovative Startups

PEC and Aspire jointly organized an online showcase held on 31st July 2022 to showcase top 30 ideas of engineering business ideas and startups.

Top five projects would be selected by Joint Committee of PEC/ jury for subsequent support for investment through relevant forums and PEC.

Pakistan Engineering Council in collaboration with Aspire Pakistan and National Idea Bank invites you to

MEET FOUNDERS OF HIGHLY INNOVATIVE STARTUPS FROM PAKISTAN

SCHEDULE	FORMATE
Welcome 9:00 PM	30+ Startup Will Showcase Their Startup
Pitch / Entrepreneur Videos 9:15 PM	5 Min Per Startup
Cross Remarks 11:00 PM	Q/A Session
	Network Opportunity

31st JULY 2022

<https://ASPIRE.ideagist.com/event/pakistan-innovates-startup-showcase>

www.aspirepk.org

National Dialogue – To Eradicate Engineers’ Unemployment through Entrepreneurial Setting

As a National organization, moving without seeking direction from real stakeholders, and listening to affectees of the existing system and policies had led to getting no suggestions and negligible deliberations on realistic solutions to be implemented. For this purpose, PEC ICE Committee organized a National Dialogue- To eradicate Engineers’ Unemployment through Entrepreneurial Settings on 28th – 29th July, 2022. The two day dialogue provided a platform for all sectors of engineering graduates (employed, unemployed, self-employed, industrial representatives, and employers) divided into groups representing all regions, where each group was assigned a moderator to keep the discussion within scope of the event. Each group presented their recommendations on the second day for both regional and national level. The Federal Secretary for Ministry of Science and Technology, Mr. Ghulam

Muhammad Memon and Federal Minister for Planning Development & Special Initiatives, Engr. Prof. Ahsan Iqbal graced the event as Chief Guests for inaugural and closing sessions respectively.



Innovation in Healthcare – A Way Forward for Pakistan

With upcoming need of health care equipment and evolving technology has made this sector very appealing to be taken up as entrepreneurial endeavor. To spread the word and relevant information about advancement in the said field and international standards to comply for making it one of the major exports of Pakistan, ICE Committee organized an awareness session jointly with Alsons Group. The event was sponsored by Systems Pvt. Ltd. Prof. Dr. David John Howard, Chairman Exovent Charity, UK gave his detailed talk on innovation in healthcare and also presented his latest work, The Exovent, a negative pressure ventilator. Chairman PEC presided as the Chief Guest of the event and the session was attended by dignitaries from academic, industrial and Government including Federal Secretaries from Ministries of Health, IT, and Planning & Development.



PITC Update

a. Ongoing Projects

PITC under PIEDC had diversified its inspection competence portfolio from ventilators to multiple avenues to facilitate local manufacturing of engineering goods and value addition through indigenous development with the vision of facilitating exports of Made in Pakistan products.

Following is a list of ongoing projects currently under evaluation at PITC.

S No.	Project Name	Manufacturer	Current Status
1.	Peritoneal Dialysis Machine	Byonyks Pvt. Ltd.	Factory Visit for Product Assessment Planned tentatively for 20 th -21 st Aug, 2022
2.	PDT 635 Medical Laser for Clinical Use	National Institute of Lasers & Optonics (NILOP)	Document Review
3.	Exovent Negative Pressure Ventilator	Alsons Group Karachi – Exovent Group, UK	Under Process
4.	Intensity-Modulated Radiation Therapy (IMRT) Machine	Pakistan Atomic Energy Commission (PAEC) - Institute of Radiotherapy and Nuclear Medicine (IRNUM)	Under Process
5.	AMBOXTRONIC Emergency Resuscitator	Shaukat Kahnium Research Center (SKMCH&RC)	Prototype Validation at OEM facility
6.	Breast Cancer computer-aided diagnostics (CADx) platform	XYLEXA	Prototype Ready for on-site Demonstration
7.	AP-IR Thermometer	Dr. Aamir Ch. & Team	Prototype Validation at OEM facility

S No.	Project Name	Manufacturer	Current Status
8.	Trydan iVent	Team Trydan (Entrepreneurs)	Final Software Validation by PITC Experts
9.	Computer-Aided Diagnostics (CADx) Tool for Tuberculosis	National Center of Artificial Intelligence (NCAI), Medical Imaging and Diagnostics Lab 1 COMSATS University, Islamabad	Document Submission under Process by OEM
10.	Computer-Aided Diagnostics (CADx) Tool for Brain Tumor		
11.	Computer-Aided Diagnostics (CADx) Tool for Breast Cancer		

