



ANNUAL REPORT

2022-2023

Pakistan Council of Scientific and
Industrial Research (PCSIR)



EMAIL: PCSIRMEMBERSCIENCE@GMAIL.COM TEL: (051) 9225395-99
WEBSITE: WWW.PCSIR.GOV.PK FAX: (051) 9225372

ADDRESS: 1- CONSTITUTION AVENUE, SECTOR - G-5/2, ISLAMABAD



Message from the Chairman

I am delighted to present the Annual Report for the fiscal year 2022-2023, a testament to the remarkable journey of progress and innovation undertaken by PCSIR. As we navigate through unprecedented times, this report serves as a beacon of resilience, showcasing our unwavering commitment to excellence and advancement.

Over the past year, PCSIR has continued to push boundaries and break new ground in scientific research, technological development, and industrial collaboration. Our relentless pursuit of knowledge and innovation has enabled us to achieve significant milestones and deliver impactful solutions across various sectors.

During 2022-23 PCSIR has made significant progress. PCSIR filed/ obtained 29 patents, developed 218 process and leases out 96 processes, published 179 papers, developed 219 analytical equipment, prepared 474 technical reports, organized 79 conferences/ seminars/ workshops and trainings, signed 34 MoU/ agreements/ ToRs, supervised 945 BS/ MS/ PhD research students, provided 1068 consultancy services and 47413 analytical/ testing services to 15333 clients.

In research, we have embarked on ambitious projects aimed at addressing global challenges, from sustainable energy solutions to environmental conservation. Through groundbreaking discoveries and pioneering technologies, we are actively contributing to shaping a better, more sustainable future for generations to come.

Our collaborations with industry partners have flourished, fostering a dynamic ecosystem of innovation and entrepreneurship. By leveraging synergies and sharing expertise, we have accelerated the translation of research findings into practical applications, driving economic growth and societal development.

Furthermore, our commitment to excellence in quality management and regulatory compliance remains unwavering. We continue to uphold the highest standards of integrity, transparency, and accountability in all our endeavors, ensuring the trust and confidence of our stakeholders.

As we reflect on the achievements of the past year, we are inspired by the possibilities that lie ahead. With our dedicated team of scientists, engineers, and professionals, along with the support of our valued partners and stakeholders, we are poised to embark on another year of transformative growth and impact.

In conclusion, I extend my sincere gratitude to all our stakeholders for their unwavering support and trust in PCSIR. Together, we will continue to push boundaries, defy expectations, and create a future filled with endless possibilities.

Dr. Syed Hussain Abidi, S.I.
Chairman, PCSIR

CONTENTS

| | | |
|---|--------------------------|----|
| 1 | Introduction | 05 |
| 2 | PCSIR Organization Chart | 06 |
| 3 | Location of PCSIR Labs | 07 |
| 4 | Main Activates | 08 |
| 5 | Service Sector | 09 |
| 6 | PCSIR Head Office | 10 |
| 7 | Year at a Glance | 12 |

Activities and Progress of PCSIR Laboratories and Units

| | | |
|----|--|-----|
| 8 | PCSIR Laboratories Complex, Karachi | 24 |
| 9 | PCSIR Laboratories Complex, Lahore | 37 |
| 10 | PCSIR Laboratories Complex, Peshawar | 59 |
| 11 | PCSIR Laboratories, Islamabad | 70 |
| 12 | PCSIR Laboratories, Quetta | 79 |
| 13 | Fuel Research Center, Karachi | 83 |
| 14 | Leather Research Center, Karachi | 87 |
| 15 | PCSIR Laboratories, Skardu | 93 |
| 16 | Scientific Information Center, Karachi | 96 |
| 17 | Institute of Industrial Electronics Engineering, Karachi | 98 |
| 18 | Pak Swiss Training Center, Karachi | 101 |
| 19 | Precision System Training Center, Lahore | 106 |
| 20 | Precision System Training Center, Peshawar | 108 |
| 21 | Precision System Training Center, Quetta | 109 |
| 22 | Cast Metal & Foundry Technology Center, Daska | 110 |
| 23 | Contact Us | 112 |

Mandate

Pakistan Council of Scientific & Industrial Research (PCSIR) is the largest public sector R&D organization with network of seventeen (17) laboratories /units including six (06) technical centres in the country. The mandate of the Council is to undertake, promote and guide scientific and technological research related to problems connected with the establishment and development of Pakistani industries and to disseminate the results of research to various sectors for economic development of the country.

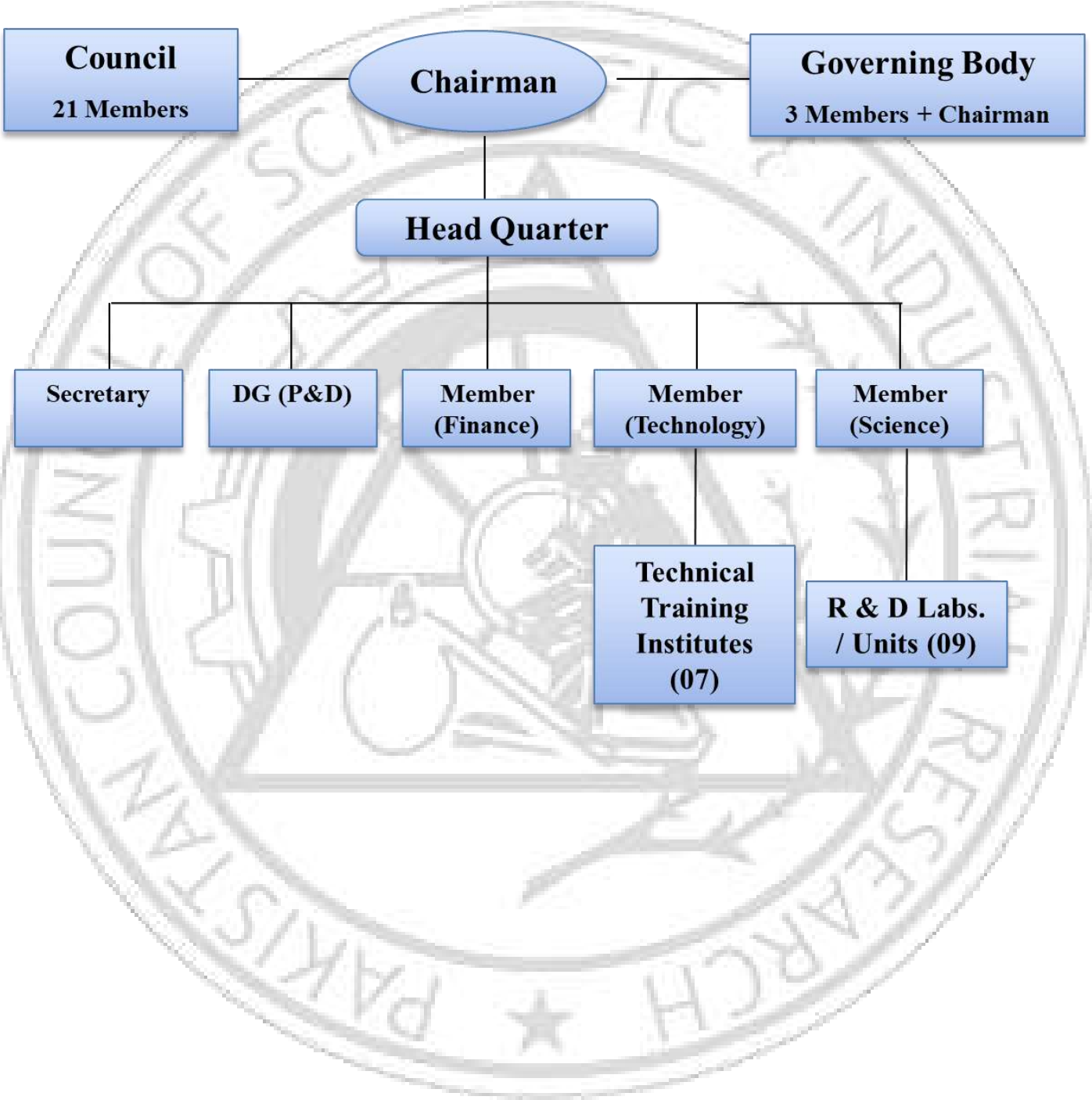
Vision

Since its inception, PCSIR has contributed immensely in terms of production activities and technological processes to boost the national industries of public and private sectors. Simultaneously, PCSIR has also contributed in terms of human resource development to meet the requirements of academic institutions and R&D organizations of the country.

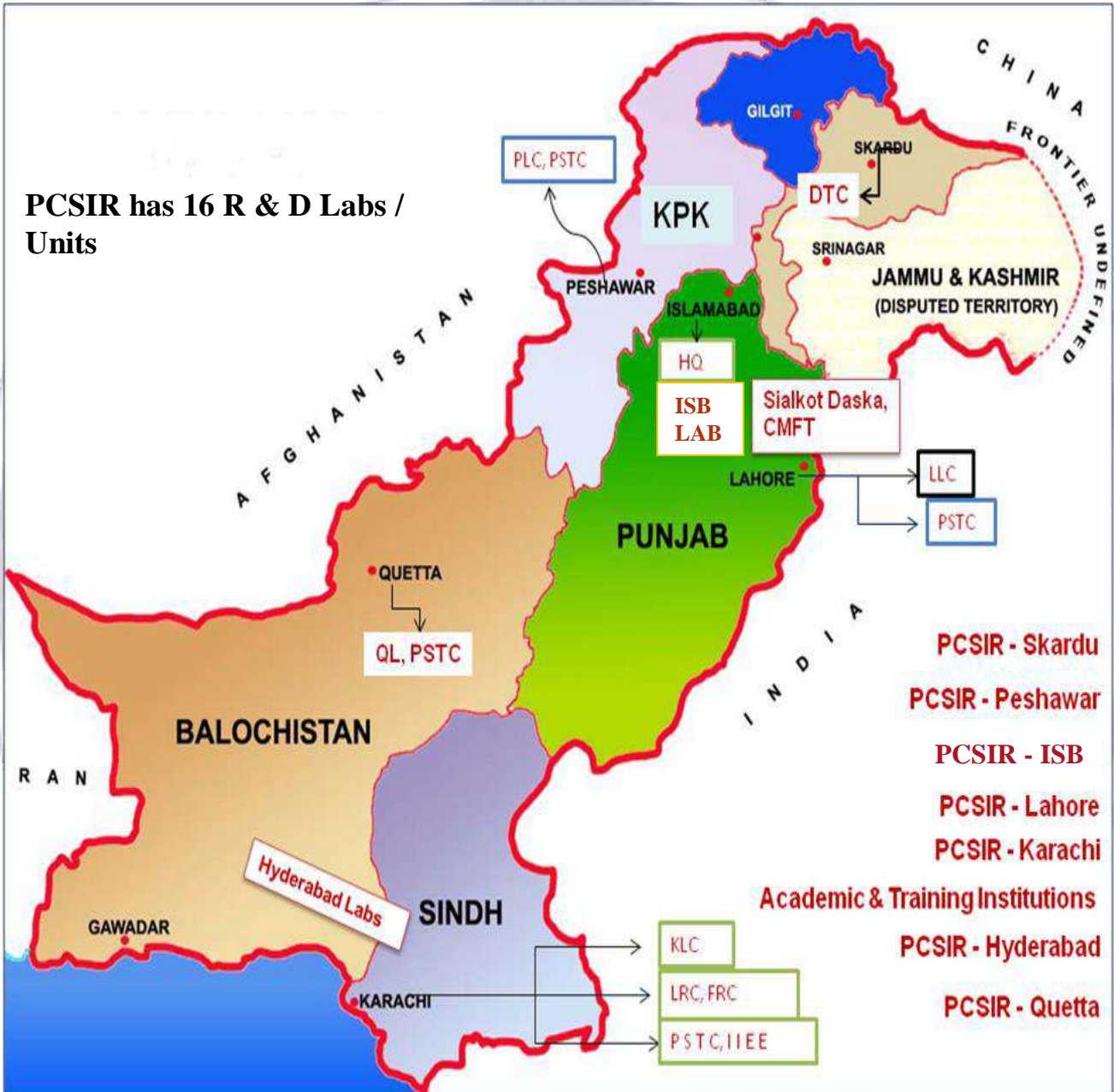


Introduction

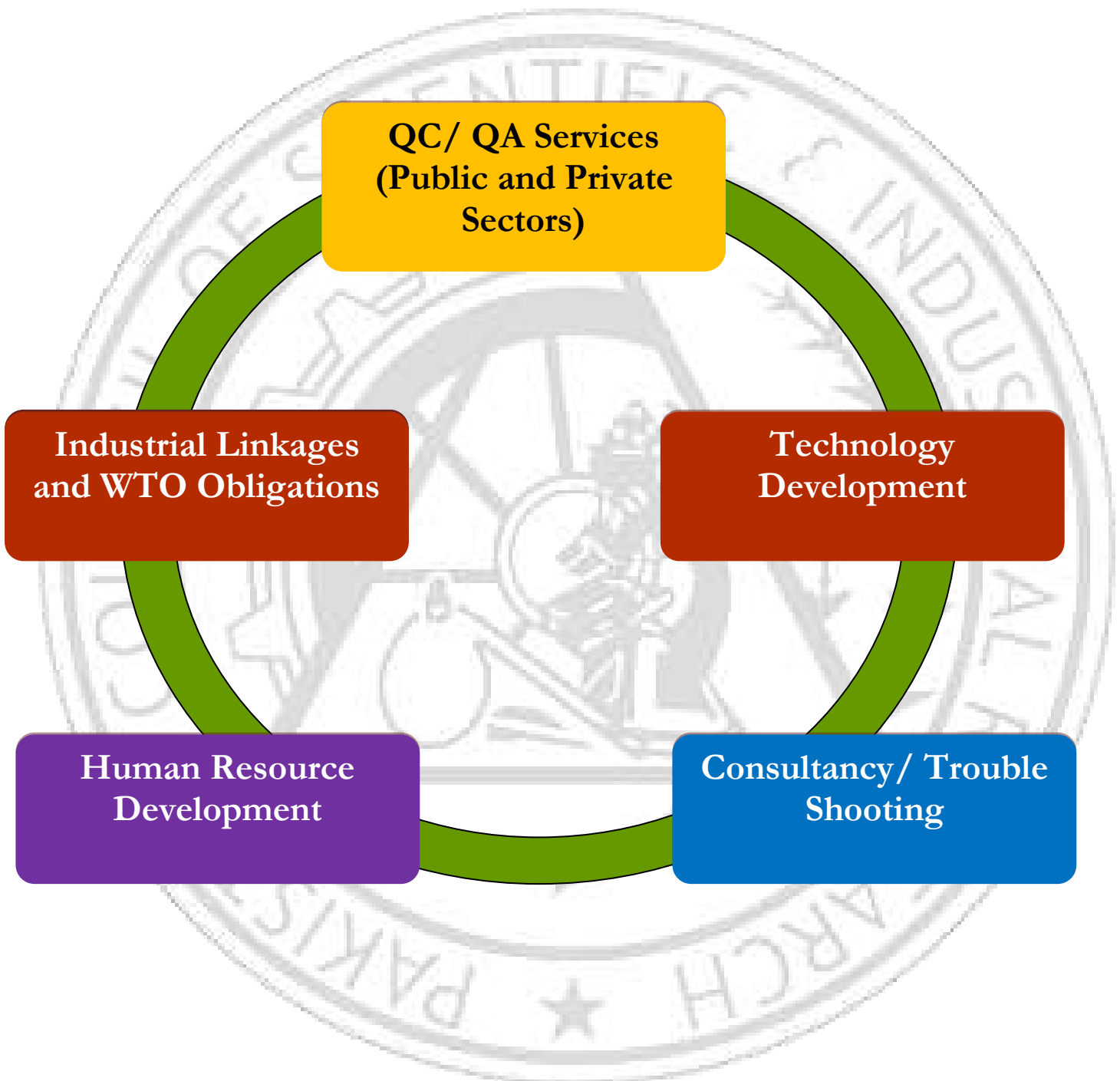
Organizational Chart



Location of PCSIR Labs and Units



Main Activities



Services Sectors

Advance Engineering Materials

Environment

Food and Allied Products

Electronics

Minerals

Industrial Chemicals

Leather and Leather Auxiliaries

Paper and Plastic/ Polymers

Textile and Associated Products

Pesticides/ Herbicides

Glass and Ceramics

Oils and Fats

Biotechnology

Dyes

Strategic Industry

Pharmaceuticals

PCSIR Head Office, Islamabad



PCSIR Head Office, Islamabad

1-Constitution Avenue, Sector G-5/2, Islamabad

Tel: 051-9225395-99; Fax: 051-9225372

E-mail: pcsirheadoffice@gmail.com

Website: www.pcsir.gov.pk

PCSIR Head Office, Islamabad:

Pakistan Council of Scientific and Industrial Research has a network of 16 research laboratories/ units including 06 training institutes located all over the country in Federal as well as all provincial capitals. Several laboratories of PCSIR are ISO-17025 accredited and some are under the accreditation process. PCSIR's Head Office is located in Islamabad.

The Chairman PCSIR is the competent authority of PCSIR. The Council of PCSIR consists of 21 members which is the supreme policy-making body. The executive organ of the Council is the Governing body which consists of four members: The Chairman and the Members for Science, Technology and Finance. Following wings are working under supervision of the Members in Head Office.

Science Wing:

Member (Science) is the Head of the wing and responsible for supervision and monitoring of all Research and Development activities of the Council, training and technical matters of units, organizing events and programmes in collaboration with international and national organizations.

The Science Wing is also responsible for scrutinizing and printing of PCSIR Annual Reports and R&D Programmes. Similarly, accreditation matters, technical comments, National Assembly/ Senate questions, networking system and software development are also dealt in the Science wing.

Technology Wing:

Member (Technology) is the Head of the wing and responsible for supervision of all civil works, PSDP projects, technical training institutes, commercialization of products/ services, exhibitions etc.

Finance Wing:

Member (Finance) is the Head of the wing and responsible for supervision of all finance-related matters of PCSIR, audit matters, annual (Development and non-development) budget, payments related to recoupment and hiring etc., monitoring of Self-Generated Income, pension and GP Fund.

Administration/ Establishment Wing:

Secretary PCSIR is the Head of the wing and responsible for supervision of administrative matters, establishment matters, security measures, legal matters, promotions and recruitments, holding of PCSIR Council and Governing Body meetings.



Year at a Glance

PCSIR's Continuous Excellence Programme

A summary of the Performance output of PCSIR in 2022-23 to support the industrial sector, as a result of implementing PCSIR's Continuous Excellence Programme, is given below:

| S. No | Key Performance Indicators (KPIs) | Achievements |
|--------------|--|---------------------|
| 1. | Processes Developed | 218 |
| 2. | Processes Leased out | 96 |
| 3. | Patents Filed/ Obtained | 29 |
| 4. | Students Supervised | 945 |
| 5. | Consultancies Provided | 1068 |
| 6. | Technical/ Feasibility Reports | 474 |
| 7. | Research Papers Published | 179 |
| 8. | Analytical Equipments Developed | 219 |
| 9. | Exhibitions/ Conferences/ Seminars Organized | 79 |
| 10. | MoUs Signed | 34 |
| 11. | Interaction with Industries (Visits) | 2369 |
| 12. | Technical/ Calibration Services to Industry | 47413 |
| 13. | No. of Clients Served | 15333 |

Human Resource Development During 2022-23

Training Received (Long-Term)

| Nature of Training | Foreign | Local | Total |
|---------------------|---------|-------|-------|
| Ph.D. | - | 06 | 06 |
| M. Phil./ M.Sc./ MS | - | 03 | 03 |

Training Received (Short-Term)

| Nature of Training | Foreign | Local | Total |
|--|---------|-------|-------|
| Short Training Courses, Webinars Workshops, Seminar, etc. | 32 | 106 | 138 |

Training Imparted

| Lab/ Unit | No. of Trainings |
|--------------------------------------|------------------|
| PCSIR Laboratories Complex, Karachi | 40 |
| PCSIR Laboratories Complex, Lahore | 9 |
| PCSIR Laboratories Complex, Peshawar | 24 |
| PCSIR Laboratories, Skardu | 05 |

Budget and Finance

Non-Development Budget (Fiscal Year 2022-23)

| | |
|-----------------|-----------------------|
| Approved Budget | Rs. 3,612.708 million |
| Released | Rs. 3,612.708 million |

Development Budget (Fiscal Year 2022-23)

| | |
|-----------------|----------------------|
| Approved Budget | Rs. 2550.195 million |
| Released | Rs. 2202.471 million |

Development Projects

On-Going Projects during 2022-23

| S. No. | PSDP # | Project Name | Total Cost (Million Rs) | PSDP Allocation (Million Rs) | PSDP Allocation Revised (Million Rs) |
|--------|--------|---|-------------------------|------------------------------|--------------------------------------|
| 1. | 1046 | Cultivation and Processing of Medicinal and Industrial Cannabis on Experimental Fields and Establishment of testing and product development facilities at PCSIR Laboratories Complex, Lahore, Peshawar and Karachi. | 1896.820 | 300.000 | 385.000 |
| 2. | 1047 | Data Repository of Scientific Instrumentation | 300.000 | 50.000 | |
| 3. | 1048 | Development of Computer Controlled Fermentors and Production of Biochemicals & Bioproducts | 1981.607 | 360.000 | 201.183 |
| 4. | 1049 | Digital transformation, strengthening and automation of PCSIR. | 960.710 | 380.000 | 350.000 |
| 5. | 1050 | Establishment of Material Resource Centre and development of additive manufacturing and Reverse Engineering Centre at PCSIR. | 1951.683 | 350.000 | 350.000 |
| 6. | 1061 | Gene Editing of Biological Agents for Nutritional Biochemical and Therapeutical purpose. | 1799.598 | 400.000 | 400.000 |
| 7. | 1063 | Medical Equipment & Devices Innovation Center (MEDICen). | 1989.520 | 200.000 | 6.000 |
| 8. | 1067 | Research, Development and Innovation Program in PCSIR | 1500.000 | 200.000 | 55.000 |
| 9. | 1072 | Up gradation of Calibration Centre Capabilities at PCSIR Peshawar | 35.000 | 20.00 | |

| | | | | | |
|-----|------|---|------------------|-----------------|-----------------|
| 10. | 1073 | Up gradation of Machinery, Equipment and Renovation of Buildings of IIEE & PSTC Karachi. | 125.000 | 63.541 | 33.717 |
| 11. | 1074 | Up gradation of Medicinal Botanic Centre as National Centre for Herbal Medicine, PCSIR Labs. Complex, Peshawar. | 286.000 | 176.647 | 63.686 |
| | | Total | 12825.938 | 2500.188 | 2432.325 |

NEWLY APPROVED PROJECTS DURING 2022-23:

| S. No. | Title of Project | Approved by | Cost (Million Rs.) | Duration |
|--------|---|-----------------------------|--------------------|-----------|
| 1. | Establishment of Mineral Resource Center in District Dukki Baluchistan for product Design, Development and Value Addition to Enhance Export | DDWP Approved 24.05.2023 | 700.00 | 24 Months |

Important Events Organized at Your Unit during July 2022-2023

PCSIR Labs Complex Lahore Executes PSDP Project on Gene Editing for Nutritional, Biochemical, and Therapeutic Purposes

PCSIR Labs Complex Lahore is executing a PSDP project titled “Gene Editing of Biological Agents for Nutritional, Biochemical and Therapeutic Purposes”. The major objective is to establish an advanced gene editing facility at PCSIR along with associated equipment and systems that could be used for analysis of bio-products: Beta-carotene (vitamin A), omega-3 (DHA), Lysine (single cell protein) and bio-butanol reproduced after TOT as per contract with PCSIR. Additionally, to develop indigenous strains/ with genetic engineering for R&D, design, development and subsequent commercial production of biomolecules of industrial importance.

In continuation of these PSDP project, as a technology transfer drive, a PPRA based open-bid process was conducted and a purchase order was issued to CDigital, a technology solutions provider company from Rawalpindi, Pakistan as per PPRA rule. CDigital contacted a world-famous technology transfer company, Coway International TechTrans Company, China, for getting production technology of project oriented bio-products. Whereas, Cowaybiois a Public Limited company and a subsidiary of Tsinghua University (one of the top Biotech universities in China). Cowaybio Laboratories is an international technol transfer company, involved in R&D, technology transfer and technology commercialization for industrial fermentation and organic synthesis technologies in the area of bio pharmaceuticals.

- As per contract between PCSIR and CDigital, Rawalpindi, a group of 4 relevant scientists from PCSIR were nominated to received online demonstration and on-site visit of Cowaybio maintaining all codal formalities for TOT of Bioproducts of DHA Lysine and beta-carotene. The scientists were engaged with technical experts and scientists of Coway from 07th April 2023 to 20th May 2023 for production technology of Lysine, DHA and beta carotene via on-line sessions and physical examination of process (15th May 2023 to 22nd May 2023). PCSIR team was briefed about, culture preparation, culture maintenance inoculation, production, and QC of DHA, Lysine and beta-carotene.
- It is further stated that this technology was not available in Pakistan. After complete ToT, PCSIR PCSIR is in a position to produce aforementioned products for local food and feed industries, transfer of technology and production technology.



Visit of the Honorable Chairman PCSIR Dr. Syed Hussain Imam Abidi:

The Honorable Chairman PCSIR Dr. Syed Hussain Imam Abidi Visited the site of Sustainable Utilization of Water for Aquaculture Project site to witness the project study and performance growth of aforementioned project. Where Engr. Ali Imran P.I / Head UMW gave briefing regarding the different phases and operational outputs were shared including mechanical filtration section where our indigenized reverse engineered drum filter was in operation and our own designed and fabricated bio-filtration tank operation and results were being witnessed. The results and outcomes of the Sustainable Utilization of Water for Aquaculture at every step were appreciated by the Worthy Chairman of PCSIR. At this eve Dr. Quratulain Syed, Director General, PCSIR Laboratories Complex, Lahore and Dr. Ijaz Ahmed Director P&D were also accompanying the Honorable Chairman PCSIR. The authority was briefed about the growth of the Pangasius in its main tank and FCR of the aquaculture were also shared.



Visit of the Honorable Mr. Agha Hassan Baloch Federal Minister for Science and Technology:

A Meeting was held with the Honorable Mr. Agha Hassan Baloch Federal Minister for Science and Technology on 21st day of June 2023. Where the respected Director General, PCSIR Laboratories Complex, Lahore discussed the matters of R&D in Science & Technology with the honorable Federal Minister for Science & Technology. The Honorable Minister for Science & Technology appreciate the work carried out in Mineral Ore Beneficiation that can uplift the economy of the country and can create jobs & opportunities for people of Baluchistan and Khyber Pakhtunkhwa.



Visit of the Additional Secretary Mr. Usman Akhtar Bajwa:
 Visit of Additional Secretary Mr. Usman Akhtar Bajwa to PCSIR Labs Complex, Lahore on 12th day of December, 2023, where he witness the Electrical Measuring Testing Laboratories (EMTL) of PCSIR Laboratories Complex, Lahore that are working as per ISO 17025 and serving the public & private sectors especially in energy, lighting, motor testing, meter testing, calibration, cable industry, fan industry, refrigerators and air conditioner sector for testing and accreditation, under one roof at PCSIR Laboratories Complex, Lahore.



Successful Installation of Ultra-filtration water purification Plant for Provision of Safe and Clean Drinking Water at Governor House Sind by PCSIR Laboratories Complex Karachi:

The Sindh Governor House approached PCSIR Laboratories Complex Karachi in May 2022, this year again with requisite funding. PCSIR Karachi has successfully installed an Ultra Filtration Water Purification Plant at Governor House Sindh in July 2022 which is providing safe and clean drinking water to the employees and residents of Staff Colony. The plant is equipped with graded silica sand and an activated carbon multimedia filtration system, followed by ultra-filtration and UV disinfectant treatment of the feed water. The plant can produce 1,200 liters of clean and safe drinking water per hour.



The plant is very efficient at removing sediments, odor, and microbiological contamination from the KDA feed water supply. The employees and residents of Governor House Sind are quite satisfied with the performance of the filtration plant and quality of the purified water.



Design & Development of Testing Apparatus for Indicator-Lights of Vehicles:

Automotive industry is trying to indigenize their parts for import substitution and saving foreign exchange. In this connection, Galaxy Polymer-Karachi requested to test their locally produced optical parts for compliance to international standards. Their optical parts are mainly indicator lights such as, brake light, parking light, side indicator light etc. their provided testing guidelines and standards were thoroughly studied and discussed with their experts. The testing apparatus has been successfully developed. Around 10 nos. of different indicator lights were successfully tested and test reports were provided to the client.

Features Achieved: According to the standard, the distance between sample (indicator light) and light intensity meter should be 3.2 meter. The light intensity meter is mounted and fixed during the testing. The sample is placed on a platform that can be tilted angularly in horizontal and vertical plane from -60 degrees to +60 degrees. In this way more than 25 points are measured for light intensity.

- The sample moving platform has been successfully developed with 2 nos. of large (1.5 feet) Protractors (D's). A mounting for the sample is made. The sample stand can be moved up and down. Similarly, it can be tilted in horizontal (-80 to 80 degrees) and vertical plane (-45 to +45 degrees)
- The testing apparatus has been successfully developed and results were matched with their reference lights and found satisfactory.



PCSIR Labs. Complex, Karachi Provided Technical Support to Hamdard Laboratories (Waqf), Pakistan:

Toxicological studies are used to identify and characterize the impact of a drug on the structure and function of vital organs like kidneys, heart, muscles etc. Toxicological studies help determine a drug's safety margin for its clinical dose. This information is important to maximize safety and minimize risks related to administered doses. PCSIR Laboratories Complex Karachi has developed a state-of-the-art animal house for rearing and breeding laboratory animals like albino mice, rats, guinea pigs and rabbits at the Pharmaceutical Research Center. This facility is utilized to determine *in-vivo* acute oral toxicity and LD 50 of herbal products provided by M/s Hamdard Laboratories (Waqf) Pakistan which is a leading herbal medicine and product's company in Pakistan. The company is taking consultancies and testing services from PCSIR Laboratories Complex Karachi on regular basis and has also signed a MoU with the lab in 2021. In October 2022, around 88 different herbal products were tested and technical reports for toxicological studies and LD 50 were provided to M/s Hamdard Laboratories (Waqf) Pakistan. These products include health care products, Syrups, Khameere, Kushte and other health care products. This information will build the confidence of the consumer with goodness associated with Hamdard products.

PCSIR Karachi Facilitate PSTC-Karachi for Launching of Digital Library

PCSIR Karachi facilitated Pak-Swiss Training Center to launch HEC-based Digital Library at Pak Swiss Training Center Karachi. Inauguration Ceremony of PSTC Digital Library held at PCSIR Labs. Complex Karachi on March 21, 2023.

Dr. Hafiz Rub Nawaz, Director General, PCSIR Labs. Complex, Karachi inaugurated the HEC-based Digital Library. Engr. S. Farhan Hamid Ali, Director, PSTC Karachi gave presentation and elaborated the advantages of Digital Library which made available at PSTC. It's a way forward which will be benefited by the students and staff of PSTC.



KLC Signed ToRs with Dollar Industries:

Dollar Industries are leading stationary manufactures in Pakistan. They also export their products to more than 50 countries around the globe. Dollar is a credible and reliable name across Pakistan. The company is continuously growing and bringing innovative products in the market, hence they seek expertise from PCSIR to help them for collaborative R&D activities. The TORs was signed with M/s Dollar Industries on 5th April 2023 for cooperation for Research and Development. The ToRs was signed by Dr. Hafiz Rabnawaz on behalf of PCSIR Labs Complex Karachi and Mr. Arif Mukhtar Head of Export Business Development from M/s. Dollar Industries (Pvt.) Ltd. These TORs will help to boost the export of writing products which in return help to reduce the current account deficit and generate foreign exchange.



KLC Signed a Memorandum of Understanding (MoU) signed with NED University of Engineering and Technology:

NED University of Engineering and Technology is one of the oldest and best engineering universities in Pakistan. It is offering undergraduate, graduate, post graduate programs in major disciplines of engineering, science and technology. The university is acknowledged for its best teaching practices and graduates. The University joined hands with PCSIR Laboratories Complex Karachi for cooperation and collaboration in academics, research and development. The MoU was signed on 6th April 2023. Vice Chancellor of NED University Prof. Dr. Sarosh Hashmat Lodi and Dr. Hafiz Rab Nawaz DG KLC signed the document on

behalf of NED and PCSIR Labs. Complex, Karachi respectively. The agreement will be beneficial for both organizations for progressive development of Research activities.



