

YEAR BOOK

2020-21



Ministry of Science & Technology
GOVERNMENT OF PAKISTAN

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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
NAM	Non Aligned Movement
NCST	National Commission for Science & Technology
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.
TSC	Technical Services Centre
UNIDO	United Nations Industrial Development Organization
WTO	World Trade 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 give this Message for the Year Book 2020-21, which highlights the activities of Ministry of Science and Technology and its Organizations including three Universities during the year.

Ministry of Science and Technology has elevated its vision to become a strategic collaborator of the industry through research, technology transfer, technology incubation and skill development. The research organizations under its administrative control are now diverting more resources towards the development and implementation of projects and plans, in close collaboration with their relevant stakeholders both from 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 high class projects are in the process of preparation and approval under the PSDP programme. These projects cover important areas of affordable and 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.

Establishment of Precision Systems Training Centre (PSTC) and PCSIR Laboratories at Gwadar, Balochistan, is underway. These laboratories in 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.

Pakistan Council of Scientific and Industrial Research (PCSIR) supports industrial sector in various fields 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.

Training Programmes are being designed for the capacity building of SMEs personnel, MoST & its organizations in consultation with the Chambers of Commerce & Industries, sector specific Trade Associations, SMEs and other stakeholders under PSDP Project. 40 training sessions of 2-Day (non-examination based) training courses against 19 certification standards have been conducted. 05 training sessions of 5-Day (examination based) lead auditor courses against 05 certification/accreditation standards have also been conducted. All of the Training sessions were conducted in the vicinity of Industrial hubs across the country to get the maximum training benefit.

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 2020-21 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. The technological revolution ushers in economic, social and cultural changes of huge proportions resulting in turnaround of nations.

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 country's economy that will positively affect big macro variables such as GDP, investment, consumption, employment and trade. This Ministry aspires to follow the global successful models for modernization of the industries in the Country. MoST is moving from the triple helix model of innovation towards penta helix model for fostering the social and economic development of the country. These initiatives will provide a robust framework to industrial sector of Pakistan.

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 is a significant step towards development as there is no such testing facility available at National level. The project is being sponsored by Ministry of Science & Technology and Korea International Cooperation Agency (KOICA), Govt. of South Korea and executed by Pakistan Council of Renewable Energy Technologies (PCRET) & KOICA. Geo-technical inspection and topographic survey of the project site has been completed. KOICA has hired local architectural firm and completed architectural design for the said lab.

The Ministry has launched STEM Education Program, the modern tool for promotion of Science, Technology, Engineering and Mathematics in Pakistan to equip our youth with meaningful learning through hands-on experiences to improve their cognitive abilities. 50 Schools and 05 top-notch Universities across the country have been shortlisted where the Mini-STEM FABLABs (for Schools) and Hi-STEM FABLABs (for Universities) are being established with state-of-the-art facilities.

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.

In pursuance of Prime Minister's directives, PCSIR was assigned the task for the establishment of Analytical Testing and Cannabis Products Development Centre in the country.

Science & Technology Park (Electronics) is being established at National Institute of Electronics (NIE) to promote Electronics Industry in the country. The Ministry has conducted various meetings with stakeholders to develop standards for energy efficient fans and natural gas geysers for domestic use to reduce energy wastage.

Projects in Health Sector are also being carried out by the Ministry namely "Establishment of Center for Advanced Technologies in Biomedical Materials" at COMSATS University, Lahore Campus. Work on this project has continued at CUI with dedication despite COVID-19 pandemic linked closures, health and safety issues and resulting challenges. Further, the scheme for Establishment of a Center of Artificial Intelligence in Health Sciences is also being executed by Husein Ebrahim Jamal (HEJ) University of Karachi.

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 pay dividends in the near future and contribute towards acceleration of 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 and 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 officer, 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 of the Ministry is distributed as specified hereunder:

Additional Secretary

Responsible for monitoring of all wings of Ministry of Science and Technology (MoST) and submission of Policy matters to Secretary, MoST for approval.

While adhering to this distribution of Business, further distribution amongst various Sections of the Administration and Finance & Accounts Wings is as under:

Joint Secretary (I):

All administrative matters of the Ministry.

Deputy Secretary (Admn):

- Administrative and Personal Management.
- HRD, Training issues and cases.
- Maintenance/Security.
- 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.
- Domestic Training of officers/officials of the Ministry.
- Rules of Business, Secretariat Instructions, etc.

Section Officer (General):

- Maintenance of office building(s).
- Maintenance of vehicles, office equipment and machinery (including telephones, computers, fax and photocopier 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 and with other Ministries.

Joint Secretary (Org):

All administrative matters of the S&T Organizations of MoST.

Deputy Secretary (Org):

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 (PTB) Pakistan Technology Board.
- STEDEC Technology Commercialization Corporation of Pakistan.
- 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 Electronics (NIE).
- Pakistan Council of Renewable Energy Technologies (PCRET).
- National University of Sciences and Technology (NUST).
- Pakistan Halal Authority (PHA).

Section Officer (Org-III):

Administrative and Personnel matters relating to:

- Pakistan Council of Research in Water Resources (PCRWR).
- 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).
- 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 Departmental Accounts Committee (DAC).
- Compliance with Rules, Regulations and Orders.
- Internal Control/Internal Audit.

Section Officer (F&A):

- Budget preparation and coordination with other Wings, MoST organizations and the Finance Division etc.
- Re-conciliation of accounts and expenditure of the Ministry and its 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 Government Vehicles of Development Projects etc.

Technical Wings

Technology Wing:

- Promotion and development of industrial technology.
- 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).

Only technical matters relating to these organizations.

Policy & Coordination (P&C) Wing:

- Establishment of institutes and laboratories for research and development in the scientific and technological fields.
- Monitoring and evaluation of research and development works.
- Support to NGOs concerned with development of science and technology.
- Establishment of science universities as specifically assigned by the Federal Government (NUST).
- Pakistan Council of Research in Water Resources (PCRWR).
- National University of Sciences & Technology (NUST).
- Pakistan Science Foundation (PSF).
- Pakistan Council for Science & Technology (PCST)/National Commission for Science & Technology (NCST).
- Pakistan Science Foundation (PSF).

Only technical matters relating to these organizations.

International Liaison (IL) Wing:

- Bilateral Cooperation in S&T through Agreements/MoUs with friendly countries including Pak-US Cooperation.
- 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.
- Foreign trainings/conferences/visits etc.
- National Institute of Oceanography (NIO).
- COMSATS University, Islamabad (CUI).
- OIC Standing Committee on Scientific & Technological Cooperation (COMSTECH).
- Commission on Science & Technology for Sustainable Development in the South (COMSATS).

Only technical matters relating to these organizations.

Electronics Wing:

- Establishment of Science/Knowledge Cities and S&T Parks.
- Monitoring and evaluation of research and development works.
- Processing of Draft Bills of MoST Organizations established through Resolution/Ordinances.
- Processing of the amendment Bills proposed in

the existing Acts of MoST Organizations.

- National Institute of Electronics (NIE).
- Pakistan Council of Renewable Energy Technologies (PCRET).
- Council for Works & Housing Research (CWHR).
- STEDEC Technology Commercialization Corporation (STCC) of Pakistan.
- National University of Technology (NUTECH)

Only technical matters relating to these organizations.

Planning & Development (P&D) 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.

Strength of Ministry of Science & Technology
As on 30.06.2021

Nomenclature of the Post	BS	Sanctioned Posts	In Position
Secretary	22	1	1
Additional Secretary	21	1	1
Joint Secretary	20	2	2
Joint Technological Adviser	20	1	1
Joint Electronics Adviser	20	1	1
Joint Scientific Adviser	20	2	2
Chief Finance & Accounts Officer	20	1	1
Deputy Technological Adviser	19	1	1
Deputy Electronics Adviser	19	3	2
Deputy Scientific Adviser	19	4	2
Deputy Secretary	19	2	1
Science Counsellor, Beijing	19	1	0
Assistant Technological Adviser	18	2	2
Assistant Scientific Adviser	18	6	1
Assistant Electronics Adviser	18	3	2
Accounts Officer	18	1	1
Section Officer	17/18	8	5
Private Secretary	17/18/19	4	4
Assistant Accounts Officer	17	2	2
Scientific Officer	17	1	0
Admin. Officer (Legal)	16	1	1
Superintendent	16	2	1
Assistant Private Secretary	16	26	25
Total:		76	59

Assistant	15/16	27	25
Sub-Librarian	15	1	1
Stenotypist	14	21	15
Upper Division Clerk	11	4	4
Lower Division Clerk	9	9	7
Technician	6	1	1
Bearer	6	1	1
Staff Car Driver	4	13	13
Dispatch Rider	4	2	2
Daftary	2	2	2
Qasid	2	2	2
Naib Qasid	1	49	48
Electrician-cum-Plumber	1	1	1
Chowkidar	1	5	5
Frash	1	2	2
Sweeper	1	4	4
Total		144	132
Grand Total		220	191

Ministry of Science & Technology

Secretary
Nadeem Irshad Kayani

Additional Secretary
Major (Retd.) Qaiser Majeed

Electronics Wing
JEA-Zawar Hussain
DEA-I-Vacant
DEA-II - Asif Akhtar Mughal
DEA-III - Naseem Haider
AEA-I – Kamran Nawaz
AEA-II – Amna Zulfiqar
AEA-III - Vacant
ASA (P&D-I)-Dr. S. Ahqabullah Kakakhel
ASA (P&D-II) - Vacant
Scientific Officer - Vacant

1. Establishment of Science cities.
2. Monitoring and evaluation of research and development works, including technical scrutiny of development projects, of assigned organizations, if required.
3. National Institute of Electronics (NIE)
4. Pakistan Council of Renewable Energy Technologies (PCRET).
5. Council for Works & Housing Research (CWHR)
6. STEDEC Technology Commercialization Corporation (STCC) of Pakistan
7. National University of Technology (NUTECH)
8. E-Government.
9. Processing of PSDP Projects through DDWP/CDWP/ECNEC.
10. Processing of release of funds of Development Budget.
11. Preparation of Development Budget.
12. Monitoring of Development Budget.
13. MoST Building Project.

International Liaison Wing
JSA – Zain-ul-Abedin
DSA-I - Khan Muhammad
DSA-II - Vacant
ASA-I –Saima Tariq
ASA-II – Vacant

1. Multilateral Cooperation in S&T through International/Intergovernmental Organizations.
2. COMSATS University, Islamabad (CUI)
3. National Institute of Oceanography (NIO).
4. COMSTECH.
5. COMSATS.
6. Economic Cooperation Organization Science Foundation (ECOSF-PSF)
7. International Trainings/Symposiums/Workshops.
8. Monitoring and evaluation of R&D works including technical scrutiny of development projects of assigned organizations, if required.

Project Management & Monitoring Cell
Assistant Scientific Adviser-I (PM&MC) (BS-18)
Assistant Scientific Adviser-II (PM&MC) (BS-18)
Scientific Officer (PM&MC) (BS-17)

- Processing of PSDP Projects through DDWP/CDWP/ECNEC.
- Processing of release of funds of Development Budget.
- Preparation of Development Budget.
- Monitoring of Development Budget.
- MoST Building Project.
- Establishment of Institutes and Laboratories for research.
- Monitoring and evaluation of research and development works including scrutiny of development projects.

Planning & Coordination Wing
JSA – Dr. Syed Zaheer Hussain
DSA – Vacant
ASA – Vacant

1. Support to NGOs concerned with development of science and technology.
2. Pakistan Council of Research in Water Resources (PCRWR)
3. Pakistan Council for Science & Technology (PCST)
4. Pakistan Science Foundation (PSF) (PMNH, PASTIC).
5. National University of Sciences and Technology (NUST).
6. Monitoring and evaluation of research and development works, including technical scrutiny of development projects of assigned organizations, if required.

Technology Wing
JTA – Ashfaque Ahmed Memon
DTA – Dr. Sarwat Ismail (On Deputation)
ATA-I –Sadaqat Khan
ATA-II – Wahab Feroze Din

1. Pakistan Council of Scientific & Industrial Research (PCSIIR)
2. Pakistan Standards & Quality Control Authority (PSQCA)
3. Pakistan National Accreditation Council (PNAC)
4. Pakistan Engineering Council (PEC)
5. Pakistan Halal Authority (PHA).
6. Monitoring and evaluation of research and development works, including technical scrutiny of development projects of assigned organizations, if required.

Commercialization Cell
Deputy Scientific Adviser (BS-19)
Assistant Scientific Adviser (BS-18)
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.

Admin Wing
Administrative matters of Ministry and S&T Organizations.

JS (I)/Admin
Aftab Alam

DS (Admn)
Shakeel Arshad

Section Officer (Estt)
Saqib Manzoor

Section Officer (Gen)
Syed Nasir Masroor

Section Officer (Council)
Qaiser Baig
(Current Charge)

Section Officer (Coord)
Saqib Manzoor
(Additional Charge)

AO/D.D.O.
Bakhat Nawaz

Admn Officer (Legal)
Ahmed Iqbal

JS (II)/Org
Zahir Shah

DS (Org)
Syed Abdul Manan

Section Officer (Org-I)
Khadija Awan

Section Officer (Org-II)
Allahyar Khan Kalwar

Section Officer (Org-III)
Ashar Mahmood

Section Officer (F&A)
Munawar Khan
(Current Charge)

Asstt. Accounts Officer
Adeel Ahmad

Accounts Officer
(Development Budget)
Nawaz Ahmed Khan

Finance & Accounts Wing
CFAO- Shahzad Naeem
Financial matters of MoST & its organizations.

International Liaison (IL) Wing

Introduction

International Liaison Wing is responsible for enabling S&T organizations in Pakistan to develop linkages and pursue cooperation with friendly countries & relevant international organizations. 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 their international counterparts to enhance individual as well as institutional capacities on the principles of equality, reciprocity and mutual benefits.

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 for initiation 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 & Special Initiatives and other Ministries /Departments.
- Cooperation with the intergovernmental bodies like UN Agencies, UNESCO, Economic Cooperation Organization (ECO), South Asian Association for Regional Cooperation (SAARC), 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), Organization of Islamic Cooperation (OIC), 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 technical and financial assistance of their S&T Organizations.
- Dealing with all matters of COMSATS University, Islamabad (CUI) including the soliciting approval of President of Pakistan.
- Preparation of Reports/Briefs for high level Pakistan delegations & Missions to facilitate their participation in International Meetings, Conferences etc. on Scientific & Technological Research matters.
- Dealing with all Technical/Semi-Technical matters related to NIO, CUI, COMSTECH, COMSATS and ECO-SF.

Bilateral & Multilateral Fora

During the financial year 2020-21, International Liaison Wing has been undertaking coordination for following activities within the framework of bilateral cooperation with different countries & through framework of multilateral cooperation with Regional & International organizations.

- **Bilateral Cooperation:**
 - **China:**
 - The draft Memorandum of Agreement between National University of Science and Technology (NUST), Pakistan and University of Electronic Science and Technology of China (UESTC), China is under process. The inter-ministerial Codal formalities have been completed and it will be signed after the approval of Federal Cabinet.
 - The draft Memorandum of Understanding (MoU) between Pakistan Science Foundation (PSF), Pakistan and Children & Youth Science Centre of CAST, China is in pipeline which will further strengthen the S&T Cooperation between the two countries.
 - Pakistan Council for Research in Water Resources (PCRWR) Pakistan and China Water Resources Beifang Investigation, Design and Research Co. Ltd. (BIDR), China intends to

- enter into Scientific and Technological Cooperation by signing a Strategic Framework Agreement. The agreement is being processed for approval of Federal Cabinet.
- 13 Joint Research projects were finalized for funding under the 18th protocol.
 - Pakistan participated in the 5th Drone summit held in Shenzing, China and the Federal Minister for S&T delivered keynote Speech.
 - Three key projects pertaining to National Institute of Oceanography (NIO), National Institute of Electronics (NIE) and Pakistan Council for Renewable Energy Technology (PCRET) were processed under CPEC.
 - The protocol for the establishment of Joint Center on Remote Sensing was finalized between National Institute of Oceanography (NIO) and State Oceanic Administration (SOA).
 - An MoU between Pakistan Standard & Quality Control Authority (PSQCA) and Standardization Administration of the People’s Republic of China (SAC) has been finalized and is ready for signing.
- **South Korea:** The Declaration of Partnership between National University of Sciences and Technology (NUST), Pakistan and Korea National Defense University (KNDU) is under process.
 - **Slovakia:** A Memorandum of Understanding (MoU) between Museum of Natural History (PMNH), Pakistan and Department of Zoology Comenius University, Bratislava, Slovakia is in pipeline.
 - **Iran:** A draft Mutual Recognition Agreement (MRA) between Institute of Standard and Industrial Research of Iran (ISIRI) and Pakistan Standards and Quality Control Authority (PSQCA), Pakistan is in process.
 - **United Nations-Women:** A Memorandum of Understanding between Centre for International Peace and Stability (CIPS), NUST, Pakistan and United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) is in pipeline.
- **International MoUs:**
 - A Memorandum of Cooperation between Institute of Water Problems, Hydropower and Ecology, Academy of Science, Republic of Tajikistan and Pakistan Council of Research in Water Resources, Pakistan has been approved by Cabinet for signature.
 - A Memorandum of Understanding between Ministry of Science and Technology, Pakistan and Ministry of Communication, Science and Technology, Republic of Tanzania has been approved by Cabinet for signature.
 - **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). 02 scientists availed this programme during the Financial Year 2020-21.
- **Cooperation at Multilateral Forum**
 Ministry of Science and Technology is the Focal point for the following Inter-Governmental and Regional Organizations and facilitates in the activities mentioned below:
 - Ministry financially contributes to the following Organizations annually:
 - 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)
 - Inter-Islamic Network on Space Sciences & Technology (ISNET)
 - **Shanghai Cooperation Organization:** IL-Wing, MoST successfully organized 6th Meeting of the Permanent Working Group on Scientific & Technical Cooperation of the Member States of the Shanghai Cooperation Organization (SCO), in Virtual format on 30th March, 2021 under the chairmanship of Pakistan.
 - **Participation in Meetings/Training Workshops and Seminars abroad:** During the FY 2020-21, many Scientists/Engineers and officers from MoST and its S&T organizations participated in various scientific activities (online) as a result of interactions at bilateral and multilateral levels.
 - **S&T Organizations of MoST**
 IL-Wing, MoST facilitated following R&D/S&T organizations in their technical, semi-technical and administrative matters:

- National Institute of Oceanography (NIO)
- COMSATS University, Islamabad (CUI)
- Economics Cooperation Organization-Science Foundation (ECO-SF)
- Commission on Science and Technology for Sustainable Development in the South (COMSATS), Headquarter
- Organization of the Islamic Cooperation Ministerial Standing Committee for Scientific and Technological Cooperation (COMSTECH)

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

Activities carried out by Technology Wing

- PCSIR and PSQCA have been included in the Virtual One Stop Shop (VOSS) for Special Economic Zones as per the Government's vision aimed at reducing the lead time
- Fan has been included in the mandatory list of PSQCA
- **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 Electronics (NIE), National Physical & Standards Laboratory (NPSL) etc.
- **Membership of the Committees**
Technology Wing is member of following committees of different organizations and actively participates in their core meetings:
 - National Technology Council (NTC)
 - Auto Industry Development Committee (AIDC), EDB
 - High Level Committee between Civil and Military organizations
 - National Energy Efficiency & Conservation Authority (NEECA)
 - National BioSafety Committee (NBC), Ministry of Climate Change
 - Pakistan Engineering Council, Governing Body
 - National Computing Education Accreditation Council
 - National Vocational and Technical Training Commission
- **Inclusion of 61 standards in the mandatory list of PSQCA**
 - Formulated and issued SRO for inclusion of 61 food and non-food items in the mandatory list of PSQCA after due diligence of seeking comments from all relevant stakeholders and getting approval from Cabinet. Standardized items will ensure improved health and safety of consumers.
 - Other items such as four-wheeler automobile vehicles (Cars, Tractors, Buses) and helmets are also under consideration for inclusion in mandatory list of PSQCA.
- **Pakistan National Quality Policy (PNQP)**
 - Pakistan National Quality Policy (PNQP) has been drafted and revised in the light of stakeholders' comments after discussion in the relevant meeting. The same is being forwarded to relevant stakeholders before submitting to Cabinet for its approval.
- **Issues related to Harmonization of Food Standards and Regulations and Enforcement between Federal Government/Pakistan Standards and Quality Control Authority and Provincial Governments/Provincial Food Authorities**
 - According to the Cabinet Decision, different stakeholder meetings were convened to discuss and resolve the matter between Federal Government/PSQCA and Provincial Government/Provincial Food Authorities regarding ease of doing business and National Steering Committee has also been formed in this regard.

- **Registration for Halal Certification Bodies**
 - PHA initiated process to publish the notice for registration of Halal Certification Bodies and also initiated the process of MoUs between different organizations.

Policy & 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 address 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 of Research in Water Resources (PCRWR), 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

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 PCRWR, 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.
- Preparation/construction and fielding of the S&T float for Pakistan Day Parade on the 23rd March, 2021 at Parade Ground, Shakarparian Zone-III, Islamabad.

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. Ministry of Science and Technology is the focal point for evaluation of credentials of scientists and technologists. Federal Minister for Science and Technology is the Chairman of Awards Sub-Committee on Science, Engineering and Education. R&D organizations, Pakistan Academy of Sciences and different Universities of the country forwarded nominations for consideration of Civil Awards-2021. Ministry of Science and Technology examined credentials of 30 nominees as per approved Quantified Criteria for different categories of Civil Awards-2021. Following scientists/technologists/researchers, nominated by Ministry of Science and Technology, were conferred with Civil Award in different categories of Science and Technology:

1.	Dr. Syed Hussain Abidi, Chairman, Pakistan Council of Scientific and Industrial Research, Islamabad.	Sitara-i-Imtiaz
2.	Professor Dr. Muhammad Junaid Mughal, TTS Professor/Incharge Academics/Chairman, Electrical and Computer Engineering Department, COMSATS University, Islamabad.	Tamgha-i-Imtiaz

3.	Dr. Muhammad Abid, Dean Faculty of Engineering/Chairman, Mechanical Engineering/Director, Interdisciplinary Research, COMSATS University, Wah Cantt Campus.	Tamgha-i-Imtiaz
4.	Dr. Yasar Ayaz, Head of Department & Associate Professor, Department of Robotics & Artificial Intelligence, School of Mechanical & Manufacturing Engineering (SMME), National University of Sciences and Technology, Islamabad	President's Award for Pride of Performance

- **Formulation of Draft National Science, Technology and Innovation Policy-2021**
A significant undertaking initiated for the development of an expert driven STI Policy under the auspices of MoST was concluded this year. A coordination committee comprising members from MoST and PCST was constituted and conducted a thorough literature review to map out the blueprint. Subsequently, an Expert Working Group was constituted, which deliberated upon the broad contours of the proposed policy and laid out a comprehensive plan in the shape of Policy Working Paper.
Consequently, a number of deliberations, group sessions and wider consultations took place during the current year to shape the final draft document of new STI Policy-2021 with key constructs that are outlined as below:
 - 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
- **Coordination with MoST's Organizations**
 - Coordination regarding BoGs/BoDs/BoTs of PCRWR, PCST, PSF & NUST on various technical matters.
 - Coordination with PCRWR for commercialization of its patents/products for the provision of safe drinking water and facilitation for operationalization of National Capacity Building Institute (NCBI) for water quality management.
 - Review of Monthly Progress Reports of PCRWR, PCST, PSF, NUST, PASTIC and PMNH and provided technical support for research activities.
 - Performance of MoST and its attached organizations was evaluated and report was forwarded to Prime Minister's Office.
 - Coordination for organizing of Scientific Advisory Committee on Defense Planning (SACDP).
 - Provided information to S.O. (Coord), MoST on Report for Comprehensive Completion of Government's Achievements for onward submission to the quarter concerned.
- **Coordination with other Ministries/Participation of P&C Wing**
 - Coordinated meetings of Prime Minister's Task Force on Science and Technology.
 - Provided requisite information and update of Prime Minister's Task Force on Science and Technology to Cabinet Division.
 - With the approval of the Secretary, Ministry of Science and Technology, a sub-committee was constituted for deliberations and proposals on the issues that are most relevant to Science, Technology & Research.
 - Ministry of Science and Technology initiated the process for formulation of Civil Drone Regulatory Authority and was involved in the process of draft legislation aimed at establishing Unmanned Aircraft System Authority. Information was provided to the Prime Minister's Office.
 - Provided information on Training Capacity and Requirements for Ex-Cadre Officers to Section Officer (Coord), MoST for onward submission to Institutional Reforms Cell, Cabinet Division.
 - Composition of Committee for revision of evaluation criteria for different categories of civil awards for Educationists, Medical Professionals and Scientists/Technologists.

- Provided information to President’s Secretariat (Public) on consumption of oxygenated water for human health.
- Provided information on HEC Policy for Eligibility of Institutions for Competitive Research Grants and list of Public Sector R&D Organizations to Higher Education Commission.
- Provided information to Prime Minister’s Office about Performance Review of Ministry of Science and Technology and its organizations.
- Forwarded input to National Security Division on Draft National Security Policy.
- Concept proposal on “Installation of Water Filtration Plants Integrated with Water Dispensing Systems and Opening Safe Water Shops on Public Private Partnership Basis” was forwarded to Law & Justice Division, Public Private Partnership Authority (PPPA), Prime Minister’s Kamyab Jawan Program and STEDEC for views/comments.
- Provided information on two year’s Performance of the Government (highlighting major initiatives and achievements of MoST’s Organizations i.e. NUST, PCST, PCRWR, PSF) to DSA (IL), MoST for onward submission to the quarters concerned.
- **Workshops, Conferences and Meetings**
 - Monthly Progress Reports Review meetings of Organizations of MoST.
 - Participated in a meeting of Underground Shelters Committee on Defence Planning held on 22nd December, 2020 in the Ministry of Housing & Works, Islamabad.
 - Meetings were organized to formulate Draft National Science, Technology and Innovation Policy 2021 at MoST.
 - Attended the meeting to finalize the Draft Unmanned Aircraft System (UAS) Policy on 28th September, 2020 at the Aviation Division.
 - Attended the 26th National Key Points Intelligence Division Committee Meeting on 4th February, 2021 at Ministry of Defence, Rawalpindi.
 - Organized a meeting for Revision of Agenda of the National Commission for Science and Technology (NCST) on 19th November, 2020 at MoST.
 - Attended the 5th, 6th, 8th, 9th and 10th meetings of the Sub-Committee of the Special Committee on Agricultural Products at Committee Room, Parliament House, Islamabad.
 - Attended the meetings of Main Awards Committee and Awards Sub-Committee for Science, Engineering and Education at Cabinet Division for Civil Awards 2020 and 2021.
 - Attended the meetings for S&T float for Pakistan - Day Parade on the 23rd March, 2021 at 501 Central Workshop, Electrical and Mechanical Engineers, Chaklala, Rawalpindi.
 - Attended the meeting of Inter-Ministerial Committee of Electric Vehicle (EV) Policy on 28th January, 2021 in the Ministry of Climate Change, Islamabad.
 - Attended the meetings of National Vaccine Task Force for COVID-19 in the Ministry of National Health Services, Regulations and Coordination, Islamabad, National Command and Operation Centre, Islamabad and AHK National Centre for Rural Development, Establishment Division, Islamabad.
 - Attended meetings on the Selection Committee for Pre-qualification of Data collecting Firms under the project titled, “Need Assessment of S&T Human Resources for Driving Innovation and Achieving Vision 2025 (NAHR)” in PCST.
 - Attended 5th meeting of the Committee for Opening of Financial Proposals of the Firms for award of contract for conducting “First Industrial National Innovation Survey (FINIS)” on 28th September, 2020 in PCST.
 - Attended first meeting of the Board of Governors (BoG) of Pakistan Council for Science and Technology on 24th August, 2020.
 - Attended the 27th Meeting of the Natural Sciences Linkage Programme (NSLP) on 18th June, 2021 at PSF, Islamabad.
 - Attended the Meetings of Economic Outreach Coordination Group (EOCG) at National Security Division, Prime Minister’s Office, Islamabad.
 - Attended the Consultative Meeting on 29th January, 2021 at National Security Division, Prime Minister’s Office, Islamabad.
 - Attended the Consultative Meeting on facilitating Islamabad Policy Research Institute (IPRI) outreach with Ministries/Divisions on 10th March, 2021 at National Security Division, Prime Minister’s Office, 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 (AAO).