Pakistan Halal Authority (PHA)

Introduction:-

Pakistan Halal Authority is National Halal Regulatory body and mandated to enhance Halal global trade evolving with new patterns of trade and production. The Halal market is considered a new commercial paradigm. PHA assures compliance with international, regional and national standards, laws, rules and policies on Halal products, processes, and services. PHA is the sole Authority for certifying products and services including meat/ slaughterhouses, and imports/ exports of Halal articles.

- Following rules/ regulations of Pakistan Halal Authority (PHA) has been approved by Federal Cabinet and notified by Printing Corporation of Pakistan (PCP):-
 - Pakistan Halal Authority Employees (Recruitment) Regulations, 2021
 - Pakistan Halal (Certification Marks) Regulations, 2021
 - Pakistan Halal Authority (Business) Rules, 2021
- Memorandum of Understanding (MoU) has been proposed with following countries for bilateral cooperation in the field of Halal and mutual recognition:-
 - State of Qatar
 - United Arab Emirates
 - Kingdom of Morocco
 - Kingdom of Jordan
 - Republic of Turkey
 - Malaysia
 - Kingdom of Saudi Arabia

National University of Technology (NUTECH)

Introduction

National University of Technology is established as the pioneer national technology university envisioned to become internationally acclaimed research university for producing leaders of international industry for technology creation, development, implementation, promotion and transfer through knowledge and innovative skills. NUTECH caters for all eight levels of National Qualification Framework (NQF). NUTECH's academic system, curricula and support infrastructure are designed by bench-marking the top ranking technology Universities of the world. These are also aligned with local policies such as the "National Science, Technology and Innovation (NST&I) Policy-2012 by MoST" and the "Planning Commission's Vision 2030". NUTECH Research System is designed for inculcating research & innovation and includes departmental research groups, inter-departmental multi-disciplinary research groups involving experts from industry and academics to work in technology research labs for innovative industrial product design and development for self-reliance in future. NUTECH is currently offering BS Mechanical Engineering, BS Civil Engineering, BS Electrical Engineering, BS Computer Engineering, BS Computer Science programs and Bachelor of Engineering Technology (Civil Engineering) while NUTECH will start two MS programs i.e. MS Computer Science and MS Civil Engineering from Fall 2022.

- **Bachelor of Engineering Technology (BET) Coop Model:** To bridge the gap as well as address the issues of unemployment of engineering technologists, an innovative program based upon the concept of University-Industry cooperative engineering technology education was designed in consultation with construction sector. It is the first ever Academia-Industry Coop BET program launched by President of Pakistan to help in production of "gets hands on" and "highly skilled" graduates for national & global industry. Program has commenced from Fall 2021. Being an industry intensive program, it is ensured that the students get enough industrial exposure. Various industry partners such as FWO, NESPAK, Capital Smart City and others are on-board to facilitate industrial training during the program.
- **Structured & Supervised Internship:** In view of internship being a mandatory requirement of undergraduate programs, detailed plan of internship for batch-2018 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 of batch-2018 was commenced in April, 2021 for 8 weeks and was completed in October, 2021.
- **Faculty Development Program:** A comprehensive faculty development program has been launched at NUTECH to meet requirement of qualified faculty. 16 MS scholarships and 16 short accredited professional trainings of existing faculty/technical staff were available in collaboration with foreign universities. 13 candidates have availed this scholarship in the current year. Moreover, 40-50 foreign PhD scholarships for 08 departments are available through HEC's HRD projects which are being processed by HEC.
- **PEC Accreditation Visits:** The programs approved by EAB through zero-visit are required to apply for an interim visit at the end of first year of each new program to ascertain its preparedness for the next phases. In this regard, Interim Visit was conducted in October, 2021 and all four engineering programs were granted permission by EAB to continue the programs, whereas final accreditation visit was conducted in March, 2022. All engineering departments were advised to address all observations, weaknesses and concerns before next accreditation visit.
- **NTC Zero Visit:** NTC Zero Visit for BSc Civil Engineering Technology programme was conducted in August, 2021.
- **QAB Follow-up Accreditation Visit:** NUTECH was awarded the status of Qualification Awarding Body (QAB) by NAVTTC in September, 2020. QAB follow-up accreditation visit was undertaken by NAVTTC from 6-8th October, 2021 at NUTECH.
- **NAVTTC Accreditation Visit:** A five-member NAVTTC Accreditation team visited NSDD-NIVATS from 4-6th November, 2021 for national accreditation purposes. The team highly appreciated the TVET standards being followed at NUTECH.
- **NUTECH Technology Labs (NUTL):** Since 2018, NUTL in coordination with teaching departments has been working diligently for procurement of state of the art lab equipment for establishing the teaching labs for engineering and non-engineering programmes and basic sciences. Almost all teaching labs, required to run four engineering and two non-engineering programmes alongside Basic Sciences, have been completed. 19 Labs have been fully established in a new building, designed for best arrangement of the lab equipment in September, 2021.
- **Collaboration with TUM International/HTS-Consulting International Group:** TUM International is the international project development company of Technical University of Munich (TUM) with a mission to establish and operate science-driven technology eco-systems worldwide. HTS-Consulting International Group is a consortium of different companies engaged in a variety of domains including academic, industry, projects