FOOD SAFETY AND NUTRITION EXPO 2022 CUM INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN FOOD SAFETY & NUTRITION

KP Food Safety and Halal Authority in collaboration with PCSIR organized two days International Conference on Emerging Trends in Food Safety and Nutrition & Food Safety and Nutrition Expo on October 26-27, 2022 at PCSIR Laboratories Complex, Peshawar with a theme of “Safer Food, Better Health”. The purpose of the expo was to spread awareness related to safe and nutritious food among the general public. The Secretary Food Capt. Retd. Mushtaq Ahmad and Director General KP Food Safety Authority Shahrukh Ali Khan inaugurated the Food Safety Expo. Secretary PCSIR and Director General, PLC also graced the occasion. Addressing to the event Secretary Food Capt. Retd. Mushtaq Ahmad appreciated the Expo, and commended the joint venture of the Food Safety Authority, along with various Universities, researchers and industries. The event was also addressed by Vice Chancellors of various Public and Private sector Universities, who actively participated in the event.

The conference highlighted keynote presentations, oral talks, poster presentations and food exhibition and addressed the challenges associated with fragile food safety and its corollaries. It also provided an opportunity to the scientific community, industrial icons, food traders, development partners, progressive farmers and policy makers to have their experiences shared at the right forum and to suggest, how challenges can be addressed to food safety and nutrition. While addressing to the audience PCSIR Director General Jehangir Shah said there is a need for collaboration among key pillars such as the Food Safety Authority, academia, research institutions and industries, and that they should work together to help in industrial growth and provide better food to the people as it is the right time to establish the Pakistan Food Safety and Nutrition Council, and that food waste should be reduced through skill-based trainings and public awareness.



Concluding session of international conference chaired by Riaz Khan Mehsud Commissioner Peshawar, founding DG KPF&HA with Prof Dr Faqir Anjum, Shahrukh Ali Khan DG KPF&HA KPK and DG PLC.



Pakistan Mega Leather Show

Leather Research Center, PCSIR participation of International Exhibition at Expo Centre, Lahore from 1st February to 3rd February 2023. Mr. Sikandar Ali *JTO* & Mr. Farrukh Hassan, *R.A* participated in above PAKISTAN MEGA LEATHER SHOW 2023, Lahore. In the exhibition, the visitors showed keen interest in the product & services of LRC mainly Ostrich Leather, Chicken Paw Leather, Tannery Solid Wastes Management, Fat-liquors, Dyes etc. Few of visitor suggested that for the improving the testing facilities of LRC also ISO/IEC 17025: 2017 accreditation with major Leather Testing in accreditation scope e.g. Chrome VI, Formaldehyde, Azo, PCP etc. also participated in the inaugurated ceremony of FIRST LEATHER MAGAZINE in Pakistan namely PAKISTAN LEATHER. M. Sajid Shad, *Editor of the Magazine* shows keen interest for the input of Leather Research Center for the development of Leather Industry in Pakistan in the form of technical articles for this yearly magazine.



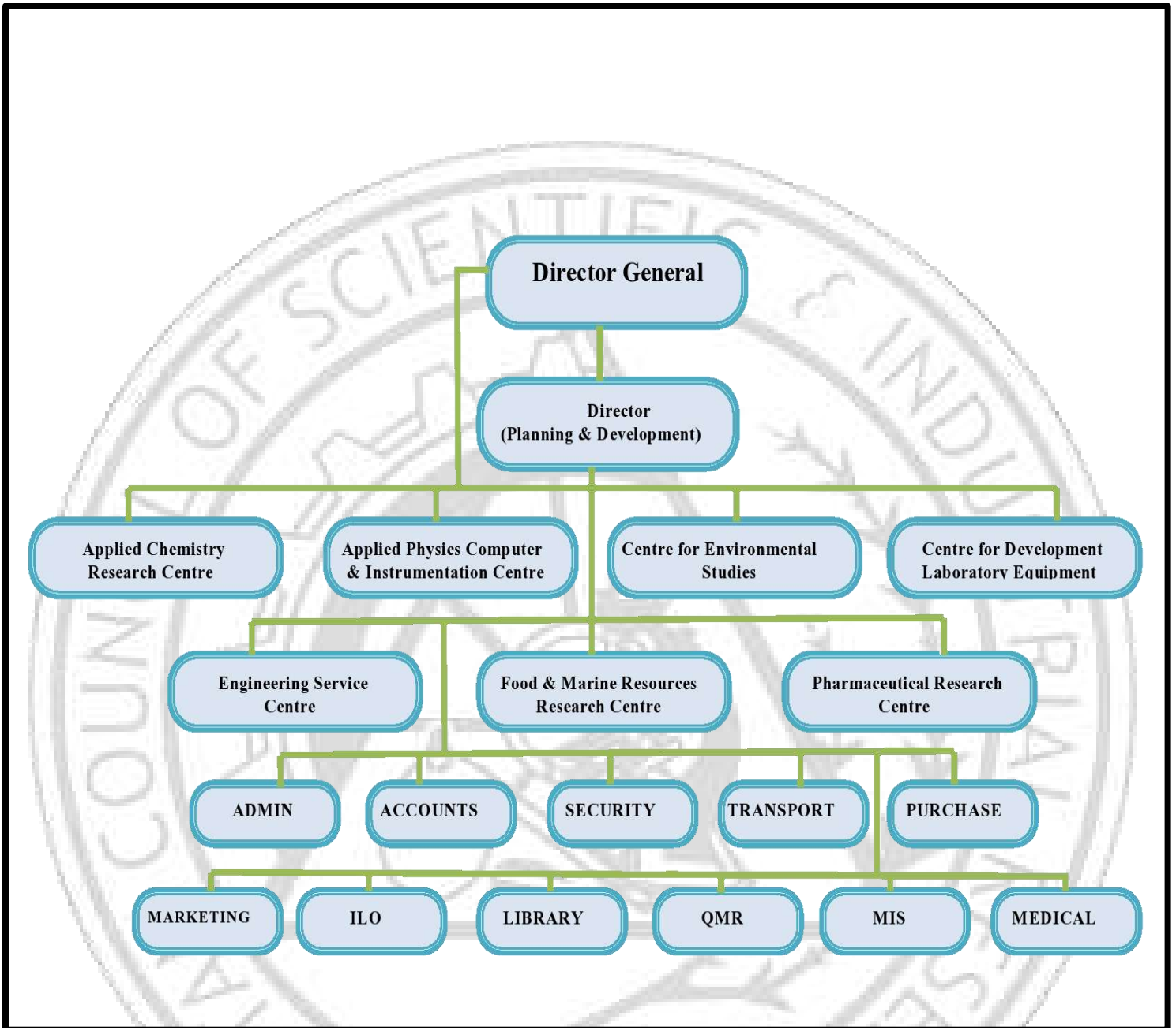
PCSIR LABORATORIES COMPLEX, KARACHI

PCSIR Laboratories Complex, Karachi (KLC) is a multidisciplinary R&D Organization having scientists with expertise in the disciplines of Marine & Food Sciences, Environment, Bio Sciences, Pharmaceuticals, Applied Chemistry & Physics, Instrumentation, Material Science and Computers. PCSIR Karachi develops processes and technologies, exploitation of indigenous natural resources for developing



import substitution and export enhancement, besides carrying out R&D work in particular disciplines, it also provides analytical and technical services to Regulatory Bodies, Custom, Private and Government Industries and Academia. In the present scenario of ISO and WTO, KLC has contributed a lot by providing quality testing and Calibration services, accredited under ISO / IEC-17025, to the Pakistani manufacturers, exporters and importers. PCSIR Karachi is playing a vital role in Human Resource Development by conducting professional Trainings. During the period under report, scientists and technologists of KLC have published number of research papers in National and International Journals of high repute. Moreover, patents have also been obtained/ filed.

ORGANIZATIONAL CHART



Processes Leased Out:

- 1) Technology Improvement & Production of vitamin AD₃E
- 2) Technology Improvement & Production of Carminative Mixture
- 3) Process for BOP fertilizer
- 4) Process for TSP
- 5) Process Development of Wheat Grass Extract
- 6) Process Development of Dhamasha Extract
- 7) Process Development of Amla Khusk Extract
- 8) Process Development of Tukme Kaddu Shereen Extract
- 9) Process Development of Karela Khushk Extract
- 10) Process Development of Kharkhask (Tribulus) Extract
- 11) Process Development of Herbal Tea Ingredients Extraction Process
- 12) Process Improvement for Poultry Feed
- 13) Ammonia Detoxification process for Cattle Feed
- 14) Aflatoxin Detoxification of Animal Feed by Adsorbent
- 15) Process Development Pure Organic Rose Water
- 16) Formulation of ALPHA NAA (4 - 4.8%) Fertilizer

International Publications (only impact factor publications)

1. N. Kumar, F. Amin, D. Hashem, S. Khan, H. Zaidi, S. Rahman, T. Farhan, Syed J. Mahmood, M. A. Asghar and M. S. Zafar, Evaluating the pH of Various Commercially Available Beverages in Pakistan: Impact of Highly Acidic Beverages on the Surface Hardness and Weight Loss of Human Teeth. *Biomimetics*, 7, 102, July, 2022 **I.F. 4.22**
2. Shahnaz Perveen, Rukhsana Rahooja, Zubid Ullah, Bushra Sarafarz, Reliability of Non-Destructive Test Results for Assessment of Concrete Using Cut Pull Out Test & Rebound Hammer Test (A Case Study), *American Journal of Engineering Research (AJER)*, Vol. 11, Issue-06, 16-31, 2022.
3. Choudhry Z, Malik S, Mirani ZA, Khan SA, Kazmi SMR, Farooqui WA, Ahmed MA, et. al. Antifungal Efficacy of Sodium Perborate and Microwave Irradiation for Surface Disinfection of Polymethyl Methacrylate Polymer. *Applied Sciences*, 12(14), 10.3390 July, 2022, **I.F. 2.9**

4. Abdul Hafeez Laghari, Salman Tariq Khan, Cloves (*Syzygium aromaticum*) cultivars: Convenient source of eugenol and its role in commercially important formulations Chapter in Book titled Clove (*Syzygium aromaticum*) Chemistry, *Functionality and Applications*, Pg 67-80, July, 2022
5. Tehmina Sohail, Hina Imran, Sohail Shaikat, Syed Rafay Yaqeen, Shazia Syed, Acute Oral Toxicity Evaluation of Ethanolic Extract of Di-Herbal Formulation (*Aegle Marmelos* and *Cymbopogon Citratus*) in Albino Mice *World Journal of Pharmacy and Pharmaceutical Sciences* 11(7), pg. 162-170 July, 2022, **I.F. 3.337**
6. Syeda Farah Bukhari, Syed Nawazish Ali, Nazish Dildar, Saima Tauseef, Salman Tariq Khan, Sara, Ambreen Zia, Erum Hasan, Sundus Ali, Mehreen Shehzadi, Bio-fabricated chromium (III) oxide nanorods for catalytic and bactericidal applications in water treatment, *Journal of Chinese Chemical Society* (1–9) DOI:10.1002/jccs.202200299, August, 2022, **I.F. 1.753**
7. Daniyal Sher Bahadur, Samreen Riaz Ahmed, Altaf Hussain Lahori, Tanveer Hussain, Sofia Khalique Alvi, Sheraz Shafique, Sadia Fatima, Viola Vambol, Monika Mierzwa-Hersztek, Preeta Hinduja, Sergij Vambo and Zengqiang Zhang Novel, Fuller Earth, Rock Phosphate, and Biochar for Phytomanagement of Toxic Metals in Polluted Soils *Agriculture* 12, 1216: 1-19, August, 2022, **I.F. 3.6**
8. Ahmed F, Mirani ZA, Mirani PN, Imdad MJ, Khan FZ, Khan MN, Khan AB, Li Y and Zhao Y. *Pseudomonas aeruginosa* response to acidic stress and imipenem resistance. *Applied Sciences*. 12, 8357, August, 2022, **I.F. 2.9**
9. Sarwat Jahan Mahboob, Kashif Pervez, Farman Ahmad, Urooj Alam, Tahira Ayaz, Rajkumar Dewani, Process of a Single Retanning Agent as a Brown Dye for Making Brown Color Leather in an Environment Friendly Approach *International Journal of Natural and Human Sciences*, 3 (1) 12–17 August, 2022
10. Aijaz Panhwar, Ateeq Memon, Azhar Naeem, Aftab Kandhro, Syed Zainulibad, Sofia Qaisar, and Awais Panhwar Chapter: Internal Audit, Published in Book; Six Sigma and Quality Management Editors: Dr. Paulo Pereira and Dr. Sandra Xavier *Six Sigma and Quality Management* Editors: Dr. Paulo Pereira and Dr. Sandra Xavier Intech Open Limited, United Kingdom DOI:10.5772/intechOpen.107220, September, 2022, **I.F. 0.101**
11. Safia Abidi, Sobia Salman, Faizah Mughal, Suleha Jabeen, Sumreen Mujahid, Zafar Alam Mahmood, Salman Tariq Khan, Abdul Hafeez Laghari, Aisha Nelofar and Syed Waleed Ahmed Bokhari. Estimation of volatile constituents in rose water by HS-GC-MS and studies on safety profile and cytotoxicity, *Journal of Xi'an Shiyou University* (Natural Science Edition). 18 (9): 675-689, September, 2022, **I.F. 0.26**

12. Muhammad Janees Imdad, Muhammad Naseem Khan, Hafiz Shahood Alam, Abdul Basit Khan, Zulfiqar Ali Mirani, Adnan Khan & Faraz Ahmed. Design and *in silico* analysis of mRNA vaccine construct against Salmonella, *Journal of Biomolecular Structure and Dynamics*, 12:1-17<https://doi.org/10.1080/07391102.2022.2119280>, September, 2022, **I.F. 5.235**
13. Ullah A, Mu J, Wang F, Chan MWH, Yin X, Liao Y, Mirani ZA, Hassan SS, Aslam S, Naveed M, Khan MN, Khatoon Z, Kazmi MR. Biogenic Selenium Nano particles and their Anticancer Effects Pertaining to Probiotic Bacteria- A review *Antioxidants*, 11(10), 1916<https://doi.org/10.3390/antiox11101916>, September, 2022, **I.F. 7.675**
14. Haris Ahmed, ErumZahir, Muhammad Asif Asghar, Clay-Iron Nanocomposite for the Removal of Sulfur as Toxic Pollutant from Fuel by Catalytic Oxidative Desulfurization, *International Journal of Economic and Environmental Geology (IJEE)*, 13 (2) 27-34, September 2022, **I.F 0.187**
15. Ahmed F, Mirani ZA, Ahmed A, Urooj S, Khan FZ, Siddiqui A, Khan MN, Ullah A, Khan AB & Zhao Y. Nanotubes Formation in *P. Aeruginosa*, *Cells*, Volume 11, Page-3374. <https://doi.org/10.3390/cells11213374>, October, 2022, **I.F: 7.666**
16. Muhammad Asif Asghar, Farman Ahmed, Mehwish Kamal, Sadia Khan, Muhammad Arif Asghar, Effectiveness of citrus fruit peel as a biosorbent for the mitigation of aflatoxins *invitroFood Addit Contam Part A*, Page-1-15.[doi: 10.1080/19440049.2022.2132300](https://doi.org/10.1080/19440049.2022.2132300)., October, 2022, **I.F.3.549**
17. **Usama Ayub Yousufzai, Aqeel Ahmed Khan, Syeda Dania, Aiman Siraj, Mariam Dildar**Wireless transmission of solar panel energy with the help of mutual induction, *SigmaJournal of Engineering and Natural Sciences*Web page info: <https://sigma.yildiz.edu.tr> DOI: 10.14744/sigma.2022.00000 November, 2022, **I.F. 0.6**
18. Nadir Buksh, Suraiya Jabeen, Akhtar Shareef Organic refuse-derived fuel (ORDF) is an alternative fuel for the Pakistan's domestic use in the post –COVID-19 green recovery. *Journal of Biodiversity and Environmental Sciences*Vol. 21, No. 4, p. 101-108, ISSN: 2220-6663Online published December, 2022
19. Uzma Asghar Rashid, Shahid Bhutto, Nusrat Jalbani, Fahmida Perveen, Sarwat Ismail, Farzana Nazir. Health Risk and Metal Contamination Assessment in Orange (*Citrus Aurantium*) of Pakistan: a Multivariate Study, *Biological Trace Element Research*, Published Online December, 2022,**I.F. 3.9**
20. Aijaz Panhwar, Aftab Kandhro, Shafqat Ali, Saima Imad, Nusrat Jalbani, Kamran Ahmed, Mansoor Iqbal, Sofia Qaisar, Iftikhar Pechuho, Determination of heavy metal and physicochemical parameters in textile finished products, *Transactions on Science and Technology*, Vol. 9, No. 4, December, 2022, **I.F. 0.724**
21. Aijaz Ali Panhwar, Impact of Climate change on global water resources, quality and challenges for sustainable development goals, *Turkish Journal of Agriculture-Food Science and Technology*

(6thInternational Anatolian Agriculture, Food, Environment and Biology Congress, Pg 150-156 December, 2022, **I.F. 1.1**

22. Abdullah, Islam Uddin, Uzma Rashid, Aijaz Panhwar, Tehseen Aslam, Aftab Kandharo, Fozia Hussain, Razia Kulsoom, Muhammad Afzal, Assessment of ground water quality in Faisalabad and Sargodha Punjab Pakistan, *Pakistan Journal of Analytical and Environmental chemistry* 23:2, December, 2022, **I.F. 0.6**
23. Dr. Nighat Sultana, Tehmina Sohail, Hina Imran, Dr. Syed Rafay Yaqeen and Dr. Shazia Syed Evaluation of Central and Peripheral Analgesic activity of Ficus Palmata leaves in animal *World Journal of Pharmacy and Pharmaceutical Sciences*, Volume 12(1,117-127) Impact factor 7.632 December, 2022, **I.F. 3.337**
24. Dur-e-shahwar Sattar, Thira Mohsin Ali, Umed Ali Somro, Abid Husnain Functional, antioxidant, and sensory properties of a ready-to-eat wheat snack incorporated with germinated legume flour, *Legume Science*, <https://doi.org/10.1002/leg3.174> December, 2022, **I.F. 4.13**
25. Sadia Khan Mehdi Hassan Kazmi, Itrat Fatima, Abdul Malik, Farah Inamullah, Sadia Ferheen, Tanveer Abbas, Cashmirins A and B, new antifungal and urease inhibitory prenylated coumarins from *Sorbus cashmiriana*, *Brazilian Journal of Pharmaceutical Sciences*;58: e21493 January, 2023, **I.F. 1.214**
26. Ullah A, Mirani ZA, Binbin S, Wang F, Chan MWH, Aslam S, Yonghong L, Hassan N, Naveed M, Hussain S, Khatoun Z. An elucidative study of the anti-biofilm effect of selenium nanoparticles on selected biofilm producing pathogenic bacteria: A disintegrating effect of SeNP on bacteria. *Process Biochemistry*, 126(3):98-107, January, 2023, **IF: 4.9**,
27. S. Riaz, S. Nasreen, Z. Burhan, S. Shafique, S. K. Alvi, M. A. Khan, Microplastics assessment in Arabian Sea fishes: accumulation, characterization and method development, *Brazilian Journal of Biology*, vol. 84, e270694 | <https://doi.org/10.1590/1519-6984.270694>, February, 2023, **I.F.0.401**
28. Abbas SZ, Khan MN, Naqvi AZ, Kaif K, Tabassum N, Mirani ZA, Khan AB, Siddiqui A & Hussain M. Hazard Analysis Critical Control Point (HACCP) system implementation in the dairy supply chain (Karachi-Pakistan) *Journal of Food and Nutrition Research*, 11(3):244-250, March, 2023, **I.F. 1.25**
29. Heena Khawaja, Erum Zahir, Muhammad Asif Asghar and Asher Benjamin Daniel Synthesizes of graphene oxide grafted with chitosan and copper oxide nanoparticles for the removal of lambda-cyhalothrin and thiamethoxam insecticides from wastewater, *Zeitschrift für Physikalische Chemie*, Published online April 10, 2023, **I.F. 2.5**
30. Asad Ullah, Muhammad Samee Haider, Malik Wajid Hussain Chan, Sadar Aslam, Lakht –e Zehra, Omer Mukhtar Tarar, Nida Saleem, Victoria Arija. Effect of temperature on fatty acid composition in the Nile

tilapia (*Oreochromis niloticus*): A temperature dependent nutritive lipid profile. *American Oil Chem. Soc.* May 3, 2023, **I.F.2.0**.

31. Usama Ayub Yousufzai, Aqeel Ahmed Khan, Syeda Dania, Aiman Siraj, Mariam Dildar, Technical Note: Wireless transmission of solar panel energy with the help of mutual induction, *Sigma J. Eng Nat Sci* Vol. 41, No. 1, pp. 194–201, 2023, **I.F. 0.6**
32. Muhammad Salman, Wajahat Hussain Shah, Agha Asad Noor, Kauser Siddiqui, Akhter Hussain Shar, Nadir Ali Rind, Qura-tul-Ain, Piar Ali Shar, Sohail Ahmed Otho and Ali Raza, A Cross-sectional Investigation of Gastroenteritis Inflicted by Salmonella Typhi, Entamoeba histolytica and Giardia lamblia in Karachi, Pakistan, *Pakistan Journal of Medical & Health Sciences*, Vol. 17, No. 6, page 25-28, June, 2023, **I.F. 2.34**.
33. Barkat Ali Solangi, Beena Zehra, Hafiz Rub Nawaz, Uzma Nadeem, Mohammad Kashif Pervez, Mohammad Zeeshan, A technical study on the effect of hydrothermal and Dry Heat Shrinkage of different shoe upper leathers used in Pakistan, *Indonesian Journal of Chemical Studies* 2(1), P. 9-12, June, 2023

National Publications (With Impact Factor Publications)

1. Abbas SZ, Khan MN, Naqvi AZ, Tabassum N, Mirani ZA, Khan AB, Ali R. Microbiological assessment of raw milk available in the metropolitan city of Sindh, Karachi-Pakistan. *Pakistan Journal of Health Science*, 3(6):220-224, November, 2022.
2. Paras Shah, Muhammad Abid, Kousar Yasmeen, Tooba Naveed, Abdul Hakeem Shaikh, Nusrat Jabeen, Noureen Basheer, Daim Darban and Adam Khan Quality Measurements of various types of wastes and their impacts on plant growth, *PAK. J. BOT.*, 54(2): DOI: [HTTP://DX.DOI.ORG/10.30848/PJB2022-2\(37\)](http://dx.doi.org/10.30848/PJB2022-2(37)) December, 2022, **I.F. 0.97**
3. Shumaila Shamshad, Muhammad A. Versiani, Ambreen Ikram, Kousar Yasmeen, Rashid A. Khan, Najma R. Mughal, Ayaz Ahmed, Wajeeda Muzafar and Shaheen Faizi Isolation of metallic salts of cytotoxic clerodanes from medicinal plant *Polyalthia longifolia* var *Pendula* *Pak. J. Pharm. Sci.*, Vol.35, No.6 (Special), pp. 1691-1698 December, 2022, **I.F. 0.863**
4. Washed Ashore, Shumaila Naz, Muhammad Nadir, Pirzada Jamal Ahmed Siddiqui, Amir Ahmed, Muhammad Noman Syed, Munawwer Rasheed Lipophilic Constituents of the Blubber from Blue Whale, *Balaenoptera musculus*, Washed Ashore at Pakistan Coast, *Journal of Chemical Society of Pakistan*, Volume 44, No. 6, 393-407 December, 2022, **IF. 0.698**

5. Abdul Rehman, Abdul Samad Khan, Nadeem Hafeez Khokhar, Wasif Iqbal, Hina Imran, Syed Junaid Mehmood, Pushout Bond Strength of Novel Injectable Bioactive Glass Sealer in Comparison with Commercially available Sealers, *Pakistan Oral & Dental Journal*, Vol.42, No.4, January, 2023
6. Nadeem Hafeez Khokhar, Abdul Samad Khan, Abdul Rehman, Wasif Iqbal, Hina Imran, Syed Junaid Mehmood, Comparison of Tensile Strength of L-PRF and A-PRF Using LSCC Technique with Commercially available GTR Membrane, *Pakistan Oral & Dental Journal*, Vol.42, No. 4, January, 2023
7. Muhammd Shaheryar Khan, Muhammad Sohail, Syed Junaid Mehmood, Indigenous development of NBR + PVC Rubber blend for Aviation Industry Baluchistan, *Journal of Engineering and Applied Sciences*, Volume 4, No 2, 200-204, January, 2023, **I.F. 0.118**.
8. Chandio AD, Shaikh AA, Channa IA, Bacha MS, Bhatti J, Khan MY, Bhutto S., Synthesis of Graphene Oxide (GO) by Modified Hummer's Method with Improved Oxidation through Ozone Treatment. *Journal of the Chemical Society of Pakistan*, 14;45(1):1. February, 2023, **I.F. 0.698**
9. Tehmina Sohail, Rashid Ali Khan, Hina Imran, Ghulam Fareed, Shazia Yasmeen, Development and Evaluation of Antimicrobial Polyherbal Gel Formulation for the Treatment of various Skin Infections. *Journal of Pharmacy and Pharmaceutical Sciences*; Vol. 10 (3), February, 2023, **I.F. 3.337**
10. Nargis Tabassum, Arfa Akram, Azizuddin, Ateka Ahmed, Muhammad Naseem Khan, Rashid Ali Khan, Iffat Azeem and Mehwish Furrugh The *in vitro* study of interaction between antacids and anti-diabetic drug sitagliptin in the treatment of type II diabetes. *Pak. J. Pharm. Sci.*, Vol.36, No.2, pp.373-378 March, 2023 **I.F: 0.8**
11. Jaffar hussain, Zeenat M. Ali, Syed Ferman Ali Shah, Abdul Nasir Laghari, Munazza Sohail Production of Bio-Diesel from Jatropha Oil in Pakistan: current trends and challenges *Journal of Innovative Sciences*, issue 1, volume 9, pp 106-110 May, 2023.

Patents Obtained:

1. An Herbal Ointment Composition for Wounds Healing, Dr. Zehra Yaqeen, Dr. Aisha Nelofar, Dr. Tehmina Sohail, Dr. Salman Tariq Khan, Dr. Hina Imran, Dr. Abdul Hafeez Laghari, 144016, 08-09-2022
2. New technique for starch-fatty acid complexes formation through high-speed homogenization under ambient conditions, Nasir mehmood khan, Ferman Ali Khan, Shujaat Ahmad, Mohammad Asif Nawaz, Zia Ullah and Sofia Qaisar, 144023, 21-09-2022
3. A process for the production of Laxative Syrup, Dr. Nighat Sultana, Mehmood ul Hasan, 52/2017, 19th Sep. 2022

Products ready for Commercialization

- A process for Development of the Reinforced Thermal Insulation Composite Material
- A process for formulation of Thermal Sensitive Medical Grade Gel
- A process for Development of Herbal medicated mouthwash
- A process for Development of Liquid Mineral recipe for R.O. Process Water for Drinking water
- A process for Development of Making Herbs Tribulus in Powder form (Extraction and Drying)
- A process for extraction of garlic oleoresin
- A process for Development of Milk Quality Check (Strips for milk adulteration testing)
- A process for Development of Mosquito Repellent Lotion (Herbal Based)
- A Process Developed for Electro Polymer Formulation
- A Process developed for Lab. scale production of Ammonium Acetate
- A Process developed for Lab. Scale production of Chromium Copper Sulphate
- A Process developed for Lab. scale production of Potassium Citrate
- A Process developed for Lab. scale production of Sodium Tartarate
- A Process Developed for the Extraction of Bioactive Compound Curcumin from Turmeric.
- A Process Developed for the formulation of Steel Polish
- A process for Development of citric acid from food waste on lab scale.

Equipment Developed:

- 1) Development of Water Purification Plant
- 2) Digital pH meter
- 3) Digital Portable pH meter
- 4) Testing & Training Bench for PLC (Programmable Logic Controller)
- 5) Development of Testing Apparatus for “Vehicle Lights Intensity measurement for various angles”
- 6) Development of Training Apparatus for “Thermal Conductivity Measurement”
- 7) Digital conductivity Meter

Exhibition / Conferences / Seminars Organized:

- 1) “Food Safety: Our National Responsibility” A provincial Seminar jointly organized by Sindh Food Authority, National Alliance for Safe Food, Global Alliance for Improved Nutrition (GAIN) and PCSIR-KLC in the Lecture Hall of PCSIR-KLC.

- 2) “Diabetes Awareness Program” Tabros Pharma and PCSIR arranged a health Awareness Session at PCSIR Laboratories Complex Karachi. Dr. Nanik Ram (Associate Professor Aga Khan Hospital) was invited to deliver a seminar on topic “**Diabetes**”. The scientists and engineers were invited to attend this valuable talk. The session was very informative and ended with a fruitful discussion. This activity is organized by Seminar Workshop Committee and Medical Department PCSIR.
- 3) “Environment sustainability through modern dispensing Technology” PCSIR Seminar Committee successfully organized Seminar at lecture hall Speaker Mr. Salman Tahir CEO Davam Life

MoU / ToR Signed:

1. “Development of Recipes Based on Analytical Technical Report of Tested Florae and Fauna of Tharparkar” A ToRs signed between PCSIR Laboratories Complex, Karachi and NGO Deutsche Welthungerhilfe (WHH). Director General, Director (P&D), Dr. Farman Ahmed, Dr. Omer Mukhtar, Dr. Samee Haider and Mr. Mehtab Ahmed attended the ToRs signing ceremony with the Guests Mr. Imran Khan, Logistic Coordinator & Mr. Sarwan Baloch, Program Manager from NGO Deutsche Welthungerhilfe (WHH) at Committee room of KLC. 20th July, 2022
2. A ToRs signed between PCSIR Karachi and M/s. Target Scientific Laboratory (Pvt.) Ltd. on 13 10. 2022 for Co-operation and collaboration in analytical testing and development of human resources.
3. A ToRs signed between PCSIR Labs. Complex Karachi and M/s. Hamdard Laboratories (Waqf) Pakistan Karachi on 25-11-2022, regarding “Co-Operation and Collaboration in R&D activities, studies & testing”
4. A ToRs signed between PCSIR Labs. Complex Karachi and M/s. Ahnaaf Enterprises, Karachi on 30-12-2022 for Grant of Non-Exclusive process relating to developing and transferring vitamin AD₃E and Carminative Mixture for veterinary use.
5. A ToRs signed between PCSIR Labs. Complex Karachi and M/s. Agrogen Corporation, Karachi on 23-12-2022 for Grant of Non-Exclusive process relating to developing / vetting and transferring BOP, NP, TSP, Sulphur WDG and 90% SSP fertilizer processes.
6. A ToRs signed between PCSIR Labs. Complex Karachi and M/s. Dollar Industries (Private) Limited, D-85, Sindh Industrial Trading Estate, Karachi on 05-04-2023 regarding Collaboration in R&D activities.
7. A ToRs signed between PCSIR Labs. Complex Karachi and NED University of Engineering and Technology, Karachi on 06.04.2023 regarding Cooperation and collaboration in Academic and Research & Development.

8. A ToRs signed between PCSIR Labs. Complex Karachi and M/s. Ahnaaf Enterprises, Karachi on 07-04-2023 regarding Grant of Non-Exclusive process relating to improving/ vetting and Transferring Poultry Feed, Cattle Feed and Culture Feed Processes
9. A ToRs signed between PCSIR Labs. Complex Karachi and. Iqra University, Karachi on 21-06-2023 relating to “Collaboration in R&D activities and development of human resources”
10. A ToRs signed between PCSIR Labs. Complex Karachi and Nazeer Hussain University, Karachi on 26-06-2023 relating to “Collaboration in R&D activities, information technology & sciences and development of human resources”

Workshop Training Organized:

- 1) Mechanical Testing of Composite Materials
- 2) Physico-mechanical Testing of GIC (Glass Ionomer Cement) Material
- 3) Training on Fluoride Estimation
- 4) Training on Biofloc Fish Farming
- 5) Training on Aqua Culture
- 6) Training on Chemical Analysis Chromite Ore
- 7) One Day Training Workshop on
- 8) Industrial Application of Chromatographic Techniques: GC & HPLC
- 9) Internal Audit of Quality Control Laboratory ISO 17025 Standard
- 10) One Day Awareness Training on ISO 17025 Standard
- 11) Physico-mechanical Testing of GIC (Glass Ionomer Cement) Material
- 12) Training on Biofloc Fish Farming
- 13) On-site training on microbiological methods for food analysis.
- 14) Training on Use, Care & Maintenance of Atomic Absorption
- 15) Training on Measurement of Uncertainty
- 16) Training for Drinking Water Analysis
- 17) Training of Lab Staff on Testing

Product Development:

Products Developed under PSDP Project entitled “Cultivation & Processing of Medicinal & Industrial Cannabis on Experimental Fields and Establishment of Testing and Product Development Facilities” at PCSIR Labs Complex Karachi.

