

# ANNUAL REPORT

2023-2024



**PAKISTAN SCIENCE FOUNDATION**

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

# **PAKISTAN SCIENCE FOUNDATION**

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(Till 27.12,2023)

Post Vacant

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(05.12.2023 till date)

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## **BOARD OF TRUSTEES**

Expired on 17.05.2023

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## ACRONYMS

AGR	Agricultural Sciences
AJK	Azad Jammu and Kashmir
AKU	Agha Khan University
B	Balochistan
BIO	Biological Sciences
BIOTECH	Biotechnology & Genetic Engineering
C	Capital
CDWP	Central Development Working Party
CEMB	Center of Excellence in Molecular Biology
CEME	College of Electrical and Mechanical Engineering
CEWRE	Center of Excellence in Water Resources Engineering
CIIT	COMSATS Institute of Information Technology
COMSATS	Commission on Science and Technology for Sustainable Development in the South
COMSTECH	OIC Standing Committee on Scientific and Technological Cooperation
DDWP	Departmental Development Working Party
EARTH	Earth Sciences
ENG	Engineering Sciences
ENVR	Environmental Sciences
ILG	Industrial Linkages Group
KPK	Khyber Pakhtoon Khwa
PU	Peshawar University
FJWU	Fatima Jinnah Women University
GCU	Government College University
GU	Gomal University
KU	Karachi University
MED	Medical Sciences
NARC	National Agricultural Research Center
NIBGE	National Institute for Biotechnology and Genetic Engineering
NNSFC	National Natural Science Foundation of China
NSLP	Natural Sciences Linkage Programme

NSTC	National Science and Technology Commission
P	Punjab
P-AU	Agriculture University
P-PU	Punjab University
PHYS	Physics
PINSTECH	Pakistan Institute of Nuclear Science and Technology
PCCC	Pakistan Central Cotton Committee
PSDP	Public Sector Development Programme
S	Sindh
SALU	Shah Abdul Latif University
SUIT	Sindh Institute of Urology & Transplantation
SU	Sindh University

## **Executive Summary**

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

Pakistan Science Foundation (PSF) is apex body for promotion and funding of scientific and technological research and other related activities in the country. The tasks undertaken by the Foundation for the performance of its statutory functions are divided into two broad categories viz., Science Promotion and Science Popularization. Some of these activities pertaining to above mentioned categories are undertaken by Pakistan Museum of Natural History (PMNH) and Pakistan Scientific and Technological Information Centre (PASTIC), the two subsidiary organizations of PSF, while others are performed by PSF Science Wing and are reflected as under:

### **Research Support**

During 2023-24, a total of 338 research proposals/concept papers in 10 scientific field namely Agricultural Sciences, Biological Sciences, Biotechnology & Genetic Engineering, Chemistry, Computer Sciences/Maths, Earth Sciences, Engineering Sciences, Health Sciences, Environmental Sciences and Physics remained under active consideration. Among these, 79 projects were under-process, of which, 11 projects were recommended by Technical Committee for the approval of Foundation. While, 19 projects were approved by the Foundation for funding at total cost of Rs. **70.827 million** (Annexure-II) whereas Rs. **48.265 million** were released on account of first installments of already approved projects.

During the period, **80** research projects remained on-going and **46** progress reports (semiannual, 1<sup>st</sup>, 2<sup>nd</sup> annual & final) of these projects were received. Semiannual reports were scrutinized by PSF staff, whereas the annual and final reports, after initial scrutiny, were sent for evaluation to the subject experts to assess the interim progress of the projects. It may be mentioned that due installments of ongoing projects are released only if the interim progress of the projects is satisfactory. An amount of **Rs. 16.007 million** was released on account of due installments and evaluation fee of projects. **06** Research projects were completed during the year. The subject experts evaluated the final technical reports of these projects, which were subsequently placed before the respective PSF Technical Committees for consideration. After the adaptation of these reports by the Committee, the accounts of these projects were settled and files were closed. One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of 06 completed projects, 03 research papers were published in national and

international journals in addition 03 Ph.D., 08 M.Phil./M.Sc. (Hons) and 4 BS students secured their respective degrees while working as Research Associates in these completed projects.

### **Science Promotion Activities**

During the report period, an amount of Rs. 5.12 million was released to various institutions for organizing 46 conferences, seminars, and workshops on important scientific topics. However, Scientific Survey, Institutional Support and PSF Fellowships programs were not entertained due to paucity of funds.

### **R & D Industry Programme**

Technology development and commercialization is the only way through which the benefits of scientific research can be transferred to the common man. PSF has formulated an effective strategy for the achievements of this function by encouraging applied research rightly identified in collaboration with the industrial community to address and solve specific industrial issues. So that the technologies and processes developed at the laboratory level can be taken up for the pilot level production to pave way for commercialization.

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

During 2023-2024 a total of **10** research proposals in scientific disciplines under R & D Industry Programme remained under active consideration. Total 11 research projects were on-going and an amount of **Rs. 3.1 million** was released on account of due instalments and evaluation fee of these projects to subject experts.

### **International Liaison Section**

PSF has the mandate to liaise with similar international bodies across the globe and is in active collaboration with many similar International bodies. In the prevalent global scenario, the importance of international collaborations has become vital for the technological developments and advancement of knowledge. Therefore, PSF has re-vitalized its international collaborations and

embarked upon new linkages to harness potential of technologically advanced nations like China, Turkey, Iran and Sri Lanka. In addition to this PSF regularly plays role as a facilitator to link various international organizations/ universities with local universities and research institutions. Delegates from the reputed universities and similar collaborating bodies regularly hold meetings with PSF to discuss the areas of joint collaboration.

Over the years, PSF has established cordial bilateral relations with various international bodies to synergize efforts for achieving technological excellence and socioeconomic well-being of the people at large. Joint research projects are already ongoing with The National Natural Science Foundation of China (NSFC); Scientific and Technological Research Council of Turkey ([TÜBİTAK](#)): Ministry of Science, Research and Technology (MSRT), Iran and National Science Foundation, Sri Lanka.

During the report period, PSF launched 5<sup>th</sup> joint R&D call for proposals with National Natural Science Foundation (NSFC), China under which 10 projects were awarded. 81 projects remained ongoing (including newly initiated projects) while 17 technical reports (semi-annual, annual & final) of ongoing projects were received and an amount of Rs.58.46 million was released on account of due installment of already ongoing projects and 93.4 Million was released on the account of first installment of newly initiated projects with NSFC-China. Whereas 15 projects were completed during 2023-24. In addition, 18 projects of IL remained ongoing funded under PSDP project Competitive Research Program. 12 technical reports (semi-annual, annual & final) of ongoing projects were received and an amount of Rs.14.28 million was released on account of due installment of already ongoing projects and first installment.

## **Planning and Development Section**

P&D is the coordination/facilitation arm of the Pakistan Science Foundation (PSF) and acts as the focal point on behalf of PSF and its subsidiary organizations i.e. PASTIC and PMNH for transmission of information to the Ministry of Science & Technology (MoST) and other ministries including Planning Commission. It is mainly responsible for preparation / finalization of PSDP projects pertaining to the statutory functions of PSF as well as their processing with MoST for approval by the competent forums at MoST and M/o Planning Development & Reforms. Following activities are being undertaken by the P&D Wing,

- Preparation/finalization and processing of New Development Projects / PC-1s.

- Submission of PC-IVs / PC-Vs to MoST
- Coordination with different Sections of PSF, PASTIC, PMNH and MoST regarding ongoing and new PSDP projects.
- Implementation of on-going development projects of PSF, PMNH and PASTIC Attending various Review meetings at MoST/Planning Commission.
- Views/Comments on the PC-Is received from MoST/ Planning Commission
- Compilation & submission of Monthly / Quarterly Reports, Reviews, Briefs, Presentations to MoST
- Replies to National Assembly / Senate Questions and other related information to MoST
- Coordination / preparation of material related to the National Assembly and Senate Standing Committee on S&T
- Activities under Non-Development Budget (Travel Grants).
- Activities to support the PSF Registered Scientific Societies in Pakistan

After the establishment of P&D Directorate in Year 2000, so far seventeen (17) projects have been completed while six (06) projects are ongoing.

### **Competitive Research Programme**

The Competitive Research Programme is the PSDP awarded to PSF to finance research projects under 04 streams viz., Individual Research, Consortium Research, Triple Helix Model and International Linkages. Its main objectives are: (i) Provision of the Research Grants to address the mega national issues and promote world class research, (ii) Development of the new processes/ products/ applications/ technologies through native knowledge / skills of the researchers working in the universities and R&D Institutions, (iii) Multi-disciplinary Research on the mega issues of National importance through provision of Consortium Research Grants, (iv) Collaborative projects with the established International Partners for Indigenous Technology Development particularly for substitution of imports, (v) Public-Private collaborations by providing strong platform to R&D institutions to liaise with Industry and Academia for the improvement and commercialization of their end-products so as to enhance the exports, (vi) Technological transformations in the specified thrust / priority areas to boost the economy that may result in the generation of S&T Human

resource as well as financial capital, (vii) Promotion of demand-driven research by linking public sector capability and private sector marketability, and (viii) Capacity building trainings for the project staff (National) and Project Formulation Workshops for the researchers.

During 2023-24, a total of 33 new Research projects were initiated and an amount of Rs. 112.974 million on account of first instalment while Rs.35.526 million were released on account of 55 ongoing research projects. 6 projects have been completed technically during this FY. During the report period 7 meetings of Scrutiny Committee, 5 meetings of Technical Committee, 3 meetings of Project Award Committee was held for review and award of the research projects/grants. 112 under process research projects have been Peer reviewed by subject experts. Call for Proposals (Academia-Industry Cooperation) was launched in March- 2024, By Pakistan Science Foundation (PSF), Govt. of Pakistan and The Scientific and Technological Research Institution of Turkey (TUBITAK) under Competitive Research Program (CRP) in the areas of Artificial Intelligence, Internet of things (IoT), Electric vehicles & Oceanography. One-day training workshop on “Monitoring & Evaluation” was arranged at PSF auditorium for the capacity building of project staff. Onsite monitoring of 17 ongoing research projects has been conducted to review the progress of the research projects. CPR projects are mostly of applied nature and result in development of new products/technologies/processes/techniques. Some short term projects resulted in development of prototypes like, indigenous Ventilator machine, Diagnostic catheter and automatic Syringe Pump for Intravenous Infusion of COVID-19 Patients in ICU.

### **PSDP “Launching of Stem in Pakistan**

The "Launching of STEM in Pakistan, Phase-I (Revised)" project, initiated by the Pakistan Science Foundation (PSF) under the Ministry of Science and Technology, seeks to revolutionize Science, Technology, Engineering, and Mathematics (STEM) education across Pakistan. The project began with a pilot phase targeting 50 Higher Secondary Schools (HSS), including 6 Cadet Colleges, and universities, with an emphasis on transforming traditional science classrooms into innovative STEM environments. This transformation is achieved through the establishment of FABLABs equipped with state-of-the-art tools and equipment for hands-on, inquiry-based learning. The project aims to provide specialized capacity-building programs for educators, develop modern pedagogical tools aligned with global best practices, and foster entrepreneurship skills among students. Through this initiative, the project seeks to nurture the next generation of innovators and job creators, thereby

contributing to the development of a knowledge-based economy in Pakistan. Originally approved in March 2021, the project was revised in August 2021 to expand its scope and increase its impact. With a revised budget of PKR 993.784 million and a revised completion date set for June 2025, the project continues to make significant strides in enhancing STEM education, equipping students with the skills and knowledge to thrive in the 21st century.

## **Science Popularization Section**

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

## **Natural Sciences Linkage Programme Endowment Fund 2023-24**

Natural Sciences Linkage Programme (NSLP) Endowment Fund is an important component of Pakistan Science Foundation (PSF) which is aimed at enhancement of agricultural production through effective research. The outcome of this research will benefit the end user by uplifting the life standard and income of the farmers. The Fund is being managed by PSF through Board of Governors (BoG) and Fund Management Committee (FMC). The Chairman, PSF is the Chief Executive of the Programme/Fund.

### **Aims and Objectives:**

- To enhance cooperation among scientists from Pakistan and the United States of America, in areas of significant mutual interest and benefit relating to natural sciences as applicable to agriculture.
- To increase the contact and collaboration among scientists and institutions of biological research, development and higher learning institutes between the two nations.
- To provide researchers and institutions with opportunities to exchange information, ideas, skills and techniques.
- To enhance opportunities to collaborate in solving problems of common interest relating to natural sciences and to utilize special research and development facilities or opportunities available.
- To identify the researchable areas in natural sciences especially agricultural sciences with aim to increase farmers profitability

### **Research Priority Areas:**

Selected priority areas for collaboration may include, but are not limited to; Collection, Evaluation and Exchange of Germplasm, Plant Genomics, Plant Biotechnology, Stress Biology, Bio-Informatics, Application of Information Technology in Agriculture, Identification and Control of Animal/Plant Diseases, Dryland/Sustainable Agricultural Production System; Integrated Pest and Disease Management, Biotechnology, Microbiology, Agribusiness Development, Biophysics, Chemistry, Environment, Energy, Water Resource Management and Climate Change particularly with reference to Agriculture.

Project proposals which highlight main problems of agricultural sector are invited from universities and R&D organizations across the country. Research work is emphasized on the food production & food security issues in Pakistani scenario. Currently 248 projects are being funded in different Universities and R&D organizations around the country under this programme.

Projects are received from researchers throughout the year; they undergo scrutiny and peer review before presenting to the Technical Committee, which comprises of eminent scientists from different specialized areas of agriculture and natural sciences. The target areas of these projects include germplasm screening of different crops, insect and pest management for the disease free crop production, nutrition management of crops and post-harvest technology. All

these research issues are vital component of today's agriculture and are imperative in bringing the value added products in the market. Apart from this, many projects from specialized fields of animal sciences are also being funded. These projects include research in genetic screening of different animal breeds, feed technology and milk quality areas. In future, the fund aims to maintain focus on applied research projects related to Energy, Water resources management, Environment and Climate Change.

### **Pakistan Scientific and Technological Information Centre (PASTIC)**

The Pakistan Scientific and Technological Information Centre (PASTIC) is premier national organization with prime focus on collection and dissemination of Scientific and Technological Information to scientists, researchers, academicians, industrialists, entrepreneurs, planners, and policymakers for research support. It also organizes various activities e.g., training workshop, seminars/webinars, conventions, symposia, conferences etc. for skill development of scientific and industrial community. PASTIC National Center is located at Quaid-i-Azam University Campus, Islamabad. It has six Sub Centers throughout Pakistan including Karachi, Lahore, Peshawar, Quetta, Faisalabad and Muzaffarabad. PASTIC's services include Bibliographic & Document Supply Service, Abstracting and Indexing Service, National Science Reference Library, Reprographic Services, Technology Information Services, Awareness and Promotion of PASTIC Services, Capacity/skill development of researchers & entrepreneurs and International Liaison.

Major achievements and initiatives taken during 2023-24 are summarized below:

- **Bibliographic & Document Supply Service:** 11,604 S&T documents and 1560 bibliographies in digital form were supplied to 823 R&D workers.
- **Abstracting and Indexing service:** 25500 records were abstracted and indexed into the database of Pakistan Science Abstracts (PSA).
- **National Science Reference Library:** 2986 users visited PASTIC library for getting references, reading, photocopying, internet browsing and web searching. Besides, the library received 135 issues of national and international journals in exchange and on gratis basis. 12 issues of Fresh Arrivals of PASTIC library published online as well as in print form and distributed among the members.
- **Reprographic Services:** 16 printing jobs from 09 R&D organizations were completed.

- **Technology Information Service:** Six (6) online issues of “Technology Roundup” a bimonthly Trade and Technology news e-bulletin were published. One (1) seminar on Patents Drafting, Filing, and Management was organized during the fiscal year (50 participants).
- **Awareness and Promotion of PASTIC Services:** 32 awareness seminars and 07 stalls were conducted/installed at various universities across Pakistan to create awareness about PASTIC’s online digital tools/databases benefitting 4100 researchers.
- **Capacity/skill Development of researchers/students:** 1469 researchers/students were trained in the area of Data analysis (SPSS, MAT-LAB), Reference Management (EndNote), Robotics, Research Ethics, Artificial Intelligence, & Research skills enhancement by carrying out 17 Training workshops/seminars across Pakistan. PASTIC also collaborated with Academia for organizing of 9 International and National Conferences benefitting 900<sup>+</sup> researchers/students.
- **International Liaison:** PASTIC as National Focal Point of UNESCO IFAP National Committee (UNESCO Information for All Programme IFAP) participated in meeting on Building Information for All (IFAP) through meaningful access and inclusive Knowledge Societies.

During the year, a total number of 690,423 users/researchers have been served through various PASTIC S&T Information services while 3100 researchers/students were trained.

### **Pakistan Museum of Natural History (PMNH)**

Pakistan Museum of Natural History the only Natural History Museum in the country was established in 1976 as an attached organization of the Pakistan Science Foundation, Ministry of Science & Technology, Government of Pakistan. Pakistan Museum of Natural History (PMNH) has four principal divisions namely Botanical Sciences Division, Earth Sciences Division, Zoological Sciences Division and Public Services Division. First three scientific divisions are engaged in the collection, identification and research activities pertaining to plants, animals, fossils and mineral resources of Pakistan, while the fourth one is responsible for mass education and popularization of natural history through various displays, exhibits and dioramas. Researchers of PMNH carried out extensive field works from the Coast of Arabian Sea to the Alpine Regions, roamed through barren areas for the collection of Flora & Fauna, Rocks, Fossils and minerals not only for research work but also for the purpose of education because education is also one of the main objectives of PMNH. For this purpose, PMNH regularly organizes trainings, workshops, seminars, symposia and other educational interactive activities related to natural history, environment and biodiversity of Pakistan. International days are also observed. PMNH has formed many national and international liaisons with the other research institutes in the country

and abroad. Due to these collective efforts of scientific and technical staff of PMNH and collaborations with other research institutions, PMNH has 1.4 million natural history specimens in its repositories. Research outcome of these field works and National and International projects are published in the form of research papers in reputed national and international journals. PMNH is not only conducting research on the natural resources of Pakistan which exists in the form of Flora & Fauna, Rocks, Fossils and Minerals but also educating the students of Pakistan along with the common people with the help of informative, interactive, educative 3-dimensional dioramas and exhibits. Students of schools, colleges and universities from all over the Pakistan visit PMNH as a part of their educational tours. Scientific and Technical staff of PMNH also facilitate the students and researchers from the other universities and institutes by providing help in their research in the form of information, technical assistance, specimens as a loan and guidance in their research work. The detail of activities and progress of 2023-2024 are given next in detail. Following are the major Divisions of PMNH.

- Botanical Science Division
- Earth Science Division
- Zoological Science Division
- Public service Division

## **Pakistan Science Foundation**

### **Introduction**

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

- i) Science Promotion supports basic and fundamental as well as applied research involving researchers/academia at universities and R&D organizations focusing socio-economic needs/development of the country.
- ii) Science Popularization endeavoring to image scientific ideas to grasp the concept of fundamental science.
- iii) Science Centers to encourage all segments of society in thinking, understanding and exploring science.

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

- i) Establishment of comprehensive scientific and technological information and dissemination centers.
- ii) Promotion of basic and fundamental research in universities and other institutions on scientific problems relevant to the socio-economic development of the country.
- iii) Utilization of the results of scientific and technological research including pilot plant studies to prove the technical and economic feasibility of processes found to be promising on a laboratory scale.
- iv) Establishment of science centers, clubs, museums, herbaria and planetaria.
- v) Promotion of scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular.
- vi) Organization of periodical science conferences, symposia and seminars.
- vii) Exchange of visits of scientists and technologists with other countries.

- viii) Grant of awards, prizes and fellowships to individuals engaged in developing processes, products, and inventions of consequence to the national economy.
- ix) Special scientific surveys not undertaken by any other organization and collection of scientific statistics related to the scientific efforts of the country.

The Foundation shall also:

- i) Reviews the progress of scientific research sponsored by it and evaluates the results of such research.
- ii) Maintain a National Register of highly qualified and talented scientists/engineers and doctors both in and outside Pakistan, and to assist them in collaboration with concerned agencies to seek appropriate employment.
- iii) Establish liaison with similar bodies in other countries.

The activities performed under the above-mentioned statutory functions are as under, however, the details are given in different chapters:

## **Activities and Programmes**

The activities and programmes undertaken by the Foundation to perform its statutory functions can be divided into the following four categories:

- i) Promotion and Financing of Scientific Research in the Country and the Utilization of the Research Results.
- ii) Promotion and Popularization of Science in Society.
- iii) International Liaison.
- iv) Establishment of Comprehensive Scientific and Technological Information Dissemination Centers.

The main functions of the Foundation i.e., research support, and science popularization, planning and development etc., are performed by the Science Wing of the Foundation and their detail is given as under:

**Research Support** is performing the following activities:

1. Research Support
  - a) Grants for Research Projects
  - b) Grants for Institutional Support
2. Research Evaluation
3. Promotion/funding of Scientific Societies/Learned Bodies
4. Funding of Conferences, Symposia, Seminars & Workshops
5. Travel Grants
6. International Liaison
7. Awards and Fellowships
8. Survey and Statistics
9. Scientists Pool
10. Innovations & Inventions
11. Planning and Development Programme

**Science Popularization** carries out science popularization activities including Science Caravans, Science Clubs, Science Fairs and holding of Popular Science Lectures, Workshops, Conferences and Symposia.

**Pakistan Scientific and Technological Information Centre (PASTIC)** is subsidiary organization of PSF, performs as Scientific and Technological Information Dissemination Center with its sub offices in all provincial capitals of the country.

**Pakistan Museum of Natural History (PMNH)** is a another subsidiary organization of PSF, established in 1979 to serve the national needs in the vitally important areas of research, conservation and education involving Pakistan's heritage of natural resources. The Museum is a National Repository for permanent storage of plants, animals, rocks, minerals and fossils of the country.

## I PAKISTAN SCIENCE FOUNDATION (PSF)

### 1. Research Support Section

#### 1.1 Under process Projects:

During the report period, **338** research proposals/concept papers remained under active consideration of the Foundation. Out of these, **79** projects were under-process, **11** projects were recommended by the Technical Committee for the approval and **19** were approved by the Foundation at a total cost of Rs. **70.827 million** (*Annexure-II*) whereas Rs. **48.265 million** were released on account of first installments of already approved projects.

#### 1.2 On-going Projects

During the period, **80** research projects remained on-going and **46** progress reports (semi annual, 1<sup>st</sup>, 2<sup>nd</sup> annual & final) of these projects were received. Semi annual reports were scrutinized by PSF staff, whereas the annual and final reports, after initial scrutiny, were sent for evaluation to the subject experts to assess the interim progress of the projects. Due installments of ongoing project are released only if the interim progress of the project is satisfactory. A list of the semi-annual, annual and final reports is given in Annexure-II.

#### 1.3 Completed Projects:

**06** Research projects were completed during the year. The subject experts evaluated the final technical reports of these projects, which were subsequently placed before the respective PSF Technical Committees for consideration. After the adaptation of these reports by the Committee, the accounts of these projects were settled and files were closed. A list of the completed projects followed by their scientific output is given below:

S.#	Project No.	Project Title	Outcome
1.	PSF/Res/C-RIU/Chem (583)	Design, Synthesis and Pharmacological Screening of Novel 2-mercapto Benzimidazole Derivatives as Potential Anti-ulcer Agents	01 Ph.D
2.	PSF/Res/KPK-PU/Earth (96)	Shale Gas Potential of the Kohat Sub-basin, Indus Basin, Pakistan	02 PhD's 04 MS 04 BS

3.	PSF/Res/P-UET.TX/Engg (152)	Design and Implementation of real time Cooperative MIMO Communication Platform for Next Generation Wireless Communications	01 Ph.D 01 M.Phil
4.	PSF/Res/P-UHS/Med (478)	Comparison of Salivary Aquaporin-5 Levels in Patients with Type-II <i>Diabetes mellitus</i> and Healthy Individuals	02 M.Phil
5.	PSF/Res/S-AKU/Med (525)	Identification of Serum miRNA as a Potential Cost-effective Biomarker of Glioblastoma	
6.	PSF/Res/S-AKU/Med (506)	Development of Mouse Model of Heart Fibrosis after Myocardial Infarction to Study the Molecular Contributions of Wnt-signaling Proteins and Galectin-3	01 M.Phil

## Chemical Sciences

- 1. Project No:** PSF/Res/C-RIU/Chem (583)  
**Project Title:** Design, Synthesis and Pharmacological Screening of Novel 2-mercapto Benzimidazole derivatives as Potential Anti-ulcer Agents  
**Duration:** 03-Years  
**Date of Initiation:** 31.10.2019  
**Date of Completion:** 30.04.2023 (extended)  
**Total Cost (Rs.)** 2,431,680/-  
**Total Expenditure (Rs.):** 2,337,762/-  
**Principal Investigator:** Dr. Humaira Nadeem  
Associate Professor  
Riphah Institute of Pharmaceutical Sciences  
**Name of Institution:** Riphah International University  
Islamabad

### SUMMARY:

The current study was designed to investigate the gastroprotective potential of synthesized benzimidazole derivatives using *in silico*, *in vitro* and *in vivo* approaches. Benzimidazole derivatives are well known for their pharmacological potential, therefore, a series of 20 benzimidazole-pyrazole hybrids were designed, synthesized and characterized successfully. First of all the compounds were designed and tested for their binding affinities with different enzymes particularly carbonic anhydrase and H<sup>+</sup>/K<sup>+</sup> Atpase using DockVina software. In the next step, ligands which showed best binding affinities were synthesized and screened for pharmacological potential.