execution & other related consultancy support etc. TUM International/HTS-Consulting International Group visited Pakistan in September, 2021 for presenting potential joint infrastructure projects, establishment of technology transfer centres, enforced industrialization in terms of digitalization, industry 4.0 perspective and certain site developments for promoting special economic zones etc. Areas that were agreed for joint collaboration include but not limited to establishment of Liaison and Technology Transfer Office at NUTECH, coordination in Academic Cluster and Exchange and R&D Cooperation and Transfer Projects etc. After the visit of TUM Intl/HTS Consulting Group, a number of interactions were held online along with visits of local representatives to NUTECH. HTS Group expressed its intent of participation in ML-2 project through their allied Chinese Group, China Shandong International Economic & Technical Cooperation Group Ltd (CSI Group) whereby NUTECH shared the interest shown by Ministry of Railways for considering their offer after getting further clarification/deliberation with HTS/TUM Intl. Furthermore, NUTECH reiterated the requirement of establishing Product Development Centre (PDC) at NUTECH by HTS Group that would broadly target railway & biomedical sectors and serve as a starting point to proceed further with the joint collaboration agenda.

- **Skills Courses at NUTECH Institute of Vocational and Technical Skills (NIVATS):** NSDD conducted 25 Technical and Vocational Classes in Year 2021-22 as per target and 580 trainees were enrolled in field of Hospitality Management, Computer Graphics & Design and Industrial Stitching. Upgrading of NIVATS Labs/Classrooms was also continued during the current year.
- **Retention and Export of Skilled Workforce Overseas:** NUTECH signed MoU with Saudi Electric Services Polytechnic (SESP) for engagement in different Skills Certification programs and to support each other to utilize their international accreditations for vocational programs etc. Takamol team from KSA visited NUTECH with an aim to establish Skills Testing Centers under Takamol program for testing & certification of Pakistani workforce for KSA. NAVTTC is coordinating this program and Construction Industry is being given top priority.
- **Joint Certification in Hospitality Management Field with TAI:** NUTECH has signed MoU with Turku Vocational Institute (TAI), Finland for exchange/ intern training program & joint certifications etc. As a first initiative, joint certification course on Hospitality Management has commenced with effect from 10th January, 2022.
- **Technical Intern Training Program–Japan:** TITP is a great employment opportunity for youth in which NUTECH has been designated as the sending organization. To facilitate the exchange of trainees to Japan, a consultation agency “World Staff System (WSS)” has been selected. Pakistani Workers demand from Japanese receiving organization has been finalized in collaboration with Pakistan Mission in Japan. All arrangements have been finalized and 1st batch of 65 Pakistani Interns are undergoing language training at NUTECH and same are planned to be sent to Japan by end of current year.
- **Hi-Tech Courses under Hunarmand Pakistan “Kamyab Jawan” Program (KJP):** Under the KJP, NUTECH was selected by NAVTTC for imparting education in Hi-tech skills courses. After successful completion and graduation of 275 students in KJP Batch-I & II, the KJP Batch-III is currently in progress at NUTECH with 150 students.
- **NUTECH Future Main Campus:** NUTECH has acquired 300 acres of Land at Capital Smart City (CSC) for main campus. Zoning and Master Planning of the campus has been completed through professional consultant. Infrastructure activities will be initiated soon. After completion, the main campus will accommodate 2000-3000 students in 6-7 applied engineering & technology programs and certify 2000 students through professional trainings in emerging high-end skills in various fields.
- **NUTECH Railway Engineering, Technologies & Skills School (NURETSS):** As part of strategic collaboration with concerned stakeholders and industry, NURETSS is conceived as bastion of latest innovative technologies based products, systems, manufacturing processes and services for projects in future. NURETSS will focus on producing quality technologists and skilled workforce required by industry through cooperative degree BET programs at par with international standard. NURETSS will also create new knowledge through R&D activities and industry projects. The Project has been approved by CDWP. Execution of project will start on availability of funds from donor agency.
- **Industrial Projects:** In response to the Covid crisis, NUTECH engineers started working on developing technologies to meet the critical requirement of mechanical ventilators titled: “NUTECH Ventilator (NuVent)”. Significant features of NuVent include 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 under process at CMH, Rawalpindi. As part of indigenous development efforts, NUTECH has also developed 3D industrial printer prototype (NUPRINT). Feasibility studies for the development of Hemodialysis & X-ray machines have also been conducted.
- **Higher Education Development in Pakistan (HEDP):** It was decided by HEC to strengthen HEIs financial autonomy through broadening resource base. Project HEDP-Higher Education Development in Pakistan is