- Extraction of Fiber from Stem and Twigs of Hemp Plant:
- Extraction of Cannabis Seed Oil
- Cannabis Seed Oil Enriched Bath Scrub Developed at KLC:
- Cannabis Seed Oil Enriched Face Wash Developed at KLC:
- Cannabis Seed Oil Enriched Shampoo Developed at KLC:
- Cannabis Seed Oil Enriched Face Cream Developed at KLC:
- Analgesic Gel/cream Researched & Developed at KLC:
- Hemp Seed Milk
- 100% Hemp Protein Powder
- Hemp Protein Energy Bar
- Hemp Muesli

HERBAL MEDICATED PRODUCTS:

1. *Anti-diabetic Capsules: Rectolax Powder*
2. *Herbal Analgesic Oil: Topical Analgesic Cream & ointment for Pain Relief*

PERSONAL CARE PRODUCTS

1. *Herbal Face Scrub*
 2. *Herbal Face & Body Wash*
 3. *Lens-Care*
 4. *Mosquito Repellent Solution*
 5. *Prickly Heat Lotion (Medicated)*
 6. *Ultrasound Gel*
 7. *Artificial Saliva*
- ✓ Fast and long lasting relief from dry mouth
 - ✓ Limit loss of water
 - ✓ Restore natural viscoelasticity of oral mucosa
 - ✓ Stimulate natural saliva production

ENZYME BASED PRODUCTS

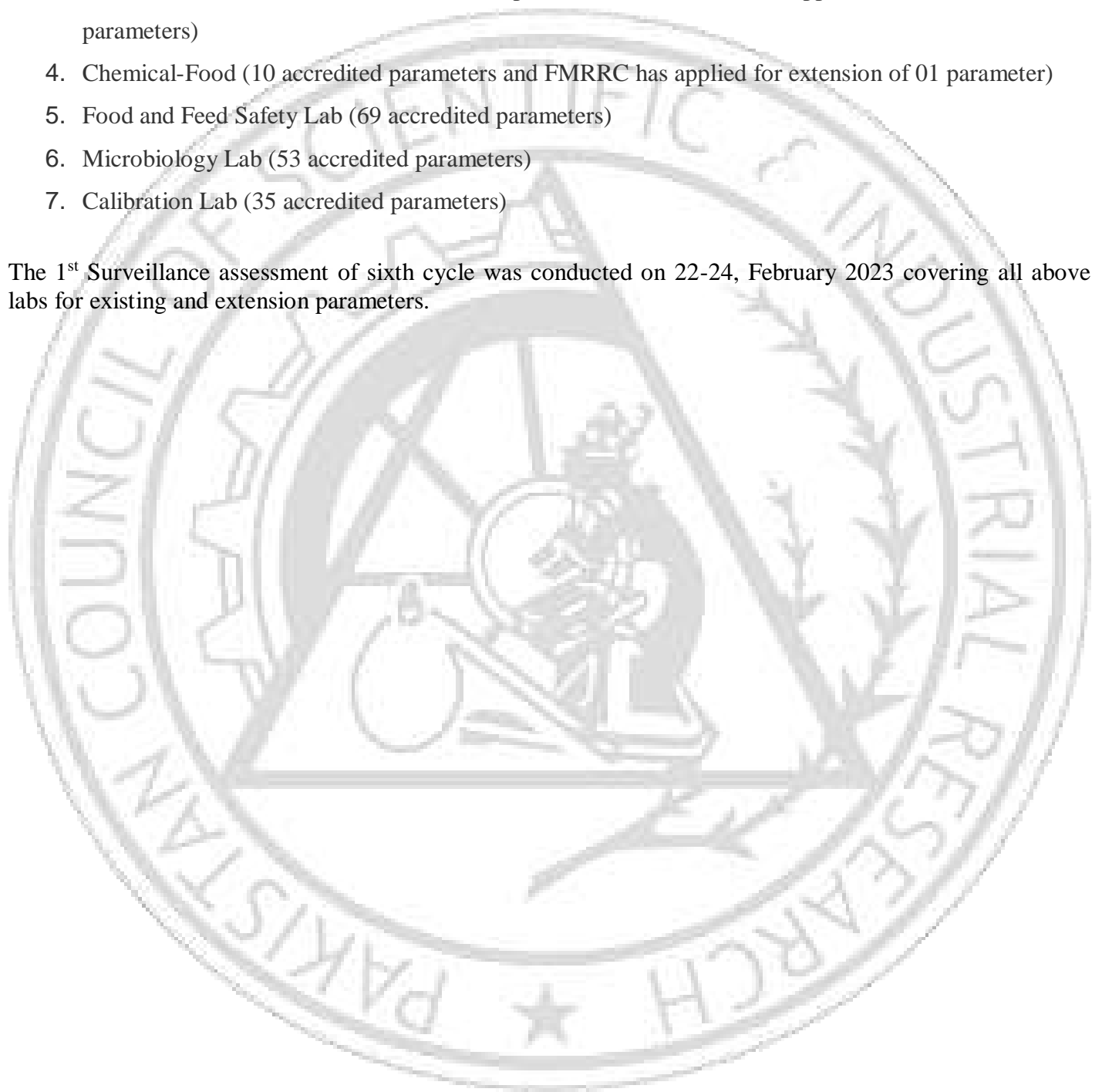
1. *Phytase (for better growth of animals)*

ISO 17025 Activities

The PCSIR Laboratories Complex, Karachi was awarded Accreditation by **PNAC** on 30-01-2004 under Lab Code 002. Following Laboratories are accredited:

1. Chemical-Environment (424 accredited parameters, covering heavy metals, pesticides, drinking water, waste water, etc)
2. Textile Lab (12 accredited parameters and ACRC has applied for extension of 02 parameters)
3. Chemical-Pharmaceutical (20 accredited parameters and PRC has applied for extension of 10 parameters)
4. Chemical-Food (10 accredited parameters and FMRRC has applied for extension of 01 parameter)
5. Food and Feed Safety Lab (69 accredited parameters)
6. Microbiology Lab (53 accredited parameters)
7. Calibration Lab (35 accredited parameters)

The 1st Surveillance assessment of sixth cycle was conducted on 22-24, February 2023 covering all above labs for existing and extension parameters.



PCSIR LABORATORIES COMPLEX, LAHORE

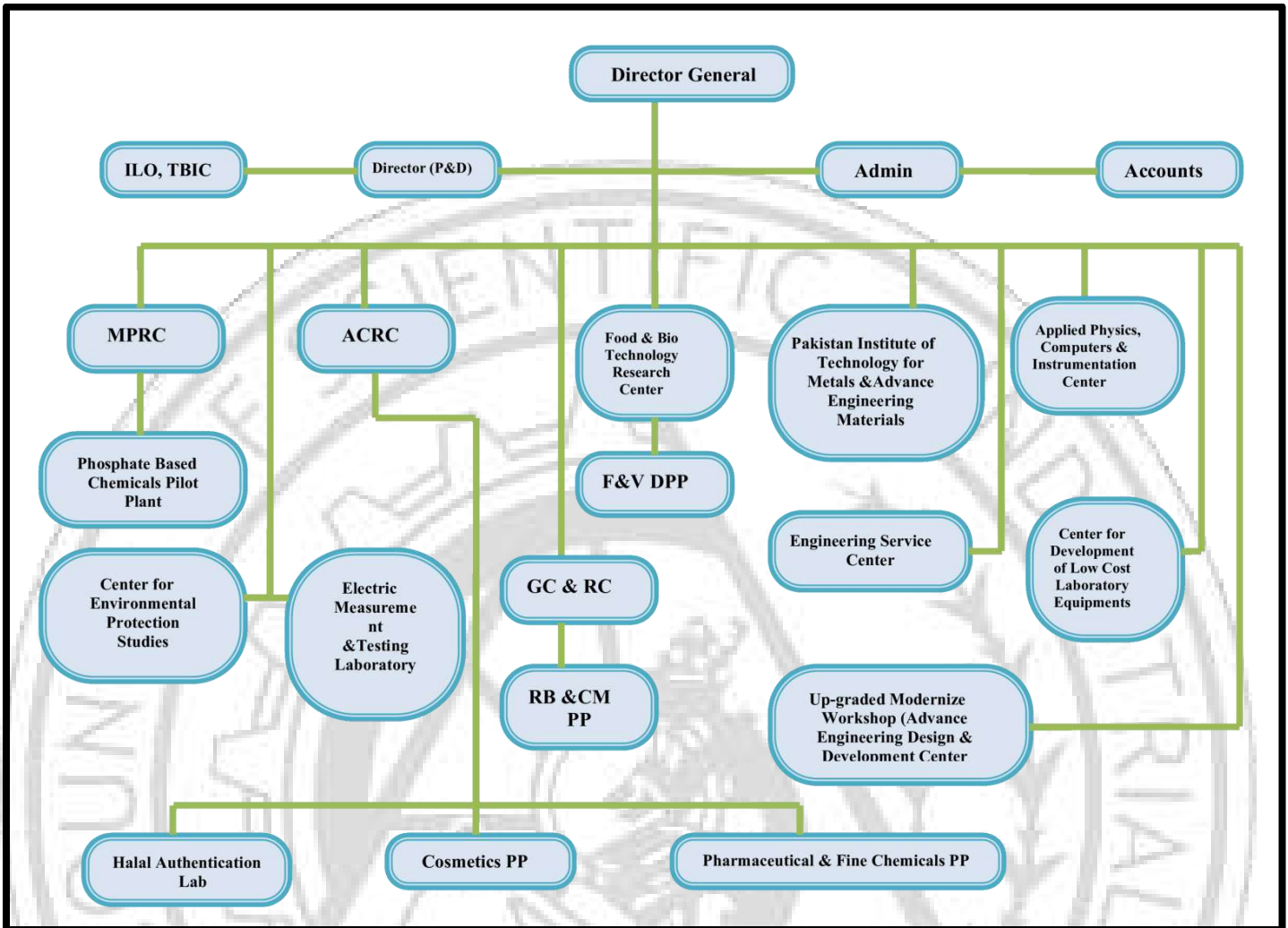
Pakistan Council of Scientific & Industrial Research (PCSIR) Laboratories Complex, Lahore (LLC) comprises of **11** research Centres. These Centres are rendering services to local industry and other organizations in diversified fields, such as:

Applied Chemistry Research Centre (ACRC), Applied, Physics Computers &

Instrumentation Centre(APC&IC), Centre for Development of Laboratory Equipment (CDLE), Centre for Environmental Protection Studies (CEPS), Electrical Measurement and Test Laboratory (EMTL),Engineering Services Center(ESC), Upgraded Modernized Workshop (UMW), Food & Biotechnology Research Centre (FBRC), Glass & Ceramics Research Centre (GCRC), Minerals Processing Research Centre (MPRC), Pakistan Institute of Technology for Minerals & Advanced Engineering Materials (PITMAEM). These Centres are not only engaged in indigenous technology development, provision of Testing and Quality Assurance Services but also effectively contributing to the Human Resource Development (HRD) through its Precision System Training Centre (PSTC). PCSIR and by providing research guidance to the B.S / M.Sc., M.S / M.Phil. and Ph.D. students from the Academic Institutions.



ORGANIZATIONAL CHART



Processes Leased Out:

- Temperature Rise & FS of Flow Voltage CT's
- Quality evaluation of Lucky Cement for Hospital construction.
- Validation for Fire rated Doors as per PFA 252 & UL10C
- Preparation of all-purpose Puree
- Shelf life study of Fruit Cake & Cup Cake
- Process Validation and verification of Hydrostatic testing of metallic cylinders as per ISO 9809-1 & 9809-3

- Shampoo
- Hair Oil
- Ripening Chemical
- Quality Evaluation of Cement
- Optimization of Heat treatment cycles of Balance Arm Brackets for Strategic Applications
- Process for Enhancement of Impact Strength of Alloy Steel (Zn32MgMnMo) for Strategic Applications
- Quality Evaluation of Cement
- Brake Oil
- High energy pellet from RDF
- Waste water analytical techniques
- Estimation of Suspension load.
- Conductivity Standard 1413uS/Cm used for Calibration.
- Quality Evaluations of lucky OP Cement
- Quality Evaluations of SR Cement Lucky brand
- Quality Evaluation of wash basin for export
- Extraction of Gold by Leaching from Gilgit Baltistan Indus River Sand Concentrate
- Process Development for Shelf Life of Beef Steak (Frozen)
- Process Development for Shelf Life of Potato Chips
- Chicken flavor Powder
- Egg white powder with dextrose
- Technical Evaluation and Validation of Malik Adulteration Testing Kit (MATK)
- Assessment of nutritional profiling of bakery and confectionary products
- Raw Materials and Additives Evaluation for Glass Manufactures
- Quality Evaluation of Cement
- Hair Holding Spray
- Evaluation of Impurities Di-ethylene Glycol & Ethylene Glycol
- Beauty Cream
- Determination of Pollution load of Waste Water and Paint Waste Samples.
- Serum & Body Lotion
- Quantification of Diethylene Glycol & Ethylene Glycol Impurities
- Shelf Life of Toffee

- Shelf Life of Bakery products (Almond Rusk & Macrons Cookies)
- Isolation of Antioxidants from Buckwheat
- Hydraulic Pressure Test of Seamless Pipe
- Dissolution Performance Verification of Tablets
- Evaluation of Temperature Rise, Primary & Secondary resistances
- Baby Feeder Cleaner
- Sanitary ware Cleaner
- Feasibility evaluation of water for process use.
- Molding & Reshaping of Gum Arabica
- Kitchen Oil Degreaser Cleaner
- Herbal Products (Blossom Rose Water, Hair Topical Solution & Hair Keratin Shampoo)
- Thermal Characterization of Castable Refectory
- RDF Formulation
- Sewage Waste Water Treatment
- Determination of Temperature Rise and DC Resistance of Transformer
- Extraction of Natural Sweetener from Stevia Leaves
- Total Dye Contents of Food Colors Corrected for Sample Dried at 105+1 °C for 2 hrs
- Sewage Waste Water Treatment
- Milk Adulteration Test Kit
- Guava Powder
- Quality Evaluation of Three Different Clays for Use in Ceramic Industry
- Quality of Fauji Cement
- Quality of Cement and Sands for Export
- Vehicle Prototype in Jumbolon
- Blowing Agent, Dinitroso Pentamethylene Tetramine (DNPT)
- Cleaning Chemicals for Milking Equipment
- Quality evaluation of Bestway Cement
- Quality control and vitamin profiling of snacks
- Washing, drying and Magnetic iron free turmeric production
- Detection of aflatoxins in wheat samples
- Process leased out on Milk Quality Assurance
- Process Validation for LPG Composite Cylinders as per ISO 11119-3 standard

- Sewage Waste Water Treatment
- Quality Performance of Kohat Cement
- Sewage Waste Water Treatment
- Chemical Evaluation of CAF, Jointing Sheets
- Sewage Waste Water Treatment
- Porcelain tiles characterization for use in commercial building

International Publication:

- Yousafi, Q., Bibi, S., Saleem, S., Hussain, A., Hasan, M.M., Tufail, M., Qandeel, A., Khan, M.S., Mazhar, S., Yousaf, M. and Moustafa, M. (2022). Identification of novel and safe fungicidal molecules against fusarium oxysporum from plant essential oils: In vitro and computational approaches. *BioMed Research International*, 2022. ID 5347224.
- Batool, S.S., Gilani, S.R., Zainab, S.S., Harrison, W.T., Tahir, M.N., Haider, M.S., Syed, Q., Mazhar, S. and Shoaib, M. (2022). Synthesis, crystal structure, thermal studies, and antimicrobial activity of benzene-1, 4-dicarboxylate-copper (II) based coordination polymer incorporating N, N, N', N'-tetramethylethylenediamine. *Journal of Coordination Chemistry*, 75(9-10), 1341-1351.
- Sarwar, A., Al-Dalali, S., Aziz, T., Yang, Z., Ud Din, J., Khan, A.A., Daudzai, Z., Syed, Q., Nelofer, R., Qazi, N.U. and Jian, Z. (2022). Effect of chilled storage on antioxidant capacities and volatile flavors of synbiotic yogurt made with probiotic yeast *Saccharomyces boulardii* CNCM I-745 in combination with inulin. *Journal of Fungi*, 8(7), 713.
- Shafiq, M., Qadir, A., Hussain, N., Firdous, S., Naeem, M., & Ahmad, S. R. (2022). Appraisal of Acute Oral LD 50 of Flonicamid and Ameliorative Effects of Selected Vitamins on Hepato Toxicity of Exposed Rabbits. *Polish Journal of Environmental Studies*, 31(5).
- Saeed, M. K., Zahra, N., Abidi, S. H. I., & Syed, Q. U. A. (2022). Phytochemical Screening and DPPH Free Radical Scavenging Activity of Aloe vera (*Aloe barbadensis miller*) Powder. *International Journal of Food Science and Agriculture*, 6(3), 301-308
- Zahra, N., Naeem, N., Butt, A. I., Saeed, M. K., Akram, J., & Gulzar, E. (2022). Determination of Aflatoxins in Different Varieties of Chillies Collected from Lahore, Pakistan.
- Naeem Abbas, Naqi Hussain, Muhammad Umar Farooq Gohar, Farhat Zaheer and Muhammad Hamza. Potential applications of indigenous bacterial consortium for the treatment of textile effluents and condition optimization by RSM technique, *Chemistry International*.

- Muafia Shafiq, Abdul Qadir, Naqi Hussain, Shamma Firdous, Muhammad Naem, Sajid Rashid Ahmad, Appraisal of acute oral LD50 of Flonicamid and Ameliorative effect of selected vitamins on hepatotoxicity of exposed Rabbits, *Pol. J. Environ. Stud*, 31 (5), 1-8, 2022
- Ullah, N., Rehman, M.U., Sarwar, A., Nadeem, M., Nelofer, R., Shakir, H.A., Irfan, M., Idrees, M., Naz, S., Nabi, G. and Shah, S., 2022. Purification, characterization, and application of alkaline protease enzyme from a locally isolated *Bacillus cereus* strain. *Fermentation*, 8(11), 628.
- Hafiza, J., Saima, N., Ammara, Y., Shumaila, U., Fouzia, N., Ijaz, A. (2022). Utilization of vegetables as a source of dietary fiber in conventional product, *MOJ Food Processing & Technology*, 10(1):16–20.
- Qamar, S., Karim, S., Aslam, S., Jahangeer, M., Nelofer, R., Nadeem, A.A., Qamar, S.A., Jesionowski, T. and Bilal, M. (2022). Alginate-based bio-nanohybrids with unique properties for biomedical applications. *Starch-Stärke*, ID 2200100. DOI: 10.1002/star.202200100.
- Muafia, S., Fariha, P., Sana, Maira, B., Hiba, I., Hudat, P. (2022). Exorbitant use of electronic cigarette and vaping device by adolescent and how it influences their health, *PharmacologyOnline*, 126-138.
- Zahra, N., Saeed, M. K., & Raza, M. H. (2023). Nitrosamines: Incredibly unsafe contaminants in different food commodities. *Chemistry International*, 9(1), 27-36.
- Rehana, B., Ama, A., Mehmooda, M., Shaista, J., Hafsa, W., Rafia, M., Saba, H., Farzana, B., Shamma, F. (2023). Anti-*Ustilago Tritici* potential of aqueous extracts of selected plant species against loose smut of wheat, *Journal of Xi'an Shiyou University, Natural Sciences Edition*, 66(2).
- Rasheed, S., Amin, A., Sarwar, A., Saleem, H. G. M., & Hassan, A. (2023). Evaluation of Antimicrobial Effect of Silver Nanoparticle Based Whey Emulsions and Edible Films for the Extension of Shelf Life of Fruits and Vegetables. *Current Microbiology*, 80(5), 158.
- Anwar, S., Saleem, A., Razzaq, A., Nasir, M.A., Hussain, A., Tariq, M.R., Ali, S.W., Intisar, A., Safdar, W., Umer, Z. and Basharat, Z. (2023). Nutritional probing and storage stability of papaya jam supplemented with date pit powder. *Heliyon*, *Heliyon*, 9 (2023), e15912, 1-12.
- Saeed, M. K., Zahra, N., Saeed, A., Shahzad, K., Nawaz, S., Abidi, S. H. I., & Syed, Q. (2023). Antimicrobial and antioxidant properties of water and methanolic extract of *G. glabra* native to Pakistan. *Chemistry International*, 9(2), 61-67.
- Asma Saeed, Shabana Kauser, Farooq U., Investigation of the Role of Extracellular Polymeric Substances (Eps) In Binding of Heavy Metals with *Microcystis Itchthyoblabe*, published in abstract book of the international scientific conference “Science, Technology and Innovation in The Period of the Revival of the New Epoch of the Powerful State” organized by Academy of Sciences of Turkmenistan held on June 12-13, 2023 at Ashgabat, Turkmenistan.

- Naseem, Z., Muhammad K. S., Abidi, S.H.I., Syed, Q.A., Saba, I., Jami A.R. (2023). Table Olives: A Nutritional Approach to Health, *Journal of Nutrition and Food Processing*, 6(4), 1-7.
- Rashid, A. A., Saeed, S., Ahmad, I., Shehzad, K., Nawaz, S., & Inayat, S. (2023). Development of ricotta cheese from concentrated buffalo cheese whey by optimization of processing conditions using RSM. *Journal of Food Measurement and Characterization*, 1-8.
- Gazala Majeed, Naeem Abbas, Naila Ali, Farah Deeba, Javeed Iqbal, M Tahir Butt, Novel low-cost biosorbent for Phenol adsorption and its optimization through Response surface method, *International Journal of Environment and Waste Management IJEWM-96185*
- Dr. Phool Shahzadi, Determination of Aflatoxins Contamination in Corn, *Journal Advances of Nutrition Science and Technology*.
- Zahid Mehmood, Preparation and characterization of Coal Fly Ash Based Zeolite Composite Material, *MineralsManuscript id # 1955184*
- Dr. Fadia Shaheen, Dr. Khalid Javed, Microstructural transformations and grain growth in alumina nanoprecursors, *Journal of Chemistry and Material research*.
- Zahid Mahmood, Samreen Zahra, Adsorption Studies of hexavalent Chromium Ions (Cr) on the dead biomass of *Cystoceria indicia*, *Europium Journal of Chemistry*, Vol.13, Page 451-59, 2022
- Samreen Zahra, Zahid Mahmood, Farah Deeba, Asma Shaikh, Hamim Bukhari and Hiba Mehtab, Modification of coconut shell charcoal for metal removal from aqueous solution, *Europium Journal of Chemistry*, 13(3) (2022);259-266.
- Dr. Phool Shahzadi, Dr. Bakht Bahadur Rana, Mrs. Razia Kalsoom, Mr. Akhtar Shahnaz, Coatings on different substrates for Multifunctional purposes, *J. Springer Nature*
- Samreen Zahra, Hamim Bukhari, Athar Amin, Synthesis of nanosize Zinc Oxide through aqueous sol-gel route in polyol medium, *BMC Chemistry* 16:104
- Samreen Zahra, Waneza Shahid, Bushra Kanwal, Polyol-mediated synthesis of nickel oxide nanoparticles through aqueous sol-gel route, *BMC Chemistry* 16:105
- Khadija Summia, Roheela, Yasmeen, Naseem Zahra, Detection of aflatoxins B1 from layer and broiler feed samples collected from different cities of Punjab, Pakistan (**Abstract Published**), *Abstract Book of Current and Innovative Trends in Applied Biosciences (CITABS)*
- Dr. Irfan Hafeez, Surface Modification of Mesoporous Silica nanoparticles with hexamethyl disilazane as Smart carrier for Tocopherol Acetate, *Journal of Nano Biomedicine and Engineering*.

- Noman Javid, Saquib Jalil, Rubina Munir, M. Zia-ur-Rehman, Amna Sahar, Sara Arshad & Jamshed Iqbal, 2,1-Benzothiazine – (quinolin/thiophen) yl hydrazone frameworks as new monoamine oxidase inhibitory agents; synthesis, in vitro and in silico investigation, RSC Advances, 13, 1701–1710, 2023.
- Zafar Iqbal, Mubeen Akhtar, Muhammad Usman Sabri, Moen ud din, Comparative studies of used and fresh lubrication oil, European Journal of Applied Sciences, 10 (6), 25, 2022.
- Noman Habib, Waseem Akram, Shahid Adeel, Nimra Amin, Mozghan Hosseinnezhad & Ehsan ul Haq, Environmental –friendly extraction of Peepal (Ficus Religiosa) bark- based reddish brown tannin natural dye for silk coloration, Environmental Science and Pollution Research, 29, 35048–35060, 2022.
- Ghulam Mustafa, Muhammad Zia ur Rehman, Sajjad Hussain Sumra, Muhammad Ashfaq, Warda Zafar, Maryam Ashfaq, A Critical review on recent trends on pharmaceutical applications of pyrazolne endowed derivatives, Journal of Molecular Structure Vol, 1262 Pages 133044.
- S. Qamar, S. KARim, S. Aslam, M. Jahangeer, R. Neolofer, A.A Nadeem, S.A Qamar, T. Jesionowski, M. Bilal, Alginate-Based Bio Nanohybrids with Unique Properties for Biomedical Applications, Starch-Starke 2200100, DOI: 10. 1002/star.202200100.
- Sakhawat, S. Siddique, Z. Ali, Z. Perveen, H. Rehman, H. Massey, Fatty Acid and Fat Contents of wild and farmed pigeon meat, Pakistan Journal of Science 75(1).
- M. Ghazanfar, M. Irfan, M. Nadeem, H.A Shakir, M. Khan, I. Ahmad, S. Saeed, L. Chen and M. Irfan, Bioethanol Production Optimization from KOH pretreated Bombax ceiba using Saccharomyces cerevisiae through response surface methology, Fermentation, 2022. 8, 148
- Muniba Shafique, Abdul Rehman Niazi, Muhammad Imran, Muhammad Zaheer, Extrapolating Qualitative Mycochemical Profiling and Therapeutic Potential of Two Mycorrhizal Amanita Species (Agaricomycetes) from Pakistan, International Journal Med Mushrooms, 2023;25(4):55-63.
- M. Naveed, Syeda Izma Makhdoom, Farzana Bashir, Traiq Aziz, zero valent Iron Nano Particles Biosynthesis using Nigella Sativa Seeds tincture and identification of carcinogenic metals in industrial effluent via net generation Bioremediation approach with Mathematical interpretation, Molecules, ISSN 1420-3049
- Muhammad Aril' Bhatti, Uzma Zafar, Ansar Mehmood, Rashid Mehmood, and Saqib Nasir, The beneficiation study on a low-grade fluorite ore of landi kotal. Khyber Pakhtunkhwa Province, Pakistan Bangladesh J. of Scientific & Industrial Research, Dhaka.
- Muhammad Usama Shabbir, Shahid Adeel, Tanveer Hussain Bokhari, Muhammad Usman, Muhammad Kaleem Khosa, Tanvir Ahmad & Asma Inayat, Eco-friendly Acid dyeing of silk and wool fabrics using acid violet 49 dye, Environmental Science & Pollution Research; 30: 9808-9818

- Naeem Abbas, Muhammad Irfan, Muhammad Hammad Khan and Ayesha, evaluating key parameters for developing a sustainable solid waste management plan in Lahore-China scheme, Chemistry International
- M. A. Bhatti, U. Zafar, A. Mehmood, R. Mehmood and S. Nasir, Potential of low-grade fluorite ore of Landi Kotal, Khyber Pakhtunkhwa Province, Pakistan, Bangladesh J. Sci. Ind. Res. 58 (2), 107-118, 2023.
- Shafaq Mubarak, Irum Shahzadi, Ariba, Naqi, Apple peels as a Potential adsorbent for removal of Cu and Cr from waste water, Aqua, Water Infrastructure, Ecosystems and Society, 72 (6), 914–929, 2023.
- Sana Riaz, Sania Mazhar, Syed Husain Abidi, Quratulain Syed, Naaz Abbas, Yasar Saleem, Abad Ali Nadeem, Maria Maryam, Ramsha Essa and Saira Ashfaq, (2022), “Bio-butanol Production from Sustainable Biomass Process of Anaerobic ABE Fermentation for Industrial Applications”, Archives of Microbiology, 204.672, <https://doi.org/10.1007/s00203-022-03284-z>
- Syeda Shahzadi Batool, Rubina Gilani, Syeda Sakina Zainab, William T.A. Harrison, M. Nawaz Tahir, M. Salman Haider, Quratulain Syed, Sania Mazhar, M. Shoaib, 75(9-10):1341-1351 (2022), “Synthesis, crystal structure, thermal studies and antimicrobial activity of benzene 1,4 dicarboxylate copper (II) based coordination polymer incorporating N,N, N', N'tetramethylethylenediamine”, Journal of coordination chemistry, <https://doi.org/10.1080/00958972.2022.2101364>
- Samreen Zahra, Sania Mazhar, Sarwat Zahra, Hira Idrees and Ali Hussnain, (2022), “Synthesis and characterization of magnesium doped titania for photocatalytic degradation of methyl red”, Journal of Matéria (Rio J.) 27 (01): ISSN: 1517-7076, DOI: <https://doi.org/10.1590/1517-7076-RMAT-2021-44880>
- S. Qamar, S. Karim, S. Aslam, M. Jahangeer, Rubina. Nelofer, A. A. Nadeem, S. A. Qamar, T. Jesionowski, and M. Bilal. 2022. Alginate-Based Bio-Nanohybrids with Unique Properties for Biomedical Applications. In Starch – Stärke.2200100. DOI: 10.1002/star.202200100.
- N. Ullah, M. Rehman, A. Sarwar, Muhammad. Nadeem, Rubina. Nelofer, H. A. Shakir, M. Irfan, M. Idrees, S. S. Naz, G. Nabi S. Shah, T. Aziz, M. Alharbi, A. Alshammari and F. Alqahtani. (2022). Purification, characterization and application of alkaline protease enzyme from locally isolated *Bacillus cereus* strain. Fermentation. 8(11):628.
- S. Mahmood, M. G. Shahid, M. Nadeem, R. Nelofer and M. Irfan. Kuwait J Sci. Kuwait January 2023 Enhanced phytase production by *Aspergillus niger* mutants in solid state fermentation. J. Sci., Vol.50, No.(1A)pp (1-14)DOI: 10.48129/kjs.15995.

National Publication:

- Saeed, M. K., Zahra, N., Shahadat, N., Shahzadi, K., Abdi, S. H. I., & Syed, Q. (2022). Extraction of poppy seed (*Papaver somniferum* L.) oil and its antioxidant activity by DPPH Assay. *Lahore Garrison University Journal of Life Sciences*, 6(02), 95-106.
- Zahra, N., Imran, A., Saeed, M. K., Arif, K., Syed, Q., & Abdi, S. H. I. (2022). Edible Cutlery: A Sustainable Alternative to Plastic Cutlery for a Better Future. *Lahore Garrison University Journal of Life Sciences*, 6(02), 124-132.
- Essa, R., Abbas, N., Mazhar, S., Riaz, S., Ashfaq, S., Nadeem, A.A., Perveen, I., Syed, Q., Saleem, Y., Abidi, S.H. and Javed, T. (2022). Analysis of Antibiotic Resistant Gene from Microbial Isolates of Chlorinated Water. *Pakistan Journal of Medical & Health Sciences*, 16(10), 144-144.
- Saeed, M. K., Zahra, N., Saeed, A., Abidi, S. H. I., & Syed, Q. (2022). *Syzygium Cumini* L. Seed A Potent Source of Fiber, Protein and Natural Antioxidants. *Lahore Garrison University Journal of Life Sciences*, 6(03), 252-267.
- Farzana, B., Yumna, S., Iqra, N., Romana, S., Rubina, N., Muhammad, T., Application of Artificial Neural Network Technique for the Production of Biotoxin from the Locally Isolated Strain of *Bacillus thuringiensis* Bt. used as Biotoxin against Dengue Vector, (2022), *Journal of Chemical Society of Pakistan*, 44(6), 540.
- Sana, R., Naaz, A., Sania, M., Ishrat, P., Saira, A., Ramsha, E., Yasar, S., Quratulain S., Syed, H.A. (2022). Cancer Mechanism, Molecular Targets and Chemotherapeutic, Phytochemical: Review, *Journal of Molecular Biology and Molecular Genetics*, 3(3): 20-30.
- Mahnoor, R., Fouzia, Q., Mateen, A., Naseem, Z. (2022). Determination and detoxification of aflatoxin in cereal samples collected from different areas of Lahore, *Pakistan Journal of Science*, 74(4), 295-302.
- Faizullah, K., Shahid, M., Muhammad, A., Asma, S., Alim, N. (2023). Nutritional evaluation of quince fruit of Baltistan region and development of value-added products, *Advances in Food Technology and Nutritional Sciences*, 9(1): 1-5.
- Muhammad, K.S., Naseem, Z., Asma, S., and Quratulain, S. (2023). Physicochemical Characteristics, Total Phenolic Content and Free Radical Scavenging Activity of Apple (*Malus Domestica*) Peel Powder, *Pakistan Biomedical Journal*, 6(2), 7-11.
- Shahid, M., Alim, N., Phool, S., Fatima, S., Adil, H., Hamood, R., Faizullah, K., Kulsoom, R. (2023). Production Sources and Potential application of Alkaline Water, *Pakistan Journal of Chemistry* 13(1-2) 30-36.

