

# YEAR BOOK 2019-20



**Ministry of Science & Technology**  
**GOVERNMENT OF PAKISTAN**

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Government of Pakistan  
Islamabad**

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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



*Senator Shibli Faraz, Federal Minister for Science & Technology*

## **Message from Senator Shibli Faraz Federal Minister for Science and Technology**

It is a great pleasure for me to give this Message for the Year Book 2019-20, which highlights the activities of Ministry of Science and Technology and its Organizations during the year.

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

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

Pakistan Standards and Quality Control Authority (PSQCA) has developed online application processing system in compliance with Government's vision for providing facilitation to the business community under National Single Window Programme.

Science Talent Farming Scheme (STFS) is being implemented under the Vision 2025 to groom the selected youth and support them to highest degree by progressively exposing them to advanced topics in science.

Pakistan Standards and Quality Control Authority (PSQCA), Pakistan National Accreditation Council (PNAC) and National Physical and Standards Laboratory (NPSL) are actively involved in trade & export enhancement and improving health & safety of consumers through mandatory and voluntary standards.

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

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



*Dr. Akhtar Nazir, Secretary, Ministry of Science & Technology*

## Foreword

The Year Book 2019-20 is an official document of Ministry of Science and Technology which indicates the activities and achievements of the Ministry and its Organizations during the period.

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

MoST is guiding and supporting Small & Medium Enterprises (SMEs) for exploring and adopting new trends and requirements of institutional competitiveness, improved industrial productivity and quality according to the requirements of internationally recognized standards and guidelines. A large number of applications were received and considered from various SMEs across the country for the award of Incentive Grant against various Certification schemes.

National University of Sciences and Technology (NUST) has established National Science & Technology Park (NSTP) which was inaugurated in December, 2019 by Prime Minister of Pakistan. NSTP is an international platform for the promotion of science, technology and innovation by facilitating cooperation and collaboration among research centers, universities, industry, communities and government to create stronger knowledge-based activities in Pakistan's economy. To combat the Corona Pandemic, NUST has developed Corona Virus Testing Kits, Aerial Spraying Units, Tele-Operated Decontamination Robots, Hand Sanitizers and Disinfectants.

Pakistan National Accreditation Council (PNAC) contributes in the economic growth and enhancement of trade through PNAC's MRA and MLA status. The certificates issued by the accredited organizations are acceptable all over the world. Accreditation by PNAC facilitates to remove the technical barrier to trade with a goal of "certified once-accepted everywhere." PNAC has accredited first personnel certification body in Pakistan for certification in the field of Non-Destructive Testing. Due to COVID-19, PNAC celebrated world accreditation day on 09.06.2020 with the theme of "Accreditation: Improving Food Safety" by raising awareness through print media to highlight the importance of World Accreditation Day.

National Institute of Electronics (NIE) provided advanced training on PLC, HMI, IC design and SCADA to professionals and trained mechanics on latest automotive diagnostic technology. NIE also provided technical services (i.e. PCB, quality testing, certification, SMT) to different universities and R&D organizations of Pakistan.

Pakistan Council of Research in Water Resources (PCRWR) has conducted 20 research studies and developed a digital inventory of the Karezes of Balochistan and uploaded on UNESCO-IHPWINS database. PCRWR has also developed 03 groundwater models. Trials of low water/high value crops have been carried out and demonstration sites have been established on farms by PCRWR under the PSDP project.

PSQCA offers Voluntary Certification to facilitate general consumers to use quality products in accordance with Pakistan Standards and International Standards. Voluntary Certification Division of PSQCA offers voluntary certification on food, electrical, mechanical and chemical Products and certified 11 food products and 25 non-food products voluntarily in the last year.

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

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

**Dr. Akhtar Nazir**

Secretary  
M/o Science & Technology

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## **Science and Technology Division (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 officers, while the Administration and Finance & Accounts Wings are being headed respectively by the Joint Secretary (I) & Joint Secretary (II) and Chief Finance & Accounts Officer (CF&AO). The Planning & Development Cell is also operating in the Ministry with specific objectives and functions.

The operational business 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 would be 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.
- a. **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.
  - Training of officers/officials of the Ministry inland and overseas.
  - National Internship Programme.
  - Rules of Business, Secretariat Instructions, etc.
  - Foreign trainings/conferences/visits etc.
- b. **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.
  - 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.

**c. Section Officer (Council)**

- Administrative and personnel matters relating to Pakistan Council of Research in Water Resources (PCRWR).
- National Assembly and Senate Secretariat Business.
- Miscellaneous matters.

**(d) Section Officer (Coord):**

- Administrative and personnel matters relating to:
  - Pakistan Halal Authority (PHA).
- Coordination between Ministry and its organizations

**Joint Secretary (II):**

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

**Deputy Secretary (Organizations):**

Administrative matters of S&T Organizations.

**a. 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).
- STEDEC Technology Commercialization Corporation (STCC) of Pakistan.
- Council for works and Housing research (CWHR).
- National University of Technology (NUTECH).

**b. Section Officer (Org-II):**

Administrative and Personnel matters relating to:

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

**c. Section Officer (Org-III):**

Administrative, Financial 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 Department Accounts Committee (DAC).
- Compliance with Rules, Regulations and Orders.
- Internal Control/Internal Audit.

### **(a) Section Officer (F&A):**

- Budget preparation and coordination with other Wings, MoST's 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.

### **(b) 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**

### **1. 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.

### **2. 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.
- Pakistan Council of Research in Water Resources (PCRWR).

Only technical matters relating to

- National University of Sciences & Technology (NUST).
- Pakistan Science Foundation (PSF).
- Pakistan Council for Science & Technology (PCST)/  
National Commission for Science & Technology (NCST).

these organizations.

### **3. 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.

### **4. 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 Resolutions/Ordinances.
- Processing of the amendment Bills proposed in the existing Acts of MoST Organizations.
- Preparation of Year Book of MoST.
- 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.

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 01.08.2020**

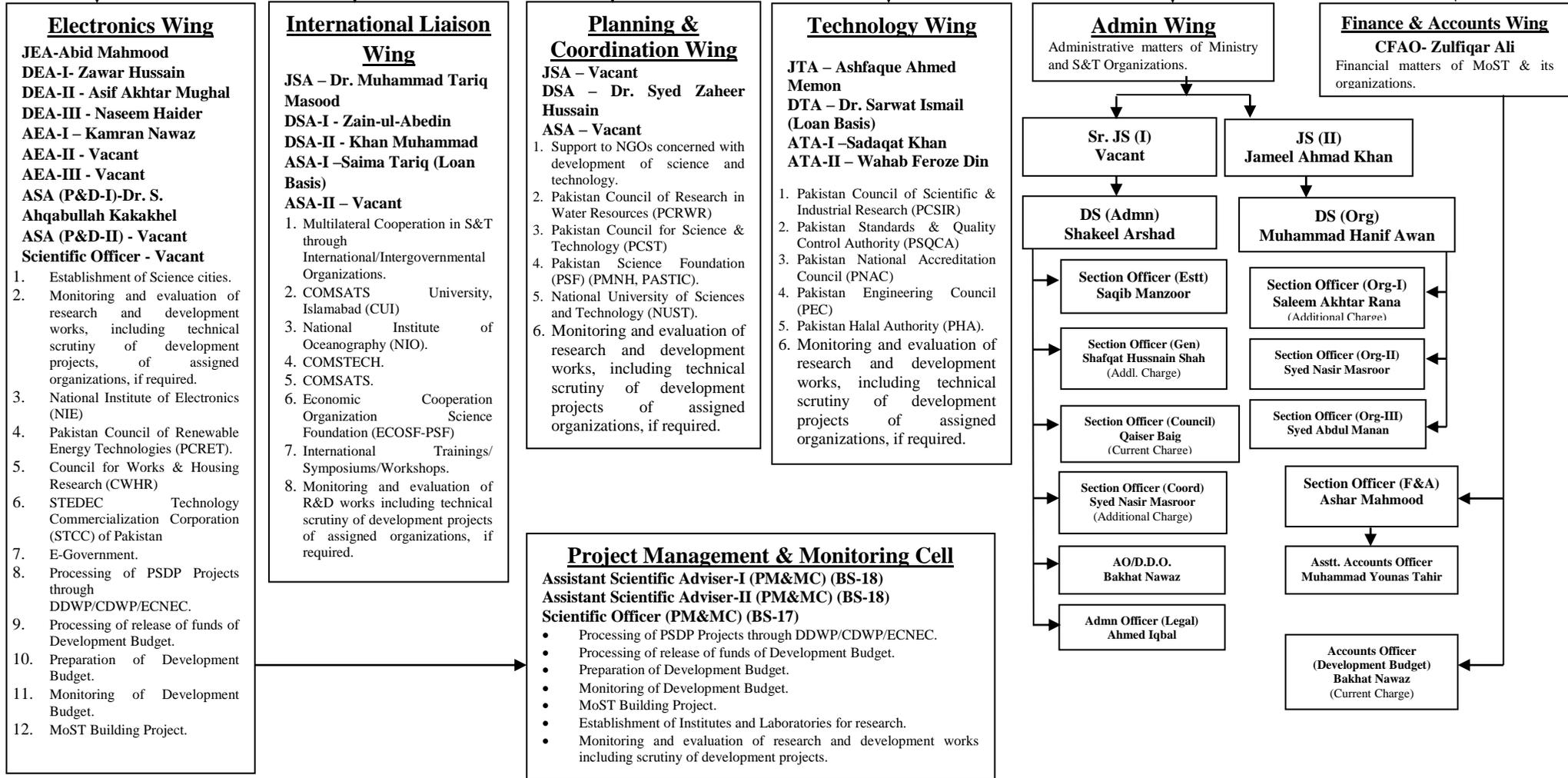
<b>Nomenclature of the Post</b>	<b>BS</b>	<b>Sanctioned posts</b>
Secretary	22	1
Additional Secretary	21	1
Joint Secretary	20	2
Joint Technological Adviser	20	1
Joint Electronics Adviser	20	1
Joint Scientific Adviser	20	2
Chief Finance & Accounts Officer	20	1
Deputy Technological Adviser	19	1
Deputy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

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

# Ministry of Science & Technology

**Secretary**  
**Capt. (Retd.) Nasim Nawaz**

**Additional Secretary**  
**Major (Retd.) Qaiser Majeed**



## **International Liaison (IL) Wing**

### **Introduction**

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

### **The main functions of the International Liaison Wing are:**

- To manage matters pertaining to bilateral and multilateral fora cooperation in Scientific & Technological fields under the umbrella of Bilateral Agreements/MRAs/PoCs/MoUs, Joint Economic Commissions (JECs), Joint Ministerial Commissions (JMCs) and Working Groups (WGs) on Science & Technology.
- Negotiations and subsequent signing of Bilateral, Tri-lateral, Multilateral Agreements/MoU, Programs & Protocols on Scientific & Technological Cooperation with friendly countries and other countries at regional, international levels with intergovernmental agencies and bodies.
- Soliciting the approval of the Prime Minister/President/Cabinet of Pakistan to initiate and sign S&T Cooperation Agreements/ MoUs/ Programmes of Cooperation (PoC)/ Protocols/ Executive Programs, etc.
- Providing briefs/inputs on Science & Technology to Economic Affairs Division, Ministry of Foreign Affairs, Ministry of Planning, Development & Reforms and other Ministries /Departments.
- Cooperation with the intergovernmental bodies like UN Agencies, UNESCO UNESF, 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 their assistance (technical and financial) of S&T Organizations.
- Dealing all matters of COMSATS University, Islamabad (CUI) including the soliciting approval of President of Pakistan as Rector, CUI.
- Preparation of Reports/Briefs for high level Pakistan delegations & Missions to facilitate their purposeful participation in International Meetings, Conferences etc. on Scientific & Technological Research matters.
- All Technical/Semi Technical matters/works related to NIO, CUI, COMSTECH, COMSATS and ECO-SF.

### **Bilateral & Multilateral Fora**

During the financial year 2019-20, International Liaison Wing has been undertaking coordination focusing on the following activities within the framework of bilateral cooperation with different countries through framework of multilateral cooperation with Regional/International organizations:

## **Bilateral Cooperation:**

**Algeria:** The draft MoU on Cooperation in the field of Standardization and Conformity Assessment between IANOR (Algeria) and Pakistan Standards and Quality Control Authority (PSQCA) is under process.

**China:** The Scientific & Technological Cooperation between Pakistan and People's Republic of China is being pursued under an agreement, signed in May, 1976, through which mutual benefits have been accrued satisfactorily. The Projects under the 18<sup>th</sup> S&T Protocol are being perused:

- **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). More than, 35 scientists have availed this program during the Financial Year 2019-20.

**Azerbaijan:** The draft Agreement on Scientific and Technological cooperation between the Governments of Pakistan and Azerbaijan is under process. The inter-ministerial Codal formalities have been completed and it will be signed after the approval of Federal Cabinet.

**Romania:** The draft MoU between COMSATS University, Islamabad (CUI) and University Politehnica of Bucharest, Romania is in pipeline between the two countries which will further strengthen the S&T Cooperation between the two countries.

**Belarus:** IL-Wing, MoST has successfully conducted the 4<sup>th</sup> Session of Joint Belarusian-Pakistan Commission for Cooperation in the Science and Technology (JCST) in virtual mode.

**Turkey:** IL-Wing, MoST has processed the following MoUs which were signed during the visit of the Turkish President to Pakistan:

- MoU between NUST and Turkish Aerospace Industries (TAI)
- Memorandum of Understanding in the Field of Halal Accreditation pertaining to Pakistan National Accreditation Council (PNAC)

**Iran:** The draft Mutual Recognition Agreement (MRA) between Institute of Standard and Industrial Research of Iran (ISIRI), Iran and Pakistan Standards and Quality Control Authority (PSQCA), Pakistan is in the process of completion of Codal formalities.

## **International MoUs:**

- A MoU on the establishment of Joint Working Group on Science, Technology and Agriculture cooperation between China and Pakistan was signed in March, 2020.
- In follow-up of a MoU on Science & Technology Cooperation under CPEC, a Joint Working Group has been notified by China and Pakistan.
- Introductory meeting of the Pak-China JWG was held in May, 2020 through a video link. The two sides agreed to cooperate in the following areas under CPEC:
  - S&T cooperation projects, training program on China Pakistan highway technical cooperation and construction of the China-Pakistan highway S&T cooperation platform
  - China-Pakistan Joint Research Center on Earth Sciences (CPJRC)
  - A proposed MoU between China Association for Science & Technology (CAST) and PEC to promote cooperation and capacity building of Engineers

- A protocol on establishment of ground station for marine remote sensing between Ministry of Science and Technology of Pakistan and Ministry of Natural Resources of China (MONR) is under consideration for signature.
- After completing codal formalities, a Memorandum of Understanding on academic and scientific cooperation between Harbin Engineering University, China and COMSATS University, Islamabad, Pakistan has been approved by the Cabinet for signature.
- Memorandum of Understanding (MoU) between Turku Vocational Institute, Turku, Finland and National University of Technology (NUTECH), Pakistan has been approved for signing from Cabinet.
- Memorandum of Understanding (MoU) between Turku University of Applied Sciences Ltd. Turku, Finland and National University of Technology (NUTECH), Pakistan is under consideration.
- Tripartite Memorandum of Understanding (MoU) between National University of Technology (NUTECH), Pakistan and Department of Civil and Environmental Engineering (DCEE), University of UTAH, USA and US PAK Center of Advanced Studies in Water (USPCASW), Mehran University of Engineering and Technology (MUET), Pakistan has been approved for signing from Cabinet.

### **Cooperation at Multilateral Forum**

Ministry of Science and Technology, Government of Pakistan is the Focal Ministry for the following Intergovernmental and Regional organizations to facilitate them in their activities:

- 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).
- Abdus Salam International Center for Theoretical Physics (AS-ICTP).
- Inter-Islamic Network on Space Sciences & Technology (ISNET).

### **Participation in Meetings/Training Workshops and Seminars Abroad:**

During the FY 2019-20, many Scientists, Engineers and officers from MoST and its S&T organizations proceeded abroad for participation in various scientific activities as a result of interactions at bilateral and multilateral levels. As per instructions of Cabinet Division, approvals of competent authority were processed and summaries were submitted to Prime Minister Office.

### **S&T Organizations of MoST**

IL-Wing, MoST facilitated the following R&D/S&T organizations in their technical, semi-technical and administrative matters during the year 2019-20:

- National Institute of Oceanography (NIO)
- COMSATS University, Islamabad (CUI)
- Economics Cooperation Organization- Science Foundation (ECO-SF)
- COMSATS Headquarter
- COMSTECH
- Ministry of Science and Technology invited joint research proposals from Pakistani Researchers for the 18<sup>th</sup> protocol on scientific and technological cooperation between Pakistan and China. The received proposals are to be evaluated by a Technical Committee.
- Facilitated in holding of the 4<sup>th</sup> Meeting of the Board of Trustees (BoT) of ECOSF, held in Iran which was attended by the Federal Minister for Science & Technology and JSA (IL), MoST.
- IL Wing of MoST, in consultation with the Institute of Space Technology (IST), COMSATS University, Islamabad (CUI) and Ministry of Foreign Affairs, prepared a Lunar Calendar for the next five (5) years.

## **Technology Wing**

### **Introduction**

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

### **Objectives & Functions**

- Promotion and development of industrial technology.
- Promotion of Metrology, Standards, Testing and Quality Assurance System.
- Establishment of Accreditation system in the country.
- Focal point for WTO/TBT affairs relating to PSQCA.
- Establishment of Common Facility Centers to provide SMEs Training, product Development, Consultancy and Quality improvement.
- Technical matters of PCSIR, PNAC, PSQCA, PEC and PHA.

### **Activities carried out by Technology Wing:**

#### **Constitution of the High Level Committee between Civil and Military organizations**

With the approval of the Honorable Prime Minister of Islamic Republic of Pakistan, a High Level Committee has been constituted for coordination between Civil and Military organizations. Joint Technological Adviser is secretary of the Committee.

First meeting of the High Level Committee between Civil and Military organizations is scheduled to be held in Ministry of Science & Technology on 9<sup>th</sup> July, 2020.

#### **Memorandum of Understanding/Agreement**

The following MoUs/Agreements have been processed and approved:

- MoU between Hashmi Brothers Pvt. Limited and Fuel Research Center (FRC), PCSIR, Karachi
- MoU between PCSIR Leather Research Centre (LRC), Karachi and M/s Hostachem Pvt. Ltd, Karachi
- MoU between PCSIR and M/s Friesland Campina Engro Pakistan Limited (FCEPL) Karachi
- MoU between PCSIR and M/s Pepsi-Cola International Pvt. Ltd, Lahore
- MoU between Pakistan Halal Authority and Saudi Food & Drug Authority (SFDA) (in draft stage and submitted to SFDA)

#### **Membership of the Committees**

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

- National Technology Council (NTC)
- National University of Technology (NUTECH)
- Electric Vehicle (EV) policy, Engineering Development Board (EDB)
- Auto Industry Development Committee (AIDC)
- High Level Committee between Civil and Military organizations
- Skill Development Councils (SDC), Ministry of Federal Education and Professional Training
- National Energy Efficiency & Conservation Authority (NEECA)
- National Biosafety Committee (NBC), Ministry of Climate Change

### **Certificate of Exemption 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 & Standard Laboratory (NPSL) etc.

### **Establishment of State of the Art Testing Facilities**

A meeting was convened with Sialkot Chamber of Commerce & Industry (SCC&I) regarding the requisite of testing facilities and certification issues and the following decisions were made:

- Feasibility report/working paper may be submitted by SCC&I.
- Detailed list of testing facilities available in PCSIR related to leather, sports, goods, textile and surgical instruments be provided to SCC&I.
- PSQCA may initiate the matter on urgent basis regarding process for CE Marking/Certification with Government of Turkey so that exporters/manufacturers can get the benefit of CE Marking within country in minimum/affordable cost.
- Trainings or workshops, if required by PSQCA, from Turkey side may be arranged through video link.
- PSQCA may establish or arrange an interim setup for CE Marking/Certification.

### **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.

### **Standards Formulation**

- Standards for four wheeler Automobiles vehicles have been drafted and are in the process of finalization.
- Standards for 2-3 wheeler Electric Vehicles initiated.

- Standards formulated for Helmets.

**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.

**Pakistan Regulatory Modernization Initiative (PRMI)**

- Working as focal person for Pakistan Regulatory Modernization Initiative (PRMI).
- Actively participated in Pakistan Single Window (PSW) initiative for ease of doing business.

## **Policy & Coordination (P&C) Wing**

### **Introduction**

Policy & Coordination Wing is headed by Joint Scientific Adviser (JSA), assisted by a Deputy Scientific Adviser (DSA) and Assistant Scientific Adviser (ASA) and is responsible for dealing with matters related to National Science, Technology and Innovation Policy initiatives and identifies areas for S&T research to respond to 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 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 & Provincial S&T Councils/Departments/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 Defense 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.

### **Achievements**

#### **○ Civil Awards for Scientists & Technologists**

Nominations for different categories of Civil Awards are processed in the Cabinet Division. Federal Minister for Science and Technology is the chairman of Awards Sub-Committee on Science, Engineering and Education. R&D organizations and Pakistan Academy of Sciences and different universities of the country, have forwarded nominations for consideration of Civil Awards – 2020. Ministry of Science and Technology examined credentials of the 13 nominees as per approved Quantified Criteria for different categories of Civil Awards-2020.

Following scientists/technologists/researchers received Civil Awards in different categories of Science and Technology:

<b>Sr. No.</b>	<b>Scientist Name</b>	<b>Recommendation for the Award</b>
i.	Prof. Dr. Anwar ul Hassan Gillani	Hilal-i-Imtiaz
ii.	Prof. Dr. Nisar Ahmed Siddiqui (Late)	Sitara-i-Imtiaz
iii.	Prof. Dr. Farhan Saif	Sitara-i-Imtiaz
iv.	Prof. Dr. Khalid Masud Gondal	President's Award for Pride of Performance
v.	Prof. Dr. Raisa Begum Gul	President's Award for Pride of Performance
vi.	Dr. Manzoor Hussain	Tamgha-i-Imtiaz
vii.	Prof. Dr. Asif Ali	Tamgha-i-Imtiaz
viii.	Dr. Faisal Shahzad	Tamgha-i-Imtiaz
ix.	Dr. Nasir Majid Mirza	Tamgha-i-Imtiaz
x.	Prof. Dr. Asghar Zaidi	Tamgha-i-Imtiaz
xi.	Prof. Dr. Nouman Ahmed	Tamgha-i-Imtiaz
xii.	Prof. Dr. Muhammad Saeed Quraishy	Tamgha-i-Imtiaz
xiii.	Dr. Yasar Mehmood Yousafzai	Tamgha-i-Imtiaz

○ **National Science, Technology and Innovation Strategy and Action Plan**

Draft National Science, Technology and Innovation Strategy has been revised to make it more focused, determine timelines and clearly delineate the roles and responsibilities of various government entities for development of Science and Technology in the country. Strategy document has been prepared after a number of meetings with clear implementation mechanism like identification of implementation agency, major stakeholder, duration, estimated cost/funding, milestones, deliverables, and key outcomes on prioritized list of science and technology policy actions. The draft National Science, Technology and Innovation Strategy and Action Plan would then be presented as an agenda item for National Commission for Science and Technology (NCST) for approval. Prime Minister of Pakistan is the chairman of National Commission for Science and Technology.

○ **National Commission for Science & Technology (NCST)**

NCST is the apex decision making body on S&T of Pakistan under the chairmanship of Prime Minister of Pakistan. Summary for convening Fourth Meeting of National Commission for Science & Technology (NCST) has been forwarded to Prime Minister's Office. Following agenda items are included for NCST meeting:

- National Research Priorities (National Research Agenda)
- National Science, Technology & Innovation Strategy and Action Plan
- Promotion of R&D and Innovation in Industry
- Increase in National R&D Spending up to 1% of GDP by the year 2020 and up to 2% by 2025
- Uniform Salary Structure for S&T Organizations
- Changes in the Composition of NCST that was approved by Executive Committee of National Commission on Science and Technology (ECNCST).

● **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.
  - Collaboration with newly established ‘National University of Technology’ by working on the following lines:
    - Resource sharing i.e. sharing of available facilities, equipment, especially sophisticated equipment with students, teachers and researchers.
    - Sharing of experience of R&D organizations for demand driven research in collaboration with industry for university/firm collaboration and to create R&D liaison with the industry.
    - Sharing of expertise of scientists working in R&D organizations of Ministry of Science and Technology to encourage scientific mobility.
  - Circulation of the following Gold Medals Schemes to R&D organizations of MoST:
    - Prof. A.R. Shakoori Gold Medal 2020.
    - Prof. Dr. Mirza Azhar Beg Gold Medal 2020.
    - Prof. Dr. Nasima M. Tirmizi Memorial Gold Medal 2020.
    - Prof. Imtiaz Ahmad Gold Medal 2020.
    - Dr. Abdul Aleem Chaudhary Gold Medal 2020.
  - Performance of MoST and its attached organizations was evaluated and report has been forwarded to Prime Minister’s Office.
  - Key Performance Indicators (KPIs) for officers of P&C Wing.
  - Coordination for organizing of Scientific Advisory Committee on Defense Planning (SACDP).
- **Coordination with other Ministries/Participation of P&C Wing**
- The Ministry of Science and Technology has prepared a draft “Intellectual Property Policy (IPP)” for S&T and revised the draft IP Policy keeping in view the response received from the World Intellectual Property Office (WIPO) and the points have been incorporated. The final draft is prepared for its approval by the competent forum.
  - Coordinated meetings of Prime Minister’s Task Force on Science and Technology.
  - Provided technical report of PCRWR on increasing efficiency of Pakistan’s canal system and conducted feasibility study to reap benefits to General Headquarters, Chief of Army Staff Secretariat, Staff Duties Directorate, Rawalpindi from hill torrents.
  - Achievable targets during the next seven (07) months of S&T organizations (Development & Non-Development Side) and Reforms and Restructuring in the Ministry of Science and Technology and its organizations.
  - Provided the information to Prime Minister’s Office for meeting of a Delegation of Techno-Entrepreneurs and Scientists of Pakistan with Prime Minister of Pakistan.