According to System of Financial Control and Budgeting as notified by the Finance Division's O.M. No.F.3 (2) Exp.III/2006 dated 13th September, 2006 in each Ministry/Division, there shall be a Chief Finance and Accounts Officer (CFAO) equivalent to Joint Secretary under the Principal Accounting Officer who shall assist him and report to him as part of his team.

The CFAO works directly under the Principal Accounting Officer and assists the Principal Accounting Officer in matters relating to reconciliation of accounts, internal control/audit, monitoring and coordination with DAC, PAC and financial proprieties of expenditure and receipts, risk management and asset protection. He/she shall coordinate his/her work with the Financial Adviser's Organization.

Duties and Responsibilities

The duties and responsibilities of the Chief Finance and Accounts Officer are as under:

- **Maintenance and Reconciliation of Accounts:**
The CFAO shall systematize proper maintenance of accounts and their timely reconciliation with the CGA/AGPR and maintenance of 'Liability Register' in the Ministry/Division, its Attached Departments and Subordinate Offices.
He shall monitor the progress of the expenditure and receipts and furnish, with the approval of the Principal Accounting Officer, a monthly statement of departmental expenditure and receipts to Financial Adviser's Organization and the Finance Division (Budget Wing) by the 10th and the reconciled statement of expenditure and receipts by the 25th of the month following the month to which it relates.
- **Coordination and Scrutiny of Budget: Expenditure and Receipts:**
He shall undertake coordination and internal scrutiny of budget estimates of expenditure as well as receipts of Ministry/Division, its Attached Departments and Subordinate Offices, including Budget Order (BO) and New-Items Statement (NIS) in accordance with the Budget Call Circular issued by the Finance Division and proposals for additional funds to be met out of Supplementary Grant.
- **Consolidation of Public Sector Development Programme (PSDP):**
He shall be responsible for consolidation of PSDP so that the development schemes of the Ministry are prepared in accordance with the prescribed procedure and instructions under the supervision and with approval of the Principal Accounting Officer.
- **Advice in Delegated Field:**
He shall tender advice to the Principal Accounting Officer in the delegated field, where called upon, in all matters of payment and matters affecting the accounts or any other matter concerning propriety and regularity of transactions.
- **Cases in Non-Delegated Field:**
He shall process, in accordance with the prescribed rules and procedure, cases relating to the non-delegated field, and matters relating to foreign exchange, and demands for Supplementary Grant, which are required to be referred to the main Finance Division through the Financial Adviser.
- **Public Accounts Committee (PAC) and Departmental Accounts Committee (DAC):**
He shall be responsible for the work relating to PAC, DAC and audit observations on Appropriation Accounts and Audit Reports, ensuring compliance with the PAC observations and recommendations. He shall assist the Principal Accounting Officer, prepare necessary briefs for PAC/DAC and attend the meetings of the PAC and DAC along with the Principal Accounting Officer in the case of PAC and Additional Secretary/equivalent officer in the case of DAC.
- **Compliance with Rules, Regulations and Orders:**
He shall tender advice to the Principal Accounting Officer for compliance of rules, such as General Financial Rules (GFR), Fundamental Rules (FR), Supplementary Rules (SR), Federal Treasury

Rules (FTR) and other regulations, instructions and orders issued by the Finance Division from time to time.

- **Internal Control:**

He shall be responsible for observance of Internal Control prescribed by the CGA in the Ministry/Division, Attached Departments and Subordinate Offices. He shall assist and advise the Principal Accounting Officer for preventing irregularities, waste and fraud and shall exercise internal checks as provided in Para 13 of GFRs Volume-I, which reads that:

- Rules on handling and custody of cash are properly understood and applied;
- An effective system of internal check exists for securing regularity and propriety in the various transactions including receipt and issue of stores etc., if any, and
- A satisfactory arrangement exists for a systematic and proper maintenance of Account Books and other ancillary records concerned with the Initial Accounts.

- **Internal Audit:**

He shall conduct the Internal Audit of the Ministry/Division/Attached Departments and Subordinate Offices and incorporate the results of these inspections in the form of an inspection report and furnish the Internal Audit Report to the Principal Accounting Officer. The Principal Accounting Officer shall, after scrutiny of the report, communicate to Audit, copies of the report along with remarks and orders/action(s) taken thereon.

Principal Accounting Officer in the Ministries/Divisions and Departments are delegated powers and may exercise these powers without consulting the Financial Adviser. The Chief Finance and Accounts Officers may, however be consulted. His advice can however, be over-ruled by the Principal Accounting Officer who may record reasons for overruling the advice.

- **Reference to Financial Adviser/Finance Division:**

In cases where a reference to the Financial Adviser/Finance Division is necessary, the Chief Finance and Accounts Officer shall ensure that:

- the case is properly examined in accordance with the relevant rules and orders;
- the facts of the case and the point of reference are clearly stated in a self-contained note or office memorandum which shall be submitted in duplicate; and
- such further data and information is furnished as may be asked for by the Financial Adviser/Deputy Financial Adviser/Finance Division for the proper disposal of the issues referred to him.

The following 13 Department Accounts Committee meetings were held during FY 2020-21:

Date	Subject
23-09-2020	DAC meeting was held to discuss the Audit Report for the year 2010-11 on the account of Ministry of Science & Technology, Islamabad.
23-09-2020	DAC meeting was held to discuss the Appropriation Accounts for the year 2009-10 relating to Ministry of Science & Technology, Islamabad
07-10-2020	DAC meeting was held to discuss the Proposed Draft Paras for the year 2019-20 on the accounts of Pakistan Science Foundation (PSF), Islamabad.
10-11-2020	DAC meeting was held to discuss the Draft Audit Report (PDP Nos.26 to 31) for the year 2020-21
08-12-2020	DAC meeting was held to discuss the Audit Report of the Auditor General of Pakistan (Civil) for the year 2013-14 on the accounts of Ministry of Science & Technology, Islamabad.
08-12-2020	DAC meeting was held to discuss the Audit Comments/Draft Paras printed in the Auditor General of Pakistan Report, Public Sector Enterprises (Federal) for the year 2013-14, on the accounts of Pakistan Science Foundation, Islamabad.
26-01-2021	DAC meeting was held to discuss the Audit Report of the Auditor General of Pakistan (Civil) for the year 2017-18 on the accounts of Ministry of Science & Technology, Islamabad.

Date	Subject
26-01-2021	DAC meeting was held to discuss the Audit Comments/Draft Paras printed in the Auditor General of Pakistan Report, Public Sector Enterprises (Federal) for the year 2017-18, on the accounts of Pakistan Science Foundation, Islamabad.
26-01-2021	DAC meeting was held to discuss the Appropriation Accounts for the year 2017-18 relating to Ministry of Science & Technology, Islamabad
09-02-2021	DAC meeting was held to discuss the 10 highlighted paras printed in the Auditor General of Pakistan Report, Public Sector Enterprises (Federal) for the years 2010-11 to 2018-19 on the accounts of Pakistan Science Foundation.
09-02-2021	DAC meeting was held to discuss the 10 highlighted paras printed in the Auditor General of Pakistan Report (Civil) for the years 2010-11 to 2018-19 on the accounts of MoST.
31-03-2021	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Civil) for the year 2019-20 on the accounts of MoST.
22-06-2021	DAC meeting was held to discuss the Audit Report printed in the Auditor General of Pakistan Report (Commercial Audit) for the year 2019-20 on the accounts of MoST (PSF & STEDEC).

Non-Development Allocation and Expenditure for the Year 2020-21

(Rs. in Million)

S. No.	Name of Organization	Final Grant 2020-21	Expenditure
1.	Ministry of Science & Technology including Science Counsellor Office at Beijing, China	265.465	260.682
2.	Pakistan Council for Science & Technology	83.229	83.180
3.	Pakistan Science Foundation	268.133	268.082
4.	Pakistan Museum of Natural History	159.661	159.619
5.	Pakistan Scientific and Technological Information Centre	186.297	186.297
6.	National Institute of Electronics	208.847	208.842
7.	National University of Science & Technology	3,180.311	3,180.311
8.	Pakistan National Accreditation Council	45.526	45.526
9.	Pakistan Council of Renewable Energy Technology	121.650	119.861
10.	Pakistan Council of Research in Water Resources	464.246	464.246
11.	National Physical Standard Laboratory	227.594	227.528
12.	Pakistan Council of Scientific and Industrial Research	3,054.872	3,054.775
13.	National University of Technology	1,000.000	1,000.000
14.	National Institute of Oceanography	165.321	160.418
15.	Council for Works and Housing Research	124.162	123.680
16.	Pakistan Halal Authority	14.175	14.006
17.	COMSTECH	141.958	141.958
18.	COMSATS	87.298	87.298
19.	ECO-SF	32.531	32.531
Grand Total		9,831.276	9,818.840

Electronics Wing

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. The 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 organized by Pakistan Standard and Quality Control Authority (PSQCA) regarding the same.

Functions of Electronics Wing

- To deal with the technical affairs of NIE, PCRET, CWHR, STEDEC-STCC and NUTECH.
- To draft and process Bills for the enactment of organizations under MoST, created through Resolutions/Executive Orders etc.; which have no legal status and other related legislative issues.
- To implement E-Government initiatives and IT Security instructions in S&T Division, as directed by the Cabinet Division.
- To pursue 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.
- To deal with the matters of National Electric Power Regulatory Authority (NEPRA) and to convey the necessary technical opinions/views to NEPRA, for awarding Power Generation Licenses/Licensee Proposed Modifications (LPM) to different Organizations/Companies.
- To examine and circulate cases of National Telecommunication and Information Technology Security Board (NTISB), Cabinet Division regarding different security threats to all organizations of MoST for awareness, precautionary measures and for strict compliance.

Details of Activities

- **Evaluation and Monitoring of NIE, PCRET, CWHR, STEDEC and NUTECH:**
Progress reports of NIE, PCRET, CWHR, STEDEC-STCC and NUTECH were expedited, evaluated and necessary guidance was provided to these 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 forwarded to the Parliamentary Affairs Division through Law& Justice Division for its introduction in the Parliament.
 - **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 Judgment of the Supreme Court of Pakistan for substituting the word “Federal Government” with appropriate authority(ies) in the Acts/Rules of the respective organizations 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 30.06.2021 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.

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 improves the archaic system of filing but also speeds 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)

- Director, Pakistan Council of Renewable Energy Technologies (PCRET) participated in the 50th, 51st, 52nd and 53rd BoG meetings of the Alternative Energy Development Board (AEDB) on behalf of Secretary, Ministry of Science & Technology.
- Joint Electronics Adviser attended the 54th BoG meeting of AEDB on behalf of Secretary, Ministry of Science & Technology.

Bahria University

- Secretary, Ministry of Science & Technology attended the 43rd BoG meeting of Bahria University on 18th August, 2020.
- Deputy Electronics Adviser attended the 44th BoG meeting of Bahria University on 2nd February, 2021 on behalf of Secretary, Ministry of Science & Technology.

Air University

- Secretary, Ministry of Science & Technology is member of the BoG of Air University. Joint Secretary-I attends the meeting on behalf of Secretary, MoST. Working papers/minutes are processed in Electronics Wing.
- Processed the case for approval of Balance Sheet Profit/Loss Statement of Air University through circulation as the meeting of the BoG could not be held due to Corona pandemic.

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.

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 NUST, PCRWR, STEDEC and CF&AO, MoST for completion of the assigned tasks on given timelines.

- Task for Formulation of National Startup 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 to make the policy document more comprehensive.
- 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).
- Electronics Wing of MoST shared the comments with Board of Investment, Prime Minister's Office regarding a report on "Post COVID-19 Economy and Investment Strategy Response".
- Data for Finance Minister's Budget Speech 2021-22 was collected from all Organizations/Wings of MoST, compiled and submitted for approval of the Competent Authority.
- Data regarding preparation of Year Book of MoST 2019-20 was collected from Organizations/Wings of MoST, examined/vetted, compiled and uploaded on MoST website for the information of general public.
- Deputy Electronics Adviser has been nominated as member of the Committee for formulation of Restructuring Plan of STEDEC.
- Deputy Electronics Adviser was nominated as Inquiry Officer to conduct an inquiry regarding STFS project of Pakistan Science Foundation (PSF). The Inquiry Report was prepared and submitted to Administration Wing of MoST.
- Electronics Wing is preparing to initiate the task for formulation of National Electronics Policy under Performance Agreement 2021-22 & 2022-23.
- Joint Electronics Adviser attended the 50th, 51st, 52nd and 53rd BoD meetings of Karachi Tools, Dies & Moulds Center (KTDMC) on behalf of Secretary, MoST.
- Electronics Wing has processed the case of a Memorandum of Understanding between National University of Technology (NUTECH), Ministry of Science & Technology and Ministry of Railways which was signed on 11.02.2021.
- Electronics Wing has processed the case and prepared a draft concept paper for digitalization of Gardwari System on the directions of Federal Cabinet. A summary for transfer of the same to MoIT&T, being relevant Ministry, was prepared and submitted to the Cabinet. The Cabinet approved the summary and transferred the Cabinet Decision to MoIT&T to avoid duplication of efforts. In compliance, the complete case along with draft concept paper was forwarded to MoIT&T.
- 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.
- Assistant 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.
- Assistant 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 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.
- Processed the case for the development of new design of official website of Ministry of Science & Technology.

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

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 during 2020-21

Following are some of the key highlights of the progress made on the development side by MoST during 2020-21:

- MoST is guiding and supporting Small & Medium Enterprises (SMEs) in 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 486 applications were received and considered from various SMEs across the country for award of Incentive Grant against various Certification Schemes. 16 IAC meetings have been held wherein 595 applicant SMEs were approved and grants of Rs. 203.050 M were disbursed. For capacity building of SMEs personnel, MoST and its organizations, Training Programmes were designed in consultation with the Chambers of Commerce & Industries, sector specific Trade Associations, SMEs and other stakeholders before finalization of the PC-1. Training Programme element of the project was outsourced to M/s Bureau Veritas Pakistan (Pvt.) Ltd. through open bidding at a total cost of Rs. 16.913 million. Under the contract M/s Bureau Veritas Pakistan (Pvt.) Ltd. has conducted 40 sessions of 2-Day non-examination based training courses against 19 certification standards. 5 examination based training sessions of 5-Day lead auditor courses against 05 certification/accreditation standards have also been conducted. To maximize the training benefit, all of the Training sessions were 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 under the Vision 2025 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 1200 students was completed. A group of 25 students visited scientific organizations and universities of London and participated in London International Youth Science Forum. Inquiry Based learning sessions and motivational lectures were also arranged for 550 students. 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.
- Up-gradation of overall R&D infrastructure of Labs and Facilities of MoST's Organizations was continued to enhance the internal research capability of these organizations. Activities for establishment of Gems & Mineral Cutting and Polishing Centre at PCSIR Skardu, Gilgit Baltistan which was initiated last year for facilitation of gemstone miners to curb the precious and semi-precious stones wastage at mining level has now achieved full swing and is making steady progress. Establishment of Precision Systems Training Centre (PSTC) and PCSIR Laboratories at Gwadar, Balochistan is also underway. 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. PCRET, in collaboration with KOICA, is establishing Pakistan's first Accredited Testing Laboratory to facilitate introduction of PV standards for imported and locally developed PV modules as per International Quality/Safety Standards. Geo-technical inspection and topographic survey of the project site has been completed. KOICA has hired local architectural firm and completed architectural design for the testing lab.
- To improve land and water conservation practices and enhancement of wasteland productivity in Thal desert, PCRWR installed 06 Drip and Sprinkler irrigation systems coupled with solar pumping systems in Khushab, Mianwali and Bhakkar districts.

- Industry focused R&D is 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 areas 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's 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.
- Trade Related Interventions by MoST are being undertaken through Pakistan Standards and Quality Control Authority (PSQCA), Pakistan National Accreditation Council (PNAC) and National Physical and Standards Laboratory (NPSL). These organizations are actively involved in export enhancement, trade increasing and improving health and safety of consumers through mandatory and voluntary standards. PSQCA formulates and promulgates standards, PNAC assists in expansion of trade through accreditation of laboratories and certification bodies and NPSL is responsible for traceability of metrology standards.
- In Health Sector, MoST is undertaking the project titled "Establishment of Center for Advanced Technologies in Biomedical Materials" which is underway at CUI, Lahore Campus. CUI has provided an independent 50,000+ square feet facility for housing this equipment, Human Resource etc. Work has continued at CUI on this project with dedication despite Covid-19 pandemic. Further, the establishment of a Center of Artificial Intelligence in Health Sciences executed by HEJ, Karachi is also underway. The renovation has been completed and labs are assigned. The networking for hi-speed internet and other amenities has been planned.

Budgetary Overview of Development Activities

During the fiscal year 2020-21, an amount of Rs. 4,458.070 Million was allocated against 32 development projects. Out of this, Rs. 1563.095 Million were released and utilized. 06 Projects were completed in 2020-21.

Monitoring of Development Projects

Monitoring and Evaluation of PSDP projects was carried out during the period under report. The overall progress/assessment regarding monitored projects remained satisfactory. The system of internal monitoring and audit within executing agencies was also kept active to overcome all retardants affecting progress and implementation of development projects. This is in line with the endeavor of MoST for effective and efficient utilization of development funds.

Pakistan Council of Research in Water Resources (PCRWR)

Introduction

Pakistan Council of Research in Water Resources (PCRWR) is an apex body in water sector primarily focusing on the R&D activities/projects pertaining to major research areas viz. water conservation and management, groundwater investigation and management, reclamation of waterlogged and salinized soils, desertification control, water quality assessment and management and hydrological modeling. Pakistan's Vision 2025 and National Water Policy, 2018 have been the centre of planning and given top priority in the development programmes/projects being implemented especially in relation to Goal 15 of the Vision 2025 (storage capacity to 90 days, improve efficiency of usage in agriculture by 20% and ensure access to safe drinking water for all).

Achievements/Activities

Mandate of PCRWR is very broad in view of the areas of different research in the country, however, the focused research areas are prioritized keeping in view the two major usages of water resources; agriculture (95%) and domestic (2%). PCRWR has conducted various research studies/collaborative projects during the fiscal year 2020-21. Besides these research studies/collaborative projects, 2 PSDP projects were also being carried out at PCRWR and as a result following key achievements/activities have been carried out:

- Measured discharges of rivers of Khyber Pakhtunkhwa at 07 river sites.
- Developed inventory of water resources by conducting groundwater survey, analysis of surface and groundwater samples, soil characterization and collection of information pertaining to common vegetation patterns, human & livestock population near the ponds/villages in Cholistan Desert.
- Constructed saline fish pond at R&D Centre, Mithi, Tharparkar to promulgate food security options in Mithi through aquaculture and effective use of land and water resources.
- Conducted groundwater assessment in district Jhelum to assess pockets of fresh and saline water and provide strategies to use saline water conjunctively.
- Studied trans-boundary effects on ground and surface waters along the eastern border of Pakistan and developed a groundwater flow pattern.
- Conducted a series of experiments to combat the situation and introduce new water-saving methods by growing rice and wheat on beds and ridges. The bed planting provides evidence that rice can be successfully grown and raised on beds without standing water in the field.
- PCRWR and Metropolitan Corporation Islamabad (MCI) jointly undertook the sampling of water supply in Islamabad at source and point of use. In total, 120 samples from waterworks, tube-wells and consumer's tap before and after chlorination were tested by PCRWR.
- Improved Land and Water productivity in Thal Desert through introduction of solar-powered High Efficiency Irrigation Systems.
- Carried out farmer led experiments by male and female farmers under project titled: "Developing Approaches to Enhance Farmer Water Management Skills in Balochistan, Punjab and Sindh in Pakistan".
- Installed 4 solar powered drip and sprinkler irrigation systems and provided vegetative cover to control wind erosion.
- Conducted water quality assessment survey of rivers, lakes and springs of six districts of Gilgit-Baltistan i.e. Skardu, Ghizer, Gilgit, Hunza, Astore and Diamer. 67% of samples collected from various sources indicated the presence of microbial contamination.
- Monitored bottled water brands on quarterly basis throughout the country. Out of 592 samples, 532 were found to be safe, whereas, 60 samples of various brands were declared unsafe.
- Provided various trainings to water sector professionals to enhance their capacity.
- Provided Irrigation Advisory Services to 20,000 farmers in 41 districts through SMS on weekly basis.
- Imparted diploma courses (6-month duration) under Prime Minister's Hunarmand Pakistan Program in collaboration with National Vocational and Technical Training Commission (NAVTTTC).
- Formulated a "Groundwater Management Plan for Pakistan" under Performance Agreement.
- Launched a report on "Groundwater Investigations and Mapping in the Lower Indus Plain".

- Organized 6th International Water Conference from 29-30th December, 2020. Key thematic areas of the conference were; Water for all (Water, Food and Energy Nexus), H₂O Podcast, Blue Economy, Water and Environment.
- Organized 3rd Steering Committee to discuss the ongoing progress on nomination process of Karez Cultural Landscape of Balochistan.
- Organized dialogue on fostering trust amongst Pakistan's water institutions in data measurement and monitoring at Islamabad.

Allocation for F.Y 2020-21

(Rs. in million)

Non-Development Budget	Development Budget
464.246	19.883

Projects during 2020-21

(Rs. in million)

PSDP					
Sr. No	Title	Allocation 2020-21	Expenditure 2020-21	Duration (Years)	Progress
1	Improved Land and Water Conservation Practices to Enhance Wasteland Productivity in Thal Desert	11.473	11.469	4	Successfully Completed
Major Activities/Outcomes					
<ul style="list-style-type: none"> • Installed four solar powered drip and sprinkler irrigation systems at Noorpur Thal, district Khushab and Dulewala and Mankera, district Bhakkar. • Provided vegetative cover at four sites of indigenous Khagal plants (10,925 plants) to control the issue of wind erosion and sand dune stabilization. 					
2	Trans-boundary effects on Ground and Surface Waters along Eastern Border of Pakistan	8.610	8.410	4	Successfully Completed
Major Activities/Outcomes					
<ul style="list-style-type: none"> • Established groundwater assessment gadgets and data collection for water-table depth and groundwater sampling. • Monitored and evaluated trans-boundary groundwater behavior along with water quality from water-table observation points (850 Nos.) in the project area. 					

Regular Research Studies		
S. No.	Title	Duration (Years)
1.	Assessment of groundwater potential in Pind Dadan Khan	1
Major Activities/Outcomes		
<ul style="list-style-type: none"> • Shallow and small fresh groundwater pocket exists near Jalalpur village, whereas the groundwater of the remaining Tehsil is highly saline and unfit for drinking. • Recommended maximum groundwater drilling depth is 50 m (150 ft) close to the River Jhelum starting from Jalalpur Sharif to Dhariaal Jaalib. 		
2.	Evaluation of Water Productivity of Wheat, Maize & Rice Crops on Bed plantation.	5
Major Activities/Outcomes		
<ul style="list-style-type: none"> • Determined conservation potential of raised bed planting and conventional (flood) irrigation method. • Evaluated cost benefit ratio of bed plantation against flood irrigation method. 		

3.	Water Requirement in Wheat-Rice-Maize Cropping System	3
Major Activities/Outcomes		
<ul style="list-style-type: none"> Determined the crop coefficient (Kc) and water requirement of rice, maize and wheat cropping system in Central Punjab. 		
4.	Determination of Consumptive Use of Water for Cotton and Wheat Crops under Different Water table Depths	3
Major Activities/Outcomes		
<ul style="list-style-type: none"> Determined the consumptive use of water for Cotton and Wheat under different water table depths in the Lower Indus Basin. Assessed the soil salinity appraisal pre-sowing and after harvesting of the crops under different water table depths. 		
5.	Evaluation of Sprinkler and Conventional Irrigation Systems on the Yield and Water Use Efficiency of Chickpeas and Sesame Crops	3
Major Activities/Outcomes		
<ul style="list-style-type: none"> Determined the yield parameters, water saving and water productivity of chickpeas and sesame crops under sprinkler and conventional irrigation systems. Evaluated the impact of sprinkler and conventional irrigation systems on pre and post soil salinity status. 		

Collaborative Research Projects/Studies		
S. No.	Title	Duration (Years)
1.	Rainwater Harvesting to Improve Groundwater Storage and Quality in Saline and Water Scarce Environment	1
Major Activities/Outcomes		
<ul style="list-style-type: none"> Developed rainwater harvesting techniques on pilot scale for beneficial use and disaster risk reduction. Demonstrated prospects of saline agriculture to provide agriculture livelihood opportunities for the local community. Developed guidelines and adoption strategy for large scale implementations of groundwater recharge activities in critical areas of the province. 		
2.	Improving Groundwater Management to Enhance Agriculture and Farming Livelihoods in Pakistan	4
Major Activities/Outcomes		
<ul style="list-style-type: none"> Introduced tools and approaches for increasing farmers' irrigation management skills and hence their livelihoods, on small and medium sized irrigation farms. 		
3.	Developing Approaches to Enhance Farmer Water Management Skills in Balochistan, Punjab and Sindh	4
Major Activities/Outcomes		
<ul style="list-style-type: none"> Developed efficient practices and approaches for groundwater management by designing groundwater models in Balochistan, Punjab and Sindh. 		
4.	Development of an inventory of Karez water system and preparation of dossier for the inscription of the Karez on the UNESCO World Heritage List	1
Major Activities/Outcomes		
<ul style="list-style-type: none"> Developed Inventory of Karez of Balochistan and conducted cultural mapping of Karez System Landscape located in Ziarat, Pishin and Quetta Districts. Developed implementation guidelines for Integrated Water Resources Management (IWRM) for Pakistan. 		