funded by World Bank & supports HEC Vision-2025. In this regard, an amount of Rs. 53.90 million has been released to NUTECH. HEC has issued guidelines for implementation of revenue generation which are vigorously being pursued by NUTECH.

- **Engagement with Special Technology Zone Authority (STZA):** STZA has been established under STZA Act, 2021 that functions under a 12 member BoG which is headed by the Prime Minister. Currently, there are 2 STZs in Islamabad i.e. Islamabad Technopolis on NIH Road & New State Life Tower in Blue Area, Islamabad. Special incentives for investors are provided through STZs that include exemption from Property Tax, exemption from all taxes under Income Tax Ordinance, 2001, exemption from Federal Sales Tax under Sales Tax Act, 1990 & exemption from tax on import of capital goods. Initial engagements have been done with STZA officials by NUTECH which were focussed on declaration of New campus as STZ for potential benefits.

National Energy Efficiency & Conservation Authority (NEECA)

Introduction

NEECA Goal/Functions:

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. 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 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 2021-22

A brief detail of projects and initiatives undertaken by NEECA in the year 2021-22 are ;

Formulation of National Energy Efficiency & Conservation Policy (NEEC) 2022

The Draft NEEC Policy 2022 aims to reduce the energy intensity of the country by 3.5% by 2030 through various energy efficiency and conservation measures in key strategic sectors of the economy.

The draft of the National Energy Efficiency & Conservation Policy (NEEC) 2022 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 policy has been revised in the light of national consultations, written comments/feedback and inputs from the NEECA board. The policy was endorsed by NEECA board and submitted to Ministry of Science and Technology for further approval from the cabinet/relevant forum.

Projects developed and executed

- MEPS Development and Labelling Regime
 - Developed/Launched Minimum Energy Performance Standards for following electrical and gas appliances