- Information on prescribed format provided to Ministry of Federal Education & Professional Training about Scholarship Schemes/Programs.
- **Workshops and Conferences**
  - Monthly Progress Reports Review meetings of Organizations of MoST.
  - Underground Shelters Committee meeting on Defence Planning was held on 25<sup>th</sup> September, 2019 in the Ministry of Housing & Works, Islamabad.
  - Updation of Federal War Book.
  - Organized first meeting of Committee of Experts, constituted for establishment of state-of-the-art herbal farm in Jhelum, in the Committee Room of Ministry of Science and Technology, Islamabad.
  - Meeting regarding Restructuring/Revamping of PCSIR, PSF, PCST and PSQCA was held on 11<sup>th</sup> July, 2019 at MoST.
  - Attended 21<sup>st</sup> meeting of Implementation Committee on Re-organizing the Federal Government.
  - Organized first meeting of Import Substitution Committee.
  - Attended the Steering Committee on Economic Diplomacy Strategy (3<sup>rd</sup> meeting) at Prime Minister's Office, Islamabad.
  - Attended the National Seminar "Disruptive Impact of Emerging Technologies on Land Warfare".
  - Attended the Consultative Meeting titled "Deliberations on S&T/R&D data Sharing Guidelines for Development of National S&T Information Strategy" at PASTIC.

## **Finance and Accounts Wing**

### **Introduction**

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

According to System of Financial 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 Department 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 four Department Accounts Committee meetings were held during financial year 2019-20.

<b>DATE</b>	<b>SUBJECT</b>
<b>12-12-2019</b>	DAC meeting was held to discuss the Audit Comments and Draft Paras for the financial year 2015-16.
<b>18-12-2019</b>	DAC meeting was held to discuss the Draft Paras for the financial year 2017-18 on the account of MoST and its organizations.
<b>18-12-2019</b>	DAC meeting was held to discuss the Audit Comments and Draft Paras for the financial year 2017-18 on the account of Pakistan Science Foundation, Islamabad.
<b>18-12-2019</b>	DAC meeting was held to discuss the Appropriation Accounts for the year 2016-17 on the accounts of MoST & its Organizations.

**Non-Development Allocation and Expenditure for the Financial  
Year 2019-2020**

<b>S.No.</b>	<b>Name of Organization</b>	<b>Final Grant 2019-2020</b>	<b>Expenditure</b>
1	Ministry of Science & Technology including Science Counsellor Office at Beijing (China).	460.826	457.275
2	Pakistan Council for Science & Technology	85.170	85.170
3	Pakistan Science Foundation	230.850	230.204
4	Pakistan Museum of Natural History	142.878	141.449
5	Pakistan Scientific and Technological Information Centre	175.100	175.100
6	National Institute of Electronics	200.032	199.859
7	National University of Sciences & Technology	2,362.470	2,362.469
8	Pakistan National Accreditation Council	50.109	50.108
9	Pakistan Council of Renewable Energy Technologies	112.213	105.942
10	Pakistan Council of Research in Water Resources	402.838	402.838
11	National Physical & Standard Laboratory	210.500	210.500
12	Pakistan Council of Scientific and Industrial Research	2,716.908	2,716.599
13	National University of Technology	731.300	731.299
14	National Institute of Oceanography	146.606	146.512
15	Council for Works and Housing Research	94.000	93.391
16	Pakistan Halal Authority	11.790	11.019
<b>Grand Total</b>		<b>8,133.590</b>	<b>8,119.734</b>

## **Electronics Wing**

### **Introduction**

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

The Wing also deals with 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 electronics components, devices, processes and attended the meetings, organized by Pakistan Standard and Quality Control Authority (PSQCA), regarding the same.

### **Activities of Electronic Wing**

- \* Dealt with the technical affairs of National Institute of Electronics (NIE), Pakistan Council for Renewable Energy Technologies (PCRET), Council for Works and Housing Research (CWHR) and STEDEC Technology Commercialization Corporation of Pakistan (Private) Limited. In particular, provided necessary guidance for the completion of extension plans of NIE, PCRET, CWHR and STEDEC, which have been planned to enhance their technical activities.
- \* Drafted and processed Bills for the enactment of organizations under MoST, created through Resolutions/Executive Orders etc.; which have no legal status and other related legislation.
- \* Implementation of E-Government initiatives and IT Security instructions in S&T Division, as directed by the Cabinet Division.
- \* Pursued the decisions taken in the meetings of the Standing Committees of the National Assembly and Senate on S&T and actions taken for their implementation, related to PCRET, NIE, CWHR and STEDEC.
- \* Dealt with the matters of National Electric Power Regulatory Authority (NEPRA) and necessary technical opinions/views were conveyed to NEPRA, for awarding Power Generation Licenses/Licensee Proposed Modifications (LPM) to different Organizations/Companies.
- \* Participated in 02 meetings of the National Computing Education Accreditation Council (NCEAC), Higher Education Commission (HEC) for awarding accreditation certificates to different educational institutes, offering degree courses in Computer Sciences i.e. Software Engineering, Computer Science, Information Technology etc.
- \* Prepared working papers for the BoG meetings of the Alternative Energy Development Board (AEDB), Bahria University, Air University, Pakistan Institute of Emerging and Applied Sciences (PIEAS) and Pakistan Madrasah Education Board (PMEB).
- \* Joint Electronics Adviser, MoST is the Chairman of the Technical Committee on Biorisk Management and member of the National Standard Committee on Health Care.
- \* Cases of National Telecommunication and Information Technology Security Board (NTISB), Cabinet Division regarding different security threats were examined and circulated to all organizations of MoST for awareness, precautionary measures and strict compliance.
- \* Data for Finance Minister's Budget Speech 2020-21 was collected from all wings of MoST, compiled and forwarded to Finance Division after approval of the Competent Authority.

- \* Data regarding preparation of Year Book of MoST 2018-19 was collected from organizations/wings of MoST, examined/vetted and uploaded on website of MoST for the information of general public.

## **Details of the Activities**

### **A. Evaluation and Monitoring of NIE, PCRET, CWHR and STEDEC:**

Monthly performance/progress reports of National Institute of Electronics (NIE), Pakistan Council of Renewable Energy Technologies (PCRET), Council for Works and Housing Research (CWHR) and STEDEC Technology Commercialization Corporation of Pakistan (Private) Limited were expedited, evaluated and necessary guidance provided to the above said organizations.

The bottlenecks pointed out by NIE, PCRET, CWHR and STEDEC regarding implementation of their projects and administrative matters were taken up with the concerned Ministries/departments for consultancy.

### **B. 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 and Human Rights 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 process 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 process at MoST, as per the Rules of Business, 1973.

- **Amendment Bills of PNAC, NIE, PCSIR & PSF**

As per the Judgement of the Supreme Court of Pakistan for substituting the word “Federal Government” with appropriate authority(ies) in the Acts/Rules of the respective organization of the Ministries/Divisions, the PNAC, NIE, PCSIR and PSF Amendment Bills were initiated and circulated for inter-ministerial consultation, as per the Rules of Business, 1973.

### **C. 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 improved the archaic system of filing, but also speeded 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 most sections of MoST and almost all files have been moved through e-Office application.

### **National Computing Education Accreditation Council (NCEAC)**

Pakistan National Accreditation Council (PNAC) participated in 02 BoG meetings of National Computing Education Accreditation Council (NCEAC), Higher Education Commission (HEC) held on 19.07.2019 & 24.10.2019, to represent Ministry of Science and Technology, for awarding accreditation certificates to different educational institutes, offering degree courses in Computer Sciences.

### **Alternative Energy Development Board (AEDB)**

On behalf of Secretary, MoST, Pakistan Council of Renewable Energy Technologies (PCRET) participated in the BoG meetings of the Alternative Energy Development Board (AEDB). AEDB is an autonomous body, established under Act No. XIV of 2010, for the purpose of implementing various policies, programmes, and projects in the field of alternative/renewable energy technologies.

### **Pakistan Madrasah Education Board (PMEB)**

Joint Electronics Adviser, Ministry of Science and Technology participated in the meeting of the Pakistan Madrasah Education Board (PMEB), Ministry of Religious Affairs and Interfaith Harmony (MoRA&IH) held on 18.02.2020 to represent MoST.

### **Pakistan Institute of Engineering and Applied Sciences (PIEAS)**

Deputy Electronics Adviser, Ministry of Science and Technology participated in the BoG meeting of the Pakistan Institute of Engineering and Applied Sciences (PIEAS) held on 03.10.2019 to represent MoST.

### **Parliamentary Business**

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

## **Public Sector Development Programme 2019-20**

### **Introduction**

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

### **Achievements in 2019-20**

Following are some of the key highlights of the progress made on the development side by MoST during 2019-20:

- MoST is guiding and supporting Small & Medium Enterprises (SMEs) for exploring and adopting new trends and requirements of intentional 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 country for the award of Incentive Grant against various Certification schemes. Seven meetings of the Incentive Award Committee (IAC) were held and 166 applicant firms were approved by the Incentive Award Committee (IAC) for award of the Incentive Grants whereas 77 are in pipeline.

For the capacity building of SMEs personnel, Training Programmes were designed in consultation with the Chambers of Commerce & Industries, sector specific Trade Associations, SMEs and other stakeholders. The said Training Programme has been outsourced to M/s Bureau Veritas Pakistan (Pvt.) Ltd. through open bidding. Under the contract, M/s Bureau Veritas Pakistan (Pvt.) Ltd. will conduct/deliver/run 2-Day (non-examination based) training courses against 19 certification standards and 5-Day (examination based) lead auditor courses against 08 certifications/accreditation standards. This training programme will be completed within 06 months period and will train 2000 personnel of SMEs.

- 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. Pakistan Science Foundation has paid monetary benefits to 900 students and distributed laptops/internet connectivity devices among selected students.
- Up-gradation of Overall R&D infrastructure of the Labs and Facilities of MoST Organizations was continued to enhance the internal research capability of these organizations. Activities to establish Gems & Mineral Cutting and Polishing Centre at PCSIR Skardu, Gilgit Baltistan started for facilitation of gemstone miners to curb the precious and semi-precious stones wastage (Civil work initiated). Up-gradation of Fruit Processing, Analytical Laboratory and up-gradation of existing fruit processing/preservation centre for value addition & minimization of post-harvest losses of fruits and vegetables of Gilgit-Baltistan also initiated during the year under review. PCRET is in negotiation with KOICA to establish 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.

- 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 districts Khushab, Mianwali and Bhakkar.
- Industry Focused R&D is the prime impetus at Pakistan Council of Scientific and Industrial Research (PCSIR). Presently, PCSIR is promoting lab scale development to Pilot scale level in areas of Pharmaceutical and Chemicals, Food, Herbal, Minerals and Cosmetics etc. PCSIR has developed processes and leased out to different industries, registered patents and provided consultancy services to various industry clients.
- 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, whereas NPSL is responsible for traceability of metrology standards.
- In Health Sector, MoST has completed the project titled: “Establishment of Medical Devices Development Center (MDDC) at NUST, Islamabad”, wherein full-fledged stent manufacturing system is being developed.

### **Budgetary Overview of Development Activities**

During the fiscal year 2019-20, an amount of Rs. 7407.361 Million was allocated against 32 development projects. Out of this, Rs. 1210.629 Million were released and utilized.

### **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) was established in 1964 and is working as body corporate vide PCRWR Act 2007 under Ministry of Science and Technology (MoST). PCRWR is mandated to conduct, organize, coordinate and promote research on all aspects of water. Therefore, the organization promotes partnerships with national and international research organizations to deal with the emerging issues and future challenges in water sector especially under climate change scenario.

### **Budget Allocation for F.Y 2019-20**

*(Rs. in Millions)*

<b>Sr. No.</b>	<b>Non Development Budget</b>	<b>Development Budget</b>
1	402.838	65.817

### **Achievements/Activities**

Mandate of PCRWR is very broad as compared to other areas of 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 20 research studies/collaborative projects during the fiscal year 2019-20. Besides these research studies/collaborative projects, four (04) PSDP project were also being carried out at PCRWR and as a result following key achievements/activities have been carried out:

- Developed a Digital inventory of the Karezes of Balochistan and uploaded on UNESCO IHPWINS database.
- Carried out Mapping of Groundwater Zones in Lower Indus Plains-Sindh Province along with the areas falling in Punjab on the right of the River Indus (parts of Mianwali, D.I. Khan, D.G. Khan and Rajanpur districts) and left side of the River Sutlej (parts of Bahawalnagar, Bahawalpur and Rahim Yar Khan districts).
- Carried out Groundwater Study of 5 Districts of KPK (Peshawar, Charsadda, Swabi, Nowshera, Mardan) with the financial support of HELVETAS.
- Carried out Water Quality Assessment in Pind Dadan Khan.
- Developed groundwater flow pattern under the study titled “Trans-boundary Effects on Ground and Surface Waters along the Eastern Border of Pakistan”.
- Carried out farmer led 119 experiments by male and female farmers in 24 villages of 6 districts under project “Developing Approaches to Enhance Farmer Water Management Skills in Balochistan, Punjab and Sindh in Pakistan”.
- Three groundwater models have been developed and scenario modelling has commenced. Trials of low water/high value crops have been carried out and demonstration sites have been established on farms managed by leading members of the Stakeholder forums under the project “Improving groundwater management to enhance agriculture and farming livelihoods in Pakistan”.
- Two solar powered drip and sprinkler irrigation systems were installed and three sites were provided with a vegetative cover.
- Regular monitoring of bottled water brands on quarterly basis throughout the country.
- Provided various trainings to water sector professionals including a two days international hands-on training workshop on “Water Quality Challenges and Advanced Treatment Technologies”.
- Provided Irrigation Advisory Services to 20,000 farmers in 44 districts through SMS on weekly basis.

- Opening of Water Analysis Laboratory for Metals in PCRWR Regional Office, Lahore.
- ISO-17025:2017 Accreditation of National Water Quality Laboratory (NWQL) has been extended for period of three years.
- Launched two diploma courses (6-month duration) in "Water Quality Technician and Waste Water Treatment" under Prime Minister's Hunarmand Pakistan Program in collaboration with National Vocational and Technical Training Commission (NAVTTTC) on February 26, 2020.
- Organized a seminar on Water Conservation through Smart Water Metering and Pricing in Pakistan on November 6, 2019 in Islamabad.
- Organized a series of consultations on Localization of Water, Energy and Food Nexus in Islamabad, Peshawar, Karachi and Lahore in December, 2019 and on 6<sup>th</sup>, 27<sup>th</sup> February and 5<sup>th</sup> March 2020, respectively.
- Conducted a stakeholder workshop on "Possible Nomination of Karez System Cultural Landscape in the UNESCO's World Heritage List" on 31<sup>st</sup> July 2019 and two Steering Committee Meetings on 31<sup>st</sup> July and 28<sup>th</sup> November 2019 respectively.
- Dissemination and Rehabilitation Training Workshop on Karezes of Balochistan was organized in Quetta on November 27, 2019.
- Conducted a Consultation Workshop on Groundwater Mapping and Soil Salinity for Indus Basin on October 22, 2019 in Islamabad.
- Held a meeting of Pakistan National Committee on International Hydrological Program on November 12, 2019 in Islamabad.
- Organized a seminar on "Water, Food, Agriculture & Mineral/Metal Analysis by using latest Spectroscopic Techniques" on October 22, 2019 in Karachi.
- Organized a joint webinar on "Policy Dialogue on Integrated Water Resources Management (IWRM); a tool for Prevention and Smart Monitoring of COVID-19" on June 17, 2020.
- NASA Featured PCRWR's Irrigation Advisory Service on World Earth Day.

### Projects during 2019-20

(Rs. in Millions)

PSDP						
Sr. No	Title	Budgetary Allocation 2019-20	Release 2019-20	Expenditure 2019-20	Duration (Years)	Progress
1	Exploration of Groundwater Potential and Promotion of Interventions for Rainwater Harvesting and Bio-saline Agriculture in Thar	33.328	2.184	2.184	3	Completed
2	Integrated Approach for Control of Waterlogging and Salinity in Low Lying Areas of Sindh	23.948	2.407	2.407	3	Completed
3	Improved Land and Water Conservation Practices to Enhance Wasteland Productivity in Thal Desert	9.986	8.486	8.335	4	Substantially Completed

4	Trans-boundary effects on Ground and Surface Waters along Eastern Border of Pakistan	18.000	14.400	11.804	3	Substantially Completed
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<b>Regular Research Studies</b>		
<b>Sr. No.</b>	<b>Title</b>	<b>Duration (Years)</b>
1	Water Quality Monitoring of Surface Water Bodies of Pakistan	2
2	Assessment of groundwater potential in Pind Dadan Khan	1
3	Evaluation of Water Productivity of Wheat, Maize & Rice Crops on Bed plantation.	5
4	Water Requirement in Wheat-Rice Cropping System	3
5	Determination of Consumptive Use of Water for Cotton and Wheat Crops under Different Water table Depths	3
6	Systems on the Yield and Water Use Efficiency of Chickpeas and Sesame Crops	3
7	Evaluation of Sprinkler and Conventional Irrigation Systems	3
8	Sowing of Wheat and Cotton under Different Irrigation Methods	3
9	Growing of Banana on Beds	4
10	Wheat and Cotton on Beds under Different Soil Moisture Depletion Levels	3
11	Evaluation of Water Saving Techniques in Peshawar Valley	3
12	Prospects of Growing Fruit Trees in Desert Environment	3
13	Determination of Fruit Water Requirement in Balochistan	3

<b>Collaborative Research Projects/Studies</b>		
<b>Sr. No.</b>	<b>Title</b>	<b>Duration (Years)</b>
1	Rainwater Harvesting to Improve Groundwater Storage and Quality in Saline and Water Scarce Environment	1
2	Improving Groundwater Management to Enhance Agriculture and Farming Livelihoods in Pakistan	3
3	Developing Approaches to Enhance Farmer Water Management Skills in Balochistan, Punjab and Sindh	4
4	Technical Studies “Adaptation Strategies to cope with Climate Change Impacts on Pakistan’s Water Resources”	1
5	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
6	Sustainable Management of Groundwater at FFL Tube Well Site-Ahmedpur Lamma	1

<b>Projects Submitted to MoST</b>		
<b>Sr. No.</b>	<b>Proposed Schemes</b>	<b>Duration (Years)</b>
1	Rehabilitation and Conservation of Karezes for Sustainable Groundwater Management and Livelihood Improvements in Balochistan	3
2	Country-wide Wastewater Profiling for Sustainable Recycling	3
3	Awareness for Diffusion and Adoption of Water Conservation Technologies and Practices	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:

- Developed PCB holders and coil body assembly (17000 each) and delivered to end user successfully.
- Developed an efficient fan dimmer using burst control mechanism for effective output.
- Developed mobile phone chargers of different rating.
- Developed flight controller module for hex-copter and testing of the module is in process.
- Designed IoT based smart energy meter.
- Developed prototype of smart parking management system using Wireless Sensor Network (WSN) technology.
- Designed 1 KVA smooth power line conditioner for defense sector and local industry.
- Developed LEDs of different designs and wattages.
- Designed Frequency Modulated Continuous Wave (FMCW) Radar.
- Development of automatic wheel chair is in process.
- Published research paper on sensor networks in international journal.

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

- Provided advanced training on PLC, HMI & SCADA to seven professionals.
- Provided advanced training on Integrated Circuit (IC) design to eight professionals and ten engineers.
- Conducted courses of two months and six months duration in different areas of electronics for 165 students.
- Trained 52 mechanics on latest automotive diagnostics technology.
- Provided general internship/training to 160 engineers from different universities of Pakistan.
- Conducted eight industrial visits of different engineering universities of Pakistan.
- 05 Final Year Projects (FYPs) of engineers from different universities are in process at NIE.

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

- Signed Memorandum of Understanding (MoU) with Foundation University, Islamabad (FUI) 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:

- **Developed 926 Printed Circuit Boards (PCBs) for following universities and R&D organizations:**
  - NECOP
  - NRTC
  - NESCOM, Islamabad
  - AWC and NDC
  - Pakistan Ordinance Factory (POF)
  - PTCL
  - National University of Sciences & Technology ( NUST)
  - COMSATS University, Islamabad
  - Air University
  - EME College, Rawalpindi
  - Pakistan Aeronautical Complex (PAC), Kamra
  - COMCEPT (Pvt.) Ltd.
  - RWR (Pvt.) Ltd.
  - UET, Taxila and Peshawar
  - Intercon Systems
  - COMSATS University, Sahiwal Campus
  - Naval Precision Electronics Complex (NPEC), Karachi
  - POULTA Inc., Karachi
  - CARE, Islamabad
- **Quality Testing & Certification Services**  
Provided quality testing and calibration services to following customers:
  - PTCL, Islamabad
  - Ministry of Defence, Islamabad
  - Institute of Space Technology, Islamabad
  - Nerus Telecom, Network services.
  - Shifa International Hospital
  - Rawalpindi Development Authority, Rawalpindi
  - Pakistan Atomic Energy Commission
  - Techmens Switch Gear Service, Islamabad
  - Garrison Engineering (Army), Jehulm Cantt
  - Hydro Carbon Development Institute, Islamabad
- **Surface Mount Technology (SMT) Services**  
Provided SMT Assembly and Rework Services to following clients:
  - ASKA-SDS Pvt. Ltd., Islamabad
  - MicroPak Pvt. Ltd., Islamabad

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

- Conference on Emerging Technologies for Smart SMEs, Industrial Revolution 4.0 was held on 25<sup>th</sup> November, 2019 at Convention Centre, Islamabad.
- Conducted three workshops on Automotive Electronics and Diagnostic for local mechanics and automotive engineers.
- Organized hands on training/seminar on national instruments (software/hardware) for officials of public/private sector and academia.

### **Non-Development Budget Allocation for F/Y 2019-20**

Non-Development Budget of Rs. 200.032 million was allocated to NIE for FY 2019-20.

### **Budget Allocation for R&D during F/Y 2019-20**

A total of 10 Million has been allocated for Research and Development work during financial year 2019-20. NIE started different projects related to Defense, Commercial, Human Resource Development, Design and development of IoT based smart energy meter, Development of efficient fan dimmer for local industry, Flight controller module for hex-copter and mobile phone charger for general public.

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

## **Pakistan National Accreditation Council (PNAC)**

### **Introduction:**

Pakistan National Accreditation Council (PNAC) established in 1998 under the administrative control of Ministry of Science & Technology 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.

### **World Acceptance of Certificates/Testing Reports:**

PNAC has achieved Mutual Recognition Arrangement (MRA) with International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Laboratory Accreditation Cooperation (APLAC) for testing and calibration laboratories since May, 2009 and inspection bodies since February, 2019. PNAC has also achieved Multilateral Recognition Arrangements (MLA) with International Accreditation Forum (IAF) and Asia Pacific Accreditation Cooperation (APAC) for QMS & EMS since May, 2013 and for Product Certification (ISO/IEC 17065) since June, 2017.

### **Successful Peer Evaluation of PNAC by IAF/ILAC/APAC:**

Acceptance of an accreditation body into the IAF/ILAC/APAC, MRA is dependent upon being successfully evaluated by peers from other accreditation bodies in accordance with the relevant rules and procedures as per the requirements of **ISO/IEC 17011:2017** (International Standard for Accreditation Bodies). Successful Peer Evaluation of PNAC was carried out during the month of February, 2020 by a 05 members Asia Pacific Accreditation Cooperation (APAC) team and PNAC was recommended for continuation of MRA signatory status for another 04 years.

### **Contribution to Economic Growth:**

PNAC contributes in the economic growth through accreditation. PNAC, MRA and MLA status contribute 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 tests 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.”**

### **First Personnel Certification Body (PrCB) Accredited:**

PNAC has accredited first personnel certification body in Pakistan for certification of persons in the field of Non-Destructive Testing as per the requirements of ISO/IEC 17024. This will enhance the credibility of manpower working at international level.

### **Total number of Accredited Conformity Assessment Bodies:**

<b>Accreditation Schemes</b>	<b>To Date</b>
<b>ISO/IEC 17025:2017</b> ( <i>General requirements for the competence of testing and calibration laboratories</i> )	163
<b>ISO/IEC 17020:2012</b> ( <i>Conformity assessment -- Requirements for the operation of various types of bodies performing inspection</i> )	11
<b>ISO/IEC 17021-1:2015</b> ( <i>Conformity assessment -- Requirements for bodies providing audit and certification of management systems -- Part 1: Requirements</i> )	07
<b>ISO 15189:2012</b> ( <i>Medical laboratories -- Requirements for quality and competence</i> )	10
<b>PS: 4992</b> ( <i>Pakistan Standard Halal Certification Bodies</i> )	06
<b>SO/IEC 17043:2010</b> ( <i>Conformity assessment -- General requirements for proficiency testing</i> )	04
<b>ISO/IEC 17065:2012</b> ( <i>Conformity assessment -- Requirements for bodies certifying products, processes and services</i> )	01
<b>ISO/IEC 17024:2012</b> ( <i>Conformity assessment -- General requirements for bodies operating certification of persons</i> )	01

### **Training Courses conducted by PNAC in 2019-20:**

PNAC has conducted number of following training courses for various Conformity Assessment Bodies (CABs) during year 2019-20:

<b>S. #</b>	<b>Training Course</b>	<b>Year</b>
1.	Two Days Transition Training Course for testing ad calibration Labs as per ISO/IEC 17025 in Karachi	29-30 July, 2019
2.	Two days training course on Measurement Uncertainty for calibration and Testing Labs in Lahore.	2-3August, 2019
3.	Two Days Transition Training Course for Assessors for testing and calibration Labs as per ISO/IEC 17025 in Islamabad	22-23 August, 2019
4.	Two days transition course for Assessors for testing and calibration Labs as per ISO/IEC 17025 in Karachi	18-19 September, 2019
5.	Two Days Awareness Training Course based on ISO/IEC-17025:2017 for Labs in Lahore	11-12 October, 2019
6.	Two Days Training Course on Measurement Uncertainty for Calibration & Testing Labs in Islamabad	18-19 October, 2019
7.	Two days Awareness Training Course on ISO/IEC 17020:2017 for Inspection Bodies in Lahore	25-26 November, 2019
8.	Two Days Training Course on Measurement Uncertainty for Calibration & Testing Labs in Karachi	13-14 December, 2019
9.	Five days Assessor Training Course on ISO/IEC: 17025:2017 in Karachi	9-13 March, 2020

### **Participation in Expo on the Role of Science and Technology Education for Industrial Development:**

PNAC has participated in the 2 day expo organized by PCSIR in Lahore. The purpose of this expo was to highlight the importance and need for research education to upgrade technology to cope up the technological changes. PNAC, being one of important influential organization of S&T, promotes the importance of accreditation as a tool to increase the opportunities for enhancement of businesses and exports. PNAC emphasized that the country's development is not possible without strong link between academia, S&T organizations and industrialists. PNAC can play pivotal role through accreditation in improving the quality of research and technology which may lead the country towards quality innovation for benefits and development of the industry.