5.	Sustainable Management of Groundwater at FFL Tube Well Site-Ahmedpur Lamma	1
Major Activities/Outcomes		
<ul style="list-style-type: none"> • Evaluated water quality and water table depth status of tubewells of FFL. • Recommended best fit water sources, at plant site, based on the results of Electrical Resistivity Survey. 		
6.	Groundwater Investigation and Mapping in Sindh	1
Major Activities/Outcomes		
<ul style="list-style-type: none"> • Conducted 50 electric resistivity survey probes in Akram Wah canal command area covering districts of Badin and in Phuleli Wah canal command area covering district of Tando Muhammad Khan. • Completed depth to water table (DTW) measurement at 300 sites. • Completed water quality sampling at 313 sites. 		
7.	Rainwater Harvesting for Groundwater Recharge in ICT Region	2
Major Activities/Outcomes		
<ul style="list-style-type: none"> • Conducted 04 electrical resistivity survey probes in Kachnar Park and sector I-10. • Carried out topographic survey of 02 locations for the identification of feasible site pertaining to rainwater harvesting for groundwater recharge in Islamabad. 		

Approved Projects

(Rs. in million)

Name of Project	Location	Approval Forum/Date	Total Cost	Duration (Years)
Rehabilitation and Conservation of Karezes for Sustainable Groundwater Management and Livelihood Improvements in Balochistan	Killa Saifullah, Pishin and Mastung (Balochistan)	DDWP/ 11-05-2020	42.000	3

Projects Submitted to MoST

Sr. No.	Proposed Schemes	Duration (Years)
1	Country-wide Wastewater Profiling for Sustainable Recycling	3
2	Awareness for Diffusion and Adoption of Water Conservation Technologies and Practices	3
3	Water Management through different Reclamation Approaches in Low Lying Areas of Sindh	3

National Institute of Electronics (NIE)

Introduction

National Institute of Electronics (NIE) is an autonomous R&D organization, under the Ministry of Science & Technology, Government of Pakistan. 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 electronic 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 electronic equipment.
- To arrange seminars & conferences.

Performance/Outcomes

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

- IoT based concept/solution for smart homes/building to minimize the risk of Pandemic transmission is in process.
- Prototype development of Flight Controller for Multirotor is in progress.
- Feasibility study & prototyping for establishment of Proficiency Testing Body in accordance with ISO-17043 standard has been completed.
- Development of Prepaid GSM based Smart Energy Meter is in process.
- Establishment of Artificial Intelligence (AI) solution for Intelligent Vehicle detection is in process.
- Design and Development of Electronic Controller for Electric Vehicles is in process.
- Designed and developed LED lights of different ratings.

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

- Advanced training on PLC, HMI & SCADA provided to 5 professionals.
- Training provided to 8 officials from public sector organization on measurement, uncertainty for implementation and maintenance of ISO/IEC-17025:2017 accreditation.
- Advance training provided to 50 students under PM Kamyab Jawan Program.
- Advanced training on Integrated Circuit (IC) design provided to 8 engineers.
- Short courses in different areas of electronics conducted for 75 students.
- Training on latest automotive diagnostics technology provided to 15 mechanics.
- General Internship/training provided to 60 engineers from different universities of Pakistan.
- 02 Industrial visits conducted for different engineering universities of Pakistan.
- 02 Final Year Projects (FYPs) of engineers from different universities are in process at NIE.

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

- Memorandum of Understanding (MoUs) signed with following universities for promotion of indigenous product development and joint R&D programs. The details are given below:
 - National University of Modern Languages (NUML), Islamabad: Memorandum of Understanding (MoUs) signed for promotion of indigenous product development and joint R&D programs.
 - Bahria University, Islamabad: To cooperate in research & development and human resource development in High-Tech areas of Electrical/Electronics and computer engineering.

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

- A total number of 900 Printed Circuit Boards developed for following universities and R&D organizations:
 - NESCOM, Islamabad
 - AWC, NDC etc.
 - Pakistan Ordnance Factory
 - Pakistan Army, Pakistan Navy & Pakistan Air force
 - 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
 - Naval Precision Electronics Complex (NPEC), Karachi
 - POULTA Inc., Karachi
 - CARE, Islamabad
- Fabrication services provided to students and faculty members of different engineering universities.
- Quality Testing & Certification Services
The quality testing and calibration services (more than 100) have been provided to following customers:
 - Institute of Space Technology (IST), Islamabad
 - PTCL, Islamabad
 - Nerus Telecom Network Services
 - Shifa International, Islamabad
 - Kulsum International Hospital, Islamabad
 - NEXUM Telecom
 - Rawalpindi Development Authority, Rawalpindi
 - Pakistan Atomic Energy Commission
 - Techmens Switch Gear Service, Islamabad
 - Garrison Engineering (Army), Jehlum Cantt
- Surface Mount Technology Services
SMT Assembly and rework services provided to following customers:
 - RapiDev, Islamabad
 - AMTC Pvt. Ltd., Lahore
 - Akbar Associates Pvt. Ltd., Islamabad
 - Prototype jobs completed for students of NUST, IST & NIC.

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

- Conference on emerging technologies in IoT, Semiconductor and Nano technologies, testing and calibration was conducted on 8th June, 2021.

Budget Allocation for R&D during F/Y 2020-21

A total of Rs. 10 Million was allocated for Research and Development work during financial year 2020-21. NIE started different projects related to defence, commercial and Human Resources Development. Work on new technologies was initiated i.e. Design and development of IoT based smart home solutions, Development of prepaid energy meter, Artificial Intelligence (AI) based vehicle detection and electronic controller for electric vehicles.

Furthermore, NIE has also provided training to professionals and engineers in advanced fields like automation & control engineering, ISO standards, integrated circuit design and different courses in electronics.

Pakistan National Accreditation Council (PNAC)

Introduction

Pakistan National Accreditation Council (PNAC) was established in 1998 under the administrative control of Ministry of Science & Technology with a mandate to accredit laboratories (testing/calibration/medical), Inspection Bodies (IBs), Certification Bodies (CBs) and Halal Certification Bodies (HCBs) etc. PNAC has established, maintained and implemented quality management system based on ISO/IEC 17011-General requirements for accreditation bodies accrediting Conformity Assessment Bodies (CABs).

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.

Contribution to Economic Growth

PNAC has achieved Mutual Recognition Arrangement (MRA) and Multilateral Recognition Arrangements (MLA) signatory status with the following regional and international forums and member of Halal forums:

- **International Laboratory Accreditation Cooperation (ILAC)**
www.ilac.org
- **International Accreditation Forum (IAF)**
www.iaf.nu
- **Asia Pacific Accreditation Cooperation (APAC)**
www.apac-accreditation.org
- **International Halal Accreditation Forum (IHAF)**
<http://ihaf.org.ae>
- **Standards and Metrology Institute for the Islamic Countries (SMIIC)**
<https://www.smiic.org/en>

PNAC contributes in the economic growth through accreditation. PNAC's MRA and MLA status contributes to enhance the trade of Pakistan. 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 test reports issued by Conformity Assessment Bodies (CABs) accredited by PNAC. Accreditation by PNAC facilitates to remove the technical barrier to trade with a goal of "certified once – accepted everywhere."

Board of Governors Meetings

- **3rd Meeting of Board of Governors:**

Honorable Federal Minister for Science and Technology, Chaudry Fawad Hussain chaired the Board of Governors (BoG) meeting of PNAC on 12th August, 2020. Ms. Ismat Gul Khattak, DG, PNAC briefed the Minister on performance of PNAC over the last year. Federal Minister appreciated the efforts and initiatives taken by PNAC. He also gave directives to enhance the mandate/scope of the Council keeping in view its importance at national & international level. The Federal Minister while appreciating the Council's initiatives, stressed on taking more actions for transfer of information to the end users and stakeholders.

- **4th Meeting of Board of Governors:**

Honorable Federal Minister for Science and Technology, Mr. Shibli Faraz chaired the Board of Governors (BoG) meeting of PNAC on 10th June, 2021. Ms. Ismat Gul Khattak, DG, PNAC briefed the Minister on performance of PNAC over the last year. Federal Minister appreciated the efforts and initiatives taken by PNAC.

Launching of a new Scheme for Medical Devices

PNAC has launched a new scheme for medical devices. This new scheme (ISO 13485:2016) specifies requirements for a quality management system where an organization needs to demonstrate its ability to provide medical devices and related services that consistently meet customer and applicable regulatory requirements.

Accredited Conformity Assessment Bodies (2020-21)

Accreditation Schemes	2020-21
ISO/IEC 17025:2017 (General requirements for the competence of testing and calibration laboratories)	192
ISO/IEC 17020:2012 (Conformity assessment -- Requirements for the operation of various types of bodies performing inspection)	11
ISO/IEC 17021-1:2015 (Conformity assessment -- Requirements for bodies providing audit and certification of management systems -- Part 1: Requirements)	07
ISO 15189:2012 (Medical laboratories -- Requirements for quality and competence)	13
PS: 4992 Pakistan Standard Halal Certification Bodies	08
SO/IEC 17043:2010 (Conformity assessment — General requirements for proficiency testing)	04
ISO/IEC 17065:2012 (Conformity assessment -- Requirements for bodies certifying products, processes and services)	01
ISO/IEC 17024:2012 (Conformity assessment -- General requirements for bodies operating certification of persons)	01

World Accreditation Day

PNAC celebrated the World Accreditation Day on 9th June, 2021 and organized a seminar at Legend Hotel, Islamabad. The theme of the seminar was “Accreditation, Supporting the Implementation of the Sustainable Development Goals (SDGs)”. This seminar also highlighted the role of PNAC, need and importance of Accreditation for Pakistan Economy to achieve the Sustainable Development Goals (SDGs).

The seminar was conducted in two sessions. The inaugural session started with the recitation of Holy Quran followed by the National Anthem. 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 supporting the Sustainable Development Goals (SDGs). The Guest of Honor, Federal Secretary for Science and Technology, Mr. Nadeem Irshad Kiyani emphasized on the awareness of accreditation. The Honorable Chief Guest, Federal Minister for Science and Technology, Mr. Shibli Faraz appreciated PNAC for its work towards Accreditation and highlighted its importance to achieve a sustainable and quality lifestyle.



PSDP Projects by PNAC

The following two PSDP projects were successfully completed on 30th June, 2021:

- **Halal Accreditation**

Background: Halal sector is a vast market of over a Billion consumers all over the world and demand for certified halal products is increasing as there is a dire need for the manufacturers/producers to get

their products certified from a source which has competency and credibility. Accreditation of Halal Certifiers is the vital source that provides recognition to the Halal Certifiers at national and international level.

PNAC is the first Accreditation Body in the World that launched Halal Accreditation Scheme in 2012. Consequently, certificates/reports issued by the accredited Conformity Bodies are being accepted around the globe. PNAC is Member of the Board of Directors of International Halal Accreditation Forum (IHAF) and also member of the Standards and Metrology Institute for Islamic Countries (SMIIC).

Objectives: The objective of this project is to:

- Create awareness in Pakistani manufacturers, exporters and traders regarding the Halal Accreditation through workshops & training sessions.
- Train lead assessors, technical assessors/experts & trainers for harmonizing the Halal Accreditation system in PNAC.
- Educate Pakistani manufacturers, exporters and traders through Halal Compliance Training sessions, as per international Halal standards to fetch higher export price.
- Promote Halal Accreditation credibility in the national and international market as the symbol of best quality through participation in national and international seminars, workshops, symposium etc. to get the due share from global halal market.

Benefits of Halal Accreditation from PNAC: Halal accreditation plays a pivotal role in the prosperity of the country through credible trade along with the following benefits:

- Facilitates WTO agreements for TBT and SPS.
- The regulatory bodies to be facilitated for maintaining security, health, safety, environment, and other requirements for Halal products.
- Assurance that Halal Certification Bodies consistently follow the applicable standards through regular surveillance; means continuous improvement in the operation of HCBs.
- Build confidence of the consumer by ensuring consistent standards in the quality of Halal product or service certified by an accredited HCB.
- Build confidence of the exporter that whatever is being exported actually conforms to the International requirements.
- Promotes Halal as a quality slogan to provide opportunities for business and export in the global Halal market.
- Enhance the credibility of the companies and enterprises that are certified by accredited HCBs.
- Industries are facilitated by providing a competitive advantage and access to export markets with the aim of one standard, one certificate, accepted everywhere over the globe.

Cumulative Achievement:

Awareness and Training through Halal Accreditation Project

Halal Accreditation		
1.	One day awareness seminar on Halal Accreditation and Certification in collaboration with AJ&K Chamber of Commerce & Industries, Muzaffarabad	19 th August, 2020
2.	Halal awareness seminar/Media campaign in collaboration with Federation of Pakistan Chamber of Commerce & Industries (FPCCI), Islamabad	9 th September, 2020
3.	One day awareness seminar on Halal Certification and Accreditation system in collaboration with Federation of Pakistan Chamber of Commerce & Industries (FPCCI), Peshawar and PCSIR	22 nd September, 2020
4.	One day awareness seminar in Karachi in collaboration with Karachi Chamber of Commerce & Industries	3 rd November, 2020
5.	Halal awareness seminar in Karachi in collaboration with Trade Development Authority of Pakistan	4 th November, 2020
6.	Halal awareness seminar in Bahawalpur in collaboration with Bahawalpur Chamber of Commerce & Industries	11 th November, 2020
7.	One day awareness seminar in Multan in collaboration with Multan Chamber of Commerce & Industries	12 th November, 2020

8.	Media awareness Seminar/Media campaign on Halal accreditation and certification in Islamabad Hill View Hotel	17 th December, 2020
9.	One day awareness seminar in Hyderabad in collaboration with Chamber of Commerce & Industries	12 th January, 2021
10.	Halal awareness campaign in Sukkur in collaboration with Sukkur Chamber of Commerce & Industries	14 th January, 2021
11.	One day seminar on Halal Accreditation and Certification in collaboration with Punjab Food Authority (PFA), Faisalabad	21 st January, 2021
12.	5 days assessor training course in Islamabad on ISO/IEC 17020	08 th to 12 th February, 2021
13.	5 days assessor training course in Islamabad on ISO/IEC 17025	15 th to 19 th February, 2021
14.	Media Campaign on Halal Accreditation & Certification at Press Club, Lahore	17 th March, 2021

- **Pakistan National Hospital and Healthcare Accreditation (PNHHA)**

Many international hospitals prioritize obtaining of Joint Commission International (JCI) accreditation or any internationally recognized accreditation as a way to attract foreign patients. Standards, as a result, are rising. In Pakistan, the Hospital services which are provided to the common people are unfortunately of extremely low standard. Due to poor quality of health facilities, this project will contribute to enhance the health facilities and overall socio-economic activities that will uplift the living condition of the common man.

Main Objectives:

- To create awareness among the Health Administrators/Professionals & Consumers of health services about the benefit of adopting quality standards in healthcare (8 healthcare centers/hospitals, two from each province).
- To encourage all stakeholders for a quality awareness campaign amongst consumers through publication of material, articles and holding of seminars/workshops etc.
- To launch a publicity campaign in print and electronic media.
- To train lead assessors, technical assessors/experts & decision makers to exchange experiences for harmonizing the hospital accreditation procedures.
- To study different accreditation bodies' procedures which award accreditation to the hospitals.

Socio-Economic Benefits:

- The credibility of hospitals adds benefit both to the patients and the doctors & also contributes immensely towards improvement of overall health care delivery system.
- The Hospital accreditation will help the planners to promote, implement, monitor and evaluate healthy practice in order to ensure that it occupies a central place in the development of the health care system.
- Quality should be an integral part of the overall national health policy.
- It will have a significant impact on improving quality and safety in health care; improving health outcomes and ensure more equitable health service provision.
- Application of quality health standards will have positive environmental prospects.

Awareness Training sessions conducted by PNHHA in 2020-21

S. No.	Activity	Date
1.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at ULTH, Lahore.	20 th July, 2020
2.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at MDMI, Muzaffarabad.	19 th August, 2020
3.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at MASH, Multan.	08 th September, 2020
4.	05 Days Assessor Training Course on ISO-15189 at Islamabad.	14 th September, 2020
5.	Seminar on the importance of Accreditation of Medical	25 th September, 2020

	Labs and Healthcare facilities at MTI Bacha Khan Medical College, Mardan.	
6.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at AKHS, Gilgit.	27 th October, 2020
7.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at AKHS, Hunza.	29 th October, 2020
8.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at CMC, Larkana.	18 th November, 2020
9.	Seminar on the importance of Accreditation of Medical Labs and Healthcare facilities at GMC, Sukkur.	19 th November, 2020
10.	05 Days Assessor Training Course ISO-15189 at Karachi	4 th to 8 th January, 2021

Activities with International Bodies

- **Meeting with ISEG Halal, Arab Republic of Egypt:** Honorable Mr. Wael Hanna, President of ISEG Halal, Arab Republic of Egypt, with his team, visited PNAC, Islamabad on 1st March, 2021. President of ISEG Halal briefed the participants of the meeting that ISEG Halal is the only entity exclusively authorized by the Government of Egypt to certify Halal exports worldwide.
- **Memorandum of Understanding with Turkish Halal Accreditation Agency (HAK):** Memorandum of Understanding (MoU) between Pakistan National Accreditation Council (PNAC) and Halal Accreditation Agency of the Republic of Turkey (HAK) was signed in February, 2020 as per the Joint Working Group (JWG) on Trade and Investment under 6th High Level Strategic Cooperation Council (HLSCC).

In order to progress further on the implementation of the MoU, a remote meeting was conducted between the following representatives of Turkish Halal Accreditation Agency (HAK) and Pakistan National Accreditation Council (PNAC) on 2nd March, 2021.

HAK Representatives		PNAC Representatives	
1.	Mr. Zafer SOYLU Chairman BoD-HAK	1.	Ms. Ismat Gul Khattak Director General-PNAC
2.	Mr. Musa MALKOÇ Acting General Secretary	2.	Mr. Muhammad Suleiman Director
3.	Mr. Taylan Coban Head of Department of International Affairs	3.	Mr. Azhar Iqbal Director
4.	Mr. Erdem Basdemiric Department of Halal Accreditation	4.	Mr. Nisar Ali Khan Deputy Director
	And Team		And Team

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. STCC generates revenues through its commercial activities and no development or non-development budgetary allocations are made to STCC in the Federal Government budget.

Functions

Following are the core functions of STCC 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

STCC is a Federal Government entity working under administrative control of Ministry of Science and Technology. STCC 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, STCC carried out the following activities:

- In order to fulfill nationally important mandate of Technology Commercialization in line with Government strategy and national aspirations of reducing foreign dependencies and to create enabling environment/technology infrastructure in the country, that would make commercialization of indigenous technologies possible, following platforms are created for the first time, at STCC. These platforms will not only promote promising technologies, products or processes but will also help encourage private sector investment in the innovation and technology domains:
 - Public Call
 - Technology Commercialization Help Desk (TCHD)
 - Technology Audit
 - Technology Commercialization Exhibition
- STCC has shifted its focus on seven technology domains, having massive potential, for commercialization i.e. 1. Health sector 2. Agriculture 3. Renewable Energy, Energy Efficient

Products 4. Environment Technologies and Sustainable Development 5. Manufacturing 6. Industrial and Urban Development 7. Construction. Portfolio of STCC was also upgraded. New list of technology proposals consists of technologies, products and processes having strong market viability, market competitive edge and sizeable demand.

- STCC. in line with its efforts to create the much needed enabling environment in the country to commercialize technologies, made its first attempt and published first public call for proposals in the domains like Health Sector (particularly relating to COVID-19), Agriculture, Renewable Energy (energy efficient products), Environment technologies and Sustainable development, Manufacturing, Industrial and Urban Development, Construction etc.
- During 2020-21, STCC conducted a vast outreach to 40 R&D and engineering based universities along with those having business incubators across Pakistan. Letters were sent to call upon interest in four priority domains of Precision Agriculture, Manufacturing, Renewable Energy and Health, with the main focus on economic and environmental sustainability. STCC has mostly received technologies from academia, specifically under the domains of Precision Agriculture, Chemical and Electronics. STCC further enhanced cooperation with the prospective R&D academia, already on-board with STCC, to commercialize their indigenous products/technologies/services to the industry. Further interactions are underway.
- With recent changes and expansion of STCC's operations beyond MoST R&D organizations and addition of new commercialization platforms like public call and exhibition, STCC has revamped its website. The new website reflects STCC's new strategic direction and is well equipped with all the necessary tools for easy access to commercialization department. The main focus of new website is the Technology Profile section; through which any individual, university, R&D organization or industry can submit their proposals regarding any emerging technology to STCC in PDF, image and video formats.

Pakistan Standards and Quality Control Authority (PSQCA)

Introduction

The PSQCA Act, 1996, 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. 06, 12 and 15 of Part II of the Constitution of Islamic Republic of Pakistan, 1973.

PSQCA is a self-financed organization and 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 plays an important role in removing technical barriers to trade through standardization, certification and testing. PSQCA has 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 countries 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 Electro-technical Committee (IEC), International Organization for Legal Metrology (OIML), Standards and Metrology Institute for Islamic Countries (SMIIC) and South Asian Regional Standards Organization (SARSO). PSQCA takes part in policy and technical activities in these international and regional standards organizations.

Objectives

- Framing, publication, amending, revising or withdrawal of Pakistan Standard in relation to any article, product, process.
- Certification of mandatory articles, products and processes under Certification Marks Scheme of PSQCA as per national and international standards and to stop manufacturing, storage and sale of such products which do not conform to the Pakistan or any other country's standards recognized by the authority.
- Inspection and testing of products and services for their quality, specification and characteristics, during use and for import and export purpose.
- Registration of inspection agencies.
- Coordination and cooperation with other national, regional and international organizations in the area of standard development, technical regulations, conformity assessment procedure, information exchange and technical assistance.
- Facilitate the trade as National Enquiry Point (NEP) to minimize or remove Technical Barrier to Trade (WTO).

Brief about Standards Development Centre (SDC)/Conformity Assessment (C.A)

After establishment of PSQCA, 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) have been enhanced in major industrial cities throughout the Pakistan to facilitate the industry.

Pakistan Conformity Assessment Rules, 2011 were formulated based on ISO-17065 and ISO-17067 Standards. Directorate of Conformity Assessment (C.A) is 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 level.

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–TBT 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 portal.

Schemes for Conformity Assessment

- **Certification Marks (CM) License Scheme** is offered for the local manufacturers of mandatory products. In this scheme, local manufacturers get the license for their products notified by the Federal Government as Technical Regulations.
- **Voluntary Conformity Assessment (VCA) license scheme** is offered for the local manufacturers of non-mandatory products. In this scheme, local manufacturers get the license for their non-mandatory products against Pakistan Standard to gain the confidence of consumer on the quality of their products.

Directorate of Conformity Assessment, PSQCA

- Detail of activities carried out in the Directorate:

S. No.	Title	Achievement July, 2020 to June, 2021
01	Applications received	1,258
	New	917
	Renewal	1,561
02	Total Licenses Issued	1,077
	New	706
	Renewal	1,529
03	Quality Assurance Activities	
a	Inspections	5,393
b	Samples Collected	8,684
c	Test Reports Received	7,007
d	Conformity Test Reports	6,722
e	Non-Conformity Test Reports	285

- During the current year, the online registration of Certification Marks was introduced all over Pakistan.

Directorate of Import & Export, PSQCA

- The progress of the Directorate of Import & Export for the year 2020-21 is as under:
 - In compliance with Government’s vision for providing facilitation to the business community under National Single Window Program, online application processing system has been developed.
 - Established web-based/online test report system with QCC, Karachi and all outsourced laboratories i.e. NED University, Karachi, Intertek Pakistan (Pvt.) Ltd., PCSIR, Karachi Shipyard & Engg. Works for incorporation of CAR/NCR and ultimate benefits/facilitation of clients by minimizing the time requirements to facilitate the trade.
 - 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 31st December, 2020, after detailed deliberation and consultation with Ministry of Commerce, FBR and consultant hired by Pakistan Customs.

- Directorate of Import & Export has submitted the request to PNAC for accreditation as Inspection Body as per ISO/IEC 17020.
- Introduced E-reporting system along with coding system for sampling to ensure transparency by minimizing the human interaction and time duration to benefit the business community.
- No. of Cases Processed: 14,982
- No. of CAR issued: 14,846
- No. of NOC/RC issued: 1,357
- No. of Samples sent to Labs.: 15,992

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:
 - Agriculture and Food
 - Automobile
 - Civil
 - Chemical
 - Electro-technical
 - Electronics
 - Halal
 - 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	=	16,507
Developed National Standards	=	7,248
Total Technical Committees	=	144
No. of National Standards Committees	=	12
Total No of Standards Developed/Adopted	=	23,755

 - More than 600 Food Standards have been harmonized with Provincial Food Authorities including 43 mandatory items by resolving the conflict between PSQCA and Provincial Authorities, under the directions of CCI.