- LEDs
 - Motors
 - Air-Conditions
 - Refrigerators
 - Gas Water Heaters
- Regulations for MEPS / Labelling regime Implementation
 - NEECA has drafted regulation for all above mentioned electrical appliances including fans.
 - NEECA board has approved the regulation, which are currently under review of Ministry of science and technology before seeking final approval from the cabinet.
- Executed UN-Environment funded project titled “delivering the transition to energy efficient lighting in residential, commercial, industrial and outdoor sectors in Pakistan”. The Objective of the project was to secure significant global climate change mitigation and environmental benefits by instituting efficient lighting policies and creating a framework for innovative financial mechanisms that promote innovative and high efficiency products. The following are the key outcomes for the proposed project
 - Developed a National Efficient Lighting Strategy
 - Strengthened monitoring, verification, and enforcement (MVE) capacities in Pakistan to ensure an effective transition to efficient lighting
 - Design Revolving Loan Fund (RLF) for investment in LEDs.
 - Awareness raising and capacity building including implementation of pilot projects were done during the project period i.e. Retrofitting of LED lights in Quaid e Azam University Islamabad and NEECA Building, Islamabad.
- Executed project “implementation of resource and energy efficient technologies in the sugar sector of Pakistan (IREET)” funded by EU. Project Outcomes are;
 - 70 Energy audit reports/Business cases
 - Trainings of 5 Service Providers
 - Life Cycle Assessment Report of Sugar production
 - 70 Carbon Foot Print reports • Trainings of 5 Solution Providers
 - 30 Sugar Mills trained on Standardized Technical Specifications
 - 3 Case Studies on pilot R&EE Project
 - Drafted Sample sugarcane supply contracts between sugar mills and farmers
- Energy Audits of Captive Power plants
 - Conducted detailed energy audit of 10 Captive Power Plant
- Initiated revision of Pakistan Building Code (Energy Provisions) with Pakistan Engineering Council.
- Executed 4-Million Euro program focused on Energy Management Systems with support of GIZ on “Promotion of Renewable Energy and Energy Efficiency Concepts in Public Buildings”. During the project Energy Audit of the following Buildings in Islamabad were successfully conducted.
 - [CDA] Secretariat Executive Block
 - NEECA Building
 - Pak Secretariat
 - ‘A’ Block
 - ‘P’ Block
 - ‘R’ Block
 - CDA Model School I-9/4 Islamabad
 - Jinnah Convention Center Islamabad
 - Sewage Treatment Plant [Phase-4] I-9
 - Sangjani Water Treatment Plant
 - CDA Municipal Water Facilities
- Initiated 12 Million Euro Energy Efficiency Program for Decarbonization of Textile Manufacture Sector under NAMA support project. The Proposed NSP aims to promote investments in renewable energy and green technologies to mitigate GHG emissions by providing access to finance, establishing a local market for resource efficient technologies

and through advocacy and policy interventions. The following are the key outcomes for the proposed project;

- Improved access to finance for Energy Efficient and Renewable Energy Technologies
- Enhanced GHG Mitigation in the textile sector of Pakistan
- Enable regulatory environment for enhanced carbon-neutral development in the textile sector
- Developed market for EE and RE technologies
- **Program Developed**
 - PC-1 and PC-11 Developed

A total of five PSDP PC-1/PC-II were submitted to NEECA Technical Committee out of which two was approved for the current fiscal year. The details of all the six PSDPs are given in the table below:

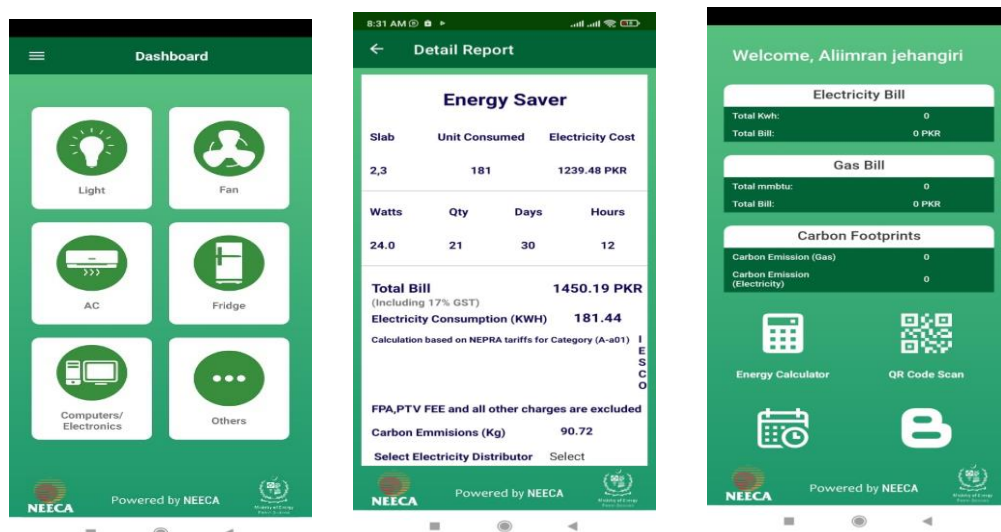
SNo	Title of the project	Amount (Pak Rs)	Status
1.	Building Sector EE Initiatives (PC-I)	500 Million	Approved (Not Allocated)
2.	Enhancing EE in Road Transport Sector (PC-II)	300 Million	Approved (Not Allocated)
3.	Certification regime for Energy Auditor and Managers and Awareness on Energy Efficiency and Conservation (PC-I)	3183 Million	Submitted
4.	Establishment of Industrial Assessment Centers in Engineering Universities (PC-1)	1000 Million	Declined
5.	Geographic Network Planner – Industrial and High-Pressure Gas Consumers for Energy Efficiency Planning (SEEP) (PC-I)	400 Million	Declined