### **World Accreditation Day:**

Since 2008, the International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC) has been celebrating World Accreditation Day on 9<sup>th</sup> June each year to raise awareness about importance of the Accreditation.

Due to COVID-19, Pakistan National Accreditation Council (PNAC) celebrated world accreditation day on 9<sup>th</sup> June, 2020 by raising awareness through print media and delivered messages to the public, highlighting the importance of World Accreditation Day. The theme for World Accreditation Day 2020 was “Accreditation: Improving Food Safety”.

## **PSDP Projects by PNAC:**

Currently, there are two PSDP projects in PNAC:

1. Halal Accreditation
2. Pakistan National Hospital and Healthcare Accreditation (PNHHA)

### **1. Halal Accreditation:**

“Halal” sector is a vast market of over 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.

In the field of “Halal” Accreditation, PNAC is the first Accreditation Body in the World that has 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 Board of Directors of International Halal Accreditation Forum (IHAF) and also member of the Standards and Metrology Institute for Islamic Countries (SMIIC).

### **Objectives:**

- 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.
- Promotion of “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 from PNAC play a pivotal role in the prosperity of the country through credible trade along with 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 a 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 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 facilitates 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**

<b>S. #</b>	<b>Training Course</b>	<b>Year</b>
1.	Conducted Halal Accreditation and Certification awareness Workshop in Quetta.	8 <sup>th</sup> October, 2019
2.	Conducted Halal awareness workshop on Halal Accreditation; Adding Value to Lifestyle & economic Success and Awareness Session on PS 4992 and PS 3733 in Lahore.	23 <sup>rd</sup> -24 <sup>th</sup> October, 2019
3.	Organized 3 Days Assessor Training course on PS 4992:2016 in Lahore.	27 <sup>th</sup> -29 <sup>th</sup> November, 2019
4.	Conducted Halal awareness Training on PS: 4992 in collaboration with NAFS in Karachi.	2 <sup>nd</sup> March, 2020
5.	Organized Halal Accreditation Road Show in collaboration with Halal Research Council (HRC) at Chamber of Commerce, Peshawar	2 <sup>nd</sup> March, 2020
6.	Organized Halal Accreditation Road Show in collaboration with Halal Research Council (HRC) at Chamber of Commerce, Mardan	3 <sup>rd</sup> March, 2020
7.	Organized Halal Accreditation Road Show in collaboration with Halal Research Council (HRC) at Arid Agricultural University, Rawalpindi.	5 <sup>th</sup> March, 2020
8.	Organized Halal Accreditation Road Show in collaboration with Halal Research Council (HRC) at Quaid-e-Azam University, Islamabad	6 <sup>th</sup> March, 2020
9.	Organized an Awareness Seminar on “Potential of Halal Industry in the Economy of Pakistan” in Lahore in collaboration with University of Management & Technology, Lahore (UMT)	11 <sup>th</sup> March, 2020

## **2. Pakistan National Hospital and Healthcare Accreditation (PNHHA)**

Many international hospitals are obtaining 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, unfortunately the Hospital services which are provided to the common people are 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 a common man.

### **Main Objectives:**

- To create awareness among the Health Administrators/professionals & consumers of Health services about the benefit of adopting quality standards in Health care in 8 healthcare centers/hospitals covering 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 procedures of different accreditation bodies which award accreditation to Hospitals.

### **Socio-Economic Benefits:**

- The credibility of hospitals adds benefit, both to the patients and doctors, & also contributes immensely towards improvement of overall health care delivery system.
- The Hospital accreditation will help planners to promote, implement, monitor and evaluate healthy practices in order to ensure 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 system; ensure more equitable health service provision.
- Application of quality health standards will have positive environmental prospects.

### **Awareness Training Sessions conducted by PNHHA in 2019-20**

<b>Sr. No.</b>	<b>Activity</b>	<b>Date</b>
1	Organized seminar/workshop on the importance of Accreditation of Medical Labs and Healthcare Facilities in Quetta.	9 <sup>th</sup> October, 2019
2	Organized seminar on the importance of Accreditation of Medical Labs and Healthcare Facilities at AFIP, Rawalpindi	30 <sup>th</sup> October, 2019
3	Organized 3 <sup>rd</sup> Pakistan Healthcare Summit 2020 at Karachi in collaboration with Consumer Association of Pakistan	25 <sup>th</sup> February, 2020

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

### **Introduction**

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

### **Goals and 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
- Facilitate public sector R&D organizations in market-driven research projects
- To promote adapting and adopting foreign technologies to reduce dependency on them through indigenization

### **Performance/Outcomes:**

STEDEC, being the national technology commercialization arm of Ministry of Science and Technology (MoST), aims to commercialize products and technologies of R&D organizations/institutions. STEDEC has been pursuing commercialization projects and developing linkages between industry, MoST and all other R&D organizations/Institutions. STEDEC has been communicating opportunities to R&D organizations/institutions by interacting with multiple industrial sectors like Textile, Pharmaceutical, agriculture, Leather, Surgical Goods, Food, Ceramics, Bottled Mineral water, Energy, Poultry/Livestock, Automotive, skincare etc. To achieve that, STEDEC follows methodologies of exploratory meetings, focus group study, interactive meetings, participation in seminars, industrial exhibitions, and tendering etc. STEDEC also identifies foreign technologies based on local need and direct efforts towards indigenizing and adapting foreign technologies/products through MoST and national R&D organizations/institutions. Moreover, STEDEC up-scales marketing efforts through marketing collateral such as website, newsletter, tendering, marketing collateral like brochures, leaflets etc. to promote R&D organizations/institutions' capabilities to industry across the country. During 2019-20, STEDEC carried out the following activities:

- A total of six market studies have been completed and submitted to MoST R&D organizations in the year 2019-20, namely COVID-19 testing kits (NUST), skincare (PCSIR), protease enzyme (PCSIR), LED Lights (NIE), Electric Tri-wheeler (Wu Traders), and Soil improver (PCSIR).
- The commercialization team at STEDEC has expanded STEDEC mandated operations from MoST R&D organizations to National level all other R&D organizations/institutions. With this expansion, STEDEC has signed Memorandum of Understanding (MoU) with PAGRL (Peel Aston Global Resources Ltd), and four MoUs are in progress with institutes namely PCSIR (General MoU), Muhammad Nawaz Sharif Agriculture University (MNSU), AHAN organization, and Water Management and Training Institute.
- STEDEC successfully interacted with industry through numerous platforms like interactive meeting with Industrial Stakeholders in collaboration with Lahore Chamber of Commerce and

Industry (LCCI) on electric vehicles and nanotechnology; attended NUTECH Symposium for getting informed about latest technologies ability to transform local industry into modern enterprise; participated in Developing Inclusive and Creative Economies exhibition of MNSU, Multan; and interacted in assessing at the SHARK session at MNSU, Multan in which numerous projects were presented for funding approval.

- STEDEC has been successfully commercializing products/technologies having market potential by MoST R&D Organizations. For example, PCSIR developed Agro Chemicals & Food; including Phytofix (Plant Growth Regulator), Sarsabz (Nitrogen Foliar Fertilizer), NPK (Nitrogen-Phosphorus-Potassium Flood Fertilizer), Sulfokil (Sulphur based fungicide), Copxykil (Copper based fungicide), Zincole (Zinc based plant nutrient), and FAMIC (fish oil supplement). In addition, hand sanitizer, disinfectant surface spray, and hand wash were successfully commercialized during COVID-19 pandemic.

# **Pakistan Standards and Quality Control Authority (PSQCA)**

## **Introduction**

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

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 3<sup>rd</sup> 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), South Asian Regional Standards Organization (SARSO). PSQCA takes part in policy and technical activities in the above 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).

## Board of Directors Meeting

16<sup>th</sup> Board of Directors meeting was held on 27<sup>th</sup> December, 2019 under the chairmanship of Minister for Science and Technology, Ch. Fawad Hussain. Following decisions were made:

- **Approval of Restructuring of System Certification Activities:**

Restructuring of System Certification was approved to offer third party management system certification to the industry. Accordingly, Minister for Science and Technology, Government of Pakistan inaugurated office of the System Certification Centre on 2<sup>nd</sup> March, 2020 at PSQCA Complex, Karachi.

- **Proposal for Standardized Minimum Marking Fee:**

The PSQCA Board has also approved the minimum marking fee @ Rs. 10,000/- for each quarter and each brand.

17<sup>th</sup> Board of Directors meeting was held on 2<sup>nd</sup> March, 2020 under the chairmanship of Minister for Science and Technology, Ch. Fawad Hussain.



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

### **Summary of Pakistan Standards Published**

No. of National Standards Committees	=	13 Nos.
No. of Pakistan Standards formulated	=	6,132
No. of ISO/IEC/Others standards adopted as Pakistan Standards	=	16,516
Total No. of Standards Developed/Adopted	=	22,648



*Technical committee meeting on Road Traffic Safety Management was held on 23<sup>rd</sup> October 2019, under the chairmanship of Dr. Salman, CEO, Liaquat National Hospital, Karachi.*

**Standards Development Works (Progress 2019-20)**

S. No.	Division	Automobile	Civil	Electrical	Electronics	IT & ICT	Mechanical	Agri & Food	Chemical	Halal	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	31	13	08	14	09	07	12	10	4	--	06	09	123																					
2	National Standards Committee (NSC) meetings held	26	1	1	1	1	Nil	01	03	--	--	01	0	35																					
3	Participation in balloting of ISO/IEC	17	84	511	835	05	00	37	200	--	--	282	--	1971																					
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	251									
		06	03	22	14	0	17	10	16	--	02	--	32	--	15	--	06	29	08	03	08	04	10	06	10		04	05	03	--	--	--	--	10	01
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	264									
		06	03	22	08	60	14	04	33	--	03	--	25	--	40	--	--	--	--	03	08	04	10	06	10		--	--	02	--	--	--	--	--	03

**Note:**

Rev= Revision, DA= Direct Adopted

## **Directorate of Conformity Assessment, PSQCA**

Detail of activities carried out in the Directorate:

<b>Sl. No.</b>	<b>Title</b>	<b>Achievement July 2019 to June 2020</b>
01	Applications received	2087
	New	757
	Renewal	1330
02	Total Licenses Issued	1873
	New	595
	Renewal	1278
03	<b>Quality Assurance Activities</b>	
a	Inspection	4416
b	Samples Collected	7421
c	Test Reports Received	5790
d	Conformity	5489
e	Non-conformity	295

### **Voluntary Product Certification Scheme:**

PSQCA also offers Voluntary Certification since 2006 to facilitate general consumers to use quality products in accordance with Pakistan Standards and International Standards. Voluntary Certification Division of PSQCA offers voluntary certification on food, electrical, mechanical and chemical Products. PSQCA certified 11 food products and 25 non-food products voluntarily during the period.

## **Directorate of Import & Export, PSQCA**

Detail of the activities carried out in the Directorate is as under:

- In compliance with Government's vision for providing facilitation to the business community under National Single Window Programme, online application processing system has been developed.
- Established web based/online test report system with QCC, Karachi and with all out-sourced laboratories i.e. NED University, Karachi, Intertek Pakistan (Pvt.) Ltd., PCSIR, Karachi Shipyard & Engineering Works Limited for incorporation of CAR/NCR & ultimate benefits/facilitation of clients, minimizing the time requirements and facilitating the trade.
- After detailed deliberation and consultation with Ministry of Commerce, FBR and consultant appointed by Pakistan Customs, list of PCT's/HS Codes against the mandatory items of PSQCA has been updated, finalized and submitted to Ministry of Commerce for inclusion in Appendix-N of Import Policy Order on December 31, 2019.
- Directorate of Import & Export has completed pre-requisite i.e. Quality Manual, Procedures and required documentation for obtaining accreditation as Inspection Body as per ISO/IEC 17020 and submitted request to PNAC.
- Introduced/established E-reporting system along with coding system without any consignee detail for sampling to ensure transparency, minimizing the human interaction and reducing time for ultimate benefit of business community.
- No. of Cases Processed : 14982
- No. of CAR issued : 14846
- No. of NOC/RC issued : 1357
- No. of Samples sent to Labs. : 15992

## **Directorate of Quality Control Centre, PSQCA**

Activities and Functions of the Directorate:

- Quality Control Centre, PSQCA undertakes testing of industrial raw material and finished products and Import Items to establish their quality/grade with respect to National as well as International Standards (i.e. ISO, IEC, ASTM etc.) according to recommended guidelines in the field of Chemical, Microbiology, Physical & Engineering (Electrical, Mechanical, Gas Home

Appliances), Building Material and Textile etc. through its laboratories located at Karachi, Lahore and Peshawar.

- Enforcement of Compulsory Certification Marks Scheme of PSQCA through testing of Mandatory Items (domestic or foreign). This financial year QCC performed 21902 tests.

### **Services Provided to Major Sectors/Organizations/Projects:**

QCC of PSQCA provided testing services to various on-going projects of Federal Government as well as Provincial Government with reference to accomplishment of their targets related to quality of material being used in these projects. Some of these Projects are as under:

- Lahore Orange Line-METRO Train Project (Package-2).
- CPEC Related Projects.
- Swat Motorway Project.
- Defense Organization (POF).
- Development of Phase-II of New Lahore City Project.
- Urban Rehabilitation and Infrastructure Improvement Project.
- WASA/LDA Development Projects.
- Punjab Police Department.
- Public Health Engineering Department.
- National Engineering Services of Pakistan (NESPAK).
- Defense Housing Authority (DHA).

### **Directorate of Technical Services 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), renamed as “Metal Industry Research and Development Centre (MIRDC)” through a Gazette Notification dated 14.10.1982. MIRDC was again renamed as Technical Services Centre (TSC) as a core component of Pakistan Standards & Quality Control Authority (PSQCA) through an Act passed by parliament and notification was issued in Gazette of Pakistan on 17<sup>th</sup> March, 1996. Since its initiation, this Centre is making useful contribution to assist the Metallurgical and Engineering Industry of Pakistan by providing quality control and quality assurance services 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.

### **Detail of Available Testing Services and Activities**

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, materials and products.
- Technical evaluations of the engineering components.
- 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 discussion 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 and Descon etc.
- Provided In-Situ Replica Metallography & failure investigation services to the leading private sector like Fertilizer Plants, Power Plants, Cement Industry, Agriculture Industry and Process Industry etc.
- Tin Coating determination on Oil & Ghee containers.

### Achievements

- 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 Hair dyes & hair shampoo (PS: 5250:2013).
- Testing of Soap (PS: 13:2018).

### Jobs Carried Out at TSC

Number of Jobs conducted Division wise	Metallurgical Engg. Div.	=1563
	Service Div.	=1512
	Metal Working & Auto Div.	=285
	<b>Total No. of Jobs</b>	<b>=3360</b>
Number of Jobs received form PSQCA (The Jobs received from CA-Lahore zones & QCC against Book adjustment)	774	
Number of Samples received from market	2586	
More than 80% of Technical Jobs conducted are of evaluation of Engineering items		
No. of trainings and internships provided	Provided 15 Internships to Universities Students & 87-Technical awareness trainings sessions to Industrial Technical Institute Students.	

### Registration of Inspection Agencies (RIA) Scheme

PSQCA, Federal Government's sole National Standards Body of Pakistan, is regulating and registering the Inspection Agencies since 1982 under "Inspection Agencies Ordinance 1981" & "Inspection Agencies Registration and Regulation Rules 1982" and has been authorized for "Registration of Inspection Agencies" operating in Pakistan; in exercise of power conferred under section VIII, sub-section XXII of PSQCA Act of 1996.

In year 2015, PSQCA revised its Inspection Agencies Registration Scheme and decided to align its registration criteria in accordance with International Standard ISO/IEC 17020:2012 guidelines, along with Law of the Land & other organizational sustainability requirements, thus, providing recognition to its registered Inspection Agencies internationally through MoUs signed by PSQCA with different National Standards Bodies/Agencies of the World.

Registration of Inspection Agencies for specific scope of inspection activities is granted for one year initially, and then renewed for two years. The PSQCA's Registration Scheme for Inspection Agencies (IAs) provides a formal registration of an inspection Agency's services for its integrity and reliability. Achieving effective inspection is important as it ensures the safety of public health, environment, plant machinery, equipment, structures and systems in operation. Upon registration, the organization is deemed to be capable of meeting standards of quality, performance, technical competence and professional judgment. Forty-two (42) Inspection Agencies (IAs) have been registered with PSQCA in different scopes of work.

## Legal Directorate

### Activities/Achievement & Development

- Seventeen (17) legal cases were disposed-off.
- PSQCA addressed 45 complaints through Prime Minister’s Performance Delivery Unit (PMDU) Portal.
- Districts & Session Judges of Quetta, Kachi, Harnia & Sibbi empowered Judicial Magistrate for pleading the PSQCA cases in above said Districts on the request of PSQCA.
- PSQCA initiated the matter to resolve constitutional and legal ambiguities between PSQCA and all Provincial Food Authorities. In this regard, a meeting under the chairmanship of Prime Minister of Pakistan was held on 23<sup>rd</sup> December, 2019 to resolve the constitutional and legal ambiguities, wherein the final decision of the 41<sup>st</sup> meeting of the Council of Common Interest (CCI) was taken in favor of PSQCA. The decision is as under:

*“Harmonized standards shall prevail across the Country as National Standard/Pakistan Standard. All Provincial Standards shall be repealed with National Standards, formulated by PSQCA.”*

### Directorate of WTO-TBT National Enquiry Point

PSQCA has also been designated as the WTO-TBT National Enquiry Point on Technical Barriers to Trade (TBT) of Pakistan under the TBT Agreement (Articles 10.1, 10.2 and 10.3) and established WTO-TBT National Enquiry Point (NEP) 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. Following are the achievements of NEP, during the period:

S #	Activities	Achievements 2019-20
1	Updating of web portal on WTO-TBT National Enquiry Point-PSQCA in compliance of TBT agreement	100%
2	Updating the information of WTO-TBT National Enquiry Point to In-charge, KPK, PSQCA regularly	100%
3	Collection of Standardization work programme (Quarterly) of various Technical Divisions of SDC and placed on PSQCA website as per TBT agreement requirement	100%
4	Collection of TBT Notifications issued by the WTO member countries through WTO Secretariat, Geneva	1276
5	Circulation of TBT Notifications among the stakeholders for their reviews and comments	1276
6	Pakistan TBT Notifications to be notified through WTO Secretariat, Geneva	100%
7	Handling of enquiries (local) on technical regulations, standards and conformity assessment procedures	296
8	Handling of enquiries (International) on technical regulations, standards and conformity assessment procedures	06

### Directorate of International Affairs and Training (IATR)

#### Local Trainings for Awareness

- Convened workshop titled “Standards & Trade Stakeholder Workshop” on 10<sup>th</sup> March, 2020 at Karachi with the help of Common Wealth Standards Network, United Kingdom.
- Convened “Sensitization Programme on Standards Development” for technical officers of PSQCA on 11<sup>th</sup> March, 2020 at PSQCA Head Office with the help of Common Wealth Standards Network, United Kingdom.
- Convened “Standards & Trade Stakeholder Workshop” on 12<sup>th</sup> March, 2020 at Lahore with the help of Common Wealth Standards Network, United Kingdom.
- 1<sup>st</sup> National Standards Steering Committee meeting on food standards was held on 10<sup>th</sup> June, 2020.

## Foreign Visits/Workshops

PSQCA participated in the following international/regional workshops during 2019-20:

S. No.	Topics/Subjects
1	3 <sup>rd</sup> meeting of Standardization Management Council (SMC) of Standards and Metrology Institute of Islamic Countries (SMIIC) was held on 3 <sup>rd</sup> November, 2019 at Makkah, Kingdom of Saudi Arabia.
2	19 <sup>th</sup> meeting of Board of Directors (BoD) of SMIIC was held on 4 <sup>th</sup> November, 2019 at Makkah, Kingdom of Saudi Arabia.
3	14 <sup>th</sup> meeting of General Assembly of SMIIC was held on 5 <sup>th</sup> November, 2019 at Makkah, Kingdom of Saudi Arabia.
4	'Counterpart Training for Energy Standards & Labeling Regime' was held from 17 to 23 November, 2019 at Japan.
5	ISO Regional Training on promotion and dimension of Standards was held on 3-5 December, 2019 at Qingdao, China.
6	ISO regional follow-up workshop on "National Standardization Strategy" was held from 3 to 5 December, 2019 in Singapore.
7	ISO 37001:2016 Anti-Bribery Management systems a tool to contribute to the UN SDGs was held from 9 to 13 December, 2019 at Kuala Lumpur, Malaysia.

## MoU's/MRA's

1	Meeting with delegation from the Turkish Standards Institution (TSE) was held on 26 <sup>th</sup> December, 2019 in the office of the Director General, PSQCA at PSQCA Complex, Karachi. Both sides discussed the following points: <ul style="list-style-type: none"><li>➤ Sharing of Standards Development procedure/model at TSE-Turkey;</li><li>➤ Recognition of Product Certification pursuant to Draft Action Plan on MoU between PSQCA-Pakistan and TSE-Turkey;</li><li>➤ Support on establishment of CE-Marking to PSQCA;</li><li>➤ Registration of Inspection Body with PSQCA; and</li><li>➤ Recognition of Testing Laboratories with PSQCA;</li></ul>
2	The Implementation Programme of the MoU between Pakistan Standards and Quality Control Authority (PSQCA) and the Turkish Standards Institution (TSE) in the field of Standardization, Conformity Assessment, Metrology and Trainings was signed on 14.02.2020 during the visit of H.E. Recep Tayyip Erdogan, President, Republic of Turkey to Pakistan at PM Secretariat, Islamabad.

## Directorate of Finance

<b>Total Revenue</b>	=	<b>1316.789 Millions</b>
<b>Expenditures</b>	=	<b>797.294 Millions</b>
<b>Budget</b>	=	<b>815.163 Millions</b>

## **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) so that 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.

### **Major Functions and Objectives of CWHR**

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

### **Activities/Outcomes**

#### **i. Non-Destructive Testing (NDT)/Contract/Consultancy Services**

Non-Destructive Testing Services were provided to following organizations:

- 01 PCSIR, Karachi Laboratory
- 01 Sindh Building Control Authority
- 02 M/s Magnacrete Pvt. Ltd.
- 01 M/s Kashif Construction Pvt. Ltd.
- 01 M/s Bore and Bore Pvt. Ltd.

#### **ii. Testing of Building Materials (QC and QA)**

Testing services of Building Materials (Quality Control and Quality Assurance) were provided to following organizations:

- 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

#### **iii. Dissemination of R&D Products**

Fabricated 330 Ferrocement Manhole Covers for Faisalabad Development Authority.

#### **iv. Conference-cum-Expo**

Displayed civil engineering R&D products/services in the conference-cum-expo on “Higher Education in Science and Technology for Socio Economic Development of Pakistan” at PCSIR Laboratories Complex, Lahore.

#### **v. Joint Collaboration**

A meeting was held with Association of Builders and Developers (ABAD) at Karachi for joint collaboration.

- vi. Non-Development Budget FY 2019-20**  
Non-Development Budget of CWHR for FY 2019-20 was Rs. 94 million.
- vii. Effects of COVID-19 Pandemic**  
The set targets for construction activities suffered due to COVID-19 pandemic.