Standards Development Works (Progress 2020-21)

S. No.	Division	Automobile	Civil	Electrical	Electronics	IT & ICT	Mechanical	Agri & Food	Chemical	Halaal	Management Standards System	Textile	Weights & Measure	Grand Total																					
	Activities	1	2	3	4	5	6	7	8	9	10	11	12																						
1	Technical Committee (TC) meetings held	10	13	19	14	15	07	19	07	14	50	04	11	183																					
2	National Standards Committee (NSC) meetings held	13	01	02	01	01	00	02	03	02	01	00	01	27																					
3	Participation in balloting of ISO/IEC	00	82	950	835	02	02	101	600	03	65	230	00	2868																					
4	No. of draft standards finalized in TCs (Revised/ Direct Adopted/New)	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	330			
		00	01	00	18	00	09	06	26	02	02	32	00	01	14	00	01	14	06	76	45	00	05	07	14	02	01	02	00	18	00		00	08	00
5	No. of draft standards approved in NSC	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	Rev	DA	New	347			
		00	01	00	20	65	09	06	26	02	03	25	00	00	15	00	00	15	00	76	45	00	10	06	10	02	01	02	00	00	12		00	00	00

Note:

Rev= Revision, DA= Direct Adopted

Directorate of Quality Control Centre, PSQCA

- Quality Control Centre (North), PSQCA, Lahore, formerly Central Testing Laboratories (CTL), Lahore, was established in 1959 under the administrative control of Ministry of Industries and Natural Resources (Industries Wing), Government of Pakistan initially for testing of pulleys and thereafter for the testing of samples received by the Supply Wing to ensure that they conform to specifications or standard samples offered by tenderers against Government orders.
- Later-on, its scope of activities was enhanced to cater the need of industrial products with reference to standard specifications on subsidized rates as a service organization and Central Testing Labs. (CTL), Pakistan Standards Institution (PSI) and Metal Industries Research and Development Centre (MIRDC) were merged as QCC under PSQCA.
- **Responsibility of QCC-Directorate:**
 - Quality Control Centre (North), PSQCA, Lahore undertakes testing of industrial raw material, finished products and imported items to establish their quality/grade with respect to National as well as International Standards (i.e. PSS/IEC, BSS, ASTM, ISO etc.) according to recommended guidelines in the field of Chemical, Microbiology, Physical & Engineering (Electrical, Mechanical, Gas/Home Appliances), Building Material and Textile etc.
 - Provision of quality testing services to customers to meet their technical requirements.
 - Provision of quality assurance services to customers according to the standard methods.
 - Enforcement of Compulsory Certification Marks Scheme of PSQCA through testing of Mandatory Items (domestic or foreign).
- **Services Provided to Major Sectors/Organizations/Projects:**
 - QCC (North), PSQCA, Lahore provided testing services to various on-going projects of Federal Government as well as Provincial Governments with reference to accomplishment of their targets related to quality of material being used in these projects. Some of these Projects are as under:
 - CPEC Related Projects.
 - Defense Organization (POF).
 - Defense Housing Authority (DHA).
 - National Engineering Services of Pakistan (NESPAK).
 - Development of Phase-II, New Lahore City Project.
 - Urban Rehabilitation and Infrastructure Improvement Project.
 - WASA/LDA Development Projects.
 - Punjab Police Department.
 - Public Health Engineering Department.
 - HKB Industries.
 - Longman Rubber Industries.
- **Achievements for the Year 2020-21**
 - QCC (North), PSQCA, Lahore created testing facility for Hand Sanitizer during Covid-19 Pandemic and assisted the relevant authorities in eradicating the sub-standard sanitizers from the local market.
 - QCC (North), PSQCA Lahore established the testing facilities for the following newly added items in the list of mandatory items:
 - Shaving Cream
 - Skin Powder
 - Hair Cream
 - Chemical Admixture for Concrete
 - Coffee and its Preparation
 - Fruit Juices & Nectars
 - Olive/Virgin/Refined Olive Pomace Oil
 - Passenger Car Tyres and Rims Part 1 (Tyres)
 - Rubber Tyres for Bicycles
 - Sanitary Taps
 - Buried Polyethylene (PE) Pipes
 - Polyethylene up-right Storage Tanks
 - Coaxial Communication Cables
 - Spectacle Frames
 - Switches for Household and Similar Fixed Electrical Installations
 - Secondary Cells and Batteries
 - Cloth Washing Machine for Household Use
 - Multiple Split-System Air-Conditioners and Air to Air Heat Pumps

- Electric Irons
 - Household Microwave Ovens
 - Plugs and Socket Outlets
- Achievements of QCC (North), PSQCA Lahore in terms of number of samples tested and revenue generated during 2020-21:

Year	Activity	Achievements
2020-2021	Samples Received	6165 Nos.
	Samples Tested	6165 Nos.

Quality Control Centre (South), PSQCA, Karachi

- **Objectives & Functions**
 - Provision of quality testing services to 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 Laboratories for more transparent and reliable data being produced by these Labs.
- **Achievements/Progress**
 - New testing facilities established for newly added Products.
 - Trainings conducted on ISO-17025 2017 revised standards.
 - Participated and qualified International Proficiency Test for seven Labs and achieved excellent score “Z”.
 - Provided Internship Training to 45 Students of different universities, like NED, Jinnah and Karachi University.
- Applied for Accreditation of following Seven labs of QCC PSQCA, Karachi
 - Food Lab
 - Building Material Laboratory
 - Microbiology Laboratory
 - Food Microbiology
 - Oil & Fat
 - Sugar Testing Laboratory
 - Water & Beverages Laboratory

Period	No of Samples tested
July, 2020 to June, 2021	18,794

Directorate of Technical Service Centre, PSQCA

- Technical Services Center was initiated as a project named “Metals Advisory Service” in 1975 with the assistance of UNIDO under United Nations Development Program (UNDP) and renamed as “Metal Industry Research and Development Centre” (MIRDC) through a Gazette Notification dated: 14.10.1982. MIRDC was again renamed as Technical Service Centre (TSC) as a component organization of Pakistan Standards & Quality Control Authority (PSQCA) through an Act passed by parliament and Gazette notified on 17th March, 1996. Since its initiation, this organization is making useful contribution to assist the Metallurgical and Engineering Industry of Pakistan by providing quality control and quality assurance service by solving their technical problems, increasing and improving productivity through transfer of technology, decreasing the wastes and to save valuable hard-earned currency (foreign exchange) through indigenous development of various Engineering components.
- **Achievements**

The testing services at TSC result from a unique combination of highly qualified/skilled human resource, ISO/IEC-17025 Accredited labs/Tests, Top class Calibrated equipment, International standards and test methods. The tests/testing services include (but not limited to):

 - Well maintained and continuous accreditation status from PNAC since 2015.
 - Testing of deformed & Plain Steel Bars for concrete reinforcement (PS: 1879:2018).
 - Testing of Weld-able Steel for reinforcement of concrete (PS: 231:1962).
 - Testing of Mild Steel bars for Structural steel (PS: 1612:2014).
 - Testing of Carbon Structural Steel (PS: 4798:2002).
 - Testing of Steel Ingots & Billets (PS: 2337:2015).

- Testing of Steel Wire Rods (PS: 16124:2015).
- Testing of Stainless-Steel Sheets (PS: 16143:2015).
- Testing of Two Wheelers (PS: 4707:2010).
- Testing of Three Wheelers (PS: 4708:2010).
- Testing of Single & Twin Blade Plastic Bonded Disposable Razors (2002:2017).
- Testing of Safety Razor Blades, Double Edge (219:1993)
- Testing of engineering parts, material and products.
- Technical evaluations of the engineering components.
- Tin Coating determination on Oil & Ghee containers.
- Testing of Hand Sanitizer (PS: 5453:2020).
- Testing of heavy metals in oil & ghee (PS: 221:2010).
- Testing of heavy metals in skin & beauty creams (PS: 3228:2017).
- Testing of heavy metals in Hair dyes & hair shampoo (PS: 5250:2013).
- Testing of Soap (PS: 13:2018).
- Provided training in the field of standardization and conformity assessment in metal and its allied industry.
- Provided internship to university students in the field of metallurgy & quality.
- Participated in technical forums and discussions as per requirement of the authority.
- Provided material evaluation services to the leading governmental organizations like Sui Gas, WAPDA, NTDC, NESPAK, WASA, LDA, Irrigation Department, Pakistan Army, Pakistan Railways, Descon etc.
- Provided In-Situ Replica Metallography & failure investigation services to the leading private sectors like Fertilizer Plants, Power Plants, Cement Industry, Agriculture Industry & Process Industry etc.

• **Jobs during 2020-21**

Number of Jobs conducted (Division wise)	Metallurgical Engg. Div. =1,563 Service Div. =1,512 Metal Working & Auto Div.=285 Total No. of Jobs =3,360
Number of Jobs received form PSQCA (The Jobs received from CA-Lahore zones & QCC against Book adjustment)	774
Number of Samples received from market	2,586
More than 80% of Technical Jobs conducted are of evaluation of Engineering item	
No. of trainings and internships provided	Provided 15 internships to Universities' students & conducted 87-Technical awareness training sessions for students of Industrial Technical Institute.

Legal Directorate

- The Legal Directorate is a sub-department of PSQCA which performs the following functions:
 - To address the Legal issues of the Authority.
 - 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 etc.
 - To ensure active presence in Courts 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 task assigned by the DG, PSQCA.

- **Achievements**
 - 4 cases of Cement Industry were pending before District & Session Judge, Lahore High Court & Honorable Supreme Court of Pakistan at Lahore Registry since 2008. The cases were fixed on 19th August, 2020 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 the following 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 and matter was finalized in the light of Court Order and personal hearing of Cement Industries.
 - 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 successfully settled it through Sindh High Court vide order dated: 17th March, 2021 with direction to Civil Nazir to release the amount of marking fees to PSQCA account deposited by the manufacturer (M/s Tapal Tea).
 - In compliance of Honorable Court directives, Civil Nazir has released the deposited amount as marking fee. Hence, Rs. 223,091,302/- have been recovered from M/s Tapal Tea (Pvt.) Ltd. and deposited in Government Treasury/PSQCA Account.
 - 74 cases including Food & Non-Food cases have been disposed-off.
 - The CCI has issued the following decision which gives certain powers to PSQCA being a Federal Entity:

“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 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.
- 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 member states 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 depends on concern Ministry/Department’s reply)
 - Collection of Technical Regulations of other members of WTO and dissemination 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 complete documents.

- Providing full text Standards, Conformity Assessment and Technical Regulations related to stakeholders on request:
 - In Original Language.
 - Translate in English Language.
(If provided by member 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 of TBT Notifications among the stakeholders for their review and comments.
 - Collection of Federal/Provincial Technical Regulations and placing them in WTO section of PSQCA's website.
 - Facilitation of the Federal/Provincial chambers, trade promotion organizations, trade associations etc.
 - Provision of information to Industries and Academia regarding technical regulations in compliance of WTO-TBT Agreement.
 - Reply to all enquiries raised by member states of WTO regarding Standards, Conformity Assessment Procedures and Technical Regulations.

- **Achievements**

S #	Activities	Achievements 2020-21
01.	Updation of website portal on WTO-TBT National Enquiry Point-PSQCA in compliance of TBT agreement.	100% for correspondence period
02.	Updation of the information of WTO-TBT National Enquiry Point to Incharge KPK, PSQCA regularly.	100% for correspondence period
03.	Collection of Standardization work programme and placing it 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.	1545
05.	Circulation of TBT Notifications issued by the WTO member countries among the stakeholders.	1545
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.	57
08.	Handling of enquiries (International) on technical regulations, standards and conformity assessment procedures.	14

Directorate of International Affairs and Training (IATR)

- **PSQCA Regional Memberships**
 - SMIIC (The Standards and Metrology Institute for the Islamic Countries):
 - PSQCA – Pakistan nominated as member of SMIIC BoD for the term 2022-2024.
 - PSQCA – Pakistan successfully won the election to be member of SMIIC SMC for the term 2022-2024.
 - South Asian Regional Standards Organization (SARSO): PSQCA is the chairman of SARSO Governing Board (GB) for the term 2021-2023.
- **Participation in International Standardization Activities and Workshops/Meetings (Virtually)**

S. No.	Title of Training/Workshop/Meetings	Dates
1.	21 st SMIIC Board of Directors Meeting	1 st June, 2021
2.	UN-International Trade Centre Geneva (UN-ITC) and Revenue Mobilization Trade Facilitation (ReMIT) organized a workshop for Standards Developers on the export Sectors i.e. Fruits, Vegetables, Meat and Poultry	7–14 th June, 2021

S. No.	Title of Training/Workshop/Meetings	Dates
3.	First Meeting of BCA, SARSO	23-24 th June, 2021
4.	2 nd Virtual Training Program on Low Carbon Development and New Energy Vehicles.	29-30 th June, 2021
5.	Emergency Meeting of Governing Board of SARSO	11 th May, 2021
6.	First Meeting of STC on Conformity Assessment, SARSO	19-20 th May, 2021
7.	Sixth meeting of STC on Building Material of SARSO.	28-29 th April, 2021
8.	CSN Sessions with PSQCA 'Standards and Trade'	3-4 th March, 2021
9.	The Commonwealth Standards Network and UK-Aid organized training course for Standards Developers and Consumers to boost their International Trade Capacities through remote training sessions	16 th March, 2021
10.	ISO virtual regional workshop on the conformity assessment activities and tools to achieve better regulatory outcomes	23 rd , 25 th and 30-31 st March, 2021
11.	15 th SMIC General Assembly meeting at Makkah Kingdom of Saudi Arabia	3 rd November, 2020
12.	Ninth Meeting of the Governing Board (GB) of SARSO.	29-30 th October, 2020
13.	Eighth Meeting of the Technical Management Board (TMB) of SARSO.	28 th October, 2020
14.	Meeting of TC-9 (Textile and Related Products) of the SMIC	15 th October, 2020.
15.	ISO General Assembly	24 th September 2020

System Certification Centre (SCC)-SDC, PSQCA, Lahore

- System Certification Center, Pakistan Standards & Quality Control Authority was established during 2007–09 under the project titled "Establishment of System Certification Center" by Ministry of Science and Technology and UNIDO–TARTA Program. The Management Systems Certification (MSCC) activity of Pakistan Standards & Quality Control Authority under the System Certification Center (SCC) consists of a series of activities aimed at assessing the capability of an organization's Management Systems such as:
 - Quality Management System – ISO 9001:2015
 - Environmental Management Systems – ISO 14001:2015
 - Occupational Health and Safety Management Systems – ISO 45001:2018
 - Food Safety Management System- ISO 22000:2018
 - Cosmetics-Good Manufacturing- ISO 22716:2007
 - Integrated Management System (combination of two or more systems)
- The PSQCA management has assigned task of SCC-PSQCA to Dr. Shahzad Afzal, Director and Engr. Khurram Mateen for the revival of System Certification System. The Documented Quality Management System was submitted to Director General in December, 2020 for necessary approval as per the requirements of PS-ISO 17021 and PNAC requirements. Finally, SCC-PSQCA, Lahore has established and implemented QMS as per PS-ISO 17021-1 at PSQCA Office, Lahore as a separate legal entity (separate block of Rooms allocated to SCC-PSQCA) in April, 2021 (after approval by the competent authority, signing of Quality Manual and other necessary documents by Director General). 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.
- **Main Function of SCC**
To provide management system certification to the local industry/importer and exporter in following areas:
 - Quality Management System – ISO 9001:2015
 - Environmental Management Systems – ISO 14001:2015
 - Occupational Health and Safety Management Systems – ISO 45001:2018
 - Food Safety Management System- ISO 22000:2018
 - Cosmetics-Good Manufacturing- ISO 22716:2007
 - Integrated Management System (combination of two or more than two systems)

- **Other functions of the SCC-PSQCA**
 - To establish an internationally recognized certification infrastructure i.e. PSQCA Certification Center and the competency to undertake certification activities for the Small and Medium-sized Enterprises (SMEs) in accordance with the applicable requirements of ISO/IEC-17021 and International Accreditation Forum guidelines.
 - SCC-PSQCA Scheme describes the general principles and policies of the PSQCA's 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.
 - 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.
 - Development of a program for training by which the evaluators could become IPC (International Personnel Certification Association) registered and qualified for leading evaluators. The PSQCA Certification center provides training courses to improve the professional skills and experience of the personnel engaged in certification activities.
 - Provision of short and long term training courses, workshops and seminars to technicians, scientists and engineers according to industrial requirement.
- **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 initiated in these areas.
 - Personal Development of Employees: Trainings are planned 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 possible time. 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 analyzed 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.
- **Achievements and Progress Report of SCC-PSQCA**
 - Invitation letters were sent to more than 500 potential clients regarding certification as per the approved scope.
 - SCC-PSQCA has received drafts of 7 applications. More than 60 potential clients are interested in integrated Quality Management System Certification.
 - SCC conducted more than 38 awareness sessions for target groups of 8 to 14 persons due to COVID-19 pandemic.
 - Awareness seminars were planned to be conducted all over Pakistan.
 - Capacity building of External Auditors was completed.
 - PSQCA has advertised to empanel external auditors/technical experts. SCC-PSQCA has received CVs of large number of external auditors. External auditors were empanelled and awareness training was given about the revised management standards by Dr. Shahzad and Engr. Khurram Mateen.
 - Target of 5 applications was assigned for System Certification and SCC-PSQCA has achieved the target and enrolled 7 applicants for system certification.
 - Document review (2 issue of documentation has been released) and management review have been conducted. SCC-PSQCA has planned to proceed Stage I and Stage II audit on already received applications. The whole process will be completed in three months.

Council for Works and Housing Research (CWHR)

Introduction

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

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

Goals and Targets

Keeping in view the quarterly targets and specified principal goals, the CWHR is taking keen interest to render standard Laboratory testing services to the construction sector of Pakistan including Academia, manufacturing sector involved in developing precast concrete product mostly used in construction of low medium to large size concrete building along with joint research efforts. At this stage, CWHR set and planned to develop R&D based building materials, building products and construction technique to construct low cost houses at rural and urban area of Pakistan. CWHR also proposed different low cost housing options to the present Government to achieve benefits from CWHR capability and the capacity as and when required basis. The Goals and Targets are specified based on R&D efforts. Principal major objectives of CWHR are outlined below:

- 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

Clear cut performance/ outcomes under FY-2020-21	Outcomes as per MTFD	Alignment of outcomes and outputs with medium term budget estimate for service delivery	Remarks
Tested Building Materials and building products developed by different manufacturers of Karachi for quality control and quality assurance and generated extra revenue through laboratory testing services for testing of Cement, Soil, Sand, Steel, Precast elements and Non-Destructive Testing at CWHR laboratories.	Around 09 clients attempted on quarterly basis	By keeping in view the medium term budget estimate for rendering service delivery, different clients from construction sector have been contacted. Total Allocation budget in accordance with NIS is Rs. 127,413,000. Cut on Policy saving: Rs, 3,251,350. Actual budget released: Rs. 124,161,650.	Following Laboratory service is being considered such as : <ul style="list-style-type: none"> • Non Destructive Testing, Contract Research and Consultancy Services • Skill Development and Training to Organizations • Other Activities Related to joint Collaboration • Civil Engineering Conference, Exhibitions, symposia etc. • Dissemination of R&D Products

Testing Services to Different Clients

CWHR provided testing services to following clients on concrete research:

- 04 Pakistan Atomic Energy Commission

- 01 University of Karachi
- 01 PCSIR
- 01 M/s. EPIC Intercom Pvt. Ltd.
- 02 M/s. DUPAK Tameer Pvt. Ltd.
- 01 M/s. Multi Model Transport Pvt. Ltd
- 02 M/s. ZAREEPA Marbles Pvt. Ltd.
- 02 M/s. Gul Construction Company
- 01 M/s. Ghazi Enterprises
- 01 M/s. Abaseen Enterprises

Sections of CWHR

- Non-Destructive Testing Lab Section works to identify concrete defect at onsite monitoring and generated extra revenue through testing as qualified performance indicator.
- Water Testing Laboratory, Chemical Testing Laboratory and Light Weight Aggregate Testing Laboratory under LWA Section, works on commercialization and testing service basis.
- Construction Material Testing Laboratory, involved in testing through commercialization of testing services.
- GEO Techniques and Road Research Laboratory Section, involved in testing also.
- LTES section, involved in testing of concrete, Cement and Water and Steel also.

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

Following targets were set in the NUST's 10 Years Development plan 2020-30 (Approved by NUST BoG in 2020):

Students' Strength

	Present Status	Targets for 2029-30
UG	11850	15442
MS/M.Phil	6560	9503
PhD	870	1503
Total	19280	26448

Faculty State

	Present Status	Targets for 2029-30
PhD	686	1400
MS/BS	564	400
Total	1250	1800

Academic Programmes

	Present Status	Targets for 2029-30
UG	39	59
MS	82	114
PhD	56	70
Total	177	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 as well as encourage/promote National innovation system ii. Established pilot National Science and Technology Park (NSTP) to host tenants engaged in Research and Innovation that is aligned with national needs. Tenants to include the categories of anchor, Hi-Tech SMEs and Startups/Spin-offs, all supporting the ecosystem of national innovation, thus contributing towards improving Pakistan's Innovation Index. iii. Declared as Special Economic Zone (SEZ) in November, 2020 by Board of Investment (BoI). iv. Enhance the incubation space and provide an environment that attracts and nurture technology based start-ups and transform them into commercially viable enterprises.
(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.

Description	KPIs
(e) Empathy for society & community service.	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.	i. Raise endowment fund. ii. Enhance registration of alumni.
(g) Develop NUST into a green university.	i. Grow plants/trees ii. Maximum use of re-cycled water for watering plants. iii. Use of solar power.

Rankings

- “QS” World University Ranking

Year	World Rank	Pakistan Rank
2020-21 (QS 2022)	358	1 st

- “QS” World University Ranking by Subject

Year	By Subject	World Rank	Pakistan Rank
2020-21 (QS 2021)	Electrical & Electronic Engineering	201-250	1 st
	Computer Science & Information System	143	1 st
	Mechanical, Aeronautical and Manufacturing Engineering	301-350	1 st
	Chemical Engineering	251-300	1 st
	Chemistry	451-500	2 nd
	Mathematics	251-300	2 nd
	Physics & Astronomy	301-350	2 nd
	Business & Management	251-300	2 nd
	Biological Sciences	451-500	2 nd

- “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
2020-21 (QS 2021)	214	1 st

- “THE” Impact Ranking

Year	World Rank	Pakistan Rank
2020-21	201-300	1 st

- Research Projects

○ Research Projects Approved for Funding	123
○ Research Projects in Progress	286
○ Research Projects Completed	90

- Research Papers

○ Research Papers Presented in Conferences	111
○ Research Papers Publications	1513

- **Intellectual Property Rights**
 - Patents filed 235
 - Patents Approved 16
- **Commercialization**
 - Technologies Licensed to the Industry 21
- **Companies Incubated/Graduated**
 - Number of Incubatees 60
 - Number of Companies Graduated 27
 - Number of Jobs Created (Graduated Incubatees) 450
- **Innovation Promotion and Marketing**
 - Industrial Problems Identified 300
 - Consultancy Projects Identified 33
 - R&D Projects Identified 40
- **Professional Development Centre**
 - Number of Internal Trainings Conducted 6
 - Number of External Trainings Conducted 36
- **Corporate Advisory Council (CAC)**
 - CAC Partner Companies 300
 - Number of CAC – NUST Partner Schools/ Institutes 19
 - Number of Student Visits Arranged by CAC Team to Industry Halted due COVID-19
 - CAC Sector Committees Member Companies 200
- **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 1275
 - Number of Recruitment Drives 217
 - Number of Industrial Talk Sessions Organized 110
- **Career Development Centre**
 - Career Development Plan 41
 - Resume writing 27
 - Professional Employability Skills 37
 - Interviewing Techniques 26
- **Develop NUST into a Green University:** In line with Government's initiative, progress on plantation is as under:
 - Last 10 Years Sapling Count 101128 (recent details as under)
 - Year 2018-19 Planted Saplings 13000
 - Year 2019-20 Planted Saplings 23000
 - Year 2020-21 Planted Saplings 3128 & Seed Balls thrown 5000

Budget Details

(Rs in Million)

Outputs	Amount
	2020-21
Promotion of Higher Education in the field of Science and Technology	3180.311

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 12th August, 2000, it has been upgraded to a Federally Chartered University in April, 2018 under the COMSATS University, Islamabad Act 2018.

CUI functions under the governance of the Senate which is chaired by Chancellor of the university. 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 & Targets

CUI has developed and expanded, following its strategic vision, 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.

Performance/Outcomes

CUI currently comprises of six faculties, 22 departments and 08 research centers. Presently, about 101 degree programs are on offer in which around 34,216 students are enrolled. CUI has become the first Higher Education Institution in Pakistan to offer hybrid teaching from Fall-2017 semester. There are 2,376 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 128 convocations have been organized in which degrees were conferred on 82,000+ graduates including 501+ PhDs.

CUI Rankings

In TIMES Higher Education (THE) World Universities Rankings 2021, CUI was placed among 601-800 world best universities and ranked 3rd in Pakistan. Besides, it was also ranked at #301-400 in THE Engineering & Technology, #401-500 in Computer Science, #301-400 in Business & Economics, #401-500 in Life Science and 501-600 in Physical Sciences subject rankings 2021. CUI was also ranked at #171 in THE Asian University Rankings 2021 and #159 & #195 in THE Emerging Economies Rankings 2020 and 2021 respectively. In addition, CUI was ranked among #1001-1200 in QS World University Rankings 2021 and #146th in Asia for 2021.