- Ullah, N., Mujaddad-ur-Rehman, M., Sarwar, A., Nadeem, M., Nelofer, R., Irfan, M., Idrees, M., Ali, U., Naz, S. and Aziz, T. (2023). Effect of bioprocess parameters on alkaline protease production by locally isolated *Bacillus cereus* AUST-7 using tannery waste in submerged fermentation. *Biomass Conversion and Biorefinery*, 1-11.
- Mazhar, S., Abbas, N., Saleem, Y., Syed, Q., Riaz, S., Essa, R., Bukhari, B., Ashfaq, S., Perveen, I. and Abidi, S.H. (2023). Development of Indigenous Alkaline Phosphatase Kit for the Detection of Milk Quality: Detection of Milk Quality. *Pakistan BioMedical Journal*, 6(5), 15-18.
- Zahra, N., Raza, M. H., Hafeez, F., Saeed, M. K., Khan, S. A., Saeed, A., & Shahzad, K. (2023). Impact of Aflatoxins Exposure on Human Health and its Management Strategies. *Lahore Garrison University Journal of Life Sciences*, 7(02), 156-172.
- Naseem, Z., Muhammad K.S, Eisha, A., Ayesha, N., Hassan, R., Asma, S. (2023). Exploring the world of raspberry: cultivation, classification, nutritional benefits, and versatile applications, *Innovare Journal of Agricultural Sciences*, 11(4), 1-4.
- Farha, D., Rubina, N., Muhammad, I. (2023). Isolation, Identification, and Screening of Keratinase Producing Bacteria from Soil and Production Optimization Using Feather Waste as Substrate, *Punjab University Journal of Zoology*, 38(1): 109-118.
- Filza Zafar Khan, Development of Air Quality and Brick Kilns During the Onset of Covid-19: An Analysis, *Biological & Clinical Sciences Research Journal* 2022:122
- Dr. Khalid, Jawwad Rabbani, Dr. Tahir Butt, Effect of Low Cost Adsorbents with Enzyme for reduction of Pulp and Paper Waste load, *Pakistan Journal of Scientific*, P J S vol.# 74, 2022
- Naeem Abbas, Gazala Majeed, Farah Deebe, M Tahir Butt, M. Irfan and Javed Iqbal, Removal of Chromium VI from Aqueous solution using modified Bentonite Clay and its application on Tanneries waste water, *PJSIR Series a Physical Sciences* 2022 65 A (3)- 282-289 poppy seed
- Muhammad Khalid Saeed, Naseem Zahra, Asma Saeed, Ijaz Ahmad, Syed Hussain Imam Abidi and Quratulain Syed, Awareness of aflatoxins, their consequences and ways of mitigation, Abstract Published Proceedings of International Conference on interdisciplinary Research Innovations at UAF, 24-26, Oct. 2022.
- Iqbal Zahid Hussain, Muhammad Rafiq Khan, Farzana Bashir, Isolation, Characterization and Identification of Specis Toxic to Dengue Vector, *PJSIR, Section B, Vol 65 (3)*, pp 246-259, 2022.
- Farzana Bashir, Yumna Sadaf, Iqra Nadeem, Romana Shehzadi, Application of Artificial Neutral Network Technique for The Production of Biotxin from The Locally Isolated Strain of *Bacillus thuringiensis Bt*. Used as Biotxin against Dengue Vector, *Journal of Chemical Society of Pakistan*, Vol. 44(6), pp 568-575

- Naeem Abbas, Ayesha, Javed Iqbal, Nadia Jamil, Naqi Hussain, Aqeel Abbas, Farah Deeba, Treatability study of Phenol by *Dracaena sanderiana* using based activated carbon from synthetic aqueous solutions, PJSIR, Section A, Phy. Sci in 2023-24
- Farzana Habib, Sumaira Nosheen, Engr. Waqas Iqbal, Engr. Muhammad Irfan, Engr. Badaruddin Soomro, Engr. Muhammad Adnan Arshad, Investigating the Effect of Sintering Temperature on Hydroxyapatite for Biological Applications, Pakistan Journal of Scientific & Industrial Research
- M. Ghazanfar, M. Nadeem, H.A Shakir, M. Khan, I. Ahmad, M. Franco, L. Chen and M. Irfan, Valorization of *Bombax ceiba* Waste into Bioethanol Production through Separate Hydrolysis and Fermentation and Simultaneous Saccharification and Fermentation, Fermentation, 8, 386.
- Tehreem Iqbal, Hammad Khan and Fauzia Qammar, Animal Blood Utilization For Biomethane Production Through Pretreatment At Lab Scale, Pakistan Journal of Science, vol.74 No. 4 December 2022
- Ayesha Nisar, A Masood, Shamma Firdous, Alim un Nisa, Muafia Shafiq and H. Mobeen, Phytochemical analysis of seven medicinal plants and evaluation of antioxidant and antidiabetic activity, 4th Pakistan Conference of Zoology.
- Irfan Hafeez, Physicochemical and Mineral Contents of Honey from Different Districts of Balochistan, Pakistan, Published in Online Journal of Animal and Plant Sciences (JAPS), <http://doi.Org/10.36899/JAPS.2023.4.0692>
- Dr. Asma Saeed, Mrs. Shabana Kauser, Dr. Asma Sheikh, Eng. M. Azam, Magnetic Iron Free Turmeric Powder: A Chelation Therapy Medicine, a research paper entitled “Magnetic Iron Free Turmeric Powder: A Chelation Therapy Medicine” published in abstract book of 2nd international conference on “Trends and Research in Chemistry (TRIC-2023)” organized by Department of Chemistry, Division of Science and Technology, University of Education, Lahore on May 16-18, 2023.

- Ramsha Essa, Naaz Abbas, Sania Mazhar, Sana Riaz, Saira Ashfaq, Abad Ali Nadeem, Ishrat Perveen, Quratulain Syed, Yasar Saleem, Syed Hussain Abidi, Tariq Javed, (2022) “Analysis of antibiotic resistance gene from microbial isolates of chlorinated water”, Pakistan Journal of Medical and Health Sciences, 16(10): 144-146 DOI: <https://doi.org/10.53350/pjmhs221610144>
- Sana Riaz, Naaz Abbas, Sania Mazhar, Ishrat Parveen, Saira Ashfaq, Rasha Essa, Yasar Saleem, Quratulain Syed, Syed Hussain Abidi, (2022) “Cancer Mechanism, Molecular Targets and Chemotherapeutic, Phytochemical: Review”, Journal of Molecular Biology & Molecular Genetics, 3(3): 21-30, DOI: <https://doi.org/10.52700/jmmg.v3i3.52>, ISSN No: 2707-6431
- Naaz Abbas, Nimra Shahbaz, Warda Sharif, Sania Mazhar, Zainab Abbas and Sakhawat Ali. (2022) “Economical production of citric acid from vegetable waste”, Journal of Science International, 34(5): 381-385, ISSN 1013-5316; CODEN: SINTE 8
- Farzana Bashir, Aysha Saleem, Khalid Iqbal Khichi, **Rubina Nelofer** and Rauf Ahmad Khan 2022. Copper Nanoparticles Embedded Rice Husk for the Removal of Bacterial Contaminants from Drinking Water. Pakistan J. Zool., pp 1-7, 2022. DOI: <https://dx.doi.org/10.17582/journal.pjz/20181009121054>.

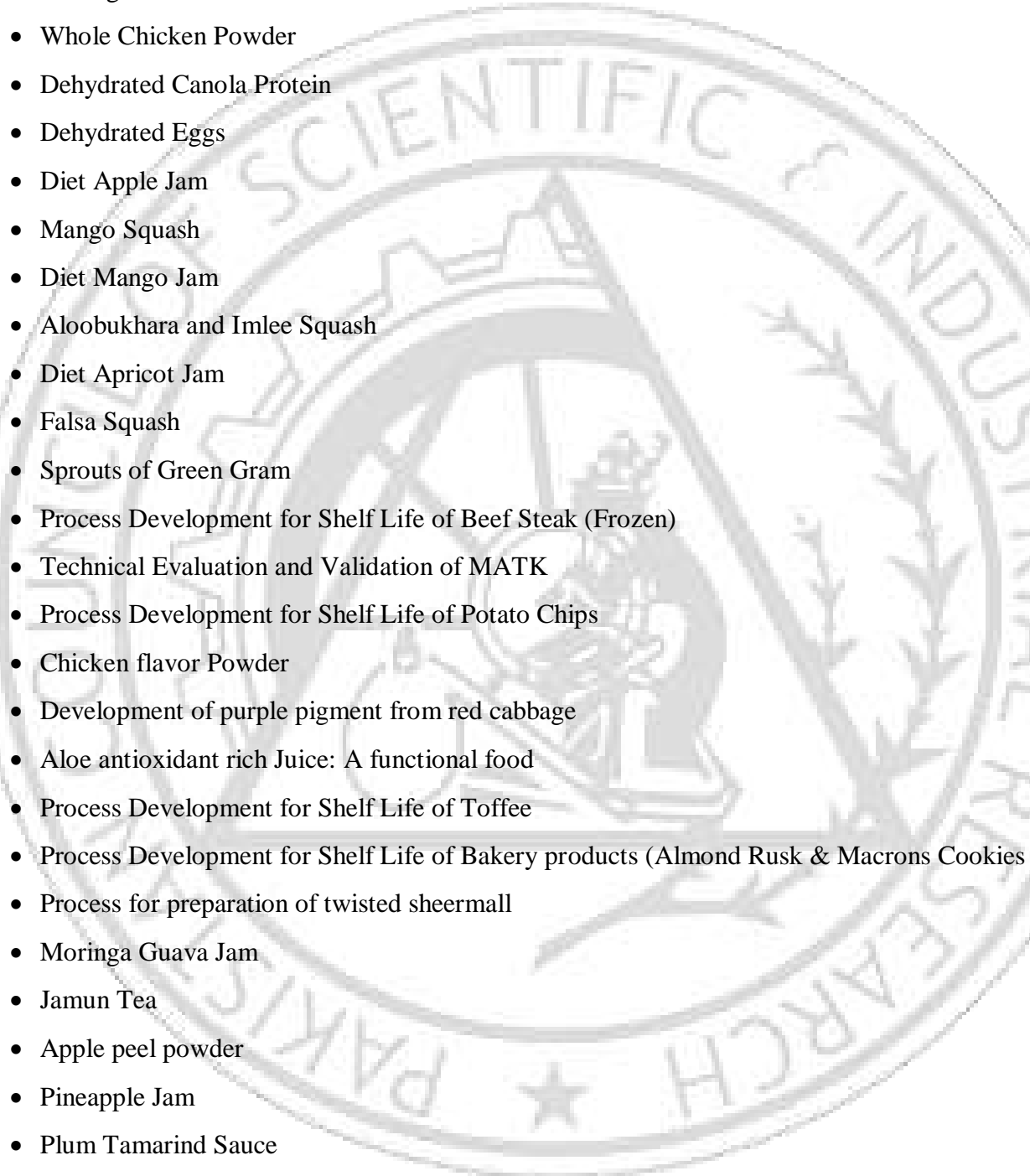
Book Published:

- Muhammad Khalid Saeed, Naseem Zahra, Moringa: A Marvel and Mystical Tree, Publisher: LAMBERT Academic Publishing, January 2023.
- BOOK Published entitled “Cell viability assays; Lab Protocols: With complete list of reagents, equations and calculations”, Sana Riaz, Naaz Abbas, Sania Mazhar, Yasar Saleem, Quratulain Seyed and Syed Hussain Abidi. Publisher Amazon USA, 2023.
- Rehana Badar, Asma, Shamma Firdous. Anti-uctilgo Tritici potential of aqueous extract of selected plant species against loose smut of wheat of Xi an Shiyou Uni. Natural Sciences Edition V.66, Issue 2/2023.
- Sana Riaz, Naaz Abbas, Sania Mazhar, Ramsha Essa, Saira Ashfaq, Yasar Saleem, Quratulain Syed “In silico anticancer phytocompound evaluation, Syed Hussain Abidi, Publisher Amazon USA, (2023)
- Sana Riaz, Sania Mazhar, Naaz Abbas, Saira Ashfaq, Ramsha Essa, Yasar Saleem, Quratulain Syed, Syed Hussain Abidi, “Cell viability assays; Lab Protocols: with complete list of reagents, equation and calculation”, Publisher Amazon USA, (2023)
- Saira Ashfaq, Sana Riaz, Ramsha Essa, Naaz Abbas, Sania Mazhar, Syed Hussain Abidi, Quratulain Syed “Recombinant production of interferon alpha 2b: Production of Interferon alpha 2b from *Bacillus subtilis*”, , Publisher Amazon USA, (2022)

- Saira Ashfaq, Naaz Abbas, Sania Mazhar, Quratulain Syed, Syed Hussain Abidi, Yasar Saleem, Sana Riaz, Ramsha Essa Polyoxometalates as a potential drug: Therapeutic potential of Polyoxometalates”, Publisher Amazon USA, (2022)

Products Ready for Commercialization:

- Haselloy coatings for wear resistyant applications by thermal spraying technique
- Nickle-Chrome coatings (Wear/Friction resistant) for Cylinder Heads of Power Generation Plant
- Aluminum based coatings (sacrificial anodic) for sub-marine environments by thermal spraying technique
- Babbit coatings for corrosion resistace in 3.5% NaCl environments by thermal spraying syste
- Titanium (bio-compatible) coatings for surgical implants by thermal spraying technique
- Zn-Mg-HA alloy based tools by powder metallurgy technique for biomedical application
- Zg₃₂MnMo High Strength Low Alloy (HSLA) Steel for Manufacturing of Armored Vehicle Components
- Aluminum based alloy
- Cast Iron (Special Grades)
- Copper based alloys
- Steel (Special Grades)
- Conducting Polymers
- TCO Glass Slides
- Hot Plate (upto 1000 °C) temperature
- Domestic / Industrial RDF Stove
- Rotor Stator
- Drum Filter
- Re-circularable Aquaculture System
- Process for preparation of all-purpose puree
- Development of date balls
- Development of date vinegar
- Egg pudding
- Development of date vinegar
- Strawberry Jam
- Apple Jam

- 
- Ginger lemon jam
 - Apricot jam
 - Mango chutney
 - Moringa Jaman Tea
 - Whole Chicken Powder
 - Dehydrated Canola Protein
 - Dehydrated Eggs
 - Diet Apple Jam
 - Mango Squash
 - Diet Mango Jam
 - Aloobukhara and Imlee Squash
 - Diet Apricot Jam
 - Falsa Squash
 - Sprouts of Green Gram
 - Process Development for Shelf Life of Beef Steak (Frozen)
 - Technical Evaluation and Validation of MATK
 - Process Development for Shelf Life of Potato Chips
 - Chicken flavor Powder
 - Development of purple pigment from red cabbage
 - Aloe antioxidant rich Juice: A functional food
 - Process Development for Shelf Life of Toffee
 - Process Development for Shelf Life of Bakery products (Almond Rusk & Macrons Cookies)
 - Process for preparation of twisted sheermall
 - Moringa Guava Jam
 - Jamun Tea
 - Apple peel powder
 - Pineapple Jam
 - Plum Tamarind Sauce
 - Tomato Sauce
 - Barberis Mentha Jam
 - Process for the Bbiosynthesis of Glucono Delta Lactone
 - Banana Peel Powder

- Belly Fat Burner Tea
- Seabuckthorn Nutritional supplement
- Extraction of Soda Ash from saji khar
- Development of Milk Adulteration Test Kit
- Extraction of natural sweetener from Stevia leaves
- Development of natural food grade brown dye from Jamun bark.
- Dogbisc (Pet adult Dog food new formula)
- Kattbisc (Pet adult Cat food new formula)
- Process developed for the preparation of Melon Juice
- Optimization and standardization of methods (bioburden and sterility) for surgical devices
- Olives Fortified Biscuits
- Moringa Fortified Biscuits
- Rose petal Jam
- Tomato Jam
- Baker's yeast
- Nutraceutical olives tea
- Faba bean gluten free flour
- Faba bean lactose free milk
- Preserved sugarcane juice
- Development of Process for the Ethanolic Extraction of Cannabidiols from Cannabis
- Development of Process for the Heat Reflective Wall Coating
- Development of Shaving Cream
- Development of Cannabis Shampoo
- Development of Hemp Hair Oil
- Development of Fruit Ripening Chemical
- Development of Anti-fog/ Cleansing Solution for Optical Glasses
- Development of Process for Instant Hemp Tea
- Development of Process for Hemp Ointment
- Development of Process for Hemp Moisturizing Cream
- Development of Process for Curative Cream
- Development of Process for Hemp Hand Wash
- Development of Brake Oil

- 
- Development of Anti-Corrosive Brake & Clutch System
 - Development of Metal Cutting Fluid
 - Development of solution for disinfection of the milking animals
 - Development of Cutting Oil for CMC Machines
 - Development of Process for activation of organic clay for lubricant
 - Development of Carburetor Cleaner
 - Development of Agent for Cleaning of Fungus from Water Jet Looms
 - Development of Process for Hemp Facial Wash
 - Development of Process for Hemp Seed Oil
 - Development of Hair Holding Spray
 - Development of Process for Evaluation of Impurities Di-ethylene Glycol & Ethylene Glycol
 - Development of Beauty Cream
 - Development of Process of Winterization of Cannabis Extract
 - Development of Serum & Lotion
 - Development of Diethylene Glycol & Ethylene Glycol Impurities
 - Development of Sanitary Ware Cleaner
 - Development of Dissolution Performance Verification of Medicine
 - Development of Thickener for MTT Oil
 - Development of process for the Preparation of over base Calcium Sulphonate
 - Development of Sanitary Cleaner
 - Development of Baby Feeder Cleaner
 - Development of Degreasing Solvent
 - Development of Process for dioctyl terephthalate Plasticizer
 - Development Molding & Reshaping of Gum Arabica
 - Development of Ripening Agent for Mangoes
 - Development of hot and cold gel
 - Development of Process Di-Butyl Phthalate
 - Development of fire-retardant canvas
 - Development of Kitchen Oil Degreaser Cleaner
 - Development of Herbal Products (Blossom Rose Water, Hair Topical Solution & Routh Hair Keratin Shampoo)
 - Development of Wax based Product for Marking of Animals

- Development of Process for Preparation of Cold Brew Saffron Concentrate
- Development of Blowing Agent, Dinitroso Pentamethylene Tetramine (DNPT)
- Cleaning Chemicals for Milking Equipment
- Development of Polymeric Coating (Wall Putty)
- Development of Water based White Color for Canvas Painting

Equipment Developed:

- Two Stage Orbital Shaker
- Convection & Ventilation Chamber
- Orbital Shaker
- Centrifuge
- Muffle Furnace 1200°C
- Tube Furnace 1000°C
- Centrifuge
- Heavy Duty Hot Plate
- Muffle Furnace 1000°C
- CVD tube Furnace 1000°C
- Overhead Agitator
- Ozone Generator
- Magnetic stirrer
- Bomb Calorimeter
- Electromantle Soxlet 500mg
- Drying Oven 60L
- Muffle Furnace 1000°C
- Incubator
- Water De-Ionizer
- Water Distillation Unit
- Calcination Oven
- Ramping Furnace

Exhibitions / Comferences / Seminar:

Pakistan Auto Show (2nd PAAPAM Symposium)- 29.07.2022 to 31.07.2022

Pakistan Automotive Industry (PAAPAM) has organized an Auto show-2022 in Expo Centre, Lahore. In this event auto parts manufacturing industries displayed their products/parts. PCSIR displayed a stall of technical/consultancy services being provided to local industry. Three engineers/scientists from PITMAEM were performed their duties on stall for delivering the knowledge to different industries regarding the role of PCSIR for local industry in the field of advanced engineering materials.

International Conference on Current and Innovative Trends in Applied Bio-Sciences 2022 (CITABS) 21.09.2022 to 22.09.2022

Scientists from FBRC attended and presented their work through oral and poster presentation in 2 days International conference held at Lahore Garrison University.

Development and Anical improvement of mech properties of HSL alloy being used fir Ahmed Vehicles, 12.12.2022

Focus group meeting was arranged of Engr. Farooq Iftikhar and Engr. Ahmed Raza with Mr. Bilal Iftikhar Foundry, Lahore. The purpose of meeting was to discuss the development of HSL alloy and their improvement in mechanical properties for utilization for armed vehicles.

MoU / ToR / Job Contracts Signed:

- MoU between PCSIR and M/s Friesland Campina Engro Pakistan Ltd., (FCEPL) is signed on Testing of FCEPL Products (Liquid Tea Whitener, Powder Tea Whitener, Packaged Liquid Milk, Dairy Drink, Ice-Cream & Frozen Desserts, Full Cream Milk Powder, Desi Ghee, Creams, Flavored Milk, Milk Powder Vegetable Fat Based)
- MoU between PCSIR and M/s Iqbal Rice Mills Chiniot is signed on Testing of Rice Samples
- MoU between PCSIR and M/s Atlas Food Gujranwala is signed on Testing of Rice Samples
- MoU between PCSIR and M/s Route 2 Health Lahore is signed on Testing of Raw Material / Finished Products
- MoU between PCSIR and M/s Global Pharma Islamabad is signed on Process for Evaluation of Diethylene Glycol and Ethylene Glycol Impurities
- MoU between PCSIR and M/s Atlas Food Gujranwala is signed on Testing of Rice Samples
- MoU between PCSIR and M/s Kanzo Ag Multan is signed on Analysis of X-Mate

- MoU between PCSIR and M/s Megachem Faisalabad is signed on Cytotoxicity Study (Duscoun Alo, Duplicate SRW, Dusil ME 200, Dusil HS 500, ASM 50)
- MoU between PCSIR and M/s Peddle Online Haroonabad Distt. Bahawalnagar is signed on Formulation of Shampoo and Hair Oil
- MoU between PCSIR and M/s Hasan Rice Corporation Hafizabad is signed on Testing of Rice Samples
- MoU between PCSIR and M/s Sunrice Foods (Pvt.) Ltd., Lahore is signed on Testing of Rice Samples
- MoU between PCSIR and M/s Mishal International Lahore is signed on Gum Recycling
- MoU between PCSIR and M/s Esskay Polymer (Pvt.) Ltd., 112/4 Quaid-e-Azam Industrial Estate Lahore is signed on Process of DNPT
- MoU between PCSIR and M/s Fauji Cement Co. Ltd., Attock is signed on Testing of Fauji Cement
- MoU between PCSIR and M/s Makerwal Coal Works Lahore is signed on Development of RDF formulation
- MoU between PCSIR and M/s Punjab Industrial Estates Lahore is signed on Testing of MV Cable

Workshops / Trainings Organized:

- Two days Training on Incubation Management at PCSIR Lahore Organized by Idea Gist Pakistan.
- Installation and Operational Training of Flame Photometer (made in USA), Training was given to Offices of PRI Rawalpindi
- The training was given to The University of Lahore on Watershed Analysis
- Measurement Uncertainty, Method Validation, Handling of Test Item, Interpretation of results in Toxicology, Training was imparted to the personnel from Sun Crop Pesticide Multan
- On-Desk In-Person Training of Intelligent Project Automation System (IPAS), organized by Dr. Rubina Nelofer
- PPRA Rules, at Pearl Continental, Lahore
- Basics Principal Working & Trouble Shouting, Calibration on Atomic Absorption Spectrophotometer, Spectrophotometer, Flame Photometer, pH Meter, Conductivity Meter etc
- Mr. Ehsan ul Haq, Dr. Rabia Nazir & Mr. Shahid Rehman, Given Training on Awareness ISO/IE 17025/2017 to M/s Bureaue Veritas / October 13th to 14th, 2022
- On-Site training session on Bruker Multipurpose FT-NIR analyzer, by Mr Dr. Kamal Tolba
- Training on 5 Parameters of PSQCA Standards.

- Dr. Rabia Nazir Given Training on salt to employees of M/s. Asna Group, 15-C, Small Industrial Estate, Lahore Road, Sargodha.
- Calibration & Measurement Uncertainty of Meteorological Parameters (Dimensions, Mass & Forces, Electrical Time & Frequency, Volume, Temperature & Pressure Measurements) training given to M/s Dyonks 45-A XX Block Khayaban-e-Iqbal Ph III DHA Lahore / 05th December, 2022 to 09th December, 2022
- Training on Egg Powder Dehydration was given to M/s Kint Laboratories Islamabad / 12th December, 2022
- Training on Measurement Uncertainty and Methods & Method Validation/ Verification for Transformers Manufacturers
- Training was rendered to M/s. Lorish Cosmetics (Pvt.) Ltd., Lahore regarding development and quality control of Hair Dyes. / 16 to 18 .01. 2023, PCSIR Lahore
- Application of RT-PCR (QuantStudio 5) and data analysis
- Risk Management, Uncertainty Measurement, Pressure Gauge Calibration, Dimensional Measurement, Thermal Equipment Calibration / PCSIR Lahore
- Calibration Metrology on Temperature Measurement, Mass & Force Measurement, Pressure Measurement, Uncertainty Measurement & Proficiency Testing, PCSIR Lahore, 27.03.2023 to 23.03.2023
- Three days training workshop on Halal was organized by Dr. Yasar Saleem, Dr. Naaz Abbas, Dr. Sania Mazhar and Scientific Staff of FBRC for PHA employees (35 Nos) (Presentations Physically as well as Via Zoom)4-6 April, 2023, at MoST Biling Auditorium Islamabad.
- Sample collection and handling for bio fortified wheat and wheat flour
- A presentation was given in a Three Days Online Training organized for Employees of Pakistan Halal Authority at Auditorium, MoST Building, Islamabad
- Training for Ceramic Industry, one-month training was given to M/s Ibtisam Saleem Mitti Gharh, 98 Sikandar Block, Allama Iqbal Town Lahore on Ceramic Industry
- Mrs. Sumaira Nosheen give One day ISO training was arranged in PITMAEM. This was attended by TMRs, DTMs and other related officials from different centres.
- Training imparted on ISO 17025: 2017 as per PNAC requirements.
- One days training workshop was organized by on application of Fluorescence Microscope in collaboration with HA Shah & Sons, Lahore

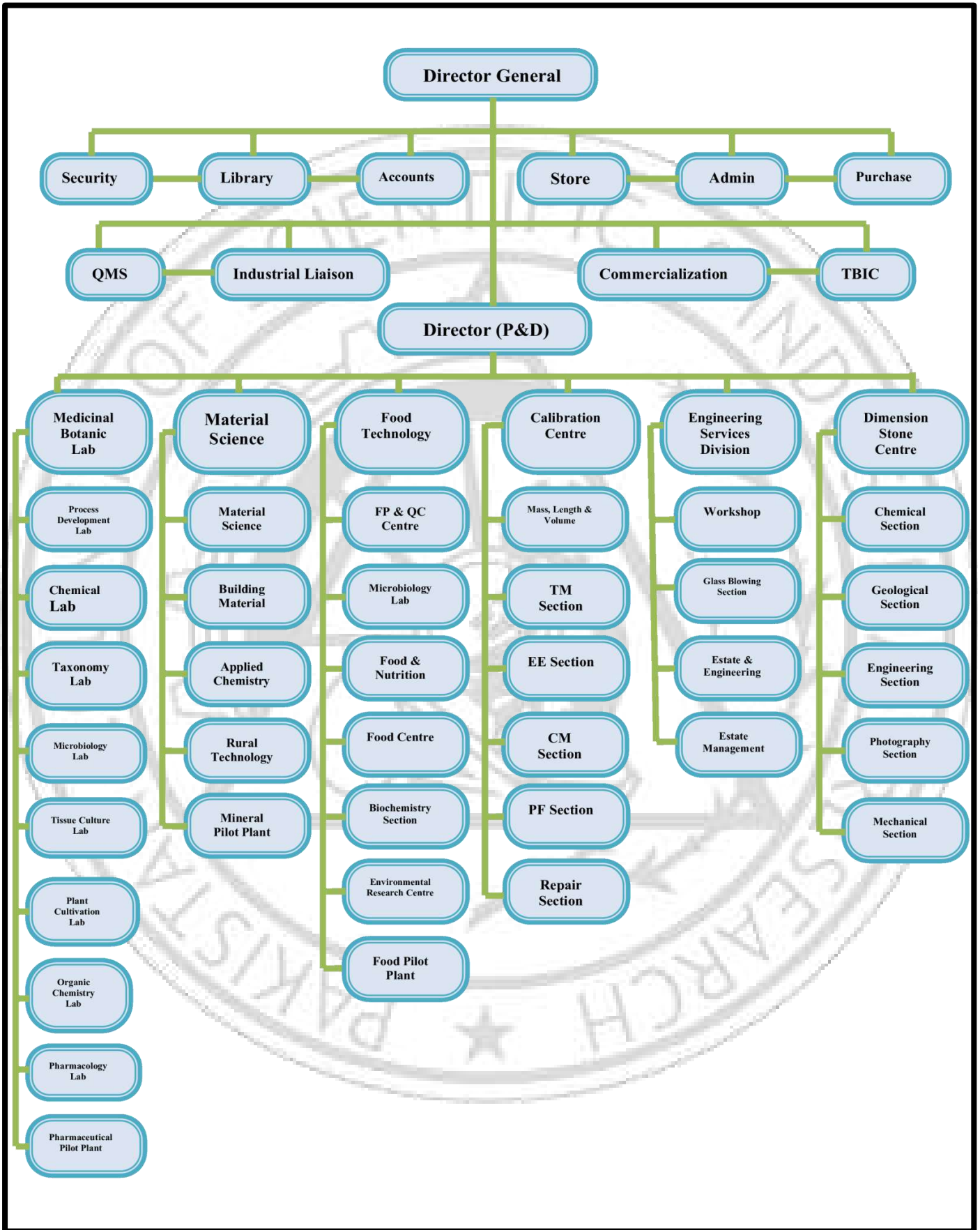
- One days training workshop on installation and application of CO₂ Incubator in collaboration with Rays Technologies, Lahore.
- One days training workshop on application of Flow Cytometer in collaboration with Dr. Sulman from UVAS, Lahore and HA Shah & Sons, Lahore.
- Training on Milk Adulteration and Kit Validation was given to M/s Directorate Animal Disease Diagnostic Reporting & Surveillance Muzaffarabad
- Training on Awareness of ISO/IEC 17025, 02 days Training rendered by Mr. Ehsan ul Haq to Employees of Pesticide Residue Laboratory, Institute of Soil Chemistry & Environmental Services, Kala Shah Kaku
- Application of Solid State Fermenter in collaboration with MedLab Services, Rawalpindi
- Training on Construction Engineering Material Quality Testing, 01-day Training rendered by Engr. Ali Imran to the Employees of Pakistan Railway Academy Walton Road Lahore

PCSIR LABORATORIES COMPLEX, PESHAWAR

PCSIR Laboratories Complex Peshawar was established in 1955 with a view to investigate raw material resources of the region and assist the industrial development of the country. The Complex comprises of six main Centres. These Centres are providing services to local industry, Government and Non-Government Organizations in diversified fields besides carrying out research for development of economical and effective indigenous raw material-based technologies. These Centres are also engaged in providing research supervision to students of almost all Government Universities of KPK in various fields of Science and Technology.



ORGANIZATIONAL CHART



Process Leased Out

- Process for the Production of Grapes Cider Vinegar by Dr. Arshad Hussain with M/s Hunter Orchards Sayed's Farms, Hazro Attock, Pakistan in June, 2023.
- Process for the synthesis of solvent yellow 2 by Mr. Amin Ur Rehman, Dr. Waheed Ur Rehman, Mr. Tahir Ali with M/S Ather Nazir Chughtai E-1, 21 Johartown Lahore on 16-6-2023.