# **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 37 undergraduate, 73 MS & 51 Ph.D. academic programmes including Engineering, IT, Biotechnology, Biosciences, Art & Design, Management and Social Sciences. As of 30.06.2020, the University has faculty strength of 1235 with 623 Ph.Ds. and student strength of 17279. 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 Strategic Development Framework (NSDF) 2013-2022 (Approved by NUST BoG), however, based on the progress, the targets were revised as under:

## **Students' Strength**

	<b>Present Status</b>	<b>Targets for 2022</b>
<b>UG</b>	10,765	12,000
<b>MS/M.Phil.</b>	5,819	5,000
<b>Ph.D.</b>	695	1,200
<b>Total</b>	<b>17,279</b>	<b>18,200</b>

## Faculty State

	Present Status	Targets for 2022
<b>Ph.D.</b>	623	1,100
<b>MS/BS</b>	612	300
<b>Total</b>	<b>1235</b>	<b>1,400</b>

## Academic Programmes

	Present Status	Targets for 2022
<b>UG</b>	37	48
<b>MS</b>	73	94
<b>Ph.D.</b>	51	59
<b>Total</b>	<b>161</b>	<b>201</b>

## 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"> <li>i. Improve overall International Ranking.</li> <li>ii. Improve Ranking in Engineering and Technology, Natural Sciences and Computer Sciences.</li> <li>iii. Enhance international linkages and visibility by securing memberships in various international associations related to Science Parks, joint Research platforms and academic leagues.</li> </ul>
(b) Relevance of education and research with the needs of country's economy & society.	<ul style="list-style-type: none"> <li>i. Become Pakistan's first full scale 3<sup>rd</sup> Generation University that has greater entrepreneurial international stature/footprint with focus on sustainability to transform it to 4<sup>th</sup> Generation University.</li> <li>ii. Promote Research &amp; Innovation with focus on areas that are aligned with national vision, needs and priorities, having greater societal impact and industrial relevance thus contributing towards knowledge economy of Pakistan.</li> <li>iii. Become an SDG-Engaged University with University Academics, Research, Operations &amp; Governance, fully aligned with SDGs and measurable outcomes.</li> <li>iv. Enhance research, commercialization and technology transfer to the industries.</li> <li>v. Outreaching to the industry for R&amp;D projects of industrial and societal needs.</li> <li>vi. Enhance research funding.</li> <li>vii. Building University-Industry Linkages aimed at full spectrum engagement with multi-sectoral industries.</li> </ul>

<b>Description</b>	<b>KPIs</b>
(c) Establish ecosystem to contribute towards National Innovation System, enhance entrepreneurial character and commercialization of the research output by building a strong Academia–Industry Collaboration (including Defense Industry).	<ul style="list-style-type: none"> <li>i. Encourage entrepreneurial culture at the University as well as encourage/promote National innovation system.</li> <li>ii. Establish pilot National Science and Technology Park (NSTP) to host tenants engaged in Research and Innovation that is aligned with national needs. Tenants will 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.</li> <li>iii. Seek approval and funding for main National Science and Technology Park (NSTP).</li> <li>iv. Seek Special Economic Zone status for NSTP from BoI.</li> <li>v. Enhance the incubation space and provide an environment that attracts and nurtures technology based start-ups and transforms them into commercially viable enterprises.</li> </ul>
(d) Inter-disciplinary academic programmes & Research and Innovation in teaching & learning.	<ul style="list-style-type: none"> <li>i. Introduce multidisciplinary subjects to achieve diversification.</li> <li>ii. Enhance soft skills of students for their career development and market acceptance.</li> </ul>
(e) Empathy for society & community service.	<ul style="list-style-type: none"> <li>i. Lay emphasis on having discernable positive impact on society.</li> <li>ii. Institutionalizing the community services and community development.</li> </ul>
(f) Building Endowment Fund and Financial Self-Reliance.	<ul style="list-style-type: none"> <li>i. Raise endowment fund.</li> <li>ii. Enhance registration of alumni.</li> </ul>
(g) Develop NUST into a green university.	<ul style="list-style-type: none"> <li>i. Grow plants/trees.</li> <li>ii. Maximum use of re-cycled water for watering plants.</li> <li>iii. Use of solar power.</li> </ul>

## Ranking

### a. “QS” World University Ranking

<b>Year</b>	<b>Overall Ranking</b>
2019-20 (QS 2020)	355

### b. “QS” Asian University Ranking

<b>Year</b>	<b>Overall Ranking</b>
2019-20	83

### c. “QS” Young University Ranking

<b>Year</b>	<b>Ranking (Under 50 Years of Age)</b>
2019-20 (QS 2020)	41

**d. “QS” Engineering & Technology Ranking**

Year	By Faculty Ranking
2019-20	260

**e. “QS” Pakistani University Ranking**

Year	Overall Ranking
2019-20	1

**f. “THE” Asian University Ranking**

Year	Overall Ranking	
2019-20	201-250	
Year	Emerging Economies	150 under 50 Years
2019-20	224	201-250

**Outcomes****Research Projects**

(a)	Research Projects Approved for Funding	65
(b)	Research Projects in Progress	285
(c)	Research Projects Completed	84

**Research Papers**

(a)	Research Papers Presented in Conferences	425
(b)	Research Papers Publications	1150

**Intellectual Property Rights**

(a)	Patents filed	628
(b)	Patents Approved	118

**Commercialization**

(a)	Technologies Licensed to the Industry	24
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**Companies Incubated/Graduated**

(a)	Number of Incubatees	24
(b)	Number of Companies Graduated	15
(c)	Number of Jobs Created (Graduated Incubatees)	193

**Innovation Promotion and Marketing**

(a)	Industrial Problems Identified	423
(b)	Consultancy Projects Identified	31
(c)	R&D Projects Identified	15

**Professional Development Centre**

(a)	Number of Internal Trainings Conducted	42
(b)	Number of External Trainings Conducted	35

**Corporate Advisory Council (CAC)**

(a)	CAC Partner Companies	261
(b)	Board of Advisors	35
(c)	Number of CAC – NUST Partner Schools/Institutes	19
(d)	Number of Student Visits Arranged by CAC Team to Industry	157
(e)	CAC Sector Committees Member Companies	169

## NUST Placement Office

(a)	Students Placed on Jobs	1507 out of 2153 graduated students (429 pursuing further studies, 95 seeking employment)
(b)	Industrial Linkages Established with top Recruiting Companies	1260
(c)	Number of Recruitment Drives	196
(d)	Number of Industrial Talk Sessions Organized	89

## Career Development Centre

(a)	Career Development Plan	25
(b)	Resume writing	21
(c)	Professional Employability Skills	29
(d)	Interviewing Techniques	28

## Develop NUST into a Green University

In line with Government's initiative, NUST has also achieved following:

- (a) Number of Trees:
  - i. Year 2019-20 - Planted 23000
- (b) Sewerage Water Being Recycled and Used for Horticulture (Daily)
  - i. Wetland Plant Installed/Operated by NUST Institute of Civil Engineering (NICE), NUST (Capacity 285,000 Litres/day)
  - ii. Membrane Bio-Reactor Plant Installed/Operated by Institute of Environmental Science & Engineering (IESE), NUST (Capacity 50,000 Litres/day)

## Alignment of Outcomes and Outputs with Budget

### a. Budget Details 2019-20

(Rs. in Million)	
Budget Type	Demand
Non-Development Budget	2,362.470

## NUST Development Plans through PSDP

### a. Ongoing Projects

#### ➤ Through MoST

- Cloud Enabled Infrastructure for Research & Innovation.
- Establishment of Medical Devices Development Center (MDDC) at NUST, Islamabad.

#### ➤ Through HEC

- Prime Minister Programme for Development of Ph.Ds. in Science & Technology.
- Upgradation and Replacement of Labs Equipment at NUST Schools/Colleges.
- Establishment of NUST Campus at Quetta.

## Future Plans and Goals

- ❖ **Establishment of National Science & Technology Park (NSTP) at NUST, H-12 Campus, Islamabad:**
  - \* Pilot project of NSTP has been inaugurated in December, 2019
- ❖ **Establishment of NUST Campus at Quetta:**
  - \* NUST is in the process of establishing its permanent campus at Quetta for approx. 550 students by the end of 2021, however, a temporary campus has been launched

in the accommodation provided by Army with effect from Fall 2019 in disciplines of Computer Sciences and Civil Engineering with 50x Students each.

❖ **Establishment of NUST Teaching/Research Hospital:**

- \* Project approved by PPPA Board on 30<sup>th</sup> December, 2019.
- \* Project Information Memorandum (PIM) and Expression of Interest (EOI) were prepared in consultation with P3A in January, 2020.
- \* On Appointment of new CEO of P3A, meeting was held on 16<sup>th</sup> April, 2020.
- \* Broad allocation of funds for TA was also approved on 29<sup>th</sup> April, 2020.

## **COMSATS University, Islamabad (CUI)**

### **Introduction**

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

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

### **Goals and Targets**

CUI has developed and expanded, following its strategic Vision 2020, with specific goals and objectives outlined for the next 15 years, including physical, quality assurance, promotion of research, industrial infrastructure, major areas of academic growth, expansion and specialization, faculty and staff development, 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**

The CUI currently comprises of six faculties, 22 departments and 08 research centers. Presently, 100 degree programs are on offer in which around 36,060 students are enrolled. CUI has become the first Higher Education Institution in Pakistan to offer hybrid teaching from Fall-2017 semester. There are 2,700+ faculty members working in CUI with 1,120+ faculty members and academic managers having Ph.D. qualification. More than 523 faculty and staff members are undergoing advanced education leading to MS and Ph.D. degrees. The Faculty Development Academy of the Institute 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 66,000 graduates including 385 PhDs.

### **CUI Rankings**

- In TIMES Higher Education (THE) world universities rankings 2020, CUI has been placed among 601-800 world best universities, and ranked 2<sup>nd</sup> in Pakistan. Besides, it was also ranked at #301-400 in THE Engineering & Technology, #401-500 in Computer Science, and Life Science and #501-600 in Physical Sciences subject rankings 2019. CUI was also ranked 137<sup>th</sup> in THE Emerging Economies Rankings 2019.
- Ranked at 221 in THE University Impact Rankings 2020, and second for Pakistan. CUI was ranked in 15 SDGs out of 17. These are as under:
  - SDG 1: No Poverty: 101-200
  - SDG 3: Good Health and Wellbeing: 401-600
  - SDG 4: Quality Education: 301-400
  - SDG 5: Gender Equality: 401+
  - SDG 6: Clean Water and Sanitation: 74
  - SDG 7: Affordable and Clean Energy: 101-200
  - SDG 8: Decent Work and Economic Growth: 35
  - SDG 9: Industry, Innovation and Infrastructure: 301-400
  - SDG 11: Sustainable Cities and Communities: 201-300
  - SDG 12: Responsible Consumption and Production: 201-300
  - SDG 13: Climate Action: 101-200
  - SDG 14: Life Below Water: 101-200
  - SDG 15: Life on Land: 101-200

- SDG 16: Peace, Justice and Strong Institutions: 301-400
  - SDG 17: Partnerships for goals: 301-400
- Ranked among 801-1000 world best universities as per QS World Universities Rankings 2020. Besides, it was ranked 135<sup>th</sup> in QS Asian Universities Rankings 2019.
  - Ranked first in Pakistan and amongst 501-600 ranked university of the world by Academic Ranking of World Universities (ARWU) prestigious Shanghai Rankings 2019.
  - While at the national level, CUI has been ranked No. 3 in General Category of universities and No. 6 in Overall Pakistani Universities. CUI was recipient of Cambridge IFA's 3G Excellence in Higher Education Award 2019. CUI also received 7<sup>th</sup> FPCCI Achievement Award 2019 in the category of Education, Technical and Vocational Education, as recognition of its efforts and achievements in Business Incubation Centers for SMEs.

### **Conferences/Workshops**

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

- **Seminar-Regulating Risk in Islamic Finance**  
The Department of Management Sciences, CUI Lahore Campus arranged this seminar on October 07, 2019. Dr. Humayon Dar, Director General of the Cambridge Institute of Islamic Finance and Dr. Jamshed Anwar Chatta, Assistant Secretary General of Islamic Financial Services Board were the main speakers.
- **TechFest Fall 2019**  
The Department of Electrical and Computer Engineering, CUI Abbottabad Campus organized a student's projects/posters exhibition "TechFest-Fall 19" on October 19, 2019. Different industries/organizations were visited and invited for the said event. Various ideas, proposals and projects were presented by the students in the said exhibition.
- **Seminar-How to prevent Crimes using Earthquake**  
CUI Lahore Campus arranged the said seminar on October 23, 2019. Prof. Dr. Marco Abate, Vice Chancellor and Professor of Mathematics, University of Pisa, Italy was the speaker on the seminar.
- **Seminar-Road Safety Awareness**  
CUI, Wah Campus organized a seminar with the aim of raising awareness of traffic rules and regulations among students and employees. The seminar was conducted by the officers of National Highway and Motorway Police (NH&MP) N-5 North Zone-1 Section on October 24, 2019.
- **Seminar-Personality, Well-Being and Good Health**  
The Department of Management Sciences, CUI, Wah Campus organized a seminar on October 28, 2019. The guest speaker, Dr. Rukhsana Sheikh, Senior Consultant/health practitioner talked on important issues and avoiding harmful activities like Obesity, Short Sleeping hours, Lack of Exercise and Excessive use of Social Media causing psychological distress among students.
- **Seminar-Geopolymer Concrete; Concrete for Next Millennium**  
One day CPD seminar was organized by the Civil Engineering Department, CUI, Wah Campus on November 05, 2019 delivered by guest speaker, Dr. Muhammad Zahid a Post-Doctoral researcher at University Technology, Petronas, Malaysia.
- **Seminar-Kalam-e-Iqbal Gosh Bar Awaz**  
In remembrance of the contribution of Allama Muhammad Iqbal and on his 142<sup>nd</sup> birth anniversary, an event was organized at CUI, Wah Campus by Literary Society.
- **Seminar-A Journey from Vehicular Networks to Vehicular Clouds and Vehicular Social Networks: Solutions and Challenges**  
The Department of Electrical and Computer Engineering, CUI, Wah Campus held an International Seminar on November 15, 2019, delivered by guest speaker, Associate Professor, Dr. Rasheed Hussain from Innopolis University, Russia.

- **Seminar–Intellectual Property Rights**  
CUI Lahore Campus arranged a seminar on November 21, 2019.
- **VisioSpark-2019**  
17<sup>th</sup> Episode of VisioSpark–2019, a National Level Mega IT Competition Event, organized by the Department of Computer Science in collaboration with the Department of Electrical & Computer Engineering, CUI, Wah Campus was held on November 23, 2019. More than 2000 students from 40 universities participated in 16 different competitions/activities.
- **Seminar on Awareness and Management of Parthenium Weed**  
Center for Climate Research & Development and Center for Agriculture & Bioscience International organized seminar on November 25, 2019 at Islamabad Campus.
- **1<sup>st</sup> International Workshop on Recent Trends in Electric Machine Design**  
The Department of Electrical and Computer Engineering, CUI Abbottabad Campus conducted workshop from November 29-30, 2019 to the participants on JMAG tool and its applications.
- **Seminar-Anti-Corruption**  
The seminar was conducted at CUI, Wah Campus on December 4, 2019 in connection with the celebration of Anti-Corruption Week and to spread knowledge against corruption, highlighting: how the corruption has crushed society and challenges in fighting against corruption in Pakistan.
- **Workshop on Scientific Writing by COMSATS Chemical Society (CCS)**  
COMSIAN Chemical Society (CCS), Department of Chemistry, CUI-Abbottabad Campus successfully organized its first technical event on December 5, 2019.
- **2<sup>nd</sup> International Symposium on Advanced Energy Material: Production to Storage (ISAEM-2019)**  
Interdisciplinary Research Centre in Biomedical Materials, CUI Lahore Campus organized the event on December 10, 2019.
- **Seminar on Counseling on Skill Ladder and Career Path**  
The Seminar was held at CUI Sahiwal Campus on December 11, 2019. Mr. Zafar Iqbal, IT Expert from Canada talked with students and enlightened them on how they can approach international market after completing graduation.
- **7<sup>th</sup> International Symposium on Biomedical Materials**  
Interdisciplinary Research Centre in Biomedical Materials, CUI Lahore Campus arranged the Symposium on December 11-12, 2019. The symposia of this series focused on Prospects and Potentials, Current Research and Future Signposting, Recent Advances and Challenges, Translational Research and Commercialization, Clinical Requirements & Regulatory Affairs, and Synergizing Partnerships, Promoting interdisciplinary research & development in Biomedical Materials and allied areas.
- **Seminar-Network Function Virtualization**  
The technical seminar was organized by the Department of Electrical and Computer Engineering at CUI, Wah Campus on December 18, 2019. The distinguished speaker Director of Graduate Education/IEEE Fellow, Prof. Ahmed E. Kamal, Iowa State University, USA addressed the new advancement in Telecommunication the Network Function Virtualization (NFV). The students were briefed on network building virtual blocks that may connect, or chain together, to create virtual communication.
- **FIT 2019 (Closing Ceremony)**  
The closing ceremony of the International Conference on Frontiers of Information Technology-FIT 2019, organized by CUI, was held on December 18, 2019 at COMSTECH Secretariat, Islamabad. Federal Secretary, Ministry of Information Technology and Telecommunication, Mr. Shoaib Ahmad Siddiqui graced the event as Chief Guest. This conference accepted 67 out of 269 submitted research papers, which were presented in 27 sessions along with several invited talks from world-renowned scholars, researchers, experts and leaders in the industry focused on AI, Water Informatics and Efficient Energy Systems

among other. Panel discussion on “National Artificial Intelligence Strategy” was held on the final day focusing on the scope of AI in economic development of the country.

- **Seminar on Collective Action for Knowledge Economy**  
CUI Sahiwal Campus arranged a seminar on January 14, 2020. Prof. Dr. Muhammad Nawaz, Izaz-e-Fazeelat, Pride of Performance, Meritorious Professor Emeritus, Former Vice Chancellor UVAS, Adviser VU, QU at CUI Sahiwal Campus delivered the lecture to the faculty members.
- **Session on Air Quality Research or other Environmental Pollution Issues**  
Department of Meteorology, CUI, Islamabad campus arranged the session on January 15, 2020 which was hosted by Prof. James Schauer, Director of the Wisconsin State Laboratory of Hygiene, University of Wisconsin-Madison and Ellen Connorton, Senior Science Advisor for the U.S. Department of State, Bureau of South and Central Asian Affairs.
- **Digital Sahiwal 2020**  
Digital Sahiwal 2020 powered by e-Rozgaar was held at Sahiwal Arts Council on February 14, 2020. Commissioner Sahiwal, Mr. Muhammad Ahsan Waheed and Director CUI, Sahiwal Campus, Prof. Dr. Saleem Farooq Shaukat were the chief guests of the ceremony.
- **Alumni Talks and Certificate Distribution**  
The Department of Electrical and Computer Engineering, CUI, Attock Campus arranged an Alumni Talks “University to Corporate World” on February 19, 2020. Three Alumni including Mr. Babar Ali Channa (Design Engineer, PAC Kamra), Mr. Talha Nadeem (AI Developer Si-Paradigm), and Mr. Hassan Hayat (Design Engineer, PAF Peshawar) visited the campus and interacted with the enrolled students.
- **Seminar-Awareness on Diabetes**  
A Free Diabetes Screening Camp and Awareness Seminar were held at CUI, Sahiwal Campus on February 19, 2020. Senior Registrar/Diabetologist, DHQ Teaching Hospital Sahiwal, Dr. Sarfaraz Ahmad Khan delivered diabetes awareness lecture in the Seminar.
- **Two Days National Workshop on Research Methodology in Chemical Sciences (Spectroscopy and Structural Analysis) RMCS-2020**  
The Department of Chemistry, CUI, Abbottabad Campus organized the workshop on February 24-25, 2020. Prof. Dr. Mujaddad Ur Rahman, Vice Chancellor, Abbottabad University of Science and Technology graced the occasion as a chief guest.
- **Awareness Seminar on Corona Virus**  
The Department of Biosciences, CUI Sahiwal Campus organized an awareness seminar on March 04, 2020.
- **CPS Seminar on Corona Virus; "COVID-19 and the Nexus between Global and National Health Governance: Policy Prescriptions for Addressing Pandemics"**  
Centre for Policy Studies (CPS), CUI arranged a seminar on March 12, 2020 at the Video Conference Hall, Junaid Zaidi Library. The speakers included: Dr. Mumtaz Ali Khan, Senior Scientific Officer & National Focal Person for Infection Protection Control, National Institute of Health (NIH); Dr. Farah Sabih, National Professional Officer IHR, WHO; Dr. Ejaz Ahmad Khan, Associate Professor, Health Services Academy, Islamabad and Dr. Imran Syed, Head, CPS, CUI.
- **COVIDESIGN E-Talk Series**  
The Department of Art and Design, Islamabad Campus initiated a “COVIDESIGN e-talk series”, which brought leading art and design experts from around the world to engage with students in an online series of talks, where they share their expertise and enlighten students with their vast knowledge. The talk series was held on June 25, 2020 and the speaker was Mr. Andreas Duspohl, Director of International Newspaper Museum in Aachen, Germany. He talked live from Germany about the "Birth of Newspaper and the Media Revolution after Gutenberg".

**Faculty Development Academy (FDA)** has been organizing series of activities for the CUI teachers along with teachers from local universities to equip them with latest knowledge, proactive instructional strategies and an active social interest to foster quality education. A brief summary of the activities conducted by the FDA during the year 2019-2020, is given below:

- A one-week workshop for admin officers of CUI Abbottabad Campus was organized during September 23-27, 2019
- A one-day seminar on ‘Social Media: An Addiction’ was held at Islamabad Campus on October 21, 2019
- A one-week Professional Discourse for admin Personnel, OG-I (Group-II) was held during November 11-15, 2019 at Islamabad campus
- A one-week Professional Development Workshop for Admin Personnel (SG-III & IV) was held at CUI Abbottabad Campus during November 18-22, 2019
- A one-week Professional Development Workshop for Admin Personnel (SG-III & IV) was held at Islamabad Campus on December 16-20, 2019
- A seminar on Moral Values: an Ignored Dimension was held at Islamabad Campus on December 18, 2019
- 6<sup>th</sup> Strategic Leadership Program for Academic Heads was held at Islamabad Campus during February 10-12, 2020
- 7-Day Professional Development Workshop for Admin Personnel (SG-III & IV) was held at Islamabad Campus during March 09–17, 2020

### **Research and Commercialization**

Faculty members at CUI are actively engaged in research in their respective fields. CUI published almost 2714 impact factor journal papers in the year 2019. Further, there are around 129 enrolled companies at its Student Start-up Business Center till date and presently incubated across SSBC’s are 42. 30 companies at Cubator-1ne and over 48 companies have graduated from Cubator 1ne. 80 patents for registration were filed out of which 24 (18 US, 06 Pak) were granted. During the reporting period, the Office of Research, Innovation and Commercialization (ORIC), Professional Development (PD) has conducted various capacity building seminars and workshops. Some of the important ones are given below:

- A 2-day workshop on "Structural Equation Modeling Using SmartPLS 3.0" was held on October 16-17, 2019
- A 2-day workshop on “Digital Marketing Trends in 2020 and Beyond” was held on November 27-28, 2019
- A 2-dayworkshop on "Hands-on Data Analytics Using R” was held on February 18-19, 2020
- One day workshop on “Structural Equation Modeling using SmartPLS 3.0” was held on February 21, 2020

### **Visits**

CUI encouraged more than 40 foreign delegates from different international organizations to visit CUI during the reporting period. Similarly, it also facilitated 21 CUI officials and faculty to visit abroad under the umbrella of exchange of faculty and officials between CUI and foreign universities.

### **Development Activities**

The COMSATS University Islamabad (CUI) has completed 38 PSDP funded projects having total cost of Rs. 5,729.247 million. During the FY 2019-20, the Government of Pakistan allocated Rs. 722.200 million in PSDP for a total of 3 projects. Rs.581.608 million were released for the ongoing PSDP projects.

### **Human Resource Development**

During the preceding years, CUI has invested generously in HRD through awarding MS and Ph.D. level scholarships to its meritorious faculty/staff. Till June 30, 2020, three hundred and sixty four (364) fully funded scholarships were awarded to the faculty/staff to pursue higher studies at some of the best universities in the world. 348 scholars have returned back after successful completion of their studies. Currently, 17 scholars are abroad and are pursuing studies on CUI funding.

<b>Strengths</b>	<b>Statistics (Period 2019-20)</b>
Campuses	7
Faculties	6
Academic Programs	100
Departments	22
Centers	08
Faculty Members	2,700+
Research Papers	2714
Students	36060
Graduates	7512
PhD's	50
<b><u>Excellence Awards</u></b>	<p><b><u>Cambridge IFA's Awards</u></b> Recipient of Cambridge IFA's 3G Excellence in Higher Education Award 2019</p>
<b><u>Campaigns/CSR Initiatives</u></b>	<p><b><u>CUI-Sav No to Plastic Campaign</u></b> CUI became the first public sector university to ban plastics on its premises. A drive to stop use of plastics and reduce waste was organized by CUI in the Sitara market area of Islamabad in which over 500 students and faculty members participated. The drive was aimed at creating awareness among the masses regarding the harmful impact of plastics on the environment and reducing disposable waste as well as mobilizing students towards service of the community. The activity was organized in collaboration with the Metropolitan Corporation of Islamabad.</p> <p><b><u>Save Water Campaign:</u></b> A save water campaign was organized by the students of the Department of Management Sciences, CUI, Wah Campus on November 7, 2019 to develop Civic Sense of Conserving Natural Resources. A special documentary was played to highlight the realization of activity theme. Students also shared their views and suggestions on conserving natural resources and keeping the environment safe. A walk was also arranged headed by the Head Management Science Department, Dr. Abdul Qayyum Khan within campus premises to spread the Save Water, Save Life awareness.</p> <p><b><u>Tobacco Smoke Free Campaign</u></b> A letter of intent was signed between COMSATS University Islamabad (CUI) and Tobacco Smoke Free Capital Project of Ministry of National Health Services, Regulations and Coordination (NHRSC) on January 17, 2020 as part of a national drive for making universities Smoke Free. In this regard, a ribbon cutting ceremony was held to inaugurate tobacco smoke free facility. After the signing ceremony Dr. Minhaj us Siraj, Project Director, Deputy DG Health of Tobacco Smoke free Capital, NHRSC and Dr. Nousheen Hamid, Parliamentary Secretary for NHSRC who were the chief guests, awarded smoke free plate to declare CUI as a smoke free campus. CUI also awarded shields to the chief guests.</p> <p><b><u>National Disaster Awareness</u></b> Department of Development Studies, CUI Abbottabad Campus celebrated National Disaster Awareness Day on October 08, 2019 in remembrance of 8<sup>th</sup> October, 2005 earthquake and the current water crises. The impressive display of pictures, slogans, art and messages by the students focused on the Earthquake of 2005 and how current disasters may be in many shapes and forms such as the present water crises in Pakistan.</p>

	<p><b><u>Clean and Green Pakistan</u></b> The Institute of Civil Engineers UK, Student Chapter at Department of Civil Engineering Department, CUI, Wah Campus organized awareness walk “Clean and Green Pakistan” on December 5, 2019. The theme of the walk was to raise awareness to keep the University Campus and surroundings Clean and Green.</p>
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## **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% of the 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 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.

### **Objectives & Functions**

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

### **Budgetary Allocations**

#### **(Non-Development)**

**(Rs. In Million)**

<b>S. No.</b>	<b>Year</b>	<b>Allocation/ Approved Budget</b>	<b>Supplementary Grant</b>	<b>Surrendered Amount</b>	<b>Released Amount</b>
(i)	2019-2020	180.200	0.00	33.594	146.606

#### **(Development)**

**(Rs. In Million)**

<b>S. No.</b>	<b>Year</b>	<b>Allocation/Approved Budget</b>	<b>Released Amount</b>
(i)	2019-2020	14.440	13.243

### **Achievements**

#### **Cruise Activity R/V "HAI YANG DI ZHI JIU HAO No. 9"**

NIO scientists, Syed Waseem Haider, Dr. Noor Ahmed Kalhor, Mr. Abdullah Memon, Mr. Faisal Hayat, participated in China-Pakistan Joint Marine Scientific Expedition conducted during the 15 December, 2019 to 20 February, 2020 in EEZ area of Pakistan. China-Pakistan Joint Marine

scientific Expedition is supported by China Geological Survey (CGS), National Institute of Oceanography (NIO), Pakistan Navy (PN), Pakistan Petroleum Limited (PPL) and Bahria University of Pakistan. It was financed and organized by CGS, and executed by R/V “HAI YANG DI ZHI JIU HAO No. 9”.

The tasks of the project namely, multi-channel Seismic survey, Multi-beam survey, Magnetometer survey, Gravity Survey for Oil and Gas exploration were conducted in the EEZ area of Pakistan.