CUI is ranked amongst the top 301-400 global universities working to improve the UN's Sustainable Development Goals in TIMES Higher Education (THE) University Impact Rankings 2021 and also ranked 2nd in Pakistan. CUI was ranked in following 16 SDG's out of 17:

- SDG 1 No Poverty 101-200
- SDG 3 Good Health and Wellbeing 601-800
- SDG 4 Quality Education 601-800
- SDG 5 Gender Equality 601+
- SDG 6 Clean Water and Sanitation 201-300
- SDG 7 Affordable and Clean Energy 101-200
- SDG 8 Decent Work and Economic Growth 101-200 (ranked # 1 in Pakistan)
- SDG 9 Industry, Innovation and Infrastructure 401-600
- SDG 10 Reduced Inequalities 401-600
- SDG 11 Sustainable Cities and Communities 401-600
- SDG 12 Responsible Consumption and Production 301-400
- SDG 13 Climate Action 101-200
- SDG 14 Life Below Water 201-300
- SDG 15 Life on Land 101-200 (ranked # 1 in Pakistan)
- SDG 16 Peace, Justice and Strong Institutions 401-600
- SDG 17 Partnerships for goals 401-600

Conferences/Workshops

During the reporting period, CUI organized the following conferences/trainings and workshops at various campuses:

- **COVID-19 Spaces between Us**
The Department of Architecture and Design in collaboration with COMSATS Art Gallery organized an exhibition titled, “COVID-19, Spaces between Us” on 7th September, 2020.
- **CPS Pre-budget Roundtable 2021-22**
Centre for Policy Studies (CPS) organized a Pre-budget Roundtable 2021-22 on 30th March, 2021 to evaluate the state of economy and suggest policy direction recommendations for the Federal Budget 2021-22.
- **Pakistan Council of Architects and Town Planners (PCATP) Accreditation Visit**
5 Members accreditation team of Pakistan Council of Architects and Town Planners (PCATP) visited the Department of Architecture at Islamabad Campus on 29th June, 2021 for revalidation of accreditation.
- **International Workshop on Remote Health Monitoring for Elderly People, Maternal and Infant**
CUI, Wah Campus’s SAFE-Rural Health (RH) team participated in the International Workshop on ‘Remote Health Monitoring for Elderly People, Maternal and Infant’ organized under the umbrella of SAFE-RH at Capital University of Science and Technology, Islamabad on 22nd April, 2021. Speakers from different countries enlightened the participants with their valuable talks covering different aspects of SAFE-RH project. CUI Wah Campus presented Maternal and Infant Health Monitoring Pilot Project of SAFE-RH in the workshop.
- **Webinar “Restore Our Earth”**
The webinar titled “Restore Our Earth” was organized on 29th April, 2021 to highlight the importance of our motherland by taking initiatives for saving the atmosphere from increasing heat-trapping emissions in air, fuel burning and industrial waste. The guest speaker, Dr. Hassan Abbas delivered his talk on the significance of water resources, earth system assessment, impacts of climate change and its vulnerabilities on natural and human environments including ocean, sea-ice, land area, ice sheets and crustal rocks.
- **Talk on “Environmental Pollution and Our Responsibilities in the Light of Islam”**
Dr. Farooq Abdullah, Lecturer, Islamic Studies delivered a lecture on “Environmental Pollution and Our Responsibilities in the Light of Islam” on 11th November, 2020.
- **Seminar on “How to avoid Plagiarism”**
The Event Management Committee organized a seminar titled “How to avoid Plagiarism” on 11th November, 2020 attended by MS and PhD scholars.
- **Webinar on “Digital Marketing, Online Business & Freelancing”**
The Event Management Committee organized a Webinar on “Digital Marketing, Online Business & Freelancing” on 20th November, 2020 for the Undergraduate students.
- **Webinar on Aesthetics of Poetry**
The Literary Wing of MINT society organized a webinar on “Aesthetics of Poetry” with Dr. Shahida Dilawar Shah, Poet & Columnist, FC College, Lahore on 24th December, 2020.
- **Webinar on “How to Improve Quality of Education in Higher Education Institutions”**
Dr. Abdus Sattar Abbasi, Head CIF, Lahore Campus moderated a webinar titled “How to Improve Quality of Education in Higher Education Institutions” organized by Think Pakistan, a Forum of Highly Qualified Pakistanis on 29th December, 2020.
- **Symposium on Advantage and Challenges of Wind Energy**
Energy Research Centre conducted an online symposium on “Advantage and Challenges of Wind Energy” on 7th April, 2021. The symposium was focused on challenges of the impact of wind generation in the conventional generation system.
- **Training under “Women Empowerment through Digital Skills Phase-II”**
Student Startup Business Center (SSBC), Abbottabad Campus facilitated the Phase II of “Women Empowerment through Digital Skills” in collaboration with Durshal, Abbottabad (A

KP-ITB initiative) on 14th December, 2020. The training courses included: Social Media Marketing, Graphic Designing, WordPress Design and Development, Blogging, Content Writing and Digital Tools for Productivity.

- **International Webinar on “Air Pollution, Climate Change and their Impacts on Mountainous Water Resources”**
International Webinar on “Air Pollution, Climate Change and their Impacts on Mountainous Water Resources” was organized by Dr. Romana Khan, Department of Environmental Sciences on 26th January, 2021. More than 500 researchers and students registered for this webinar from 12 countries.
- **Virtual Training Session on Islamic Banking Operations/Islamic Banking Branch Operations**
Student Startup Business Center (SSBC) and the Department of Management Sciences jointly organized a virtual training session on “Islamic Banking Operations/Islamic Banking Branch Operations”. The training was conducted by National Institute of Banking & Finance (NIBAF) and sponsored by SBP.
- **International Webinar on “The role of Genomics and Biotechnology in COVID-19”**
The webinar was organized by Bioscience Department on 16th December, 2020. More than 150 participants from different countries i.e. China, Bangladesh, Turkey, India, Japan and Pakistan attended the opening Ceremony.
- **Seminar on “Evaluating the Potential of Zero Energy Cool Chamber for Horticultural Crops”**
Department of Environmental Sciences, CUI, Vehari Campus organized a seminar titled “Evaluating the Potential of Zero Energy Cool Chamber for Horticultural Crops” on 11th March, 2021. Fruit and vegetable growers, agricultural researchers, local technical officers and faculty members from the various universities attended the seminar. The seminar was funded by Pakistan Science Foundation under Natural Science Linkages Program.
- **Workshop on “Soft Skills Development”**
A one-day Workshop on “Soft Skills Development” was organized by the Career Development Cell, Department of Management Sciences on 16th June, 2021. The objective of the seminar was to familiarize students with the emerging ideas and trends on developing personality and career in the current requirement of the dynamic changes of corporate sectors and academia.
- **Seminar on “Modern Technologies and Eye Care Awareness”**
A seminar on “Modern Technologies & Eye Care” was organized by Health Awareness Committee on 17th June, 2021. The seminar was organized to discuss, how the eyes can be protected with common and simple techniques during studies and from use of electronic equipment.
- **Webinar on the topic of “Utilization and Indigenization of Hydro-Power as Renewable Energy Source**
Alumnus of the Department of Mechanical Engineering Department, ASME (American Society of Mechanical Engineers), CUI, Sahiwal Campus arranged a webinar on “Utilization and Indigenization of Hydro-Power as Renewable Energy Source in Pakistan” on 27th October, 2020.
- **Breast Cancer Awareness**
“Breast Cancer Awareness” seminar was organized by Dr. Farha Fezan on 11th October, 2020 at CDC, Islamabad Campus.

Faculty Development Academy (FDA) organized following activities to equip CUI teachers and teachers from local universities with latest knowledge, proactive instructional strategies and an active social interest to foster quality education:

- A 5-day ‘Workshop for Academic Leaders’ of CUI, Islamabad Campus was arranged from 14-18th December, 2020.
- A hybrid training ‘From ZOOM Fatigue to ZOOM Vroom’ was arranged on 8th February, 2021.
- A hybrid workshop on ‘Understanding Decision-Making: Unraveling the Complexities’ was organized on 25th February, 2021.

- A seminar on ‘Current Economic Scenario of Pakistan’ was organized at CUI, Islamabad Campus on 26th February, 2021. Dr. Muhammad Ahmed Zubair, Chief Economist, Planning Commission of Pakistan delivered a lecture.
- An online workshop on ‘Outcome Based Education (OBE): Special Engineering Training Approach for Global Competitiveness’ was organized for Engineering Faculty of CUI, Wah Campus on 12th April, 2021.
- A Training Needs Assessment (TNA) of each campus of CUI was conducted in collaboration with respective Campus Directors to plan Skill Enhancement and Employee Development (SEED) Program for Admin Personnel across CUI Campuses and an activity plan/schedule was developed to organize these workshops. The first SEED Program was held at CUI, Attock Campus on 30th June, 2021 for their Admin Personnel.

Research and Commercialization

CUI faculty is actively engaged in research in their respective fields. During the year 2020, 3473 research papers were published. 136 companies are enrolled at CUI’s Student Startup Business Center and presently 76 companies are incubated across SSBC. Three companies are at Cubator 1ne and over 72 companies have graduated from Cubator 1ne. 90 patents have been filed for registration out of which 38 (22 US, 16 Pakistan) were granted. For the financial year 2020-21, Economic footprint of CUI Incubation Companies was Rs. 150 Million and 300 jobs along with 200 paid internship opportunities were created by Companies Incubated under CUI.

Visits

- During the period, three international collaborations were established with following countries.

S#	Name of Institution
1	Industrial Technology Institute, Sri Lanka
2	Technological University Tajikistan, Tajikistan
3	Harbin Engineering University, China

- In addition, 27 active international linkages/collaborations are continued with some of the most reputed Universities/institutions.

Budget Estimate

- **Development Activities:**

CUI has completed 49 projects having a cost of Rs. 8853.592 Million. For the FY 2020-21, Rs. 267.698 Million were allocated for three development projects and Rs. 229.230 million were released.

- **Human Resource Development:**

Over 360 fully funded scholarships have been awarded to the faculty/staff of CUI for pursuing their studies in high ranking universities of the world. Nearly 160 MS and over 200 PhD scholars have successfully completed studies. These scholarships were awarded through meritorious criteria which is open to candidates already serving or willing to serve CUI upon completion of their studies. During the period, 45 scholars joined the CUI after completion of their studies.

Strengths	Statistics (Period 2020-21)
Campuses	7
Faculties	6
Academic Programs	101
Departments	22
Centers	08
Faculty Members	2300+
Research Papers	3473
Students	10,438
Graduates	8451
PhD’s	83

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, technicians and supporting staff; more than 30% scientists hold Ph.D's from national and international universities. Almost 95% of the scientific team has received specialized training from well reputed 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 projects of national and international level have been undertaken. In this regard, laboratories were equipped with the 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.

Budgetary Allocations

(Non-Development/R&D)

(Rs. in Million)

S. No.	Year	Allocation/ Approved Budget
(i)	2020-21	198.902 10.00 (R&D)

(Development)

(Rs. In Million)

S. No.	Year	Allocation/ Approved Budget
(i)	2020-2021	71.00 10.00

During the year 2020-21, NIO continued to progress as per its main objectives and functions assigned under NIO Act of 2007.

Objectives & Functions of the Institute

- 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.

Research Activities of NIO

- **8th Meeting of Board of Governors (BoG)**
8th Board of Governors meeting of NIO was held online on 20th July, 2020 due to the COVID-19 pandemic situation.

- **Interview for the post of regular Director General, NIO**
The Selection Board for the appointment of regular Director General, NIO was conducted on the 5th October, 2020 at NIO, Karachi. The Federal Minister of Science and Technology chaired the meeting for selection of Director General, NIO. The minutes were later circulated amongst the BoG members of NIO for their concurrence and the new Director General was notified on the 7th January, 2021.
- **Visit of the Secretary MoST**
The Federal Secretary, Ministry of Science & Technology visited National Institute of Oceanography on 12.02.2021. He was welcomed and briefed on the mandate/functions of NIO and current activities of the Institute by the Director General, NIO.
- **Visit of the Federal Minister and Secretary, MoST**
The Federal Minister for Science and Technology, Mr. Shibli Faraz and Secretary, Mr. Nadeem Irshad Kiyani visited National Institute of Oceanography (NIO) on 17.06.2021. The Director General, NIO, Dr. Samina Kidwai welcomed the honorable guests and briefed about the performance of institute and different research projects.
- **International Projects**
Pakistan is participating in “NANO-DOAP- a global study of coastal Deoxygenation, Ocean Acidification and Productivity at Selected Sites” with 5 sites to contribute to this global synthesis.
NIO, Pakistan is the key partner in Mega Delta Decade Programme of UN Decade of Ocean Science for Sustainable Development 2021-2030. This programme is in continuation to the Executive Agreement for Joint Research between the National Institute of Oceanography, Pakistan and East China Normal University, China.

Public Sector Development Projects (PSDP)

- Following three projects are on-going:
 - Monitoring the Sea Water Intrusion, Sea Level Rise, Coastal Erosion and Land Subsidence along Sindh and Balochistan Coast (PKR 730.00 Million–5 years)
 - Assessment of Tidal Energy Potential along Indus Deltaic Creeks, Sindh Coast (PKR 35.00 Million-2 Years)
 - Strengthening of Oceanographic Research Sub-station, Gwadar (PKR 300.00 Million–3 Years)
- following projects were approved and funded during the FY 2020-21 (PKR 20.00 Million):
 - Environmental and Ecological monitoring of Pakistan Coast with reference to CPEC and SDGs
 - Implementation of International collaboration
 - Monitoring of Plastic Debris and Microplastic in the Coastal Marine Environment of Pakistan
 - MPAs
 - Detection of HAB in the Indus Delta Region
 - Food Dynamics and Ecosystem sustainability of Indus Delta
 - Geological and Physical Observation pertaining to Coastal Issue

NIO’s Peer reviewed Research Publications

- 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*. DOI: 10.1007/s00343-021-0293-9
- Ahmed, W., Wu, Y., Kidwai, S., Li, X., Zhang, G. and Zhang, J., 2021. Spatial and temporal variations of nutrients and chlorophyll in the Indus River and its deltaic creeks and coastal waters (Northwest Indian Ocean, Pakistan). *Journal of Marine Systems*, 218 (2021), p.103-125.

Reactivation of Pak-Antarctic Program and Pak-Argentina Cooperation for Antarctic Research

During the 3rd Session of Pakistan-Argentina Joint Commission (in virtual format March-April, 2021), the Agenda 3 was cooperation in Science & Technology between the two countries. Pak-Argentina cooperation for Antarctic Research is included as an agenda point which will be discussed during the forthcoming 4th Session of the Pakistan-Argentina Joint Commission.

The National Institute of Oceanography (NIO), which is the lead institution in Antarctic Research in Pakistan, was directed to reach out to the potential counterparts in Argentina. NIO requested the Pakistan Mission in Buenos Aires for their assistance. A virtual meeting was arranged with counterparts by the Pakistan Mission on 23rd April, 2021 to discuss the areas of cooperation.

Visitors in NIO

- Teachers of Aga Khan School & College visited NIO and its laboratories.
- 10 officers of Underwater Warfare School, PNS Bahadur, Pakistan Navy, Karachi visited NIO on 22nd October, 2020 for 1st Principal Warfare Officer (ADQUAL) Course.
- 12 participants (Surveyors), along with course instructor, of Navigation & Hydrography School, PNS Bahadur, Karachi visited NIO on 28th October, 2020 for NIO-LST 'Q' A/2020 course.
- First Seawater Intrusion Cell meeting was held at the NIO Auditorium. SUPARCO, PCRWR and Pakistan Navy officers attended the inception meeting for the discussion of PSDP Project "Seawater Intrusion, sea level rise and coastal erosion along Balochistan and Sindh Coast".
- Mr. Tolga UCAK, Consul General, Turkish Consulate visited NIO on 1st March, 2021.
- Mr. Muhammad Awais and Mr. Sohail Younas Moghal, Development Consultants of Small & Medium Enterprises Development Authority (SMEDA), Karachi visited NIO on 29th June, 2021 for SMEDA Productivity Improvement Project for SMEs in Garments Industry through Lean Tools.

Events at NIO

NIO Celebrated 30 years (15th January, 1991-15th January, 2021) in Antarctic

Dr. M.M Rabbani led the Antarctic expedition 30 Years ago on 15th January, 1991. NIO celebrated this achievement on 15th January, 2021 with Dr. M.M Rabbani as honorable guest and on 4th February, 2021 at NIO Conference Hall.

Seminar/Symposiums/Conferences/Meetings attended by NIO Scientists

- DG, NIO attended the 1st meeting of China-Pakistan Joint Working Group on Science & Technology on 6th November, 2020 at MoST, Islamabad.
- NIO delegation attended meeting regarding Petroleum Marine Development Committee-Marine Research Fee at Office of the Deputy Commissioner, District Malir, Karachi on 27th November, 2020.
- DG, NIO attended the meeting of National Assembly Standing Committee on S&T held on 12th March, 2021 at MoST.
- Director General, NIO attended the inauguration and closing ceremony of the 9th International Maritime Conference (IMC) at Movenpick Hotel, Karachi from 13th-15th February, 2021. The theme of IMC was "Development of Blue Economy under a Secure and Sustainable Environment – A Shared Future for Western Indian Ocean Region". Scientific sessions were attended by NIO scientists.

Official Meetings

- Mr. Waqar Ahmed, Research Officer, NIO attended a meeting organized by Ministry of Climate Change on 19th May, 2021 for proposing and declaration of new Marine Protected Areas in Sindh and Balochistan.
- DG, NIO participated as Speaker in the Webinar to celebrate the World Environment Day 2021 titled "Restoration and Preservation of Marine Ecosystem of Pakistan" organized by National Institute of Maritime Affairs (NIMA) on 07.06.2021.
- DG, NIO participated as Speaker in the Webinar to celebrate the World Ocean Day 2021 titled "The Ocean Life and Livelihoods" organized by National Institute of Maritime Affairs (NIMA) on 08.06.2021.
- A team of Asian Development Bank virtually connected with NIO team to discuss the "Building Prosperous and Resilient Sindh Coastal Region" on 21st June, 2021.
- DG, NIO participated as Speaker in the Webinar to celebrate the World Hydrography Day 2021 titled "One Hundred Years of International Cooperation in Hydrography" organized by National Institute of Maritime Affairs (NIMA) on 21.06.2021.
- DG, NIO attended IEEE Oceans 2022 Conference online, jointly organized by Indian Institute of Technology (IIT) and National Institute of Ocean Technology (NIOT), India from 21-24th February, 2021.
- DG, NIO attended meeting of Senate Standing Committee on Science & Technology at Parliament House, Islamabad on 03rd February, 2021.

- DG, NIO attended the meeting of Inter-Ministerial Committee of Development Plan for 14+ Priority Districts of Sindh under the chairmanship of Deputy Chairman, Planning Commission via zoom link on 22nd April, 2021.
- DG, NIO attended a seminar-cum-webinar on “Growing Economic Connectivity in the Indian Ocean Region-Challenges and Opportunities” organized by Bahria University via zoom link on 29th April, 2021.
- DG, NIO attended the meeting of the National Assembly Standing Committee on Science and Technology at PCSIR, Islamabad on 2nd June, 2021.
- DG, NIO attended the Roundtable on Protecting Indus Delta on World Environment Day 2021 jointly hosted by WE Forum, ICIMOD, IWMI, PCRWR and WB via zoom link on 3rd June, 2021

Pakistan Council for Science and Technology (PCST)

Introduction

Pakistan Council for Science and Technology (PCST) was established under Ministry of Science and Technology 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, it seeks expert opinion and advice regarding development and application of Science and Technology in different 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).
- Perform any other functions as may be assigned to it by the Federal Government.

Budget Details for the Year 2020-21

(Rs. in Million)

Budget	Non-development			Development		
	Allocation	Release	Expenditure	Allocation	Release	Expenditure
2020-21	111.155	83.229	83.180	58.979	33.281	8.742

Achievements

A brief review of the major activities carried out by PCST during the period from July, 2020 to June, 2021 is as under:

- **Formulation of new Science, Technology and Innovation (STI) Policy**
The work for formulation of new Science, Technology and Innovation (STI) Policy was initiated and a Coordination Committee, comprising members from PCST and MoST, for the purpose was constituted. In this regard, national STI policies of other countries were studied 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 constituted to provide support and guidance for formulation of draft STI Policy-2021 and a 55-page background working paper was prepared by the Coordination Committee for the first meeting of Working Group which included brief information about the following:
 - Ministry of Science and Technology

- Background (for formulation of new STI Policy)
- Manifesto of PTI – Points of Relevance

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, for facilitation of the Working Group.

The Coordination Committee for the National Science, Technology and Innovation (STI) Policy-2021 held a number of meetings and prepared draft outline for 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-2021 was prepared which included the 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

- **National Startup Policy**

Pakistan has initiated the ‘Startup Pakistan Program’ which envisions to provide training in entrepreneurship to young people and create jobs and economic activity in an inclusive, scalable and sustainable way and to provide a single point of contact for the entire Startup ecosystem, enable knowledge exchange and access to funding/investment. However, Pakistan's Startup ecosystem is still in its embryonic stage compared to other nations of the world. In the Global Startup Ecosystem Rankings 2021, Pakistan is ranked 75th among the top 100 countries which have been ranked in the index which is way behind the neighboring China (7th) and India (20th).

This clearly demonstrated that there is a dire need to formulate a well-coordinated national policy for promotion of technology and innovation based Startups in the country to boost Startup ecosystem and to come closer to Startup nations in the world. In order to fill this gap, the Prime Minister’s Office assigned the task for formulation of National Startup Policy to MoST under its Ehsaas Programme. On the directions of MoST, PCST has prepared draft of the first National Startup Policy of the country. The aim is to build a strong ecosystem for nurturing innovations and Startups in the country that will drive sustainable economic growth and generate large scale employment opportunities. As Startups do not exist in a vacuum but are part of a broader business and entrepreneurship environment, therefore, the policy aims to address all important aspects of the Startup ecosystem in the country as well as accelerate Startup and innovative activity across all sectors of the society and economy.

The draft document of the Policy has been prepared in consultation with all stakeholders of Startup ecosystem such as Startups, innovators, incubators etc. which was forwarded to MoST for circulation to the relevant Government Ministries/Organizations for their comments and views.

- **Science, Technology and Innovation (STI) Policy Research Initiative of PCST**

Pakistan Council for Science and Technology has taken an initiative to boost research on the issues concerning Science, Technology and Innovation (STI) Policy in the country and to build a network of STI policy researchers in the country. In this regard, a programme titled “Science, Technology and Innovation (STI) Policy Research Initiative of PCST” was launched. In response to PCST call of proposals, about 700 proposals were received. In order to short-list and select the most relevant and important proposals for undertaking research/study/survey, a Proposal Review & Assessment Committee was constituted for initial short-listing and final selection of the proposals, after detailed review of the received proposals. Initial short-listing of the proposals has been completed while detailed review of short-listed proposals is under process.

- **Technology Foresight Report on Automotive**

The Technology Foresight on Automotive Sector was carried out & completed by PCST during the year. A 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.

- **Collaboration with International Organizations**

- In relation with the S&T Collaboration with Cuba, concept proposals in the following areas were submitted to the MoST:
 - Development and implementation of S&T policies in developing countries
 - STI Indicators in developing countries
 - National Innovation System (NIS) in developing countries
 - Foresight Studies critical to poverty reduction in developing countries
- In relation with the Pak-UK Science and Technology Cooperation, concept proposals in the following areas were submitted to the MoST:
 - Cooperation in Conducting Foresight for Science, Technology and Innovation Policy (Proposals):
 - UK may cooperate with Pakistan in building capacity to conduct Foresight exercise for Science, Technology and Innovation policy formulation.
 - UK and Pakistan may work jointly on Foresight projects in Pakistan.
 - Building Capacity in Science, Technology and Innovation to Fight Against Terrorism and Corruption (Proposal):
 - UK may support Pakistan to develop expertise in technologies which can prove critical in fight against terrorism and corruption
- The following collaboration proposals were also prepared and submitted to MoST:
 - Capacity building in the field of S&T Policy between Pakistan Council for Science & Technology (PCST) and Institute for Economic and Policy Research (IEPR) in Sarajevo School of Science and Technology, (SSST) at Bosnia & Herzegovina (BiH).
 - Bilateral short-term visits between Science, Technology and Innovation (STI) Policy Professionals of Pakistan and Netherland were conducted.
 - Capacity building in the field of S&T Policy between Pakistan Council for Science & Technology (PCST) and Advisory Council for Science, Technology and Innovation (AWTI), Netherlands.
 - Capacity building of PCST for evaluation of R&D organizations for enhancing their efficiency and effectiveness for Japanese Request Survey for Technical Assistance in 2020.
 - Cooperation in the field of STI Policy between Pakistan and Saudi Arabia.

- **Knowledge Centre to Create Awareness on the COVID-19**

A web-based Knowledge Centre was created on the PCST official website to provide reliable information about COVID-19 pandemic to the public. Regular daily updated information and latest situation is shared through the website.

- **Project Concept Papers**

The following project clearance/concept papers were prepared and submitted to concerned forums for consideration:

- Investigating R&D-Commercialization Gaps in R&D Organizations in Pakistan: Case of the Ministry of Science and Technology.
- Relationship between Innovation, Financial Development and Economic Growth in Selected South East Asian Countries.
- “Building Capacity in Science, Technology and Innovation to Fight against Terrorism and Corruption” for 47th Session of the Council of Foreign Ministers (CFM), Niamey, Niger (27-28th November, 2020).
- Proposals regarding Training Need of PCST’s officers along with Software Need of PCST were prepared on a PSF prescribed proforma under the Task Force initiative entitled “Grants for the Strengthening of Research in Pakistan” and submitted to the concerned quarters.

- **Development Projects of PCST**

The salient achievements have been made under the following development projects:

- **First Industrial National Innovation Survey**
Recruitment of the project staff and purchase of books on industrial innovation was completed. 5000 booklets titled “Products/Technologies Developed by Organizations of

MoST” was printed by PASTIC. Meetings were held with Chamber of Commerce & Industry and Industrial Associations at Faisalabad and Lahore, Punjab. 21 firms applied against the EoI invited by the PCST for data collection of 5000 industrial units. Out of which, 08 firms were pre-qualified. Bidding documents were drafted and sent to pre-qualified firms for submission of Technical and Financial Proposals. Out of 8 pre-qualified firms, 5 firms submitted Technical and Financial proposals. Among these 5, M/s Apex Consulting was declared as the most advantageous bidder and letter of acceptance of bid was issued. But firm failed to submit performance security (10%) and award of contract was canceled as per bidding documents. Award of contract was signed with M/s UHY Hassan Naeem & Co., Chartered Accountants, being the next most advantageous bidder. Pilot study (100 Samples) was conducted by the hired firm and report was submitted to PCST along with dully filled Questionnaires which were evaluated by cross verification through telephone by Project FINIS Team and results were shared with hired firm. After number of in-house project committee meetings, Inception Report shared by M/s UHY Hassan Naeem and Co., Chartered Accountants was accepted. The data collection will be started soon and planned project activities will be completed in the financial year 2021-22.

- **Need Assessment of S&T Human Resources for Driving Innovation and Achieving Vision 2025**

Documentation for Evaluation Process including detailed Expression of Interest/Pre-Qualification documents were drafted and advertised. 16 firms submitted document & participated in pre-qualification process. An external evaluation/selection committee was constituted for evaluation of applications. Out of 16 firms, 11 were pre-qualified for the next step (single stage-2 envelope) bidding process. Bidding document was finalized and circulated among the pre-qualified firms for the submission of Bids (single stage-two envelopes). After due process, M/s Management & Development Center was qualified in ranking and the contract was signed with the firm. After a number of in-house interactive sessions and external committee meetings, the draft of inception report is in final stages along with questionnaires/survey instrument and lists of target areas. The data collection will be started soon and the planned project activities will be completed in the financial year i.e. 2020-21.

- **Views/Comments**

Views/comments were provided on following topics/issues:

- Impact of Research Organization in Pakistan.
- Nomination for Scientific Board of the International Basic Sciences Programme (IBSP).
- Pak-EU Strategic Joint Commission.
- 210th Session of UNESCO Executive Board held from 4-18th November, 2020 at UNESCO Headquarter, Paris, France.
- Summary of the Plan of Joint measures of the SCO member States to overcome the negative Socio-Economic Consequences of the COVID-19 pandemic, problems, solution & proposal from Pakistan side was prepared and submitted to MoST.
- Draft outcome document of OIC, STI Agenda 2026 was prepared for 1st OIC Summit on Science & Technology held in 2017 in Astana, Republic of Kazakhstan.
- Draft outcome document was prepared for 2nd OIC Summit held in June, 2021.
- Draft “Declaration of the Council of Heads of Member States of the Shanghai Cooperation Organization (SCO) on Strengthening in Science, Technology and Innovation” was prepared.