Studies Conducted

- Pakistan renewable hydrogen energy pre-feasibility study.
- The study proposed 13 value chains for the production, storage, distribution, and utilization of renewable hydrogen.
- Three of these were selected for financial modelling to assess their economic viability under a range of current and hypothetical future scenarios.
- The three hydrogen value chain cases that were selected for the above analysis were:
 - Hydrogen electrolysis from hydroelectricity on the existing Ghazi-Barotha dam (fed by a canal from the Tarbela dam) and admixing of the hydrogen at a low concentration into the local natural gas grid
 - Run of the river hydro power remote micro-grid with a portion of the power diverted for hydrogen production during 10 months of hydro power generation. The hydrogen would be stored and released to a fuel-cell for 2 winter months when the hydro plant would be winterized to avoid ice damage.
 - Use solar power from the Quaid e Azam solar park to produce hydrogen on an electrolyzer for admixing at a low concentration into the local natural gas grid for use
- E-mobility study on Electric Vehicle Charging Stations. The study provide the following critical insights on electric vehicle charging stations.
 - Current and future landscape of EV in Pakistan
 - Assessing the impact of Electric mobility on the grid
 - Modeling the impact of EV on GHG emission
 - Understanding the economics of commercial EV Charging
- **Awareness campaign**
 - **Behavior Change Awareness Campaign for EE&C:** NEECA believes that energy conservation at national level is possible through behavior modification for responsible production and consumption (SDG 12). However, behavior modification to save the energy is not a simple task. It involves continuous efforts to inform the various stakeholders to adopt the best practices to save energy. In this reference, NEECA has

initiated various behavior modification activities at national level to create a culture of conservation for sustainable development. Mainly, NEECA has initiated Energy Talks/ Thursday Series to cover the key dimension of EE&C in key sectors of the economy and community engagement sessions to highlight its importance. Academia (faculty and students), civil society and media was invited to these events, which was followed by useful discussions, questions. Similarly, continuous efforts are being made for behavior modification through social media platforms in the form of short videos, visuals and facts about various EE&C measures and strategies. NEECA is also developing a comprehensive awareness plan to share the findings of the technical reports, energy saving potential in different sectors, causes of wasteful use of energy resources and energy performance standards of different equipment and appliances to contribute to national level energy saving targets. The future energy conservation awareness campaigns will focus on;

- EE&C Conservation Competition (writings, videos, arts & design)
- Digital Media Campaign/Social Media awareness Campaign
- Animated Cartoon Series
- School Awareness Campaign
- **“NEECA APP” – An iOS/ Android Based Mobile Application**
NEECA Mobile Application was developed for public awareness on Energy Efficiency and Conservation (EE&C) and is freely available for download at Google Play Store and Apple App Store.



Thursday Series Energy Talks

To achieve the broader objectives of EE&C, NEECA organized seminars on various topics of EE&C known as “Thursday Series/Energy Talks”. The purpose of the seminar series was to create awareness about the importance of EE&C and to engage various stakeholders to develop coordination & collaboration at national level for EE&C gains. About 325 participants from public and private sector (senior officials from public, private, development sector) have attended these talks. Senior professionals/experts from the respective sector were invited as guest speakers in these sessions. Energy Talks were conducted on following topics;

- Green Financing and EE&C
- EE&C in Agriculture Sector
- EE&C in Power Sector
- Behavior Change for EE&C
- EE&C in Petroleum Sector
- EE&C in Transport Sector

- EE in Electrical Appliances



Energy Efficiency Technology Awareness in National Universities and Schools

NEECA started an awareness campaign to enlighten the use of technology in electricity efficiency and conservation. Engineering and CS/IT students are being encouraged to come forward with new ideas of EE&C through this campaign.