### **“Interactive Workshop on the Geology and Oceanography of the Makran Coast, Pakistan”**

Chinese delegate and representatives of DHPN visited NIO on and participated in “Interactive Workshop on the Geology and Oceanography of the Makran Coast, Pakistan” organized by NIO on October 31, 2019. The presentations were made by Chinese delegates and NIO Scientists. Dr. Yao Huiqiang talked about “Marine gas hydrate resources and geological exploration” and areas of interest for cooperation in the future. DG NIO briefed about the activities of NIO. Three presentations were given by the NIO scientists. During discussions, Chinese counterpart appreciated the role of NIO and Pak Navy. DG NIO requested to increase the number of NIO scientists from 4 to 8 on board in coming research vessel and emphasized upon keeping NIO scientists in all activities that include pre cruise preparation, onboard sampling & Observations and data processing and analyses as well as contribution in combined publications.



### **NIO Team Survey along the Makran coast to observe the environmental and ecological conditions of the coastal waters after lock down situation**

NIO Conducted field/Boat survey along the Makran coast (Kund Malir, Ormara, Pasni, Gwadar and Jiwani) from 6-10 May, 2020 to observe the environmental and ecological conditions of the coastal waters after lock down situation to identify the working in future.

## Secretary MoST visited NIO

The Secretary, MoST visited NIO to discuss the Administrative & Financial issues of NIO on 24 July, 2019



## Field trip of Indus delta under PSDP project “Capacity building for tapping marine living resource potential of Pakistan, through biological oceanography-Phase 1 NIO (CPEC related project)”

NIO scientists visited Indus delta on 23-29 January, 2020 for instrument testing. Another field trip to Indus delta under this project was conducted for Monsoon sampling on 21-23 June, 2020



## Project Activities

The status of the PSDP project (at the cost of Rs. 54.36 million) with the following objectives for the FY 2019-20 is completed and 96% targets achieved.

- Institutional capacity enhancement through refurbishment of the existing facility to an integrated functional biological oceanographic research and analytical facilities at NIO.
- Increase the efficiency of the Biological oceanography section.
- Enhance NIO’s human resource capacity.

## International Ocean Day, 2020

Amid Covid-19 pandemic, NIO celebrated International Ocean Day on June 08, 2020 via online webinar. Dr. Hina Baig, Principle Scientific Officer, organized the webinar. This year the theme of world ocean day was "Innovation for a sustainable ocean". NIO scientists and other dignitaries from the field of marine science, BYCO petroleum, Karachi Port Trust, Ministry of Maritime Affairs, Department of Microbiology, University of Karachi and Center of Excellence in Marine Biology along with 30 participants participated in the online webinar.

## Foreign Trainings

- Ms. Saira Ishaq, SRO, attended “Renewable Energy Technologies, Pakistan from July 11 to July 31, 2019”, organized by the Korea International Cooperation Agency (KOICA) and the Korea Water Resources Cooperation under the International Cooperation Program of the Government of Korea.



- Ms. Saira Ishaq, SRO and Mr. Waseem Haider, SRO participated in training course “OTGA/INIOAS-Remote Sensing of Coral Reefs”, jointly organized by the UNESCO/IOC IODE and Iranian National Institute for Oceanography and Atmospheric Science (INIOAS) from 20-23 October, 2019 at INIOAS, Tehran, Iran.



## Local Trainings

- Mr. Uzair Lodhi, RO attended training on Python Programming on 11–12 July, 2019 at COMSATS University, Islamabad.
- Mr. Anwar Zeb, RO attended 3<sup>rd</sup> National workshop on Classical and Instrumental Analytical technique for different types of rocks and mineral identification on 25–29 November, 2019 at Geosciences and Advance Research Lab, Islamabad.
- Dr. Tariq Mahmood, RO participated in the Workshop on “3 Days Workshop on Drone Application of Remote Sensing” organized by Geography Department, University of Karachi on 23-26 December, 2019.
- Dr. Sanober Kahkashan, RO participated in the training course “Preparation of PC-1” on 28-30 August, 2019 which was organized by Pakistan Planning and Management Institute (PPMI), Ministry of Planning and Development, Islamabad.
- Mr. Anwar Zeb, RO attended the “3<sup>rd</sup> National Workshop on Instrumental Analytical Techniques for Different Types of Rock and Minerals” at Human Resources Centre, Geoscience Advance Research Laboratories, Islamabad from 25-29<sup>th</sup> November, 2019.
- Ms. Saira Ishaq, SRO participated in “Basic training course on Satellite Remote Sensing”, SUPARCO, SPARC, Lahore from 16-20 March, 2020.
- NIO scientists participated in following software trainings organized by NIO under the Project “Capacity Building for Mapping through Biological Oceanography-Phase-I” at NIO:

- SPSS, Microsoft Excel & EndNote on February 2020
- Adobe Photoshop, Adobe Premier, Adobe Animate on May, 2020

### Other Activities

- Mr. Nozomu Aoki, Economic Advisor, Consulate General of Japan, Karachi visited NIO on 22 July 2019. Several projects of cooperation were discussed including aquaculture.
- DG, NIO and Dr. Tariq Mahmood, RO attended the Fifth meeting of the WWF-Pakistan's Marine Programme Advisory Committee (MPAC) at Movenpick Hotel, Karachi on 23 July, 2019.
- A Team of Asian Development Bank (ADB) visited NIO for PAK: Cooperation on Coastal Risk Management & Climate Change Policy-Consultation Mission on 30 August, 2019.
- DG, NIO attended the meeting regarding Composite Tasking on Service Relating Matters and other Miscellaneous Affairs Pertaining to Ministries/Divisions and their attached formations at Prime Minister Office, Islamabad on 30 July, 2019.
- NIO scientists attended International Environment Conference 2019 organized by EMC Pakistan Pvt. Ltd. on July 09, 2019.
- Mr. Muslim Mohamedi, Vice President, FPPCI visited NIO for the meeting with DG, NIO on 23<sup>rd</sup> August 2019 for Promotion of Aqua Culture in Pakistan.
- Capt. (R) Tanvir Ahmed TI(M), General Manager (LNG Project) visited NIO for Exploration of Minerals along Pakistan Coast on 27 August, 2019.
- NIO scientists attended "Indus Ecoregion Community Livelihoods Project: Knowledge dissemination and lesson sharing workshop" organized by WWF-Pakistan on August 28, 2019.
- Mr. Asif Jan Siddiqui, Project Coordinator, Pakistan Disaster Management Authority (PDMA) visited NIO on 26 July and 22 August 2019 to discuss working of collaborative program funded by both organizations. A competition "Poster Contest" conducted at NIO Head Office, Karachi among students of age 15 and above of different schools and colleges to celebrate "International Beach Cleanup week" on 27<sup>th</sup> September, 2019. The theme of the competition was "What I see and what I want to see?".



- NIO organized one day Familiarization visit of NIO for 38<sup>th</sup> Long ND Course of Pak Navy (16 Officers of Navigation & Hydrography School PNS Bahadur) on 03-09-2019.



- NIO scientists attended a Seminar organized by Hydrographic Department, Pakistan Navy (HDPN) on 30<sup>th</sup> October, 2019. China Geological Survey (CGS) and NIO team displayed the results of the seismic survey that was undertaken during the CGS cruise from 18.12.2018 to 3-02-2019. The CGS delegate along with Pak Navy team visited NIO on October 31, 2019.
- NIO scientists attended the meeting with M/S Advisian and Saudi Aramco on Joint Project of Pakistan and Saudi Arabia under Government-to-Government arrangement for Greenfield Refinery & Petrochemicals Manufacturing Facilities of 250-400 KBD crude capacity organized by Pakistan State Oil Company Limited on 30-08-2019 at Pearl Continental Hotel, Karachi.
- NIO participated in the International Coastal Cleanup Day Celebration. NIO was invited by Ministry of Climate Change to participate in the South Asia Cooperative Environment Program (SACEP) through SACEP. In this connection, Dr. Hina Baig was given the task to organize a one day seminar on September 27, 2019 entitled “Beach and Coastal Health-Vulnerability, Resilience and Risks”.
- DG, NIO attended a meeting on “the Impact of Oxo-Biodegradable Plastic Bags on Marine Life” at Pak EPA Office, Islamabad on October 04, 2019.
- Dr. Samina Kidwai, SRO attended Policy Seminar on “Promoting Fisheries in Pakistan-Opportunities Challenges and Way-Forward” at Bahria University, Karachi on October 21, 2019.
- DG NIO along with NIO scientists visited Pakistan Navy Research Vessel “Behr Masah” on 18<sup>th</sup> December, 2019 at Naval Dockyard Karachi to discuss future cooperation in the utilization of research vessel for R&D activities of NIO.
- Dr. Hina Saeed Baig, PSO attended workshop as resource person on “Biodiversity and Ecosystem 2019” and delivered lecture entitled “Marine Wetlands of Pakistan” organized by Scientific and Cultural Society of Pakistan and Department of Zoology in collaboration with IUCN CEM, Central Asia at University of Karachi on 26 October, 2019.
- DG, NIO as a member of IUCN attended Asia Regional Conservation “Greening Asia for Nature and People” organized by IUCN at Serena Hotel, Islamabad from 6-8 November, 2019.
- Mr. Alamgir Khan Gandapur, Project Director, Indus Delta Capital Ltd. Mangroves REDD+Project (MRP) visited NIO for the meeting on impact of climate change issues at Ghora Bari on August 22, 2019. In this connection, five NIO scientists carried out the field trip at Indus Delta Area from 6-7 November, 2019.
- Bahria College, Karachi celebrated World Maritime Day on 26<sup>th</sup> September, 2019. Principal of College invited maritime expert Dr. Hina Saeed Baig, PSO as key speaker on Oceanography on this occasion to deliver a lecture.

- Five SUPARCO members visited Sea Water Intrusion Cell at NIO on 14<sup>th</sup> November, 2019.
- Mr. Waqar Ahmed, RO participated in one day seminar on “Water, Food, Agriculture and Mineral Metal Analysis by using latest spectroscopic techniques” on 11<sup>th</sup> December, 2019, organized by Rays Technologies, Pakistan.
- Ms. Saira Ishaq, SRO and Mr. Waqar Ahmed, RO attended the consultative workshop on Conservation of Sharks and Rays in Northern Indian Ocean; Sharing lesson learnt and successful stories from Pakistan organized by WWF-Pakistan at Marriot Hotel, Karachi on 20<sup>th</sup> November, 2019.
- DG, NIO attended a meeting with Mr. Muhammad Amin, General Manager, Hydro Planning, WAPDA to discuss Sea Water Intrusion Project in light of Sindh Barrage Project at Lahore on 20<sup>th</sup> November, 2019 as per directives of Senate Standing Committee for Science & Technology.
- Mr. Waqar Ahmed, RO & Ms. Aneela Shaheen, RO attended the 4<sup>th</sup> Karachi International Water Conference organized by Hisaar Foundation on following subjects at Marriot Hotel, Karachi:
  - Water-Energy-Food Nexus: Agenda for the 21<sup>st</sup> Century on 26<sup>th</sup> November, 2019.
  - Moving forward in the 21<sup>st</sup> Century on 27<sup>th</sup> November, 2019.
- A team of NIO Scientists conducted water quality monitoring & bathymetric field survey at Pishukan Fish Harbour from 27<sup>th</sup> November to 1<sup>st</sup> December, 2019.
- DG, NIO attended the brief-cum-discussion session on Marine Sciences with DG, Maritime Science & Technology Park (MSTP) at Bahria University Head Office, Islamabad on 17<sup>th</sup> December, 2019.
- Dr. Emma Rendle, Consultant, Asian Development Bank visited NIO to give the presentation on prospective Sindh Coastal Resilience Project on 21 January, 2020.

**NIO organized training/familiarization/course visits on request from different academia, institute, government and non-government organizations for creating awareness and strengthening indigenous manpower**

- A Group of 6 Students from Microbiology Department of Federal Urdu University, Karachi visited NIO on 24 October, 2019.
- One Day Course was organized for 80 Students of B.Sc. (Hon) 3<sup>rd</sup> year, Department of Microbiology, University of Karachi.
- A Group of 60 Students from Microbiology Department of Federal Urdu University, Karachi visited NIO on 24 October, 2019.
- A Group of 80 students of BS 3<sup>rd</sup> year, Microbiology Department, Jinnah University for Women along with 3 academic staff members visited NIO on 22 November, 2019.
- A Group of 10 Students of M.Phil along with faculty members of Centre of Excellence on Marine Biology (CEMB), University of Karachi visited NIO on 13 February, 2020.

**Research Papers Published**

- Sanobar Kahkashan, Jianfang Chen, Xinhong Wang, Peter D Clift, Bassem Jalali, Asif Inam, Monawwar Saleem, Javed Aftab, Zhongqiang Ji, Youcheng Bai, Zhongqiao Li, Jin Haiyan, Hongliang Li, Lihua Ran. 2020 “Holocene organic geochemical record from the Western Indus continental shelf (northern Arabian Sea)” The Holocene 30, 810 –819.
- Abdullah Memon 2020. Batch to batch variation study for biodiesel production by hydrothermal carbon catalyst: preparation, characterization and its application. Material Research Express. 7, 015521.

- Shahid Amjad, Nuzhat Khan, Saira Ishaq, 2020. Coral community: Preliminary Biodiversity Survey of Churna Island, Northern Arabian Sea Mehran University Research Journal of Engineering and Technology vol 39 no 2, 378-385.
- Tingting Wu, Jiangong Wei, Xiguang Deng, Huiqiang Yao, Bin Liu, Jinfeng Ma, Syed Waseem Haider, Zongzev Yu, Lifeng Wang, Miao Yu, Jianfei Lu, Engr. Naimatullah Sohoo, Noor Ahmed Kalhoro, Sanober Kakhkashan, 2020 “Distribution and development of submarine mud volcanoes on the Makran Continental Margin, offshore Pakistan” Marine and Petroleum Geology.
- Shan chenzhen, deng xiguang, wen mingming, feng qiangqiang, Syed Waseem Haider, huang wei. 2020. Application of parametric sub-bottom profile in gas plumes detection-atlas p70 in Makran area as an example, progress in geophysics; v.3, online first.
- Bin lin, jiang-xinchen, syed Waseem haider, xi-guang deng, li yang, min-liang duan. 2020. New high-resolution 2d seismic imaging of fluid escape structures in makran subduction zone, china geology; v.2; p 1-14.
- Li yan, ruanaiguo, niuxiong wei, liushao wen, Syed Waseem Haider, wei-xiao dong. 2020. Chinese journal of geophysics; On spreading rate and crustal structure at mid-ocean ridges, Chinese journal of geophysics; v.63; no.5; p 1-14.
- Muhammad Shoaib, Saif-ur-Rehman, Imran Siddiqui, Shafiqur Rehman, Shamim Khan, Zia Ibrahim, 2020, Comparison of Weibull and Gaussian Mixture Models for Wind Speed Data Analysis Int. J. Econ. Environ. Geol. Vol. 11 (1) 10-16, 2020.
- Majid Nazeer, Muhammad Waqas, Muhammad Imran Shahzad, Ibrahim Zia and Weicheng Wu, 2020, Coastline Vulnerability Assessment Through Landsat and Cubesats in A Coastal Mega City Remote Sens. 2020, 12, 749; doi:10.3390/rs12050749, Impact Factor = 4.509
- Sanober Kakhkashan, Xinhong Wang, Jianfang Chen, Youcheng Bai, Miaolei Ya, Yuling Wu, Yizhi Cai, Siqian Wang, Monawwar Saleem, Javed Aftab, Asif Inam 2019. “Concentration, distribution and sources of perfluoroalkyl substances and organochlorine pesticides in surface sediments of the northern Bering Sea, Chukchi Sea and adjacent Arctic Ocean” Chemosphere 235, 959-968.

### **Manuscript Submitted**

Mr. Waqar Ahmed, RO submitted “Spatial and temporal variations of nutrients and chlorophyll *a* in the River Indus, its deltaic creeks and coastal waters (Northwest Indian Ocean, Pakistan)” to an international journal for publication and manuscript is under review.

### **NIO PSDP Projects**

Project titled, “Establishment of National Central Marine Research Laboratory at National Institute of Oceanography Phase-I”, Chemical Oceanographic analytical facilities completed.

Project titled “Capacity building for tapping marine living resource potential of Pakistan, through biological oceanography- Phase 1” NIO (CPEC Related Project), 2<sup>nd</sup> Financial Year completed (96%).

Proposed Project: Monitoring the Sea Water Intrusion, Sea Level Rise, Coastal Erosion & Land subsidence along Sindh and Balochistan Coast and Project 2: Assessment of Tidal Energy Potential of Four Major Creeks of the Indus Delta along the Sindh Coast

**PSDP Project Submitted:** Mapping of the Bio-Resources in the Maritime Area of Pakistan- Establishing Ocean Bio-geographical Information System for Pakistan

## **Pakistan Council for Science and Technology (PCST)**

### **Introduction**

Pakistan Council for Science and Technology (PCST) is one of the oldest institutions of Ministry of Science and Technology; established to provide advice to the government on Science and Technology policy issues. 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.

PCST also oversees the overall development of S&T in the country. To achieve this objective, it evaluates research of scientists, carries out studies on important S&T issues and publishes the results in the form of S&T indicators, reports and articles. Besides this, for seeking expert opinion and advice regarding development and application of science and technology in different S&T areas, the Council constitutes “Think Tanks” and “Expert Committees” as and when needed.

### **Objectives & Functions**

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

### **Budget Details for the Year 2019-20**

<b>Budget</b>	<b>Non-development</b>				<b>Development</b>			
	<b>Allocation</b>	<b>Release</b>	<b>Expenditure</b>	<b>Surrendered</b>	<b>Allocation</b>	<b>Release</b>	<b>Expenditure</b>	<b>Surrendered</b>
2019-20	94.100	85.170	85.170	8.930	34.490	11.138	4.539	29.812
<b>Total</b>	<b>94.100</b>	<b>85.170</b>	<b>85.170</b>	<b>8.930</b>	<b>34.490</b>	<b>11.138</b>	<b>4.539</b>	<b>29.812</b>

## Performance Indicators for 2019-20 & Future Plan

Output (s)	Selected Performance Indicators	Planned Targets	Targets Achieved	Planned Targets		Forecast Targets	
		2019-20	2019-20	2020-21	2021-22	2022-23	
Advice to Government on S&T Policies and Plans	i) National Commission for Science & Technology (NCST) meetings	1	-	-	-	1	
	ii) Executive Committee of NCST meetings	1	-	1	1	1	
	iii) S&T policies/ Strategies or Research Agenda	a) Science and Technology Action Plan	-	1	-	-	-
		b) S&T Strategy	1	-	-	-	-
		c) National Research Agenda	-	-	-	-	-
		d) STI Indicators	1	1	1	1	1
		e) 10 year S&T plan	-	1	-	-	-
	iv) Meetings on S&T related issues	5	5	5	5	5	
	v) Review of S&T policies	1	2		1	1	
	vi) Sectoral Policy Review	-	-	-	-	-	
vii) S&T Policy studies/Technical Reports	5	1	5	5	5		
viii) Advice/comments/briefs on S&T issues	5	6	5	5	5		
S&T Planning & Development and Futuristic studies	i) Technology Foresight studies	a) No. of Expert panel meetings	3	-	3	3	3
		b) No. of Technology Foresight Reports	1	1	1	1	1
	ii) S&T Planning & Development	a) Meetings	5	3	5	5	5
		b) Proposals	5	3	-	5	5
Evaluation of Scientific Research	i) Evaluation of Individual Research of Scientists (No. of Scientists evaluated)	3000*	-*	3000*	3000*	3000*	
	ii) Research Productivity Award (incentive given to 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	5	5	5	5	5	
Capacity Building	i) Workshops & Conferences (No. of Events)	1	-#	1	1	1	
	ii) Workshops & Conferences, in collaboration (No. of events)	2	-#	2	2	2	
	iii) Lectures/presentations on S&T issues	5	-#	5	5	5	
Cooperation in Science and Technology	Proposals submitted on S&T Cooperation	a) International	5	6	5	5	5
		b) National	5	-	5	5	5
Publications	i) Quarterly Journal "Science Technology and Development"	4	4	4	4	4	
	ii) PCST Quarterly Newsletter "STI Voice"	4	-	4	4	4	
	iii) Books (Directories, etc)	1	-	1	1	1	

\*Targets could not be achieved due to non-revision of evaluation criteria for the year 2018-19

# Targets could not be achieved due to vacant position of Chairman, PCST in FY 2018-19

### Achievements

A brief review of the major activities carried out by PCST during the period from July, 2019 to June, 2020 is as under:

#### 1. Fourth Meeting of NCST

A new agenda item for the forthcoming meeting of the National Commission for Science and Technology (NCST) titled "Civil-Defence Interface in R&D" was prepared. The Agenda Item included background, justification and recommendations for the said agenda item. Constitution of a "Committee for Civil-Defence R&D Cooperation (CCDC)" and establishment of a "Civil-

Defence R&D Cooperation Cell (CDCC)” were recommended. Membership, Terms of Reference of the proposed committee and manpower and functions of the cell were given. Agenda and Working Paper of the 4<sup>th</sup> meeting of the National Commission for Science and Technology (NCST) was finalized which included updating of all agenda items in the Working Paper, completion of documents of Science, Technology and Innovation Strategy and Action Plan and National Research Agenda. Power Point Presentation for the meeting and presentation notes were also finalized.

**2. Science, Technology & Innovation (STI) Indicators:**

The national STI indicators, based on 135 Higher Education Institutes (HEIs) and 115 R&D organizations, were compiled, and data of S&T Human Recourses (HR) and R&D expenditure were provided to UNESCO Institute of Statistics (UIS) on prescribed format.

**3. 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 Pakistan.

**4. Collaboration with International Organizations.**

The following collaboration proposals were prepared and submitted to MoST:

- ✓ Capacity building in the field of S&T Policy between Pakistan Council for Science & Technology (PCST) and Chinese Institute of Policy and Management (IPM) of Chinese Academy of Sciences (CAS), China.
- ✓ Bilateral short-term visits between Science, Technology and Innovation (STI) Policy Professionals of Pakistan and China.
- ✓ Proposal for trainings in various fields of Science, Technology & Innovation.
- ✓ “OIC Science, Technology and Innovation (STI) Policy Forum”, for inclusion in the OIC-2025; Program of Action.

**5. “Policy to Promote Start-ups”**

PCST has been directed by the Ministry of Science and Technology to undertake an activity to formulate “Policy to Promote Start-ups” under the Ehsaas Programme of the government. Initially, PCST has identified critical activities needed to be undertaken for accomplishment of each of the following step and provided timelines for completing these steps as per template prescribed by the PM’s Delivery Unit:

- Step 1: Development of Abstract of the Initiative*
- Step 2: Preparation of Draft Policy for Promotion of Start-ups*
- Step 3: Completion of Consultative Process*
- Step 4: Approval from the Relevant Forum*

**6. 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. Daily updated information and latest situation is shared through the website.

**7. Project Concept Papers**

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

- Prepared proposals on the 7<sup>th</sup> round of Pakistan-The Netherlands bilateral political consultations, The Hague-2019 and submitted to MoST.
- Prepared proposals on the actionable items regarding inaugural round of Pakistan-Malta bilateral political consultations, NICOSIA-2019 and submitted to MoST.

**8. Views/Comments.**

During the period under report, views/comments were also provided on following topics/issues:

- Prepared views/comments on the 40<sup>th</sup> Session of the General Conference at UNESCO Headquarters, Paris, France from 12<sup>th</sup>-27<sup>th</sup> November, 2019 and submitted to MoST.

- Prepared views/comments on Pakistan National Quality Policy and submitted to MoST.
- Comprehensive views/comments, after the careful examination of the PC-1 titled “Science Diplomacy Initiative (SDI): Strengthening of International Collaboration of the Pakistan Academy of Sciences” prepared by the Pakistan Academy of Sciences in collaboration with the Ministry of Affairs, were provided to MoST
- A Report/Input of PCST on a reference received from MoST regarding “Promotion in Growth of IT & Telecommunication Sector” was prepared and submitted to MoST. Along with other proposals; It was also proposed in the report that the name of the initiative may be changed to “ICT knowledge Capital” and a small city in the close vicinity of Islamabad may also be considered for the purpose. Further, such initiatives may also be replicated in other localities as per the strength of that particular locality.

#### **9. Journal “Science, Technology and Development”**

PCST is publishing a quarterly journal of Science, Technology and Development from 1982 without break as part of its mandate. The journal has been recognized by HEC and is placed in category “Z”. The work for establishment of Journal Content Management System (CMS) for handling online submission, publishing, editing and modification of content has been completed. Four (04) issues of the journal were published during the period under report.

#### **10. Others**

- A document (Urdu & English) titled “Mapping of Research and Development Activities of Pakistan” was prepared for the meeting of the Senate Standing Committee on Science and Technology.
- A brief presentation/briefing on the role and responsibilities of the PCST (both in English & Urdu) along with information regarding delay in the appointment against the sanctioned posts was prepared for the meeting of the Senate Standing Committee on S&T was held on 13<sup>th</sup> February, 2020.
- A detail list of top 50 scientists of Pakistan was prepared & submitted to MoST for a joint meeting of a delegation of Techno-Entrepreneurs and Scientists with the Prime Minister of Pakistan.
- In relation, a meeting was organized with the Federal Minister for Science and Technology, to discuss prospects of Scientists and Scientific Research. The working papers including proposed activities for issues such as Research Mapping by PCST, Top Scientists index & registration of scientists, Research co-ordination and up-date mechanism were prepared and submitted to MoST.

# **Pakistan Council of Renewable Energy Technologies (PCRET)**

## **Introduction**

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

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

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

## **Goals and 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.
- Establishment of R&D Center on Key Technologies of Small Hydel Power for Rural Electrification.
- Solarization of public/private buildings and Solar PV Products development.
- Development of improved version of Solar Thermal and Biogas/biomass Products as per user requirements.
- Up-gradation of R&D Training Center.
- To organize International Workshops/Seminars.
- Filing of patents in the field of renewable energy technologies.
- To boost national collaboration between Government organizations and academia for mass propagation of renewable energy technologies.

## **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 and induction of lab equipment such as Gloves Box, Filtration system, fume hood and materials.
- Efficiency of 5-6% achieved in new solar cell materials such as perovskite, quantum dot etc.
- Published 2 impact factor journal publications.

### **Establishment of National Testing Laboratory for PV and Allied Equipment as per International Standards:**

- PC-I approved in CDWP meeting.
- Record of Discussion (RoD) was signed between KOICA-Korea and PCRET-Pakistan on 19<sup>th</sup> July, 2019.
- Project implementation plan finalized and recorded under MoM with PMC KOICA.
- Project Site trees removed with the approval of CDA.