- **Others**

- Requisite information on HEC Policy for Eligibility of Institutions for Competitive Research Grants and List of Public Sector R&D Organizations was provided to MoST.
- Answer to the Starred National Assembly Question No. 146, 6th Group, 28th Session moved by Ms. Naureen Farooq Ibrahim, MNA, regarding the total number of scientists of international repute in Pakistan and the name of the fields being looked after by them and the policy options available with Pakistan in the field of technology which can be helpful for the progress of Pakistan was prepared and forwarded to MoST.
- Outlines for a training course on Technology Foresight covering various modules i.e. introduction, organizing, methods of technology foresight exercise at national level etc. were developed and submitted to MoST for onwards communication to Establishment Division.
- Detailed information on prescribed format for Progress Assessment and Monitoring of Organizations were prepared and submitted to MoST.

- List of research topics for National Security War Course at the National Defence University on themes of national security, economy, finance, national defence, socio-political, environment, strategic management, strategic security management, human resource management, marketing, public policy & governance and international relation was prepared and submitted to MoST.
- A draft write-up on “Role of other Stakeholders” for inclusion in the “Pakistan National Quality Policy (PNQP)” was prepared and submitted to MoST.
- A write-up material regarding complaints from Pakistan’s Citizen Portal was drafted and shared with MoST.
- Talking points for Federal Minister for Science and Technology on “Role of STI in a sustainable and resilient recovery from current pandemic” were prepared for 24th Annual Session of the United Nations Commission on Science & Technology for Development (CSTD) in Geneva from 17-21st May, 2021 and submitted to MoST.
- Reply on un-starred Senate Question’s Diary No. 01, 312th session moved by Senator Seemee Ezdi was prepared and submitted to MoST.
- Lists of Scientists working in different disciplines were prepared and forwarded to MoST.
- Comprehensive response was prepared on “Request for Information-Task for inclusion in Performance Agreement” and submitted to PCRWR.
- Report on comprehensive completion of Government Achievements in line with PTI manifesto, Baseline, Key objectives & Initiative undertaken by PCST was prepared and submitted to MoST.
- Response on the Meeting of the “Senate Standing Committee on Science and Technology” held on 15th July, 2020 in Parliament House, Islamabad was prepared and submitted to MoST.

Performance Indicators for 2020-21 & Future Plan

Output (s)	Selected Performance Indicators		Planned Targets	Targets Achieved	Planned Targets		Forecast Targets
			2020-21	2020-21	2021-22	2022-23	2023-24
Advice to Government on S&T Policies and Plans	i) National Commission for Science & Technology (NCST) meetings		-	-	-	-	1
	ii) Executive Committee of NCST meetings		-	-	1	1	1
	iii) S&T policies/ Strategies or Research Agenda	a) Science and Technology Action Plan	1	-	-	-	-
		b) STI Policy 2021	-	1	-	-	-
		c) Startup Policy	-	1	-	-	-
		b) S&T Strategy	-	-	-	-	-
		e) STI Indicators	1	-	-	-	-
	iv) Meetings on S&T related issues		5	-	5	5	5
	v) Review of S&T policies		2	5	-	1	1
	vi) Sectoral Policy Review		-	18	-	-	-
vii) S&T Policy studies/Technical Reports		1	-	5	5	5	
viii) Advice/comments/briefs on S&T issues		6	8	5	5	5	
S&T Planning & Development and Futuristic Studies	i) Technology Foresight Studies	a) No. of Expert panel meetings	-	2	3	3	3
		b) No. of Technology Foresight Reports	1	1	1	1	1
	ii) S&T Planning & Development	a) Meetings	3	-	3	3	3
		b) Proposals	3	-	3	3	3
Evaluation of Scientific Research	i) Evaluation of Individual Research of Scientists (No. of Scientists evaluated)		3000*	-*	3000	3000	3000
	ii) Research Productivity Award (incentive given to number of Pakistani Scientists)		250	-*	250	250	250
	iii) Evaluation of Scientists for Medals & Awards etc. (No. of Scientists evaluated)		70	-*	50	50	50
S&T Databases	i) Development and maintenance of S&T databases		-	-	2	2	2
Capacity Building	i) Workshops & Conferences (No. of Events)		1	-#	1	1	1
	ii) Workshops & Conferences, in collaboration (No. of events)		2	-#	1	1	1
	iii) Lectures/presentations on S&T issues		5	-#	2	2	2
Cooperation in Science and Technology	Proposals submitted on S&T Cooperation	a) International	6	12	5	5	5
		b) National	-	4	5	5	5
Publications	i) Quarterly Journal "Science, Technology and Development"		4	-	4	4	4
	ii) PCST STI Policy Briefs		-	-	4	4	4

**Targets could not be achieved due to non-revision of evaluation criteria for the year 2020-21*

Targets could not be achieved due to vacant position of Chairman, PCST in FY 2020-21

Pakistan Council of Renewable Energy Technologies (PCRET)

Introduction

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

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

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

Goals & Targets

- R&D in the field of Third and Fourth generation solar cell materials such as; perovskite, quantum dot etc.
- Establishment of National Testing Laboratory for PV and allied equipment 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.
- Development of improved version of Solar Thermal and Biogas/biomass Products as per user requirements.

Performance/Outcomes

- **R&D in the field of Third and Fourth generation solar cell materials such as; perovskite, quantum dot etc.:**
 - Upgraded Advance PV lab through induction/operation of lab equipment.
 - Efficiency of 5-6% achieved in new solar cell materials such as perovskite, quantum dot etc.
 - Research conducted by various students from academia.
- **Establishment of National Testing Laboratory for PV and allied equipments as per International Standards:**
 - Project implementation plan finalized and recorded under MoM with PMC, KOICA
 - Project site cleared of trees and leveled.
 - Geo-technical and topographic survey of the project has been completed.
 - Office equipment procured.
 - Initial Appointment for the project has been completed.
 - The Korean side has completed the process of hiring for a consortium of three firms under Korea Confirmatory Laboratories (KCL) in South Korea to execute and complete this project. The KCL has hired Islamabad-based architectural firm to finalize the architectural design as per local by-laws of project site. The initial architectural design of the testing lab was finalized.
 - Rs. 3.016 Million utilized from July-2020 to June-2021.
- **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.

S. No	Objectives	Current Status
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)	4x trainings completed, 3x trainings partially completed and 3x trainings will be carried out in coming years.
iv.	Addition of 10-15 Solar PV and Wind Energy on a selected hydropower plant for hybrid power generation	Discussion for site selection in KPK and Gilgit-Baltistan is in progress.
vi.	Establishment of a 100kW hydropower plant on a canal in Punjab	Pending on part of Energy Department, Punjab since 2017.
vii.	Hydropower Development Planning of a selected river/canal in Punjab	Pending on part of Energy Department, Punjab since 2017.

- 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 6x engineers and officials of PCRET will be conducted by Hohai University China on Small Hydropower Development. The duration of the training will be 3 months.

- **Development of improved version of Solar Thermal and Biogas/Biomass Products as per user requirements:**

- Upgraded and developed following Solar Cookers:
 - Panel/Foldable
 - Parabolic Dish Type Solar Cooker with Glass Reflecting Material
- Improved prototype units of High efficiency Dish Type Solar Cooker with Sun Tracker, Box type solar cooker and Solar Desalinator for water purification.
- Upgraded and developed Briquette machine for limited production of Biomass fuel.
- Upgraded Solar Thermal product development workshop at PCRET HQ, Islamabad.

Outcomes/Service Delivery

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

- 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.
- 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, Transfer of technology for capacity building etc.

- **Promotion of Alternate Energy:**
 - Students from different Universities across the country conducted visits of PCRET Labs. The visits aimed for promotion/awareness and to enhance skill development in renewable energy field.
- **Research and Development for Socio Economic Development:**
 - Upgraded Advance PV lab, which is utilized for R&D in Silicon Technologies & Solar Cell Materials to conduct research in 3rd and 4th generation solar cells such as; perovskite, quantum dot, thin film etc. to achieve high efficiency.
 - Carried out research on thin films, perovskite and organic cell materials by Ph.D. and Master’s students and two impact factor journals were published.
 - Developed prototype of Renewable Energy Products for socio-economic development, commercialization to generate revenue and import substitution through indigenization and Transfer of Technology (ToT) for the development of quality and economical products by utilizing the local material and capability.
- **Liaison with International Organizations for the Development of Science and Technology:**

Sr#	Project Name	Collaborating Entity	Project Cost	Status
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 	<ul style="list-style-type: none"> • Project implementation plan finalized and recorded under MoM with PMC KOICA • Project site cleared of trees and leveled. • Geo-technical and topographic survey of the project has been completed. • Office equipment procured. • Initial Appointment for the project completed. • The Korean side has completed the process of hiring for a consortium of three firms under Korea Confirmatory Laboratories (KCL) in South Korea to execute and complete this project. The KCL has hired Islamabad-based architectural firm to finalize the architectural design as per local by-laws of project site. The initial architectural design of the testing lab was finalized. • Rs. 3.016 Million were utilized from July-2020 to June-2021.

Sr#	Project Name	Collaborating Entity	Project Cost	Status
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	<ul style="list-style-type: none"> • Project has been approved by National Research Institute of Rural Electrification, Hangzhou Regional Center (NRIRE, HRC), Ministry of Water Resources of China & Government of Pakistan. • 4 engineers and technical staffs (2 from PCRET and 2 from Energy Department, Punjab) obtained 6 months training on design and development of Small Hydro Power (SHP) plants. 3 engineers (2 from PCRET, 1 from PSQCA) partially completed their 6 months training from NRIRE, HRC, China. • Project site i.e. IRI, Nandipur, Gujranwala was finalized by Energy Department, Punjab for establishment of 100 kW SHP plant but its funding for civil works to be carried out by Energy Department, Govt. of Punjab is pending since 2017. • HRC, China completed the development of equipment for up-gradation of existing Hybrid lab in PCRET (from 20kW to 30kW) which has arrived in Islamabad. • Project agreement via MoU Extension has been signed between PCRET and NRIRE, HRC, China on 13th January, 2019. • MoU/Agreement between NRIRE, HRC, PCRET and PSQCA for the formulation of “Standard System for Small Hydropower in Pakistan” is in progress.
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	Submitted to M/o Climate Change and in process of approval.

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:**
 - **Project Name:** China Pakistan Joint R&D Center on Key Technologies of SHP and Rural Electrification
Date of Initiation: 2017
Date of completion: 2021
Funding: CYN 6.4 million, Chinese Government's Grant in terms of equipment, trainings and seminars + GoP Local Share
Current Status: In-progress
Place of Execution: PCRET Head Office, Islamabad, Punjab and Gilgit-Baltistan
 - **Project Name:** Joint Research on Small Hydropower Technology between China and Pakistan
Date of Initiation: 2021
Tentative Date of completion: 2023
Funding: USD 600,000 (~Rs. 102 million), Chinese Government's Grant in terms of equipment, trainings and seminars + Rs. 20 million GoP Local Share
Current Status: In-progress
Place of Execution: PCRET Head Office, Islamabad, KPK and Gilgit-Baltistan
 - **Project Name:** Talent Cultivation Program
Date of Initiation: 2021
Date of completion: December, 2021
Current Status: In-progress
Purpose: Online training of 6x 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:**
 - 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 2020-21 for R&D/Non-development activities was Rs. 16 Million. An amount of Rs.11,922,000/- was re-appropriated to A03401-Charges to meet the CDA liabilities. The remaining budget of amount Rs.4,043,336/- was utilized against R&D activities and the an amount of Rs.34,664/- was lapsed during F.Y.2020-21.

Pakistan Science Foundation (PSF)

Introduction:

Pakistan Science Foundation was established under an Act of Parliament on 30th June, 1973 as an autonomous body to promote and finance scientific and technological activities for socio-economic needs of the country. The tasks undertaken by the Foundation under its statutory functions are divided into following three broad categories:

- Science Promotion provides funding for basic as well as applied research involving researchers/academia at universities and R&D organizations focusing on socio-economic needs/development of the country.
- Science Popularization endeavors to imagine scientific ideas to grasp the concept of fundamental science.
- Establishment of Science Centers/Museums/S&T Information 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 Science Wing of PSF.

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 planetaria.
- Promotion of scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular.
- Organization of periodical science conferences, symposia and seminars.
- Exchange of visits of scientists and technologists with other countries.
- Grant 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.
- Review the progress of scientific research sponsored by PSF 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 and Targets

- 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

Performance/Outcomes

Pakistan Science Foundation (PSF) has various sections and programs to achieve the prescribed goals and targets. Details is as under:

- **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 root 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, number of activities were initiated to develop Science culture in the country. Under the action plan of the National Science Policy, 1984 and STI Policy, 2012, the Government has emphasized on strengthening and expansion of PSF programs for popularization of science at grass root 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 enhance/improve 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:

- **Science Caravan (Mobile Science Lab)** is a Mobile Science Exhibition 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 film (for 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, nine Science Caravan units are in operation, two for each of the four provinces and one for federal and adjoining areas. During the year 2020-21, 19224 students from 109 Schools visited Science Caravan Exhibitions, detail is as under:
 - Federal unit: 9234 students from 31 schools.
 - Sindh units: 7630 students from 66 schools.
 - Punjab units: 1432 students from 6 schools.
 - Khyber Pakhtunkhwa units: 808 students from 5 schools.
 - Baluchistan units: 120 students from 1 school.
- 30th Annual Intra and Inter Board Science Essay and Poster Competitions remain under process during the period.
- Donation of Popular Science Magazines and Scientific Books is one of the regular and important activities for science popularization. 8000 copies of Quarterly “Urdu Science Magazine” were distributed to 2000 schools.
- 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. As this year has been marked by the COVID-19 pandemic, the theme of the 2020 celebration is “Science for and with Society”. Chaudhry Fawad Hussain, Federal Minister for Science and Technology remarked that now exists an opportunity to renew our resolve for the noble purpose of advancing scientific knowledge and its practical application so that globally all people can live their lives in peace and freedom in a dignified manner. He emphasized the need of free and equal availability of vaccines on a global level. Ms. Patricia McPhillips, Representative and Director, UNESCO, Islamabad, Dr. M. Iqbal Choudhary, Coordinator General, COMSTECH and others highlighted the importance of science from different aspects of the theme. The speakers talked about the role of science for society, key issues concerning people and nature interactions, the impact of science for and with society from the youth perspective, science communication and the importance of sharing in-time knowledge & data and the strengthening of international scientific cooperation.
- **Popular Science Lectures:** Pakistan Science Foundation arranges series of lectures where eminent Scientists and educationists express themselves for the benefit of the audience

comprising scientists, scholars, students and the general public as one of its mandatory functions. During the current year, 03 Popular Science Lectures were organized on different scientific themes.

- **Women in Science**
Pakistan Science Foundation celebrated the International Women's Day in collaboration with UNESCO and organized an event on the topic of "Women in Science" on 8th March, 2021 in PSF Auditorium.
- **Islamabad Space Observatory**
The Ministry of Science and Technology & Pakistan Science Foundation has started initiative to establish an observatory at Shakarparian Hill Park which will enable students, researchers and general public to observe moon and other celestial bodies. The layout plan, 50x47 (261.11 square yards), is proposed for establishment of the space/planetarium/observatory. The foundation stone was laid by the then Federal Minister for S&T, Chaudhary Fawad Hussain.
- **Youth Recognition Programme**
Popularization of science makes an effort to imagine scientific ideas in such a way that everyone can understand the fundamental concept of science and their role in improving quality of our life. Pakistan Science Foundation aimed to acknowledge the outstanding service of youth in science & innovation competition at National and International level to strengthen the science culture in the society. In this regard, PSF organized an event on Youth recognition in June, 2021 in which cash prize was distributed among the eminent young scientists.
- **Participation of Pakistani Students in International Junior Olympiad**
PSF, also being a focal organization for IJSO, coordinated with the organizers for participation of Pakistani students in IJSO-21. This year International Science Olympiad will be held in UAE. The advertisement for "call for applications" was published in different national newspaper. The activities of this event will continue till next fiscal year.
- **Participation of Pakistani Students in 5th Belt and Road Teenager Maker Camp 2021**
The 5th Belt and Road Teenager Maker Camp & Teacher Workshop was organized during 2020-21 by the Children & Youth Science Center, China Association for Science and Technology (CAST) and Ministry of Science and Technology of the People's Republic of China.
- **International Contest of Creative Popular Science Video Works in Collaboration with World Organization for Science Literacy, People's Republic of China**
Pakistan Science Foundation in collaboration with World Organization for Science Literacy, People's Republic of China is jointly organizing Creative Popular Science Videos contest. The programme is under process and the approved contest advertisement will be uploaded on PSF Website.
- **A Series of Seminars on Plastic Waste Management and Inter-University Competition to Develop Low-Cost Plastic Waste Recycling Machine**
PSF, in collaboration with United Nations Educational, Scientific and Cultural Organization (UNESCO), planned to organize a series of seminars on plastic waste management and inter-university competition to develop low-cost, small scale and easily replicable plastic waste recycling machine for universities present in Islamabad Capital Territory (ICT). This initiative is supported by UNDP Pakistan, New World Programme and Coca Cola Foundation. The activities of this event will continue till next fiscal year.
- **Science Communication Workshop in Collaboration with Peshawar University will be held in September, 2021**
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 were organized in Islamabad, Khairpur and Quetta. Next workshop is planned to be organized 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 2020-21, a total of 179 research projects/concept papers in 10 scientific fields namely Agricultural Sciences, Biological Sciences, Biotechnology & Genetic Engineering, Chemistry, Computer Sciences/Maths, Earth Sciences, Engineering Sciences, Health Sciences, Environmental Sciences and Physics remained under active consideration. Among these, 61 were under process, of which, 3 projects costing Rs. 3.719 million were approved and an amount of Rs. 3.594 million was released to 4 new projects on account of 1st installments. Total 50 projects were on-going and an amount of Rs. 11.871 million was released on account of due installments and evaluation fee of these projects.

Based upon the results of 16 completed projects, 33 research papers were published in national/international journals. In addition, 07 Ph.D. and 16 M.Phil./M.Sc. (Hons) students secured their respective degrees while working as Research Associates in these completed projects.

- **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 2020-21, a total of 6 research projects/concept papers in R&D-Industry remained under active consideration. Among these, 04 were under process. Total 16 projects were on-going and an amount of Rs.0.8 million was released on account of due installments and evaluation fee of these projects.

Based upon the results of 7 completed projects, 5 research papers were published in national/international journals. In addition, 9 M.Phil./M.Sc. (Hons) students secured their respective degrees while working as Research Associates in these completed projects.

Moreover, under the Invention to Innovation Programme, financial grants of Rs. 0.2 million were provided to two proposals of inventions & innovations to Dr. Ahmad Kamal Hassan, GIK Institute, Topi, Swabi and Engr. Babar Abbas, University of Engineering & Technology, Taxila.

- **Competitive Research Programme (2020-21):**

The Competitive Research Programme (CRP) is a 5-year development programme of Pakistan Science Foundation to finance research projects under four streams viz., Individual Research, Consortium Research, Triple Helix Model and International Linkages at a total cost of Rs. 1964.500 Million. Out of 38 projects, 24 research projects have been funded and 14 are on-going.

- **18th Pak-China S&T Protocol:**

Ministry of Science & Technology, Pakistan signed S&T protocol with China and launched joint call under 18th S&T protocol. Federal Secretary, Ministry of Science & Technology chaired a meeting and shortlisted 13 research projects to be jointly funded under this call. These 13 projects were accorded final approval by Steering Committee.

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.

During the year 2020-21, 79 concept papers in the fields of natural sciences were received for processing. 26 project proposals costing Rs. 113.414 million were approved and amount of Rs. 51.033 million was released to these new projects on account of 1st installment. During the year, 64 projects were on-going and an amount of Rs. 5.466 million was released on account of due installments and evaluation fee of these on-going projects.

Based upon the results of 7 completed projects, 10 research papers were published in national/international journals. In addition, 05 Ph.D. and 13 M.Phil./M.Sc. (Hons) students secured their respective degrees while working as research associates in these completed projects.

- **International Linkages (IL) Programme**

During the year 2020-21, 3rd joint call with TUBITAK, Turkey and fourth joint call for proposals with NSFC, China were launched. More effective linkages were developed with international counter parts to benefit the scientific community of Pakistan. During the period, 74 projects remained ongoing under three calls with NSFC, China, two with TUBITAK, Turkey and two with MSRT. A total of 34 technical reports (semi-annual and annual) of ongoing projects were received and an amount of Rs. 28.5 million was released on account of due installment of already ongoing projects and first installment of newly initiated projects with NSFC, China. Chairman, PSF held various meetings with international counterparts to further expand the PSF activities at international scale.

- **Other Science Promotion Activities**

During the report period, an amount of Rs. 1.837 million was released to various institutions for organizing 17 conferences, seminars and workshops on important scientific topics and Rs. 0.1 million were released to 01 scientific societies/journals for their regular activities.

Science Talent Farming Scheme (STFS)

Development project “Science Talent Farming Scheme (STFS) for Young Students, Phase-I, Component-I (Revised)” was conceived by 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 year (December, 2015–December, 2020). Extension in the project period till 30.06.2022 has been approved by the competent forum, to complete all the activities/pending liabilities of the remaining batches of the project.

The scheme was envisioned to be implemented through the collaborative efforts of relevant existing institutions and Science enthusiasts in the public and private sector. Main goals of the STFS are:

- Attracting youth towards Science in early years of education
- Developing a competitive knowledge economy through value addition
- Improving the quality of Science and Technology education particularly in the Natural Sciences and Mathematics

Project Objectives:

- To identify the young students, interested and passionate towards science education through appropriate selection criteria like 3rd party evaluation via written test, computer based IQ test and interview.
- To groom and support the selected students all the way to the highest degrees by progressively exposing them to advancements in science and mathematics through inquiry based learning approach.
- Purchase of land and hiring of consultant for establishment of the National Science School for continuous support of the selected students up to F.Sc. level.
- To provide opportunities to the toppers from the selected students for visit to the world’s leading science and technology institutions and universities.
- To arrange training sessions for students/teachers on Inquiry Based Science Education (IBSE).

Implementation Strategy:

The project objectives will be achieved through the following processes and activities:

- Selection of 300 students, each year, through evaluation by a specialized testing agency (NTS etc.). Scientific aptitude test to be conducted in following three phases:
 - Specialized written/screening test
 - Paper Based IQ Test
 - Presentation on innovative ideas/Interview
- Scholarships @Rs.10,000/- per month, Tuition fee @Rs.10,000/- per year and hostel fee (where applicable) @Rs.10,000/- per year.
- Research projects to be undertaken by each student under supervision of university teacher/researcher.
- Visits to universities and S&T organizations both at national and international levels.
- Science lectures, Presentations, Film/Planetarium Shows and Hands-on activities through Mobile Science Labs.
- Interaction with eminent scientists.
- 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.

- Fund allocation for Year 2020-21: 60.00 million.

Achievements/Outputs:

- Selection and monetary benefits to 4 batches completed (total 1200 students).
- 5th batch provisionally selected.
- Pre-Qualification of travel companies completed on technical basis to arrange summer camps for 4th and 5th batch.
- Honorarium to 20 newly selected/already selected mentors @100,000 in total for supervision of STFS students in their research projects.
- Total 117 research projects of 4th batch students received in poster/report form.
- Procurement of office equipment/stationery items for STFS-PMU.

Outcome/Impacts:

- The project will 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.
- Development of a competitive knowledge economy through value addition.
- Improvement of the quality of Science and Technology education particularly in the Natural Sciences and Mathematics.

Planning & Development (P&D) Section

Since 1973, PSF has been providing 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 2000 to 2016.

During the FY 2020-21, the said activity was financed through non-development budget. An amount of Rs. 3.75 Million was allocated for this activity. One meeting of travel grant award committee was arranged on 16th October, 2020. In the meeting, 6 travel grant requests, duly received from Public Sector R&D Institutions and Universities were presented for consideration of the committee. After thorough evaluation, no applicant was recommended due to COVID-19 pandemic.

33 Scientific Societies were registered under Societies Act as well as with PSF. However, after the lapse of seven years between approval of Phase-I and Phase-II, most of the societies became inactive. 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, the registered scientific societies were able to manage some activities. Main achievements made under the project are:

- 14 Scientific Societies were financially supported in order to enable them to perform their scientific activities regularly.
- Funds were released to societies for organizing 18 National/International Science Conferences, Seminars, Symposia and Lectures on scientific topics.
- 40 issues of 10 Scientific Journals were partially supported.
- Maintained liaison with 2 International Scientific Societies/Scientific Councils.
- One new Society i.e. Pakistan National Heart Association (PANAH) was registered and supported.

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. 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. 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. International days are also observed.

PMNH has formed many national and international liaisons with 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.

Budget Allocation for 2020-21

Regular: Rs. 177.650.000 million (Non-Development).

Goals & 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 etc. 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, Cataloguing, Digitization:**
 - To collect, identify and catalogue the natural history specimens through field studies for developing a national repository of plants, animals, rocks, minerals and fossils for further scientific studies.
 - To document and display specimens in the form of attractive exhibits/films/documentaries to educate the masses about the natural wealth of Pakistan.
- **Presentations/Lectures:**
 - To address all the issues related to biodiversity, conservation, environment, wildlife and ecology.
- **Research Publications:**
 - To publish natural history books, research articles, field guides, monographs, popular articles, technical reports, bulletins, brochures, pamphlets etc. for the promotion of scientific research and public awareness.
- **Collaboration/MoUs:**
 - To establish 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:**
 - No. of Schools/Colleges/Universities and General Public visits in PMNH.