Paper Published (International)

- Nutritionally-rich biochemical profile in essential oil of various Mentha species and their antimicrobial activities by Hina Fazal, Muhammad Akram, Nisar Ahmad, Farina Kanwal, Gohar Rehman, Irfan Ullah. (Journal) <https://doi.org/10.1007/s00709-022-01799-2> on 10.08.2022.
Fazal, H., Akram, M., Ahmad, N., Qaisar, M., Kanwal, F., Rehman, G., & Ullah, I. (2023). Nutritionally rich biochemical profile in essential oil of various Mentha species and their antimicrobial activities. *Protoplasma*, 260(2), 557-570.
- Quality Estimation and Iodine Determination of Marketed Edible Iodized Salt at Consumer Level for Better Nutrition by Qazi Muhammad Sharif, Roohul Amin, Jan Nisar, Muhammad Siddique Afridi, Sana Ullah. (Journal) *Lighthouse Journal of Natural Sciences*, Vol. 01, Issue 01, summer 2022, pp. 39-46 on July 2022.
Sharif, Q. M., Amin, R., Nisar, J., Afridi, M. S., & Ullah, S. (2022). Quality Estimation and Iodine Determination of Marketed Edible Iodized Salt at Consumer Level for Better Nutrition. *The Lighthouse Journal of Natural Sciences*, 1(01), 39-46.
- Potential antimicrobial, anti-diabetic, catalytic, antioxidant and ROS/RNS inhibitory activities of Silybum marianum mediated biosynthesized copper oxide nano particles by Iqbal, Junaid; Andleeb, Anisa; Ashraf, Hajra; Meer, Bisma; Mehmood, Azra Jan, Hasnain; Zaman, Gouhar; Nadeem, Muhammad; Drouet, Samantha; Fazal, Hina; Giglioli-Guivarc'h, Nathalie; Hano, Christophe; Abbasi, Bilal (Journal) *RSC advances*, 12(22), pp.14069-14083 in 2022.
- Iqbal, J., Andleeb, A., Ashraf, H., Meer, B., Mehmood, A., Jan, H., & Abbasi, B. H. (2022). Potential antimicrobial, antidiabetic, catalytic, antioxidant and ROS/RNS inhibitory activities of Silybum marianum mediated biosynthesized copper oxide nanoparticles. *RSC advances*, 12(22), 14069-14083.
- Technical and Financial Analysis of the Solar Energy Harnessing in Karachi by Dr. Mahmood Iqbal, Abid Karim Rabia Kaneez (Journal) *Journal of Nanoscope* ISSN(P): 2707-711X/ISSN(O):2788-7456.

- Iqbal, M., Karim, A., & Kaneez, R., (2022). A Technical and Financial Analysis of the Solar Energy Harnessing in Karachi. *JOURNAL OF NANOSCOPE (JN)*, 3(1), 47-67.
- Chemical composition and in vitro and in vivo biological assortment of fixed oil extracted from *Ficus benghalensis* L. by Muhammad Ibrahim, AbdurRauf, Naveed Muhammad, Anees Ahmed Khalil, Muhammad Akram, Qasim Aziz, Zia Ullah, Yahya S. Al Awthan, Omar Bahattab, Mohammed A. Al Duais. (Journal) *Open chemistry* 2022; 20; 583-592, July 2022.
Ibrahim, M., Rauf, A., Muhammad, N., Khalil, A. A., Akram, M., Aziz, Q., Zia Ullah, Yahya S. Al Awthan, Bahattab, O., & Al-Duais, M. A. (2022). Chemical composition and in vitro and in vivo biological assortment of fixed oil extracted from *Ficus benghalensis* L. *Open Chemistry*, 20(1), 583-592.
 - Targeted metabolomics reveals acid abundance as playing a crucial in drought-stress response post-drought recovery in Wheat by Safi Ullah, Mudassar Nawaz Khan, SalahuddinLodhi, Iftikhar Ahmed, Muhammad Tayyab, Tariq Mehmood, IsrarUd Din, Majid Khan, QuahirSohail and Muhammad Akram (Journal) *Frontiers in Genetics* Nov, 2022.
Ullah, S., Khan, M. N., Lodhi, S. S., Ahmed, I., Tayyab, M., Mehmood, T., IsrarUd Din, Khan, M., Sohail, Q., & Akram, M. (2022). Targeted metabolomics reveals fatty acid abundance adjustments as playing a crucial role in drought-stress response and post-drought recovery in wheat. *Frontiers in Genetics*, 13, 972696.
 - Evaluation of Heavy Metals in Drinking Water of Tribal Districts Ex-FATA Pakistan by Muhammad, S., Hina, F., Shah, Z. A. S., Ahmad, M. N., Ahmed, Y., Naik, N., Aiman, N., & Ahmed, K. (Journal) *Journal of Chemistry and Environment*, Dec, 2022.
Muhammad, S., Hina, F., Shah, Z. A. S., Ahmad, M. N., Ahmed, Y., Naik, N., Aiman, N., & Ahmed, K. (2022). Evaluation of Heavy Metals in Drinking Water of Tribal Districts Ex-FATA Pakistan. *Journal of Chemistry and Environment*, 1(01), 74-79.
 - In-vivo study of Cedar Wood Oil on the protective effects of hepatotoxicity, renal toxicity and hyperlipidemia by Farah Gul, Muhammad Qaiser, Farina Kanwal, Mushtaq Ahmad, NumanSalehazada, JavedBangash, YaqooburRehman (Journal) *International Journal of Biosciences*, Dec, 2022.
Gul, F., Qaiser, M., Kanwal, F., Ahmad, M., Salehazada, N., Bangash, J., & Rehman, Y. (2022). In-vivo study of Cedar Wood Oil on the protective effects of hepatotoxicity, renal toxicity and hyperlipidemia. *International Journal of Biosciences*, 21(6), 341-347.
 - Bio-Fabrication of Silver Nanoparticles Using *Melia azadirach* Leaf Extract and Its Potential as Functional Material against Foodborne Pathogens by Javid Ali, Inayaturrehman, Javed Abbas Bangash, Jehangir Shah (Journal) (Abstract Book) *International Conference on Emerging Trends in Food Safety and Nutrition* on 26-27 October 2022, page No.109.

Ali, J., Rehman, I., Bangash, J. A., & Shah, J. (2022). Bio-Fabrication of Silver Nanoparticles Using Melia azadirach Leaf Extract and Its Potential as Functional Material against Food borne Pathogens. *International Conference on Emerging Trends in Food Safety and Nutrition*, 109.

- Phytochemicals content and in-vitro antioxidant properties of Azadirachta indica seeds, leaves and twigs prepared from different extraction techniques by Ali J., Rehman I.U., Bangash J.A. (Journal) *International Journal of Engineering, Science and Technology*, Vol. 14, No. 4, pp. 12-20. doi: 10.4314/ijest.v14i4.22022.

Ali, J., Rehman, I. U., & Bangash, J. A. (2022). Phytochemicals content and in-vitro antioxidant properties of Azadirachta indica seeds, leaves and twigs prepared from different extraction techniques. *International Journal of Engineering, Science and Technology*, 14(4), 12-20.

Microbiological evaluation of different types of branded and un-branded snacks sold at elementary schools of Peshawar by Arshad Hussain, Zia-ur-Rehman Muddasar Khan (Journal) *BioScientific Review* (Accepted) by email on Jan 2023.

Hussain, A., Rahman, Z. U., & Khan, M. (2023). Microbiological Evaluation of Different Types of Branded and Non-branded Ready-to-Eat Snacks Sold in Elementary Schools of District Peshawar, Pakistan. *BioScientific Review*, 5(2), 1-9.

- Comparative bioactive compounds and fourier transform infrared spectroscopic evaluation of Azadirachta indica extracts and its potential as bio-fungicides against plant pathogenic fungi by Javid Ali, Javed Abbas Bangash, Muhammad Siddique, *International Journal of Engineering, Science and Technology* Vol. 15, No. 1, 2023, pp. 1-12.

Ali, J., Bangash, J. A., & Siddique, M. (2023). Comparative bioactive compounds and fourier transform infrared spectroscopic evaluation of Azadirachta indica extracts and its potential as bio-fungicides against plant pathogenic fungi. *International Journal of Engineering, Science and Technology*, 15(1), 1-12.

- Exfoliation Characteristics of Swat Vermiculite Clay & its application in the Preparation of Lightweight Composite Panels by Dr. Waheed Ur Rehman, Amin Ur Rehman, Qazi M. Sharif, Asma Yamin, *Construction and Building Materials*, Volume 336, 22-02-2023.

Rehman, W. U., Rehman, A. U., Sharif, Q. M., & Yamin, A. (2023). Exfoliation characteristics of Swat vermiculite clay and its application in the preparation of lightweight composite panels. *Construction and Building Materials*, 366, 130200.

- Synthesis and deicing Performance of Calcium Magnesium Acetate by Asma Yamin Waheed Ur Rehman, Amin Ur Rahman, Ibrar Ahmad, Siddiq Afridi, *Journal of Chemical Technology and Metallurgy* February Accepted.

- Yamin, A., Rehman, W. U., Rehman, A. U., Ahmad, I., & Afridi, S. (2023). Synthesis and deicing Performance of Calcium Magnesium Acetate. *Chemical Technology and Metallurgy*.
- Mineralogical and Beneficiation Studies of Copper Ore of Chaghi Baluchistan by Waheed-Ur-Rehman, Amin-Ur-Rehman International Conference on Minerals and Ores Processing in Pakistan March 15th-17th, 2023
Rehman, W. U., & Rehman, A. U. (2023, March 15th-17th). Mineralogical and Beneficiation Studies of Copper Ore of Chaghi Baluchistan. *International Conference on Minerals and Ores Processing in Pakistan*.
 - Detailed Characterization of Saponins isolated from *Zygophyllum Propinqueem Decne* by Muhammad Qaisar, Farina Kanwal, Muhammad Siddique, Muhammad Akram, Humaira Inayat, Farah Gul, Yaqoobur Rehman, Shazma Anwar, Rifat Naza, Syed Murtaza Hussain, Mushtaq Ahmad, International Journal of Biosciences January 2023, Vol: 22, No.1, p. 70-76, 2023
Qaisar, M., Kanwal, F., Siddique, M., Akram, M., Inayat, H., Gul, F., Rehman, Y., Anwar, S., Naza, R., Hussain, S. M., & Ahmad, M. (2023). Detailed Characterization of Saponins isolated from *Zygophyllum Propinqueem Decne*. *International Journal of Biosciences*, 22(1), 70-76.
 - Impacts of heat shock on productivity and quality of *Triticum aestivum* L. at different growth stages by Goher, R., M. Hiba, Alkharabsheh, M.F. Suleiman, A. André, Diatta, H. Gitari, O. Daniel, Wasonga, G.R. Khan, M. Akmal Not Bot Horti Agrobo. 51(1): 13090. March 2023.
GOHER, R., ALKHARABSHEH, H. M., HIBA, M., SELEIMAN, M. F., DIATTA, A. A., GITARI, H., WASONGA, D.O., KHAN, G.R., & AKMAL, M. (2023). Impacts of heat shock on productivity and quality of *Triticum aestivum* L. at different growth stages. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, 51(1), 13090-13090.
 - Grain Quality, Biochemical Traits, and Internal Water Status of Chinese Elite Wheat Lines by Sowing Interval in Semiarid Conditions by Khan, B., M.M. Anjum, N. Ali, M. Ullah and G.R. Khan *Gesunde Pflanzen*. <https://doi.org/10.1007/s10343-022-00806-z> March 2023.
Khan, B., Anjum, M. M., Ali, N., Ullah, M., & Khan, G. R. (2023). Grain quality, biochemical traits, and internal water status of Chinese elite wheat lines by sowing interval in semiarid conditions. *Gesunde Pflanzen*, 1-12.
 - Comparative bioactive compounds and Fourier Transform Infrared Spectroscopic evaluation of *Azadirachta* extract and its potential as Biofungicides against plant pathogenic fungi by Javid Ali, Javid Abbas Bangash, Muhammad Siddique, International Journal of Engineering Science and Technology Vol.15 No1 2023, pp.1-12 March 2023.

Ali, J., Bangash, J. A., & Siddique, M. (2023). Comparative bioactive compounds and fourier transform infrared spectroscopic evaluation of *Azadirachta indica* extracts and its potential as bio-fungicides against plant pathogenic fungi. *International Journal of Engineering, Science and Technology*, 15(1), 1-12.

- In-vitro evaluation of phytochemicals, heavy metals and antimicrobial activities of leaf, stem and roots extracts of *calthapalustris* var. Alba, by Syed Wajid Ali Shah, Muhammad Siddique Afridi, Mujaddad Ur Rehman, A\zam Hayat, AbidSarwar, Tariq Aziz, MetabAlharbi. *Journal of the Chilean Chemical Society*. Vol 68 No 1 (2023)

Shah, S. W. A., Siddique Afridi, M., Ur-Rehman, M., Hayat, A., Sarwar, A., Aziz, T., & Alasmari, A. F. (2023). In-vitro evaluation of phytochemicals, heavy metals and antimicrobial activities of leaf, stem and roots extracts of *Caltha palustris* var. alba. *Journal of the Chilean Chemical Society*, 68(1), 5807-5812.

- Development of Low-value Fishery Items into High value Fishery Products by N. Sultana, A. J. Afridi, Z. Khatoon, M. Qaisar, M. Akram, R. Naz, F. Naz, and S. Anwar *Chronicle of Aquatic Science* Volume 1, Issue 1 ARTICLE ID: CoAS_VIIS1_10 TYPE: Review PUBLISHED: 27 June 2023 ISSUE:

Sultana, N., Afridi, A. J., Khatoon, Z., Qaisar, M., Akram, M., Naz, R., Naz, F., & Anwar, S. (2023). Development of Low-value Fishery Items into High value Fishery Products. *Chronicle of Aquatic Science*, 1(1).

- Heavy metalloids contamination, pollution quantification, and health risk assessment along with coal mines in the Hangu and Kurram Districts, Northwest Pakistan by Din, I. U., Muhammad, S., *Environmental Science and Pollution Research*, (<https://www.researchsquare.com/article/rs-2471132/v1>). April, 2023.

Din, I. U., & Muhammad, S. (2023). Heavy metal(loid)s contamination, pollution quantification, and health risk assessment along with coal mines in the Hangu and Kurram Districts, Northwest Pakistan. *Environmental Science and Pollution Research*

- Comparative bioactive compounds and fourier transform infrared spectroscopic evaluation of *Azadirachta indica* extracts and its potential as bio-fungicides against plant pathogenic fungi by Javid Ali, Javed Abbas Bangash, Muhammad Siddique *International Journal of Engineering, Science and Technology* Vol. 15, No. 1, 2023, pp. 1-12.

Ali, J., Bangash, J. A., & Siddique, M. (2023). Comparative bioactive compounds and fourier transform infrared spectroscopic evaluation of *Azadirachta indica* extracts and its potential as bio-fungicides against plant pathogenic fungi. *International Journal of Engineering, Science and Technology*, 15(1), 1-12.

- Comparative bioactive compounds and antifungal potential evaluation of Menthalongifolia (L.) Hudson (Lamiaceae) extracts against plant pathogenic fungi by Javid Ali and Javed Abbas, International Journal of Engineering, Science and Technology Vol. 15, No. 2, 2023, pp. 48-57.

Ali, J., & Abbas, J. (2023). Comparative bioactive compounds and antifungal potential evaluation of Mentha longifolia (L.) Hudson (Lamiaceae) extracts against plant pathogenic fungi. *International Journal of Engineering, Science and Technology*, 15(2), 48-57.

Paper Published (National)

- Quality Estimation and Iodine Determination of Marketed Edible Iodized Salt at Consumer Level for Better Nutrition by Mr. Qazi M. SharifMr. Muhammad Siddiq Afridi (Journal) The lighthouse journal of natural sciences, Vol. 01, Issue 01, 2022, pp. 39-46.

Sharif, Q. M., Amin, R., Nisar, J., Afridi, M. S., & Ullah, S. (2022). Quality Estimation and Iodine Determination of Marketed Edible Iodized Salt at Consumer Level for Better Nutrition. *The Lighthouse Journal of Natural Sciences*, 1(01), 39-46.

- Antibacterial and Antifungal Activities of Garlic (*Allium sativum*) against Common Pathogens by ZiaurRahman, ZobiaAfsheenArshadHussain, Muddasir Khan (Journal) Vol 4, No. 2,2663-4201, 2022.

Rahman, Z., Afsheen, Z., Hussain, A., & Khan, M. (2022). Antibacterial and antifungal activities of garlic (*Allium sativum*) against common pathogens. *Bioscientific Review*, 4(2), 30-40.

- Evaluation of microbial load in drinking water from different areas of Peshawar by ArshadHussain, Zia-ur-Rehman, Slamalman. Journal of the Pure and Applied Biology. Vol: 12, No. 1, 316 – 325, 2023(Online published).

Hussain, A., & Zia ur Rahman, S. I. (2023). 28. Evaluation of microbial load in drinking water from different areas of Peshawar. *Pure and Applied Biology (PAB)*, 12(1), 316-325.

- Synthesis and characterization of new composite for dental restoration- An in vitro study by Dr. MahmoodIqbalSohail Noor (Journal) Pakistan Journal of Science andIndustrial research. FebruaryAccepted

Noor, M.I.S. (2023). Synthesis and characterization of new composite for dental restoration- An in vitro study. *Pakistan Journal of Science and Industrial research*

- Temperature-Properties Relationships of Martensitic stainless steel for improved utilization in surgical tools by Engr. Noor Faraz Khan Mr. Muhammad Bilal AfzalProceeding of the Pakistan Academy of Sciences: Physical and Computational Sciences

Khan, N. F., Afzal, M. B., (2023). Temperature-Properties Relationships of Martensitic Stainless Steel for Improved Utilization in Surgical Tools. *Proceedings of the Pakistan Academy of Sciences: A. Physical and Computational Sciences*, 60(1), 15-21.

- Water Analysis collected from different areas of Charsadda Distt. KPK for microbial risk assessment and different constituents in water bodies by Qazi M. Sharif, Tauheed Ullah, Rohul Amin (Journal) *The Lighthouse Journal of Natural Sciences* winter 2022-2023 Vol: 01 Issue 02, 35-38.
- Ullah, T., Sharif, Q. M., & Amin, R. (2022). Water Analysis Collected from Different Areas of Charsadda District Khyber Pakhtunkhwa (Pakistan) for Microbial Risk Assessment and Different Constituents in Water Bodies. *The Lighthouse Journal of Natural Sciences*, 1(02), 35-48.

Patents Obtained:

- “A Process for Biosynthesis of Silver Nanoparticles from Seabuckthorn Leaves” by Dr. Bashir Ahmad; Dr. Javid Ali; Dr. Jehan Bakht; Dr. Shumaila Rauf and Dr. Abdul Naeem Pakistan. Patent application No. 143723.
- Process for the production of high purity food grade calcium carbonate from marble waste by Mr. Sohail Noor, Mr. Amin Ur Rehman, Dr. Mehmood Iqbal, Dr. Waheed Ur Rehman. Patent application No. 574/20.

Technical Report:

- Production of Single Super Phosphate (SSP) From Rock Phosphate Ore of Abbotabad, KP by Dr. Waheed Ur Rehman, Amin Ur Rehman, Asma Yamin.
- Production of Calcium Nitrate from marble waste powder by Dr. Waheed Ur Rehman, Amin Ur Rehman, Sohail Noor.
- Design and Development of Upper Body of M4 Rifle by Engr. Muhammad Younas, Engr. Aamirullah Khan, Muhammad Bilal, Usman.
- Epoxy Coating of Steel Reinforcement by Engr. Noor Faraz Khan, Muhammad Bilal Afzal, Muhammad Usman.
- Effect of milling time on the blaine value and particle size distribution of early setting Cements by Dr. Waheed Ur Rehman, Amin Ur Rehman, Sohail Noor.
- Effect of Ethanolic extract of Cannabis sativa on Neurobehavioural activity in Rats by Dr. Farah Gul, Dr. Yahoo ur Rehman, Dr. Nauman, Mrs. Farina Kanwal, Dr. Mushtaq Ahmad.

- Production of Herbal Drink by Dr. Javed Bangash, PSO, Dr. Nabeela G Dar, SSO, Dr. Abdul Wajid Khalil, SSO, Dr. Ghulam M U Paracha, SO.
- Epoxy Coating of Steel Reinforcement by Engr. Noor Faraz Khan, Muhammad Bilal Afzal, Muhammad Usman
- Development of Manganese Carbonate from Indigenous Manganese Ore of District Bajaur by Asma Yamin, Dr. Waheed-Ur-Rehman, Amin-Ur-Rehman.
- Determination of chlorophyll pigments in Wild and Tirah variety of (*Cannabis sativa*) using UV Spectrophotometry by Dr. Hina Fazal, SSO.
- Training on microbiological techniques” and Hands on training on Herbarium Techniques, Management and its digitization by Dr. Hina Fazal, SSO.
- Extraction of lead metal from indigenous galena ore by Dr. Mahmood Iqbal, Mr. Sohail Noor, Dr. Waheed Ur Rehman

Worshop/Seminar/Conferences/ Training Organized:

- PCSIR Laboratories Complex, Peshawar organized one-day seminar on “Water and Foodborne Pathogens (Bacteria)” on October 04, 2022. The speaker gave a detailed lecture on the foodborne concept, bacterial infection of human beings, water and foodborne diseases classification, how food and water contaminated, and dangers of foodborne diseases. At the end Dr. Javid Ali, SSO-PLC briefed the audience with recent research and methodology used for the decontamination of water and foodborne diseases.
- One Day Seminar titled as “Recent Trends in Biotechnology” Organized by PCSIR Peshawar management October 05, 2022. The resource person was Dr. Javid Ali, SSO of PLC. In this seminar, the speaker gave a detail lecture on the concept of biotechnology, development of biotechnology, application of molecular biology, modern biotechnological processes, steps involved in modern biotechnology research. At the end speaker also highlighted the limitation and problems related to the GMO and transgenic animals research.
- One-day seminar on Status and Importance of Decoding Breast Cancer Genetics in Khyber Pakhtunkhwa Pakistan was organized at PCSIR Laboratories Complex, Peshawar on October 19, 2022. Dr. Najeeb Ullah Khan, Assistant Professor, Biotechnology Department, Agriculture University Peshawar gave an informative presentation on prevention, symptoms, causes and treatment of breast cancer.

- One-month Internship training was organized for Chemical Engineering students of UET Peshawar related to crushing, grinding and mineral processing on November 19, 2022.
- Scientists of PCSIR Laboratories Complex, Peshawar participated in a virtual two days International SCIENTEX Conference on Nutrition and Health Care by Zoom organized in Paris, France on November 24-25, 2022 organized by COMSTECH Islamabad and Embassy of Republic of Indonesia in Pakistan. National and International Speakers of well repute shared their valuable views with the audience. The speakers discussed the importance and advantages of the herbal drugs along with their future marketplace. They also discussed the drawbacks associated with allopathic drugs. *Jamu*-an Indonesian traditional medicine system was also described in detail. They also highlighted their own efforts and successes they have made so far in the field of medicinal plants and herbal drugs' research.

MoU/ToR Signed

- Memorandum of understanding for logo authorization with Serena hotel, Pakistan dated: Feb 8, 2023 Rs. 200,000/-
- Process for Grapes Cider Vinegar for M/s. Hunter Orchards Syed's Farms Hazro, Attock, Pakistan dated: 21-06-2023 Rs. 90000/-
- ADB's KP Food Security support project, ToR for Sampling/Testing of Soil and Water for Initial Environmental Examination (IEE) dated: 21-06-2023 Rs. 550,000/-

PCSIR LABORATORIES COMPLEX, ISLAMABAD

The PCSIR Laboratories, Islamabad has been established on 14th January, 2022 in Sector H – 9, Islamabad to undertake Research and Development (R&D) and provide analytical testing services to the industrial sector in the Federal Capital and Rawalpindi

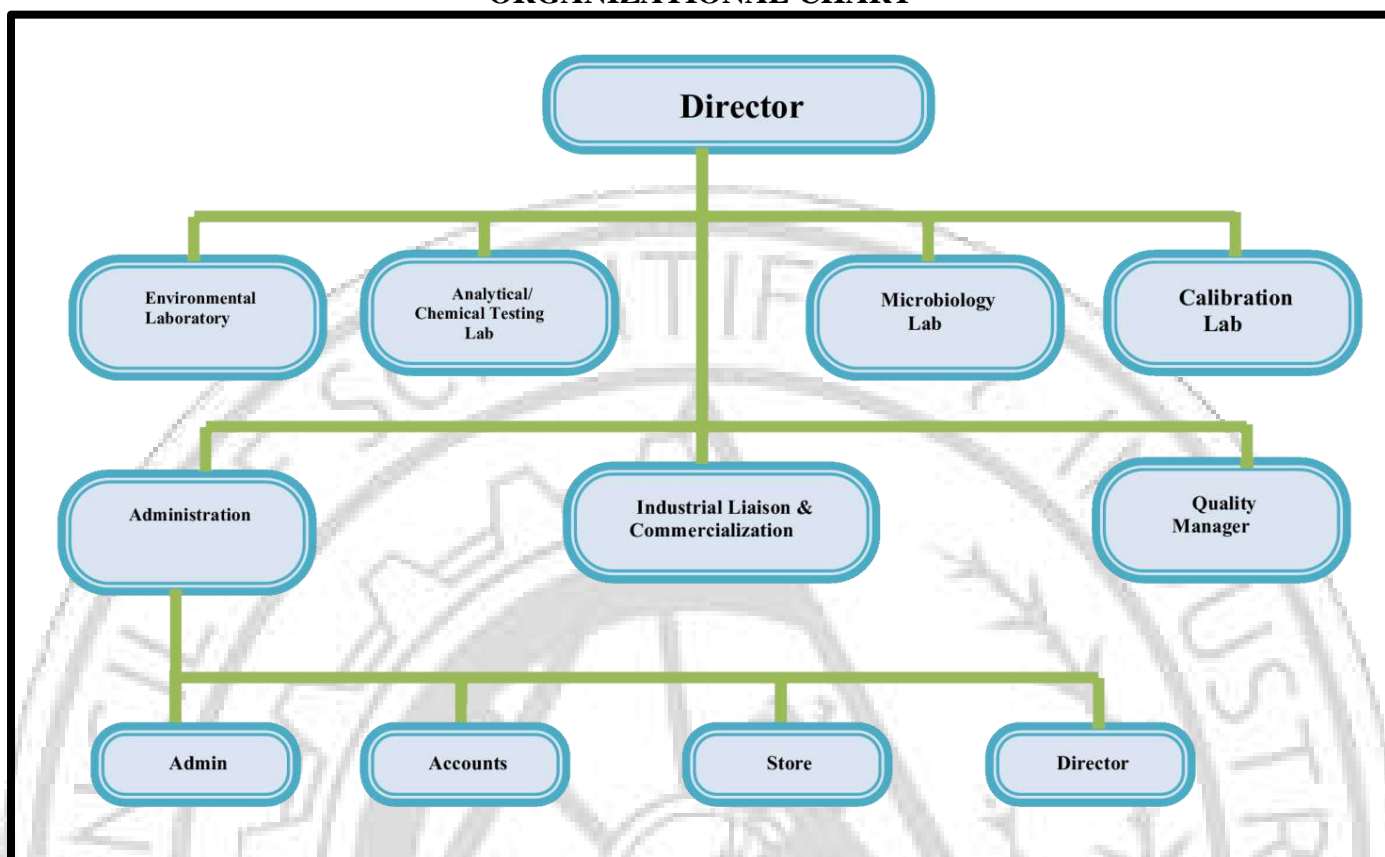


region, Azad Jammu & Kashmir region. PCSIR Laboratories Islamabad is currently providing testing/analytical and advisory services to clients from public and private sectors in the disciplines of Food, Material, Environmental monitoring, Halal testing. Being a premier R & D and testing organization, this establishment would serve a great technical support to Academia also. In addition, it also provides research facilities to M.Sc., M. Phil and Ph. D students.

Dr. Muhammad Tahseen Aslam (Principal Scientific officer) has been serving as Director of PCSIR Laboratories Islamabad since its establishment. The PCSIR Laboratories Islamabad comprised of four major laboratories i.e. Environmental Laboratory; Analytical/Chemical Testing Laboratory; Microbiology Laboratory; Calibration Laboratory. The PCSIR Laboratories Islamabad is enhancing its research and commercial testing facilities from different DWP Projects and PSDP projects. PCSIR Labs Islamabad is planning to establish the following centers in future:

1. National Hemp and Cannabis Analytical Laboratory
2. Food Research Center
3. Material Research Center
4. Environmental Research Center
5. Halal Testing and Research Center
6. Pharmaceutical Research Center
7. Calibration Center

ORGANIZATIONAL CHART



Process Developed

- i. **Title:** *Preparation of Organic Strawberry Marmalade without the addition of synthetic Preservatives*

Name of Researchers: Dr. Tahseen Aslam, Dr. Fouzia Noreen, Dr. Uzma Rashid, Razia Kalsoom, Fozia Hussain, Ammara Kanwal Abdullah, Afzal Tahir

Field: Food Biotechnology

- ii. **Title:** *Development of organic Mosquito/Insect repellent*

Name of Researchers: Dr. Tahseen Aslam, Dr. Fouzia Noreen, Dr. Uzma Rashid, Razia Kalsoom, Fozia Hussain, Ammara Kanwal, Abdullah, Afzal Tahir

Field: Pharmaceutical (topical Application)

Paper Published

a. Paper Published (International Journals No: 1)

- i. Uzma Rashid, Shahid Bhutto, Nusrat Jalbani, Fahmida Perveen, Sarwat Ismael and Farzana Nazir., “Health Risk and Metal Contamination Assessment in Orange (*Citrus aurantium*) of Pakistan: A Multivariate Study”, *J Bio Trace Elem Res* 201, 4558–4566 (2022)

b. Paper Published (HEC- Recognized National Journals- No: 5)

- ii. Muhammad Tahseen Aslam, Abdullah, Uzma Rashid, Dr. Islam ud Din, Farzana Nazir, Ammara Kanwal, Razia Kulsoom, Fouzia Hussain, Muhammad Afzal, Syed Hussain Abidi, Niaz Memon, “*Physicochemical and pathological assessment of groundwater quality from Sargodha, Pakistan using hybrid multi-layer slow sand filter: pre and post treatment analysis*”, *Mehran University Research Journal of Engineering & Technology* (accepted)
- iii. Muhammad Tahseen Aslam, Abdullah, Islam ud din, Uzma Rashid, Aijaz Panhwar, Fouzia Hussain, Razia Kalsoom, Muhammad Afzal, “*Groundwater Contamination Study of Faisalabad and Sargodha Metropolitan Cities*”, *Pak J. Anal. Environ. Chem. Vol. 23, No. 2(2022)* 259-269.
- iv. Muhammad Tahseen Aslam, Fouzia Noreen, Ashif Sajjad, Saima Nazir, Khalil Ur Rehman and Inam Ul Haq, “*Nutritional, phytochemical and content variation of essential trace element in selected folk medicinal plants around Lahore, Pakistan*” *Pakistan Journal of Pure and Applied Biology* 12(1), 817-82,2023.
- v. Alim-un Nissa, Hamna Nisar, Phool Shahzadi, Fatima Sajjad, Shahid Masood Aqsa Khizar, Asma Saeed, Sana Nisar, Hamood ur Rehman, M. Ashraf, M. Adil, Razia Kalsoom, “*Production sources and potential applications of alkaline water*”, *Pakistan Journal of chemistry* 13(1-2):30-36,2023.
- vi. Badar-Ud-Din Soomro, M. Irfan, M. Yousif, Faraz Khan, M. Bilal Afzal, Junaid Israr, Ambreen Saddozai, “*Temperature properties relationship of martensitic stainless steel for improved utilization in surgical tools*”, *Proceedings of the Pakistan academy of sciences: A Phy Comp Sci* 60(1): 15-21 (2023).

Products Ready for Commercialization

Title: Development of organic Mosquito/Insect repellent

Name of Researchers: Dr. M. Tahseen Aslam, Dr. Fouzia Noreen, Dr. Uzma Rashid, Razia Kalsoom, Fozia Hussain, Ammara Kanwal, Abdullah, Muhammad Afzal

Field: Pharmaceutical (Physical Application, not to inhale)

PCSIR Laboratory Islamabad has taken an initiative in the best of public interest, for the development/ preparation of mosquito repellent that can be used as an effective tool as preventive measure against the current critical situation of Dengue fever in flood affective areas in Pakistan.

This Laboratory has developed a product named MOS-QUIT (Organic Mosquito Repellent Oil). Mosquito-borne infections like dengue, malaria, chikungunya, etc. are a nuisance and can cause profound discomfort to people. Due to the objectionable side effects and toxicity associated with synthetic mosquito repellent products, this organic oil has been developed.