- Applications for the appointment of AD, Civil and Principle Tech along with security guards are under scrutiny.
- Payment made to Civil Department of UET, Taxila through Pak-PWD to conduct geotechnical and topographic survey of the project site (The task will be executed after the opening of the UET, Taxila).

#### **Solarization of Public/Private Buildings and Solar PV Products Development:**

- Finalized and amended solar power garden/street lights and drip irrigation systems.
- Upgraded existing 15 kW system installed at PCRET, HQ, Islamabad up to 20 kW system.
- Upgraded Renewable Energy Technology Demonstration Park for promotional trainings at PCRET, HQ, Islamabad. The park includes:
  - 2 x 2.4 kW Solar Arrays with Auto Sun Trackers
  - Solar Water Pumping System (3 hp) for Drip Irrigation/Storage
  - Solar Model House
  - Solar Cookers (Dish and Oven Types)
  - Solar Garden and Street Lights (20 and 30 Watts)
  - Biogas Plant for burning fuel (2m<sup>3</sup>)
  - Solar Powered Rickshaw
  - Micro Hydel Plant (500 Watt)
- Upgraded R&D Training Centre in PCRET, HQ, Islamabad.

#### **Establishment of R&D Center on Key Technologies of Small Hydel Power for Rural Electrification:**

- Project has been approved by Hangzhou Regional Center (HRC), Ministry of Water Resources of China & Government of Pakistan.
- 3 x engineers (2 from PCRET and 1 from Energy Department, Punjab) obtained 6 months training on design and development of Small Hydro Power (SHP) plants.
- Project site i.e. IRI, Nandipur, Gujranwala has been finalized by Energy Department, Punjab, for establishment of 100 kW SHP plant.
- HRC, China completed the development of equipment for up-gradation of existing Hybrid lab in PCRET (from 20kW to 30kW) & ready for transportation to Islamabad, Pakistan.
- Cooperative agreement/MoU has been signed between PCRET, Pakistan and NRIRE/HRC, China.

#### **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 efficient Dish Type Solar Cooker with Sun Tracker, Box type solar cooker and Solar Desalinators for water purification.
- Upgraded and developed Briquette machine for limited production of Biomass fuel.
- Upgraded Solar Thermal product development workshop at PCRET, HQ, Islamabad.

#### **Upgradation of R&D training Center:**

- Established R&D Training Centre in PCRET, HQ for R&D trainings.

#### **To organize National/International Workshops/Seminars:**

- Organized workshops/seminar regarding Transfer of Environmentally Sound Technologies.
- Conducted training on Solar Thermal and Solar PV technologies in R&D Training Center, Islamabad from 3<sup>rd</sup> to 4<sup>th</sup> July, 2019.
- Organized “International Seminar on Small Hydropower Development and Rural Electrification for South Asian Countries (Marriot, Islamabad on January 13<sup>th</sup>-14<sup>th</sup>, 2020)”. The Seminar was attended by 7x International participants from China and

Nepal and 60x participants from various government and private sectors in the country.

#### **Filing of patents in the field of renewable energy technologies:**

- The following Patent filed in January, 2020:
  - Novel and Cost Effective Design for Solar Auto Tracker

#### **To boost national collaboration between Government organizations and Academia for mass propagation of renewable energy technologies:**

- Collaborated with following Government Organizations/Universities after signing MoUs for mass propagation of renewable energy technologies in the country:
  - Ministry of Climate Change.
  - USPCAS-E, NUST, Islamabad.
  - USPCAS-E, UET, Peshawar.
  - Karakoram International University.
  - Usman Institute of Technology (UIT), Karachi.

### **Outcomes/Service Delivery**

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

- Provided testing services and issued test certificates to ten 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.
- Renovated/upgraded the testing/QC Lab at PCRET, HQ, Islamabad.

#### **Promotion of Alternate Energy:**

- Participated in 12 different conferences/workshops/trainings/exhibitions for promotion/awareness and to enhance skill development in renewable energy technologies.

#### **R&D Activities for Socio Economic Development:**

- Upgraded Advance PV lab, which is now fully functional. The said lab is utilized for R&D in Silicon Technologies & Solar Cell Materials to conduct R&D in 3<sup>rd</sup> and 4<sup>th</sup> generation solar cells such as; perovskite, quantum dot, thin film etc. and to achieve high efficiency.
- Research on thin films, perovskite and organic cell materials carried out by Ph.D. and post-graduate students and published two impact factor journal publications.
- Development of prototype of Renewable Energy Products for socio-economic development, commercialization for revenue generation for the Government. Import substitution of different renewable energy products through indigenization and Transfer of Technology (ToT) for the development of quality and economical products utilizing the local material and capability.
- Established Renewable Energy Technology Park at PCRET Headquarter, Islamabad for operational demonstration, promotion and training. The park includes; 2.4 kW Solar Arrays with Sun Tracker, Solar Water Pumping System for Drip Irrigation/Storage, Solar Model House, Solar Cookers, Solar Garden and Street Lights, Biogas Plant for burning fuel (2m<sup>3</sup>), Micro Hydrel Plant (Prototype Model).

**Liaison with International Organizations for Renewable Energy Technology Development:**

Sr#	Project Title	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"> <li>Foreign Grant: USD 9.5 M</li> <li>GoP Share: Rs 71.629 M</li> </ul>	<ul style="list-style-type: none"> <li>Project implementation plan finalized and recorded under MoM with PMC KOICA</li> <li>Project Site partially cleared and estimates for Geo-technical and topographic survey of the site in process</li> <li>Advertisement for Recruitment under process at MoST</li> <li>Procurement of office equipment in process</li> </ul>
2.	China-Pakistan Joint R&D Center on Key Technologies of Small Hydel Power and Rural Electrification	NRIRE/HRC, China	Estimated: 7.6 Million CYN	<ul style="list-style-type: none"> <li>Project has been approved by Hangzhou Regional Center (HRC), Ministry of Water Resources of China &amp; Government of Pakistan.</li> <li>3 x engineers (2 from PCRET and 1 from Energy Department, Punjab) obtained 6 months training on design and development of Small Hydro Power (SHP) plants.</li> <li>Project site i.e. IRI, Nandipur, Gujranwala has been finalized by Energy Department Punjab, for establishment of 100 kW SHP plant.</li> <li>HRC, China completed the development of equipment for up-gradation of existing Hybrid lab in PCRET (from 20kW to 30kW) &amp; ready for transportation to Islamabad, Pakistan.</li> <li>Cooperative agreement/MoU has been signed between PCRET, Pakistan and NRIRE/HRC, China on 13<sup>th</sup> January, 2019.</li> </ul>
3.	Green Climate Fund: Adaptation of Photovoltaic, Biogas Technologies and Establishment of Renewable Energy Labs in Pakistan for Climate Change Mitigation	Green Climate Fund (GCF)	USD 40 M	Submitted and in process of Approval

## Performance of each Section/Attached 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 3<sup>rd</sup> and 4<sup>th</sup> generation solar cell materials**  
Efficiency of 5-6% achieved
- **Impact factors and journal publications**  
Published two impact factor journal publications
- **Research collaboration established with Academia**  
Four Ph.D. and three MS students supervised
- **Solarization of Public/Private Buildings**
  - Finalized and amended solar power garden/street lights and drip irrigation systems.
  - Upgraded existing 15 kW system installed at PCRET HQ, Islamabad up to 20 kW system.
  - Upgraded Renewable Energy Technology Demonstration Park for promotional trainings at PCRET HQ, Islamabad.

### Solar Testing/QC Lab:

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

### Biogas/Biomass Department:

- **Design and development of prototypes of biogas/biomass products**
  - Designed, developed and installed Biogas plants of capacity 3.5m<sup>3</sup> at PCRET HQ, Islamabad.
  - Designed and installed 100m<sup>3</sup> biogas plant at Pinanwal District Jhelum, in collaboration with private sector organization.

### Micro Hydro Power Section:

- **Collaboration with HRC, China for Establishment of Research Centre on Key Technologies of Small Hydropower and Rural Electrification**
  - Proposal finalized and approved by HRC-China.
  - Project site i.e. IRI, Nandipur, Gujranwala has been finalized by Energy Department Punjab, for establishment of 100 kW SHP plant.
  - HRC, China completed the development of equipment for up-gradation of existing Hybrid lab in PCRET (from 20kW to 30kW) & ready for transportation to Islamabad, Pakistan.

### Wind Energy Section:

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

- **Design and development of prototypes of Solar Thermal products**
  - Designed and upgraded following Solar Cookers:
    - Panel/Foldable

- Parabolic Dish Type Solar Cooker with Glass Reflecting Material
- Designed and developed Solar Oven (Wooden Type for Indoor Cooking),
- Designed and developed Solar Desalinator and Solar Dryers.
- Upgraded Solar Thermal product development workshop at PCRET, HQ, Islamabad.

### **Linkages with Budget for R&D Activities**

Total budget allocated to PCRET for the year 2019-20 for R&D/Non-development activities was Rs. 16 Million. The budget of amount Rs. 11,906,077 was planned and utilized against the projects/activities for F.Y 2019-20. And budget of amount Rs. 2,228,075 was utilized against the liabilities of F.Y 2018-19. The remaining budget of amount Rs. 1,865,848 was lapsed during F.Y 2019-20.

## **Pakistan Science Foundation (PSF)**

### **Introduction:**

Pakistan Science Foundation working under the Ministry of Science & Technology is an apex body for the promotion of scientific research in the country. It has been striving, since its inception, to facilitate scientists and researchers by funding research projects for the socio-economic development of the country. The main programmes of the Foundation are; Research Funding, R&D-Industry Program, International Matching Grants and Popularization of Science. PSF is actively working to bring 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. To promote basic and applied research relevant to socio-economic development of the country, following programmes are being undertaken within Research Support Section:

### **Performance/Outcomes:**

#### **Research Support Section:**

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 2019-20, a total of 205 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, 60 were under process, of which 03 projects costing Rs. 7.933 million were approved and an amount of Rs. 3.364 million was released for 02 new projects on account of 1<sup>st</sup> installments. Total 56 projects were on-going and an amount of Rs. 5.375 million was released on account of due installments and evaluation fee of these projects.

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of 06 completed projects, 03 research papers were published in national/international journals under these completed projects. In addition, 01 Ph.D. and 06 M.Phil./M.Sc. (Hons) students secured their respective degrees while working as Research Associates in these completed projects.

#### **International Liaison (IL) Funding Programme:**

PSF is mandated, in its act, to liaise with similar international bodies for joint collaborations on S&T for the uplift of Pakistani scientists in their scientific endeavors. In the prevalent global scenario, the importance of international collaborations has become vital for the technological developments and advancement of knowledge. Therefore, PSF has re-vitalized its international collaborations and embarked upon new linkages to harness potential of technologically advanced nations.

PSF has successfully launched 26 joint projects with National Natural Science Foundation of China (NSFC) first and second call respectively. In addition to this, ten joint projects with Scientific and Technological Research Council of Turkey (TÜBİTAK), Turkey, 18 joint projects with Ministry of Science, Research and Technology, Iran and 06 projects with National Science Foundation (NSF), Sri Lanka are also initiated under "International Matching Grants".

Foreign delegates from Beijing Association of Science and Technology (BAST), Beijing Academy of Science and Technology (BAST) and Chinese Association of Science and Technology (CAST) visited PSF to initiate programme of mutual collaborations. Two officers from PSF and PMNH participated in "BJAST Science Fair" held on October 14, 2019, in Beijing, China.

PSF in collaboration with EU delegation to Pakistan organized "Seminar on EU Horizon 2020 Programme Open Call for Proposals" on March 02, 2020. The seminar was delivered by Anne Marchal, Deputy Head of Mission, and Delegation of the European Union to Pakistan.

During the year 2019-20, third call of proposals with National Natural Science Foundation of China (NSFC) was launched between 22.04.2020 and 03.06.2020 under disciplines of fossil energy conversion and materials, renewable energy, new energy and resource utilization and its scientific basis and safety evaluation and adaptation mechanism of Water-Energy-Food Nexus in

CPEC under climate change respectively. A total of 131 proposals were received at PSF-NSFC. After three tier review process, 09 proposals have been selected for funding under “PSF-NSFC, China Third Call of Proposals”.

#### **R&D-Industry Programme:**

During the year 2019-20, a total of 14 research projects in R&D-Industry Programme remained under active consideration. Among these, 05 were under process, of which 02 projects costing Rs. 5.921 million were sanctioned and an amount of Rs. 2.8214 million was released to two new projects on account of 1<sup>st</sup> Installment. During the year, 10 projects were on-going and an amount of Rs. 0.964 million was released on account of due installments and evaluation fee of these projects. Based upon the results of 02 completed projects, 09 research papers were published in national/international journals. The most remarkable was the 02 new patents nos. 167/2019 and 168/2019.

#### **Invention to Innovation Summit:**

Two “Invention to Innovation Summits” were organized during 2019-20 in Balochistan and Sindh provinces of Pakistan. Summits at Punjab and KPK were postponed due to COVID-19. However, the venues in Punjab, Balochistan, Sindh and KPK were University of the Punjab, Lahore, University of Balochistan, Quetta, University of Karachi, Karachi and the University of Engineering & Technology, Peshawar respectively. The two summits at Quetta and Karachi were organized with mutual collaboration of Pakistan Science Foundation (PSF), Pakistan Scientific and Technological Information Center (PASTIC), Institute of Research Promotion (IRP) and the Offices of Research, Innovation & Commercialization (ORICs) of the respective universities.

The industries aiming innovations in business were invited to visit exhibition, perceive new technologies and to commercialize them. An exhibition was the crux of these activities where researchers, academia personals, R&D organizations and industrialists having technologies engrossed with local R&D physically displayed their products, processes and technologies. Along-side, this summit proceeded with Technical Sessions facilitated by the R&D experts from public & private sector entities relating to different fields viz. Food Safety and Standards for Hotels & Restaurant Industry, Technologies for Mineral Based Chemicals and Material, Live Stock & Dairy, Technologies for Electrical and Communication, Business Plan Competition, Food Processing Technologies, Technologies for Agriculture Engineering, Pre-Harvesting Technologies for Agriculture Sector, Social Sector Innovation-Processes, Models and Marketing Ideas and Technologies, Dyes & Pigments etc. These Summits are the provincial level annual activity of the joint collaboration of R&D-Industry Programme of Pakistan Science Foundation (PSF) and Pakistan Scientific & Technological Information Center (PASTIC), respective Universities and Institute of Research Promotion (IRP).

Pakistan Science Foundation organizes an exclusive session on “PSF Fund Winning Opportunities for Academia and Industry” at these summits. This session was specially designed for the industrialists and researchers who have novel ideas but could not harness funds due to unawareness about research planning and development of project proposals.

#### **National Science Linkages Programme (NSLP):**

The NSLP Endowment is an important component of Pakistan Science Foundation. It is being managed by the Foundation through the Board of Governors (BoG) and Fund Management Committee (FMC). The Chairman, PSF is the Chief Executive of the Programme/Fund. Main objective of this fund is to enhance the agricultural production through effective research carried out by Pakistani scientists. Besides, other science promotion activities like workshops and conferences etc. are also entertained by this section.

During the year 2019-20, a total 202 concept papers in the fields of natural sciences were received for processing. All were passed through 03 meetings of PSF Screening Committee and 64 concept papers were shortlisted for further processing. A total of 16 project proposals costing Rs. 76.24 million were approved and amount of Rs. 40.61 million was released to these new projects on account of 1<sup>st</sup> installment. During the year, 53 projects were on-going and an amount of Rs. 9.67 million was released on account of due installments and evaluation fee of these on-going projects.

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of 10 completed projects, 57 research papers were published in national/international journals. In addition, 08 Ph.D. and 48 M.Phil/M.Sc. (Hons) students secured their respective degrees while working as research associates in these completed projects.

### **Planning & Development Section:**

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

During the FY 2019-20, the above activity was financed through non-development budget. An amount of Rs. 3.00 Million was allocated for this activity. A total of 130 travel grant requests were received for financial assistance from Pakistani Scientists, Technologists, Doctors and Engineers working in R&D organizations and educational institutions for their participation/presentation of research papers at international forums. The cases were presented in 07 meetings of Travel Grants Award Committee, wherein 36 requests were recommended for approval. A total of 22 scientists/technologists/Ph.D. students participated and presented research papers in international science conferences, seminars and workshops.

### **Science Popularization Programme:**

Popularization of science, increasing science awareness and development of scientific culture in the society are major functions entrusted to Pakistan Science Foundation. Under the action plans of various S&T Policies, the task of popularization of science at grass roots level in the country has also been assigned to PSF.

#### **A. Regular Activities**

- a. **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 2019-20, 49,566 students from 234 schools visited Science Caravan Exhibitions as detailed below;
  - Federal unit: 9,234 students from 49 schools visited the exhibition.
  - Sindh units: 12,456 students from 60 schools visited the exhibition.
  - Punjab units: 7,334 students from 17 schools visited the exhibition.
  - Khyber Pakhtunkhwa units: 12,891 students from 65 schools visited the exhibition.
  - Baluchistan units: 7,651 students from 43 schools visited the exhibition.
- b. **28<sup>th</sup> Annual Intra and Inter Board Science Essay and Poster Competitions** were organized between the students of all Boards of Intermediate and Secondary Education (BISE) of the country. Students from all over the country took part in the competitions. Winners were awarded cash prizes. Essay Competition was on theme titled “Our Changing Earth; Impact of Globalization” and for Science Poster Competition the theme was “Water Scarcity and Best Practice to Use it”. Thousands of students from all over the country participated in these competitions and 57 winner students were awarded cash prizes.
- c. Donation of **Popular Science Magazines and Scientific Books** is one of the regular and important activities for science popularization. Popular Science magazine “Monthly Global Science” and Quarterly “Urdu Science Magazine” were distributed to 2000 schools during the period.
- d. **World Science Day for Peace and Development (WSDPD)**: This year, the theme selected by UNESCO was “Open Science, Leaving No One Behind” and the Foundation celebrated WSDPD on November 11, 2019. Dignitaries from COMSTECH, PCRET and other scientific organizations, students from different universities, colleges and schools of Islamabad also participated. Medals, cash prizes and certificates were distributed among the winners of PSF’s 28<sup>th</sup> Science Essay & Poster Competitions and Asian Science Camp (ASC)-19.
- e. **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, 05 Popular Science Lectures were organized on different scientific themes.

#### **B. Development Activities**

- a. **Participation of Pakistani Students in International Forum Asian Science Camp (ASC):** This year Asian Science Camp was organized on 28<sup>th</sup> July-3<sup>rd</sup> August, 2019 in Shantou, Guangdong Province, China. The Pakistani delegation comprising five students along with the Team Leader from PSF participated in the event.
- b. **Participation of Pakistani Students in International Junior Science Olympiad (IJSO-19):** PSF being a focal organization for ASC, coordinated with the organizers for participation of Pakistani students in IJSO-19. This year Asian Science Camp was organized on 3-12 December, 2019 at Doha, Qatar. The Pakistani delegation comprising five students along with the Team Leader from PSF participated in the event.

#### **C. Future Plans**

- International Training Workshops on IBSE
- Foreign Trainings of PSF officers
- Strengthening of Science Centre, Faisalabad
- Establishment of Science Centres and Science Clubs
- Science Awareness through Mass Media
- Enhancement of all Science Popularization activities in collaboration with National and International S&T Organizations

#### **Performance/Outcome:**

- The targets set for the funding of research projects under different ongoing programme are same as in the Medium-Term Budget Estimates.
- The targets set for provision of travel grants for participation/presentation of research papers at international forums were 35-40.
- The targets set for the support of Scientific Societies are same as in the Medium Term Budget Estimates i.e. financial support to 15-20 societies.
- Implementation and processing of PSF's on-going development activities were undertaken as per KPIs assigned to the relevant section of PSF.
- An amount of Rs. 230.00 million to be released for research projects under different funding programme (Research Support, R&D Industry, NSLP and CRP)
- An amount of Rs. 6.00 million to be released for other science promotion activities (financial support to conferences/seminars/symposiums/workshops, invention to innovation summits and scientific survey).
- An amount of Rs. 7.325 Million was utilized on the Scientific Societies while Rs. 3.70 Million was provided for travel grant activities.
- It is estimated that fifteen (15) scientific societies will be strengthened and 35-40 travel grants will be provided in FY 2020-21.

### Detail of Science Promotion Activities/Funding

Funding Programme	Concept Paper/Research Proposal/funding Request Received	On-going Funded Projects	New Approved Funded Projects	Amount Released for New Funded Projects (Rs in million)	Amount Released for On-going Funded Projects (Rs in million)	Completed Projects	Performance Outcomes			
							Research Paper	Patent	M.Phil /MSc	Ph.D.
Research Support	205	56	03	3.364	5.375	06	03	-	06	01
R&D Industry	14	10	02	2.8214	0.964	02	09	02	-	-
International Liaison	168	58	09	35.8	25.78	07	36	-	18	06
Natural Science Linkages Programme (NSLP)	202	53	16	40.61	9.670	10	57	-	48	08
<b>Other Science Promotion Activities</b>										
Invention to Innovation Summits	04	-	02	-	-	-	-	-	-	-
Conferences/Seminars/Symposia/Workshops	106	-	43	7.350	-	-	-	-	-	-
Scientific Survey	04	-	01	0.200	-	-	-	-	-	-

## Public Sector Development Projects (PSDP)

### Science Talent Farming Scheme (STFS)

1.	<b>Name of the Project:</b>	Science Talent Farming Scheme (STFS) for Young Students – Phase I (Component-1)
2.	<b>Approved Cost:</b>	Rs. 1,285.361 Million

### Financial Support to Scientific Societies in Pakistan (Phase-II):

1.	<b>Name of the Project:</b>	Financial Support to Scientific Societies in Pakistan (Phase-II)
2.	<b>Outcomes during 2019-20</b>	<ul style="list-style-type: none"><li>• Thirteen (13) Scientific Societies were financially supported in order to enable them to perform their scientific activities regularly.</li><li>• Funds were released to the societies for organizing twenty one (21) National/International Science Conferences, Seminars, symposia and lectures on burning topics.</li><li>• Thirty Eight (38) issues of ten (10) Scientific Journals were published by the societies.</li><li>• Maintained liaison with three (03) International Scientific Societies/Scientific Councils.</li></ul>

### Competitive Research Programme (CRP):

1	<b>Name of the Project:</b>	Competitive Research Programme
2	<b>Approved Cost:</b>	Rs. 1,964.500 Million

# PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

## Introduction

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

The non-development budget of PASTIC for the year 2019-20 was Rs. 175.100 million.

## Mission

To cater 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	Budget Allocation (2019-20) Rs. 5,000,000/-
		Planned Targets 2019-20	Achieved Target 2019-20		
<b>Disseminate S&amp;T/R&amp;D information through contemporary information services/ tools/publications</b>	• Document Supply Service: No. of S&T documents supplied to R&D Organizations, Universities, Professional Colleges, Hospitals, Industry R&D Workers, Students, Researchers by PASTIC	200000	140,000	200000	1,171,076/-
	• No. of Users Clients served by PASTIC:	12,000	8,000	12,000	

Goal/Target	Performance Indicators	Performance Outcomes/Output		Future Plans	Budget Allocation (2019-20) Rs. 5,000,000/-
		Planned Targets 2019-20	Achieved Target 2019-20		
	<ul style="list-style-type: none"> <li>Bibliographic Search Service</li> </ul>	10000	6500	10,000	
	<ul style="list-style-type: none"> <li>No. of References/ Abstracts Supplied literatures search conducted by PASTIC.</li> </ul>	7000	4000	7000	
	<ul style="list-style-type: none"> <li>No. of Users Clients served regarding Literature search/ Bibliographic Information Services</li> </ul>				
	<ul style="list-style-type: none"> <li>Technology Roundup (Technology News-e bulletin) No. of Issues brought out annually</li> </ul>	6	6	6	
	<ul style="list-style-type: none"> <li>Pakistan Journal of Computer and Information Systems (PJCIS) No. of Issues brought out annually</li> </ul>	2	2	2	
<b>Promotion of R&amp;D based industrial development</b>	<ul style="list-style-type: none"> <li>Technological Information Services: Seminars, Workshops, Symposia, Exhibitions organized under University Industry Partnership Programme and Technology &amp; Innovation Support Centre in collaboration with IPO Pakistan</li> </ul>	16	9	16	455,430/-
<b>Strengthen National Science Reference Library</b>	<ul style="list-style-type: none"> <li>PASTIC National Science Reference Library No. of clients served</li> </ul>	14000	8000	14000	

Goal/Target	Performance Indicators	Performance Outcomes/Output		Future Plans	Budget Allocation (2019-20) Rs. 5,000,000/-
		Planned Targets 2019-20	Achieved Target 2019-20		
<b>Develop a National S&amp;T/R&amp;D Information Repository of indigenous S&amp;T information resources (databases)</b>	<ul style="list-style-type: none"> <li>IT Support Service &amp; S&amp;T/R&amp;D Databases: No. of Abstracts produced and indexed</li> </ul>	19000	16000	19000	4,192,703/-
<b>Development of Databases</b>	Database of Industry of Pakistan	8000	5000	8000	
	Database of Pakistani Commercialize-able Products/Indigenous Products	847	600	800	
	Database of Pakistani Industrial Problems and Proposed Solutions	80	20	80	
	Database of Industry-Academia Linkages	80	20	80	
	Database of Foreign Industries	100	30	100	
	Database of Universities/ Institutes of Pakistan	200	150	200	
	Database of Local & International Industrial Linkages	50	20	50	
	Union OPAC (Books of 11 libraries) No. of records entered	500000	200000	500000	
	Energy Publications related to Pakistan, No. of records entered	600	400	600	
	Climate Change Publications related to Pakistan No. of records entered	500	200	500	
Scientific Books Published by Pakistani Authors (records entered)	3000	2000	3000		
<b>Facilitate Printing of S&amp;T/R&amp;D Publications of S&amp;T Organizations</b>	<ul style="list-style-type: none"> <li>PASTIC Publication and Printing Services No. of Printing jobs completed</li> </ul>	170	100	170	
<b>Capacity/skill development</b>	<ul style="list-style-type: none"> <li>PASTIC Trainings</li> </ul>				

Goal/Target	Performance Indicators	Performance Outcomes/Output		Future Plans	Budget Allocation (2019-20) Rs. 5,000,000/-
		Planned Targets 2019-20	Achieved Target 2019-20		
of researchers, Information Professionals & Entrepreneurs	No. of Library and Information Professionals/ Researchers trained in the area of ICT/Research Tools by PASTIC	1000	650	1000	180,791/-

## PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

Pakistan Museum of Natural History, the only Natural History Museum in the country, was established in 1976 as an attached organization of the Pakistan Science Foundation, Ministry of Science & Technology. 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.