Performance/Outcomes

- **Training Courses:**
 - Attended online training course on Mariculture Technologies for Asia-Pacific Region hosted by “Belt and Road” Training Base for Mariculture Technologies from 21-25th September, 2020 at Qingdao, China.
 - Attended one-day national policy seminar on “Ecotourism for Rural Economy” on 19th November, 2020 at Akhter Hameed Khan National Centre for Rural Development (NCHRD), Chak Shahzad, Islamabad.
 - Participated as resource person in one-day training workshop on “Capacity Building of Wildlife Officers in Wildlife Surveys to Standardize Survey and Census” conducted by Ten Billion Tree Tsunami Programme/Green Pakistan on 26th February, 2021 in Lahore.
- **Trainings Conducted:**
 - Botanical Sciences Division (BSD) conducted training program with the scientists and staff of Southern Agriculture Research Institute/PARC and University of Karachi, Karachi on tissue culture, mushroom spawn production.
 - BSD conducted mushroom cultivation and mushroom tissue culture trainings for two members of the Agri Education of Pakistan, Faisalabad in November and December, 2020.
 - BSD conducted a training regarding spawn production, tissue culture and mushroom cultivation in January, 2021.
 - BSD organized a 5-day training in collaboration with Shaheed Zulfiqar Ali Bhutto Agricultural College, Dokri, Larkana on mushroom cultivation.
 - BSD conducted a 5-day training on cultivation of Mushroom Spawn from 27-31st March, 2021 in Muzaffarabad and surrounding areas.
- **Research Outcomes:**
 - **Field Works**
Researchers of Botanical Sciences Division (BSD), Earth Sciences Division (ESD) and Zoological Sciences Division (ZSD) conducted numerous field works in all related areas of the country for collection of plants, animals, insects, rocks, fossils and minerals specimens for the purpose of research and public education.
 - **Collection, Cataloguing, Digitization of Natural History Specimens**
54,297 natural history specimens were collected during the entire field works and catalogued & preserved in the PMNH repositories as a reference material. Meanwhile, 1.5 million natural history specimens are already present in the PMNH repositories.
 - **Research Publications**
Scientists of PMNH remain engaged in the research on specimens of plants, animals, rocks, fossils and minerals. Outcome of this research is published in the national and international journals in the form of research papers & articles, natural history books, monographs, technical reports and popular articles etc. During the period, 35 research papers on Botany, Geology and Zoology were published in National & International Journals by PMNH researchers. 03 Technical Reports were also submitted under Sustainable Forest Management (SFM) Programme in collaboration with Ministry of Climate Change.
 - **Research Projects (National & International)**
PMNH developed mutual collaboration for joint research on National and International level and successfully initiated following research projects:
 - PMNH collaborated with Natural Science Foundation of China (NSFC), Beijing, China on an International joint research project titled “Cooperative development of an innovative auto-ID platform for the beetles from China and Pakistan”.

National & International Liaison

PMNH established liaison with similar institutions both within and outside Pakistan for sharing of knowledge and expertise. PMNH has already developed liaison with the following National and International Institution for joint venture:

- Ozone Cell, Ministry of Climate Change
- National Institute of Folk & Traditional Heritage (Lok Virsa)
- University of Sindh, Jamshoro
- University of Haripur, Hazara

- National Museum of Natural History, Paris, France
- Beijing Museum of Natural History, Beijing, China

In 2020-21, following activities were performed for research and mutual cooperation:

- PMNH facilitated Ph.D., M.Phil. M.Sc. (Hons) students of different Universities for completion of their research work.
- Highlighted the effects of climate change on Indus Blind Dolphin in Pakistan through international news agency.
- Delivered lecture on the “Silk Route Flora Diversity and its utilization by local communities” in an online meeting organized by IvCOM, under the umbrella of ICOM, Pakistan on 17.06.2021.
- BSD scientist delivered a lecture on “International Symposium on Current Trends and Future Perspectives in Medicinal Plants Research” in an International Webinar organized by Women University, Rawalpindi in February, 2021.
- Officials from BSD attended a training regarding olive production technologies organized in Islamabad by NARC in January, 2021.
- Scientists of BSD participated in an online Pak-China Science Workshop on Use of New Technology for Locust Control, organized by PASTIC/PSF on 20.08.2020.
- BSD participated in a webinar on “Impact of COVID-19 in the ECO region and what does it hold for the future of the ECO Member Countries” held on 10.08.2020.
- BSD attended an online National Consultation on “Assessment of the status of implementation of the Pakistan National Biodiversity Strategy and Action Plan (NBSAP) in relation to Invasive Alien Species (IAS)” in collaboration with Ministry of Climate Change and CABI on 27.08.2020 to represent MoST.
- BSD attended a two-day online International Conference on Smart Plant Protection organized by Mian Muhammad Nawaz Sharif Agriculture University, Multan in January, 2021.
- BSD delivered a lecture to the community of Abbal-Moriwal villages regarding onsite preservation of 609 years old Banyan tree at Midh Ranjha.
- BSD attended two-day online certificate course titled “Basic Plant Tissue Culture Techniques” jointly organized by COMSTECH, ICCBS and PABIC, Karachi from 16-17th February, 2021.

Services to Other Organizations

PMNH provided services to the students of BS, MS, M.Phil. and Ph.D. belonging to the various universities of Pakistan in their research and thesis work and also supervised their research activities. Students from the following universities were provided assistance as a co-supervisor in their research work:

- Quaid-e-Azam University, Islamabad
- University of Haripur, Hazara
- Bahria University, Islamabad
- National Center of Excellence in Geology, University of Peshawar
- National University of Sciences and Technology, Islamabad
- Pakistan Institute of Engineering & Applied Sciences (PIEAS), Islamabad
- COMSATS University, Islamabad
- PMAS-University of Arid Agriculture, Rawalpindi
- Sindh Agricultural University Sub-campus, Umerkot, Sindh

Design and Display Activities of PMNH for Informal Education

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

- Invasive Plant Species Diorama.
- Gems & Minerals of Pakistan.
- Display of Asian Elephant (completed).
- Six specimens including Asiatic Black Bear, Puma, Lioness, Common Leopard & Mouflon Sheep has been stuffed and shifted to Ungulate Carnivore Diorama.

Establishment of following new Displays/Exhibits/Dioramas is under process:

- Climate Change Diorama.
- Ocean Diorama.

Educational Activities

- PMNH also facilitates visitors, National and International delegations and students of schools, colleges and universities during their visit to the PMNH display galleries by providing guided tours. Large number of people including students of schools, colleges and universities belonging to various regions of Pakistan visited PMNH display galleries. In 2020-21, 109,311 people visited the museum including 33,118 students, 49,348 general public, 75 foreigners and 26,770 children (below the age of 5 years).
- For promotion and publicity, invitation letters were sent to 800 public and private schools of Rawalpindi district inviting them to arrange their student group trips to PMNH.

Information Technology Services

Public Services Division (PSD) is also providing I.T. services to the Scientific Divisions of the PMNH. Detail of activities of IT Services is given below:

- Prepared conceptual document for PMNH Automation.
- Prepared an overview of Automation Software for PMNH staff.
- Modified the code of Payroll Management System to update the system from PHP 5.6 to PHP 7.3 and fixed errors and warnings during testing phase.
- Installed display screens at surveillance room.
- Shared news and information regarding PMNH through Social Media (Facebook).

Pakistan Scientific & 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.

The non-development budget of PASTIC for the year 2020-21 was Rs. 186.297 million.

Mission

PASTIC caters to S&T Information needs of R&D and Industrial sector through Anticipatory and Responsive Information Services.

Vision

To be known as a leading national organization of Scientific & Technological information resources for promoting & supporting Research & Development for sustainable socio-economic development.

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.

Goals/Targets along with Performance/Future Plans and Budget Alignment

Goal/Target	Performance Indicators	Performance Outcomes/Output		Future Plans 2021-22	Budget Allocation (2020-21) Rs. 6,000,000/-
		Planned Targets 2020-21	Achieved Target 2020-21		
Disseminate S&T/R&D information through contemporary information services/tools/publications	Document Supply & Bibliographic Service				Rs. 760,810
	• Number of S&T documents supplied to R&D Organizations, Universities, Professional Colleges, Hospitals, Industry R&D Workers, Students & Researchers	20,000	35,891	50,000	
	• Number of Users/Clients served	12,000	1,555	2,000	
	• Number of references/abstracts supplied & literatures search conducted	10,000	2,350	5,000	
	• Technology Roundup (A News Bulletin-Online) Number of Issues brought out annually	6	6	6	
• Pakistan Journal of Computer and Information Systems (PJCIS) (A Peer reviewed Open Access bi-annual publication) Number of Issues brought out annually	2	0	2		

Goal/Target	Performance Indicators	Performance Outcomes/Output		Future Plans 2021-22	Budget Allocation (2020-21) Rs. 6,000,000/-
		Planned Targets 2020-21	Achieved Target 2020-21		
Promotion of R&D based industrial development	<ul style="list-style-type: none"> • Technological Information Services Seminars, Workshops Symposia & Exhibitions organized under University-Industry Partnership Programme and Technology & Innovation Support Centre in collaboration with IPO, Pakistan 	16	3	10	Rs. 140,000
Strengthen National Science Reference Library	<ul style="list-style-type: none"> • PASTIC National Science Reference Library Number of clients served 	14,000	3,847	5,000	
Develop a National S&T/R&D Information Repository of indigenous S&T information resources (databases)	<ul style="list-style-type: none"> • IT Support Service and S&T/R&D Databases Number of Abstracts produced and indexed (Abstracting and Indexing Journals/References Publication i.e. PSA Food and Agricultural Sciences; PSA Biochemistry & Biotechnology; PSA Animal & Veterinary Sciences; PSA Earth, Environment & Energy etc.) 	19,000	8,233	12,000	Rs. 5,050,821
	<ul style="list-style-type: none"> • Database of Industry of Pakistan 	8,000	8,200	8,500	
	<ul style="list-style-type: none"> • Database of Pakistani Commercializable Products/Indigenous Products 	800	830	850	
	<ul style="list-style-type: none"> • Database of Pakistani Industrial Problems and Proposed Solutions 	80	50	80	
	<ul style="list-style-type: none"> • Database of Industry-Academia Linkages 	80	40	80	
	<ul style="list-style-type: none"> • Database of Foreign Industries 	100	50	70	
	<ul style="list-style-type: none"> • Database of Universities/Institutes of Pakistan 	200	210	220	
	<ul style="list-style-type: none"> • Database of Local & International Industrial Linkages 	50	100	150	
	<ul style="list-style-type: none"> • Union OPAC (Books of 11 libraries) Number of records entered 	500,000	100,000	200,000	
	<ul style="list-style-type: none"> • Energy Publications related to Pakistan Number of records entered 	600	450	450	
	<ul style="list-style-type: none"> • Climate Change Publications related to Pakistan Number of records entered 	500	500	500	
<ul style="list-style-type: none"> • Scientific Books Published by Pakistani Authors Records entered 	3,000	2,050	2,100		
Facilitate Printing of S&T/R&D Publications of S&T Organizations	<ul style="list-style-type: none"> • PASTIC Publication and Printing Services Number of Printing jobs completed 	170	96	100	
Capacity/skill development of researchers, Information Professionals & entrepreneurs	<ul style="list-style-type: none"> • PASTIC Trainings Number of Library and Information Professionals/Researchers trained in the area of ICT/Research Tools 	1,000	2,269	1,500	Rs. 64,954

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 for sustainable development of Pakistan. 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. Current major activities 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.

Technical training centers of PCSIR at Karachi, Lahore, Peshawar, Quetta and Daska are providing 3-4 years diploma certificates. More than 300 students are being awarded diplomas/degrees annually and most of them get jobs immediately.

Science Wing

- **Research & Development:**
 - **Progress & Performance (Outcome) and Targets of PCSIR in Key Performance Indicators (KPIs)**

S. No.	Performance Indicators	2020-21	
		Targets	Achieved
1.	Processes Developed	190	187
2.	Processes Leased out	70	80
3.	Patents Filed	55	20
4.	Patents Obtained	30	03
5.	Students Supervised	950	718
6.	Consultancies Provided	400	889
7.	Technical/Feasibility Reports	170	288
8.	Papers Published (International)	190	124
9.	Papers Published (National)	80	39
10.	Analytical Equipment Developed	170	253
11.	Exhibitions/Conferences/Seminars Organized	95	93
12.	Workshops/Training Organized	150	115
13.	MoUs Signed	50	25
14.	Interaction with Industries (Visits)	1,200	1,833
15.	No. of Services Provided	38,000	45,686
16.	No. of Clients Served	14,000	16,394

- **Major Initiatives:**
 - **Cultivation & Processing of Medicinal & Industrial Cannabis on Experimental Fields and Establishment of Testing and Product Development Facilities**

The main objectives are to develop experimental fields/land for cultivation of industrial cannabis and to conduct R&D on processing of industrial cannabis and development of high-value commercial products. This initiative would enable PCSIR to provide state-of-the-art analytical services and R&D support to the exporters and industry based on cannabis products. PSDP titled “Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields and Establishment of Testing and Product Development Facilities (PCSIR & Arid Agriculture University)” is under process. The project aims to develop indigenous resources and export enhancement.

- **Establishment of Gems Cutting and Polishing Centre at PCSIR, Skardu, Gilgit-Baltistan**
The purpose for establishment of these technical facilities is to undertake preliminary cutting and polishing of gems, precious & semi-precious stones. This will facilitate SMEs in value addition of gems and mineral resources. Ultimately, these newly established centres will contribute to expedite and promote quality control/ quality assurance services and play a vital role in fostering the region to the path of prosperity and self-sustainability. So far, 2 batches of 40 trainees have received three months training on Gems/Minerals Cutting and Polishing.
- **Up-Gradation of Food Processing & Analytical Laboratory**
A series of trainings on Fruit Handling, Processing, Preservation and Dehydration Techniques was successfully conducted during the fiscal year 2020-21. More than 100 local farmers were trained.
- **Establishment of Precision Systems Training Centre (PSTC), Gwadar, Balochistan**
Gwadar is an important city of Pakistan with natural port. It is emerging as a hub for commercial, economic and social activities as part of China Pakistan Economic Corridor (CPEC). A development project titled: “Establishment of Precision Systems Training Centre (PSTC)” is being executed by PCSIR. This training centre at Gwadar will not only create jobs but will also play a vital role in the economic development by providing skilled manpower to the local industries.
- **Role of PCSIR in the Wake of COVID-19 Pandemic**
PCSIR Laboratories, keeping in view the available resources, have taken the following initiatives:
 - **Product Development**
 - Hand Sanitizer developed and supplied.
 - Disinfectant Spray developed and supplied.
 - Walk-Through Gate/Tunnel Disinfectant developed & supplied.
 - Foot Dispenser produced & supplied.
 - **Quality Assurance Services**
In order to ensure the quality of Hand Sanitizers & Personal Protective Equipment (PPE) against COVID-19, PCSIR Laboratories have provided quality assurance related services to different clients from public & private sector organizations for:
 - Sanitizer/Disinfectant Testing
 - Personal Protective Equipment (PPE) Testing
 - Walk through Gates, Corridor and Tunnel Testing
- **Interaction with Public Sector Organizations:**
Organizational linkages with other public sector counterparts are being enhanced to share human & material resources with an aim to create synergies for the development of industrial sector and to meet the national strategic requirements.
 - **Collaboration with Defense Sector Organizations:**
 - Pakistan Ordnance Factories (POF), Wah
 - Pakistan Aeronautical Complex (PAC), Kamra
 - Heavy Industry Taxila (HIT)
 - **Human Resource Development in Collaboration with Federal/Provincial Vocational Training Authorities:**
Apart from the regular diploma and certificate courses, PCSIR Laboratories/Training Institutes are conducting various trade related training courses in collaboration with following Federal/Provincial Vocational Training Authorities as per demand of the local industry:
 - National Vocational & Technical Training Commission (NAVTTTC)
 - Punjab Skill Development Fund (PSDF)
 - Technical Education & Vocational Training Authority (TEVTA)
 - FATA Development Authority (FDA)
 - **PCSIR Leather Research Centre, Karachi and Al-Khidmat, Karachi jointly organized a Seminar on “Preservation of Hides & Skins and Transportation” on the Eve of Eid-ul-Azha**
A seminar on “Preservation of Hides & Skins and Transportation” was organized by PCSIR Leather Research Centre, Karachi in collaboration with Al-Khidmat, Karachi on 21st July, 2020. Dr. Kashif Pervez, Principal Scientific Officer thoroughly discussed various types of leather and techniques for leather processing, preservation of hides & skins and transportation. All participants appreciated the efforts of PCSIR Leather Research Centre.

- **Two Days National Symposium on “Integrated Solid Waste Management”**
PCSIR Laboratories Complex, Karachi organized a national symposium on Integrated Solid Waste Management on 3rd and 4th February, 2021 at Karachi Chamber of Commerce and Industries. This symposium was a joint effort of SEGMITE, KCCI, SEPA, PSF and PCSIR. Dr. Sofia Khalique Alvi was symposium Convener. The Symposium was inaugurated by Barrister Murtaza Wahab, Advisor to Chief Minister, Sindh on Environment, Climate Change and Coastal Development, Government of Sindh.
- **CAD–CAM Training Program under the Prime Minister Kamyab Jawan Program “Skill for All” in Collaboration with NAVTTC**
PCSIR Labs Complex, Karachi successfully conducted six months CAD-CAM Training Program, for two batches of total 50 trainees, in collaboration with NAVTTC under the Prime Minister Kamyab Jawan Program “Skill for All”.
- **Commercial Mushroom Farming Business Training Workshop**
Three days training workshop on “Commercial Mushroom Farming Business” was arranged on 12th to 14th February, 2021 at PCSIR Laboratories Complex, Karachi in collaboration with O’Mushroom & Kissan Training Institute. During the workshop, mushroom growing technologies and the commercial aspects of mushroom farming in Pakistan were thoroughly discussed. The aim of the workshop was to create awareness among SMEs regarding utilization of indigenous resources for revenue generation.
- **National Level Recognition of the Research Achievements:**
 - **Tamgha-e-Imtiaz in the field of Synthetic, Medicinal, Organic and Natural Product Chemistry**
Dr. Shahnaz Perveen, Director General, PCSIR Laboratories Complex, Karachi received *Tamgha-e-Imtiaz* from the Honourable Governor of Sindh on behalf of His Excellency, the President of Islamic Republic of Pakistan. This prestigious award was conferred in recognition of her outstanding performance and achievements in the field of “Synthetic, Medicinal, Organic and Natural Product Chemistry”.
 - **Presidential Award for Technology**
Dr. Asma Saeed, PSO, PCSIR Labs Complex, Lahore received a Presidential Medal for Technology on 27th August, 2020. The medal and certificate was awarded in recognition of her outstanding achievements and contribution in the field of Science & Technology.

Technology Wing

- **Development Activities:**
 - **Summary of PSDP Projects during 2020-21**
 - Ongoing Projects : 04
 - Newly Approved Projects : 09
 - Completed Projects : 01
 - **Ongoing PSDP Projects during 2020-21**

S. No.	Project Name	Physical Progress
1.	Establishment of Technical Training Centre for Precision Mechanics and Instrument Technology, PSTC, Gwadar, Balochistan	<ul style="list-style-type: none"> • Admin and Academic Block 80%, Workshop Building 80% and Hostel Building 90% completed. • Boundary Wall completed & watch towers are 80% completed. • Underground Tank (UGT) completed. • Supply and Installation of Furniture & Fixture 35% completed. • Machinery and equipment of Rs. 60 Million has been procured (20% completed).
2.	Up-gradation of Medicinal Botanic Centre as National Centre for Herbal Medicine, PCSIR Labs. Complex, Peshawar	<ul style="list-style-type: none"> • Completed procurement of 46 Lab equipment and 12 chemicals and consumables. • Civil works: 2000 Sq.ft. renovation has been completed. • Recruitment under process. • Revised PC-I submitted to MoST

S. No.	Project Name	Physical Progress
3.	Up-gradation of Polymer & Plastics Laboratory at PCSIR Laboratories Complex, Lahore	<ul style="list-style-type: none"> • 33 laboratory equipment, 49 Items of laboratory apparatus and 18 items of chemicals/solvents have been procured. • Procurement of office equipment has been completed. • Procurement of office/laboratory furniture has been completed. • Renovation of 5 laboratories has been completed. • Procurement of Books and Standards at the cost of Rs. 1.5 million has been completed
4.	Up-gradation of Machinery, Equipment and Renovation of Buildings of IIEE & PSTC, Karachi	<ul style="list-style-type: none"> • 37 Computers Systems for Computer labs at IIEE & PSTC, Karachi have been procured. • Furniture and fixture of Rs. 3.1 million have been procured. • Trainers (Instrumentation and measurement, electrical machines and feedback control) and General Labs equipment has been procured. • Admin Approval was issued on 15.10.2020

○ **PSDP Projects Completed during 2020-21**

S. No.	Project Name	Objectives	Outcome/ Impact
1.	Up-gradation of Food Processing & Analytical Laboratory and Establishment of Gems Cutting and Polishing Centre at PCSIR, Skardu, Gilgit-Baltistan	<ul style="list-style-type: none"> • Establishment of Gemstones Cutting & Polishing Centre for facilitation for the exporters regarding cutting, polishing and support to miners and traders to curb the wastage at production and marketing level. • Up-gradation of existing fruit processing /preservation centre for value addition & minimization of post-harvest losses of fruits and vegetables of Gilgit-Baltistan. • Up-gradation of existing fruit processing and analytical laboratory for providing advance testing facilities of water, foods and fruits products. 	<ul style="list-style-type: none"> • The project was successfully completed on 30.06.2021. • Two batches of total 40 trainees have received three months training on Gems/Minerals Cutting and Polishing under project "UPGCPC". • Imparted training to more than 100 farmers on "Fruit processing, handling, dehydration techniques and preservation".

○ **Newly Approved PSDP Projects during 2020-21**

S. No.	Title of Project	Approved by
1.	Establishment of Technical Training Centre for Precision Mechanics and Instrument Technology, PSTC, Gwadar, Balochistan	DDWP 09.11.2020
2.	Gene Editing of Biological Agents for Nutritional Biochemical and Therapeutic Purpose	DDWP 10.12.2020

S. No.	Title of Project	Approved by
3.	Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields and Establishment of Testing and Product Development Facilities (PCSIR & Arid Agriculture University)	DDWP 06.05.2021
4.	Development of Computer Controlled Fermentors and Production of Bio-chemicals & Bio-products	DDWP 06.05.2021
5.	Establishment of Material Resource Center and Development of Additive Manufacturing & Reverse Engineering Center at PCSIR	DDWP 27.05.2021
6.	Research, Development and Innovation in PCSIR	DDWP 27.05.2021
7.	Data Repository of Scientific Instrumentation	DDWP 27.05.2021
8.	Digital transformation, strengthening and automation of PCSIR	DDWP 27.05.2021
9.	Medical Equipment & Devices Innovation Center (MEDICen)	DDWP 27.05.2021

- **Human Resource Development (HRD) Programs:**

For the development of human resource, there are 6 technical training centres located in different provinces. The detail of these training centres is given below:

- Institute of Industrial Electronics Engineering (IIEE), Karachi
- Precision Systems Training Centre (PSTC), Karachi
- Precision Systems Training Centre (PSTC), Lahore
- Precision Systems Training Centre (PSTC), Peshawar
- Precision Systems Training Centre (PSTC), Quetta
- Cast Metal and Foundry Technology Centre (CM&FT), Daska

S. No.	Technical Training Centre	Courses	No. of Seats (2020-21)
1	IIEE, Karachi	B.E. Industrial Electronics	50
2	PSTC, Karachi	03 Years DAE in Mechanical Technology Specialization in Precision Mechanical & Instrumental Technology	48
		03 Years DAE in Instrumentation & Process Control Technology	30
		04 Years DAE in Mechanical Technology Specialization in Dies & Mould Technology	18
		04 Years B.Tech Program in Mechanical Technology	40
3	PSTC, Lahore	03 years DAE in Mechanical Technology Specialization in Precision Mechanical & Instrumental Technology	40
		04 Years DAE in Mechanical Technology Specialization in Dies & Mould Technology	40
4	PSTC, Peshawar	03 years DAE in Mechanical Technology Specialization in Precision Mechanical & Instrumental Technology	50
		04 Years DAE in Mechanical Technology Specialization in Dies & Mould Technology	50
5	PSTC, Quetta	DAE in Mechanical Technology Specialization in Precision Mechanical & Instrumental Technology	30
6	CM&FT, Daska	03 Years DAE in Mechanical Technology Specialization in Cast Metal & Foundry Technology	30

Medium Term/Future Plans

- To execute demand driven R&D projects with financial support of MoST and relevant industry.
- To extend the scope of accredited parameters for cement, Halal foods, food grade packaging materials, rapid testing of SPS organisms, calibration etc. for making Pakistani products competitive in the international markets through a robust system of quality control.
- Strengthening of Triple Helix model of innovation which refers to a set of interaction between research, academia and Industry.
- To strengthen marketing cell for commercializing processes, products and technologies.
- Institutional strengthening, development of infrastructure and manpower for industry-oriented research & development in emerging fields e.g. nanotechnology, biotechnology, biosensors etc.
- Establishment of new R&D disciplines which may include the following:
 - Up-gradation of machinery, equipment and renovation of buildings of IIEE & PSTC, Karachi
 - Up-gradation of Medicinal Botanic Centre as National Centre for Herbal Medicine at PCSIR Labs. Complex, Peshawar.
 - Up-gradation of Polymer & Plastics Laboratory at PCSIR Laboratories Complex, Lahore.
 - Cultivation and processing of medicinal and industrial cannabis on experimental fields and establishment of testing and product development facilities.
 - Data Repository of Scientific Instrumentation to develop a nation-wide system to facilitate those research centers and universities which do not have scientific instrumentation of their own.
 - Development of Computer Controlled Fermentors and Production of Bio-chemicals & Bio-products.
 - Implementation of new digital and information technology and systems, such as enterprise-wide information systems, data analytics, knowledge repository, to enhance efficiency and effectiveness of PCSIR.
 - Establishment of Material Resource Center and Development of Additive Manufacturing & Reverse Engineering Center.
 - Establishment of an advanced gene editing facility at PCSIR along with associated equipment and systems that could be used for a wide range of purposes such as nutritional and therapeutic purposes, leading to indigenous commercial/industrial manufacturing.
 - Establishment of Medical Equipment & Devices Innovation Center (MEDICen).
 - Establishment of an RD&I Programme facility for a variety of purposes in the domain of scientific/technological/industrial research such as new technology initiatives, cutting-edge/advanced R&D, commercialization, digitalization, marketing, industrial-business linkups/partnerships etc.
 - Up-gradation of Calibration Centre capabilities at PCSIR Labs Complex, Peshawar.
 - Up-gradation of Halal Authentication Labs at PCSIR Laboratories Complex, Lahore, Karachi and Peshawar.
 - Establishment of E-library for advanced scientific literature.
 - Capacity building as a Proficiency Testing provider in the areas of water, waste water, fuel, heavy metals and minerals.
 - Enhancement of the capability of Leather Research Centre (LRC) to comply with the guidelines of ZDHC, LWG, REACH & CE Certification to facilitate the export oriented leather industry.
 - Establishment of PCSIR Laboratories Complex, Multan.

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 to regulate the quality of engineering education and the practice of engineering and technology.

PEC has its Headquarter in Islamabad & regional and branch offices in various cities of the country. 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 a term of three years. Composition of the PEC Governing Body is as below:

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

Major Functions

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, 2021, total number of engineering programs being offered in the country in public and private sectors are more than 414 in 155 HEIs based on four years Bachelor program after 12 years of schooling/education.