Various *in vitro* and *in vivo* methods were used to identify most potent compounds among the synthesized derivatives. First of all, *in vitro* anti-oxidant activity was performed and IC<sub>50</sub> of compounds with greater free radical scavenging potential were determined. Derivatives with best anti-oxidant potential were selected and proceeded further for *in vivo* anti-ulcer activity. The selected compounds were also evaluated for their *in vitro* carbonic anhydrase inhibitory potential and most of the selected compounds exhibited better IC<sub>50</sub> values as compared to standard drug. Promising anti-ulcer activity was observed in ethanol-induced and indomethacin-induced ulcer models in rats for selected derivatives. Stomach tissues from treated animals were also preserved and subjected to ex-vivo H<sup>+</sup>/K<sup>+</sup> Atpase inhibitory potential and histopathological studies.

Results of pharmacological investigations revealed that most of the newly synthesized 2-mercaptobenzimidazole derivatives have demonstrated remarkable antioxidant potential with less gastrointestinal toxicity. The selected compounds exhibited good anti-ulcer potential comparable to standard drug. Among the selected benzimidazole M3i and M3m exhibited strong inhibitory effects on gastric H<sup>+</sup>-K<sup>+</sup> + ATPase comparable to the control drug omeprazole thus provided insights into the mechanism of action of test compounds. Safety profiling of these derivatives was done through *in vivo* acute toxicity assay. Overall, Comprehensive approach combining computational and experimental techniques was used to discover new molecules for the treatment of peptic ulcer.

## Earth Sciences

<b>2. Project No:</b>	<b>PSF/Res/KPK-PU/Earth (96)</b>
Project Title:	Shale Gas Potential of the Kohat Sub-basin, Indus Basin, Pakistan
Duration:	03-Years
Date of Initiation:	23.4.2019
Date of Completion:	22.10.2022 (extended)
Total Cost (Rs.)	6,342,870
Total Expenditure (Rs.):	4,822,734
Principal Investigator:	Dr. Muhammad Hanif Associate Professor
Name of Institution:	National Centre of Excellence in Geology (NCEG) University of Peshawar, Peshawar

### SUMMARY:

The decline in conventional hydrocarbon reserves and rising energy demand highlight the need for cost-effective unconventional resources like shale gas and tight oil. The project aims to assess the source rock potential of Cretaceous and Paleogene shales in the Kohat Sub-basin for shale gas feasibility. Key results derived from this study include:

**Mapping and Fieldwork:** Isopach mapping, fieldwork, and lithostratigraphic analysis of the strata under investigation identified the thickness, continuity, and characteristics of key shale formations in the Kohat Basin favorable for the shale gas plays.

**Geochemical Analysis:** shale source rocks were evaluated from outcrop samples and ditch cuttings for hydrocarbon potential, kerogen type, and thermal maturity, revealing varying organic richness and generative potential among formations including;

- Hangu Formation: Mixed Type II-III kerogen, thermally mature, fair to good organic richness and a potential candidate for shale gas of optimum thermal maturity.
- Patala Formation: Mixed Type II-III kerogen, marginally mature to mature, with fair to good organic richness and is potential oil/gas-prone source rock.
- Bahadur Khel Salt and Jatta Gypsum shales: Predominantly immature to mature with poor to good gas generative potential with limited thickness and lateral continuity.

### **Mineralogy and Petroelastic Properties:**

- Dominant mineral phases (dolomite, calcite, quartz) and less clay mineral phases in the Hangu and Patala formations compared to Bahadur Khel and Jatta shales that contribute to good reservoir quality.
- Brittleness, is higher in formations with significant quartz and dolomite content, favoring Hangu, Patala, and Lumshiwal formations.

- The mineralogy of the Patala, Lumshiwai, and Chichali formations varies across wells, with dominant clay minerals like illite, glauconite, and mixed-layer clays, along with calcite, dolomite, and quartz in varying proportions.
- Petroelastic property analysis reveals that the Chichali Formation showing potential as an unconventional reservoir despite low TOC in some wells.

**Thermal Maturity and Burial History:** Thermal maturity models reveal that the Sumari Deep-X-01 wells are less buried than the Makori-01 and Manzalai-02 wells, with the latter reaching peak oil generation. The Datta and Lumshiwai formations show the best hydrocarbon potential due to greater burial and favorable TOC, while the Hangu and Lockhart formations have lower potential due to shallower burial. Burial-history indicate the Patala Formation oil generation began 2 million years ago, with significant hydrocarbon expulsion occurring between 14 and 2.5 million years ago.

**Reservoir Quality and Challenges:** While Chichali, Lumshiwai, and Lockhart formations exhibit favorable petroelastic properties, issues like limited data, lateral discontinuity, and thin source intervals present challenges.

### Engineering Sciences:

<b>3. Project No:</b>	<b>PSF/Res/P-UET.TX/Engg (152)</b>
Project Title:	Design and Implementation of real time Cooperative MIMO Communication Platform for Next Generation Wireless Communications
Duration:	02-Years
Date of Initiation:	01.07.2017
Date of Completion:	31.12.2019 (extended)
Total Cost (Rs.)	1,171,980/-
Total Expenditure (Rs.):	472,280/-
Principal Investigator:	Dr. Sarmad Sohaib
	Department of Electrical and Electronic Engineering
Name of Institution:	University of Engineering & Technology, Taxila.

### SUMMARY:

In this study investigated the use of Software Defined Radio (SDR) for practical implementation of a wireless transceiver. The main goals of this project are:

- Study of multi carrier modulation schemes.
- Implementation of real time orthogonal frequency division multiplexing (OFDM) prototype using software radio peripheral (USRP).
- Investigate the challenge of synchronization and channel estimation in real time implementation.

- Design and implementation of non orthogonal multiple access (NOMA) scheme for 5G and beyond.
- Experimental evaluation of cooperative NOMA in diverse channel condition with sufficient quality of service requirement.

The methods involved in this work are extensive literature study, design and implementation of digital transceiver through simulations using MATLAB and testing those models using National Instruments (NI) USRP 2932. In primary stage, basic baseband modulation scheme Quadrature Phase Shift Keying (QPSK) is implemented using MATLAB/Simulink and over the air performance is evaluated by USRP. In the next stage, we have implemented an OFDM based WLAN standard on MATLAB interfaced with USRP. The biggest challenge in implementation of this model was the synchronization of transmitter and receiver which was overcome by using correlation properties of training sequences and Schmidl-Cox method. The benefits of this project are quite diverse which can be utilized in undergraduate as well as graduate level.

The prototype model developed during this work will enable the real-time implementation of communication system and provide supporting material to understand the theoretical concepts. On the other hand, this work will be extended to develop a test bench for the experimentation of 5G communication network.

At the advance stage of this work a prototype of NOMA transceiver is developed. This prototype model is used for the experimental evaluation cooperative NOMA under diverse channel conditions. The main contributions of this stage are highlighted as:

1. Development of the physical layer prototype of downlink NOMA transceiver using Simulink/SDR platform.
2. Presented the extensive comparative analysis of cooperative NOMA with the traditional multiple access schemes along with an assessment on the utility of user cooperative NOMA and dedicated relay cooperative under diverse channel conditions.
3. Testing of the power allocation mechanism based on the QoS requirement to serve multiple user.
4. Finally, the implementation of NOMA transceiver according to the IEEE 802.11a standard to show its compatibility with previous standard.

The findings of this stage titled “Cooperative NOMA, Prototyping and Experimental Evaluation using SDR” published in IEEE Transaction on Vehicular Technology. Furthermore, the OFDM model is used for dataset collection for human activity recognition (HAR) using channel state information.

The key contributions of this work are:

1. We propose a device free HAR model which uses the DGRU based deep learning approach for activity classification by exploiting the CSI.
2. We leverage on the advanced DGRU network which has the ability to process the rapidly changing CSI using two gates for better parameter generalization and reduced convergence time and a comparative analysis is done with traditional methods to validate our results.
3. For real time experimental evaluation and dataset collection, software defined radio (SDR) platform is used. 30 volunteers including both male and female of different age groups are involved in experimental setup.

The results of this work shows that proposed scheme has outperformed the traditional activity recognition schemes in indoor environment. The finding of this work titled “A DGRU Based Human Activity Recognition Using Channel State Information” published in special issue of Measurement.

### **Health Sciences:**

4. **Project No:** PSF/Res/P-UHS/Med (478)  
**Project Title:** Comparison of Salivary Aquaporin-5 Levels in Patients with Type-II *Diabetes mellitus* and Healthy Individuals
- Duration:** 02-Years  
**Date of Initiation:** 03.12.2018  
**Date of Completion:** 28.02.2022  
**Total Cost (Rs.):** 1,233,588/-  
**Total Expenditure (Rs.):** 798,480/-  
**Principal Investigator:** Dr. Sarah Ghafoor  
Associate Professor  
Department of Oral Biology  
University of Health Sciences  
Lahore
- Name of Institution:**

### **SUMMARY:**

Diabetes Mellitus (DM) is a systemic condition with xerostomia and dryness of eyes as commonly reported complaints and the study has designed to compare levels of salivary and lacrimal AQP-5 levels in Type-I and Type-II diabetic patients via ELISA and qPCR to better understand pathophysiology of diabetes-induced xerostomia and dryness of eyes. Majority of diabetes patients suffer from dryness of mouth, while dryness of eyes is less common in Type-I diabetes mellitus. Salivary APQ-5 gene expression is reduced in Type-II patients as compared to control while lacrimal APQ-5 mRNA expression did not exhibit any statistically significant relationship in both the disease groups and healthy controls. Salivary APQ-5 protein levels decrease in Type-I and Type-II diabetes mellitus patients, suggesting that APQ-5 protein may be involved in maintaining of the salivary flow, the mis-regulation of which can lead to xerostomia. It can be concluded that Pakistani patients of Type-I DM suffer from dryness of mouth and also from dry eye syndrome. Current data suggest a prevalence of 29% of xerostomia and 50% of dry eye syndrome among the type-I diabetic patients and 97% of the type II DM patients suffer from dryness of eyes. The salivary APQ-5 levels decrease both in Type-I DM and in Type –II DM patients suggesting role of APQ-5 in saliva regulatory flow in humans. The mRNA analysis of lacrimal type-I and Type II patients found no statistically significant values, however the mRNA analysis of APQ-5 salivary samples showed a statistically significant relationship

indicating that 74 APQ-5 may be involved in salivary flow and causing of dryness of mouth in type –II diabetes patients.

**5. Project No:** **PSF/Res/S-AKU/Med (525)**  
**Project Title:** Identification of Serum miRNA as a Potential Cost-effective Biomarker of Glioblastoma  
**Duration:** 1.5-Years  
**Date of Initiation:** 06.05.2022  
**Date of Completion:** 05.05.2023  
**Total Cost (Rs.):** 2,245,800/-  
**Total Expenditure (Rs.):** 1,486,042/-  
**Principal Investigator:** Prof. Dr. S. Ather Enam  
Chair  
Department of Surgery  
**Name of Institution:** The Aga Khan University  
Karachi

### **SUMMARY:**

The current study is a validation-based study, and we intend to validate serum miRNAs as a diagnostic and prognostic marker for the biopsied tissue and MRI radiographic evaluation. GBM biopsied tissue samples and their serum samples (pre-op and post-op) were retrieved from patients who underwent brain surgery at the Aga Khan University Hospital (AKUH), Karachi, Pakistan during report period. The study was effective in terms of its study design and feasibility. The microRNAs (miR-21, 210-3p-5p) that act as an onco-miRs and are upregulated in GBM as compared to other glioma grades and normal samples.

**6. Project No:** **PSF/Res/S-AKU/Med (506)**  
**Project Title:** Development of Mouse Model of Heart Fibrosis after Myocardial Infarction to Study the Molecular Contributions of Wnt-signaling Proteins and Galectin-3  
**Duration:** 03-Years  
**Date of Initiation:** 28.10.2019  
**Date of Completion:** 27.10.2022  
**Total Cost (Rs.):** 3,314,693/-  
**Total Expenditure (Rs.):** 3,084,629 /-  
**Principal Investigator:** Dr. Satwat Hashmi  
Associate Professor  
Department of Biological and Biomedical Sciences  
**Name of Institution:** The Aga Khan University, Karachi

## **SUMMARY:**

Development of fibrous tissue in the heart is the cause of dysfunction associated with heart failure. Current research is focused on the development of approaches for ameliorating heart fibrosis. The Renin Angiotensin Aldosterone system (RAAS) is the only pathway that is currently targeted for the prevention of fibrosis in the heart related to different cardiovascular conditions, e.g. hypertension or after myocardial infarction. Galectin-3 and Wnt/ $\beta$  catenin mediated signaling are other pathways getting attention now in the development of fibrosis. Bioinformatics and experimental models suggest a link between Wnt/ $\beta$  catenin, Galectin-3 signaling and RAAS activation, however the exact mechanism by which these players interact remains to be determined. Using mouse model of myocardial infarction and ischemia reperfusion injury to study the cardiac fibrosis after ischemic injury, we aimed to dissect the molecular contributions of Gal-3 and Wnt signaling to the pathogenesis of interstitial fibrosis in cardiovascular diseases. Our objectives were to determine if pharmacological inhibition of Gal-3 and Wnt signaling pathways attenuate cardiac fibrosis and to investigate its relationship to the RAAS system proteins.

A surgical murine myocardial infarction and Ischemia reperfusion injury model was developed which helped in studying the mechanisms of injury, healing, and heart fibrosis. This model was characterized by staining for fibrosis and estimating infarct size and expansion index for our experimental groups. Pharmacological inhibition of Galectin-3 and Wnt signaling was achieved by three-week treatment with N-acetyl-lactosamine and Pyrvinium pamoate given intraperitoneally before subjecting them to myocardial infarction and ischemia reperfusion injury.

Partial inhibition was observed; however, it did help us develop a cause-and-effect relationship between these two players. We found that Galectin-3 and Wnt/ $\beta$  catenin signalling is linked to RAAS system. Gal-3 caused an increase in RAAS activation suggesting that Gal-3 upstream attenuated RAAS activation. Pyrvinium pamoate showed cardioprotective effects by reducing infarct size in Post MI and IR injury models.

#### **1.4 Scientific Publications Produced through PSF Supported Projects**

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of completed projects, research papers were published in different national/international journals. Details are at Annexure-II.

### Higher Degrees Earned through PSF Supported Projects

One of the major goals of the Foundation is the development of scientific human resource in the country. This results in strengthening of R&D infrastructure of various scientific organizations. The Foundation has been developing scientific manpower through its research projects and the Research Associates employed in the PSF supported research projects to register for higher degrees. Following students working on PSF supported research project were awarded Ph.D/M.Phil/MS/BS degrees:

S. No.	Project No.	Name of the Researcher	Degree awarded
1.	PSF/Res/C-RIU/Chem (583)	Hafiz Aamir Ali Kharl	Ph.D
2.	PSF/Res/KPK-PU/Earth (96)	Mr. Muhammad Ishaq	Ph.D
		Mr. Murad Tahir	MS
		Mr. Afrasiab	MS
		Mr. Majid Ullah	MS
		Mr. Talha Mehboob	MS
		Sagir Safir	BS
		Abid Usman	BS
		Ahmad Wahab	BS
		Danish Saeed	BS
3.	PSF/Res/P-UET.TX/Engg (152)	Mr. Ahsan Raza Khan	Ph.D
		Mr. Syed Mohsin Bukhari	M.Phil
4.	PSF/Res/ P-UHS/Med (478)	Hina Nasim	M.Phil
		Talal Ahmed	M.Phil
5.	PSF/Res/S-AKU/Med (506)	Rena Zaman	M.Phil

## 2. International Liaison Section

PSF has the mandate to liaise with similar international bodies across the globe and is in active collaboration with many similar International bodies. In the prevalent global scenario, the importance of international collaborations has become vital for the technological developments and advancement of knowledge. Therefore, PSF has re-vitalized its international collaborations and embarked upon new linkages to harness potential of technologically advanced nations like China, Turkey, Iran and Sri Lanka. In addition to this PSF regularly plays role as a facilitator to link various international organizations/ universities with local universities and research institutions. Delegates from the reputed universities and similar collaborating bodies regularly hold meetings with PSF to discuss the areas of joint collaboration.

Over the years, PSF has established cordial bilateral relations with various international bodies to synergize efforts for achieving technological excellence and socioeconomic well-being of the people at large. Joint research projects are already ongoing with The National Natural Science Foundation of China (NSFC); Scientific and Technological Research Council of Turkey ([TÜBİTAK](#)): Ministry of Science, Research and Technology (MSRT), Iran and National Science Foundation, Sri Lanka.

During the report period, PSF launched 5<sup>th</sup> joint R&D call for proposals with National Natural Science Foundation (NSFC), China under which 10 projects were awarded. 81 projects remained ongoing (including newly initiated projects) while 17 technical reports (semi-annual, annual & final) of ongoing projects were received and an amount of Rs.58.46 million was released on account of due installment of already ongoing projects and 93.4 Million was released on the account of first installment of newly initiated projects with NSFC-China. Whereas 15 projects were completed during 2023-24. In addition, 18 projects of IL remained ongoing funded under PSDP project Competitive Research Program. 12 technical reports (semi-annual, annual & final) of ongoing projects were received and an amount of Rs.14.28 million was released on account of due installment of already ongoing projects and first installment *Annexure V*.

## 2.1 Joint R&D Bilateral Projects and Calls

### a. PSF-NSFC, China joint call for proposals

Pakistan Science Foundation (PSF) and National Natural Science Foundation of China (NNSFC) signed a MoU on 30th of October, 1992 for joint research activities. In order to further strengthen the ties between Pakistan and China, and to take maximum benefit from the experience of Chinese Scientists.

PSF launched 5<sup>th</sup> R&D Call with National Natural Science Foundation (NSFC), China dated 14.07.2023. As a result, total 319 joint proposals were received both at PSF and NSFC, which were processed for screening and critical review. Among these 10 top projects were awarded grants mutually both at China and Pakistan Sides. List of successful projects is placed at **Annexure-I**.

### b. PSF-TUBITAK, joint call for proposals

Under the MoU signed by both the organizations, 4<sup>th</sup> R&D Call for proposals was launched on 18.03.2024 and a total of 36 proposals were received. Currently the projects are under review. 16 projects awarded under three calls were ongoing in different universities/S&T organizations across the country. During the duration (2023-24), 4 projects were also completed.

In total, IL section completed 16 Projects in the report period. While these projects produced 40 research publications in reputed journals. 03 patents were also filed. 32 students (M.Phil/PhD) completed their degrees.

### c. Meetings of PSF Screening Committees

The 5<sup>th</sup> call for joint research proposals between PSF and National Natural Science Foundation, China (NSFC), was opened from 14.07.2023 to 05.09.2023. As a total of the call 319 projects commonly received at PSF and NSFC. In order to scrutinize the project, three screening committees were held on 07.11.2023 (Fig. 1A), 10.11.2023 (Fig. 1B) and 14.11.2023 (Fig. 1C) at PSF Committee Room. The committees thoroughly reviewed the proposals and gave its recommendations. 61 Proposals were shortlisted for critical review by subject experts.



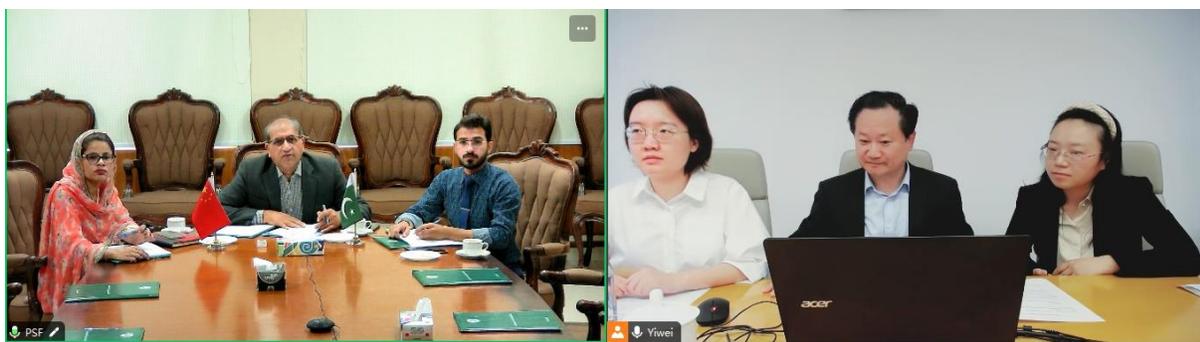
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Scrutiny Committees for shortlisting the projects received under PSF-NSFC 5<sup>th</sup> R&D Call held on 07.11.2023(A), 10.11.2023(B) and 14.11.2023(C).

a. Online Joint Technical Meeting with NSFC-China

An online Joint Technical meeting of PSF officials with NSFC authorities was held on 25<sup>th</sup> April, 2024 at PSF (Fig. 2). In the meeting, there was formal exchange of results of the PSF-NSFC joint 5<sup>th</sup> R&D call. Besides this, two sides also exchange gratitude on existing collaboration. Afterwards, 10 successful projects were announced and awarded grants.



Joint Technical Committee with NSFC China being held on 25.04.2024

## b. First Secretary, Embassy of China, Islamabad meets Chairman, PSF

A momentous stride towards fostering international collaboration in scientific research and innovation was witnessed today as the Pakistan Science Foundation (PSF) and First Secretary of S&T, China convened to explore avenues of joint cooperation.

Chairman of PSF, Prof. Dr. Akram Shaikh, together with Mr. Yin Shengxin, First Secretary of Science and Technology from China, led the high-level meeting, which also included distinguished officials from both sides. Among them were Dr. Mirza Habib Ali, Member Finance, Dr. Saqib Nasir, Director of Planning & Development, and Ms. Zaiban Farooq, In charge of the International Liaison Wing, representing PSF.

The meeting was marked by a comprehensive exchange of ideas and initiatives aimed at strengthening bilateral ties in scientific research and development. Chairman Prof. Dr. Akram Shaikh provided an overview of the existing cooperation between PSF and the National Natural Science Foundation of China (NSFC) on Research and Development (R&D) projects. He also elucidated the ongoing collaboration between PSF and the China Youth Science and Technology Center of the Chinese Academy of Sciences (CYSC-CAST) on STEM Education.

In a significant decision, both parties agreed to organize an annual conference that will serve as a platform to showcase the performance of cooperation between PSF and China, while also deliberating on future avenues of collaboration. The conference will serve as a testament to the commitment of both nations towards advancing scientific progress and innovation.

During the meeting, discussions centered on various facets of cooperation, including Science Diplomacy, Entrepreneurship/Innovation, Science and Technology Exchange, and collaboration in launching R&D projects funded by PSF and NSFC China. Additionally, both parties affirmed their commitment to addressing pressing environmental issues, notably air pollution, through joint initiatives and funding.

Looking ahead, plans were made to renew the Memorandum of Understanding (MoU) between the Pakistan Museum of Natural History (PMNH)/Pakistan Scientific and Technological Information Center (PASTIC) and China, further solidifying the collaborative framework between the two countries.

The meeting concluded with a shared commitment to strengthening cooperation in STEM Education, recognizing its pivotal role in nurturing the next generation of scientific leaders and innovators.

The Pakistan Science Foundation and China are poised to embark on a transformative journey of collaboration, driven by a shared vision of harnessing scientific research and innovation for the betterment of society and the world at large.



Visit of First Secretary of China to PSF

c. **Chairman PSF, convened a meeting with Minister Counsellor and Deputy Head of Mission, European Union**

Prof. Dr. Akram Shaikh, Chairman of the Pakistan Science Foundation (PSF), recently convened with Mr. Philipp Oliver GROSS, Minister Counsellor and Deputy Head of Mission at the Delegation of the European Union to Pakistan, to explore avenues of cooperation in scientific research and education between Pakistan and the European Union (EU).

The meeting, held at the PSF headquarters in Islamabad, focused on key areas of mutual interest and potential collaboration between the PSF and the EU. Among the topics discussed were:

**Awareness Seminars for Horizon Europe-2027:** Both parties discussed the importance of conducting a series of awareness seminars across federal and provincial capitals in Pakistan to introduce the EU's new Framework Programme, Horizon Europe-2027. These seminars aim to inform Pakistani scientists and researchers about funding opportunities, collaborative initiatives, and the thematic priorities of Horizon Europe-2027.

**Utilizing Expertise from the European Research Council (ERC):** Recognizing the expertise of the ERC in technology transfer and bilateral research projects, Prof. Dr. Akram Shaikh proposed that the PSF could benefit significantly from collaboration with the ERC. The

exchange of knowledge and best practices in research and innovation would foster the development of innovative solutions and strengthen scientific ties between Pakistan and the EU.

**Collaboration on STEM Education:** The meeting highlighted the importance of collaboration in Science, Technology, Engineering, and Mathematics (STEM) education. Both parties emphasized the need to enhance STEM education initiatives, promote scientific literacy, and foster innovation among students and educators in Pakistan. Collaborative projects and exchange programs were identified as effective means to achieve these objectives.

Prof. Dr. Akram Shaikh expressed his appreciation for the EU's continued support for scientific research and education in Pakistan. He emphasized the significance of fostering partnerships with international stakeholders to address global challenges and drive sustainable development.

Mr. Philipp Oliver GROSS commended the PSF's commitment to promoting scientific excellence and innovation in Pakistan. He reiterated the EU's commitment to enhancing cooperation with Pakistan in the fields of science, research, and education.