The marketing of the product is in process. The customers from public and private Organizations are now approaching to PLI (PCSIR) for purchasing this repellent.

The **500 bottles** have been prepared and distributed to flood effected areas and found effective to overcoming dengue spread in 2022.

Technical Reports

- i. X- Ray Fluorescence Analysis of Various Geomaterials from Loralai, Balochistan Submitted to M/S Brig. Dr. Sarfraz Ali, Dr. Tahseen Aslam, Dr. Uzma Rashid, Fouzia Hussain, Razia Kalsoom and M. Afzal
- ii. “Evaluation of Milk Adulteration in Fresh Milk Samples Collected from Various District of AJ&K (TR/PLI-01/013-2022)”, Submitted to: Food Safety Office Mirpur AJ&K, Razia Kalsoom, Ammara Kanwal, Dr. Uzma Rashid, Dr. Tahseen Aslam, Fouzia Hussain, M. Afzal
- iii. “Microbiological Evaluation of Orange Concentrate ((TR/PLI-02/046-2022)”, Submitted to: CITRO PAK Limited 38-A, Main Gulberg Lahore, Pakistan, Fouzia Hussain, Dr. Tahseen Aslam, Razia Kalsoom, Ammara Kanwal, Dr. Uzma Rashid, M. Abdullah.
- iv. Development / Validation & Measurement of Aflatoxin in Different Food Materials by Using HPLC-FLD (TR/PLI-04-2022), Dr. Tahseen Aslam, Fouzia Hussain, Ammara Kanwal, Dr. Uzma Rashid, Razia Kalsoom.

Exhibition / Seminars / Conference / Focus Group Meetings / Workshops attended

- i. Dr. Muhammad Tahseen Aslam PSO/Director PCSIR Labs Islamabad has attended the conference titled “**SECDIV-NIPS Islamabad International Conference on “Promoting Strategic Trade Controls through International Cooperation”** at National Institute of Policy Studies (NIPS), National University of Sciences and Technology (NUST), 05 – 06 September, 2022.

- ii. Dr. Tahseen Aslam (Director PCSIR Labs Islamabad), Dr. Uzma Rashid (SSO) and Ms Ammarah Kanwal (SO) virtually attended **“International Conference on Innovation, Technology Transfer and Cooperation for Addressing Climate Change”** organized by APCTT (Asian and Pacific Centre for Transfer of Technology, United Nations Economic and Social Commission for Asia and the Pacific; on 06 December 2022.
- iii. Dr. Uzma Rashid attended Workshop/Training on **“Capacity Building on regulatory guidelines”** at Board of Investment, Islamabad/Prime Minister Office PMU-ICDP on 12 December 2022. The objective of this session was to prepare the focal persons to carry out necessary activities for the implementation of regulatory modernization in their respective domain over the next two years.
- iv. Dr. Tahseen Aslam (Director PCSIR Labs Islamabad) and Mrs. Razia Kulsoom (SSO) attended 4 days **“Hands on Training on Extraction and Analysis of Cannabinoids”** at PCSIR Laboratories Complex Lahore from 24-27 January 2023.
- v. Dr. Uzma Rashid (SSO), Mrs. Razia Kalsoom (SSO) and Dr. Tahseen Aslam (PSO/Director PLI) have attended training Assessor Training Course as per ISO/IEC; 17025; 2017 on Feb 27-3 March 2023 by PNAC and qualified the course.
- vi. Dr Uzma Rashid, SSO and Ms. Razia Kalsoom, SSO attended a Training work shop regarding **“Preparedness and response for Mass gathering and other Health Threats”** at Marriot Hotel, Islamabad on 30-31 January 2023.
- vii. Dr Uzma Rashid and Ms. Ammarah Kanwal attended AARDO International webinar on **“Ecosystem Restoration for sustainable Development: Agenda 2030 & CO27”**, 27 February 2023.
- viii. Dr Tahseen Aslam, Dr. Uzma Rashid and Ms. Ammarah Kanwal had actively participated in the workshop on behalf of PCSIR Laboratories Islamabad. The workshop was organized by BOI at Pavilion Hall, Best Western Premier, Hotel, Islamabad on 06-03-2023. PCSIR Islamabad had received an invitation from BOI management to attend a workshop regarding Asaan Karobaar Bill. The bill has been drafted by Board of Investment with the approval of Federal Government and in consultation with public and private sector Board of Investment in order to apprise the stakeholders about key features of the proposed legislation and gather feedback.
- ix. Ammarah Kanwal attended one-day international workshop on **“Flexible Energy Systems Technology Perspective from Materials to Circuit”** At Quaid i Azam Auditorium Islamic International University Islamabad Organized by the department of physics and Centre for Advanced Electronics and Photovoltaic Engineering (CAEPE), IIUI on 13th March 2023.

- x. Dr. Tahseen Aslam (Director PCSIR Labs Islamabad), Dr. Uzma Rashid (SSO) and Mrs. Razia Kulsoom (SSO) attended “Assessors Training Course on ISO/IEC 17025:2017” being held at PNAC Islamabad from 27 February-03 March 2023.
- xi. Dr. Fouzia Noreen and Ms. Ammarah Kanwal attended International webinar entitled “Routine LC-MS Mass Detections Made Easy” virtually organized by Labroots international on 28th March 2023.
- xii. Dr. M. Tahseen Aslam (Director PLI) has attended this workshop titled “**Regulatory framework of Pakistan; Challenges and Way Forward**” at Marriot Hotel Islamabad, April 12, 2023.
- xiii. Dr. M. Tahseen Aslam (Director PLI) and Mrs. Razia Kulsoom SSO has attended international conference virtually titled “Scaling up climate change adaptation technology applications for a resilient future in Asia and the Pacific” on May 19, 2023, organized by United Nations ESCAP (Economic and Social Commission for Asia and the Pacific) at United Nations Conference Centre Bangkok Thailand.
- xiv. The Center for Peace and Development Initiatives (CPDI) has organized a Stakeholders consultation workshop on World Environment Day 2023, “Pakistan Climate Budget 2022-2023” on 07.06.2023 at Best Western Hotel, Islamabad. Dr. M. Tahseen Aslam, Director PCSIR Laboratories Islamabad has participated in this workshop as an expert on Climate Change.
- xv. Dr. M. Tahseen Aslam, Director PCSIR Laboratories Islamabad has participated as an expert on WASH/water, in the workshop titled “Expert Group Workshop on Climate Risk Assessments (CRA) for Punjab and KP” organized by Global Climate Change Impact Studies Centre and German Cooperation organization GIZ at Best Western Hotel, Islamabad on June 12, 2023.
- xvi. Mrs. Razia kalsoom (SSO) has attended an event “50 – Years celebrations of WWF at Pakistan National Council of Arts Islamabad on 30th May 2023.
- xvii. Dr. Fouzia NoreenSSOattended webinar “Advanced digital PCR applications for cell and gene therapy research: Viral vector quantification and CAR-T cell monitoring” 23 June, 2023.
- xviii. Dr. Fouzia NoreenSSOattended webinar “**Studying protein polymerization with mass photometry**” on April 16, 2023.
- xix. Dr. Fouzia NoreenSSOattended webinar “**Multivalent RNA CAR-T cell for malignant glioma**” on May 16, 2023.

Training Organized

1. National Focal Point – ECO Nanotechnology Network Tehran

The Ministry of Foreign Affairs of Islamic Republic of Pakistan has nominated **Dr. Muhammad Tahseen Aslam, (Director, PCSIR Laboratories Islamabad)** as a **National Focal Point in respect of Economic Cooperation Organization Nanotechnology Network**. The embassy of Islamic Republic of Pakistan Tehran has conveyed this nomination to the Secretariat of Economic Cooperation Organization in Tehran via letter No. ECO-7/18/2023-B/06 dated 25.06.2023.

Other Facts:

a) On-Site Inspection

Dr. Tahseen Aslam (Director PLI), Dr. Uzma Rashid (SSO) and Ammarah Kanwal (SO) visited Aviation Design Institute AvDI PAC, Kamra on 19th May 2023 regarding On-Site Inspection of water supply system at their facility of Servo Hydraulic Actuator.

b) Establishment of New Facility at PLI

PCSIR Laboratories Islamabad (PLI) in its revolutionary phase; has been striving to upgrade the existing facilities and skills of manpower. In order to extend the scope of testing, the Officers of PLI exercised the method validation practice of aflatoxin facility using Thin Layer Chromatography (TLC) and HPLC.

PLI as a new established Laboratory is striving for establishing basic and advance infrastructure. Our microbiology section is working on establishing new testing facility in PLI scope. Endotoxin method validation and verification (ILC/CRM) internal and external quality assurance exercises are being performed

c) Referred Project

i. Title: Analysis of wheat/ maize samples

Submitted to: Cashma Sugar Mills limited, Kings Arcade, 20- A Markaz F-7, Islamabad (Ref-proj-PLI-06/001-2023)

Amount charged: 75000

Researchers: Dr. Tahseen Aslam, Dr. Fouzia Noreen, Ammara Kanwal, Razia Kalsoom, Dr. Uzma Rashid, M. Afzal, Abdullah

ii. Title: Quality Assessment of different Variety of Snack Food Sold in Various District of AJ&K (RP-PLI-02/094&096-2022)

Submitted to:Food Safety Office Mirpur AJ&K(RP-PLI-02/094&096-2022)

Amount charged: 180000/-

Researchers:Dr. Tahseen Aslam, Dr. Fouzia Noreen, Ammara Kanwal, Razia Kalsoom, Dr. Uzma Rashid, M. Afzal, Abdullah

d) ISO 17025:2017 Related activities

i. PLI has prepared all the requisite documents for seeking accreditation of PNAC for its 35 scope parameters.

ii. PLI has launched online application on PNAC portal for pre assessment

iii. Participation in PT program

iv. Received Interim Report of Participation in PT program /Water Microbiology WM-08-2022
PCSIR Laboratories Islamabad participated in Proficiency Testing Program of Water Microbiology (WM-Round-08/2022) in September-October, 2022, from **Qarshi Research International (Pvt.) Ltd. Hattar.**

The interim report of the said PT was received on 29th December 2022 with satisfactory results. The Microbiology Lab of PCSIR labs. Islamabad had participated in the analysis of seven (7) organisms; Total Plate Count at 20⁰C, Total Plate count at 35⁰C, Total Coliform, Fecal Coliform, E. coli, Enterococcus faecalis and Pseudomonas. The Lab has qualified in five parameters out of seven with good/satisfactory Z- Score.

v. Participation in PT program /Water Chemistry MI-10-2022

The laboratories have to participate in various Proficiency Testing Programme annually, in order to monitor lab's quality performance and to meet the requirement of **ISO/IEC 17025:2017**. In this connection **PCSIR Laboratories Islamabad** has participated in another Proficiency Testing Program of Water Chemistry (WMI-Round-10/2022) in December, 2022, from **Qarshi Research International (Pvt.) Ltd. Hattar.** The analysis is under process for the testing of Parameters; **Total Hardness, Alkalinity, Chlorides, pH, Conductivity, Total Dissolved Solids, Bicarbonates, Fluorides, Nitrates as Nitrogen Nitrate, Sulphate, Sodium, Potassium, Calcium, Magnesium and Turbidity.**

vi. Assessor Training Course as per ISO/IEC; 17025;2017

Dr. Muhammad Tahseen Aslam (Director PCSIR Labs Islamabad), Dr. Uzma Rashid (SSO) and Mrs. Razia Kalsoom (SSO) have qualified Assessor Training Course based on ISO/IEC;

17025:2017 by Pakistan National Accreditation Council (PNAC). The result has been announced on 28th April 2023. This course will enhance the assessment capabilities of scientists of PCSIR Labs Islamabad regarding accreditation of laboratories nationally and internationally as per requirements of ISO/IEC 17025:2017.



PCSIR LABORATORIES COMPLEX, QUETTA

PCSIR Laboratories Quetta was established under the development project “Establishment of PCSIR Laboratories Quetta”. The development project was completed in June 2004 with the establishment of three research centers namely, Food Technology, Mineral Technology and Chemical Engineering & Pilot Plant Centre along with Administration Block including a Library.



PCSIR laboratories, Quetta are presently

engaged in R&D activities along with testing/analytical and advisory services to clients from public and private sectors in the disciplines of food and mineral technologies. In addition, it provides research facilities to the M.Sc., M. Phil and Ph.D. students. By utilizing the present modest but fully functional research and development facilities, the scientists of these laboratories have developed a number of bench scale processes. Now, Quetta lab. is in a process of establishing pilot plant facilities which would enable to assess the developed bench scale processes/technologies on pilot scale for commercialization.

The Province of Balochistan is endowed by nature with vast mineral deposits, a large variety of fruits, vegetables and fish. The Minerals and fruits have been the backbone of the province economy. Due to lack of proper exploitation and paucity of research and development facilities the common man could not take advantage of this massive wealth of the province.

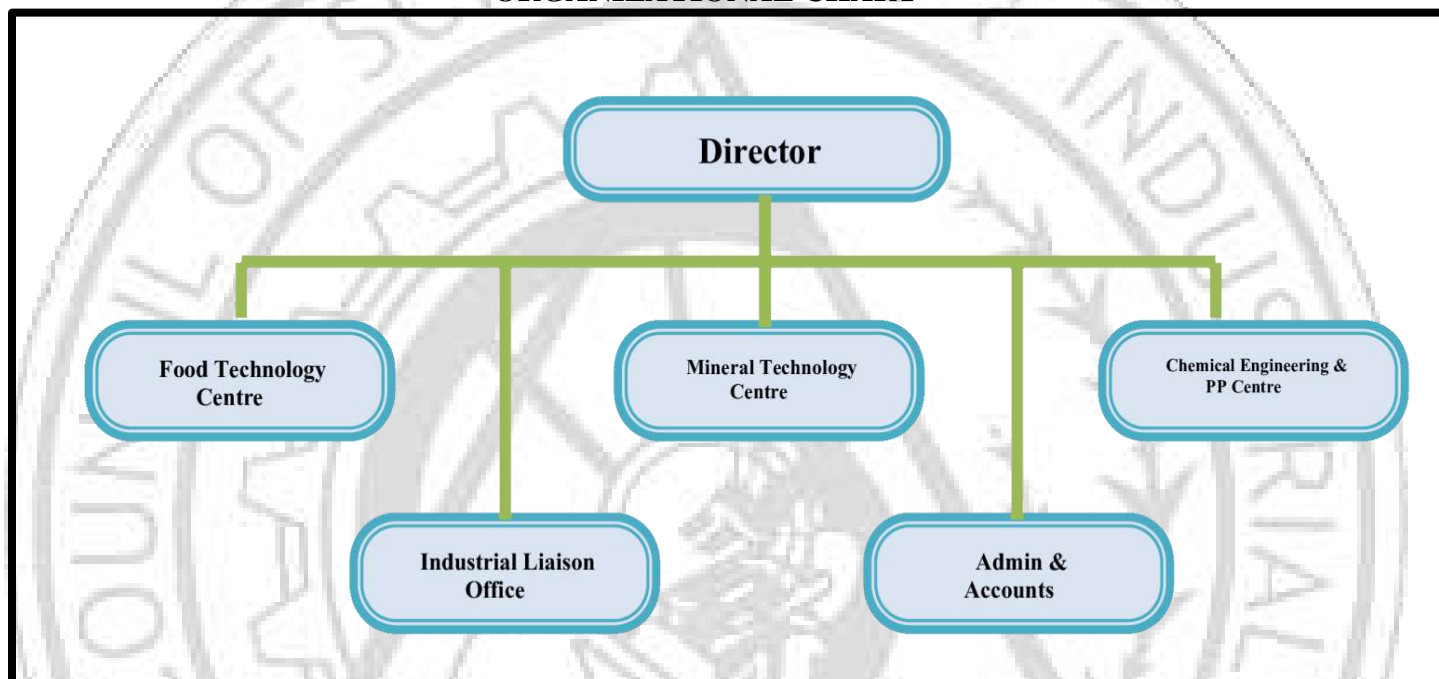
The main objectives of the laboratories are:

- Collection and dissemination of information relating to research and development being undertaken on indigenous fruits, vegetables and minerals.
- Evaluation, characterization and processing of the indigenous resources.
- Enhancement of export potential through value addition to indigenous raw materials.
- Extension of technical and scientific assistance, advisory services to local entrepreneurs and industries.
- Training of scientific/technical manpower.
- Supervision of Students from colleges / universities

At present the PCSIR Laboratories has established full facilities for undertaking bench /pilot plant scale R&D and analytical /testing facilities in the discipline of Food and Mineral & Material Science.

PCSIR Labs Quetta is presently functioning with a total staff of 34 including 09 Scientists/Engineers, members in Technical Staff and 25 officers/officials providing support services in the above outlined disciplines.

ORGANIZATIONAL CHART



International Publications

1. Zwitterionic Surfactant Modified Carbon Nanotubes Incorporated Percolative Polymer Composites with improved Features, F. Bashir, T. Hussain, A. Mujahid, A. Mushtaq, M.A. Raza, M.N. Ahmad, M. Zahid, M.I. Din, M. Zahid, Nano Biomed Eng.

Technical Services

Analytical and testing services were provided public and private sector organizations. Test related to food products, drinking water / wastewater and minerals and petrochemicals products have been conducted. 88 clients availed analytical / testing & advisory services for 4568 samples, enabling these labs. to generate income of Rs. 21.5259 million.

Seminars / Workshops/ Meetings / Vistis/ Visitors

Training Received:

- Mrs. Hiba Amanat Ali (SO) and Mr Aamir Raza (EO) received 04 days hands on training on extraction and analysis of CBD and THC from cannabis on 24th to 27th January 2023 at PCSIR Lab complex Lahore.

Training Conducted:

- Five students from Agriculture Collage Quetta, completed Internship final semester session 2018-2022.
- .A student of BS water management, Lesbella University of Agriculture, water and marine Sciences was supervised his final year Project.
- Three Students of BUISTEMS Quetta supervised for their final projects.

Visits:

The Director along with industrial Liaison Officer of these labs. visited local industries time to time and offered lab facilities for evaluation of their products.

- M/s Quetta Chemicals, Eastern By-pass, Quetta
- M/s Adil flour mills, Quetta
- M/s Mratin Dow Marker Limited, Quetta
- M/s Aqua Perfect Mineral Water, Jan Mohammad Road, Quetta
- M/s Darvesh Flour Mills, Saranan Road, Pishin
- M/s Rizwan Oil & Ghee Mills (Pvt.) Ltd. Quetta
- M/s Farooq Ghee & Oil Mills (Pvt.) Ltd. Quetta
- Department of Mines & Minerals, Balochistan
- PSQCA, SDC- Balochistan Regional Office, Quetta

Visitors:

1. Honorable Chairman PCSIR visited PCSIR labs Quetta
2. Honorable Minister Science & Technology Mr. Agha Hassan Baloch inaugurated the COMSAT Quetta Campus at PCSIR labs Quetta
3. Mr. Umair Hassani, Ex-Minister for Health, Balochistan, Visited these labs. and shown interest in beneficiation of copper and available research facilities.

4. Group of 30 students along with their teachers from government Girls collage Quetta from chemistry department Jinnah Town Quetta on 25th May 2022.
5. A Group of 40 students and their teacher of Girls collage Quetta Cantt, Chemistry department visited PCSIR Labs Quetta on 7th June 2022.

Liaison/ Collaboration:

PCSIR Laboratories Quetta offers technical guidance and advisory services to organization from public and private sectors, students and researchers as well. During the year under report, these labs. maintained collaboration with the following:

- Centre of excellence in Mineralogy, UOB, Quetta.
- Institute of Botony, UOB, Quetta.
- Institute of Biochemistry, UOB, Quetta.
- Agriculture Collage Quetta
- PPL Kallat Balochistan.
- Merck Marker Quetta
- SardarBahadurKhanUniversity.
- BalochistanUniversity of Information Technology and Management Sciences, Quetta.
- Custom collectorate
- DMD Balochistan
- BUITEMS

FUEL RESEARCH CENTER, KARACHI

Fuel Research Centre (FRC) Pakistan Council of Scientific and Industrial Research (PCSIR) is the premier research and development (R&D) organization first of its kind in Pakistan for coal, energy and environmental research.

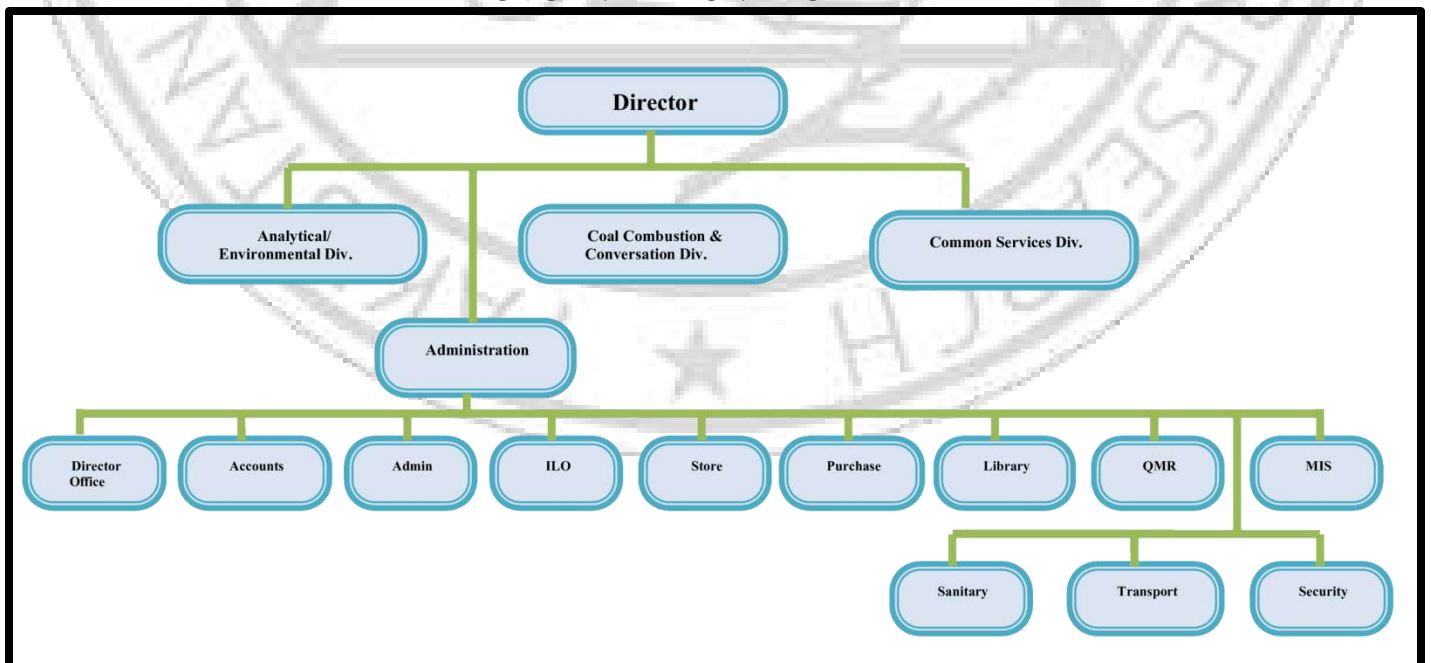
The centre is actively engaged in scientific research and technological research work pertaining to coal, coke, bio-mass, liquid, gaseous fuels and especially on different aspects of power generation from coal and biomass not only to reduce power crises but also to enhance self sufficiency in this regard.



Our mission is to promote fuel related R & D activities, to provide reliable analytical testing services and improve fundamental understanding of solid and liquid fuel as well as address critical issues and barriers for utilization of coal as an alternate energy source.

FRC's vision is to provide R&D based solution to utilize fossil fuel and to produce clean and cost -effective energy from indigenous resources. With such a desire of attaining self sufficiency in power generation, we are with the endeavors not only to convert raw coal into a type of an efficient, clean energy but also built healthy environment and vibrant economy.

ORGANIZATIONAL CHART



• **Papers Published / International**

Nadir Buksh, Suraiya Jabeen, & Akhtar Shareef (2022). Organic refuse-derived fuel (ORDF) is an alternative fuel for the Pakistan's domestic use in the post-Covid-19 green recovery. *Journal of Biodiversity and Environmental Science*, <http://www.innspub.net>21(4), 101-108

• **Product Ready for Commercialization:**

1- Hybrid Fuel Briquettes

Hybrid fuel briquettes are formulated by blending of charcoal in indigenous coal. The main advantage of this fuel over raw coal is an increase in combustion efficiency and decrease in emission gases during burning of the fuel. It is the prime subject of interest for the industries considering EPA rules strictly.

2- Bio Coal Fuel – for Boilers and Power Plants

- A solid waste biomass / indigenous coal blended fuel
- a low-risk, low-cost, sustainable, renewable energy option
- reduction in effective CO₂ emissions
- reduction in SO_x and NO_x emissions
- Follows EPA regulations

3- Subzazar Humic Acid (Liquid and Granulated)

Humic Acids have vast application fields but it is still anonymous in Pakistan, whereas it is best known plant growth hormone utilizing all over the world besides its other applications in veterinary, poultry and fish farming as good feed stock. The development of such technology and necessary adaptations for the processing / purification of the said product will be beneficial for national economics. It will also meet the future challenges to Pakistan and remain to be seen whether we accept the alternative to switch over to use our indigenous, less expensive, natural resources to develop the concept of organic agriculture. FRC-PCSIR has published several publications in national and international journals and patents have been filed.

Technical Report:

Technical report on coal/coke briquettes was compiled considering the highlighted points as requested by the Adviser to the Honourable Federal Minister for Science & Technology and submitted for onward submission.

Exhibitions / Conferences / Seminars Organized:

FRC participated by providing R&D Products to the following Seminar:

COMSTECH International Workshop & Exhibition on “Research Commercialization Challenges and Opportunities” 14-15 June, 2022 at Comstech Secretariat, Islamabad

Workshops/ Trainings Organized:

- Quantitative Analysis of Calorific Value of Coal, Fuel Processing and Analysis of Fuel Related Products, One Month internship training was organized to train 09 Nos. of internees (S. No. 1-9) from Pure and Applied Geology / University of Sindh Jamshoro, Sindh, Pakistan (ILO CASE I.D; FR/ILO/TRAINING-82/2022 dated: 23-06-2022).
- Study on Combustion Technologies for Utilizing Coal Water Slurry and Coal Water & Oil Slurry as An Industrial Fuel, Training to six students from NED University of Engineering and Technology, Karachi.
- Control of Emission Gases in High Sulfur Coal, Training to four students from NED University of Engineering and Technology, Karachi.
- Comparative Studies on the Analytical Methods for the Determination of Metals and Non-Metals in Coal Samples by Atomic Absorption Spectrophotometer, Training to five students from NED University of Engineering and Technology, Karachi.
- The Future of Pakistani Coal, Training to five students from NED University of Engineering and Technology, Karachi.
- Coal Processing to Obtain Value Added Products and Analytical Methodology to Assess Fuel & its Value Added Products, Training to twenty students from NED University of Engineering and Technology, Karachi
- Coal Processing to Obtain Value Added Products and Analytical Methodology to Assess Fuel & its Value Added Products, Assessment of Flash Point as a Useful Indicator for Adulteration in Diesel Fuel, Two weeks internship training was organized to train 07 Nos. of internees (S. No. 1-7) from Petroleum and Gas Engineering Department, Dawood University of Engineering & Technology, Karachi.
- Coal Processing to Obtain Value Added Products and Analytical Methodology to Assess Fuel & its Value Added Products, Comparative study on “Different Analytical Methods for the Determination of Copper Percentage” Two weeks internship training was organized to train 09 Nos. of internees (S. No. 1-7) from Petroleum and Gas Engineering Department, Dawood University of Engineering & Technology, Karachi
- Coal Processing to Obtain Value Added Products and Analytical Methodology to Assess Fuel & its Value Added Products, Demineralization of Coal, Two weeks internship training was organized to

train 09 Nos. of internees (S. No. 1-7) from Petroleum and Gas Engineering Department, Dawood University of Engineering & Technology, Karachi.

- Coal Processing to Obtain Value Added Products and Analytical Methodology to Assess Fuel & its Value Added Products, Identification of Combustible and Flammable Liquids, Training to ³three students from Department of Geology / University of Sindh Jamshoro, Sindh, Pakistan, Sindh University Campus Mirpurkhas and Federal Urdu University of Arts, Sciences & Technology, Main University Rd., Block 9 Gulshan-E-Iqbal, Karachi.
- Coal Processing to Obtain Value Added Products and Analytical Methodology to Assess Fuel & its Value Added Products, Review Study of ASTM for the Testing of Liquid Fuels by Classical methods and Application in the Lab, Training to ³three students from Department of Geology / University of Sindh Jamshoro, Sindh, Pakistan, Sindh University Campus Mirpurkhas

E Learning 2022 Multilateral Training Program under China Aid:

With reference to email dated: 01-08-2022 received from H.O. Islamabad and M/O Economic Affairs O.M. No. 2(1)EA/China-II/2022 dated 25-07-2022, nomination forms for the E Learning 2022 Multilateral Training Program Under China Aid have been submitted to PCSIR Head Office, Islamabad for Six officials from FRC PCSIR to receive the training, and all of them are selected by the concerned authority to receive training on Five Different Topics. (Ref. No. DFRC/TW(1)/2022/1903 Dated: August 04, 2022). Their submitted applications have been approved by Ministry of Economic Affairs, Islamabad to receive the training as mentioned below. All the following participants successfully completed their respective courses.

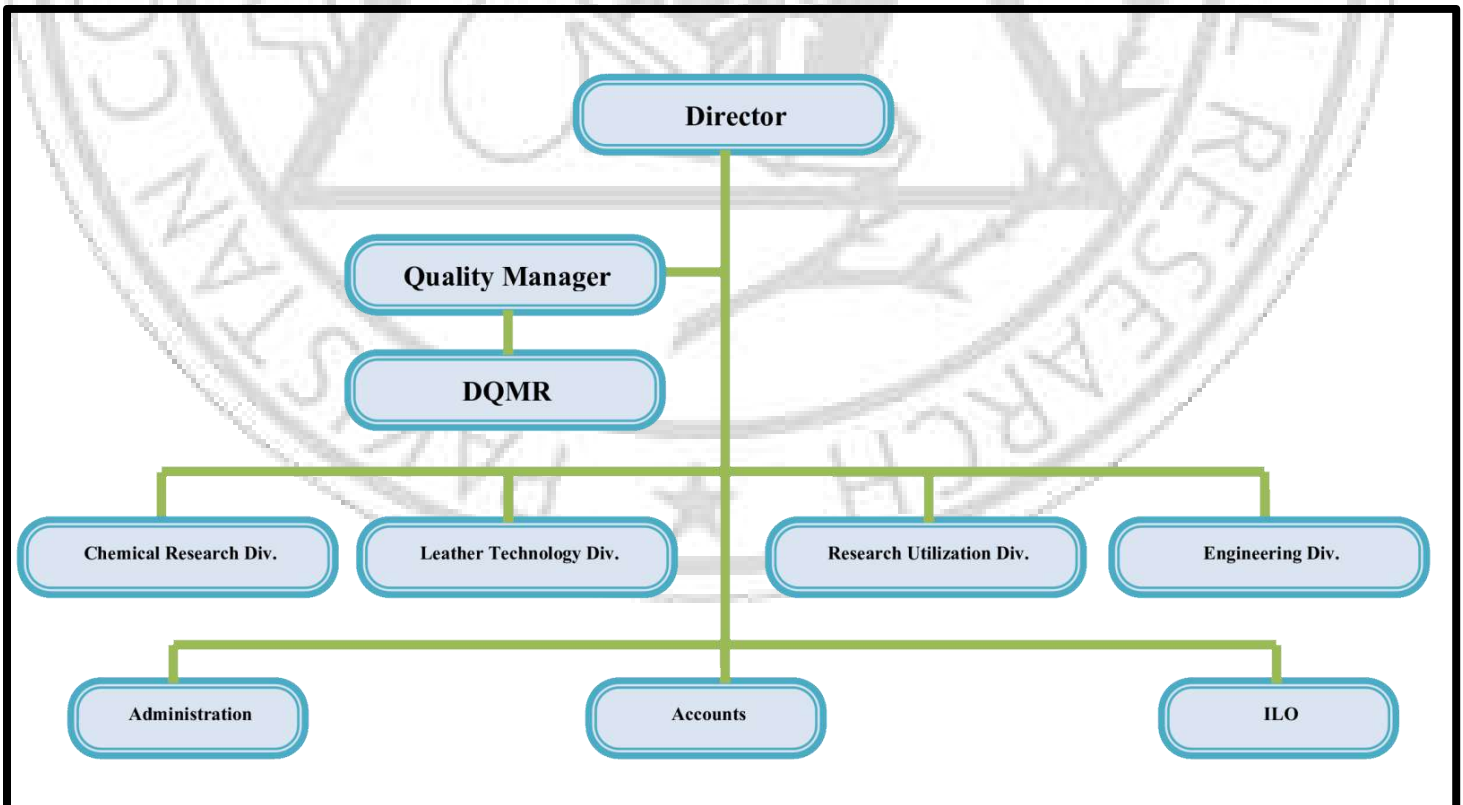
| S. No. | Training Title / Code | Opening Date | Duration (Days) | Participant |
|---------------|--|---------------------|------------------------|--|
| 1. | Training Course for Professional Technicians of Coal Industry / 3(145)EA/China-II/2022 | 18-10-2022 | 28 | Mr. Santosh Kumar, Principal Scientific Officer |
| 2. | Seminar on Rural Energy and Environment for Developing Countries/3(210)EA/China II/2022 | 07-10-2022 | 21 | Dr. Anila Sarwar, Senior Scientific Officer |
| 3. | Seminar on Energy Development and Industrial Policy / 3(157) EA/China-II/2022 | 25-10-2022 | 21 | Syed Kabir Shah, Senior Scientific Officer |
| 4. | Seminar on Power Generation Operation and Management for Developing Countries/3(124) EA /China-II/2022 | 11-10-2022 | 21 | Engr. Ali Gohar, Jr. Engr. |
| 5. | Training Course for Professional Technicians of Coal Industry / 3(145)EA/China-II/2022 | 18-10-2022 | 28 | Mr. Nadir Buksh, Scientific Officer |
| 6. | Seminar on Management and Application of Government Big Data in Cloud Management /3(201)EA/China-II/2022 | 24-11-2022 | 21 | Syed Najam Ul Islam, Technical Officer |

LEATHER RESEARCH CENTER, KARACHI

In 1959 Leather Section was established in PCSIR Labs., Karachi to serve the tanning industry, under the purview of the ministry of Science and Technology. In 1981 this Leather Section was upgraded into Research Division. Later on in 1984 Leather Research Division was upgraded to Leather Research Centre at SITE, Karachi. Currently, manpower of Leather Research Centre includes Scientists, Engineers and Leather Technologists. The team of Technologists along with highly qualified chemists and engineers form a well experienced and trained research group.