Location	Total HEIs	Level-I	Level-II	Total Engg. Programs (Level-I & II)
Islamabad	27	19	34	53
Punjab	71	104	77	181
KP	21	25	32	57
Sindh	31	54	45	99
Balochistan	2	14	2	16
AJ&K	3	8	0	8
Total	155	224	190	414

- **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.

- **Goals and Targets:**

- Global recognition/equivalence of engineering qualifications through Washington Accord (WA).
- Global acceptance/recognition of Pakistani engineers through International professional Engineers Agreement (IPEA).
- Post-Washington Accord (WA) signatory status Scenario-International Conference of Engineering Institutions for benchmarking/standardization of Engineering Education, Challenges and their Solutions.
- Capacity Building of Faculty from HEIs and the PEC Program Evaluators (PEVs) to implement Outcome Based Education and Assessment System of Accreditation (OBE/OBA) in-line with Washington Accord guidelines and international best practices.
- Curriculum Development/Revision by PEC in support of PEC Act and Bye-Laws in-line with WA of IEA guidelines.
- Establishment of National Engineering Academy for promoting professional engineering activities.

- **Activities:**

In order to promote engineering education, PEC has been involved in following national and international activities:

- **3rd PEC International Deans' Conference of Engineering Institutions: Engineering Education-Reshaping the Economy**

PEC organized 3rd International Deans Conference of Engineering Institutions, on 7-8th April, 2021, through Online/Virtual Mode with the main theme of "Engineering Education: Reshaping the Economy" and 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.



- **International Engineering Alliance Meetings (IEAM)**

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. IEAM-2021 was held online from 21-26th June, 2021. The main objective of the meeting was to discuss policy matters on Graduate Attributes & Professional Competency Profile (GAPC), IEA virtual verification and periodic reviews of signatories, virtual accreditation and accreditation of HEIs in jurisdiction of other signatories. Mentoring progresses and annual reports of the signatories were also presented. Signatories used their voting right for the election of Chair and Deputy Chair, IPEA. The active role of PEC and contribution towards international practices, policy making and highlighting various topics of concern regarding engineering education was appreciated at the level of various IEA forums.

- **Mentoring of Engineering Board Kenya (EBK) & ETEC-NCAAA, Saudi Arabia**

Engineers Board of Kenya (EBK) approached PEC through WFEO for their mentoring towards WA Signatory Status. Saudi Arabia also approached PEC for their mentoring and nomination as a provisional signatory. PEC held several mentoring sessions with Kenya and Saudi Arabia towards attaining WA provisional signatory status.

- **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. 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.

- **PEC-CAST Progress towards Mutual Recognition Agreement (MRA)**
China Association for Science & Technology (CAST) approached PEC in June, 2019 to cooperate and promote mutual recognition of substantial equivalence of engineering capacity standards between the two organizations. In this regard, a Memorandum of Understanding (MoU) was signed between PEC and CAST on 8th November, 2019 at PEC HQ, Islamabad. The purpose of the MoU was to establish a bilateral cooperation and exchange mechanism for engineering capacity building, improve the quality of engineering education and talents to facilitate the mutual recognition of engineers of both countries, in line with the principle of mutual benefit and win-win situation. Both PEC and CAST are Signatories of the Washington Accord (WA) which covers substantial equivalence of engineering qualifications among the signatories. However, Professional Practice/Registration of engineers does not come under the scope of WA Accord. Therefore, it was agreed that a Mutual Recognition Agreement (MRA) would be worked out between the two counterpart organizations and to work together to formulate procedures/criteria for further implementation, if feasible. Moreover, a Working Mechanism for China-Pakistan cooperation on Mutual Recognition of Engineering Qualifications was developed, elaborating the tasks and responsibilities to formulate the MRA. Detailed discussions were held between both counterparts that lead to consensus on designing the MRA for bilateral benefit through exchange of Professional Engineers for CPEC projects.
- **FEIIC Engineers Register (FER)**
PEC is member of the Federation of Engineering Institutions of Islamic Countries (FEIIC) since 2009. FEIIC, established in May, 1989, is an international non-profit professional organization, with the aim of fostering cooperation in engineering education, research and professional practice in the Islamic Countries. PEC has been extensively contributing to all relevant forums of FEIIC and has been involved in all its activities/projects including EQAPS project, formulation of the documentation for FEIIC Engineers Register (FER), Madinah Accord and Makkah Accord. The FER was inaugurated under Makkah Accord in 2019 to register Professional Engineers to facilitate cross-border mobility among the member countries resulting in enhanced job opportunities for engineering professionals and providing a database of relevant professionals for engineering companies. FER Committee was established in 2019 including PEC along with BEM, Malaysia and was assigned the task to develop an FER online portal and database.

Registration Department (Engineers)

Registration is mandatory to practice engineering profession across the 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). PEC registered 23,209 engineers of various engineering disciplines of different universities during the period.

Data of Engineers From 1st July, 2020-30th June, 2021		
Sr. No.	Description	Count
1	Engineers Registered as RE.	23,082
2	Engineer Registered as PE.	127
3	Male Engineers Registered.	20,827
4	Female Engineers Registered.	2,382

- **Goals & Targets:**
 - Online Registration (New/Renewal) as per international standards and best practices.
 - Complimentary Registration for fresh engineering graduates only.
 - Biometric verification of engineers for updating their profile.

- Archiving of engineers data.
- Registration of International Professional Engineer (Int. P. Engr.).

Registration Department (Constructors/Operators & Consultant)

PEC 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 PEC. 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 a standard license. However, foreign Consulting Engineering firms are granted specific projects or consultancy works which need expertise and specialized technology, not available with Pakistani Consultants as per Conduct & Practice of Engineers Bye-laws, 1986.

Status of Firms (as on 30th June, 2021)

Sr. No.	Facilities	Total Registration	Active Firms (As on 30th June 2021)
1	Constructors	94,470	31,033
2	Operators	1,019	248
3	Consultants	2,114	742
4	Foreign Firms	206	49

- **Goals & Targets:**

- Registration/Renewal along with a variety of miscellaneous cases pertaining to 25,000 active constructors/operators and consultants firms/companies.
- Successfully coping with difficulties/obstacles posed by COVID-19 through effective improvisation and re-adjustment of Constructor/Operators and Consultants registration procedures.
- Extending relief packages to alleviate the difficulties of constructors/operators and consultants being faced in terms of financial and procedural areas due to COVID-19.
- Holding regular meetings of Enrolment Committee for disposing-off the contractor cases even in hard situation under COVID-19.
- Simplification of Application Forms and reduction in documentation related with registration/allied cases of contractors.
- Extension in validity of contactors' licenses for a period of over 9 months, thus addressing their Corona driven difficulties.

Continuing Professional Development (CPD) Department

PEC, under CPD Bye-laws, is working for the professional growth and skill enhancement of ever growing engineering community. Under PDE Bye-laws, the CPD activities and Engineering Practice Examination (EPE) are two distinct parts of professional growth and assessment to get the title of PE for Registered Engineers. 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, trainings, workshops, research publications, professional memberships, Member of any Technical Committee etc.) for the ultimate benefits 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 engineers.
- Nominations are also sought from potential organizations.
- **Strategies adopted during COVID to achieve targets:**
 - Online course facilities were provided for the engineers as live webinars, recorded webinars, self-learning webinars and free course from COURSERA.
 - Convinced PEBs for online activities and free online webinars for engineers.
 - Motivated, registered and encouraged Professional Bodies already managing online courses.
- In 2020, 44 CPD activities (31 physically and 13 online) were conducted by PEC in which 4604 engineers participated (1767 physically and 2837 online).
- **Professional Engineering Bodies (PEBs) and CPD Activities conducted by PEBs:**

Sr. #.	Professional Engineering Bodies (PEBs)	Nos.
1	Engineering Universities/Professional Engg. Institutions	109
2	Engineering Departments/Organizations	62
Total		171

Statistics of CPD Activities Conducted by PEBs			
Sr. No.	Year	No. of Courses	No of Participants
1	2020	386	10,355
2	2021	106	3,246

- **Engineering Practice Examination (EPE):**

Statistics of EPE				
S.#	EPE	Appeared	Qualified	% age Qualified
01	Fall-2020	467	270	57.82
02	Spring-2021	521	375	71.97

- **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” for enhancing management skills of the engineers (presentation skills, time management, project management, leadership etc.).
- **VoE Web Channel**
PEC has launched a non-political non-commercial YouTube channel/Web channel titled “Voice of Engineers (VoE)”. VoE studio was established in November, 2020 through which eminent engineers and renowned experts will share their professional experience and knowledge.

Think Tank Department

PEC is mandated to provide ‘Assistance to the Federal Government as a Think Tank’ on engineering issues under section 8(1) of PEC Act, 1976. For this purpose, Think Tank constituted sub-committees on various sectors like Water, Energy, Telecommunication, Building & Infrastructure etc.

- **Development of Building Code of Pakistan:**
PEC, in collaboration with World Bank, National Disaster Risk Management Fund (NDRMF) and NED University of Engineering & Technology, Karachi, arranged a National Consultation Workshop as a first step towards the revision and for updating the Building Code of Pakistan (2007). In parallel, PEC also entered into “ICC Development License Agreement” in collaboration with International Code Council (ICC) and obtained international copyright permission for utilization of “2021 International Building Code” as resource material/base document for the development of updated Building Code of Pakistan (2021). The PEC Task Force comprising of eminent professional engineers and allied professionals, after a robust exercise, carried out technical processing, review/editing as derivative work and successfully developed Building Code of Pakistan (2021). In this regard, PEC in collaboration with the World

Bank will launch this updated Code in December, 2021. Subsequently, both organizations will also organize the national level workshop on Building Code of Pakistan (2021) for greater dissemination of information about the updated Code among Authorities Having Jurisdictions (AHJs) across the country.

- **Development of updated/revised Pakistan Standard Form of Bidding Documents:**

PEC being the statutory regulatory body has been entrusted to regulate engineering profession. As per PEC Act 1976, one of the important prerogative functions of PEC is stated under Section 8: Clause (p) “establishing standards for engineering contracts, cost and services”. Accordingly, PEC carried out development of first-ever “country specific” procurement documents to regulate and streamline hiring of engineering consultancy services and procurement of works by taking onboard the employers, constructors and consultants along with the relevant stakeholders including provincial and federal entities i.e. WAPDA, NESPAK, Planning Commission, FIDIC etc. and notified first ever Standard Form of Bidding Documents-Civil Works in 1992.

The Planning Commission of Pakistan promulgated “PEC Standard Form of Bidding Documents (2002)” on 21st August, 2002. PEC once again revised/updated “PEC Standard Form of Bidding Documents (2007)”, which harmonized with “FIDIC (1987)” and “PPRA Rules” in 2007. Accordingly, ECNEC and Planning Commission of Pakistan approved “PEC Standard Form of Bidding Documents” on 12th February, 2008 and 24th December, 2009, respectively.

PEC once again notified “Bidding Documents Committee”. The PEC experts after a robust exercise of several years by taking 76 stakeholders on-board, shared the revised “Pakistan Standard Form of Bidding Documents (2020)” which harmonized with “PPRA Rules”, with Federal/Provincials Departments, Funding Agencies, Regulatory Authorities, AGP Office and Planning Commission etc. for feedback/comments. The same documents were already shared with PPRA on 30th July, 2020 and approved by PEC Governing Body on 24th December, 2020 which are as under:

- Pakistan Standard Form of Bidding Documents-Civil Work (2020).
- Pakistan Standard Form of Bidding Docs for Procurement of Works (Electrical & Mechanical (2020).
- Pakistan Standard Form of Bidding Documents for Procurement of Works for Smaller Contracts (2020).
- Pakistan Standard Form of Contract for Engineering Consultancy Services (Time Based Assignments (2020)).
- Pakistan Standard Form of Contract for Engineering Consultancy Services (Lump Sum Assignment) (2020))
- Pakistan Standard Form of Contract for Engineering Consultancy Services for Smaller Projects (2020).

These updated documents are primarily based on Bidding Documents for National Competitive Bidding (NCB), Pakistan and the Short Form of Contract prepared by FIDIC and comprise Instructions to Bidders, Bidding Data, Conditions of Contract, Contract Data and sample Schedules required for bidding. The process of notifying these documents by the Planning Commission is in process.

- **Standardization of Building Codes, Standards and Specification for Low Cost (Affordable) Units:**

PEC developed standardization of building codes, standards and specification for low cost (Affordable) Units-2020 in cooperation with Naya Pakistan Housing Development Authority (NAPHDA), Pakistan Council of Architect and Town Planners (PCAT) etc.

Pakistan Innovation and Testing Centre (PITC)

PEC is promoting R&D culture in HEIs under the guidance of Ministry of Science and Technology. PEC has established Pakistan Innovation and Testing Centre (PITC) to act as a creative hub for the linkages 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 intends to collaborate with ORICs through HEIs to enhance their vibrant role and to facilitate and promote innovation and local manufacturing of products for commercialization. PEC through PITC also facilitates ORICs and Industries in testing, certification, capacity building and regulatory approvals.

- **Functions:**

Major functions of PITC are as under:

- Facilitating stakeholders for promotion of entrepreneurship activities, product development, establishing standards for design, prototype development, testing, regulatory approvals and serial production.

- Identifying and arranging the potential funding resources other than PEC for the selected projects through Innovation/Entrepreneurship Committee (ICE).
- Linking startups, innovators and R&D initiatives with National Investment Portal (NIP) and other interested investors, angel funding and seed funding.
- Coordinating with local manufacturers, innovators and public/private setups to promote innovation in their products/services, processes, layout, management of resources and technology advancements including adoption of emerging technologies.
- Connecting the local manufacturer with the international firms to access the international market and undertake contract manufacturing of products in Pakistan.
- Facilitating indigenization and reverse engineering of products/systems.
- Promoting the national brands through showcase events and display center of made-in-Pakistan products at PITC and selected locations for technology transfer and contract manufacturing opportunities with reputed international OEMs and independent product developers in Pakistan.
- Facilitating the local innovators to file their IP with IPO office and make them aware of IP protection right, trademark, trade secrets, copyright and patent.

- **Major Achievements:**

PITC has been facilitating manufacturers/researchers/designers/HEIs for research and innovation related activities, taking a lab design project to a commercial product, facilitating for test/trials, Acceptance Test Procedures (ATPs), IP filing, regulatory approvals, linkage for serial production and commercialization at national and international level.

- **Pakistan Manufactured Ventilator System (PMVS)**

- Coordination hub for more than 40 organizations including ministries, developing agencies, hospitals and OEMs
- Technical Publications/Documents–PITC
- 57 ventilators design received
- 17 shortlisted for Prototype evaluation
- 8 Approved for Industrial Grade Versions
- 3 Ventilators Commercialized
- 2 Ventilators in Clinical Trials



- **Innovative Engineering Products/Solutions**

In addition to PMVS, PEC has also pursued the following innovative engineering products/solutions:



○ **Details of Export of Electro Medical Devices and Induction in Healthcare System in Pakistan**

Sr. No.	Device Name	Manufacturer	Total Units Sold	Quantity Breakdown	
				Country	Units
1	SafeVent SP-100	National Radio & Telecommunication Organization (NRTC), Haripur	178	Health Dept., Govt. of Punjab	33 units
				Health Dept., Govt. of Sri Lanka	75 units
				Nepal	30 units
				Maldives	30 units
				Bangladesh	10 units
2	Alnoventura CPAP/HFNO	Alsons Industries (Pvt.) Ltd., Karachi	284	Tajikistan	50 units
				Malawi	4 units
				Sri Lanka	150 units
				Bangladesh	20 units
				Nepal	30 units
				Maldives	30 units

○ **Technical Publications/Documents –PITC**

- **Acceptance Test Procedures (ATP)**
 - PMVS-ICU Ventilator
 - COVRAID (AI based COVID detection from chest X-Ray)
 - Oxygen Concentrator
 - Currency Disinfectant System (CDS)
 - Mechanical and Powered Resuscitator
- **Clinical Validation Protocols (Approved by National Bioethics Committee, Pakistan)**
 - Clinical Validation Protocols for PMVS- ICU ventilators
 - Clinical Validation Protocols for Ambu-bag based Emergency Resuscitator
- **Technical Reports**
 - PMVS Technical Evaluation Reports:
 - ❖ Pakvent-1
 - ❖ I-Live

- ❖ Trydan iVent
- ❖ NUVent
- ❖ AlnoVent
- ❖ Safevent SP-100
- Emergency Resuscitator
 - ❖ AIRVent
- EKKO wave therapeutic device
- Alnoventura CPAP/HFNO
- COVRAID (AI based COVID detection from Chest X-Ray)

- **Visit of Honorable Federal Minister for Science & Technology to PITC:**

The honorable Federal Minister for Science and Technology was briefed about the development process and testing framework for ventilators developed by PEC with OEMs and DRAP.

The Minister emphasized that during serial production of PMVS, the life cycle support mechanism should be defined by OEM and validated by PEC. He further highlighted that institutionalized training of technicians, paramedic staff, doctors and engineers should be organized to ensure optimum utilization and performance when inducted in the health care system. The central data repository for the testing laboratories in academia and industry needs to be developed that could be used in future to test the engineering equipment.



- **Way Forward:**

- **Collaboration with Offices of Research, Innovation and Commercialization (ORICs) in HEIs**

PITC is engaging ORICs in HEIs across Pakistan for creating a database of potential labs that can be upgraded to accreditation status to address the challenge of providing quality/product testing at national level. These lab resources will then be utilized for providing testing services to relevant industries.

- **Conformity Assessment Body (CAB)**

Testing, International Standard Certifications and Quality Enhancement of the locally manufactured products are the vital elements to not only boost the exports of engineering products but also to meet the demands of local market which will have significant impact on imports. Hence, PITC, based on its strategic importance and vision, has developed a phase-wise plan to become the national Conformity Assessment Body (CAB) accredited by Pakistan National Accreditation Council (PNAC). PITC needs to enhance its capacity and capability in terms of human and physical resources.

Pakistan Halal Authority (PHA)

Introduction

Pakistan Halal Authority was established through an Act of Parliament to promote trade and commerce in Halal articles and processes, imports and exports with foreign countries and inter-provincial trade and commerce in Halal articles and processes.

Powers of the Authority

- Develop and implement strategies, plans and programmes for promotion of imports and exports, trade and commerce with foreign countries and inter-provincial trade and commerce in Halal articles and processes.
- Recommend the Halal Standards developed for articles and processes, to be notified in the official Gazette by the Federal Government for adoption and notification by the National Standards Body:
“In this context, the Authority may consider the OIC Guidelines in schedule-I, relating to Halal food and other articles or processes, as modified by the Organization of the Islamic Cooperation from time to time, as a reference point”.
- Recommend mechanism for the Accreditation of Halal Certification Bodies and adoption of Halal Certification systems.
- Develop policies, plans and programmes for ensuring compliance of Halal articles and processes with the Halal Standards.
- Develop and authorize use of Halal logo for Halal articles and processes.
- Operates as a certification body after obtaining due accreditation from the National Accreditation Body.
- Levy fees for issue or renewal of the Halal certificate and/or authorizing the use of Halal Logo.
- Maintain a register of all persons, firms and companies authorized to use the Halal logo.
- Inspect and test Halal products and processes for their quality, specification and characteristics with relation to the Halal Standards, for purposes of imports and exports, trade and commerce with foreign countries and inter-provincial trade and commerce.
- Prohibit production, storage and sale in the Islamabad Capital Territory of such Halal products that do not conform to the Halal Standards.
- Arrange and conduct public awareness campaigns in relation to the Halal sector in general and Halal products and processes in particular.
- Secure international recognition of the Halal logo to build confidence in the Halal Certification system and Pakistani Halal products abroad.
- Co-ordinate with national and international organizations for strengthening the Halal sector.
- Promote and encourage establishment of libraries and laboratories for the purpose of developing the Halal sector.
- Collect and circulate statistical and other information relating to the Halal sector.
- Any other function assigned by the Government for development of the Halal sector and promotion of Halal products and processes.

Following Rules/Regulations of PHA have been approved by Cabinet Committee for Legislative Cases (CCLC) and submitted for endorsement of Federal Government before issuing in official Gazette:

- PHA (Business) Rules 2021.
- Pakistan Halal (Certification Marks) Regulations 2021.
- PHA Employees Recruitment (Regulations) 2021.

Functions

- Registration/Recognition of Foreign Halal Certification Bodies (HCB's).
- Registration/Recognition of Local Halal Certification Bodies (HCB's).
- Registration/Recognition of Slaughter houses operating in Pakistan.
- PHA as self-sustained/self-financed organization will meet its all expenses from its own resources in line with current Government Policies.
- Pakistan Halal Certification Marks Regulations implementation.
- Registration/Recognition of Halal Authentication Laboratories.
- Establishment of State-of-th-Art Halal Facilitation Centre.
- MoU's/MRA's with export potential countries.

- Introduction of Quick Response (QR) Codes for traceability of products.
- Introduction of Mobile application for Halal products/services verification.

National University of Technology (NUTECH)

Introduction

National University of Technology (NUTECH) has emerged as the first 'University for Industry'. The University is focused on promoting technology, research, development and training of the youth in the relevant fields and qualifications needed by the industries. The university was established as a Federally Chartered University through an Act of Parliament and Gazette notified on 26th February, 2018 and commenced its five Undergraduate (UG) engineering programs on 1st October, 2018. NUTECH has adopted/implemented policies as per HEC guidelines. NUTECH aims to prepare the youth of Pakistan to take on the challenges of the 21st century proffered by rapid technology advancements.

- **Bachelor of Engineering Technology (BET) Coop Model:** It is the first ever Academia-Industry Coop BET program launched by President of Pakistan in February, 2021 to help in production of "gets hands on" and "highly skilled" graduates for national & global industry. This program was designed based upon the concept of University-Industry cooperative engineering technology education, in consultation with construction sector, to bridge the gap as well as address the issues of unemployment of engineering technologists. Commencement of program is scheduled in 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:** Being a mandatory requirement of undergraduate programs, detailed internship plan for batch-2018 was chalked out by all departments of NUTECH and organizations like FWO, HIT, Attock Refinery, NECOP, SNGPL etc. were selected. The internship of students of batch-2018 commenced in April, 2021 for 8 weeks and will be completed in October, 2021.
- **Faculty Development Program:** A comprehensive faculty development program has been established 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 against which 13 candidates have availed this scholarship in the current year. Moreover, 40-50 foreign PhD scholarships for 08 departments have been proposed through HRD projects under HEC umbrella and so far one candidate has availed this scholarship.
- **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 are functional to run four engineering, two non-engineering programmes alongside Basic Sciences. Initially, the labs were established at ground floor of academic block. However, with increased equipment, 19 Labs have been established in newly designed building.
- **NUTECH as Qualification Awarding Body (QAB):** NUTECH has been awarded the status of QAB in September, 2020 after fulfilling the criteria of NAVTTC. The NUTECH Board of Technical and Professional Education (NBTPE) has been established and authorized as QAB of NAVTTC for level 1-5.
- **MoU between MoST and EGV Transport Corporation Ltd.:** EGV Transport Corporation Ltd., UK and Eurabus, Germany team visited NUTECH in October, 2020 and later on MoU was signed and 5 clauses pertaining to NUTECH (as an academic partner) were added. These clauses include establishment of its technical liaison & technology transfer office (TL&TTO), state-of-the-art R&D labs of EV technology and technology-based "Product Development Center (PDC)" at NUTECH. This collaboration is a giant leap of NUTECH towards participation in electrical vehicles technology domain.
- **Skills Courses at NUTECH Institute of Vocational and Technical Skills (NIVATS):** NSDD conducted 17 x Technical and Vocational Classes in year 2020-21 as per target and 392 x students were enrolled in these classes. So far, 177 trainees have graduated in the field of Hospitality Management, Computer Graphics & Design and Industrial Stitching. Up-gradation of NIVATS Labs/Classrooms was undertaken during the current year.

- **NUTECH & SESP, KSA Collaboration:** NUTECH collaborated with Saudi Electric Services Polytechnic (SESP) for engagement in different Skills Certification programs and supporting each other to utilize their international accreditations for vocational programs. Modalities for formal MoU with SESP are under process of approval.
- **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. As a first initiative, joint certification proposal on Hospitality Management course has been finalized with TAI, while curriculum preparation for course is under progress as part of Phase-1. Commencement of course is planned as part of Phase-2 in January 2022 for a period of 09 months.
- **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. Modalities for program execution are in final stages for approval of Cabinet.
- **Hi-Tech Courses under Hunarmand Pakistan “Kamyab Jawan” Program (KJP):** NUTECH was selected by NAVTTC for imparting education in Hi-tech skills courses under the KJP. NUTECH was awarded 05 Hi-Tech courses by NAVTTC under KJP in 2020 (Batch-I) whereas 06 Hi-Tech courses were awarded for the year 2021 (Batch-II). KJP Batch-III is also being planned for which NAVTTC has asked NUTECH to submit Expression of Interest (EoI) for its commencement in January/February 2022.
- **Upgrading of 12 TVET Institutes:** NUTECH is undertaking up-gradation of 12 selected TVET institutes of Pakistan as a pilot project (assigned by MoST) to emulate international standards certifications in different skills for CPEC, SEZs as well as other industrial sectors of Pakistan. PC-1 has been submitted to MoST in this regard.
- **NUTECH Future Main Campus:** Land for Main Campus at Capital Smart City has been acquired. Main Campus will specifically focus on infrastructure requirements for missing facilities at Initial Campus. Overall design of Main Campus aims at faculty development, teaching labs for ongoing programs, infrastructure development to facilitate 1,200-1,500 students in 6-7 applied engineering & technology programs and certify approx. 2,000 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 Pak Railways, NURETSS is conceived as bastion of latest innovative railway and allied technologies based products, systems, manufacturing processes and services for ML-1, 2 & 3 CPEC projects in future. NURETSS will comprise NUTECH School of Engineering and Technology (NUSET), Advanced Railway Technologies Innovation Centre (ARTIC) and NUTECH Institute of Vocational & Technical Skills (NIVATS). Tripartite MoU between MoST, MoR and NUTECH was signed in February, 2021 to address the stated objectives along with other collaboration aspects.
- **Industrial Projects:** In response to the COVID crisis, NUTECH initiated the work on developing technologies to meet the critical requirement of mechanical ventilators (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 and trials conducted at PEC according to ATP and is ready for Clinical Validation Study at CMH, Rawalpindi. As part of indigenous development efforts, NUTECH has also started working on design and local fabrication of 3D industrial printer prototype (NUPRINT). The project is in advance stage of completion. The development of Hemodialysis & X-ray machines is in design phase and NUTECH is studying different aspects of critical design issues and cost effective production in Pakistan.