The meeting concluded with a consensus to further explore opportunities for collaboration and to develop concrete action plans to advance scientific research, technology transfer, and STEM education initiatives in Pakistan.



Visit of Minister Counsellor and Deputy Head of Mission, European Union to PSF

**d. International Symposium on the Development of Natural Science Museums Under the Belt and Road Initiative (BRISMIS 2023), NOVEMBER 27-30, 2023**

From November 27th to 30th, Dr. Ahsan Feroze, Director IL, Pakistan Science Foundation, was invited to attend the International Symposium on the Development of Natural Science Museums under the Belt and Road Initiative (BRISMIS 2023).

Theme of the conference was “Making Life Better for All: STEM Education in an Informal Context”. The BRISMIS 2023 events mainly included the opening ceremony, keynote speeches, thematic forums, workshops, professional visits, an online exhibition, etc.

Dr. Feroze delivered a Key Note Speech on 27th November, 2023 (Fig. 1) regarding the status of STEM in Pakistan: Issues and Challenges. He further deliberated that STEM education is closely related to the scientific and technological advancement and social development throughout the world. It has become a new trend leading the development of science and technology and talent cultivation worldwide; in fact, many countries have adopted it as a core strategy for future development, while incorporating it into both formal and informal educational programs. He stated that as important facilities for science popularization and social educational institutions, science and technology-related museums are well-positioned to conduct STEM education by offering visitors opportunities to experience scientific and technological practices and creating an inquiry-based learning environment. STEM education now serves as a new fulcrum for improving exhibitions’ educational effects in science and technology-related museums, fostering future scientific and technological talents, and boosting social innovation and development. STEM Education in an Informal Context, continues to serve as a communication and cooperation platform

During his visit, Dr. Feroze met with many delegations from multiple countries and consulted with CYSC-CAST on implementing STEM Education in Pakistan and innovation of ARTS in STEM Education.



Dr. Ahsan delivering answering the questions on STEM Education.

- e. **PSF representative Dr. Ahsan Feroze (Director, International Linkages, PSF) participated and delivered a speech at 4th Annual Meeting of STEPAN 13-14 June 2024 at Jakarta, Indonesia.**

Dr. Ahsan Feroze (Director, International Linkages, PSF) participated and delivered a speech at 4th Annual Meeting of STEPAN 13-14 June 2024 at Jakarta, Indonesia .

STEPAN, which was initially established in 1988, was relaunched in July 2021 by the UNESCO Regional Office in Jakarta (UNESCO Jakarta). The network aims to address the need for a regional collaboration platform for science, technology, and innovation policy in Asia and the Pacific, a need that was identified during the meeting of the regional Science, Engineering, Technology and Innovation (SETI) experts in 2020. Currently, STEPAN has 20 Member States and one observer member. Member States are represented by National Focal Point Representatives (NFPRs) nominated by the National Commission for UNESCO in their country. Since its revival STEPAN, has been led by a Coordination Board consisting of a chairperson and four vice-chairs. UNESCO Jakarta hosts the Secretariat of STEPAN. Pakistan is invited to this

forum for the first time. As a participant, Pakistan will deliberate on the Action Plan 2021-2025 in following areas;

1. SETI governance
2. SETI cooperation and collaboration for SDGs-related technologies
3. Supporting multi-spectrum STEM capacity building for enhanced science services to society.



PSF Representative, Dr. Ahsan Feroze (Dir. IL) participating in STEPAN

- f. **PSF Chairman, participated and delivered a speech at 2023 International Industry Academia Research Application Cooperation Conference on Advanced Materials and Intelligent Manufacturing held at Beijing China from 25<sup>th</sup> to 27<sup>th</sup> November, 2023.**

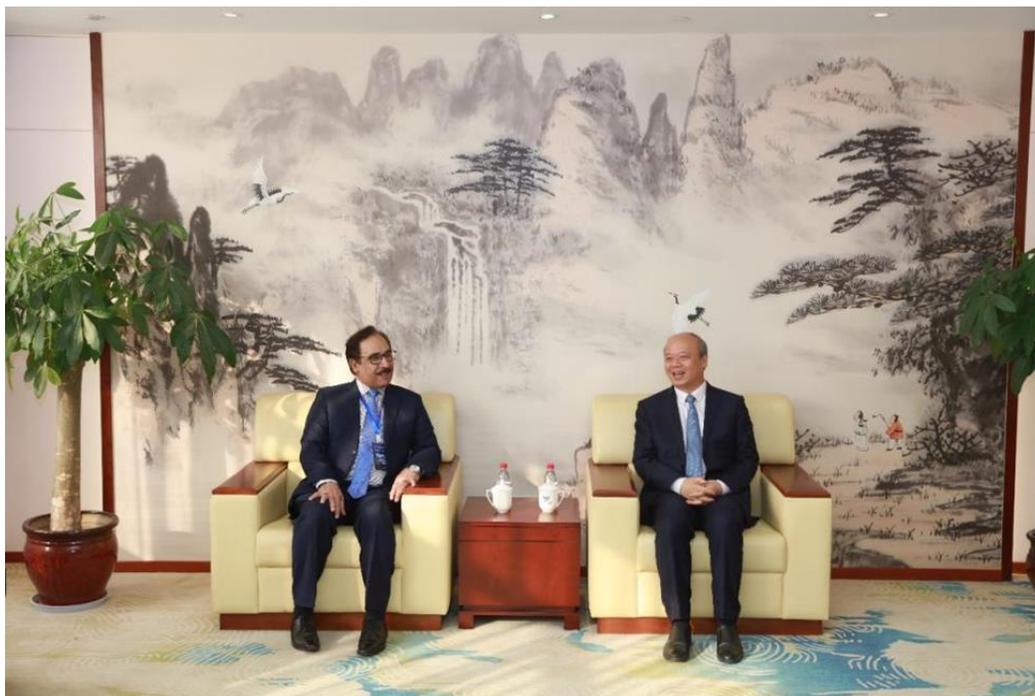
From November 25th to 27th, Shahid Mahmood Baig, Chairman of the Pakistan Science Foundation, was invited to attend the 2023 International Industry-Academia-Research-Application Cooperation Conference on Advanced Materials and Intelligent Manufacturing. During the visit, Principal Chen Wenxing met with Baig and his delegation (Fig. 7).

Chen Wenxing extended a warm welcome to Baig's visit and briefly introduced the basic situation of the school and the relevant work carried out by the school in international scientific and technological cooperation. Chen Wenxing said that the school will give full play to the bridging role of Pakistani foreign teachers and postdoctoral fellows at the school, strengthen contacts and exchanges with Pakistani universities, scientific research institutes and scholars, and

carry out pragmatic cooperation in jointly applying for projects and jointly building research platforms. He hopes that Pakistani science Foundations can give more support. Baig expressed his gratitude to our school for inviting him to participate in the conference, and spoke highly of the high-quality holding of the 2023 International Industry-Academia-Research-Application Cooperation Conference on Advanced Materials and Intelligent Manufacturing.

Furthermore, Baig introduced the cooperation projects between the Pakistan Science Foundation, the Ministry of Foreign Affairs of China and the National Natural Science Foundation of China in recent years, and expressed his willingness to contribute to the cooperation between our school and Pakistani experts and scholars. Provide support and convenience for exchanges, strengthen academic exchanges between the two parties, exchange visits between teachers and students, and conduct cooperative research in related fields of industry, academia, and research.

During his visit, Baig signed a cooperation framework agreement with our school on behalf of the Pakistan Science Foundation and gave an academic report titled "Disease Gene Hunting Using the Genomic Technologies in the inbred Pakistani Population " .



Meeting between Dr. Baig (Chairman, PSF) and Principal Chen Wenxing regarding the promotion of Science and Technology in China & Pakistan during the conference.

- g. PSF representative participated and delivered a speech at World Conference on Scientific Literacy held in Beijing China from 18th-20th September, 2023 and sponsored by China Association for Science and Technology (CAST).**
- h. PSF in collaboration with National Institute of Health (NIH), Higher Education Commission (HEC) and Pakistan Academy of Sciences (PAS) organized National Health Conference at Serena Hotel, Islamabad from 9-10th September, 2023.**
- i. PSF in collaboration with Swiss Leading House (ZHAW) organized a one-day “Genomic Medicine and Recessive Disorders” workshop on Tuesday November 21, 2023 in the PSF auditorium, Islamabad, Pakistan**

The Pakistan Science Foundation (PSF) in collaboration with Swiss professor concludes a groundbreaking workshop that brought together leading experts in Genomic Medicine and Earthquake Engineering, marking a pivotal moment in the integration of advancements in these critical fields.

Under the esteemed guidance of Dr. Baig, Chairman PSF, the workshop witnessed the participation of esteemed experts in Genomic Medicine, including Dr. Alexander and Dr. Anser, who shared their extensive knowledge and expertise. Their insights into genomic research and its applications in healthcare have opened new horizons for personalized medicine and disease management based on individual genetic profiles.

Dr. Igor, an eminent authority in Earthquake Engineering, also contributed significantly to the workshop, presenting innovative approaches aimed at fortifying structures and minimizing the impact of seismic events. His expertise in this domain sparked discussions on strategies to enhance the resilience of infrastructure in earthquake-prone regions.

The workshop served as a dynamic platform for collaboration and knowledge exchange, where researchers, academics, and practitioners from diverse backgrounds converged to explore interdisciplinary approaches. Through engaging panel discussions, illuminating keynote presentations, and interactive sessions, participants delved into the latest advancements, challenges, and opportunities in Genomic Medicine and Earthquake Engineering.

Reflecting on the workshop's success, Dr. Baig emphasized, "The rich exchange of ideas and expertise among these distinguished experts has been truly inspiring. This collaborative effort has laid the foundation for innovative solutions that will significantly impact healthcare and infrastructure resilience in our region."

PSF extended its heartfelt appreciation to all participants, speakers, and sponsors whose unwavering support and contributions were integral to the success of this workshop.

### **3. Science Popularization Section**

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

#### **3.1 Regular Activities**

**Science Caravans (Mobile Science Labs)** is a Mobile Science Exhibit that has been designed to increase public awareness about science and to motivate the younger generation of the country towards study of science. Science Caravans consist of three major components; firstly, demonstrate the exhibits & display items, secondly screening of science films/documentaries and lastly the Star lab Planetarium system. Microscopes, Computers, laser holograms and working models reflecting various phenomena of physics, chemistry, mathematics and biology are included in Caravan Exhibitions. At present, 09 Science Caravan units are in operation, 02 for each of the 04 provinces and 01 for Federal and adjoining areas.

**The Detail of activities showing No of Students/Schools/ Days along with Expenditures During the year 2023-24;**

<b>Sr. No</b>	<b>Unit Name</b>	<b>No of Days</b>	<b>No of Schools</b>	<b>No of Beneficiaries</b>	<b>No of Exhibition</b>	<b>Expenditures</b>
1.	<b>Federal</b>	33	42	12,704	07	967,394
2.	<b>KPK</b>	47	67	12,427	12	1,020, 070
3.	<b>Faisalabad</b>	15	18	5,700	03	532,497
4	<b>Multan</b>	28	12	6,130	06	466,650
5	<b>Sukkur</b>	20	39	8,330	05	505,846
6.	<b>Quetta</b>	23	30	4,817	14	371,347
7.	<b>Tando Jam</b>	28	156	13,658	08	741,623
<b>Grand Total</b>		<b>194</b>	<b>364</b>	<b>63,766</b>	<b>55</b>	<b>4,605,427</b>

**3.2 World Science Day for Peace and Development (WSDPD):**

Since 2001, PSF celebrated World Science Day on November 10, 2023 on the theme “**Stem for Socio Economic Development**”. Chairman PSF, highlighted the importance of Stem Education role in the development of a nation. Apart from Federal Unit, Science Caravan units Faisalabad, Multan, Tando jam, Quetta and Peshawar Unit also celebrated World Science Day for Peace and Development, at their respective centers.



Group Photo of PSF along with Chief Guest Dr. Youssef Filali-Meknassi, Director UNESCO, Islamabad and key note speakers, Prof. Dr. Shahid Mahmood Baig, *S. I.*, Chairman PSF, Ambassador Dr. Mohammad Nafees Zakaria, Executive Director of COMSATS and Dr. Seyed Komail Tayebi, President, ECO Science Foundation, at the event of World Science Day for Peace and Development organized by PSF on 15<sup>th</sup> to 16<sup>th</sup> November 2023

### 3.3 Popular Science Lectures

Pakistan Science Foundation arranges series of lectures, where eminent Scientists and Educationists express their views for the benefit of the audience comprising scientists, scholars, students and the general public as one of its mandatory functions. During the current year, **05** Popular Science Lectures were organized on different scientific themes at Islamabad and different Science Caravan Centers.

### 3.4 Distribution of Popular Science Magazines

Distribution of Popular Science Magazines is one of the regular and important activity of Science Popularization. 4000 copies of Quarterly “Urdu Science Magazine” were distributed to 1987 schools during the report period.

### 3.5 Participation of Pakistani Students in International Junior Olympiad

PSF, being a focal organization for IJSO, coordinated with the organizers for participation of Pakistani students in IJSO-23. This year International Science Olympiad was held on 01-10 December 2023 at Bangkok, Thailand. 05 Students along with Team leader Ms. Rehana Batool, Principal Scientific Officer (SP) participated in the event.



Photo of winner student of Pakistani team in IJSO 2023 Bangkok Thailand from 1<sup>st</sup> to 10<sup>th</sup> December 2023. He won the bronze medal in IJSO 2023 Thailand.

- **Science Talent Farming Scheme Batch-6;**

A Total of 500 Students were selected for 6<sup>th</sup> Batch of STFS/PSF programme. 250 Students attended the STFS/PSF programme from 4<sup>th</sup> to 9<sup>th</sup> March, 2024. The Students were stayed at “Faletti Grand Hotel, Murree” the Students were offered Local Study Visits of NUST, PINSTECH, PMNH AND PNC.



Photo of PINSTEC LAB during Local Study visit/Science Camp of 250 Students of STFS Batch-6 in “Faletti’s Grand Hotel, Murree” held from 4<sup>th</sup> to 9<sup>th</sup> March 2024.



Photo of Mechatronics Lab in NUST during Local Study visit/Science Camp of 250 Students of STFS Batch-6 in “Faletti’s Grand Hotel, Murree” held from 4<sup>th</sup> to 9<sup>th</sup> March 2024.

### **Women in Science Leadership: A New Era for Sustainability**

Pakistan Science Foundation arranged a Seminar on the international Day of Woman and girls in science on 12<sup>th</sup> March 2024 at PSF Auditorium with the theme **“Woman in Science Leadership; A New era for Sustainability”**. A total no 120 peoples attended the Seminar. Prof .Dr. Zarin Fatma Rizvi Vice Chancellor Govt College Woman University Sialkot, Dr. Rohama Gill Department of Environmental Sciences FJWU Rawalpindi and Dr. Sofia Khalid Chairperson, Department of Environmental Sciences Allama Iqbal Open University expressed their views on the occasion.



Group photo of Prof. Dr. Muhammad Akram Sheikh, Member Science PSF and Dr. Mriza Habib Ali, Member Finance along with Prof. Dr. Zarrin Fatima Rizvi, Vice Chancellor, GC Women University Sialkot, Prof. Dr. Rohama Gill, Faculty of Applied and Basic Sciences, Fatima Jinnah Women University Rawalpindi and Dr. Sofia Khalid, Chairperson, Department of Environmental Sciences, AIOU, Islamabad, at Seminar on Women in Science with the theme of “Women in Science Leadership: A New Era for Sustainability” held on 12<sup>th</sup> March 2024

### **Science Centre Faisalabad**

During the financial year 2023 - 24 a total of 4455 no of Students and visitors of 63 Schools visited the Science Centre Faisalabad.



## Scientists Conventions

The Science Popularization Section arranged Scientists Conventions at Karachi, and Peshawar this fiscal year. Scientists Conventions were successfully held at Agricultural University Peshawar and IIEE (PCSIR) Karachi. Total of 950 Students/visitors attended these conventions.



Scientist Convention in Peshawar “Science for Socio Economic Development” on Golden Jubilee Celebrations on of Pakistan Science Foundation 50 years of Excellence in the field of Science & Technology.



**Glimpses of the Keynote speakers & organizers with the Chief Guest at Scientists Convention Karachi**

#### **Other Activities**

- **PSF IBSE Science Essay and Poster Competitions**

31<sup>st</sup> PSF Essay and Poster Competitions were conducted at various centers throughout the country.

- **Youth STEM Learning Festival**

PSF Tando jam Unit participated at Food, Arts, and Cultural Festival Pangrio and in at Sajawal Sindh.

#### **4. Planning & Development (P&D) Section**

P&D is the coordination/facilitation arm of the Pakistan Science Foundation (PSF) and acts as the focal point on behalf of PSF and its subsidiary organizations i.e. PASTIC and PMNH for transmission of information to the Ministry of Science & Technology (MoST) and other ministries including Planning Commission. It is mainly responsible for preparation /

finalization of PSDP projects pertaining to the statutory functions of PSF as well as their processing with MoST for approval by the competent forums at MoST and M/o Planning Development & Reforms. Following activities are being undertaken by the P&D Wing,

- Preparation/finalization and processing of New Development Projects / PC-1s.
- Submission of PC-IVs / PC-Vs to MoST
- Coordination with different Sections of PSF, PASTIC, PMNH and MoST regarding ongoing and new PSDP projects.
- Implementation of on-going development projects of PSF, PMNH and PASTIC
- Attending various Review meetings at MoST/Planning Commission.
- Views/Comments on the PC-Is received from MoST/ Planning Commission
- Compilation & submission of Monthly / Quarterly Reports, Reviews, Briefs, Presentations to MoST
- Replies to National Assembly / Senate Questions and other related information to MoST
- Coordination / preparation of material related to the National Assembly and Senate Standing Committee on S&T
- Activities under Non-Development Budget (Travel Grants).
- Activities to support the PSF Registered Scientific Societies in Pakistan

After the establishment of P&D Directorate in Year 2000, so far seventeen (17) projects have been completed while six (06) projects are ongoing.

#### **a. Activities under Non-Development Budget**

##### **Provision of Travel Grants:**

During the fiscal year 2023-24, an expenditure of **Rs. 4.056 million** was made for the provision of travel grants to scientists and technologists across the country. A total of **113** requests were received from scientists and technologists of HEC recognized universities and R&D's across the country. After comprehensive scrutiny as per eligibility criteria, **97** requests were presented in **09** meetings of Travel Grant Award Committee (TGAC). Out of the **97** requests presented to the

TGAC, **33** were recommended whereas **16** scientists/technologists availed the grant and **17** could not proceed abroad due to visa problems and other reasons (*Annex-VI*). However, **64** requests were not recommended by the Committee due to eligibilities short coming and funding constrains.

**b. Activities under Development Budget:**

**Submission of important Information to MoST:**

- ✓ Extension request for the PSDP “Development of National Digital Archive of Research Published in Pakistani Journals” prepared/ processed & submitted to MoST and project was extended till June 2024.
- ✓ Revised PC-I for the “Development of National Digital Archive of Research Published in Pakistani Journals” with re-appropriation within the PC-I heads submitted to MoST in November 2023.
- ✓ Position paper of the PSDP “Science Talent Farming Scheme (STFS) for Young Students – Phase I (Component-1)” prepared and submitted to MoST.
- ✓ Annual Plan 2024-25 of PSF and its subsidiary organizations prepared and submitted to MoST.
  - ✓ PSDP 2024-25 and projections for PSDP 2025-26 and PSDP 2026-27 submitted to MoST regarding Four (04) ongoing, Three (03) Newly approved and Four (04) new unapproved projects of PSF and its subsidiaries.
  - ✓ Quarterly Progress reports submitted and attended Review meetings of the ongoing PSDP projects at Ministry of Science and Technology and Planning Commission.
  - ✓ Four (4) new proposals / PC-Is prepared / processed and submitted for PSDP 2024-25 for funding consideration in the DDWP meeting. The PC-Is / working paper of the same were also submitted on I-PAS software.

Sr. No	Name of the PSDP Project	Cost (Rs in Million)	Duration
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1.	Promotion of Open Science in Pakistan through Collaboration with International Scientific Community	201.65	36 Months
2.	National Science, Technology, and Innovation Management Information System (STI-MIS) (Phase-I)	112.00	36 Months
3.	Development of Digital Archive of the Repositories / Herbarium of PMNH	171.743	36 Months
4.	Introducing STEAM Education in Pakistan	989.00	36 Months

### **Ongoing PSDP Projects:**

During the financial year, following six (06) PSDP projects were executed under the umbrella of Pakistan Science Foundation.

- i) Competitive Research Programme
- ii) Financial Support to Scientific Societies in Pakistan (Phase-II)
- iii) Science Talent Farming Scheme (STFS) for Young Students – Phase I (Component-1)
- iv) Launching of STEM in Pakistan, Phase-I (Revised)
- v) Extension of Display Galleries, Collection Repositories Improvement, and Research Facilities Enhancement at Pakistan Museum of Natural History-PMNH
- vi) National Digital Archive of Research Published in Pakistani Journals

The achievements made under the above projects are as follows,

#### **4.1 Competitive Research Programme**

##### **Project Objectives:**

The main objectives of the project are:

- i. Provision of the Research Grants to address the mega national issues and promote world class research.
- ii. Development of the new processes/ products/ applications/ technologies through native knowledge / skills of the researchers working in the universities and R&D Institutions.
- iii. Multi-disciplinary Research on the mega issues of National importance through provision of Consortium Research Grants.
- iv. Collaborative projects with the established International Partners for Indigenous Technology Development particularly for substitution of imports.
- v. Public-Private collaborations by providing strong platform to R&D institutions to liaise with Industry and Academia for the improvement and commercialization of their end-products so as to enhance the exports.
- vi. Technological transformations in the specified thrust / priority areas to boost the economy that may result in the generation of S&T Human resource as well as financial capital.
- vii. Promotion of demand-driven research by linking public sector capability and private sector marketability.
- viii. Capacity building trainings for the project staff (National) and Project Formulation Workshops for the researchers.

**Achievements FY 2023-24:**

- A total of **33** new Research projects were newly approved and initiated (**Annex-II**).
- An amount of **Rs. 112.974 million** on account of first instalment while **Rs. 35.526 million** were released on account of **55** on-going research projects.
- **6** projects have been completed technically during this period.
- During the report period **7** meetings of Scrutiny Committee, **5** meetings of Technical Committee, **3** meetings of Project Award Committee was held to review and award of the research projects/grants.
- **112** under process research projects have been Peer reviewed by subject experts.
- Call for Proposals (Academia-Industry Cooperation) was launched in **March-2024**, By Pakistan Science Foundation (PSF), Govt. of Pakistan and The Scientific and Technological Research Institution of Turkey (TUBITAK) under Competitive Research Program (CRP) in the areas of Artificial Intelligence, Internet of things (IOT), Electric vehicles & Oceanography.

- One-day training workshop on “Monitoring & Evaluation” was arranged at PSF auditorium for the capacity building of project staff.
- Onsite monitoring of 17 ongoing research projects has been conducted to review the progress of the research projects.

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

##### **Project Objectives:**

The project proposes to strengthen the role of Scientific Societies in Pakistan by providing them financial assistance for:

- i. Holding National and International Conferences, Seminars, Symposia, Workshops and Lectures on important scientific topics
- ii. Publication of Scientific Journals / Books
- iii. Development and maintaining the Linkages with Counterpart International Societies in advanced countries.
- iv. Providing travel grants to the members of the Societies who have been invited in the prestigious International forums for giving plenary talks/lead papers or as invited speakers.
- v. Provision of travel grants to the Ph.D. Scholars for presentation of research papers in International Science conferences/symposia and trainings abroad
- vi. Provision of Young Researcher Awards for outstanding achievements/ papers in a particular year by each society.

##### **Achievements FY 2023-24:**

An amount of Rs.20.420 million was utilized under the PSDP project and spent mainly for provision of financial assistance to the registered Scientific Societies for undertaking their regular scientific activities. In this regard, Grant-in Aid provided to following fourteen (14) registered Scientific Societies.

- i. Society of Mechatronics Engineers
- ii. Pakistan Thalassaemia Welfare Society
- iii. Pakistan Society of Nuclear Medicine
- iv. Pakistan Society for Biochemistry and Molecular Biology

- v. Pakistan Association for the advancement of Science
- vi. Soil Society of Pakistan
- vii. Pakistan Vacuum Society
- viii. The Zoological Society of Pakistan
- ix. Pakistan Society of Nematologists
- x. Weed Science Society of Pakistan
- xi. Pakistan National Heart Association
- xii. Pakistan Academy of Engineering
- xiii. Pakistan Nuclear Society
- xiv. Society of Economic Geologists and Mineral Technologist (SEGMITE)

The request received from the societies was considered in the two (02) meetings of the Committee constituted in the approved development project. The meetings were held on **20<sup>th</sup> May, 2024 and 29<sup>th</sup> May, 2024**. Following activities were financial supported,

- Grant-in Aid provided to fourteen (14) PSF registered Scientific Societies. Following activities were undertaken by the societies,
  - ✓ Thirty Eight (38) International / National Science Conferences / Workshops / Seminars/ Symposia were financially assisted (*Annex-V*).
  - ✓ Linkages Fee paid to Five (05) International Federations annually (*Annex-V*).
- Fifteen (15) travel grants (*Annex-V*) were provided to the Ph.D scholars and PSF registered Scientific Society Members for their participation in International Science Conferences/ Seminars / Workshops and Training Abroad. During the year, 43 requests were received from Ph.D Scholars and Society Members. After comprehensive scrutiny as per eligibility criteria forty-one (**41**) requests were presented in **03** meetings of Travel Grant Award Committee (TGAC). The TGAC recommended **17** cases for an amount of Rs.**4.98** million whereas **15** applicants were availed the grant and **02** could not proceed abroad due to visa problems and other reasons.
- Two (02) events physically monitored by PSF Officers.
- A meeting of the Presidents/General Secretaries of the Registered Scientific Societies was held in PSF dated 25<sup>th</sup> June 2024. More than 30 participants attended the meeting from fifteen (15) different societies and PSF.