<b>Budget allocation for FY 2019-20</b>	Regular: 155.600 million (Non-Development)
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### Goals and Targets:

- **Field Work:**
  - ❖ To arrange expeditions for the study and collection of natural history specimens i.e., Rocks, Minerals, Fossils, Higher plants, Lower plants, Herbs, Reptiles, Birds, Mammals, Fishes by the scientists of PMNH.
  - ❖ To carry out research on biological and geological resources of Pakistan.
  - ❖ To interpret our natural resources and environment in the light of the past and plan for future course of action.
- **Collection, 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 to share 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:**
  - ❖ Number of Schools/Colleges/Universities and General Public visits to PMNH.

- **Training Courses Held/Attended:**
  - ❖ PMNH scientists attended six days International Training workshop on “Resource and Environment Scientific data sharing and Disaster Risk Reduction Knowledge Service” at Department of Earth Sciences, Quaid-i-Azam University, Islamabad.
  - ❖ Many students under the disciplines of Zoology, Geology and Botany of various universities of Pakistan have been provided lab environment and guided in their M.Phil. and Ph.D. research work during the year.
  - ❖ All Zoological Sciences Division (ZSD) officers attended training workshop on “Design, survey and analysis of Wildlife Populations” jointly organized by PMNH, Snow Leopard Foundation, Ministry of Climate Change, UNDP-Pakistan from 1<sup>st</sup> to 12<sup>th</sup> July 2019 at National Information Technology Board Islamabad.
  - ❖ Attended one day symposium on “The role of Science in Wildlife Management” organized by Department of Animal Sciences, Quaid-e-Azam University on 8<sup>th</sup> July 2019 at Geosciences Auditorium Islamabad.
  - ❖ PMNH Scientists of Zoological Sciences Division delivered lectures on “Why we study Insects” at Biological Science Department, COMSATS University, Islamabad on 3<sup>rd</sup> December, 2019, on “Insect and their ecology” at ZSD insect repository to the students of Department of Entomology, PMAS Arid Agriculture University, Rawalpindi on 28<sup>th</sup> January, 2020, and on mammalian taxonomy and taxidermy to students from NUST, Islamabad.
  - ❖ PMNH Scientists of Botanical Sciences Division delivered lectures on “Response of plant communities to soil characteristics on riverine, estuarine and coastline regions of Pakistan” in seminar “Advances in plant, soil and microbes interactions” held at Dept. of Botany, PMAS-UAAR, Rawalpindi.
  - ❖ Three online lectures delivered by PMNH Botanists on “Current Locust issue and its management” to the students of University of Sialkot, Punjab, on “Khushal Zameendar” in a local language programme and on Locust management through *Metarhizium Fungus*.
  
- **Research Outcomes:**
  - ❖ **Field Works:**

Researchers of Zoological Sciences Division (ZSD), Botanical Sciences Division (BSD), and Earth Sciences Division (ESD) conducted numerous field works in the areas of Chitral, Muzzaferabad, Neelum Valley, Torkham, Tanada Dam Reservoir Kohat, Kalabagh, Chumbisurla, Thal, Salt Range, Chiltan Hazaganji National Park, Nushki Conservancy, Ziarat, Harnai, Mastung, Lal-Sohanra National Park, Bahawalpur, Gilgit, Skardu, Hyderabad, Rani Kot & Laki Range, Ghizer (Yaseen valley), Nagar, Gilgit, Naran (Babusar top), Chilas, Gilgit, Yasin valley, Gulmit (Nagar), Margalla National Park, Abbal-Moriwal, Tahseel Kot Momin, Umerkot, Islamkot and Mithi, Kunri for the 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:**

As a result of these extensive field works, 26,972 natural history specimens were collected, catalogued, and preserved in the PMNH repositories as a reference material in 2019-20. Meanwhile, 1.03 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 was published in the national and international journals in the form of research papers & articles, natural history books, monographs, technical reports and popular articles etc. In 2019-20, a total 17 research papers on Botany, Geology, Paleontology and Zoology were published in National & International Journals by PMNH researchers. 02 Guides prepared on Amphibians and Reptile Field and on Butterfly Field for Eco-tourists of PSLEP Project area for promotion of Ecotourism in selected Valleys of Gilgit Baltistan.
  - ❖ **Research Projects (National & International):**

PMNH researchers developed mutual collaboration for research on National and International level. As a result of these joint ventures, scientists of PMNH successfully initiated following research projects:

    - PMNH scientists visited china during December, 2019 under collaborative research project entitled “Cooperative development of an innovative auto-ID platform for the

beetles from China and Pakistan” and explored various future strategies with the Chinese counterparts at Beijing. Under this project, 6900 beetle images prepared.

- International Display Project entitled “Zhub Dinosaur Track Way Reconstruction”, initiated in 2017-18 to search Dinosaur tracks in the area of Zhub. This project is the joint venture between Earth Sciences Division, Pakistan Museum of Natural History (PMNH), Islamabad and Palaeostreet Studio, Warsaw Poland and Factum Foundation (Madrid/London). This project is being funded by Factum Foundation (Madrid/UK) & Palaeostreet Studio (Poland). During first phase of the project, two joint geological field works have been carried out by the collaborating research partners in the area. Second phase of Project remained in progress during 2019-20. In the Second Phase of this international project, High-resolution animated recording of a fossilized dinosaur footprint in motion was performed. The imprint was captured by using a combination of systems, including photo-grammetry and drone recording. The high-resolution information obtained is used to make an exact facsimile of dinosaur footprints.
  - Pakistan Museum of Natural History (PMNH) and Institute of Geology, Earthquake Engineering and Seismology, Academy of Sciences of the Republic of Tajikistan (ASRT) and MoST mutually agreed to initiate an International research Project titled “Collision Granites of Pamir and Pakistan”. Research activity is associated with the availability of funds. Correspondence is in Progress for further execution of the project.
  - Researchers of Institute and Museum of Palaeontology of the University of Zurich (PIMUZ), Switzerland and Earth Sciences Division, PMNH researched in the Central Salt Range from 2016-2019 under an International Research Project entitled “Early Triassic Bio-stratigraphy and Carbon Isotope Stratigraphy of the Salt Range” to evaluate the effect of climate change on fauna during Permo-Triassic event. Second Phase of the International Research Project has been initiated. Correspondence with Institute and Museum of Palaeontology of the University of Zurich (PIMUZ) for the execution of second Phase of the project remained in progress during 2019-20.
  - Preliminary project proposal submitted to Pakistan Agricultural Research Council, Islamabad entitled “Biological Control of Desert Locust *Schistocerca Gregaria* through Indigenous Entomopathogen Fungi, Nematodes and Parasitoids” for funding.
  - Proposal entitle: “Developing on Small Scale Commercial Cordyceps, a Highly Medicinal Mushroom Production and Product in Pakistan” submitted for funding to Pakistan Agricultural Research Council, Islamabad under Agriculture Linkages Programme (ALP).
- **National & International liaison:**
    - ❖ PMNH has strong liaison with similar institutions both inside and outside Pakistan for sharing of knowledge and expertise. PMNH has already developed liaison with the following National and International Institutions for joint venture:
      - Centre for Agriculture and Biosciences International (CABI), Pakistan
      - National University of Sciences & Technology, Islamabad
      - China Agriculture University, Beijing-China
      - Quaid-e-Azam University, Islamabad
      - Ozone Cell, Ministry of Climate Change, Government of Pakistan
      - Pakistan Air Force for collaborative research on flight safety
      - Forest, Wildlife & Fisheries Department, Punjab
      - National Institute of Folk & Tradional 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 2019-20, following activities were performed for research and mutual cooperation:
      - Scientists of PMNH established liaison with the Centre for Agriculture and Biosciences International (CABI), Pakistan for the collaborative research in the field of Botany and prepared a diorama entitled “Nature vs Invaders” focusing on the hazards of the invasive species with special focus on the Parthenium hysterophorusat PMNH display gallery.

- Guided 5 students of Department of Biological Sciences, NUST, Islamabad regarding entomological and mammalian collection, stretching, labeling and preservation on 22<sup>nd</sup>-23<sup>rd</sup> July 2019.
  - Processed a request regarding 13 Neuropteran specimens on loan basis request of Mr. Muhammad Asghar Hassan, PhD Scholar, Department of Entomology, China Agriculture University, Beijing-China.
  - A meeting held with Air Commodore, PAF flight safety for developing collaborative research work concerning PMNH and Pakistan Air Force to address airstrike hazards in aviation on 27<sup>th</sup> December, 2019 at Committee Room, PMNH.
  - Develop collaboration with Forest, Wildlife & Fisheries Department, Punjab to acquire Rhinoceros skeleton buried at Lal-Sohanra National Park, Bahawalpur.
  - Organized one day Wildlife Exhibition at University of Haripur for celebration of World Wildlife Day on 4<sup>th</sup> March, 2020. Exhibition was visited by more than 1500 students.
- **Services to other Organizations:**
    - ❖ In 2019-20, services were provided 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 International 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
    - ❖ Brief of some services rendered to other organization is as follows:
      - Facilitated Dr. Sameera Arshad, Qaud-i-Azam University, Islamabad regarding her research work on “Identification of Birds through Feathers”.
      - Checked and sent report of M.Phil. thesis entitled “Distribution, systematic and illegal harvest of freshwater turtle in District Mardan, Khyber Pakhtunkhwa” for the University of Haripur, Khyber Pakhtunkhwa, Pakistan.
      - Supervised a Ph.D. student of Department of Entomology, PMAS Arid Agriculture University, Rawalpindi.
      - Identified 27 mammalian skins by hair analysis at Quaid-e-Azam University. These skins were confiscated by Zoo & Wildlife Management, Islamabad as illegal wildlife trafficking.
      - ESD Researchers facilitated one Internee (MS student) from NUST, Islamabad in the field of Paleontology, two Internees (M.Sc. students) of Archaeology Department from Quaid-e-Azam University, Islamabad and one Internee (BS student) from the University of Swabi, KPK.
      - Supervised 02 Ph.D. scholars of Pakistan Institute of Engineering & Applied Sciences (PIEAS), Islamabad through Earth Sciences Division of PMNH.
      - Twenty-eight sedimentary rocks thin sections have been prepared for the BS (Geology) students from the University of Swabi by the ESD Thin Section Lab.
  - **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 year 2019-20, 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 04 new Displays/Exhibits/Dioramas were established and opened for public:
      - World of Animal
      - Indian Rhinoceros

- Gems & Minerals of Pakistan
- Invasive Species Diorama
- ❖ Establishment of following 05 new Displays/Exhibits/Dioramas are in progress:
  - Stuffing of Indian Elephant specimen
  - World's Largest Flower
  - Climate Change Diorama
  - Ocean Diorama
  - Interactive System (Phase-II)
- **Educational Activities:**
  - ❖ PMNH also facilitates visitors, National and International delegations and groups of students of schools, colleges and universities during their visit to the PMNH display galleries by providing guided tours. Large number of people including students of schools, colleges and universities belonging to the various regions of Pakistan visited PMNH displays galleries. In 2019-20, 1,39,678 people visited museum including 44,333 students, 75,765 general public, 458 foreigners, and 19,122 children below 5 years of age.
    - As a part of educational activities, PMNH arranged regular film shows at the PMNH Audio-Visual Hall. Special film shows are also being run on request of visiting student groups and general public. The visitors are showing keen interest in natural history films.
    - To promote and for publicity, in 2019-20, invitation letters were sent to public and private Schools of Rawalpindi district inviting them to arrange their student groups trips to PMNH.
- **Information Technology Services:**
  - ❖ Public Services Division (PSD) is also providing I.T. services to the Scientific Divisions of the PMNH. In addition, following new software was developed by the I.T. experts of PMNH;
    - Web Application "Pay Roll System of PMNH Employees".
    - Interactive Application for Cave life exhibits (scientific data inserting stage)
    - Android Supported Web version of QR Code App. to facilitate visitors by providing them an access to the narrations through their smart phones.

## **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 Ministry of Science and Technology 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.

PCSIR provides services in almost every field of the economy including biotechnology, engineering, food, advance and composite materials, leather, textile, herbal medicines and nutraceuticals, energy etc. The council laboratories provide testing and certification services to various industrial sectors and most of the exportable products are tested/certified by its ISO-17025 accredited labs.

The activities undertaken during the year 2019-2020 are as below:

### **Science Wing**

#### **A. Research & Development**

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

<b>S. No.</b>	<b>Performance Indicators</b>	<b>Achieved (2019-20)</b>	<b>Targets (2020-21)</b>
1.	Processes Developed	210	220
2.	Processes Leased out	72	80
3.	Patents Filed	28	40
4.	Patents Obtained	12	25
5.	Students Supervised	2305	2400
6.	Consultancies Provided	525	550
7.	Technical/Feasibility Reports	281	300
8.	Papers Published (International)	113	150
9.	Papers Published (National)	52	80
10.	Analytical Equipment Developed	213	250
11.	Exhibitions/Conferences/Seminars Organized	54	70
12.	Workshops/Trainings Organized	74	100
13.	MoUs Signed	25	30
14.	Interaction with Industries (Visits)	1929	2000
15.	No. of Services Provided	44,318	45,000
16.	No. of Clients Served	14,584	15,00
17.	<b>Revenue Generated (2019-20)</b>		(In million Pak Rs. )
	Technologies/Products/Processes/Royalty etc.		18.038
	Analytical Testing/Calibration		249.667
	Consultancies/Collaborations/Trainings/HR/Funded Projects		125.331
	Di-ammonium Phosphate (DAP)		23.812
<b>Total</b>		<b>416.847</b>	

#### **B. Major Initiatives**

##### **Role of PCSIR in the wake of COVID-19 pandemic**

Pakistan Council of Scientific & Industrial Research (PCSIR) Laboratories, keeping in view the available resources, have taken the following initiatives:

##### ➤ **Product Development:**

###### **Chemical:**

- Hand Sanitizer developed and supplied.
- Disinfectant Spray developed and supplied.

###### **Engineering:**

- Walkthrough 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 1098 quality assurance related services to different clients from public & private sector organizations.
- **Sanitizer, Disinfectant Testing:**
  - Chemical composition analysis
  - Microbiological Test
  - Skin Irritation Test
- **Personal Protective Equipment (PPE) Testing:**
  - Gloves, Mask, Kits, Shoes, Shoe Cover, Gown, Face shield etc.
- **Walk through Gates, Corridor and Tunnel testing:**
  - Workability and effectiveness analysis
- **PCSIR & FPCCI Collaboration during COVID-19 Pandemic to Facilitate Industries:**
  - PCSIR & FPCCI are actively collaborating to facilitate industries in order to create awareness about current situation and to make them ready for resumption of industrial activities. On March 30, 2020, a Corona Awareness Desk was established for addressing questions raised by business community on scientific matters and issues relating to COVID-19 Pandemic. In order to provide feedback, scientists from PCSIR have been taken on-board to support the business community during pandemic. The main activities of the desk are:
    - Promote COVID-19 related matters & awareness among business community.
    - Provision of authentic information of Pakistan industry through a reliable forum.
    - Addressing individual/industrial queries.
    - Identification of scientific/technical areas where R&D awareness interventions are essential.

#### **Establishment of Precision Systems Training Centre (PSTC), Gwadar, Balochistan:**

Gwadar is an important city of Pakistan with natural port and is an emerging hub of Commercial, Economic and Social activities due to China-Pakistan Economic Corridor (CPEC). A development project “Establishment of Precision Systems Training Centre (PSTC)” is being executed by PCSIR. This training center 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.

#### **Interaction with Public Sector Organizations:**

Organizational linkages with other public sector counterparts are being enhanced to share human & material resources with an aim of creating synergies for the development of industrial sector and to meet the national strategic requirements.

##### ❖ **Collaboration with Defense Sector Organizations:**

- Pakistan Ordnance Factories (POF), Wah Cantt.
- 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)

#### **Participation of Pak-Belarus Center at Belarusian National Exposition at the IEMA-2019 and Belarus-Pakistan Business Forum**

The Embassy of Belarus invited Pak-Belarus Center of Science and Technology Cooperation, PCSIR Head Office, Islamabad to attend the event from September 26-28, 2019 at Lahore Expo Center. The

exhibitors from Belarus included representatives of Belarusian National leading companies related to Automobile, Heavy Machinery, Petro-Chemical, Chemistry, tourism and Agriculture as well as scientific and technological Organizations and Universities. Further, to promote trade and economic cooperation between the two countries and to encourage closer scientific and technological cooperation, Pakistan-Belarus Forum was also scheduled on September 27<sup>th</sup>, 2019 during the Expo as a sideline activity.

**Pakistan Aeronautical Complex (PAC), Kamra collaborates with PCSIR Laboratories Complex, Lahore in different R&D Projects**

A meeting was arranged on 6<sup>th</sup> August, 2019 between a team working on the AZM Project, Pakistan Aeronautical Complex (PAC), Kamra and a group of Engineers/Scientists of PITMAEM, PCSIR along with Dr. Qurat-ul-Ain Syed, Director General, PCSIR Office, Lahore. The purpose of meeting was to discuss different R&D projects related to advance engineering materials for future collaboration between PAC, Kamra and PCSIR. PITMAEM, PCSIR Labs Complex, Lahore is already working with PAC, Kamra on different projects. A detailed discussion was made for mutual collaboration with team of Project “AZM”. After the meeting, a detailed visit of different production units of Pakistan Aeronautical Complex (PAC), Kamra was arranged.

**PCSIR Leather Research Centre presented series of Preservation Of Hides & Skins of Animals on Eid-ul-Azha**

Scientists of PCSIR Leather Research Centre, Karachi delivered lectures in connection with the seminars arranged on the Eid-ul-Azha. During these seminars, oral presentation on “Flaying, Preservation and Transportation of Hides and Skins” was delivered, wherein processes of flaying, preservation and transportation of hides and skins of animals during the occasion of Eid-ul-Azha were discussed. The participants appreciated the Leather Research Centre’s efforts and general discussion regarding various steps of precautions during slaughtering process (Qurbani).

**PCSIR Laboratory, Skardu provided Fruit Processing and Preservation Trainings to Farmers**

PCSIR Labs, Skardu successfully conducted trainings on “Fruit Processing and Preservation” in collaboration with Mountain Agriculture Farmer Support Organization, Skardu and various other welfare organizations at farmer’s doorstep in the villages: Hashopi, Yono, Daso and Hyderabad of district Shigar, during the period. The aim of these trainings was to minimize/reduce the post-harvest losses of fruits/vegetables in Gilgit-Baltistan. This series of trainings covered the dehydration of apricots and the processing which covers preparation of Jams, Juices and fruits leather/slab, tomato paste, Ketchup, vegetable pickles etc. and preservation of fruits like pulping of mulberry, apricot and sea-buckthorn etc. Extraction method of Sea-buckthorn oil was also a part of this training.

**Expo on “Role of S&T Education for Industrial Development”**

PCSIR organized a two day Expo on “Role of S&T Education for Industrial Development” from 23<sup>rd</sup> –24<sup>th</sup> September, 2019 at PCSIR Laboratories Complex, Lahore. The theme of the Expo was “the enhancement of linkages between Industries, academia and R&D organizations to promote economic growth, sustainable development, innovation and entrepreneurship”. There was active participation of R&D organizations, universities, trade associations, SMEs, and national industrial units.

**Technology Wing**

**A. Development Activities**

**Summary of PSDPs during 2019-20:**

S. No.	PSPD Projects	
1.	Ongoing Projects	04
2.	Newly Approved Projects	04

**PSDP Ongoing Projects 2019-20:**

S. No.	Project Name	Physical Progress
1.	Establishment of Technical Training Centre for Precision Mechanics and Instrument Technology, PSTC, Gwadar, Baluchistan	<ul style="list-style-type: none"> <li>• Construction of admin and academic block.</li> <li>• Construction of workshop and ancillary workshop building.</li> <li>• UGT top slab laid.</li> <li>• Hostel building.</li> <li>• External development work.</li> </ul>

S. No.	Project Name	Physical Progress
2.	Up gradation of Fruit Processing & Analytical Laboratory and Establishment of Gems Cutting and Polishing Centre at PCSIR Skardu, Gilgit-Baltistan.	<ul style="list-style-type: none"> <li>• 95% Civil works has been completed.</li> <li>• Lapidary/display installation work has been completed.</li> <li>• Procurement of laboratory/machinery equipment has been completed.</li> <li>• Conducted/imparted training to 12 group of farmers (25 Participants each) on “Fruit processing, handling, dehydration techniques and preservation” at district Shigar.</li> </ul>
3.	Up gradation of Medicinal Botanic Centre as National Centre for Herbal Medicine, PCSIR Labs. Complex, Peshawar	<ul style="list-style-type: none"> <li>• Procurement of 11 equipment completed.</li> <li>• Procurement of 12 chemicals completed.</li> <li>• Tender process for purchase of equipment (Rs. 10.00 million) has been completed.</li> </ul>
4.	Up gradation of Polymer & Plastics Laboratory at PCSIR Laboratories Complex, Lahore.	<ul style="list-style-type: none"> <li>• Total seven Laboratory equipment have been purchased.</li> <li>• 49 items of laboratory apparatus and 18 items of chemicals/solvents have been purchased.</li> </ul>

#### Newly Approved Projects 2019-20:

S. No.	Title of the Project
1.	Up gradation of Machinery, Equipment and Renovation of Buildings of IIEE & PSTC Karachi.
2.	Up gradation of Calibration Centre Capabilities at PCSIR Labs Complex, Peshawar
3.	Up gradation of Halal Authentication Labs at PCSIR Laboratories Complex, Lahore, Karachi and Peshawar
4.	Establishment of PCSIR Laboratories Complex, Multan

#### B. Human Resource Development (HRD) Programs

There are seven (7) technical training centres located in different provinces for the development of human resource. The detail is as under:

- 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

Sr. #	Technical Training Centre	Courses	No. of Seats (2019-20)
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 DAE in Mechanical Technology Specialization in Precision Mechanical & Instrumental Technology	40
		04 Years DAE in Mechanical Technology Specialization in Dies & Mould Technology	40

<b>Sr. #</b>	<b>Technical Training Centre</b>	<b>Courses</b>	<b>No. of Seats (2019-20)</b>
4	PSTC, Peshawar	03 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

## **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 programmes 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. The council shall encourage, facilitate and regulate working of professional engineering bodies for creativity and as custodians of engineering under the umbrella of the Council.

PEC is financially self-sustaining institution which meets its expenses from the accrual of registration fees from engineers, constructors, operator and consulting firms and having no dependency on government or any other outside agency.

PEC interacts with the Government, both at the Federal and Provincial level by participating in Commissions, Committees and Advisory Bodies. PEC is a fully representative body of the engineering community in the country. PEC has also been providing support to the Government in conducting technical enquiries and recommending remedial measures on the subjects referred. Over the years, PEC has become an influential voice, which speaks for the engineering profession as a whole in the country. It forms an effective bridge between Government, industry and academia.

In the last decade, PEC has achieved numerous national and international achievements and has become part of the top internationally recognized engineering bodies. The major achievements include excellence in the quality of engineering education, transformation of regulations in line with international standards and best practices.

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

### **Role of PEC in COVID-19: Local Manufacturing of Ventilators & Biomedical Equipment**

Pakistan Engineering Council (PEC) is continuing its role towards socio-economic development even under Coronavirus Pandemic. In the wake of acute shortage of Ventilators and other biomedical equipment to deal with COVID-19, PEC constituted a high level Experts Committee comprising foreign/local engineers and professionals for the local manufacturing of Ventilators and allied equipment. In a very short period of time, the proposal of PEC Experts Group has been approved by the Federal Government/DRAP for the local manufacturing of Ventilators at 4-5 times less cost which would be available in the market in few weeks' time to deal with the COVID-19 emergency. From now onwards, PEC has also been assigned the lead role to assist in the local manufacturing of Innovative Engineering and Technological solutions including Biomedical Equipment.

### **37<sup>th</sup> PEC Governing Body Meeting**

37<sup>th</sup> PEC Governing Body meeting was held online under country-wide lockdown due to COVID-19. The main agenda of the meeting was setting policy towards online engineering education to save the precious time of the graduates while ensuring safety against Coronavirus Pandemic. Altogether 70 participants including GB Members and PEC officials from all over the country joined the online meeting. The Governing Body also approved Relief Package for the Constructors & Operators under economic crisis due to COVID-19. A similar package was also proposed for the Consulting firms besides recommendations to GoP for tax reforms.

### **Humanity in the Time of COVID-19**

Coronavirus Pandemic has brought global economy to halt by forcing most of the people stranded in their homes. Pakistan has taken necessary protective, strategic and economic measures to fight against this Pandemic. PEC has taken drastic measures for employees and visitors by providing masks, sanitizers and adopting precautionary measures while continuing its services mostly online.

### **National Post COVID-19 Exhibition “Changing Calamity into Opportunities”**

Ministry of Science & Technology (MoST) organized a National Post-Covid-19 Exhibition “Changing Calamity into Opportunities” at COMSTECH, Islamabad on 30<sup>th</sup> April, 2020. The Prime

Minister of Pakistan, Imran Khan graced the event as Chief Guest. The showcase brought together various technologies and solutions developed by the country's scientists, engineers and innovators, to fight the COVID-19 pandemic. Chaudhry Fawad Hussain, Federal Minister for Science and Technology, Engr. Jawed Salim Qureshi, Chairman, PEC and other dignitaries were also present at the event.

The Prime Minister appreciated the efforts under the leadership of Federal Minister for S&T for transforming a calamity into an opportunity especially by the Pakistan Engineering Council in developing standards, specification & testing facilities for Bio-Medical & Engineering Products including Ventilators. He also added that within 02 months, Pakistan is on the path to become self-sufficient in the production of ventilators & other medical equipment and is considering the export of these equipment.