ORGANIZATIONAL CHART



Paper Published / International

1. SarwatJahanMahboob, Kashif Pervez, Farman Ahmad, TahiraAyaz, &RajkumarDewani(2022). Process of a Single Retanning Agent ISSN as a Brown Dye for Making Brown Color Leather in an Environment Friendly Approach. *International Journal of Natural and Human Sciences*, 3(1) 12–17.
Mahboob, S. J., Pervez. K., Ahmad.F, Ayaz.T., &Dewani,R. (2022). Process of a Single Retanning Agent ISSN as a Brown Dye for Making Brown Color Leather in an Environment Friendly Approach. *International Journal of Natural and Human Sciences*, 3(1) 12–17.
2. Sarwat Jahan Mahboob, Shakil Ahmad, Rajkumar Dewani, Sikandar Ali Soomro, Muhammad Noushad, Tahira Ayaz, & Muhammad Kashif Pervez (2022). Fatliquor Development from Hemp Oil to Produce High Quality Natural Finished Leather. *Indonesian Journal of Chemistry and Environment*, 5(1), 9-16.
Mahboob, S. J. (2022). Fatliquor Development from Hemp Oil to Produce High Quality Natural Finished Leather. *Indonesian Journal of Chemistry and Environment*, 5(1), 9-16.
3. BeenaZehra, Barkat Ali Solang,& UzmaNadeem(2022). Preparation of Flame Resistant Retanning Product for Glove Leather. *Indonesian Journal of Chemical Studies*, 1(2), 39-42.
Zehra, B., Solangi, B. A., & Nadeem, U. (2022). Preparation of Flame Resistant Retanning Product for Glove Leather. *Indonesian Journal of Chemical Studies*, 1(2), 39-42.
4. Sarwat Jahan Mahboob, Rajkumar Dewani, Muhammad Kashif Pervez, &Tahira Ayaz, IArcSAS-2022” 2nd International Architectural Sciences and Applications Symposium, Symposium Proceeding Book, ISBN: 978-625-8246-12-4, 25/10/2022, P 145-6.Baku, Azerbaijan.
5. SarwatJahanMahboob, RajkumarDewani, Muhammad Kashif Pervez,&Tahira Ayaz 2022. Uncertainty Calculation for the Determination of Chromium Oxide in Leather.*Journal of Architectural Sciences and Applications*,7(2), 871-877.
MAHBOOB, S., DEWANI, R., PERVEZ, M. K., & Tahira, A. Y. A. Z. (2022). Uncertainty calculation for the determination of chromium oxide in leather. *Journal of Architectural Sciences and Applications*, 7(2), 871-877.
6. RajkumarDewani, Muhammad Kashif Pervez, SarwatJahan Mahboob, Tahira Ayaz1, & Sikander Ali Soomro, Objective Review: Advanced Testing and Toxicity of Restricted Substances for Sustainable Leather Industry, *JALCA*, 2023, VOL. **118**, 117-28.

- Dewani, R., Pervez, M. K., Mahboob, S. J., Ayaz, T., & Soomro, S. A. (2023). Objective Review: Advanced Testing and Toxicity of Restricted Substances for Sustainable Leather Industry. *Journal of the American Leather Chemists Association*, 118(3), 117-128.
7. SarwatJahanMahboob, TahiraAyaz, RajkumarDewani, and Muhammad Kashif Pervez, Self-Colored Leather Making in Fawn Shades by Application of a Resorcinol Based Synthetic Tanning Agent on Sheep Crust, *CUKUROVA 10th INTERNATIONAL SCIENTIFIC RESEARCHES CONFERENCE*, April 2-4, 2023, *Full Text Book*, 553-562, Adana, Turkiye.
8. Barkat Ali Solangi, BeenaZehra*, Hafiz Rub Nawaz, UzmaNadeem, Mohammad Kashif Pervez, Mohammad Zeeshan, A Technical Study on the Effect of Hydrothermal and Dry Heat Shrinkage of Different Shoe-Upper Leathers Used in Pakistan, *Indones. J. Chem. Stud.* 2(1), 9-12
- Solangi, B. A., Zehra, B., Nawaz, H. R., Nadeem, U., Pervez, M. K., & Zeeshan, M. (2023). A Technical Study on the Effect of Hydrothermal and Dry Heat Shrinkage of Different Shoe-Upper Leathers Used in Pakistan. *Indonesian Journal of Chemical Studies*, 2(1), 9-12.
9. SagheerShafia, Jabbar* Abdul, Pervez M. Kashif, Rani Kiran, Ambreen, RiazSaadia, Sulfonamide based antimicrobial reactive dyes: A study of their synthesis, fastness and antimicrobial activity, *Journal of Molecular Structure*, vol 1250, Part 2, 131837, 2022.
- Sagheer, S., Jabbar, A., Pervez, M. K., Rani, K., & Riaz, S. (2022). Sulfonamide based antimicrobial reactive dyes: A study of their synthesis, fastness and antimicrobial activity. *Journal of Molecular Structure*, 1250, 131837.

Product Ready for Commercialization

- 1. Fatliquor from Vegetable Oil Blend of Castor and Cotton Seed Oil for Leather Industry**
- 2. Fatliquor from blend of canola to soyabean oil in 3:1 ratio for leather industry.**
- 3. Resorcinol Based Synthetic Tanning Agent**
- 4. Industrial Leather and Technology for the Preparation of Gasket for High Pressure Jack, Oil & Water Seals, Machine Belt etc**
- 5. Lizard Look Leathers from Chicken-Paw Skins and their Valuable Products**
- 6. Technology for Exotic Leather from Ostrich Skins**
- 7. Stingray Fish Leather for Decorative, Protective & Other Various Articles**
- 8. Recovery of Protein and Chromium from Leather Solid Waste**

Technical Report Prepared:

1. A Technical Report for the Process for Eco- Friendly Leather Processing Using Single Bath by Sarwat J. Mahboob, Muhammad Noushad, TahiraAyaz, RajkumarDewani&Sikandar Ali Soomro.
2. A Technical Report for Preparation of Fire Proofing Retanning Agent for Upholstery Leather by Dr. BeenaZehra, Barkat Ali Solangi, UzmaNadeem& Muhammad Zeeshan.
3. A Technical Report for the Preparation of Fatliquor from Soybean Oil by SarwatJahanMahboob, Shakil Ahmad, RajkumarDewani, Sikandar Ali Soomro&TahiraAyaz.
4. A Technical Report for Preparation of multi-functional finishing formulation using microwave radiation for leather goods by Dr. BeenaZehra, Barkat Ali Solangi, UzmaNadeem& Muhammad Zeeshan.
5. A Technical Report for The Coacervation of Indigenous Source Gum Arabic with Tanneries Waste Protein for Synthetic Adhesives by Dr. BeenaZehra, Barkat Ali Solangi, UzmaNadeem& Muhammad Zeeshan.
6. A Technical Report for the Fatliquor development from blend of Canola Oil to Soybean Oil in 3:1 ratio by RajkumarDewani, SarwatJahanMahboob&TahiraAyaz.
7. A Technical for Enhance the Physical Properties of Low Grade Leather for Safety Gloves by Barkat Ali Solangi, UzmaNadeem, , Dr. BeenaZehra M. Zeeshan&Farrukh Hassan.
8. A Technical Report For the Application of Fatliquor prepared from Soyabean Oil to Develop Leather by SarwatJahanMahboob, Shakil Ahmad, RajkumarDewani, Sikandar Ali Soomro&TahiraAyaz.
9. A Technical Report for the 'Kitchen Microwave Strategy: Novel Co-Polymers Acrylic Finishing binders by Dr. BeenaZehra, Barkat Ali Solangi, UzmaNadeem& Muhammad Zeeshan.
10. A Technical Report for the Synthesis of Fatliquor from Hemp Oil to Produce High Quality Natural Finished Leather by Sarwat J. Mahboob, TahiraAyaz, Dr. RajkumarDewani, Sikandar Ali Soomro and Shakil Ahmad.
11. A Technical Report for the rapid reaction of acacia nilotica gum from Karachi trees with inorganic compounds by Barkat Ali Solangi, UzmaNadeem, Dr. BeenaZehra& M. Zeeshan.

12. A Technical Report for Application of Fatliquor made from Hemp Oil to Produce High Quality Natural Finished Leather by Sarwat J. Mahboob, Tahira Ayaz, Dr. Rajkumar Dewani, Sikandar Ali Soomro and Noshad
13. A Technical Report for the Synthesis of Polymer Retanning Agent, "Res-Acrylan" Developed from Resorcinol by Sarwat Jahan Mahboob, Tahira Ayaz, Rajkumar Dewani, and Muhammad Kashif Pervez.
14. A Technical Report for The "Application Of Resorcinol Based Polymer Retanning Agent For Making Non-Dyed, Self-Color, Finished Leather In Fawn Shades by Sarwat Jahan Mahboob, Tahira Ayaz, Rajkumar Dewani, Mr. Sikandar Ali Soomro & Mr. Mohammad Noshad
15. A Technical Report for "The Preparation of efficient phosphated glue utilizing leather solid waste" by Dr. Beena Zehra Barkat Ali Solangi, Uzma Nadeem, & M. Zeeshan.
16. A technical report for the Synthesis of fatliquor from a blend of Castor oil and Cotton seed oil in 4:1 ratio for use in leather industry by Tahira Ayaz, Sarwat Jahan Mahboob, Dr. Rajkumar Dewani and Mr. Shakil Ahmed.
17. A technical report of Chamois Leather for cleaning of equipment, automotive & optics by Barkat Ali Solangi, Dr. Beena Zehra, Uzma Nadeem & Muhammad Zeeshan.
18. A technical report for Synthesis of green bio-retanning agents from local tanneries waste of Karachi by Dr. Beena Zehra, Barkat Ali Solangi, Uzma Nadeem & Muhammad Zeeshan.

Exhibitions / Conferences / Seminars Organized

On the occasion of Eid-Ul-Azha many Welfare Trust, Madaris & allied groups etc. are keenly involved to collect skins & hides of sacrificial animals. According to statistical survey & media report usually more than 1.5 millions of skins / hides are collected by various Communities and Institutes at the time of Eid-Ul-Azha in the Karachi City. The cost of this Skins/hides is approximately Rs. 1750 million and the value of raw material ultimately increased in manifold on handling & storage with proper techniques. To keep in view, the commercial significance of skins & hides which are the major input for the processing of Leather Industries. Leather Research Centre, PCSIR, Karachi, organized the programmes for concern stakeholders at various avenues in last ten years. More than 50 awareness sessions were arranged benefits for the more than 1500 persons to save the "Qurbani" skins / hides from postmortem defects like butcher cuts,

salt stains, drying, damaging, corrosion and putrefaction in the interest of Leather Industries of Pakistan which contributes 10% (approx.) of total export of the country and provides opportunity of employment directly and indirectly more than 0.9 million peoples. In this connection Management of LRC arranged a couple of Seminars with Al-Khidmat and various welfare organizations and madaris.

Dr. Rajkumar, *Senior Scientific Officer* and Mr. Farrukh Hassan Bhatti, *Research Technical Assistant*, visited Al-khidmat head office to present an awareness lecture on the ‘Preservation of Hides and Skins at Eid-ul-Azha’ on 24th June, 2023. Participants from all districts of Karachi were present at the event and they shared their difficulties, asked questions and highly appreciated the presenters. Mr. QaziSadrudin and Mr. Sarfaraz delivered the vote of thanks to Leather Research Center, PCSIR.

Workshop/ Training Organized

Leather Research Center organized a 04 Weeks Training on “Leather Processing & Quality Control for 04 Nos. Army Personnel’s from 15th May to 9th June, 2023 and Certificate Distribution Ceremony was held on 9th June, 2023.

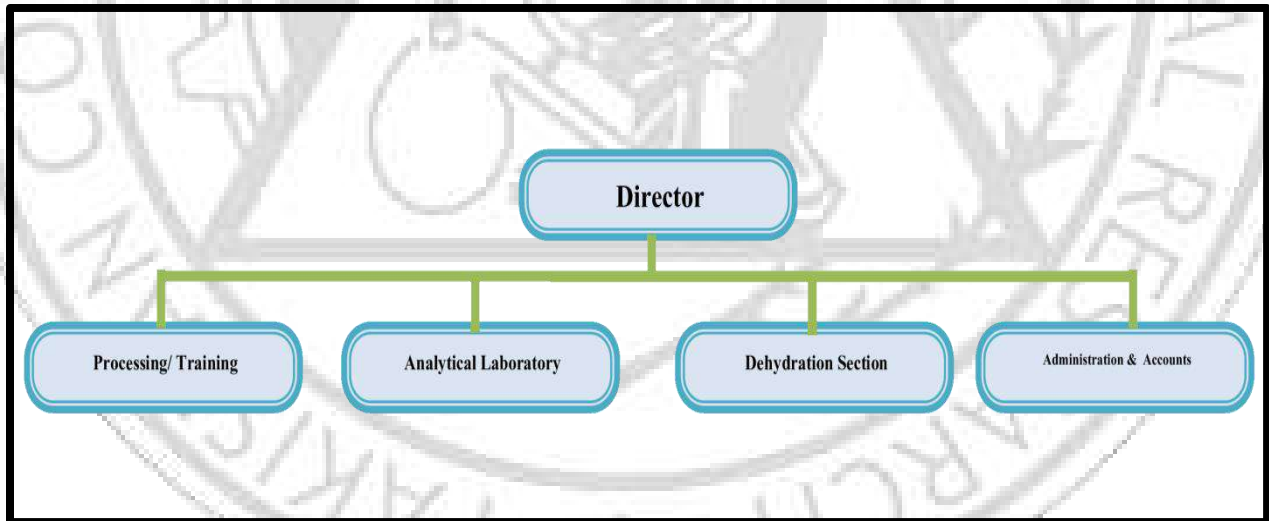
PCSIR LABORATORIES, SKARDU

The center started working in 1998 under the administrative control of PCSIR Laboratories Complex, Peshawar to impart technical training on processing, preservation, value addition, packaging, transportation and storage of fruits and vegetables. Center



is helping rural population of the region in their socio-economic development by imparting training and offering technical help in minimizing the post-harvest losses. Provision of technical assistance in establishment of small cottage industries of processing and preservation of fruit/vegetables. Center is also providing testing facilities to the farmers/students in the field of agricultural raw materials and its value-added products.

ORGANIZATIONAL CHART



Paper published/International:

- Research paper titled “Nutritional Evaluation of Quince Fruit of Baltistan Region and Development of Value added Products” co-authored by Tariq Umer Khan and Faizullah Khan published in “Advances in Food Technology and Nutritional Sciences”.

Products Ready for Commercialization

- Apricot marmalade
- Apple Fruit Chips
- Cherry Fruit Tonic
- Mulberry and Cherry Blended Jam
- Black Mulberry Fruit Leather

Technical Reports:

- Development of Quince Fruit Nectar dated 16 July, 2022.

Exhibition/Conference/Seminars Organized

- Agriculture Department Shigar in collaboration with PCSIR Laboratories Skardu organized two days “3rd National Apricot Festival 2022” at agriculture garden Hashopi Shigar dated 25-26 July, 2023.
- One day conference on “Public and Private Partnership Opportunities in Gems and Minerals Industry” arranged at PCSIR Labs Skardu for participants from AKRSP and Local Support Organizations (LSOs) of Baltistan region.

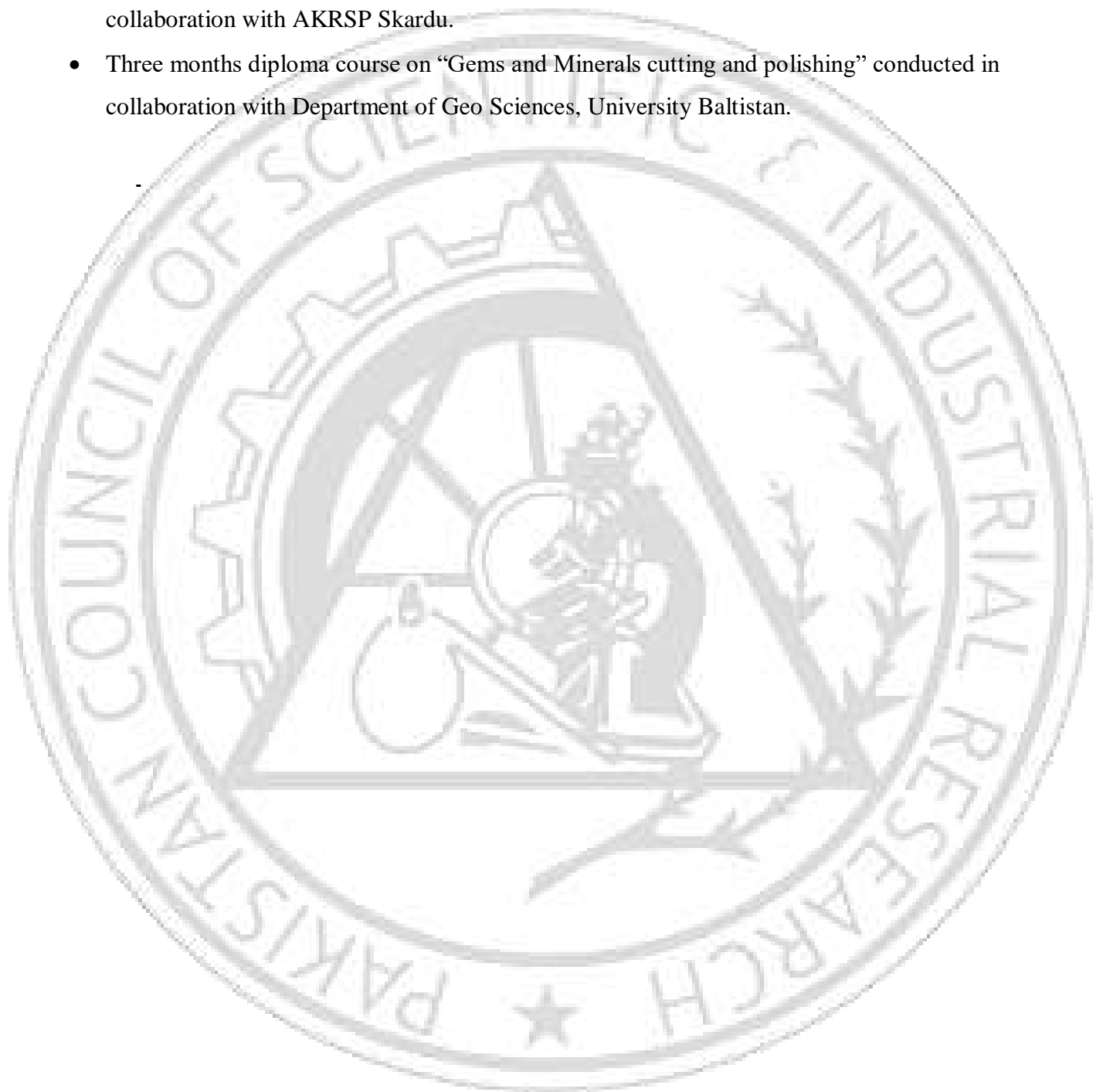
MoU/ ToR/ signed

- MoU signed between PCSIR Skardu and University of Baltistan Skardu for provision of testing facility to research students under “PCSIR DRSI Project.
- MoU signed between PCSIR Labs Skardu and AKRSP (Agha Khan Rural Support Program) on “Training on Gems and Minerals Cutting and Polishing”.

Workshops/Trainings Organized:

- One day training session organized at PCSIR Labs Skardu on “Water Quality of Deosai and Skardu” to the students of LUMS University Lahore and University of Baltistan Skardu.
- Six Months short course on “Fruit Processing” conducted in collaboration with GB NAVTTC Gilgit.

- Six Months short course on “Fruit Processing” conducted in collaboration with GB NAVTTC Islamabad.
- Three Months training session on “Gems and Minerals Cutting and Polishing” conducted in collaboration with AKRSP Skardu.
- Three months diploma course on “Gems and Minerals cutting and polishing” conducted in collaboration with Department of Geo Sciences, University Baltistan.



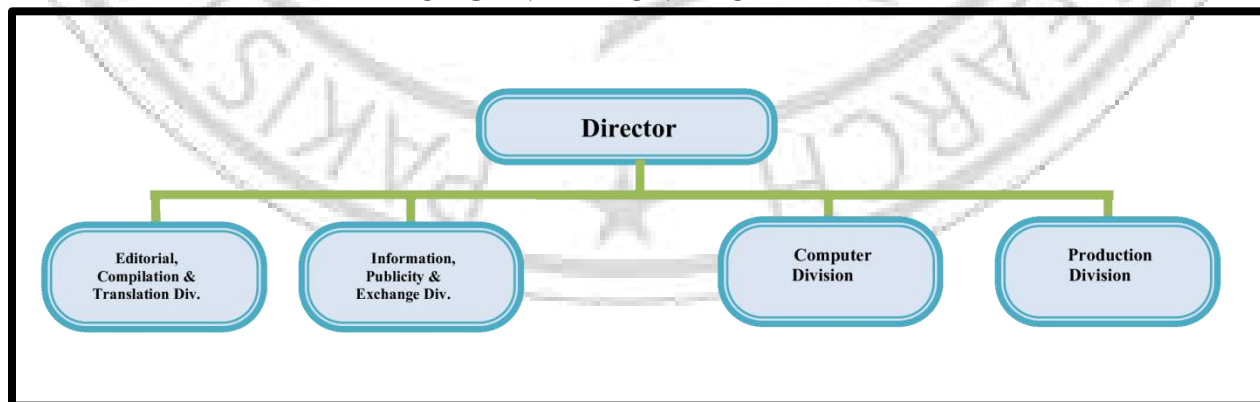
SCIENTIFIC INFORMATION CENTER, KARACHI

Scientific Information Centre (SIC) is scientific and technical information Unit of PCSIR (Pakistan Council of Scientific and Industrial Research) which is located in Karachi. It is recognized as an essential tool to the orderly development of society and publication Centre which works along with the Head Office since 1958. This Centre is actively engaged in dissemination of R&D results through



regular and occasional publications for the scientific community, and publishes on regular basis triennially research journal i-e Pakistan Journal of Scientific & Industrial Research (PJSIR), which deals in different fields of Physical Sciences and Biological Sciences. Other regular publications of PCSIR published by SIC are: PCSIR News Bulletin, PCSIR Annual Report and PCSIR R&D Programme. Beside the regular publications, the SIC also published miscellaneous printing work i.e. Test Reports (Accredited and Non-Accredited), Log registers, file covers, prospectus guide books of admission forms, technical books, stickers, pension forms, election ink leaflets, TR forms, visiting cards, service history books etc. SIC has five divisions i.e. (a) Editorial and compilation division (b) Information, publicity and exchange division (c) Computer division (d) Production division (e) Accounts and administration division.

ORGANIZATIONAL CHART



Significant Activities

| S.No | A: Annual Work done on PJSIR papers from 1 st July -2022 to 30 th June 2023 | |
|------|---|--|
| 1 | Total no. of papers received for PJSIR publications | 171 |
| 2 | Total no. of papers present in processing | 325 |
| 3 | Total no. of papers accepted | 65 |
| 4 | A-1: Total no. of Papers Published from 1st July -2022 to 30th June 2023 | |
| 4-1 | In Physical Series: A | 45 Papers published |
| 4-2 | In Biological Series:B | 54 Papers published |
| 5 | B: Work done by Computer Section | |
| 5-1 | Total no. of pages Edited/Formatted/Composed/Proof read for PJSIR Biological Sciences | <ul style="list-style-type: none"> ➤ PJSIR Vol 65(2) Biological Sciences: May-August 2022 (Total 13 papers were published which contain 102 pages) ➤ PJSIR Vol 65(3) Biological Sciences: September-December 2022 (Total 14 papers were published which contain 106 pages) ➤ PJSIR Vol 66(1) Biological Sciences: January-April 2023 (Total 13 papers were published which contain 100 pages) ➤ PJSIR Vol 66(2) Biological Sciences: May-September, 2023 (Total 14 papers were published which contain 98 pages) |
| 5-2 | Total no. of pages Edited/Formatted/Composed/Proof readfor PJSIR Physical Sciences | <ul style="list-style-type: none"> ➤ PJSIR Vol 65(2) Physical Sciences: May-August 2022 (Total 11 papers were published which contain 102 pages) ➤ PJSIR Vol 65(3) Physical Sciences: September-December 2022 (Total 11 Papers were published which contain 110 pages) ➤ PJSIR Vol 66(1) Physical Sciences: January-April 2023 (Total 12 Papers were published which contain 108 pages) ➤ PJSIR Vol 66(2) Biological Sciences: May-September, 2023 (Total 14 papers were published which contain 98 pages) |
| 5-3 | Total no. of pages for Bulletin Edited/Composed/Formatted | <ul style="list-style-type: none"> ➤ Three Issue Nos. 456-458, 08 No of pages ➤ Three Issue Nos. 459-461 , 08 No of pages |
| 5-4 | Total no. of pages for Research and Development Programme (R&D)Edited/Composed/Formatted | <ul style="list-style-type: none"> ➤ R&D Programme 2022-23: 107No of pages |

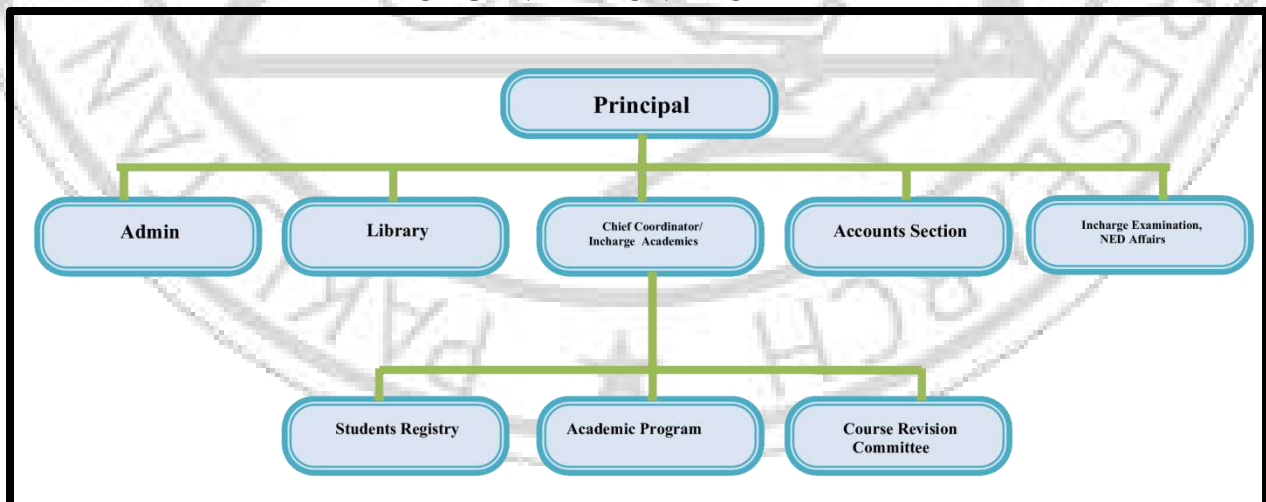
INSTITUTE OF INDUSTRIAL ELECTRONICS ENGINEERING, KARACHI

Trained and Skilled manpower is a bloodline of Industries and Institutions of any country. Keeping in view the needs of the nation, PCSIR founded Institute of Industrial Electronics Engineering (IIEE) in 1989 in collaboration with SWISS CONTACT Government of Switzerland. The institute was established with aim to prepare trained and skilled manpower for the local Industry in the form of



Industrial Electronics Engineering Graduates. IIEE is affiliated with N.E.D. University, Karachi IIEE with its unique laboratory, workshops and computer facility, is inducting a batch of 47 undergraduates in 1st Year Engineering every year. Graduate Engineers of IIEE are very much sought by the industries/ organizations and those who have so far graduated are gainfully employed throughout the country and abroad.

ORGANIZATIONAL CHART



Papers Publications by IIEE Faculty Members:

- Jaffer, S.S, Hussain, A., Qureshi, M.A. J.Mirza and Qureshi, K.K., “Reliable and cost efficient protection scheme for 5G fronthaul/backhaul network, Volume 9, issue 3, E14215, Heliyon March2023 (IF:3.7] <https://doi.org/10.1016/j.heliyon.2023.e14215>.
- A. Arshad, M.Zahid, A. Yasar, Jaffer,S.S, ", MIMO Antenna for C-band Applications" 2023 International multi-disciplinary Conference in emerging research trends (IMCERT), 2023, indus university Karachi.
- Nehal Abdul Rehman, Farah Haroon, “Adaptive Gaussian and Double Thresholding for Contour Detection and Character Recognition of 2D Area Using Computer Vision”, submitted in Interact 2023, Karachi.
- Hussain, Sajid, S. F. Hasany, and Syed Usman Ali. "Hematite Decorated MWCNT Nanohybrids: A Facile Synthesis." Journal of the Chemical Society of Pakistan 44, no. 5 (2022): 480.
- Jafri, Syed Riaz un Nabi, Sheraz Shamim, Sadia Muniza Faraz, Asif Ahmed, Syed Muhammad Yasir, and Jamshed Iqbal. "Characterization and calibration of multiple 2D laser scanners." PLOS one 17, no. 7 (2022): e0272063, 2022.
- Abdullah, Minhal, Syed Hasany, Muhammad Amir Qureshi, and Sajid Hussain. "Cost-Effective Synthesis of Cobalt Ferrite Nanoparticles by Sol-Gel Technique." In Materials Science Forum, vol. 1067, pp. 213-219. Trans Tech Publications Ltd, 2022.

Workshops/ Trainings Organized

i) Faculty Development

- Engr. Sajid Hussain conducted the CPD session on the “ The future of teaching : Enhancing Learning outcomes.” on 3rd March 2023
- OBE cell of IIEE has arranged an online workshop on OBE/OBA system by Dr. Muhammad Ali Qureshi from Islamia university Bahawalpur on 6th Feb. 2023.
- Engr. Mazhar Ali attended the subject faculty development program arranged by the quality management cell of NED university from 9 December 2022- 4 January 2023
- The interactive session on Integration of 5G with Passive Optical Network (PON) is delivered on 30th Dec 2022 by Dr. Syed Saeed Jaffar

- Engr. Ayaz Butt has delivered the CPD session on OT to IT layer integration in Process Control System on 15 December 2022
- Importance of Free Space Optics in future generations on 19th Oct 2022 by Dr. Muhammad Sameer Ahmed.
- The CPD session on Earn Through E-Commerce is delivered by Engr. Jahangir Nawaz on 6th October 2022.