### **4.3 Science Talent Farming Scheme (STFS) for Young Students – Phase I (Component-1)**

#### **Project Objectives:**

Major objectives of the STFS are;

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

#### **Achievements FY 2023-24:**

- Monetary benefits worth Rs. 101.966 Million paid to the remaining students of 6<sup>th</sup> batch (490 students)
- Local study visit conducted of 6<sup>th</sup> batch (250 students) from 4<sup>th</sup> to 9<sup>th</sup> March, 2024. During the study tour, the students of 6<sup>th</sup> batch visited the top notch S&T organizations and universities of Rawalpindi/ Islamabad including PINSTECH, Islamabad, NUST, Rawalpindi, NARC and PMNH (Pakistan Museum of Natural History). Training sessions on STEM education and Inquiry Based Science Education (IBSE) were conducted by the team of Robotmea, Islamabad. Along with all these activities, STFS students got the opportunity to interact with national and international eminent scientists who delivered their lectures on the importance and utilization of modern Sciences and shared innovative ideas on future aspects of Science and Technology. The closing ceremony of the event was held on 8<sup>th</sup> March and graced by Prof. Seyed Komail

Tayebi, Professor of Economics, University of Isfahan, President, ECO Science Foundation Islamabad as Chief Guest accompanied by Chairman PSF.

- 500 students of 6<sup>th</sup> batch were allocated to STFS approved universities for undertaking research activities under supervision of university faculty.

#### **4.4 Launching of STEM in Pakistan, Phase-I (REVISED)**

##### **Project Objectives:**

The project's objectives include:

- **Official Launch of STEM Education:** To introduce STEM as a modern educational tool in 50 Higher Secondary Schools (HSS), 6 Cadet Colleges, and 5 universities across Pakistan.
- **Capacity Building for Teachers:** To coordinate national and international capacity-building programs for science teachers, empowering them with contemporary STEM teaching methodologies.
- **Adoption of Modern Pedagogical Tools:** To facilitate the development and adoption of modern pedagogical frameworks such as Inquiry-Based Science Education (IBSE) and LAMAP.
- **Promote Entrepreneurship:** To equip students with the skills and mindset to become job creators rather than job seekers, fostering entrepreneurship and innovation.

##### **Achievements FY 2023-24:**

- A state-of-the-art STEM Project Management Unit (PMU) and STEM Pilot Academy were established at PSF. These facilities are designed to support the implementation and execution of the STEM project by providing advanced infrastructure and facilities. The PMU will actively monitor the performance of STEM teachers and ensures that all project activities are aligned with the pre-defined goals.
- A total of 54 FABLABs have been successfully enabled and transformed from conventional science labs, located in various STEM designated institutions, including schools, cadet colleges, universities, science centers, and the Pakistan Museum of Natural History (PMNH). Designed to house advanced FABLAB equipment, these

labs will provide students with access to modern tools and technologies, enabling them to engage in hands-on learning and innovative experimentation. By fostering an environment of creativity and practical problem-solving, these FABLABs will empower students to apply theoretical knowledge to real-world challenges.

- The development of 230 STEM modules was completed in collaboration with multiple stakeholders, including the Pakistan Science Foundation (PSF), Federal Directorate of Education (FDE), Federal College of Education (FCE), National Curriculum Council (NCC), and the China Association for Science and Technology (CAST). These modules are designed to integrate low-cost activities, experiments, and kits that are aligned with the national curriculum.
- A Memorandum of Understanding (MoU) and Letter of Intent (LoI) with the China Youth Science Center (CYSC) under the China Association for Science and Technology (CAST) was signed. This partnership focuses on STEM teacher training and module development for grades 9-12. As part of this collaboration, CYSC-CAST shared 32 specialized STEM training modules.
- Over 300 prototypes of STEM modules, hands-on activities, and experiments using low-cost materials were developed by the STEM staff at the STEM Pilot Academy. These prototypes are designed to provide practical, cost-effective reference models for STEM learning experience and are ready for mass-scale fabrication.
- The selection process for STEM teachers was completed in FY 2023-24, with four teachers chosen from each designated STEM school. These teachers will serve as STEM Mentors and Innovation Handlers, equipped to harness the innovations emerging from the FABLABs and apply them to real-world challenges.
- Two (02) Master Trainer Trainings were organized at the Pakistan Science Foundation (PSF) and the National Institute of Electronics (NIE). These trainings provided specialized training to 40 Master Trainers and experts, equipping them with advanced knowledge and skills in STEM education. The trained Master Trainers are now prepared to conduct further training for 200 STEM teachers across Pakistan.
- During the year, significant efforts were made to monitor the project's progress. Monitoring activities conducted on the enabling work at 21 schools and 2 universities. A total of Rs.1.00 million was allocated to each STEM-designated school for the

establishment of FABLABs. The monitoring officer conducted thorough inspections and financial evaluations to ensure that the work was carried out as per the approved scope and budget. Furthermore, the Request for Proposal (RFP) for the STEM Learning Management System (LMS) was finalized, which will feature an interactive portal for online evaluation and assessment. The PSF STEM Pilot Academy will continue to monitor the performance of STEM teachers against pre-defined targets, with regular performance reports being uploaded to the STEM portal.

#### **4.5 Extension of Display Galleries, Collection Repositories Improvement, and Research Facilities Enhancement at Pakistan Museum of Natural History-PMNH**

##### **Project Objectives:**

Major objectives of the project are as follows.

- To bring the Museum's outlook to a world class level through addition of new attractive exhibits in the display galleries
- To upgrade the existing displays, collection repositories and research facilities
- To enhance and strengthen research facilities of PMNH
- To improve public facilities for general visitors and students
- To extend the display galleries and operations by constructing remaining five display centers and one operation block of PMNH building

##### **Project Achievements:**

- **Operational Block (III):** Civil work (grey structure) and E/M work for spaces including 10 exhibits, a meeting room, a digital studio, equipment stores, and offices: 50% completed. The digital studio, once operational, will serve as a hub for youth-oriented science workshops, webinars, and interactive digital content.
- **Display Centres IV and V:** Civil work (grey structure) and E/M work for 30 exhibit spaces, a cafeteria, and a souvenir shop: 45% completed. These centres are designed to offer engaging scientific displays and immersive learning experiences for students.
- **Display Centres VI to VIII (Auditorium):** Foundations excavation work for the block-VIII (auditorium 283 person capacity), connecting bays, and additional educational

spaces: 15% completed. This facility will host youth science seminars, science fairs, and film screenings, providing a dedicated venue for scientific discourse.

- Procurement for PMU related IT equipment, furniture, fixtures, and internet/telephone connectivity completed.

#### **4.6 National Digital Archive of Research Published in Pakistani Journals**

##### **Project Objectives:**

Major objectives of the project are as follows.

- Development of National Digital Repository of S&T Journals publish in Pakistan
- Development of National Consortium of S&T Journals publishers of Pakistan
- Capacity building of publisher's/researchers toward application/content utilization
- Develop visualization model to analyze national research gaps/trends

##### **Project Achievements:**

- Five (05) training activities at National level have been accomplished and 400 Journal publishers and researchers have been trained on modern research publishing software and tools.
- Centralized software platform for data archiving along with federated search facility have been developed whereas debugging and fine-tuning of the application is in process.
- One (1) consortium launching and awareness activity has been accomplished at University of AJ&K, Muzaffarabad and total of 196 journal publishers have been registered.
- 45% of full-text data of the registered Consortium journals data have been archived
- Fabrication of PMU and digitalization lab have been accomplished
- Revised PC-1 of the development project has been submitted for the approval of the DDWP forum.

## **5. PAK-US Natural Science Linkage Programme (NSLP) Endowment Fund**

### **NATURAL SCIENCES LINKAGE PROGRAMME ENDOWMENT FUND 2023-24**

Natural Sciences Linkage Programme (NSLP) Endowment Fund is an important component of Pakistan Science Foundation (PSF) which is aimed at enhancement of agricultural production through effective research. The outcome of this research will benefit the end user by uplifting the life standard and income of the farmers. The Fund is being managed by PSF through Board of Governors (BoG) and Fund Management Committee (FMC). The Chairman, PSF is the Chief Executive of the Programme/Fund.

#### **Aims and Objectives:**

- To enhance cooperation among scientists from Pakistan and the United States of America, in areas of significant mutual interest and benefit relating to natural sciences as applicable to agriculture.
- To increase the contact and collaboration among scientists and institutions of biological research, development and higher learning institutes between the two nations.
- To provide researchers and institutions with opportunities to exchange information, ideas, skills and techniques.
- To enhance opportunities to collaborate in solving problems of common interest relating to natural sciences and to utilize special research and development facilities or opportunities available.
- To identify the researchable areas in natural sciences especially agricultural sciences with aim to increase farmer's profitability

#### **Research Priority Areas:**

Selected priority areas for collaboration may include, but are not limited to; Collection, Evaluation and Exchange of Germplasm, Plant Genomics, Plant Biotechnology, Stress Biology, Bio-Informatics, Application of Information Technology in Agriculture, Identification and Control of Animal/Plant Diseases, Dryland/Sustainable Agricultural Production System; Integrated Pest and Disease Management, Biotechnology, Microbiology, Agribusiness Development, Biophysics, Chemistry, Environment,

Energy, Water Resource Management and Climate Change particularly with reference to Agriculture.

Project proposals which highlight main problems of agricultural sector are invited from universities and R&D organizations across the country. Research work is emphasized on the food production & food security issues in Pakistani scenario. Currently 248 projects are being funded in different Universities and R&D organizations around the country under this programme.

Projects are received from researchers throughout the year; they undergo scrutiny and peer review before presenting to the Technical Committee, which comprises of eminent scientists from different specialized areas of agriculture and natural sciences. The target areas of these projects include germplasm screening of different crops, insect and pest management for the disease free crop production, nutrition management of crops and post-harvest technology. All these research issues are vital component of today's agriculture and are imperative in bringing the value added products in the market. Apart from this, many projects from specialized fields of animal sciences are also being funded. These projects include research in genetic screening of different animal breeds, feed technology and milk quality areas. In future, the fund aims to maintain focus on applied research projects related to Energy, Water resources management, Environment and Climate Change.

## **5.1 Activities and Programmes**

### **5.1 Research Funding**

Research funding is the principal activity of Natural Sciences Linkage Programme (NSLP) efforts are being made to establish linkages between end-users and scientists of different R&D organizations and Universities throughout the country. Projects of applied nature are selected for funding and research proposals received undergo the strict process of scrutiny before the funding. The criteria include the competence of the scientific personnel to carry out the research, institutional capabilities i.e availability of the basic equipment and laboratory facilities, scientific merit of the proposed research proposals and likelihood of completion of proposed research work within the stipulated time and funds requested. The proposals are reviewed by two

Pakistani experts along with US experts. The proposals recommended by experts are placed in the relevant subject Technical Committee for technical evaluation and recommendation. Technical Committee on NSLP comprises of the renowned scientists from various fields of agriculture and natural sciences. The proposals recommended by the Technical Committee are then submitted to NSLP Fund Management Committee (FMC) for administrative and budgetary approval, before the release of funds.

**a) Under process Projects:**

During the report period, 55 concept papers remained under consideration of the NSLP. Out of these concept papers, 36 projects were presented in four Technical Committee meeting held during the report period. Technical Committee recommended 19 new projects for funding along with suggestions. The Fund Management Committee approved budgets of 15 new projects of worth Rs.62.412 Million, recommended by the NSLP Technical Committee. List of projects approved for funding during the report period is given in *Annexure IV*.

**b) On-going Projects**

During the year, there were one hundred and twenty three (123) ongoing research projects and (46) progress reports of projects (semiannual, 1<sup>st</sup> and 2<sup>nd</sup> annual & final reports) were received. The NSLP staff scrutinized the semiannual reports before releasing of next due installment. Whereas, annual and final reports after initial scrutiny by NSLP team were sent for evaluation to the subject experts to assess the interim progress of the projects before next due installment was released. It is worth mentioning that due installment of the on-going projects are released only if the interim progress of the projects at the end of each year is rated as satisfactory by the subject expert. An amount of Rs.42.529 million was released on account of due installments of on-going projects. A list of semiannual, annual and final reports is given in *Annexure IV*.

**c) Completed Projects**

During the year 2023-24 four (04) projects were completed. The subject experts evaluated the final technical reports of the projects which were subsequently placed

before the Technical Committee for adoption. The accounts of these projects have been settled. Details of the projects along with the scientific output are given below.

Project No	<b>PSF/NSLP/KP-UAP (709)</b>
Project Title	Optimization of Environmental and Nutritional Standards for Mass Production of Mealworm Meal Under Tropical Environment of Pakistan
Duration	3-Years
Date of initiation	15-12-2016
Date of completion	30-04-2023 (Six months no-cost extension)
Final report received	05-04-2023
Final technical report was adopted in the Technical Committee meeting held on	03.08.2023
Location of project	Department of Poultry Science The University of Agriculture, Peshawar
Principal Investigator	<b>Prof. Dr. Sarzamin Khan</b>
Total Expenditure	Rs.5,803,511/-
Main objectives	<ul style="list-style-type: none"> <li>• Standardization of environmental standards for mass production of meal worm meal</li> <li>• To Economize mass Production of meal worm meal through different substrates</li> <li>• To develop commercialized products of meal worm meal for use in backyard chicken, commercial poultry and feed for pheasants and other poultry pets.</li> </ul>

Project No	<b>PSF/NSLP/KP-UAP (768)</b>
Project Title	Development of a phyto-protease and its comparative assessment with different commercial proteases used in poultry feed production
Duration	2-Year

Date of initiation	15.09.2020
Date of completion	14.09.2022
Final report received	18.01.2023
Final technical report adopted in the Technical Committee meeting was held on	13.11.2023
Location of project	Department of Poultry Science The University of Agriculture, Peshawar
Principal Investigator	<b>Dr. Asad Sultan</b> Assistant Professor
Total Expenditure	Rs.5,784,833/-
Main objectives	<ul style="list-style-type: none"> <li>• Isolation and development of phyto-protease from Ginger and Neem.</li> <li>• Assessing the efficacy of phyto-protease (Ginger + Neem) on the growth performance of broilers and nutrient digestibility at different stages of broiler life.</li> <li>• Assessment of gut health benefits of phyto-protease (Ginger + Neem) with increased level of animal protein meals in ration in diet for broilers.</li> <li>• Comparison of commercial proteases with phyto-protease (Ginger + Neem) on growth performance, nutrient digestibility and economics.</li> </ul>

Project No	<b>PSF/NSLP/P-GCUF (750)</b>
Project Title	Enrichment of <i>Omega</i> ( $\Omega$ ) Fatty Acids in Edible Oils using Ultrasound Technology
Duration	1-Year
Date of initiation	01-09-2021
Date of completion	31-08-2023
Final report received	02-11-2023
Final technical report was adopted in the Technical Committee	02.04.2024

meeting held on	
Location of project	Institute of Home and Food Sciences Government College University of Faisalabad
Principal Investigator	<b>Dr. Muhammad Kaman Khan</b> Assistant Professor
Total Expenditure	Rs.1,708,870/-
Main objectives	<ul style="list-style-type: none"> <li>• To enrich the canola, sunflower and cotton seed edible oils with Omega-3 and Omega-6 fatty acids using novel technology of ultrasound.</li> <li>• To introduce hassle free, cheap and time saving novel technology of ultrasound for single-step enrichment by eliminating “extraction and purification of Omega(s) and then their fortification in edible oils”</li> </ul>

Project No	<b>PSF/NSLP/KP-AWKUM(827)</b>
Project Title	Large Scale Reclamation of Farm Land Using Innovative Bio-solid Fertilizer from Different Agro-waste, Sewage Slurry and Microbes
Duration	03-Years
Date of initiation	01-09-2020
Date of completion	31-08-2023
Final report received	30-11-2023
Final technical report was adopted in the Technical Committee meeting held on	02.04.2024
Location of project	Department of Zoology, Abdul wali Khan University, Mardan
Principal Investigator	<b>Dr. Abid Ali,</b> Associate Professor,

Total Expenditure	Rs.4,234,361/-
Main objectives	<ul style="list-style-type: none"> <li>• To design an innovative bio-solid fertilizer from different (agro-waste, sewage slurry and microbes) for field scale application</li> <li>• To assess bio-solid fertilizer effectiveness for saline soil and nutrients availability under different reaction and environmental conditions.</li> <li>• To investigate variations in mineralogical, morphological and textural compositions of the agro-waste and sewage slurry before and after tests through characterization analyses.</li> <li>• To investigate the impact of bio-solid fertilizer on HMs availability in reclaimed farm land soil.</li> </ul>

## 5.2 Scientific Publications and Patents Produced through PSF Funded Projects

One of the main achievements and usefulness of any research is the publication or patents of its results in scientific journals. Based upon the results of research projects nine (10) research papers were published in peer review journals the details of which are given at *Annexure IV*.

## 5.3 Project Formulation Workshops

A total of four (01) Project Formulation Workshop was organized to enhance the capacity of the researchers for writing project proposals. The workshop was organized at the The University of Lahore, Sargodha Campus. The workshop enabled and trained 52 researchers and Scientists in preparing fund winning project proposals.

## 5.4 Meetings of Fund Management Committee of NSLP

During the year 2023-24 two (02) meeting of the Fund Management Committee (FMC) were held on 02.11.2023 and 05.03.2024, respectively to review the financial matters of NSLP. The meeting was chaired by the Chairman, PSF/Chief Executive, NSLP and attended by members of the Fund Management Committee. The FMC approved budgets of 15 new projects of worth Rs.62.412 Million, recommended by the NSLP Technical Committee. An amount of Rs.34.20 million was approved for released to these new projects on account of 1<sup>st</sup> installment. List of projects recommended for funding during the report period is given in *Annexure IV*.

### **5.5 Meetings of Technical Committee of NSLP**

During the year 2023-24 three (03) meeting of the Technical Committee (TC) were held on 03.08.2023, 23.11.2023 and 02.04.2024, respectively to technically evaluate the projects to be funded. The meetings were chaired by the Chairman, PSF/Chief Executive, NSLP and attended by the renowned scientists related to agriculture and natural sciences. A total of 36 new projects were presented to the Technical Committees out of which 19 projects were recommended for funding.

## II. PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

Pakistan Scientific and Technological Information Centre (PASTIC) is premier national organization with prime focus on collection and dissemination of Scientific and Technological Information to scientists, researchers, academicians, industrialists, entrepreneurs, planners, and policymakers for research support. It also organizes various activities e.g., training workshop, seminars/webinars, conventions, symposia, conferences etc. for skill development of scientific and industrial community. PASTIC National Center is located at Quaid-i-Azam University Campus, Islamabad. It has six Sub Centers throughout Pakistan including Karachi, Lahore, Peshawar, Quetta, Faisalabad and Muzaffarabad. PASTIC's services include Bibliographic & Document Supply Service, Abstracting and Indexing Service, National Science Reference Library, Reprographic Services, Technology Information Services, Awareness and Promotion of PASTIC Services, Capacity/skill development of researchers & entrepreneurs and International Liaison.

Major achievements and initiatives taken during 2023-24 are summarized below:

- **Bibliographic & Document Supply Service:** 11,604 S&T documents and 1560 bibliographies in digital form were supplied to 823 R&D workers.
- **Abstracting and Indexing service:** 25500 records were abstracted and indexed into the database of Pakistan Science Abstracts (PSA).
- **National Science Reference Library:** 2986 users visited PASTIC library for getting references, reading, photocopying, internet browsing and web searching. Besides, the library received 135 issues of national and international journals in exchange and on gratis basis. 12 issues of Fresh Arrivals of PASTIC library published online as well as in print form and distributed among the members.
- **Reprographic Services:** 16 printing jobs from 09 R&D organizations were completed.
- **Technology Information Service:** Six (6) online issues of “Technology Roundup” a bimonthly Trade and Technology news e-bulletin were published. One (1) seminar on Patents Drafting, Filing, and Management was organized during the fiscal year (50 participants).
- **Awareness and Promotion of PASTIC Services:** 32 awareness seminars and 07 stalls were conducted/installed at various universities across Pakistan to create awareness about PASTIC’s online digital tools/databases benefitting 4100 researchers.

- **Capacity/skill Development of researchers/students:** 1469 researchers/students were trained in the area of Data analysis (SPSS, MAT-LAB), Reference Management (EndNote), Robotics, Research Ethics, Artificial Intelligence, & Research skills enhancement by carrying out 17 Training workshops/seminars across Pakistan. PASTIC also collaborated with Academia for organizing of 9 International and National Conferences benefitting 900+ researchers/students.
- **International Liaison:** PASTIC as National Focal Point of UNESCO IFAP National Committee (UNESCO Information for All Programme IFAP) participated in meeting on Building Information for All (IFAP) through meaningful access and inclusive Knowledge Societies.

During the year, a total number of 690,423 users/researchers have been served through various PASTIC S&T Information services while 3100 researchers/students were trained.

PASTIC is an ISO 9001: 2000 Certified S&T Information Provider and is the oldest organization in Pakistan dedicated to the management and dissemination of S&T knowledge. PASTIC meets the diverse information needs of researchers across all fields of science, technology, and social sciences while serving as a gateway for accessing and delivering global S&T information. Its services are utilized by a wide range of users, including researchers, academics, scientists, engineers, entrepreneurs, and industry professionals.

The PASTIC National Centre is located in its own building on the Quaid-i-Azam University campus in Islamabad, holding extensive information resources across various fields of science and technology. In addition, six sub-centers operate in different cities—Karachi, Lahore, Peshawar, Quetta, Faisalabad, and Muzaffarabad—each with access to global information for dissemination of information to their users. The total sanctioned strength of PASTIC National Centre and its 6 sub-centers including Scientific, Technical and Administrative Staff is 164.

## 1. PASTIC Objectives

- Development of a National S&T/R&D Information Repository of indigenous information resources (databases)
- S&T/R&D information dissemination through contemporary reference information tools
- Strengthen National Science Reference Library for resource sharing & Inter-library collaborations (consortium) and empowerment of information professionals.

- Promotion of R&D based industrial development
- Facilitate printing of S&T/R&D Publications
- Capacity/skill development of researchers & entrepreneurs
- Develop collaborations with national and international information networks

## **2 Activities and Services**

PASTIC is a national multidisciplinary S&T Information Centre. It procures, processes and preserves national scientific, technological and industrial information for catering to the S&T information needs of R&D and industrial community through anticipatory and responsive Information Services leading to sustainable socio-economic development in the country.

The Services provided and activities undertaken during the period, July 2023 to June 2024 are described below:

### **2.1 Bibliographic Information & Document Supply Service**

This service promotes local Research and Development (R&D) among young scientists/researchers/engineers, technologists, faculty members, R&D workers and & industry people. Under this service, copies of Research Articles (Abstracts/Full text) Reports, Conference Papers, Books or Book-chapters, etc., published locally or abroad are provided free of cost and within no time to the clients. Documents and bibliographies are supplied through email service for quick delivery and minimizing delays.

For acquisition of documents from within the country, the Union Catalogue of the S&T libraries of Pakistan compiled by PASTIC, resources of LEJ-HEJ and HEC are mainly used.

PASTIC has access to digital resources such as:

#### **A. LEJ Resources, Karachi (Under MoU)**

- Institute of Electrical and Electronics Engineers (IEEE)
- American Chemical Society (ACS)
- Nature Publishing
- JSTOR
- SpringerLink

#### **B. HEC licensed databases**

PASTIC has subscribed HEC databases (Basic resources) which are as under:

- Tayler & Francis
- Springer link
- Wiley online Library

- INFORMS

Under the Bibliographic Information & Document Supply Service, 11,604 S&T documents and 1560 bibliographies in digital form were supplied to 823 users belonging to R&D Organizations, Universities, Professional Colleges, Hospitals & Industry upon their request during the reporting period.

## **2.2 Abstracting and Indexing Service**

### **Pakistan Science Abstracts (PSA)**

PASTIC has been providing abstracting and indexing service by compiling abstracts of research articles published in Pakistani Journals and Conference proceedings under the title of “Pakistan Science Abstracts” in different scientific disciplines, which serves as a secondary information resource to give support to research and development activities in the country. This service is being provided through an online database application with an efficient searching facility.

During the period 2023-24, Bibliographic data of 25500 abstracts from 170 Journals and 5 Abstract Books were entered into the database of Pakistan Science Abstracts with current counts of 99376 records. For details visit <https://psa.pastic.gov.pk/>

### **Directory of Scientific Periodicals of Pakistan**

PASTIC maintains an online database (Directory of Scientific and Technological Periodicals of Pakistan), which indexes a variety of S&T periodicals such as journals, magazines, digests, newspapers, and secondary journals published within the country. This database aims to serve as a comprehensive guide to national S&T periodicals, making it easier for researchers to locate relevant periodicals and journals within their scientific disciplines, including the social sciences.