### **MoU signed between Ministry of Science & Technology and Ministry of National Health Services, Regulations and Coordination**

The Memorandum of Understanding (MoU) was signed between Ministry of Science & Technology and Ministry of National Health Services, Regulation and Coordination for framework/mechanism of Pakistan Manufactured Electro-Medical Devices on June 11, 2020. As per MoU, Pakistan Engineering Council (PEC) has been assigned the responsibility to mentor the designs for local manufacturing of Electro-Medical (EM) devices used to counter COVID-19. PEC will also assist in seeking approval of devices from Drug Regulatory Authority, Pakistan (DRAP). Chaudhary Fawad Hussain, Federal Minister for Science and Technology and Dr. Zafar Mirza, Special Assistant to the Prime Minister on Health, signed the MoU.

PEC was also directed to identify and assist in development of innovative solutions/products in the field of science, technology and engineering. The framework/mechanism under this MoU would spark off innovation and local engineering solutions besides opening new avenues for the innovators to invent multiple EM equipment in Pakistani engineering universities and change the culture of

"Degree to get Government job" to "Degree for innovative products". During COVID-19 Pandemic, PEC made possible the local manufacturing of ventilators besides opening fronts for testing and certification of electro-medical equipment and devices.

### **National Stakeholders Consultative Workshop on Building Code**

PEC in collaboration with World Bank organized a National Stakeholders Consultative Workshop on Building Code Updation on 13<sup>th</sup> May, 2020. The workshop was the first step towards the revision and updating of the Building Code of Pakistan (Seismic Provision-2007). Due to the current COVID-19 pandemic, the consultation workshop was arranged online. A large number of stakeholders, representing federal and provincial government departments, academia, consultants, senior law-makers and other related bodies attended the workshop. The event was inaugurated by the Chairman, PEC, Engr. Jawed Salim Qureshi.

The objective of the workshop was to offer a platform to the relevant stakeholders for sharing their experiences, feedback and challenges faced by them in the past. As a way forward, the updation of Building Code of Pakistan was stressed, based on experts' suggestions, latest international standards and new seismic data which was not available in the past. A comprehensive working plan was also shared, which was agreed by the participants.

### **Regulation of Engineering Education**

By virtue of its Act, PEC is the apex body for accreditation and licensing/registration within its jurisdiction. The Council is carrying out process of accreditation for the 1<sup>st</sup> cycle (undergraduate level) of engineering education. As on June 2020, total number of engineering programs being offered in the country in public and private sectors are more than 364 in 122 Higher Education Institutions (HEIs) as a four years Bachelor program after 12 years of schooling/education.

The accreditation process has been practiced in-line with international best practices as per the Washington Accord/IEA guidelines through the Accreditation Manual 2014 (Outcome Based Education and Assessment System of Accreditation OBE/OBA). 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.

### **Washington Accord (WA) Workshop on “Sharing Policies & Best Practices through Online TLA and Accreditation”**

The unprecedented COVID-19 pandemic has urged all the stakeholders like the policy makers, regulators, QC authorities, accrediting & professional bodies and the academia to timely respond to the calamity towards tangible solutions by converting the challenge into opportunities in a sustainable manner, particularly during the initial transient period of spread. All nations are striving to explore and develop short/long-term solutions and preparing for their readiness to live in a virtual world for a considerable time. The PEC Engineering Accreditation Division (EAD) has taken-up this important issue for brainstorming the best possible practices/policies and digital solutions with Signatories of the highest prestigious forum of Washington Accord (WA) under International Engineering Alliance (IEA). After one week initial discussion at the WA Basecamp with all Signatories, it was agreed, by the WA leadership, to proceed with PEC's timely and very important proposal.

The theme of the workshop covered two major areas of concern in this new paradigm specifically:

- Quality assurance of the robustness and equivalence of Higher Education Institution (HEI) Virtual/Online Teaching-learning and Assessment (TLA) systems
- Virtual/Online Accreditation of HEIs

Accordingly, a grand international virtual workshop of Washington Accord (WA) was arranged by PEC as main partner with Institution of Engineers, Singapore (IES), which was the first ever of its kind under WA/IEA and PEC/Pakistan's history. The event was envisioned by the Chairman, PEC, Engr. Jawed Salim Qureshi and Chair, EAB/Chairperson, PHEC & Vice Chairman (Punjab), Engr. Prof. Dr. Fazal Ahmed Khalid.

The workshop was conducted online through Zoom video link with live streaming on YouTube and was well received with participation of more than 864 from 29 Washington Accord Signatories (Full and Provisional). The top leaderships of IEA/WA, including Damien Owens (President, IEA), Prof. Elizabeth Taylor (Chairperson, WA), Prof. Dr. Kai Sang Lock (Deputy Chair, WA), Vice Chancellors, prominent experts from academia/industry, and Presidents/Chairmen of various engineering accrediting bodies and policy makers from around the world attended this excellent event. The Session Chairs/Moderators, Panelists, Speakers exchanged different practices and

solutions, explored and discussed on existing challenges in transition and post-COVID-19 scenarios to frame anticipated acceptable policies to impart knowledge and skills to students, and outcome based assessment in both cognitive and psycho-motive domains based on set principles to ensuring quality, robustness and equivalence of the Online TLA system and virtual Accreditation process to adopt and live in a virtual world—a paradigm shift. The workshop started with welcome remarks by the Chairman, PEC, followed by opening remarks from the Chair, WA, Prof. Elizabeth Taylor in the Inaugural Session. In all four sessions, 15 presentations were made by leading Speakers of the world followed by interactive Q&A sessions with the panelists conducted by 10 Moderators/Co-Moderators from different Signatories. This proved to be a very fruitful forum with smooth live streaming in such a huge rum of participation, generated interesting discussions, ideas and way forward to work more closely at the regional/global level.

The workshop was greatly appreciated by participants from all around the globe. This event has provided a source of confidence in the innovative spirit of our engineering educators, professional organizations and accreditation systems around the world. International forums are silent in their policies, standards and benchmarking to adopt and implement as no obvious solution could be proposed to address the emerging challenges, which has to be explored further only by working closely. The recommendations of this workshop will be taken up in the relevant forum of IEA/WA for the formulation of policy guidelines on online TLA and virtual accreditation processes. In addition to the success of this workshop, it has enhanced the visibility of PEC and thereby Pakistan with International leadership community in engineering profession.

### **International Engineering Alliance Meetings (IEAM) 2020**

Pakistan, represented by PEC, is full signatory of the Washington Accord (WA) and authorized member of International Professional Engineers Agreement (IPEA) under the umbrella of International Engineering Alliance (IEA). The annual IEA Meetings (IEAM-2020), initially planned to take place in Cape Town, South Africa, was organized virtually/online on 21-26 June, 2020 due to the unprecedented COVID-19 pandemic. The documents relevant to IEAM 2020 agenda were distributed to all Signatories by IEA Secretariat and a Base camp discussion forum was created regarding agenda items. PEC Annual reports on Educational Accord (WA) and Competence Agreement (IPEA) were already shared with IEA during March and April, 2020 respectively for the relevant agenda items. Moreover, feedback on certain IEA documents were also sent to the secretariat pre-IEAM 2020. The discussions and feedback on Base camp continued till June 12, 2020, that helped IEA to formulize certain important motions and final program with Zoom sessions, live and pre-recorded webinars.

PEC actively participated and contributed in all relevant live meetings/webinars and used its voting right along with other signatories to make required decisions regarding WA and IPEA. Towards the end of session, IPEA Annual Reports of all members were presented, where PEC's report was accepted without any observation.

### **PEC Contribution to IEAM 2020:**

PEC contributed to the revision of documentation worked out by the relevant IEA/WFEO Working Group for revision of Graduate Attributes and Professional Competency Profile (GAs and PC) in-line with UN Sustainable Development Goals (SDGs). Feedback by PEC was taken up positively by the IEA/WFEO Working Group and incorporated in the latest revision.

PEC also recorded its professional feedback and suggestions through discussions at the WA Base camp which were duly taken up for consideration at the relevant forums of IEA.

## **Registration of Engineers**

### **Introduction**

PEC registration is mandatory to practice engineering profession in 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). The Council is in the process to open a register for International Professional Engineer (Int.PE) as authorized by International Professional Engineers Agreement (IPEA) in June, 2018. From 1<sup>st</sup> July, 2019 to 30<sup>th</sup> June, 2020, PEC has registered 18621 engineers of accredited engineering programs of different universities.

Sr. No.	Description	Count
1	Total no of engineers registered with PEC in calendar year 2019-20.	18621
2	Engineers registered as RE in calendar year 2019-20	18559
3	Engineer registered as PE in calendar year 2019-20	62
4	Male Engineers registered in calendar year 2019-20	16830
5	Female Engineers registered in calendar year 2019-20	1791

### Goals & Targets Achieved

In recent years, PEC has transformed registration system by initiating following reforms to facilitate the engineering community:

- Online Registration (New/Renewal) as per international standards and best practices.
- Biometric verification of engineers for updation of their profile.
- Archiving of engineers data.
- Issuance of Supervisory Certificates to fresh engineers.
- Registration of International Professional Engineer (Int.P.Eng.)

### Registration of Constructors, Operators & Consultants

Pakistan Engineering Council is entrusted to regulate engineering profession in the country. One of main functions of PEC is registration and regulation of activities of Constructors, Operators, Consulting Engineers, Professional and Registered Engineers.

### Assessment Procedure to Register/Operator Firm in any Category

PEC prescribed certain parameters to evaluate constructors and operators for allowing their entry in the field of engineering practices. Following are the most critical aspects which are to be kept under focus while formulating the said criteria:

- Knowledge and skill of engineering and technology.
- Financial status.
- Availability of machinery and equipment.
- Experience in the field of construction and operation.

### Licenses Issued to Constructors/Operators and Engineers/Consultants in FY 2019/20

<b>Constructors/Operators (Local Firms)</b>								
Category	C/O-A	C/O-B	C/O-1	C/O-2	C/O-3	C/O-4	C/O-5	C/O-6
		333	149	493	1283	2048	4077	5016
<b>Constructors/Operators (Foreign Firms)</b>								
	FC/O-A		FC/O-B			FC/O-1		
	36		4			7		
<b>Consultants/Engineers (Local)</b>	1984							
<b>Consultants/Engineers (Foreign)</b>	114							

### Continuing Professional Development (CPD) Program for Engineers

Pakistan Engineering Council under its Act has mandate for introducing and ensuring Continued Professional Development (CPD) activities amongst its growing community of engineers. For this purpose, PEC has devised a comprehensive framework titled Professional Development of Engineers (PDE) Byelaws – 2008 (amendments notified up to April 23, 2013) approved by the Government of Pakistan. This has become effective since 10<sup>th</sup> July, 2010.

The main objective of CPD is to develop competence and ability of engineers for the application of theoretical knowledge to practical situations and to evolve innovative solutions to real life problems while adhering to professional ethics and acquisition of a broader understanding of their obligations to society. Continued Professional Development of Engineers is also mandatory requirement for International Professional Engineers Agreement (IPEA) – previously known as Engineers Mobility Forum (EMF) -- under International Engineering Alliance (IEA), to which Pakistan is now full signatory since June, 2018. With permanent status as Member to the WA and IPEA, Global mobility

of the Pakistani Engineers would improve and the graduates from Pakistani Engineering Institutions will have more access to global job market.

Under PDE Byelaws, the CPD activities and Engineering Practice Examination (EPE), are two distinct parts of professional growth and thereby assessment to get the title of “PE” for Registered Engineers “RE”. Since July, 2010, Continued Professional Development of engineers in their respective domain is also mandatory for renewal of existing professionals as well as for newly registered engineers.

For the professional growth and skill development of engineers in the country, PEC has implemented following three-pronged strategy:

- PEC regularly organizes nation-wide short courses, seminars, and trainings for engineers in different disciplines.
- Encouraging professional bodies all over country (like IEP, IEEP and universities) to impart CPD activities (list available on PEC website) through registration with PEC as Professional Engineering Bodies (PEBs)
- Establishing professional development academies at various engineering universities/PEBs.

#### **CPD Activities Conducted by PEC**

PEC regularly conducts CPD activities for its members including short courses (refresher courses, management, leadership etc.); workshops; seminars; expert lectures etc. 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](http://www.pec.org.pk)) and also through newspapers for information of the engineers. Besides, nominations are also sought from potential organizations.

#### **CPD Activities conducted by PEC during the Period**

<b>Province</b>	<b>No. of Short Courses</b>	<b>No. of Engineers Participated</b>
Federal	9	960
Punjab	11	930
Sindh	5	526
KPK	9	613
Balochistan	6	470
AJK	4	469
Gilgit Baltistan	3	261
Online	8	1583
<b>Total</b>	<b>55</b>	<b>5812</b>

#### **Professional Engineering Bodies (PEBs)**

To facilitate the engineers, PEC has registered large number of Professional Engineering Bodies and the list is available on PEC website. As per provision of Byelaw-16 of PDE Bylaws 2008, most of Continuing Professional Development activities (courses, training workshops, etc.) are being undertaken by these PEBs.

The courses/CPD activities are being planned by the PEBs according to the specified criteria and guidelines. Such bodies also provide schedule of courses and share verified list of participants with PEC to maintain transparent record of CPD activities and points for all the registered/professional engineers. PEC Regional/Branch and Liaison Offices play role of facilitator for the professional bodies in organizing CPD activities.

#### **Registration/Renewal Status of PEBs**

- Total No. of PEBs, as on June 30, 2020 166 Nos.
- No. of PEBs having valid License/Renewal 102 Nos.
- PEBs Registered during the Period (July, 19- June, 2020) 13 Nos.

<b>S.#</b>	<b>Category of PEBs</b>	<b>Total PEBs as on June 30, 2020</b>
1	Engineering universities/institutions	105
2	Technical organizations	45
3	Professional Institutes	16
<b>Total</b>		<b>166</b>

### CPD Activities (Short Courses/Workshops) by PEBs during the period

Period	No. of Activities	No. of Engineer Participants
July, 2019 to June, 2020	204	8,220

### Engineering Practice Exam (EPE)

As per provisions of Byelaw-5(e) of PDE Byelaws-2008, PEC holds Engineering Practice Examination for Registered Engineers (REs) to get prestigious title of Professional Engineer (PE) through assessment of engineering competence, knowledge and skills of an engineer. The EPE is an essential part of assessment for the title of Professional Engineer (PE).

So far, PEC has conducted 15 examinations in which 1,116 candidates appeared. The 15<sup>th</sup> EPE was conducted as per the revised scheme. The detail of exams conducted during the period is given below:

### Professional Exams (EPE) conducted during the period (July, 2019-June, 2020)

S.#	EPE	Held on	Eligible	Appeared	Qualified
1	15 <sup>th</sup> EPE (Fall-2019)	27-10-2019	275	266	101

### Outcomes of CPD Activities

- Knowledge and Skill development of the fresh engineers to help in job/professional career.
- Capacity building of middle level engineers towards technical problem solving and skill enhancement.
- Management trainings of senior engineers for leadership and decision making.
- The overall outcome is to maintain the professional competence of engineers to contribute in national development and betterment of the society as a whole.

### Think Tank-Assistance to the Federal Government

As per PEC Act 1976 under Section 8(l), PEC is mandated to provide 'Assistance to the Federal Government as a Think Tank' on engineering issues. For the purpose, Think Tank constituted subcommittees on various sectors like Water, Energy, Telecommunication, Building & Infrastructure etc.

### Updation of Building Code of Pakistan (Seismic Provisions-2007)

- The Pakistan Engineering Council (PEC) in collaboration with World Bank, National Disaster Risk Management Fund (NDRMF) and NED University of Engineering and Technology (UET) has arranged a National Consultation Workshop on 13<sup>th</sup> May, 2020, as a first step towards the revision and updation of the Building Code of Pakistan (Seismic Provision - 2007). The consultative workshop was organized online (via Zoom) to mitigate the risk of spread of current COVID-19 pandemic. The next phase of the project would be initiated after normalization of the emergent situation.
- Ministry of Climate Change and UN Habitat initiated Guidelines on Pakistan Green Building Code. PEC has submitted detailed overview on technical aspects on green building code keeping in view the following:
  - Roadmap for GBP may present a strategic overview of all relevant and essential elements of green built environment keeping in view the local needs and requirements.
  - A national level techno-legal frame work for effective implementation may be devised in guidelines.
  - Industry and academia linkages may be developed for green products.
  - Mechanism for development, distribution and availability of green materials used for green code.
  - Recommendations on awareness, capacity building and transfer of technologies.
- Alternative Energy Development Committee, PEC has recommended/suggested the Federal Government for implementation of Net-Metering Regime to single phase customers as well in the country.

### Standards for Engineering Contracts, Cost and Services

In order to bring transparency, efficiency, and timeliness in the implementation of public and private sector projects, PEC developed unified Bidding and Contracts Documents for procurement of engineering goods and services. These documents were approved by the ECNEC and also adopted by PPRA. PEC has further developed thirteen documents to facilitate procurement of goods and

services. These documents are available at websites of PEC ([www.pec.org.pk](http://www.pec.org.pk)) and PPRA ([www.ppra.org.pk](http://www.ppra.org.pk)). In order to strengthen the PEC efforts and as per provisions of PEC Act, PEC has now undertaken the initiative to revise/update these documents based on latest FIDIC and MDBs (Multi Development Banks) documents 2012; incorporating users' feedback and Federal Governments relevant laws.

**PEC Acts as bridge between Engineering Forums & Federal Government**

PEC provides advice and expert opinion to various Government departments and private organizations on engineering procurements, services, and Bidding Documents. A large number of services are being provided to various public and private organizations and individuals.

**Forum for Arbitration**

PEC is also serving as a forum for arbitration pertaining to disputes in construction and consultancy contracts as per PEC Act 1976 - Section (8)-s. The matters referred to PEC are adjudicated as per PEC Construction/Consultancy Byelaws. A panel of arbitrators/experts is being maintained by PEC.

## **Pakistan Halal Authority (PHA)**

### **Introduction**

Pakistan Halal Authority (PHA) was established through an Act of the Parliament known as the Pakistan Halal Authority Act No. VIII of 2016.

The purpose of establishing PHA is to promote imports and exports, trade and commerce with foreign countries and inter-provincial trade and commerce in Halal articles and processes. The Provincial Governments and the respective Governments of Gilgit Baltistan and Azad Jammu and Kashmir may also opt to adopt the provisions as envisaged in the Act.

There exists a huge international market of Halal business worth trillions of dollars, bulk of which is being taken away by non-Muslim countries. Countries mostly involved in the Halal products exports are Brazil, Australia, Malaysia, Indonesia, Thailand, China, Korea, South Africa, America etc. The scope of the Halal sector covers a wide range of items such as food, pharmaceuticals, health, food supplements and toiletries etc. 85% of the Halal Food imports by OIC Nations are from Non-Muslim Countries. Pakistan being a Muslim country is taking only a nominal share of this huge export potential, due to non-existence of a legal and recognized entity/authority at the national level dealing with the Halal sector.

### **Powers and functions of the Authority:**

Powers and functions of the Authority shall be to:–

- (a) 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;
- (b) 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;”
- (c) Recommend mechanism for the Accreditation of Halal Certification Bodies and adoption of Halal Certification systems;
- (d) Develop policies, plans and programmes for ensuring compliance of Halal articles and processes with the Halal Standards;
- (e) Develop and authorize use of Halal logo for Halal articles and processes;
- (f) May operate as a certification body after obtaining due accreditation from the National Accreditation Body;
- (g) Levy fees for issue or renewal of the Halal certificate and/or authorizing the use of Halal Logo;
- (h) Maintain a register of all persons, firms and companies authorized to use the Halal logo;
- (i) 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;
- (j) Prohibit production, storage and sale in the Islamabad Capital Territory of such Halal products as do not conform to the Halal Standards;
- (k) Arrange and conduct public awareness campaigns in relation to the Halal sector in general and to Halal products and processes in particular;
- (l) Secure international recognition of the Halal logo to build confidence in the Halal Certification system and Pakistani Halal products abroad;
- (m) Co-ordinate with national and international organizations for strengthening the Halal sector;
- (n) Promote and encourage establishment of libraries and laboratories for the purpose of developing the Halal sector;
- (o) Collect and circulate statistical and other information relating to the Halal sector; and
- (p) Any other function assigned by the Government for development of the Halal sector and promotion of Halal products and processes for purposes of the Act.

### **Activities carried out during year 2019-2020**

Following activities have been carried out:

- Two meeting of Board of Governors (BoG) of PHA have been conducted.
- PHA Rules, 2019 and Recruitment Regulations have been approved in the 2<sup>nd</sup> BoG meeting of PHA. The same is being submitted to CCLC for approval.
- Logo of Pakistan Halal Authority was accepted by Intellectual Property Organization (IPO) for publication in Trade Marks Journal.
- PHA was enlisted in Rules of Business as Autonomous Body of Ministry of Science and Technology.
- The regular Director General, PHA has been appointed and assumed the charge on 10.04.2020.
- Recruitment process for BS-09 to BS-15 has been completed.
- Recruitment process for the post of Field Inspector (BS-17), Assistant Director (BS-17), Deputy Director (BS-18) and Director (BS-19) is in process.

## **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, economy to ensure knowledge and technology based productivity driven rapid and sustainable economic development. NUTECH Bill 2018 was approved by the National Parliament on 14<sup>th</sup> February, 2018. Consequently, the university was established as a Federally Chartered University through an Act of Parliament and Gazette notified on 26<sup>th</sup> February, 2018 and commenced its five Undergraduate (UG) engineering programs on 1<sup>st</sup> 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 twenty first century proffered by rapid technology advancements.

### **Vision & Mission**

NUTECH envisions to be a world-class technology-driven research university committed to best serve society and industry through purposeful education, research and innovation. Based on this vision, the NUTECH mission is to advance knowledge and educate students in science, engineering, technologies and other areas of scholarship so as to grow knowledge economy and develop leaders, professionals and skilled workforce embodied with the spirit of discovery, innovation, entrepreneurship, social responsibilities and ethical practices to best serve the society and industry.

In line with its vision and mission, NUTECH has declared itself a “University for Industry”; based on its orientation towards applied engineering, technologies and skills courses and their curricula. In contrast to conventional engineering and technologies (UETs etc), NUTECH, UG learning cycle is based on 5 steps i.e. theory, lab work, industrial work, establishing relationship with best international practices and finally the conclusion studies in the form of student workshops/seminars. Besides personality grooming, this 5 steps learning cycle enables students to become effective technologies innovators, implementers and future entrepreneurs.

In line with the vision of NUTECH, BoG, under the chairmanship of COAS, NUTECH will evolve into an international level technology driven research university to serve Pakistan with a professional research based innovative education system.

### **Outcomes**

In a short span of time of 2 years, NUTECH’s UG enrolment threshold has risen from almost 55% to 80% merit in all the programs which tantamount to effective implementation of its academic policies/standards, confidence of prospective students in its UG programs and provision of serene but disciplinary education environment at the NUTECH Campus.

### **Budget Allocation**

MoST has provided a total of Rs. 731.300 million as recurring budget during FY 2019-20 to NUTECH. NUTECH has been able to meet all its management requirements very effectively. While operating its 5 UG programs, NUTECH has conceived following future national level projects:

- **NUTECH Railway Engineering, Technologies and Skills School (NURETSS):** Establishment of NURETSS has been planned in order to produce professional engineers, technologists, high-end skilled workforce and other management professionals to contribute in the state-of-the-art railway development, operation and management of Pak Railways through indigenous technology solutions for ML-1, 2 and 3 projects. The total cost of the project is Rs. 9358.184 Mn with FEC of Rs. 1738.750 Mn. PC-1 of the project has been submitted to Chairman, CPEC Authority on June 8, 2020 for consideration.
- **Innovative Technologies and Skills Centre (ITSC):** The concept behind establishing Innovative Technologies and Skills Centre (ITSC) is to convert upcoming challenges of 4<sup>th</sup> industrial revolution into big opportunity by creating elite stakeholders of latest technologies in the 21<sup>st</sup> century. ITSC will be established as vital hub to develop

technologies and future HR to support national industry and uplift economy. The total cost of phase-1 of the project is Rs. 1998.343 Mn including FEC of Rs. 865.659 Mn. PC-1 of the project was submitted to CDWP through Ministry of Science and Technology for consideration on April 7, 2020.

- **NUTECH Global Technologies & Engineering Complex (NUGTEC) at Special Education Economic Zone (SEEZ), Sambrial:** NUGTEC will be established to develop industry at Sialkot, Gujranwala, Gujrat, Mandi Bahauddin and Wazirabad as hub of value-added technology driven exports in 21<sup>st</sup> century through top quality engineering, technology and skills education. For this purpose, NUGTEC will have schools, institutes, departments, labs and research center to develop indigenous solutions for industry at Sialkot, Gujranwala, Gujrat, Mandi Bahauddin and Wazirabad.
- **NUTECH Main Campus in the Vicinity of Islamabad:** The project for establishment of Main Campus of NUTECH was submitted to CDWP through HEC on August 8, 2019 which was approved by CDWP on October 17, 2019. HEC accorded administrative approval on November 29, 2019. The total cost of the project is Rs. 2851.231 Mn with FEC of Rs. 389.261 Mn with a duration of 36 months. An amount of Rs. 300 Mn was released for PSDP in FY 2019-20. MoU has been signed for Land Acquisition and master planning of this campus, based on NUTECH Academic Vision-2050, is in progress.

### **Linkages with Industry/Organizations/Universities**

As “University for Industry”, NUTECH has developed effective linkages with Defence Industry, most of industries of Karachi, Sialkot, Islamabad, Lahore and Pakistan Railways. The linkages have enabled NUTECH to realize problems of these industries so as to design its future academic and R&D programs.

In two years’ time period, NUTECH has developed linkages with three international Universities and a number of R&D organizations/entities.

### **Response to COVID-19 Pandemic**

In COVID-19 pandemic environment, NUTECH team of young engineers and scientists worked relentlessly to design & develop its indigenous ventilator “NuVent”, which will be shortly qualifying PEC and DRAP standards and shall go into production in collaboration with NRTC. These engineers are now working on design & development of 3-D Printer “NUPRINT” and Portable X-Ray system “PXRay”.

### **Achievements/Accreditation**

NUTECH’s technical education and skills programs are unique in their essence. The University is expanding its capacity to affiliate more than 40 technical institutes for award and accreditation of their TVET programs. NUTECH high end skills programs under “Kamyab Jawan Program-KJP” have earned a reputation of international standards qualification. Its hospitality programs are being aligned with Turkey and Finland hospitality programs for award of Joint Certifications. This shall grant international liability to graduates of NUTECH hospitality programs.