List of Final Year Projects 2022-23 (Batch-31)

- Automation and monitoring through IIOT for Hank to Cone Winding Machine at Textilfort (Private) Limited.
- IIOT Based Monitoring of Industrial Parameter and Alarming System.
- Development of Pinhole Tester for Aluminum Foil Based on Image Processing.
- Design and development of CDI and Rectifier tester for two wheeler at Atlas Honda.
- Design and Development of Smart Energy Meter with Cyber Security.
- Development of Electronic Skin Based on AI.
- 3D Map Merging with Multi Rover SLAM using AI.
- Intelligent Stethoscope
- Humanoid Biped Robot
- Hardness Testing Machine
- AI Assisted Smart Monitoring & Control System for Hybrid Electric Motorbike
- SWARM Intelligence Multi-Bot System

Industrial Visits

ILO has arranged an industrial visits to Ebrahim textile Mills, Afroze Textile and Shangrila Foods Pvt. Limited during July 2022 till June 2023

- i) **Ebrahim Textile Mills**
- ii) **Afroze Textile**
- ii) **Shangrila Foods Pvt.Limited**

PAK-SWISS TRAINING CENTER, KARACHI

Pak Swiss Training Centre (PSTC), Karachi a unit of Pakistan Council of Scientific & Industrial Research (PCSIR). The establishment of Pak Swiss Training Centre was to provide technical personnel for the emerging industrial sector in the Country. PSTC came into existence in 1965 and started

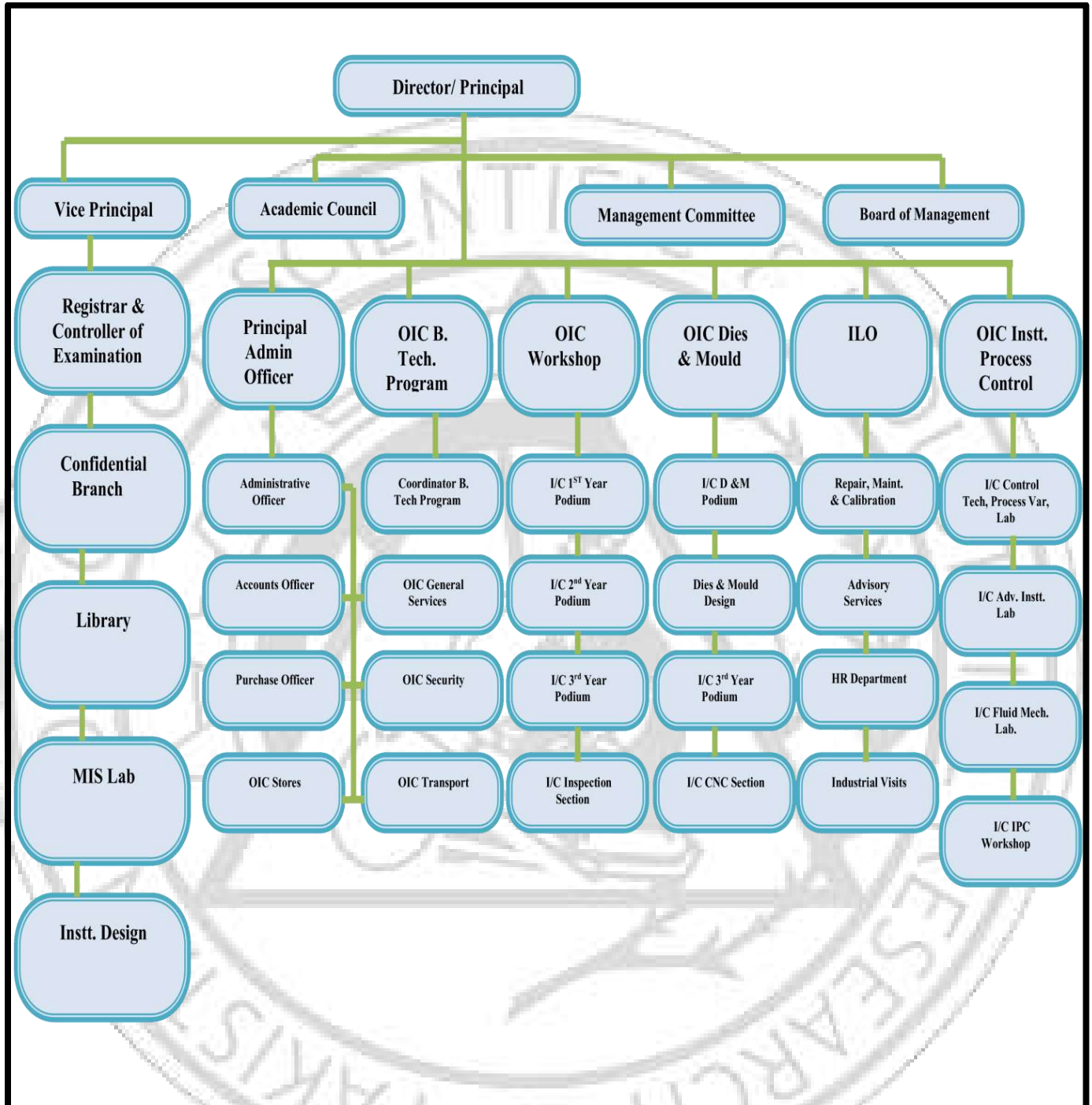


functioning with introducing a training program of 03 Years Diploma in the discipline of Precision Mechanics and Instrument Technology. Since its inception it has progressed and introduced new training programs in different disciplines. Due to its high standards and recognition, the trained manpower have played their role in national development and capacity building of national industries.

In Morning, 03 Years Diploma Course of Associate Engineer in Mechanical Technology with Specialization in Precision Machining & Instrument Technology for 48 students per year and 04 Years Diploma of Associate Engineer in Mechanical Technology with Specialization in Dies & Mould Technology for 18 students per year and in the Evening 66 students are conducted according to the methods of training followed in Switzerland. The Course is affiliated with the Sind Board of Technical Education, Karachi. Three years Diploma Course of Associate Engineer in Instrumentation and Process Control Technology also initiated in morning, in the year 2005 for a Batch of 30 students from all over Pakistan, now, the seats have been increased upto 40.

In addition to the regular Diploma courses, PSTC is also organizing and conducting the evening short courses (CAD/CAM, PLC, CNC, Electronics & Dies & Mould) of 06 months duration through NAVTTC under Kamyab Jawan Program Scheme of Prime Minister of Pakistan, since 2020.

ORGANIZATIONAL CHART



Activities & Achievements of the Centre Diploma of Associate Engineering Courses

- ***Three Years Diploma of Associate Engineer in Mechanical Technology with Specialization in Precision Machining & Instrument Technology***
The unique course to impart excellent skill oriented training on various conventional machine coupled with lectures in relevant theory, started in 1965 with the collaboration of Switzerland.
Duration: 03 Years
Endorsed by Sindh Board of Technical Education
Annual intake: 48 students
- ***Four Years Diploma of Associate Engineer in Mechanical Technology with Specialization in Dies & Mould Technology.***
Started in 1980 in collaboration with Switzerland
Duration: 04 Years
Endorsed by Sindh Board of Technical Education
Annual intake: 18 students (Morning)
In the year 2009, intake of 66 students were increased as a full batch in Evening.
- ***Three years Diploma of Associate Engineer in Instrumentation and Process Control Technology.***
Commenced in the Year 2005, Instrumentation and Process Control Technology was initiated with the collaboration of Govt. of Spain.
Affiliated with Sindh Board of Technical Education.
Duration: 03 Years, Annual intake: 40 students

Admission of New Batch for the Year 2022-2023

The admission process (2022-23) completed successfully and selected on merit in the following disciplines.

Regular Basis

| | | |
|---|---|--------------------|
| ➤ | 03 Years DAE Mechanical Technology with Specialization in Precision Machining and Instrument Technology | 48 Students |
| ➤ | 04 Years DAE in Mechanical Technology with Specialization in Dies & Mould Technology | 18 Students |
| ➤ | 03 Years DAE in Instrumentation & Process Control Technology | 30 students |
| ➤ | TOTAL: | 96 Students |

Self Finance Basis

| | | |
|---|--|---------------------|
| ➤ | 04 Years DAE in Mechanical Technology with Specialization in Dies & Mould Technology | 31 Students |
| ➤ | 03 Years DAE in Instrumentation & Process Control Technology | 10 Students |
| ➤ | TOTAL:- | 41 Students |
| ➤ | GRAND TOTAL | 137 Students |

Some Significant Achievements 2022-23

Got ISO-9001-2015 Certification

PSTC has achieved a milestone of getting ISO 9001-2015 Certification. A ceremony was held today for awarding the ISO 9001-2015 Certificate to PSTC Karachi. The ISO Team Leader, Project Director Engr Farah Haroon, Engr Anjum Darakhshan, Principal PSTC Karachi was gathered along with the team members of ISO 9001-2015 from IIEE and PSTC. Certificates and Shields of Appreciation were presented to the Members.

Initiation of Project Digital Transformation, strengthening and Automation of PCSIR (DTSA).

The inauguration of the project digital transformation, strengthening and automation of PCSIR (DTSA) held at Pak Swiss Training Center Karachi. The project is a milestone achievement where all the Units of PCSIR will be digitized and strengthen. The Inauguration made by Dr Hafiz Rab Nawaz Director General KLC, Engr. Muhammad Ibrahim, Co- Project Director DTSA, Islamabad and Mr. Farhan Hamid. Director PSTC along with the team members.

Digital Library System at PSTC Karachi

Today the Inauguration Ceremony of PSTC Digital Library held at PCSIR Labs. Complex Karachi and inaugurated by Dr. Hafiz Rab Nawaz, Director General, PCSIR Labs. Complex, Karachi. Engr. S. Farhan Hamid Ali, Director, PSTC Karachi gave presentation and elaborated the advantages of Digital Library which made available at PSTC. It's a way forward which will be benefited by the students and staff of PSTC.



PRECISION SYSTEMS TRAINING CENTRE-LAHORE

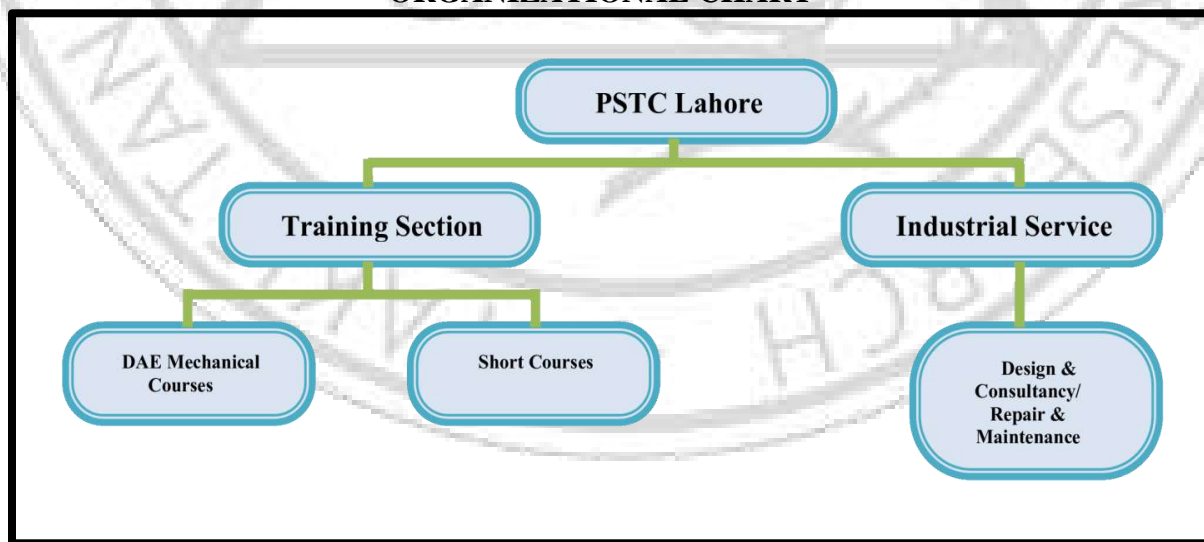
Precision Systems Training Centre – Lahore (PSTC – Lahore) was established in 2007 considering the requirement of the local industry for introducing training programme in Mechanical and Instrument Technology.

Objectives are to provide the foundation for development and generation of technical know – how and to organize and conduct training in the following fields:



- i. DAE in Mechanical Technology with specialization in Precision Mechanical & Instrument Technology (3 years)
- ii. DAE in Mechanical Technology with specialization in Dies & Moulds Technology (4 years)
- iii. Short term courses of 06 to 24weeks duration for Engineer & Technicians employed in the industries.

ORGANIZATIONAL CHART



Academic Activities:

Passouts:

14th batch of 35 trainees for DAE in Mechanical Technology with specialization in Precision Mechanical & Instrument Technology (3 years) and **13th batch** of 19 trainees for Mechanical Technology with specialization in Dies & Mould Technology (4 years) have completed their training in April 2023. Most of the students are now serving in different sectors of well reputed industry and other organizations both local and abroad.

Trainings Conducted:

Rescue 1122, Lahore:

The Punjab Emergency Service Rescue 1122, Community Safety and Training Wing Lahore has conducted basic life support (BLS) and fire safety training (03 days) for students (02 batches) and staff members of PSTC, PCSIR Lahore w.e.f 09/02/2023 to 10/02/2023. In this programme, volunteer students has been trained on ‘Basic Life Support and Fire Safety Orientation’ through lectures, presentations and practical demonstrations.

3D Scanning with portable scanner:

In order to enhance the skills of students a training session has been arranged on 3D Scanning with portable scanner by representative s of Dynamic Tooling Pvt. Ltd. Lahore.

In –house Training by Director PSTC-Lahore:

In –house trainings were conducted for the capacity building of staff by the Director PSTC Lahore on following topics:

- a) Emotional Intelligence at the Workplace Setting
- b) SWOT Analysis
- c) Goal

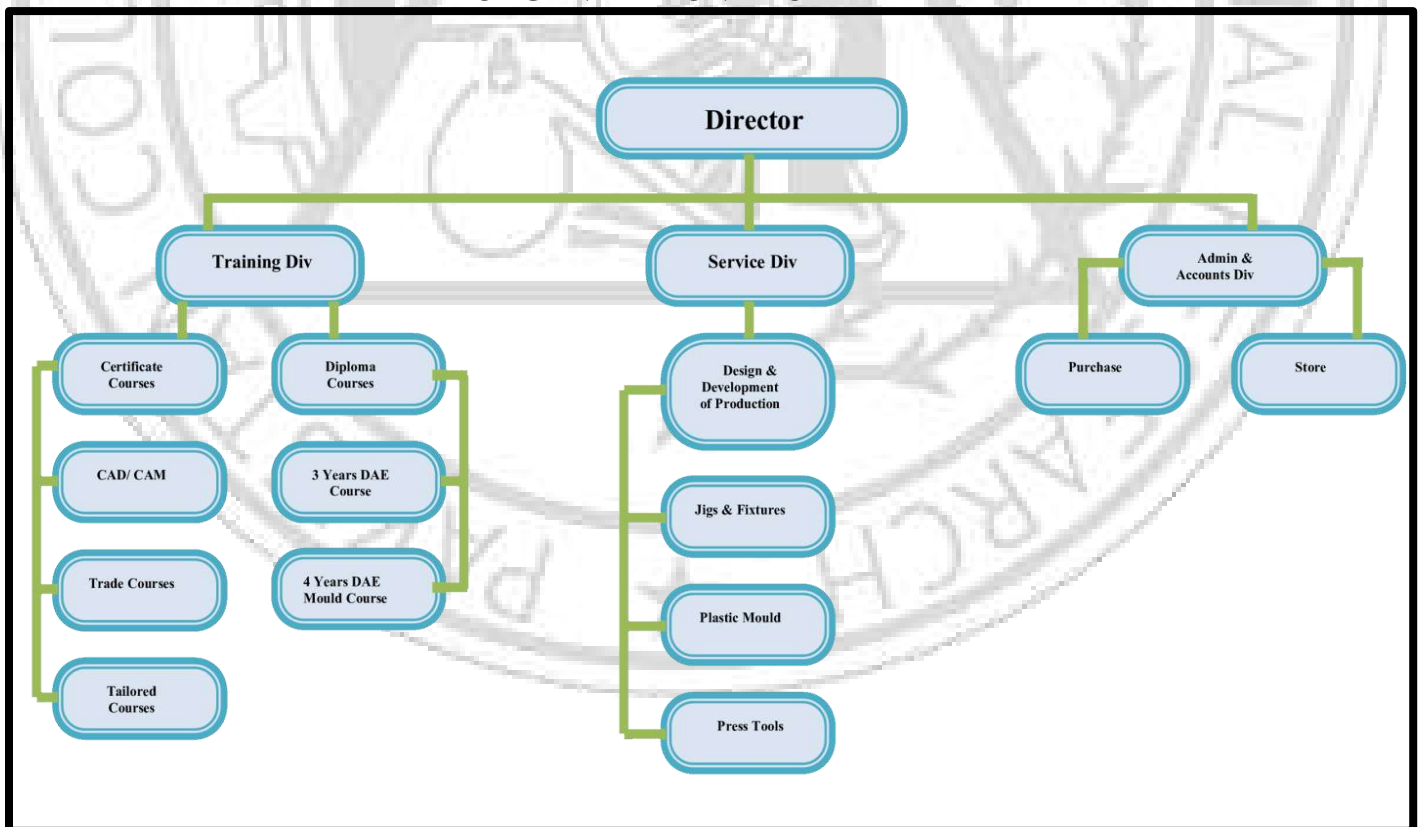
PRECISION SYSTEMS TRAINING CENTRE-PESHAWAR

Precision Systems Training Centre (PSTC), Peshawar was established in 2004 with the aim to ensure rapid development in the industrial sector of K.P.K by introducing new training programme in the emerging trades with modern-age techniques of teaching and as per requirement of the industries through;



Organizing and conducting three years Diploma course of Associate Engineer in Precision Mechanical & Instrument Technology and Four Years Diploma course of Associate Engineer in Dies & Mould Technology. Organizing & conducting short term courses of 4 to 24 weeks duration in the field of Machine Tool Operations, CAD/CAM, Process Control, Dies & Mould, Engineering, Drawing & Design.

ORGANIZATIONAL CHART

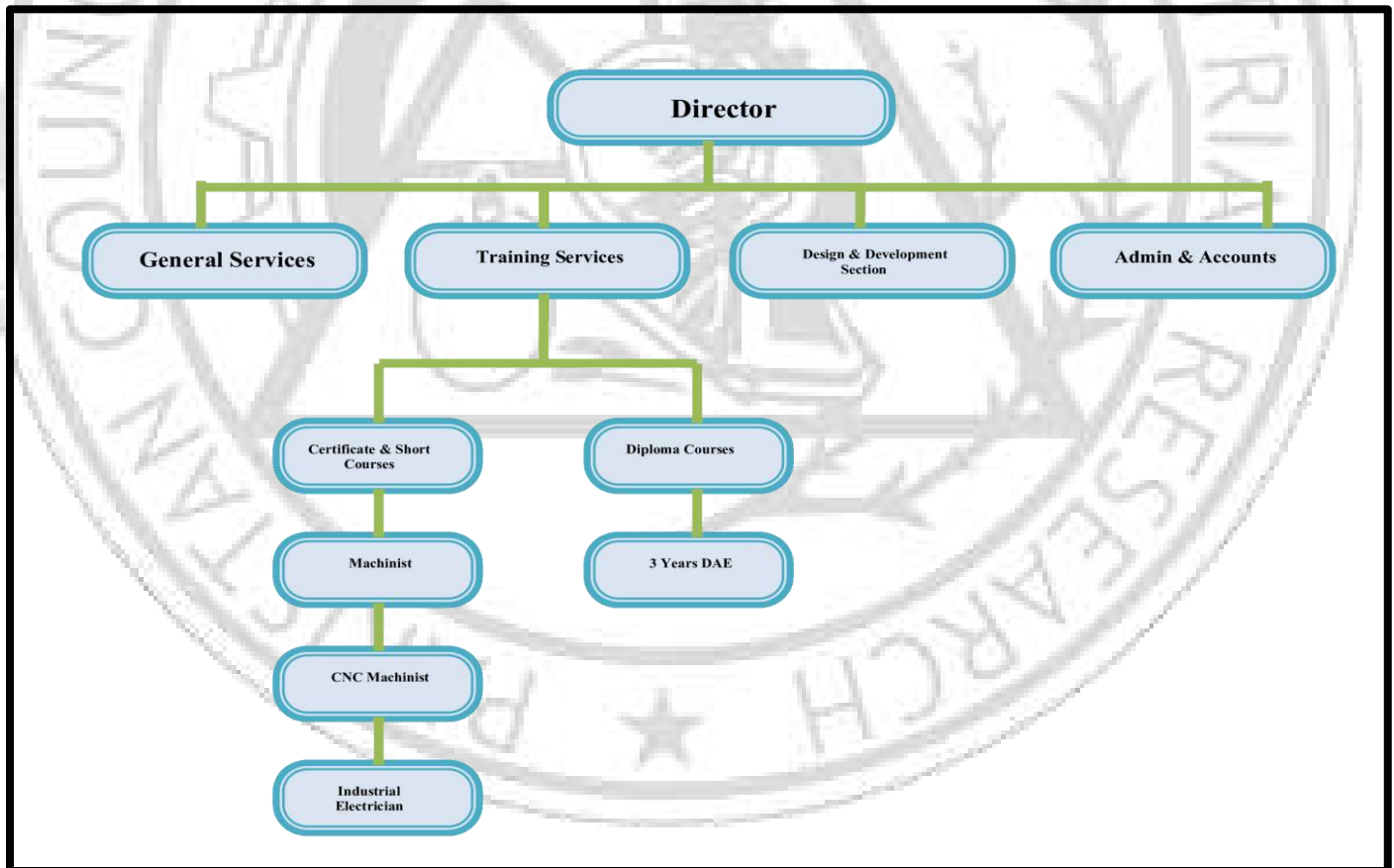


PRECISION SYSTEMS TRAINING CENTRE-QUETTA

Precision Systems Training Centre (PSTC) Quetta was established in 1987, PSTC Quetta is the only training centre in Balochistan, providing quality training in line with requirement of industrial development in the region. The Centre is actively involved in development of specialized skilled manpower and presently conducting 03 years course of DAE in the field of Mechanical Technology with Specialization in Precision Machining and Instrument Technology.



ORGANIZATIONAL CHART



PCSIR-CAST METALS & FOUNDRY TECHNOLOGY (CM&FT) CENTRE, DASKA.

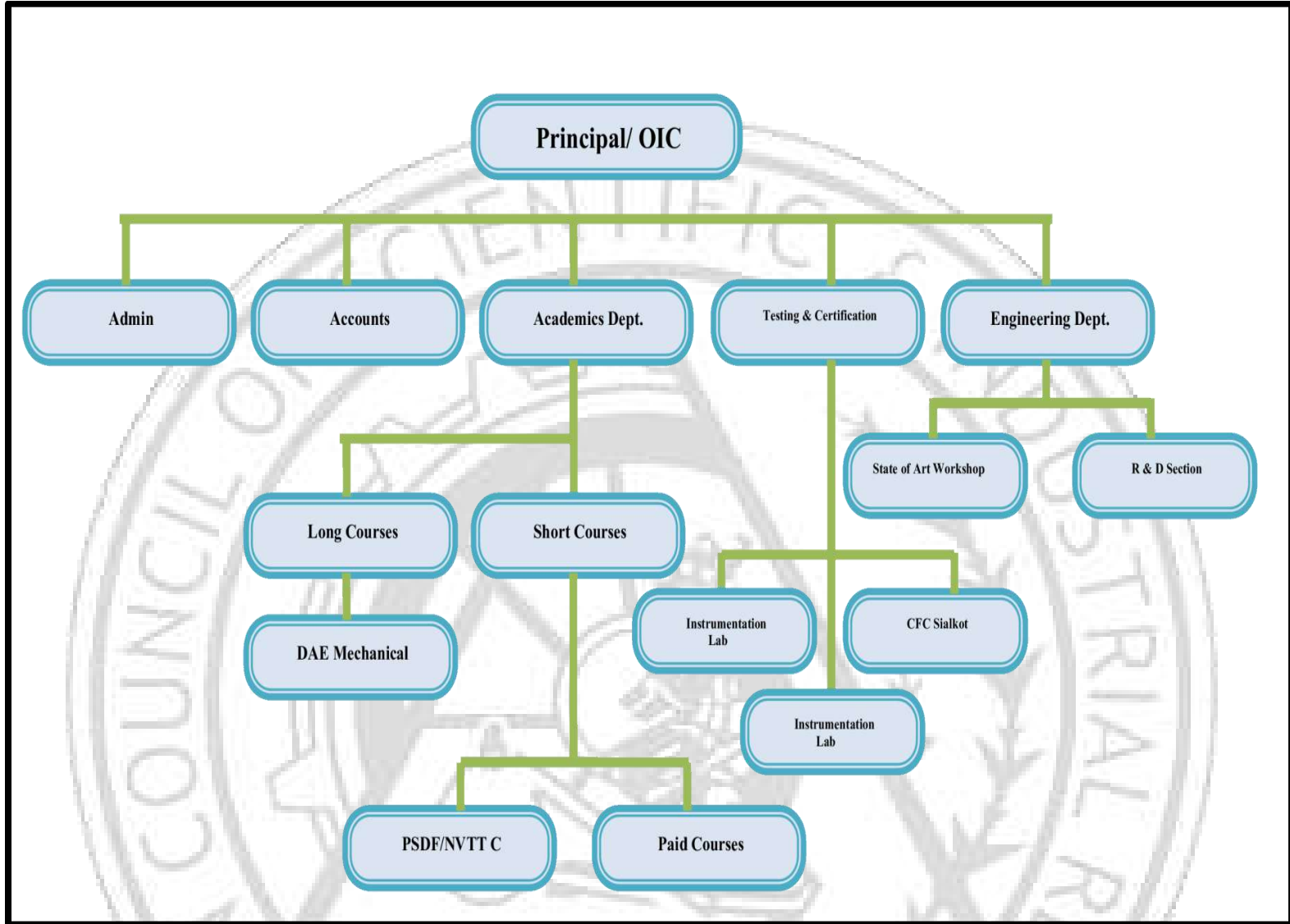
The Cast Metals & Foundry Technology Centre, Daska is a PSDP Project and established at Punjab Small Industries Estate, Daska, with the capital cost of Rs. 304.7 Million (including Rs. 95.00 Million as F.E.C). The project was started in Jan 2005, and has been completed in Dec 2011. The centre is providing multi-pronged and multi-dimensional services to all engineering industries especially the Cast & Metal Industry.



Cast Metals & Foundry Technology Centre conducts and promotes industrial projects and help research scholars, institutes and industries in the following ways:

- Provision of trained human resource to all relevant institutes and concerned industries.
- Sharing of information, literature and technical knowhow regarding Cast Metals & Foundry Technology.
- Provide customized training for employees in the metal Casting Industry
- Product Design & Development with the help of JV partners.
- Analyze metallic samples using a world class optical Emission Spectrometer
- Prepare samples and conduct micro structural examination using a digital Microscope
- Performs physical and mechanical tests including Hardness, Tensile and Impact Testing
- Heat Treatment of metallic parts by using muffle furnace & induction hardening etc.
- The Centre has an Academic Block, Admin Block, Workshop Building and Hostel building.

ORGANIZATIONAL CHART



MoUs / JV's Agreements/Collaborations:

PCSIR has established a common facility centre (CFC) at SIMAP Sialkot. The objective of the centre is to provide technical services/testing to the stakeholders. Number of industries has been served & more than, 2000 analytical tests has been conducted so far.

Contact Us

Dr. Syed Hussain Abidi, S. I.

Chairman

PCSIR Head office, 01-Constitution Avenue, Sector G-5/2, Islamabad
Phone: +92- 51-9225395-99, Fax: +92-51-9225372, E-mail1: chairman@pcsir.gov.pk

Engr. Sohail Ameer Marwat
Member (Technology)

PCSIR Head Office, 01-Constitution Avenue, Sector G-5/2, Islamabad
Phone: 051-9225374, E-mail: membertechnology@pcsir.gov.pk

Dr. Sarwat Ismail
Member (Science)

PCSIR Head Office, 01-Constitution Avenue, G-5/2, Islamabad.
Tel: +92-51-9225380; Email: pcsirmemberscience@gmail.com

Mr. Tanveer Ahmad Khan
Secretary

PCSIR Head Office, 01-Constitution Avenue, Sector G-5/2, Islamabad
Phone: 51-9225393, E-mail: memberfinance@pcsir.gov.pk

Mr. Muhammad Akram
Director (Finance)/ CAO

PCSIR Head Office, 01-Constitution Avenue, Sector G-5/2, Islamabad
Phone: 51-9225382, E-mail: memberfinance@pcsir.gov.pk

Dr. Hafiz Rab Nawaz
Director General

PCSIR Laboratories Complex, Karachi
Off university Road, Karachi-75280, Karachi, Pakistan.
Phone: 021-99261922, Email: pscirkarachilabs@gmail.com

Dr. Quratulain Syed
Director General

PCSIR Laboratories Complex, Lahore
Ferozpur Road, Lahore
Phone: 042-99230697, Email: llcpsir@gmail.com

Engr. Nasir Ali Baloch
Director

PCSIR Labs Quetta
Mustang Raod, Near Mian Ghundi, Quetta
Phone: 0304-9910276, Email: qlcpsir@gmail.com

Mr. Jahangir Shah
Director General

PCSIR Laboratories Complex, Peshawar
Jamrud Road, Peshawar
Phone: 091-9222166, Email: plcpsir@gmail.com

Dr. Muhammad Tahseen Aslam
Director

PCSIR Laboratories, Islamabad
Plot # 16, Sector H-9, Islamabad
Phone: 051-9265158, Email1: directorpcsirlabsisb@gmail.com

Engr. Ahmad Ali
Director

PCSIR Precision System Training Centre, Peshawar
Campus PCSIR, Palosi Road, Off University Road, Peshawar
Phone: +92-91-9221348, Email: pcsirpstcpehawar@gmail.com

Dr. Naheed Kausar
Director

Fuel Research Centre, Karachi
Off University Road, Karachi
Phone: +92-21-99261963, Email: frcpsirkarachi@gmail.com

Mr. Tariq Umar Khan
Director

PCSIR Labs, Skardu
Sadpara Road, Skardu
Phone: 05815-920305, Email: pcsirdctcskardu@gmail.com

Ms. Shahida Begum
Director

PCSIR Scientific Information Centre, Karachi
PCSIR Laboratories Campus, Sharah-e-Dr. Salimuzzaman Siddiqui,
Karachi
Phone: +92-21-99261914, Email: sicpcsirkarachi@gmail.com

Dr. Farman Ali
Director

PCSIR Leather Research Centre, Karachi
D-102, S.I.T.E, South Avenue, Karachi
Phone: +92-21-99333372, Email: lrcpcsirkar@hotmail.com

Engr. Syed Farhan Hamid Ali
Principal

PCSIR Pak-Swiss Training Centre, Karachi
PCSIR Labs Campus, Shahrah-e-Dr. Salimuzzaman Siddiqui, Karachi
Phone: +92-21-99261970, Email: pcsirpstckarachi@gmail.com

Engr. Dr. Farah Haroon
Principal

PCSIR Institute of Industrial Electronics Engineering, Karachi
ST-22/C, Block 6, Gulshan-e-Iqbal, Karachi
Phone: +92-21-99244581, Email: iieeecsir@iiee.edu.pk

Engr. Abdul Wahab
Officer Incharge

PCSIR Cast Metals & Foundry Technology Centre, Daska
Small Industries Estate (SIE) Daska, District Sialkot
Phone: +92-52-6625045, Email: pcircmftdaska@gmail.com

PCSIR ANNUAL REPORT 2022-2023

*Compiled, Edited, Proofread,
Designed and Composed by:*

Dr. Sarwat Ismail, Member (Science)
Dr. M. Tehseen Aslam, Director (Marketing)
Dr. Gul-i-Rana, PSO, SIC Karachi
Dr. Shafqat Ullah, (SSO)
Mr. Islam Ud Din Khushik, Baloch (Assistant)
Mr. Nadeem Ahmad, (Senior Technician)



PCSIR Head Office

1-Constitution Avenue, Sector G-5/2, Islamabad

Tel:(051) 9225395-99

Fax:(051) 9225372

Email: pcsirmemberscience@gmail.com

Website: <https://www.pcsir.gov.pk>