During the period 2023-24, 55 new records of Scientific & Technological Journals were created in the database with current records of 689 periodicals including 615 Journals. For details visit <http://www.pastic.gov.pk/searchperiodicals.aspx>

### **Publications**

PASTIC supports printing/publishing of abstract books of the national or international conferences organized by the renowned national S&T or R&D institutes/ HEIs. During the reporting period eight (08) Abstract Books were published/processed as follows:

1. Abstract Book of “*International Conference on “Food and Applied Sciences (ICFAS-23)”*” August 3-5, 2023 organized by SBBU Sheringal, Dir (U), KP, Pakistan
2. Abstract Book of “*9<sup>th</sup> Annual Neuroscience Conference (ANC-23)”*”, August 12-13, 2023 organized by Department of Biochemistry, University of Karachi, Karachi, Pakistan
3. Abstract Book of International Conference on “*Sustainable Agriculture and Food Security (ICSAFS-23)”*”, August 27-31, 2023 organized by the University of Agriculture, Peshawar, Pakistan
4. Abstract Book of 2<sup>nd</sup> International Conference on “*Recent Innovations on Plant Sciences and Natural Products”*”, organized by the University of Okara, Okara, Pakistan
5. Abstract Book of International Conference on “*Revamped Scientific Outlook of 21st Century-2023”*”, November 15, 2023 organized by the Rawalpindi Women University, Rawalpindi, Pakistan
6. Abstract Book of International Conference on “*Contemporary World: Challenges & Transformations-2023”*”, November 16, 2023 organized by the Rawalpindi Women University, Rawalpindi, Pakistan
7. Abstract Book of International Conference on “*Earth Sciences Pakistan (ESP-2024)”*”, June 02-04, 2024 organized by NCE in Geology, University of Peshawar, Peshawar, Pakistan
8. Abstract Book of “*2<sup>nd</sup> International Conference on Computing Technologies, Tools and Applications”*”, June 04-06, 2024 organized by The University of Agriculture, Peshawar – Pakistan

### **2.3 Technology Information Service (TIS)**

This service is focused on dissemination of Technological Information Services to Academia/R&D community, Engineers, Entrepreneurs, SMEs, Industrialists and various Government entities. To promote R&D based industrial development in the country, this service undertakes following activities:

- Develop collaborations with Chambers of Commerce and Industry (CCIs) across Pakistan to promote local industry, small manufacturing enterprises (SMEs), their products/services and challenges/issues by developing different indigenous industrial databases available on PASTIC Website (TIS-Databases) and Technology Roundup online bulletin (<http://www.pastic.gov.pk/technews.aspx>).
- Promote S&T/R&D organizations/academia and their commercializable technologies/research expertise and R&D projects in different industrial sectors by developing different *indigenous S&T/R&D databases* available on PASTIC Website (TIS Databases).

- Promote *University-Industry Partnership (UIP)* through seminars/workshops across Pakistan for "Building Effective Coordination between R&D & Industry for Enhancing Innovations Competitiveness and Productivity of Indigenous Technologies".
- Enhance Capacity building of scientists on *communication skills* and creating platforms between scientists and members of the media for promotion of scientific and technological innovation in the society.
- Organize *Technology & IT-Expos* across Pakistan for empowering youth and general public on new and faster ways of delivering and accessing information to improve their productivity in ICTs, education, health and other social services, banking, and government services, and create earning opportunities.
- Provide Technology and Innovation Support Services under Technology and Innovation Support Centre (TISC) Desks (in collaboration with HEC-IPO Pakistan & WIPO) at PASTIC National centre Islamabad as well as at its 06 sub-centres for guidance and support of the innovators on "*how to exploit their potential to create, protect, and manage their intellectual property rights(IPRs)*" by providing assistance in searching and retrieving technology information through patent database search; creating awareness of TISC program through trainings/seminars/library visitors/online queries etc.

### **Patent Information**

During the reporting period, 119 Clients were provided 2364 Patent (37 full text and 2327 abstracts) and 7 miscellaneous information on request basis through Offline/Online Patent Query Form at PASTIC website.

### **Technology Roundup**

Six (6) online issues of bimonthly Trade and Technology news bulletin titled "Technology Roundup" were made available on PASTIC website.

### **Training Workshops/Seminars Under TIS**

- One day seminar on Patents Drafting, Filing, and Management was organized at the University of Haripur, Haripur, KP (50 participants).

### **TIS Databases**

- R&D Projects: Database of R&D projects was cleaned by removing duplicates with total records of 9772 projects.
- National Scientists Directory (NSD): 2729 new records have been entered into the database of NSD with total records of 9232 scientists.

## **2.4. PASTIC National Science Reference Library Service**

The National Science Reference Library (NSRL) serves the information needs of the research scholars and others seeking scientific literature. PASTIC Library is equipped with both Print and Electronic information resources. It has a collection of more than 8000 books, 900 titles of journals and approximately 400 miscellaneous documents such as reference material/secondary sources, government documents, conferences/seminars proceedings, etc.

The library also organizes capacity building programs in the area of Library & Information Management, Library Automation, Digital Library, Soft Skills for Librarians, and Information Literacy, etc. Monthly Library bulletin “Fresh Arrivals” is published on regular basis and distributed among relevant circles, and uploaded on PASTIC website.

### **Main Services of Library**

- Reference & Referral Services
- Reader Service
- Journal Listings
- Photocopying & Scanning Services
- Free WIFI access

### **Acquisition of Library Material**

135 Journal issues, 12 documents, 2 books & 22 newsletters were received from different national and international organizations.

### **Technical Processing**

During the reporting period, 1,750 books were labeled with RFID tags, resulting in a total of 4,000 books.

### **Library Automation**

Library automation is in progress using the international open-source library automation software i.e., Koha. During the reporting period, metadata of 2400 library items (Gift and

donation including PASTIC Publications) are entered into the online system. Now total 12,400 library items are available in OPAC for search at <http://www.koha.pastic.gov.pk:5129/>

## 2.5 PASTIC Koha Cloud Service

PASTIC provides free of cost library automation software “PASTIC Koha Cloud” as a service to all Pakistani Libraries to ensure optimal and effective utilization of national library resources. In this connection, now 270 college and universities libraries are facilitated for automating their functions through PASTIC Koha cloud service however during the reporting period 90 new libraries have been added into the system.

### **Library Publication**

12 issues of Fresh Arrival have been published during the reporting period. For details please visit at <http://www.pastic.gov.pk/fresharrivals.aspx>

### **Capacity Building of Information Professionals**

The National Science Reference Library (NSRL) organized following capacity building activities during the reporting period:

- Three Days Training Workshop on "Utilization of Modern Techniques for Research & Librarianship" on July 21-23, 2023 (50 participants)
- Two Days Training Workshop on "*Role of Librarians in the age of AI (Artificial Intelligence and Skills for Freelance Librarian*" on August 30-31, 2023 (51 participants)
- Two Days Training Workshop on "KOHA: A Problem Based Session for Practitioner Librarians & Data Bases: Access & Usage on October 11-12, 2023 (75 participants)
- First All Pakistan Universities Libraries Convention on April 22, 2024 (150 participants)
- One Day Seminar on "How to Access and Effectively Use HEC Digital Library and Tips for Research Proposal Writing for Hunting PhD Scholarships" on May 31, 2024 (50 participants)
- Three Days National Conference on "Exploring the Nexus: Artificial Intelligence and Libraries" on June 28-30, 2024 (100 participants)

## **Users Served by PNSR**

PASTIC Library services for reference purpose (i.e. reading, photocopying and internet browsing) was provided to 2986 physical users, while 686600 (online) researchers accessed Digital resources of PASTIC Library i.e., DSPACE Digital Repository, PakCat & PASTIC KohaCloud and 476 information professionals/students/researchers were trained.

## **2.6 Reprographic Service**

PASTIC Reprographic Section has facilities for composing, designing, plate making, offset printing, and binding, etc., for books, Pamphlets, Brochures, Journals, Newsletters, Cards, and Folders etc. These facilities are not only used for printing of PASTIC publications but are also extended to all other S&T and R&D Organizations. The Unit is equipped with:

- Offset Printing Machines
- Printing Down Frame
- Cutting Machine
- Stitching Machine
- Creasing Machine
- Dark Room Camera
- Latest Computers/Printers

During the current fiscal year i.e., 2023-24, 16 printing jobs were carried out for 09 R&D organizations of the country.

## **2.7 IT Support Service**

PASTIC has a well-equipped IT Section with a dedicated team of IT professionals working hard to develop and maintain PASTIC electronic resources for effective delivery of information services. PASTIC IT section also extended its technical expertise (on need basis) to PSF, PMNH and COMSTECH toward ICT infrastructure development and provision of services e.g., Software as a Service (SaaS) and Infrastructure as a Service (IaaS).

During the year 2023-24, following activities were undertaken by the IT team of PASTIC:

### **Website/Portal Development and Updation**

1. PASTIC Website: Improved user interface and ensured smooth functionality. (<https://www.pastic.gov.pk/>)
2. PSF PSDP STEM Project Web Portal: Enhanced user experience and added new features for better accessibility. (<https://stem.psf.gov.pk/>)
3. IFAP (Information For All Programme National Committee Pakistan) Web Portal: Updated and maintained the IFAP web portal for better information dissemination and accessibility.
4. Consortium of Science & Technology and Research & Development Libraries of Pakistan (CSTRDLP) Web Portal: Updated and maintained the CSTRDLP web portal to promote resource sharing among libraries. (<http://consortium.pastic.gov.pk/>)
5. SAARC Women Entrepreneurs (SMEs) Web Portal: Updated and maintained the web portal focused on promoting women entrepreneurs within SAARC countries. (<http://www.saarcweportal.com>)
6. DSpace Digital Repository of Indigenous Literature: Migrated the DSpace system from Mercurial Mind server to the COMSATS server by ensuring seamless data transfer, maintaining system integrity and improved performance on the new server.
7. PASTIC Library Koha Cloud: Upgraded the Koha library management system from version 18.0 to version 23.13 LTS by migration of all existing data to the newly acquired COMSATS server, ensuring data integrity and enhanced system features.

### **Databases Updated**

1. Conferences/Workshops/Seminars/Proceedings in Pakistan
2. R&D Projects (Ongoing/Completed) of Pakistan
3. Directory of Scientific Periodicals of Pakistan

4. Pakistan Science Abstracts
5. Research Journals in Pakistani Libraries (Union Catalogue)
6. S&T and R&D Organizations/Institutions of Pakistan
7. Books in Pakistani Libraries (PakCat)
8. Scientific Books Published by Pakistani Authors
9. Industrial Problems & Solutions in Pakistan
10. Scientific Societies/Associations of Pakistan
11. Industrial Linkages (Local & International)
12. Energy related Publications in Pakistan
13. Industry Academia Linkages in Pakistan
14. Universities/Institutes in Pakistan
15. Foreign Industries in Pakistan
16. S&T Libraries in Pakistan
17. Industries in Pakistan

## **2.8 International Liaison**

Following activities were carried out during the fiscal year 2023-24.

- DG PASTIC, Dr. Muhammad Akram Shaikh attended an online Meeting on Building Information for All (IFAP) through meaningful access and inclusive Knowledge Societies.
- Submitted a proposal to MoST entitled “Development of Digital Cloud Network for Industrial Innovation & Technology Information at PASTIC” under Japan’s “Technical Cooperation, “Development Study” and “Grant Aid” program.

## **2.9 Newsletters and Reports**

- PASTIC Monthly Newsletters are compiled and uploaded at PASTIC website.
- Monthly action plans / target reports are prepared and submitted.
- Quarterly reports are prepared and submitted.
- Annual Report 2022-23 is prepared and submitted.

- Monthly Progress Reports of PASTIC are prepared and submitted.

## 2.10 PASTIC Services Awareness Seminars/Stalls

In order to publicize PASTIC Services & activities, PASTIC service awareness seminars and stalls were organized at various departments of universities on regular basis. Through this activity, PASTIC services are popularized and promoted at the doorsteps of the researchers. As a result, a large number of new research scholars and faculty members have come to know about PASTIC information services.

During the reporting period (i.e., 2023-24), 32 Awareness seminars/presentation have been organized/delivered and 07 PASTIC Service Awareness Stalls have been installed. Total 4100 researchers/students were benefitted. Details of the Stalls are as follows:

<b>Date</b>	<b>Venue</b>	<b>Organized by</b>
July 21-23, 2023	Upper Swat College of Nursing & Health Sciences, Upper Swat (50 visitors)	PSC, Peshawar
Aug 12, 2023	Arts Auditorium, University of Karachi, Karachi (150 visitors)	PSC, Karachi
Sep 14, 2023	Sardar Bahadur Khan Women's University, Quetta (100 visitors)	PSC Quetta
Sep 20, 2023	Hamdard University in Karachi (100 visitors)	PSC, Karachi
Dec 7, 2023	Pakistan Institute of Rehabilitation and Medical Sciences (PIRMS) Karachi (100 visitors)	PSC, Karachi
April 22, 2024	Bahria University Karachi Campus, Karachi (200 visitors)	PSC, Karachi
May 13, 2024	Bahria University Karachi Campus (300 visitors)	PSC, Karachi

## 2.11 Human Resource Development

Another important activity of PASTIC is to impart training to information professionals and researchers through organizing of workshops / seminars on research related topics e.g., Data analysis, Reference Management, Proposal/paper writing etc. In this regard, during the reporting period following training workshops/seminars/conferences were organized.

## 2.12 Trainings/Workshops/Seminars/Conferences Organized/Co-Organized

<b>Title</b>	<b>Date</b>	<b>Venue</b>	<b>Organizers/ Collaborators</b>
<b>PASTIC NATIONAL CENTRE (PNC) ISLAMABAD</b>			
Three Days Training Workshop on " <i>Project</i> "	19-21 Jul,	PASTIC,	Pakistan

<b>Title</b>	<b>Date</b>	<b>Venue</b>	<b>Organizers/ Collaborators</b>
<i>Management and Monitoring &amp; Evaluation</i> " (40 participants)	2023	Islamabad	Science Foundation
One Day Pre-Conference Workshop on “ <i>Application of Statistics and Data Analysis through SPSS</i> ” (50 participants)	Aug 22, 2023	Rawalpindi	Women University (RWU)
International Conference on “ <i>Revamped Scientific Outlook of 21<sup>st</sup> Century-2023</i> ” (100 participants)	Nov 15, 2023	RWU	RWU, PSF, HEC & others
International Conference on “ <i>Contemporary World: Challenges &amp; Transformations-2023</i> ” (100 participants)	Nov 16, 2023	RWU	RWU, PSF, HEC & others
Three Days Training Workshop on “ <i>Research Tools and Techniques (SPSS)</i> ” (42 participants)	Nov 28-30, 2023	PASTIC, Islamabad	--
2 <sup>nd</sup> International Conference on “ <i>Recent Innovations on Plant Sciences and Natural Products</i> ” (100 participants)	Feb 15 -16, 2024	University of Okara (UO)	UO, PSF & others
One Day Training Workshop on “ <i>Empower Your Institution with Global Content Connect Project GCCP: Training Workshop for QEC, and Teaching Departments</i> ” (50 participants)	May 04, 2024	Malir University of Science and Technology	PSC, Karachi
Five Days Training Workshop on “ <i>Geochemical Data Analysis Tools and Techniques</i> ” (20 participants)	Jun 5-11, 2024	HDIP	NUST & HDIP
<b>PASTIC SUB CENTRE (PSC) PESHAWAR</b>			
Three Days Training Workshop on “ <i>Utilization of Modern Techniques for Research &amp; Librarianship</i> ” (50 participants)	Jul 21-23, 2023	USCON, Swat	KKUK, SUIT, & USCON
03-Days “ <i>International Conference on Food &amp; Applied Sciences (ICFAS-23)</i> ” (100 participants)	Aug 3-5, 2023	SBBU, Sheringal	PNC & others
International Conference on “ <i>Sustainable Agriculture and Food Security (ICSAFS-23)</i> ” (100 participants)	August 27-31, 2023	University of Agriculture, Peshawar	PNC & others
Two Days Workshop on “ <i>Data Arranging and Analysis using SPSS</i> ” (41 participants)	Sep 25-26, 2023	Pakistan Forest Institute, Peshawar (PFI)	
One Day Training Workshop “ <i>Customizing Journals for Indexation in SCOUPS</i> ”	Jan 10, 2024	Khyber College of Dentistry, Peshawar	

<b>Title</b>	<b>Date</b>	<b>Venue</b>	<b>Organizers/ Collaborators</b>
(25 participants)			
One Day Training Workshop on " <i>What is Research &amp; How to Write a Research Paper</i> " (70 participants)	Jan 18, 2024	Khyber College of Dentistry, Peshawar	
Online Course on Research Methodology (80 participants)	Apr 22-26, 2024	Zoom	Abdul Wali Khan University, Mardan
One Day Seminar on " <i>How to Access and Effectively Use HEC Digital Library and Tips for Research Proposal Writing for Hunting PhD Scholarships</i> " (50 participants)	May 31, 2024	Khyber College of Dentistry Peshawar	
7 <sup>th</sup> International Conference, " <i>Earth Sciences Pakistan 2024</i> " (ESP 2024) (100 participants)	Jun 2-4, 2024	Baragali Summer Campus, University of Peshawar	NCEG, UoP, PNC & others
2 <sup>nd</sup> International Conference on " <i>Computing Technologies, Tools and Applications</i> " (ICTAPP-24) (100 participants)	Jun 4-6, 2024	The University of Agriculture, (AUP), Peshawar	AUP, PNC, HEC & Other
Patents Drafting, Filing, and Management (50 participants)	Jun 25-26, 2024	The University of Haripur	
Three Days National Conference on " <i>Exploring the Nexus: Artificial Intelligence and Libraries</i> " (100 participants)	Jun 28-30, 2024	SBBU Sheringal, Dir (U), KP	SBBU, ICP, KKUK, UoP, PNC & others
<b>PASTIC SUB CENTRE (PSC) KARACHI</b>			
One Day Seminar on " <i>Role of Information Technology in Higher Education</i> " (50 participants)	Jul 18, 2023	Federal Urdu University of Arts Sciences & Technology, Karachi	
9 <sup>th</sup> Annual Neuroscience Conference (ANC-23) (100+ participants)	Aug 12-13, 2023	University of Karachi, Karachi, Pakistan	
One Day Webinar on " <i>How to Use MAT-LAB with Python</i> " (106 participants)	Aug 22, 2023	Zoom	--
One Day Seminar on " <i>Future of Robotics in</i>	Sep 20, 2023	Hamdard University,	

<b>Title</b>	<b>Date</b>	<b>Venue</b>	<b>Organizers/ Collaborators</b>
<i>Medical Sciences</i> " (100 participants)		Karachi	
One Day "Awareness Seminar on Breast Cancer" (200 participants)	Oct 4, 2023	Hamdard University Karachi	
Two Days Training Workshop on " <i>KOHA: A Problem Based Session for Practitioner Librarians &amp; Data Bases: Access &amp; Usage</i> " (75 participants)	Oct 11-12, 2023	Faculty of Health & Medical Sciences, Hamdard University, Karachi	
One Day Seminar on " <i>Research Ethics in Artificial Intelligence</i> " (75 participants)	Feb 22, 2024	Pakistan Institute of Rehabilitation and Medical Sciences (PRIMS), Karachi	
One Day Training Workshop on " <i>Open Journal System (OJS)</i> " for the Capacity Building of Journal Editors (75 participants)	Mar 07, 2024	International Center for Chemical and Biological Sciences (ICCBS)	
One Day Training Workshop on " <i>Open Journal System (OJS)</i> " for the Capacity Building of Journal Editors (65 participants)	June 12, 2024	University of Sindh (USINDH), Jamshoro	USINDH & PNC
<i>First All Pakistan Universities Libraries Convention</i> (150 participants)	Apr 22, 2024	Bahria University Karachi Campus	PFLA & Bahria University
<i>The Scientist Convention: Science for Socio-Economic Development</i> (400 participants)	June 24, 2024	Institute of Industrial Electronics Engineering (IIEE), PCSIR, Karachi	
<b>PASTIC SUB CENTRE (FSC) FAISALABAD</b>			
Two Days Training Workshop on " <i>Role of Librarians in the age of AI (Artificial Intelligence and Skills for Freelance Librarian)</i> " (51 participants)	Aug 30-31, 2023	National Textile University, Faisalabad	
One Day Training Workshop on " <i>Open Journal System (OJS)</i> " for the capacity building of Journal Editors (52 participants)	Dec 09, 2023	Govt College Uni. Faisalabad (GCUF)	PNC
One Day Training Workshop on " <i>Open Journal System (OJS)</i> " for the Capacity Building of Journal Editors (60 participants)	Jan 18, 2024	Islamia University of Bahawalpur	PNC

<b>Title</b>	<b>Date</b>	<b>Venue</b>	<b>Organizers/ Collaborators</b>
One Day Training Workshop on " <i>Open Journal System (OJS)</i> " for the Capacity Building of Journal Editors (55 participants)	May 06, 2024	Bahauddin Zakariya University (BZU), Multan	
<b>PASTIC SUB CENTRE (LSC) LAHORE</b>			
One Day Training Workshop on " <i>Citation Management by Using EndNote Software</i> " (70 participants)	May 23, 2024	Government College University, Lahore	
<b>PASTIC SUB CENTRE (MSC) MUZAFARABAD</b>			
One day Seminar on " <i>Consortium Launching and Awareness of PASTIC Project on National Digital Archive of research published in Pakistan journals</i> " (40 participants)	Aug 25, 2023	University of AJ&K. New Campus Muzaffarabad.	

***Total no. of participants benefited were 3100***

## **2.13 Meetings / Workshops / Trainings / Seminars/ Conferences ATTENDED BY PASTIC OFFICIALS**

### **Events/ Webinars /Meetings Attended by PASTIC Officers/Officials**

#### **Prof. Dr. Muhammad Akram Shaikh, Director General PASTIC**

- Participated online at a high-end dialogue during the event titled “Beijing Science Literacy Week 2023” on September 17, 2023. The theme was “*How can Science Museums play a part in improving the quality of education for teens*”. The role of Science Museums in improving the digital education was highlighted.
- Presented agenda on Think Tank’s Third Moot Organized by (PIDE) on October 5, 2023 at Islamabad Hotel Islamabad.
- Attended Meeting regarding Presentation of PASTIC to Federal Secretary MoST on October 9, 2023 at Committee Room MoST.
- Invited as a special guest by VC, QAU to participate in Convocation of Quaid–e-Azam University at Jinnah Convention Centre, Islamabad on October 12, 2023.
- Invited as a special guest to Participate in the Graduation Ceremony of the Students from CUI, Wah Campus at Jinnah Convention Centre, Islamabad on October 24, 2023.
- Invited as a program evaluator (PEV) for evaluation/reaccreditation of software and civil engineering programs at NUST on October 30-31, 2023 at NUST, Islamabad
- Participated in “*Annual General Meeting of Alumni 2023*” organized by KOICA Pakistan Office at Serena Hotel Islamabad on November 3, 2023. The event was attended by Park Ki Jun, Ambassador to Pakistan, President Yeonjeho of KOICA Pakistan Office, Korean companies, Taekwondo Demonstration Team and 150 KAAP alumni.
- Invited to participate in International Conference on Science & Technology ICST-23 Bhakkar (November 9-10, 2023) on November 09, 2023 organized by Thal University & Evolution Pakistan in collaboration with Government Graduate College Bhakkar
- Attended “*World Science Day 2023*” at PSF Auditorium on November 15, 2023
- Attended workshop on “*Genomic Medicine and Earthquake Engineering*” at PSF/PAC on November 21, 2023
- Invited to 5<sup>th</sup> Convocation of Indus Medical College Tando Muhammad Khan Sindh at Indus Medical College at Tando Muhammad Khan Sindh on December 9, 2023.

- Attended Frontiers of Information Technology 20<sup>th</sup> International Conference at COMSTECH Islamabad on December 11-12, 2023.

**Mrs. Ghazala Ali Khan, Additional Director (STI), PASTIC Sub Centre, Peshawar**

- Mrs. Ghazala Ali Khan, Additional Director, PASTIC Sub-Centre, Peshawar attended a “*Meeting of the Committee to Devise the Criteria for appointment of the Professor Emeritus*” at National Centre of Excellence in Physical Chemistry, University of Peshawar on July 31, 2023.
- Attended a three-day International Conference on Food & Applied Sciences (ICFAS), 2023 held on August 3-5, 2023 at Sheringal University-Upper Dir along with Muhammad Ghazi, Additional Director PASTIC. The conference was organized by the Evolution Pakistan and SBBU Sheringal-Upper Dir.
- Attended 45<sup>th</sup> BOG meeting on September 04, 2023 at NCE in Physical Chemistry, University of Peshawar.

**Dr. Syed Aftab Hussain Shah, Additional Director (STI), PASTIC**

- Attended meetings as Member for Formulation of Draft Action Plans of National Science, Technology and Innovation (STI) Policy-2022 Pillar-II, “*Improving STI Governance and Management*” (Chapter 3 entitled “Adopting 21<sup>st</sup> Century Approach to STI Governance and Management”) at PSF/PCST under the directives of MoST. Prepared PASTIC Action Plan for implementation of the said policy.
- Provided Data and Information Relevant to Goals and Objectives of the OIC Programme of Action-2025, Experts data of Minerals & Mining; Agri Tech; Artificial Intelligence; Biotechnology; Chip/ Integrated Circuits (ICs); EV Batteries and Intellectual Property and Genetic Resources to MoST on request.
- Attended the closing ceremony of PSDP project, “*Feasibility Study for Establishment of National Spatial Data Infrastructure (NSDI) for Pakistan*” on June 28, 2024 at Serena Hotel, Islamabad. The event was attended by all relevant stakeholders and technical experts.

**Dr Maryum Ibrar, Additional Director (STI)**

- Attended a three days training workshop on “*Scrum & Agile Project Management*” at Pakistan Planning and Management Institute (PPMI), Islamabad on 22-24 November 2023. The workshop was designed to provide a fundamental understanding of the agile project management (software development) with focus on Scrum methodologies.

- Delivered presentation on “*PASTIC Information services*” to the participants of five days training workshop on “Geochemical Data Analysis Tools and Techniques” from June 6-11, 2024 at Hydrocarbon Development Institute of Pakistan (HDIP).

**Ms. Afsheen Tariq, Assistant Director (STI), PASTIC Sub Centre Karachi**

- Attended “*23<sup>rd</sup> ITCN Asia 2023*” Exhibition & Conference on August 31, 2023 at Expo Centre Karachi accompanied by Mr. Shahid Jamil Assistant Director (Admin). The Event was organized by Ecommerce Gateway Pakistan (Pvt.) Ltd. in Collaboration with Ministry of Information Technology, Government of Pakistan.
- Attended “*20<sup>th</sup> Health Asia International Exhibition & Conference*” on October 20, 2023 at Expo Centre Karachi. This event organized by the Ecommerce Gateway Pakistan (Pvt.) Ltd.
- Delivered presentation on importance of prevention of infectious diseases in children’s, Promoting Healthy Habits for a Stronger Future, Vaccination, Immunization, good hygiene habits, Healthy Lifestyle and Nutrition in a post conference workshop on the "Role of Microbes in Everyday Life" held on December 7, 2023, at the Pakistan Institute of Rehabilitation and Medical Sciences (PIRMS) Karachi.
- Attended Seminar on “*Establishment of an IT Park & DHA Tech Talk: Building the Future*” on December 12, 2023 at the Convention Hall DHA Country & Golf Club Karachi. The event was organized by the Ecommerce Gateway Pakistan (Pvt.) Ltd and DHA Karachi.
- Attended a Seminar on “Tropical Cyclone and Tsunami Threats to Pakistan Coast and our Preparations” on the occasion of 50<sup>th</sup> anniversary of the PTC, PMD on December 13, 2023 at Pearl Continental hotel, Karachi. The event was organized by Pakistan Meteorological Department (PMD), Society of Economic Geologists and Mineral Technologies (SEGMITE) and Pakistan Science Foundation (PSF).
- Participated and represented PASTIC in the “*4<sup>th</sup> International Conference on Biological Research and Applied Sciences (IBRAS)*” on January 23-25, 2024 at Muhammad Uzair Auditorium, Jinnah University for Women (JUW), Karachi. The conference was organized by Faculty of Science, Jinnah University for Women, Karachi in collaboration with PASTIC, PARC, NIO, KATI, The Wild Life Experience Centre etc.
- Attended a webinar on the “I.T Landscape of Pakistan” Hosted by the embassy of Pakistan in Czech Republic on February 28, 2024.
- Attended the two-day "Project Formulation Workshop" and visited the University Project Exhibition and Poster Competition “GEEKS” 2024, held on May 13-14, 2024 at

Bahria University Karachi Campus. The workshop was organized by the Pakistan Science Foundation in collaboration with Bahria University Karachi Campus and the PASTIC Sub Centre Karachi team.

- Attended JCHEM Expo 2023 as a judge on November 14, 2023 in Exhibition Hall, Jinnah University for Women Karachi. The Event was organized by Department of Chemistry, Jinnah University for Women (JUW).
- Visited “20<sup>th</sup> Pharma Asia International Exhibition & Conferences” on November 16, 2023 in Expo Centre Karachi accompanied by Mr. Shahid Jamil Assistant Director (Admin).

### **2.13 Development Project (On-Going)**

#### **Title of The Project: Development of National Digital Archive of Research published in Pakistani Journals**

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

#### **Objectives:**

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

#### **Achievements:**

During the Fiscal Year 2023-24, Following activities were undertaken:

- 180 Scientific Research Journals of Pakistan got registered to the project consortium.
- Software development for online Journal archived platform has been launched according to national standard.

- Implemented a data import crawler to extract data from Open Journal Systems (OJS)-based websites. Extracted data is formatted into XML for compatibility and later used to import into the NDA project.
- Federated search have been enabled with consortium journals to search full text facility.
- Full text (10,00 articles) data of eighty (80) journals have been uploaded on single platform for search.
- Four (4) Training workshops on Open Journal System (OJS) and Two (2) Project awareness/Consortium launching activities for Scientific Journal Publishers of Pakistan were organized in different regions of the country (Details are provided in the following table).

<b>Name of Activity</b>	<b>Location</b>	<b>Date</b>	<b>Participants</b>
OJS Training Workshop	Faisalabad	09-Dec-23	55
	Bahawalpur	18-Jan-24	60
	Karachi	07-Mar-24	75
	Multan	06-May-24	50
Project Consortium/ Awareness Activity	Muzaffarabad	25-Aug-23	40
	Jamshoro	12-Jun-24	67
<b>Total participants</b>			<b>347</b>

## 2.14 Miscellaneous Activities

- Mr. Raheel Sarwar, Lecture Benazir Bhutto Shaheed University, Karachi & IT Consultant Sindh Tourism Development Corporation visited PASTIC Sub-Centre Karachi on July 17, 2023. COMSTECH (Organization of Islamic Cooperation (OIC).
- Following four officers from PASTIC National Centre, Islamabad: Mr. Saifullah Azim, Principal System Analyst; Dr. Syed Aftab Hussain Shah, Additional Director (STI); Dr. Maryum Ibrar, Additional Director (STI) & Mrs. Rahila Khurram, Sr. SIO attended 3

days workshop on "Project Management: Monitoring & Evaluation" at PASTIC National Centre, Islamabad from July 19-21, 2023 organized under PSDP Project "Competitive Research Program (CRP)". While following officer/sub-Centre Incharges attended the said training remotely through Zoom: Mr. Abdul Khaliq Sial, Assistant Director (STI), Quetta; Mrs. Ghazala Ali Khan, Additional Director (STI) Peshawar, Muhammad Hasnain, Additional Director (STI), Faisalabad; Mr. Ali Raza Khan, Additional Director, Lahore; Ms. Afsheen Tariq, Assistant Director (STI), Karachi & Mr. Muhammad Altaf, Deputy Director (STI), Muzaffarabad.

- Written Test for 20<sup>th</sup> International Junior Science Olympiads (IJSO) for students of Punjab region was conducted by Pakistan Science Foundation in collaboration with PSC Peshawar & Lahore on August 29, 2023 at respective sub-centres.
- Syed Shabib Zaidi, Carvan Assistant at PSCK, attended a seminar on "*Health Literacy and Poster Competition*" on October 31, 2023, at the University of Karachi. The event was organized by the Department of Biochemistry at the University of Karachi.
- PSCK Official Syed Shabib Zaidi, Carvan Assistant attended & participated in All Sindh Stakeholders Meeting of Industry, Higher Educational Institutions (HEIs), Polytechnic, Vocational and Government Technology Colleges for "*Strengthening Academia-Industry Linkage for Engineering Technology*" on November 28, 2023 at UIT University.
- PASTIC & COMSTECH signed a memorandum of understanding in a ceremony held at COMSTECH Secretariat, Islamabad on December 5, 2023 for potential collaboration by facilitating in areas of combined growth for their beneficiaries. Senior officials of PSF, PASTIC and COMSTECH attended this ceremony.
- PASTIC officers attended opening ceremony of the inspiring Invited Talk on "*Mysteries of Quantum Mechanics*" by a renowned Pakistani Physicist, Prof. Dr. Mohammad Suhail Zubairy (HI, SI, FPAS) on December 4, 2023 at the A.Q. Khan Auditorium of the Pakistan Academy of Sciences, Islamabad.

- Mr. Saif Ullah Azeem, Project Director PASTIC shared details of PASTIC's development project titled “*National Digital Archive of Research Published in Pakistani Journals*” through an online session during a one-day training workshop on “Customizing Journals for Indexation in SCOPUS” on January 10, 2024 organized and hosted by Khyber Collage of Dentistry, Peshawar in collaboration of PASTIC.
- Dr. Muhammad Ali Memon, Consultant Oncologist, Ex Director of Atomic Energy Medical Centre (AMEC), Jinnah Postgraduate Medical Centre (JPMC) Karachi visited PASTIC Sub Center Karachi on January 26, 2024. Ms. Afsheen Tariq Assistant Director (STI) gave him briefing about PASTIC activities and services for researchers.
- Syed Amjad Ali Shah, PASTIC Sub Centre Peshawar joined one-day Steering meeting arranged by ORIC, CECOS University of IT & Emerging Sciences, Peshawar on June 28, 2024 under the chairmanship of worthy Vice Chancellor Dr. Naseer Ahmed.

### III. PAKISTAN MUSEUM OF NATURAL HISTORY

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

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

Scientists of PMNH regularly execute extensive field works from the Coast of Arabian Sea to the Alpine Regions, roamed through barren areas for the collection of Flora & Fauna, Rocks, Fossils and minerals for the purpose collection, research, publication and education. Due to these collective efforts of scientific and technical staff of PMNH and collaborations with other research institutions, PMNH has 1.5 million natural history specimens in its repositories. Research outcome of these field works and National and International projects are published in the form of research papers in reputed national and international journals. Scientific and Technical staff of PMNH also facilitate the students of BS., M. Phil./MS., and Ph. D. scholars belonging to the various universities of Pakistan and research institutes by providing help in their research in the form of information, technical assistance, specimens as a loan and guidance in their research work. Providing informal education is one of main objectives of PMNH mandate. For this purpose, PMNH regularly organizes trainings, workshops, seminars, symposia and other educational interactive activities related to natural history, environment and biodiversity of Pakistan. International days are also observed. As per mandate “*To establish liaison with similar*

*institutions both within and outside Pakistan for sharing of knowledge and expertise”,* PMNH established many national and international liaisons with the other research institutes in the country and abroad. PMNH is not only conducting research on Flora & Fauna, Rocks, Fossils and Minerals of Pakistan but also educating the students of Pakistan along with the common people with the help of informative, interactive, educative 3-dimensional dioramas and exhibits. Students of schools, colleges and universities from all over the Pakistan visit PMNH as a part of their educational tours.

Summary of PMNH Progress 2023-24 During report period, In the report period (2023-2024) 155,943 people visited museum galleries including 52,994 students, 557 foreigners. Total 16 Technical Reports were prepared for the field surveys and baseline studies of floral and faunal diversity in the KPK merged districts. Total collections made during the year 2023-24 was 10,783 specimens including the flora, fauna, rocks and fossils from all over the country. Some 80,064 specimens/samples of plants, animals, rocks, minerals and fossils were curated during this period. Total cataloguing of 21,193 specimens was done. Total 7,695 samples were also digitized. The scientific divisions published 43 research papers in the reputed scientific journals.

## **1 Botanical Sciences Division**

### **PERFORMANCE AGAINST SPECIFIED GOALS AND TARGETS:**

- **Training Courses/Workshops Held/Attended:**
  - BSD scientists attended the training entitled “Project Formulation Workshop” as participant organized by PMNH and facilitated by Dr. Israr as expert from PSF. The workshop highlighted the important steps towards the preparation, submission and the further progress in running of a scientific project.
  - BSD scientist participated in Science Mela, held in Divisional Public School, Lahore.
  - BSD scientist attended Training on Integrated Natural Resources Management (13-17 May, 2024) held at AKHNCRD, Chak Shahzad, and Islamabad
  - BSD scientist attended Training on Diagnosis of Viral Diseases (December 05-07-2023) at Nuclear Institute for Agriculture and Biology Faisalabad.
  - BSD Scientist visited Astola Island for the making of the documentary along with the MPCEN and Zoological Sciences Divisions. PMNH.

- **Trainings Courses / Workshops Conducted:**

- BSD Scientist Dr. Syed Aneel Ahmad Gilani (Curator BSD) presented the lecture at the International Conference at Women University Rawalpindi as Resource Person.
- BSD scientists conducted training on Kitchen Gardening held for students and teachers of Al-Huda International Foundation, Islamabad.
- BSD scientists conducted training to farmers in Larkana district, Sindh to train on rice fungal diseases. Horizon Scanning Workshop: Prioritization of Quarantine Pests for Pakistan 29 April - 03 May 2024 held in Ramada Hotel, Islamabad
- Dr. Muhammad Ismail Bhatti, Curator at Botanical Sciences Division, Pakistan Museum of Natural History, Islamabad participated in a training workshop “**Horizon Scanning Workshop: Prioritization of Quarantine Pests for Pakistan**” which was organized by CABI to **identify and prioritize potential quarantine pests that could threaten Pakistan's agriculture and biodiversity**. The workshop's primary objectives included:
  - Identifying **high-risk quarantine pests**: To assess the likelihood of these pests entering Pakistan and their potential impact on the country's agriculture and environment.
  - Developing a **prioritization framework**: To establish a system for ranking the identified pests based on their risk level and potential economic and environmental consequences.
  - Strengthening **early warning systems**: To enhance Pakistan's ability to detect and respond to emerging pest threats.
  - **Fostering collaboration and knowledge sharing**: To facilitate collaboration among stakeholders and promote the exchange of information and expertise related to quarantine pests.

- **Research Outcomes:**

### **1.1 Field Works**

- Researchers of Botanical Sciences Division (BSD), conducted numerous field works in the areas of Kalar Lahar, Salt Range, Swat, Nathia Gali, Murree, Neelam Valley, Muzaffarabad, Karachi, Jewani, Ormara, Gawadar and Astola Island including the

adjoining areas and Coastal areas of Sindh and Baluchistan for the collection of plants, animals, insects, rocks, fossils and minerals specimens for the purpose of research and public education.

- BSD scientist visited the Astola Island in October 2023 for the making of the documentary on the plant and animal life and conservation of the species in Astola Island. Astola is Pakistan's largest offshore island at approximately 6.7 km lengthy with a maximum width of 2.3 km and an area of about 6.7 km<sup>2</sup>. The highest point is 246 feet above sea level. Administratively, the island is part of the Pasni sub district of Gawadar District in Baluchistan province. The island can be accessed via motorized boats from Pasni, with a journey time of approximately five hours to attain the island. The main purpose was to explore and record the floral and faunal diversity of the island for education and conservation purpose.
- PMNH team consisting of scientists from Botanical and Zoological Division visited the Astola Island from Pasni and Gawadar area. The team was supported by MPCEN (Media Project on Conservation, Environment and Nature). During the visit the floral diversity of the Astola Island was explored along with the photography and video making. The floral wealth has diversity with limited trees, shrubs and various herbs species. The main purpose of the visit was to make a documentary for the exposure of the targeted area with the students, academia and general public through the social media and link of the documentary on various organizations websites including the PSF and PMNH.
- Three days Field was conducted for the plant collection, curation, identification and preservation in the field. The proposed field visit was conducted in Swat and nearby areas including the different vegetation zones including the plains, wetlands, lakes for the collection of the floral diversity. The surrounding areas of Swat are mostly composed of moist temperate of Himalaya's vegetation area including the plains and wetlands. The vegetation mainly included the broad leaf plant species with characteristic shrubs, herbs, climbers. The proposed sites for the field visit focused on the collection of the moisture and aquatic vegetation, as well as Algae and Higher Plants from Swat and surrounding areas.
- BSD scientist organized an orientation field visit to Kallar Kahar and nearby area for junior BSD researchers.

- Two days of field work. From September 9 to 10, students and lecturers from CUST University (Capital University of Science and Technology) Rawalpindi went Nathiagali and Abbottabad and gathered 30 mushroom specimens. 30 specimens were dried and tagged with the accession number. 10 mushroom specimens recognized up to the species level
- **Collection, Cataloguing, Digitization of Natural History Specimens:**
  - **Collection & identification status**
    - Higher and lower plants
      - i. **5,214** samples/plants collected from different regions of Pakistan for herbarium.
  - **Cataloguing**
    - i. Higher/lower plants **16,700**
  - **Curation/ Preservation/ Poisoning / Mounting / Arrangement**
    - i. Higher/Lower plants Herbarium **18,500**
  - **Digitization/Database**
    - i. Lower/Higher plant **10,000**
  - **Photography**
    - i. Higher/lower plants **1300**
  - **Laboratory Work:**
    - i. Maintain fungi cultures (*Cordyceps*, *Trichoderma*, *Metarhizium*, *Beauveria*, *Milky*, *Oyster*, *King Oyster*) in the BSD laboratory.
    - ii. Maintained pure culture and spawn of macro fungi like Oyster Mushroom, King Oyster Mushroom, Milky Mushroom and their spawn.
    - iii. Production and maintained of mushroom spawn of milky, oyster and *Cordyceps spp.* (mushrooms) in the laboratory of BSD
    - iv. Overall curation, preservation, microscopy and identification of Algal herbarium specimens and their classification up to species level.
    - v. Working on taxonomic studies of Lamiaceae, Zygophyllaceae and Acantheceae families.
    - vi. Working on pollen study of different angiosperm families.

## 1.2 Research Publications

Scientists of BSD remain engaged in the research on specimens of plants, animals, rocks, fossils and minerals. Outcome of this research published in the national and international journals in the form of research papers & articles, natural history books, monographs, technical reports and popular articles etc. Research publications, technical reports, popular articles, books and abstracts are as under:

### a) Research articles:

- i. **Sumaira Sahreen**, Soundararajan Vijayarathna, Manisekaran Hemagirri, Mohd Adnan, Md Imtaiyaz Hassan, Mitesh Patel, Reena Gupta et al. (2024). "Plant bioactive compounds driven microRNAs (miRNAs): A Potential Source and Novel Strategy Targeting Gene and Cancer Therapeutics." *Non-coding RNA Research*, Elsevier 9(4):1140-1158. Impact Factor 5.9
- ii. S. Oranab, A. Ghaffar, A. Ahmad, M.F.K. Pasha, B. Munir, S. Arif, S. Ishaq, S.H. Mahfooz, R. Kousar, **S. Zakia** and H.M. Ahmad. 2023. Genome-Wide Analysis of Cyclic Nucleotide-Gated Ion Channels (Cngcs) Of Arabidopsis Thaliana Under Abiotic Stresses. *SABRAO Journal of Breeding and Genetics* 55 (1) 0-0, 2023
- iii. **Narejo, G.A.**, Mirbahar, A.A., Yasin, S. *et al.* (2023). Effect of Hydro and KNO<sub>3</sub> Priming on Seed Germination of Cotton (*Gossypium hirsutum* L.) Under Gnotobiotic Conditions. *J Plant Growth Regul* 42, 1592–1603. <https://doi.org/10.1007/s00344-022-10644-y>
- iv. Nazir, S., Murtaza, G., Hameed, A., **Abbas, G** (2023) Evaluation of the antibacterial activity of liverwort species of Bagh Azad Jammu and Kashmir (Western Himalaya) against pathogenic bacteria. *GSC Biological and Pharmaceutical Sciences*, 22 (02), 166-172. <https://doi.org/10.30574/gscbps.2023.22.2.0052>
- v. Ramzan Ali, ErumIqbal, Muhammad Ismail Bhatti and Saboohi Raza (2023).Taxonomic Data of New Recorded Plant Parasitic and Soil Nematodes from

Different Vegetation of Thar Desert, Sindh Pakistan in *Pakistan Journal of Nematology*, Vol. 41, Iss. 1, Pages 70-94

- vi. UzmaSitara, Parwaiz Ahmed Baloch, Atta Ullah Khan Pathan, **Muhammad Ismail Bhatti**, Mohammad Abbas Bhutto, Qazi Mehmood Ali, Abid Ali and Mehwish Iqbal (2023). In vitro studies to determine antibacterial and antifungal properties of three *Pleurotus* species (Oyster mushroom). *Pakistan Journal of Botany* DOI: 10.30848/PJB2023-1(14)
- vii. Jameel Ahmad Bhatti, Armghan Shehzad, Waqar Ahmad Bhatti, Haider Ali, SadfarHussain, Muhammad Arif, Danish Abbasi, **Muhammad Ismail Bhatti** and Muhammad IshaqueMastoi (2024). A short review on the impact of evolving and adopted yellow rust strain in wheat, *Journal Pure and Applied Biology* Manuscript No. PAB-MS 2312-132.
- viii. Ranjutha V, Chen Y, Al-Keridis LA, Patel M, Alshammari N, Adnan M, Sahreen S, Gopinath SCB, Sasidharan S. 2023. Synergistic Antimicrobial Activity of Ceftriaxone and *Polyalthia longifolia* Methanol (MEPL) Leaf Extract against Methicillin-Resistant *Staphylococcus aureus* and Modulation of *mecA* Gene Presence. *Antibiotics (Basel)*. 12(3):477. doi: 10.3390/antibiotics12030477. PMID: 36978344; PMCID: PMC10044657. (impact factor 5.2221).
- ix. Jing HH, Bardakci F, Akgöl S, Kusat K, Adnan M, Alam MJ, Gupta R, Sahreen S, Chen Y, Gopinath SCB, Sasidharan S. 2023; Green Carbon Dots: Synthesis, Characterization, Properties and Biomedical Applications. *Journal of Functional Biomaterials*. 14(1):27. <https://doi.org/10.3390/jfb14010027>(impact factor 4.901).
- x. Fatima, M., Khan, M.R., Al-Keridis, L.A., Alshammari, N., Patel, M., Adnan, M. and Sahreen, S., 2023. *Pleurosporum candollei* Methanolic Extract Ameliorates CCl<sub>4</sub>-Induced Liver Injury by Modulating Oxidative Stress, Inflammatory, and Apoptotic Markers in Rats. *ACS omega*, 8(29):25999–26011. <https://doi.org/10.1021/acsomega.3c02031> (impact factor 4.132).

- xi. Sasidharan, S., Vijayarathna, S., Oon, C.E., Al-Zahrani, M., Abualreesh, M.H., Chen, Y., Kanwar, J.R., Sahreen, S., Ghazanfar, S. and Adnan, M., 2023. Standardized *Polyalthia longifolia* leaf extract induces the apoptotic HeLa cells death via microRNA regulation: Identification, validation and therapeutic potential. *Frontiers in Pharmacology*, 14, p.1198425. <https://doi.org/10.3389/fphar.2023.1198425> (impact factor 5.988).
- xii. Alhassan, H.H., Al-Keridis, L.A., Ayub, H., Alenazy, F.O., Alruwaili, Y., Khan, M.R., Fatima, M., Patel, M., Alshammari, N., Adnan, M. and Sahreen, S., 2023. GC-MS-based profiling and ameliorative potential of *carissa opaca* stapf ex haines fruit against cardiac and testicular toxicity: An In vivo study. *Heliyon*, 9(8):e19324. <https://doi.org/10.1016/j.heliyon.2023.e19324>(impact factor 4.0).
- xiii. Saadia Munir ,H.A., “GCMS, molecular identification, proximate and mineral content Composition of two wild mushrooms (*Ganoderma lucidum*, *Pleurotus ostreatus*) from Gilgit
- xiv. Saadia Munir, H.A Baltistan Northern area of Pakistan ”*South African Journal of Botany* 163, page 57-60, 2023.
- xv. Sumaira, Sahreen, Soundararajan Vijayarathna, Manisekaran Hemagirri, Mohd Adnan, Md Imtaiyaz Hassan, Mitesh Patel, Reena Gupta et al. (2024). "Plant bioactive compounds driven microRNAs (miRNAs): A Potential Source and Novel Strategy Targeting Gene and Cancer Therapeutics." *Non-coding RNA Research*, 9(4):1140-1158. (Impact Factor = 5.9)

**a) Conference abstracts/Proceedings**

Nil

**b) Popular Science Articles:**

**NIL**

**d. Research Papers Submitted**

- i. **Narejo, G.A.**, Jabeen, A., Mirbahar, A.A., Yasin, S., Afzal T., Sadia H (2023) Effect of foliar applied silicon on Raya (*Brassica juncea* L.) genotypes under cadmium toxicity. Under review process in Silicon Journal.
- ii. **Narejo, G.A.**, Mirbahar, A.A., Yasin, S., Saeed, R (2023). Effect of Hydro and Osmopriming on agronomic and physico-chemical attributes of cotton (*Gossypium hirsutum* L.) under saline conditions in the field. Under review process in Journal of Agronomy and Crop Sciences.
- iii. Nawaz, A., Jabeen, F., Mansha, S., **Narejo, GA** (2023) The potential of chitinolytic bacteria for biological control of citrus fruit deteriorating fungi. Under review process in Scientia Horticulturae journal.

**e. Research Papers Reviewed**

- o 04

**f. BS., MS. & Ph.D. Viva Conducted**

BS: 04

MS: 02

Ph.D.: 01

**g. Research Projects (National & International):**

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

➤ National/International Projects (Running)

Three scientific research proposals submitted by the BSD/PMNH scientist to the PSF/NSLP for funding and the Screening Committee for Research Proposals have approved the following.

1. Exploring Aquatic Plant Biodiversity of Wetlands of Punjab, and Monitoring Genetic Resources through DNA Barcoding (As CO. PI. under review).

2. Phenological assessment of family Lamiaceae/Labiatae of herbarium specimens: Case studies from various eco-regions of Pakistan. (As PI, Approved).
3. PSF/NSLP/C-PMNH (990) Entitled Formulation of Eco-Friendly Trichoderma Based Indigenous Bio-Fertilizer for Management of Plant Diseases. (As PI, awarded)
4. PSF/NSLP/C-PMNH (1000) Entitled “Conservation, Propagation and Research on Native Desert Plants In PMNH Islamabad.” (As PI, under review)
5. PROJECT NO. PSF/RES/CP/KPK-SBBU/AGR (29)  
Project Title: Cultivation/ Processing of Mushrooms at High Altitude Research Centre at Shringal, Dir Upper under the Shaheed Benazir Bhutto University, Shringal, Dir Upper (Technology Transfer). (As Co. PI under review process).
6. Project Entitled “Exploring Aquatic Plant Biodiversity of Wetlands of Punjab, and Monitoring Genetic Resources through DNA Barcoding” (As CO-PI under review) in PSF NSLP Program.

#### **h. Publication of Book as contributor**

Dr. Syed Aneel Gilani along with Moinuddin Ahmed, Athar M., Asrar M., Siddiqui M.F., Ahmed D. and Nazim K. published the book as contributor entitled “Wonders of some plants and spices” ISBN Number: 979-969-7985-28-8, Printed by Bazm-E-Takhleeq-Adab, Pakistan P.O. Box 17667 Karachi-75300

### **1.3 National & International Liaison**

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

- a. Ozone Cell, Ministry of Climate Change, Government of Pakistan
- b. National Institute of Folk & Traditional Heritage (Lok Virsa)
- c. University of Sindh, Jamshoro

- d. University of Haripur, Hazara
- e. University of California Davis USA.
- f. MPCEN Pakistan
- g. National Museum of Natural History, Paris, France
- h. Beijing Museum of Natural History, Beijing China
- i. Kohat University, Kohat
- j. University of Poonch, AJK
- k. Organizations MPCEN & PIWEFF

#### **1.4 Services to Other Organizations**

In the financial year of 2023-24, services were provided to the students of BS, MS, M. Phil. belonging to the various universities of Pakistan in their research and thesis work and also supervised their research activities. Students from the following universities were provided assistance as a co-supervisor in their research work;

- Quaid-e-Azam International University, Islamabad
- University of Haripur, Hazara
- Bahria University, Islamabad
- Kohat University, Kohat
- University of Poonch, AJK
- PMAS Arid Agriculture University Rawalpindi
- NUST University Islamabad
- Government College for Women University Rawalpindi
- Women University Rawalpindi
- National University of Science and Technology (NUST), Islamabad

### 1.5 Services Provided by BSD Scientists

- BSD scientist guided and identified the medicinal plants of the BS students from different COMSATS campuses from Nagar and Phander area (GB) for the completion of their BS and PhD research work comprising on higher, lower & medicinal plants. BSD scientists guided to International and our home-grown students of Ph.D., BS levels of Biosciences from ASAB, Atta Ur Rehman School of Biological Sciences NUST University for their research work on different topics including the Therapeutic effects of Alzheimer's disease in humans by using *Fagonia indica* plant, medicinal value plants, Cashew nut. BSD scientists also guided Dr. Kamran (Assistant Prof. COMSATS University) who visited the BSD herbaria along with 40 BS Biosciences students. BSD scientists facilitated the students at the angiosperms, phycology and mycology herbaria.
- BSD scientists also guided several students including students from Bio-Engineering students from PIAS University Islamabad at the Angiosperms, Mycology and Phycology Herbaria, Department of Plant Sciences Quaid-i-Azam University Islamabad for the completion of the research work on the *Morchella species* in Pakistan, Department of Biotechnology and Genetic Engineering, University of Kohat regarding Spirulina: identification and culture,
- BSD researchers guided and facilitated to the students from Department of Genetic Engineering of PMAS Arid University, Kohat University and University of Azad Kashmir Muzaffarabad for the identification of the floral diversity and guidance in the completion of BS and Ph.D. research work.
- BSD researchers provided guidance and co-supervision of the Ph.D. Scholar (working on *Mentha* species form Pakistan) from PMAS Arid Agriculture University Rawalpindi, Department of Bio Sciences for her Ph.D. Research on the use of Anthelmintic plants from Pakistan. The research is still in progress 2024.
- A group of 30 BS students and 02 faculty members from Department of Botany Fatima Jinnah Women University Rawalpindi visited BSD Herbaria and laboratories. During their visit to BSD Angiosperms, Gymnosperms, Fungarium and Alga

Herbarium. The detail demonstration of the collection, curation and identification was given to the students so that they could learn more easily in future.

- A Community based school with 5 children and faculty members visited the BSD herbaria. The kids took keen interest in the plant collection and discussion on different relevant topics in the BSD herbaria.
- A group of F.Sc. students from OPF College visited the BSD Herbaria. The BSD scientists and researchers demonstrated the different research activities at the BSD labs and Herbaria.
- BSD researcher's facilitated 15 students came from the department of plant pathology and entomology at Pir Maher Ali Shah Arid Agriculture University, Rawalpindi, regarding placement in internships at PMNH.
- Ph.D. student from Department of Botany, Hazara University, Mansehra visited the BSD herbaria for the taxonomic studies at the higher plants herbarium for his Ph.D. research.
- BSD scientists facilitated the research scholars from Kohat University of Science and Technology, Kohat in collection and identification of fresh water micro algae.
- A Visit of 40 BS student from Department of Biological sciences, AIOU University Islamabad visited the higher and lower plants herbaria. Dr. Zarqa Nawaz (Faculty member) headed the students group.
- The International Ph.D. students from Rawlakot University visited the BSD herbaria and laboratories for identification of the *Rubus* plant species for her Ph.D. research work.
- The M.S. student from Department of Botany Kohat University completed the research work.
- BSD scientist guided Mr. Aurangzeb Abbasi (Ph.D. student) from Department of Botany, Hazara University, Mansehra for the taxonomic studies at the higher plants herbarium for his Ph.D. research.

## **1.6 Seminars/Symposia/Presentations/Webinars/Conferences**

- BSD researchers attended three days training on “PC-I preparation” organized by Ministry of Planning, Development and Special Initiatives at PPMI, Islamabad.
- BSD scientist attended seminar in the International biodiversity day at MAJU Islamabad on 22nd May.
- BSD scientist celebrated International Museum day on 18th May at Pakistan Museum of Natural History, Islamabad.
- BSD scientist Dr. Syed Aneel Ahmad Gilani participated in the 2<sup>nd</sup> International Conference on Revamped Scientific Outlook of the 21<sup>st</sup> Century organized by Rawalpindi Women University, Rawalpindi. The scientist Co-Chaired the technical session and also presented his invited lecture on the “Baseline studies and Conservation Status of the Plant Bio-Diversity of Kurram District KPK”
- BSD scientist Dr. Syed Aneel Ahmad Gilani attended Consultation workshop on mapping museum Needs and Challenges of Museums in Pakistan for effective implementation of UNESCO 2015 Recommendations (29-30 November). The workshop was organized in partnership with the Department of Archaeology and Museums, Islamabad. The workshop was attended by the different museum professionals and stakeholders from all around the country. The workshop highlighted the overall progress of different museum in the country along with the problems and challenges along with the recommendations for the solutions.
- BSD scientist visited the Astola Island in October 2023 for the making of the documentary on the plant and animal life and conservation of the species in Astola Island
- BSD Scientist Attending a one-day seminar on “Interfacial Premelting and the Mechanics of Frost” conducted by Dr. Alan W. Rempel, Professor of Department of Geological Sciences, University of Oregon, USA, on August 29, 2023 at the Pakistan Academy of Sciences in Islamabad.

- BSD scientist attended seminar on China- Pakistan Joint International Symposium on “The Economically Important Plants of the Himalayas- A Shared Wealth of Pakistan and China” (26 April 2024) The workshop aimed to help Pakistan better protect its agricultural resources and prevent the introduction of harmful pests, thereby contributing to the country's food security and environmental sustainability

## **1.7 Display Activities**

### **Addition of the New Diorama “Flower, Hive and Honey” at PMNH Display Gallery.**

PMNH has completed the new interactive and informative diorama on Honey bee, Hive and Plants focusing on the role of plant and honeybee in making of honey and the importance of pollination in the whole process. The diorama is one of its own kinds and describes the overall process of pollination along with the type of honeybee and plants involved in the production of honey. The role of honey bees and flower is vital in pollination. Honey bees, scientifically known as *Apis mellifera*, play a crucial role in the pollination of many of the world's flowering plants, including agricultural crops and wild flora. The diorama also depicts the floral diversity of the important plant species involved in the honey production as a source for honey bee. The plant species common for the different type of honey are shown in the diorama in the form of herbarium samples, these samples will be a source of learning and information of the public and students. The diorama is a source of complete life cycle of honey bee, its types, and plant species famous for the specific honey, process of pollination and role of honey bees in honey production. In addition, the 3-D models of honey bee and relief models of flowers, nectar and pollens are also placed for the information at the information desk. The common types of honey in Pakistan along with the beehive wax products are also part of this important diorama. In short this diorama will be source of information, pleasure and attraction of the general public, students and researchers all around the country and Internationally Worldwide.

## **2. Earth Sciences Division**

### **Performance Against Specified Goals and Targets**

#### **i. Training Courses Held/Attended**

- Dr. Hamad ur Rahim attended 3 days training workshop on “Natural Disaster Monitoring, Prevention and Mitigation Technology along CPEC” organized by China Pakistan Joint Research Centre on Earth Sciences (CPJRC) at Quaid-i-Azam University, Islamabad on 22-25 October 2023.
- Dr. Muhammad Murtaza, Mr. Tassarwar Hayat and Mr. Jawad Ahmed Jan attended and successfully completed 03 Days training workshop on Project Management: Monitoring and Evaluation PSDP Project" Competitive Research Program (CRP)" From 19th to 21st July 2023. It was organized by Pakistan Scientific and Technological Information Centre (PASTIC).
- Dr. Muhammad Murtaza attended a workshop for digitalization of Museum objects to celebrate international Museum Day.
- Dr. Hamad ur Rahim attended international conference on “Climate Change and Disaster Risk Reduction” organized by China Pakistan Joint Research Centre on Earth Sciences (CPJRC) at Quaid-i-Azam University, Islamabad 25-27 October 2023.
- Dr. Muhammad Murtaza attended and successfully completed the training on implementation of e-Pak Acquisition & Disposal System (EPADS) modules, arranged by Public Procurement Regulatory Authority (PPRA).

#### **ii. Research Outcomes**

- Collection, Cataloguing of Natural History Specimens

In the results of geological field works conducted in the previous years and lab work activities, following number of rocks, fossils and minerals and gemstones collected, catalogued and preserved in the repositories of Earth Sciences Division;

	Collected	--
	Catalogued	
a.	Invertebrate Fossils	1350
b.	Vertebrate Fossils	200
c.	Sedimentary Rocks	250
d.	Hard Rocks (Igneous, Metamorphic)	90
e.	Digitization of samples	430
f.	Thin Sections (prepared and studied)	115
	Total	2435

## 2.1 Research Publications

Following are the publications of ESD officers.

- i. B. Ahmada, S. H. Alia, A. Wahidb , Y. Bashirc , N. Shoukatd, S. M. T. Qadrie , A. Alif N. A. Siddiquid, M. Abiouig,h, and A. Yaseen. Soft Sedimentary Deformations Structures (SSDS) in Neoproterozoic Sharaban Formation, Kirana Complex, Pakistan: Regional Tectonic Implications. Doklady Earth Sciences, 2023, Vol. 510, Part 2, pp. 371–386.
- ii. H. U. Rahim, M. M. Shah, A. Kamal, T. Zafar, R. Khalil, M. S. Ahmed, M. Sami (2024) “Cathodoluminescence Petrography and Stable Isotope Geochemistry to Evaluate Diagenetic Evolution of the Middle Jurassic Samana Suk Formation (SSF), Kahi Section, Nizampur Basin, NW Himalayas, Pakistan” (IF: 0.9) in Doklady Earth Sciences, DOI: 10.1134/S1028334X24601779.
- iii. Kamal, M. M. Shah, H.U. Rahim, T. Zafar, R. Khalil, M. Shahzeb(2024) “Detailed Investigation of Dolomites in the Middle Jurassic Samana Suk Formation (SMSF), Kahi

Section, Nizampur Basin, NW Himalayas, Pakistan” in Russian Geology and Geophysics (IF: 1.13) DOI:10.2113/RGG20244737.

- iv. Tehseen Zafar, Fabrizio Frontanini; Hafiz ur Rehman, Danish Khan, Hamad ur Rahim, Zahid Hussain, Mabrouk Sami (2024) Understanding the origin of Cambrian marine oncoids: a petrological, geochemical and isotopic perspectives, *Sedimentary Geology*. (IF: 2.7) DOI: <https://doi.org/10.1016/j.sedgeo.2024.106638>.
- v. Hamad ur Rahim, Waqar Ahmad, Muhammad Jamil, Muhammad Zafar, (2024) “Sedimentary Facies, Diagenetic Analysis, and Sequence Stratigraphic Control on Reservoir Evaluation of Eocene Sakesar Limestone, Upper Indus Basin, NW Himalayas” in *Carbonates and Evaporites Journal*.
- vi. Muhammad Shahzeb, Mumtaz Muhammad Shah, Hamad ur Rahim, Jawad Ahmed Jan, Imran Ahmad, Rayan Khalil Kamran Shehzad (2024) “Depositional and Diagenetic Studies of the Middle Jurassic Samana Suk Formation in the Trans Indus Ranges and Western Extension of Hill Ranges, Pakistan: An Integrated Sedimentological and Geochemical Approach” in *Carbonates and Evaporites Journal*.
- vii. Jawad Ahmed Jan, Mumtaz Muhammad Shah, Hamad ur Rahim, Shahid Iqbal, Samina Jahandad, Muhammad Jamil, Rayan Khalil Yawar Amin (2024) Depositional and Diagenetic Studies of Clastic Reservoirs Zone in the Cretaceous Lower Goru Formation, Sindh Monocline, South Pakistan in *Journal of Earth System Science*.
- Research Articles (In Progress):
  - i. Syed Waqas Haider, Hamad ur Rahim, Muhammad Jamil, Jawad Ahmed Jan, Mustafa Yar “Lithofacies analysis and Geochemical signatures of Permian Tobra Formation, Salt Range, Pakistan: Implications for paleo-environmental conditions and paleo-geographic reconstruction”
  - ii. Nofal Munir Awan, Dr. M Zafar, Dr. Muhsan Ehsan, Rajun Chen, Tassawar Hayat, Hammad Ur Rahim “Diagenetic Studies and Reservoir Quality Assessment of Clastic Reservoir; Implications for Reservoir Development”.

- iii. Jabir Hussain, Dr. Ahmed E.Radwan, Mumtaz khan, Tassawar Hayat “Depositional and diagenetic evolution of the Early Eocene homoclinic-ramp carbonates (a paradigm from the Salt Range, Pakistan): Sequence stratigraphic, petrographical, diagenetic and geochemical attributes”. (Submitted in Journal of Marine and Petroleum Geology)
- Conference Papers (Presentation/Posters):
  - i. Khawaja Hussnain Iltaf, Hamad ur Rahim, Tofeeq Ahmad “Early Eocene Climate Optimum Event at The Ypresian Age from Shallow Marine Deposit Salt Range Eastern Neo-Tethys, Pakistan” Geological Society of America Connects-2023 (October) at Denver, Colorado. DOI: [10.1130/abs/2022AM-383251](https://doi.org/10.1130/abs/2022AM-383251) (Conference is attended by the 1<sup>st</sup> author).

## **2.2 Laboratory Work**

- i. Curation and cataloguing of 250 sedimentary rock specimens present in the repository of Earth Science Division. The rock sample were separated into clastic, carbonate rocks based on their classification. These sedimentary rocks are part of Earth science Division collection. New scheme of classification as per international standards is adopted as per discussion/instruction of Incharge, ESD.
- ii. Dr. Hamad Ur Rahim completed Petrographic studies of thin section slides of the Samana SukFormation were carried out to characterize rock type and to distinguish digenetic features. Detailed paragenetic sequence was established based on these petrographic studies.
- iii. Dr. Hamad Ur Rahim completed Scanning Electron Microscopy (SEM) of 10 rock samples and thin sections from National Centre of Excellence in Geology, University of Peshawar. Energy Dispersive spectroscopy (EDS) is attached with the SEM to determine the mineral composition of different phases and plotted different diagrams.

### Services to Other Organizations

- i. Dr. M. Murtaza and Mr. Tassawar Hayat expert consultancy services were instrumental in the success of Dr. Muhsan Ehsan's HEC-NRPU project, "Seismic Driven Stochastic

Reservoir Facies Classification of Lower Ranikot Sandstone, Kirthar Fold Belt, Lower Indus Basin, Pakistan".

- ii. The Earth Sciences Division (ESD) at PMNH has commercialized its Thin Section lab for students, Ph.D. scholars, and researchers for geological section preparation and rock cutting. Over the recent years, ESD has established a state-of-the-art Thin Section Laboratory equipped with modern facilities for the preparation of thin sections. This facility is widely utilized by Geology MS/M.Phil. /PhD students for thin section preparation, crucial for petrographic studies. The thin section preparation services are available to R & D organizations, Companies and students from various universities across Pakistan, aiding them in their research and thesis work. The facility not only provides the necessary tools but also offers supervision and guidance in research activities. Students from the following universities have availed themselves of the research facilities provided:
  - a. Quaid-i-Azam University, Islamabad
  - b. University of Haripur, Hazara
  - c. Bahria University, Islamabad
    - Research Co-supervision:
      - i. Dr. Hamad Ur Rahim is HEC approved PhD supervisor in the field of Earth sciences (Physical Sciences). Presently co-supervising 2 PhD students (Ms. Shazia Qamar, Mr. Muhammad Siddique) from department of Earth Sciences, Quaid-i-Azam University, Islamabad.
    - Summary of students provided assistance;
      - a. Co-supervised 01 students from Bahria University (Islamabad campus)
      - b. Internship provided to 12 BS (Geology) students from University of Malakand, Malakand, Bahria University (Islamabad Campus), International Islamic University.

Research Facilities:

Thin section Facility:

The Earth Sciences Division (ESD) at PMNH has commercialized its Thin Section lab for students, Ph.D. scholars, and researchers for geological section preparation and rock cutting. Over the recent years, ESD has established a state-of-the-art Thin Section Laboratory equipped with modern facilities for the preparation of thin sections. This facility is widely utilized by Geology MS/M.Phil. /PhD students for thin section preparation, crucial for petrographic studies. The thin section preparation services are available to R & D organizations, Companies and students from various universities across Pakistan, aiding them in their research and thesis work. The facility not only provides the necessary tools but also offers supervision and guidance in research activities. Students from the following universities have availed research facilities from Earth Sciences Division Thin Section laboratory:

- a. Quaid-i-Azam University, Islamabad
- b. University of Haripur, Hazara
- c. Bahria University, Islamabad
- d. University of Malakand, Chakdara, Dir

Soil Testing:

The soil testing was recently initiated by the Earth Science Division. The specific gravity of coarse and fine aggregate samples has been satisfactorily determined by the ESD scientists. Additionally, the picture of the current test for determining the barite fine aggregate sample is displayed below. The Earth Science Division intends to conduct soil tests for other organizations on payment basis in the near future.

### **2.3 Trainings**

Training Workshop on Natural Disaster Monitoring, Prevention and Mitigation Technology along CPEC held in Department of Earth Sciences, Quaid e Azam University, Islamabad

A training workshop titled "Natural Disaster Monitoring, Prevention, and Mitigation Technology along CPEC" was organized by the China-Pakistan Joint Research Center on Earth Sciences (CPJRC) and the Department of Earth Sciences at Quaid-i-Azam University (QAU) Islamabad spanning from 22 Oct. to 25 Oct. 2023. The China-Pakistan Economic Corridor (CPEC) traverses through the intersection of three major mountain systems: the Himalayas, the Karakoram, and the Hindu Kush in the northeastern parts of Pakistan. Due to its vulnerable geological features and distinct climate characteristics, it is highly susceptible to natural disasters.

This training workshop was aimed to strengthen regional sustainable development and facilitate the exchange of knowledge and technologies related to disaster prevention and mitigation between Chinese and Pakistani researchers.

Prof. Dr. Niaz Ahmad Akhtar, Vice Chancellor, Quaid-i-Azam University, Prof. Dr. Cui Peng, Director-general, CPJRC, Dr. Lei Yu, and Prof. Dr. Mumtaz Shah, Chairperson, Department of Earth Sciences, QAU addressed the inaugural session of the training workshop.

Dr. Hamad ur Rahim, Associate Curator of the Earth Sciences Division at the Pakistan Museum of Natural History, was an active participant in the event. Throughout the event, he engaged in fruitful discussions about various projects with his Chinese counterparts, scientists from HDIP, and representatives from various universities.

Key highlights of the workshop included:

- **Interdisciplinary Expertise:** The workshop featured a multidisciplinary approach, with participants gaining insights into various aspects of natural disasters, including earthquake monitoring, landslides, floods, and climate-related phenomena.
- **Practical Demonstrations:** Attendees were provided hands-on experience in using advanced monitoring and mitigation technologies, with a focus on real-world applications.

- CPEC-Specific Concerns: Participants engaged in discussions to address the unique challenges and vulnerabilities associated with the CPEC route, given its extensive geographical coverage.
- Cross-Border Collaboration: The workshop fostered strong ties between Chinese and Pakistani experts, encouraging a collaborative approach to disaster preparedness.

Prof. Dr. Cui Peng, Director General of the China-Pakistan Joint Research Centre on Earth Sciences, remarked, "The CPEC route is of immense significance, and as we develop and expand this economic corridor, it's crucial to prepare for and mitigate natural disasters that may occur. This workshop is a vital step towards building the necessary expertise and knowledge to ensure the safety and security of this monumental project."

#### National Training Workshop on Ore Microscopy

The National Training Workshop on Ore Microscopy took place from October 23 to 27, 2023, organized by the Geological Survey of Pakistan at the Geoscience Advanced Research Laboratories in Islamabad. Among the attendees was Mr. Adnan Qadir, a Fossil Technician from the Earth Sciences Division at the Pakistan Museum of Natural History.

This workshop represented a significant event aimed at enhancing the knowledge and skills of professionals and students in the fields of geology and mineral exploration. Its primary focus was on the practical aspects of ore microscopy, providing participants with a valuable opportunity to deepen their understanding of ore minerals and mineralogical analysis.

The training commenced with in-depth theoretical lectures covering the fundamental principles of ore microscopy. Attendees gained knowledge of key concepts such as polarization methods, light microscopy, and the identification of ore minerals. However, the heart of the workshop lay in the practical sessions, where participants had access to ore samples and state-of-the-art microscopes. These hands-on sessions equipped them with the ability to prepare small samples, examine ore minerals, and recognize important mineralogical characteristics, which are crucial for accurate mineral classification.

The workshop also fostered a conducive environment for networking and information sharing. Through interactions with peers, instructors, and industry experts, participants had the

opportunity to collaborate and exchange best practices. Geologists, researchers, and students alike found this National Training Workshop on Ore Microscopy to be an invaluable resource for improving their mineralogical analysis abilities and understanding.

Mr. Adnan Qadir gained a comprehensive learning experience, encompassing case studies, advanced methodologies, theoretical knowledge, and practical training. It is expected that the skills and networking opportunities acquired during this workshop will be prolific for the thin section laboratory work at Earth Sciences Division, Pakistan Museum of Natural History.

#### Earth Science Division Conducted Specialized Training on Thin Section Preparation

In a significant development for the Earth Science Division at the prestigious Pakistan Museum of Natural History (PMNH), a specialized training program on thin section preparation was conducted to enhance the skills and knowledge of the division's staff members. The training aimed to equip the participants with advanced techniques and methodologies necessary for the preparation and analysis of thin sections, which play a crucial role in geological research and mineralogy studies. The participant was exposed to state-of-the-art laboratory equipment and cutting-edge technologies utilized in thin section preparation, ensuring they gained comprehensive insights into the process. The training covered various aspects of thin section preparation, including sample collection and preparation, rock cutting and grinding techniques, epoxy mounting, thin section slicing, grinding, polishing, and staining methods.

#### **2.4 Design and Display Activities of PMNH for Informal Education**

Following three new displays added into the display galleries of PMNH for public;

- a. Construction of “Invertebrate Fossils of Pakistan” Display.
  - b. Beautification and upgradation of Rock Garden.
  - c. Rocks and fossils of Pakistan in the ESD corridor.
- a.** Construction of “Invertebrate Fossils of Pakistan” Display:

To provide awareness about biodiversity to public especially students, construction of Invertebrate Fossils of Pakistan display has completed. Rare specimens of invertebrate fossils

collected from different areas of Pakistan has been displayed in this diorama. Invertebrate fossils of Foraminifera, Belemnites, Gastropods, Echinoderms, Brachiopods, Sea shells, Ammonites and Bivalves has been displayed in this display gallery to provide awareness about fossils to the visitors.

**b. PMNH Unveils Upgraded Rock Garden for Enhanced Learning and Exploration**

Earth Sciences Department (ESD) scientists and technical staff collaborated on a thorough renovation of the Rock Garden at the Pakistan Museum of Natural History (PMNH) the plan included creation of new rocks, aiming to enhance the value of the garden at educational and aesthetic have enhanced the tourism.

The Advanced Rock Garden now displays various collections of rocks, minerals and skeletons from different parts of Pakistan. These exhibits provide valuable insights into the geological diversity of the country, giving visitors a deeper understanding of the rock and mineral diversity found in Pakistan, not to mention a practical resource so for students and researchers.

Plants were added to further enhance the natural atmosphere of the garden, creating an environment that reflected nature. This combination of landscape features and lush vegetation not only appeals to the eye but also creates a peaceful learning environment.

Essential to the mission of the PMNH, fieldwork activities play an important role in museums offering new paradigms of natural history. These efforts are consistent with the scientists' goal of increasing knowledge and ensuring that research resources are continuously deployed to support educational efforts The availability of field machinery and sample collection tools to facilitate this process is not yet available is still the first step.

The elevated Rock Garden stands as a testament to PMNH's commitment to education, research and community engagement, and provides a unique learning experience for all visitors

### c. New Displays at ESD Corridor, PMNH: A Glimpse into Earth's Natural Treasures

The Pakistan Museum of Natural History (PMNH) unveils its newly constructed displays in the corridor of the Earth Sciences Division (ESD). This latest enhancement offers visitors an immersive experience, showcasing a diverse collection of fossils, minerals, metals, rocks, and dimension stones such as marble tiles.

These meticulously curated exhibits aim to bridge the gap between science and aesthetics, providing a visual journey through Earth's natural wonders. Each display highlights the intricate beauty and scientific significance of these geological specimens, offering insights into the planet's rich history and resources.

The newly refurbished style now evokes a natural setting, blending the rugged textures of rock and bone with the polished beauty of marble tiles. This addition enhances ESD's visual appeal not only but also emphasizes PMNH's commitment to foster public interest in geosciences.

Visitors are encouraged to explore the new displays and deepen their understanding of Earth's geological heritage.

#### 1. World's Largest Giant Mammal 'Baluchitherium' Relocated at PMNH Amid Expansion Project

The Pakistan Museum of Natural History (PMNH) has relocated its iconic show off, the world's biggest massive mammal, Baluchitherium, to a new location inside the museum. The move comes as part of the Extension of Display Galleries, Collection, Repositories Improvement, and Research Facilities Enhancement challenge presently underway at PMNH.

Baluchitherium, a prehistoric massive whose fossils were first observed in 1910 by English paleontologist Sir Clive Forster Cooper collectively with scientists of Earth Sciences Division, Pakistan Museum of Natural History Islamabad, is considered the most important land mammal to have ever lived. Following the dramatic extinction of the dinosaurs, Cooper unearthed the bones of this gigantic creature in Balochistan and named

it Baluchitherium, meaning "the beast of Balochistan." He cautioned that its length rivaled that of some dinosaurs.

Decades later, within the early Nineties, French paleontologist Jean-Loup Welcomme launched into a quest to rediscover the fossils. Under the project "Mission Paléontologique Française au Balochistan", with PMNH as a key stakeholder, Welcomme retraced Cooper's footsteps. Upon arriving in Dera Bugti, he sought the help of Nawab Akber Khan Bugti, who no longer most effectively granted excavation permissions however additionally furnished essential resources and nearby hard work.

In 1997, Welcomme made a groundbreaking discovery: the primary finger bone of Baluchitherium in a stony valley near Dera Bugti. This turned into just the beginning of a chain of superb reveals. Within a small two hundred-square-meter region, Welcomme and his team uncovered a treasure trove of fossils, such as several skeletal remains of both male and lady Baluchitherium. The site is now seemed as one of the most prolific bone beds in the international.

To make sure that site visitors can continue to explore this extraordinary chapter of Earth's history, PMNH has carefully relocated the Baluchitherium exhibit. Once construction is complete, the museum's new blocks will provide modernized galleries and enhanced research facilities, offering an enriched experience for visitors and researchers alike.

## 2. Participation of PMNH in Lahore Science Mela

A group of officers from the Pakistan Museum of Natural History (PMNH) actively participated in the two-day Lahore Science Mela, which was organized by the Khwarzami Science Society at Divisional Public School, Lahore from the 28th to the 29th of October, 2023. This annual science event, hosted by the Khwarzami Science Society, serves as a platform for promoting scientific engagement and activities within the country.

The team of PMNH officers, led by Mr. Muhammad Imran, Associate Curator of the Earth Sciences Division (ESD), included members such as Mr. Abdul Nasir from the

Botanical Sciences Division (BSD), Mr. Khurram Hussain from the Zoological Sciences Division (ZSD), and Mr. Dawood Khan from the Public Services Division (PSD). They actively participated in the event by setting up a stall featuring a diverse collection of natural history specimens. This display included rocks, fossils, minerals, stuffed animals, and plants.

The Lahore Science Mela attracted a wide range of visitors, from scientific organizations to students of schools, colleges, and universities, as well as a large number of the general public. Particularly, students displayed a great deal of interest in the natural history specimens showcased at the PMNH stall. Notable attractions included stuffed animals like the "Langur," the Russell's viper (the most poisonous snake in Pakistan), the "Steppe Eagle," "Guitar Fish," minerals and gemstones, and a variety of mushrooms and plants.

The public and students alike demonstrated keen interest in mushroom cultivation and its potential benefits, both as a source of nutrition and medicine. The PMNH stall received visits from numerous scientists, scholars, faculty members from various universities, colleges, and schools, as well as students. These visitors appreciated the efforts of PMNH researchers and staff for sharing valuable knowledge and information.

The PMNH officers took the opportunity to provide information to all visitors about the functions and research activities carried out at the PMNH. The Lahore Science Mela continued for two days, officially concluding on the 29th of October, 2023.

## **2.5 Educational Activities**

Researchers of ESD performed various educational activities on behalf of PMNH including preparation write-ups for displays, Science Festivals etc. Details of these activities are as follows;

- a. Mr. Muhammad Imran, Associate Curator, ESD participated in Khwarzami Lahore Science Mela from held on Divisional Public School (DPS), Model Town Lahore.
- b. Officers of ESD performed duty in the PMNH display galleries for overall supervision of display matters.

- c. Mr. Tassarwar Hayat together with Dr. Sumaira Shireen and Muhammad Umer participated in 3<sup>rd</sup> Rawalpindi Women University job fair held on 24<sup>th</sup> April, 2024 in Rawalpindi Women University.

#### Education through PMNH displays

In 2023-24, Officers of ESD, provided guidance to the visitors, delegations, students and faculty members from various universities and dignitaries during their visit to the PMNH display galleries. Brief of some special visits are as follows;

- Dr. Hamad Ur Rahim guided international delegation from Pakistan China Research Centre for Earth Sciences (CPJRC) on 22 Dec 2023 and held a meeting to explore the possibilities of future collaboration.

### **3 Zoological Sciences Division**

#### **3.1 Training Courses Held/ Attended**

- Mr. Muhammad Umar, Research Associate, ZSD, attended a three-days training on “Project management and Monitoring & Evaluation” under PSDP project “Competitive Research Programme (CRP) from 19<sup>th</sup> to 21<sup>st</sup> July, 2023 at PASTIC Islamabad.
- Mr. Muhammad Umar, Research Associate, ZSD, attended a two-days training workshop specifically on “E-Pak Acquisition & Disposal System (E-PADS) from 25<sup>th</sup> & 26<sup>th</sup>, 202, organized by PPRA at MoST Islamabad.
- Mr. Muhammad Umar, Research Associate, ZSD, attended five-days training on “Integrated Natural Resource Management” from 13<sup>th</sup> to 17<sup>th</sup> May, 2024, at Akhter Hameed Khan National.

#### **Training Courses Conducted:**

- A training workshop conducted by Dr. Shabir Ali Amir regarding “Small scale Tilapia Fish Cage-Culture in Pakistan” in Multan from 18<sup>th</sup> to 22<sup>nd</sup> December 2023 arranged by Pakistan Fisheries Board, Islamabad.

### **RESEARCH OUTCOMES**

#### **3.2 Field Work**

- Dr. Shabir Ali Amir, the Associate Curator and Mr. Muhammad Umar Research Associate, ZSD, embarked on a field survey from 26<sup>th</sup> February 2024 to 11<sup>th</sup> March

2024. This survey focused on the collection of marine fishes from specific locations, including the Hub River estuary, Ibrahim Haidri Creek, and Hawaksbay areas. Dr. Amir collected 380 specimens of marine fishes belonging to families Solindae, Sparidae. The description of new species in the family Soliedae is in progress.

- Mr. Muhammad asif Khan, Director ZSD, conducted field visits of surrounding areas of Noor khan Air base Rawalpindi, Mushaf Air Base Sargodha, and M.M Alam Air base Mianwali, under the PSF funded project entitled “Birds / Wildlife Aircraft Strike Hazards & Prevention's”. Furthermore, it is stated that Director ZSD also conducted a field visit of Masroor Air Base Karachi and surrounding areas on the request of Pakistan Air Force.

### **Collection, Cataloging of Natural History Specimens**

- Collection and identifications of specimens: **1173 nos.**
- Curation and arrangements of specimens: **31129 nos.**

### **Laboratory Work**

- Stuffing: **05 nos.**
- Repairing of specimens: **09 nos.**
- Study skins: **35 nos.**
- Preparation of skeleton: **05 nos.**
- Preparation of skulls: **25 nos.**

### **3.3 Research Publications**

- i. Mi C., Ma L., Yang M., Li X., Meiri S., Roll U., Oskyrko O., Pincheira-Donoso D., Harvey L. P., Jablonski D., Safaei-Mahroo B., Ghaffari H., Šmíd J., Jarvie S., Mwangi Kimani R., Masroor R., Kazemi S. M., Nneji L. M., Fokoua A. M. T., Taboue G. C. T., Bauer A., Nogueira C., Meirte D., Chapple D. G., Das I., Grismer L., Avila L. J., Ribeiro-Junior M. A., Tallowin O. J. S., Torres-Carvajal O., Wagner P., Ron S. R., Wang Y., Itescu Y., Nagy Z. T., Wilcove D. S., Liu X. & Du W.. 2023. Global protected areas as refuges for amphibians and reptiles under climate change. [Nature Communications](https://doi.org/10.1038/s41467-023-36987-y), 14:1389. <https://doi.org/10.1038/s41467-023-36987-y>.

- ii. Hofmann S., Schmidt J., Masroor R., Borkin L.J., Litvinchuk S., Rödder D., Vershinin V. & Jablonski D. 2023. Endemic lineages of spiny frogs demonstrate the biogeographic importance and conservational needs of the Hindu Kush-Himalayan region. *Zoological Journal of the Linnean Society*, 198: 310–325. <https://doi.org/10.1093/zoolinnean/zlac113>.
- iii. Jablonski D., Khalili F. & Masroor R. 2023. The herpetofaunal diversity of Takhar Province, Afghanistan. *Herpetozoa*, 36: 73–90. <https://doi.org/10.3897/herpetozoa.36.e98319>.
- iv. Lee J. L., Yushchenko P. V., Milto K. D., Radjabizadeh M., Pouyani E. R., Jablonski D., Masroor R., Karunarathna S., Mallik A. K., Dsouza P., Orlov N. L., Nazarov R. A. & Poyarkov N. A. 2023. Kukri snakes *Oligodon Fitzinger, 1826* of the Western Palearctic with the resurrection of *Contiatranscaspica Nikolsky, 1902* (Reptilia, Squamata, Colubridae). *PeerJ*, 11: e15185. <https://peerj.com/articles/15185/>.
- v. Jablonski D. & Masroor R. 2023. *Dendrelaphis tristis* (Common Brozenback Tree Snake). Pakistan: Azad Jammu and Kashmir. *Herpetological Review*, 54: 74.
- vi. Abbas M., Bai M., Hassan M. A., Yang X., & Masroor R. 2023. Taxonomic Study of the Tribe Onitini Laporte, 1840 (Coleoptera: Scarabaeidae: Scarabaeinae) from Northern Pakistan. *Journal of the Entomological Research Society*, 25(2): 405–416. <https://doi.org/10.51963/jers.2023.97>.
- vii. Hofmann S., Masroor R. & Jablonski D. 2023. First comprehensive tadpole description of the relict and endemic mountain frog *Chrysopa asternosignata* (Murray, 1885) from Afghanistan. *Herpetologica*, 79 (3): 128–134. <https://doi.org/10.1655/Herpetologica-D-22-00046>.
- viii. Abbas, M., Khaliq, S., Masroor, R. & Hassan, M.A. 2024. A checklist of the dung beetles (Coleoptera, Scarabaeidae, Scarabaeinae) deposited at Pakistan Museum of Natural History. *Journal of Insect Biodiversity and Systematics*, 10(2): 415–430. <https://doi.org/10.61186/jibs.10.2.415>.
- ix. Jablonski D., Mebert K., Masroor R., Simonov E., Kukushkin O., Abduraupov T. & S. Hofmann. 2023. The Silk roads: phylogeography of Central Asian dice snakes (Serpentes: Natricidae) shaped by rivers in desert and mountain valleys. *Current Zoology* 70: 150–162. <https://doi.org/10.1093/cz/zoad008>.

- x. Pola, L., Crochet P.-A., Geniez P., Shobrak M., Busais S., Jablonski D., Masroor R., Abduraupov T., Carranza S. & Šmíd J. 2024. Some like it hot: Past and present phylogeography of a desert dwelling gecko across the Arabian Peninsula. [Journal of Biogeography](https://doi.org/10.1111/jbi.14823), 51: 1244-1258. <https://doi.org/10.1111/jbi.14823>.
- xi. Hofmann, S., Rödder D., Andermann T., Matschiner M., Riedel J., Baniya C. B., Flecks M., Yang J., Jiang K., Jianping J., Litvinchuk S. N., Martin S., Masroor R., Nothnagel M., Vershinin V., Zheng Y., Jablonski D., Schmidt J. & Podsiadlowski L. 2024. Exploring Paleogene Tibet's Warm Temperate Environments through Target Enrichment and Phylogenetic Niche Modeling of Himalayan Spiny Frogs (Paini, Dicroglossidae). [Molecular Ecology](https://doi.org/10.1111/mec.17446), 33: e17446. <https://doi.org/10.1111/mec.17446>.
- xii. Hofmann, S., Podsiadlowski L., Andermann T., Matschinner M., Baniya C. B., Litvinchuk S. N., Martin S., Masroor R., Yang J., Zheng Y., Jablonski D. & Schmidt J. 2024. The last of their kind: Is the genus Scutigera (Anura: Megophryidae) a relict element of the Paleo-Trans Himalaya biota?. [Molecular Phylogenetics and Evolution](#): accepted. Amir Javed
- xiii. Javed, A., Shafique, S., Amir, S. A., and Siddiqui P. J.A. (2024) Shark (Elasmobranchs) Fisheries Trend in Pakistan: Species Composition of Catch and their Conservation Status. *Pakistan J. Zool.*, pp 1-9. <https://dx.doi.org/10.17582/journal.pjz/20230612060631>

### 3.4 Research Projects

#### I. National

- i. PSF funded project “Birds / Wildlife Aircraft Strike Hazards & Prevention's”.
- ii. PSF funded project “Establishment of Fabricated Lab” under STEM Programme Phase-I is successfully completed and Phase II is underway.
- iii. PSF funded project “Establishment of a DNA bar-code reference bank for the marine and freshwater fishes of Pakistan”
- iv. A PSDP project “Extension of display galleries, Collection Repositories Improvement and research facilities enhancement at Pakistan Museum of Natural History” building structure of the remaining six blocks is under construction. Total cost of the project is 1866.640 Million.

## **II. International**

**i.** A bilateral research project title “Cooperative development of an innovative auto-ID platform for the beetles from China and Pakistan” under PSF-NSFC programme is successfully operating.

## **B. Services to Other Organizations**

**i.** Dr. Shabir Ali Amir, Associate Curator, ZSD, is working on fish taxonomy with the collaboration of MARBEC, Université de Montpellier, France.

**ii.** Dr. Rafaqat Masroor, Associate Curator, ZSD, is working on herpetofaunal taxonomy with the collaboration of COMENIUS University, Czech Republic.

## **C. Design & Display activities of PMNH for Informal Education**

**i.** Establishment of new skeleton diorama.

**ii.** Establishment of Fabricated Lab.

**iii.** Establishment of Unique/ Reference collection diorama.

**iv.** Upgradation of Trophy wall, PMNH.

**v.** Upgradation of Elephant display/ diorama, PMNH.

## **3.5 Educational Activities**

### **1. Trainings/ Internships**

**i.** BS students from Arid Agriculture University, Rawalpindi: **01 nos.**

**ii.** Bs students from Islamic International University, Islamabad.**02 nos.**

### **2. Supervision of Students**

#### **BS(Hons)**

**i.** Students from COMSAT University, Islamabad on marine fish’s identification: **02nos.**

#### **MS/M.Phil**

**i.** Facilitated M.Phil. Student from Arid Agricultural University, Rawalpindi working on insect fauna of Rawalpindi-Islamabad.

## D. Others

- i. Dr. MishkatUllah, Associate curator, ZSD, presented his research finding in the 21<sup>st</sup> “European Carabidologists Meeting (ECM) held on 3<sup>rd</sup> to 5<sup>th</sup> June, 2024.
- ii. Received 16 large mammal specimens from CDA as donation for research and education purposes to PMNH
- iii. Mr. Muhammad Umar (RA) Participated in “Job Fair” at 3<sup>rd</sup> Rawalpindi Women University” on April 24,2024.
- iv. Dr. MishkatUllah (AC) &Mr. Muhammad Umar (RA) Participated in the Invited Talk/ Seminar on “Interfacial Pre-melting and the Mechanics of Frost by Dr Alan W. Rempel, Professor. Department of Geological Sciences. University of Oregon, USA on 29 August, 2023 at Pakistan Academy of Sciences, Islamabad.

## 4. PUBLIC SERVICES DIVISION

The Pakistan Museum of Natural History has unveiled four new and exciting dioramas, offering an immersive and educational experience for visitors. These interactive displays aim to raise awareness about the country's rich natural heritage, promote conservation, and foster a deeper appreciation for the environment. By showcasing Pakistan's diverse ecosystems, wildlife, and geological history, the museum is taking a significant step in science education, community engagement, and conservation efforts.

### 4.1 Educational Activities

- PMNH celebrated “**International Biodiversity Day**” by conducting different activities on the theme “Be a part of Plan”. A colorful and thought provoking activities related to celebrations of the International Day for Biodiversity, 2024 in collaboration with IMCG NIH colony college and PMNH Islamabad held on 22 May 2024. DG PMNH
- “**World Museum Day**” was celebrated among different schools of Rawalpindi and Islamabad inside PMNH premises to give awareness to school children about the importance of this day. Director General of PMNH, paid a special visit to the museum's displays. During

her tour, she engaged with children and young visitors, sharing insights into the museum's exhibits and the importance of natural history. A highlight of the day was a cake-cutting ceremony, where Dr. Tanveer and a young visitor celebrated the occasion together.

- On the occasion of **International Women's Day**, the museum hosted a variety of activities and events celebrating women's empowerment and contributions. To mark this special day, the museum offered free entry to all women visitors, providing an opportunity for them to engage with the exhibits and learn about the achievements of women throughout history.
- Brief the media teams (Dawn, AJJ, Express) about the PMNH vision, mission and programs for their documentaries/reports.
- "The Pakistan Museum of Natural History (PMNH) launched the 'Exhibit of the Month Activity' to highlight the significance and relevance of its exhibits and dioramas to students and the general public.

By highlighting the 'Exhibit of the Month', PMNH aims to create a sense of excitement and curiosity, encouraging visitors to explore and appreciate the museum's treasures."

- **Visitors Data of the Year 2023-2024**

Year	Students	General public	Foreigners	Children's under 05 years	Total	Amount (Rs.)
2023-24	52,994	97,365	557	5,026	155,943	6,763,619

PMNH display galleries are open in two shifts to facilitate the visitors, National and International delegates, student groups of schools, colleges and universities. Provided them guided tours during their visit to the display galleries. A sizeable number of people, from all the regions of Pakistan visited displays galleries of PMNH. In the report period (2023-2024) 155,943 people visited museum galleries including 52,994 students, 557 foreigners.

## **4.2 Design & display Activities of PMNH for Informal Education.**

### **New diorama of Skeleton**

The Pakistan Museum of Natural History (PMNH) is thrilled to announce the addition of a captivating new exhibit to its display galleries: The Skeleton Diorama. This fascinating display showcases a diverse array of animal skeletons, offering a unique and educational experience for visitors of all ages. The meticulously arranged skeletons provide a striking visual representation of the natural world, making for an engaging and informative experience.

### **New diorama of Ocean Biodiversity & whale Shark**

The "Ocean Biodiversity & Whale Shark" diorama is an immersive exhibit that transports visitors into the depths of the ocean, showcasing the incredible diversity of marine life. At its centerpiece is a majestic whale shark, the largest fish in the world, surrounded by a vibrant array of marine species, including colorful fish, coral, and other creatures.

This diorama aims to educate visitors about the importance of ocean conservation and the interconnectedness of marine ecosystems. By recreating the underwater world in stunning detail, the exhibit inspires a sense of wonder and curiosity, highlighting the need to protect our planet's precious oceanic resources for future generations.

### **New diorama of Dendrochronology**

The "Dendrochronology" diorama is an innovative exhibit that delves into the fascinating world of tree-ring research. Dendrochronology is the scientific study of the growth rings of trees, which can reveal valuable information about past environmental conditions, climate patterns, and historical events.

This diorama takes visitors on a journey through time, exploring the techniques and applications of dendrochronology. By exploring the world of dendrochronology, this diorama educates visitors about the importance of trees as natural archives of history and the role of science in understanding our past and present.

### **New diorama The "Flower, Hive & Honey"**

The "Flower, Hive & Honey" diorama is a vibrant and interactive exhibit that explores the fascinating world of pollination, bee biology, and honey production. This immersive display takes visitors on a journey from the flower to the hive, showcasing the incredible process of how

bees collect nectar and create honey. By exploring the intricate relationships between flowers, bees, and honey, this diorama educates visitors about the natural world, the importance of pollinators, and the sweet rewards of their hard work.

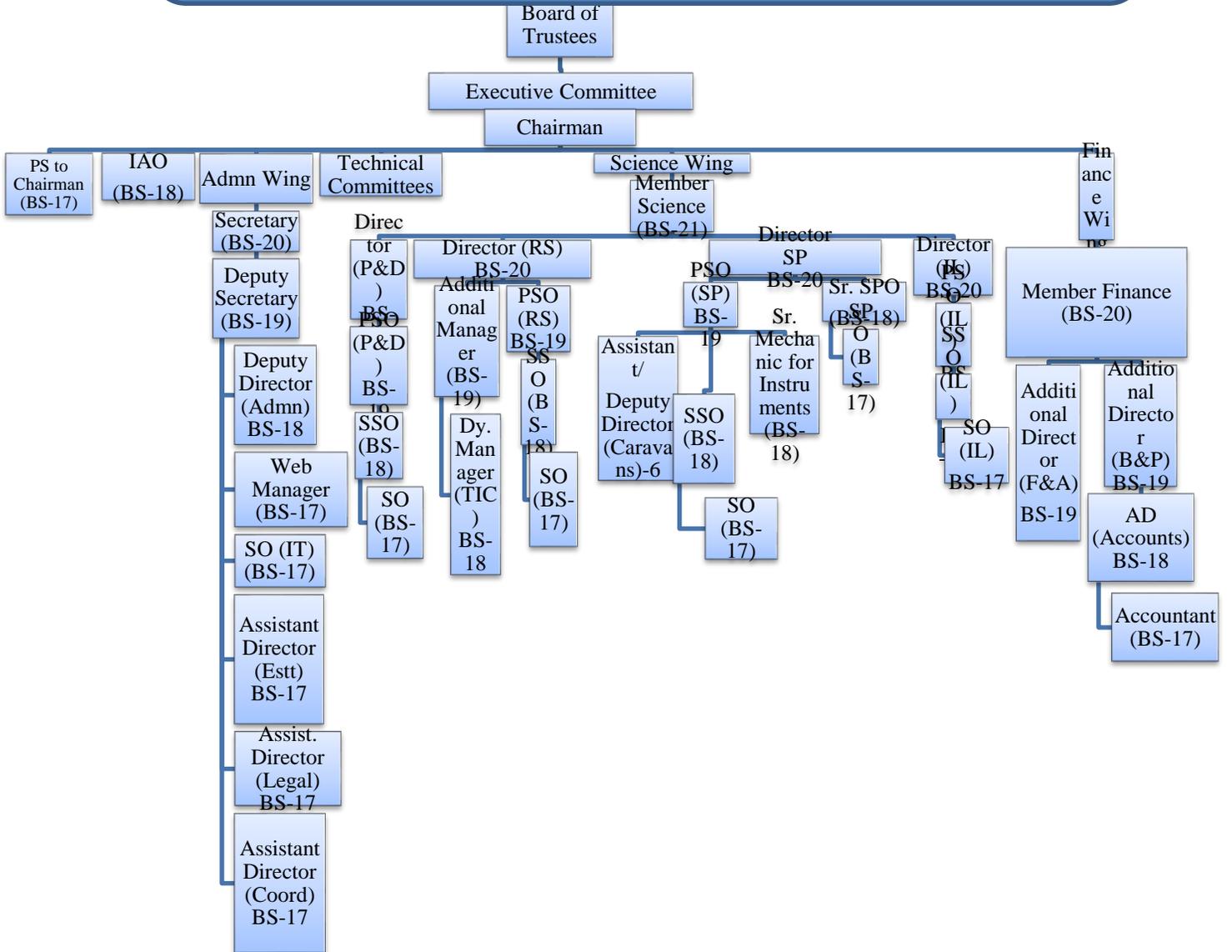
**Relocation of Baluchitherium** (Large size outdoor Model)

Museum officials have announced the temporary relocation of the large outdoor model of Baluchitherium, a prehistoric rhino, due to upcoming construction on a new building. The beloved exhibit, a favorite among visitors, shifted carefully to a new location within the open space of the museum.

#### IV. Organization and Administration

##### 1 PSF Organizational Chart and Sanctioned Posts

# Organogram of Pakistan Science Foundation



## Actual Working Strength 2023-24

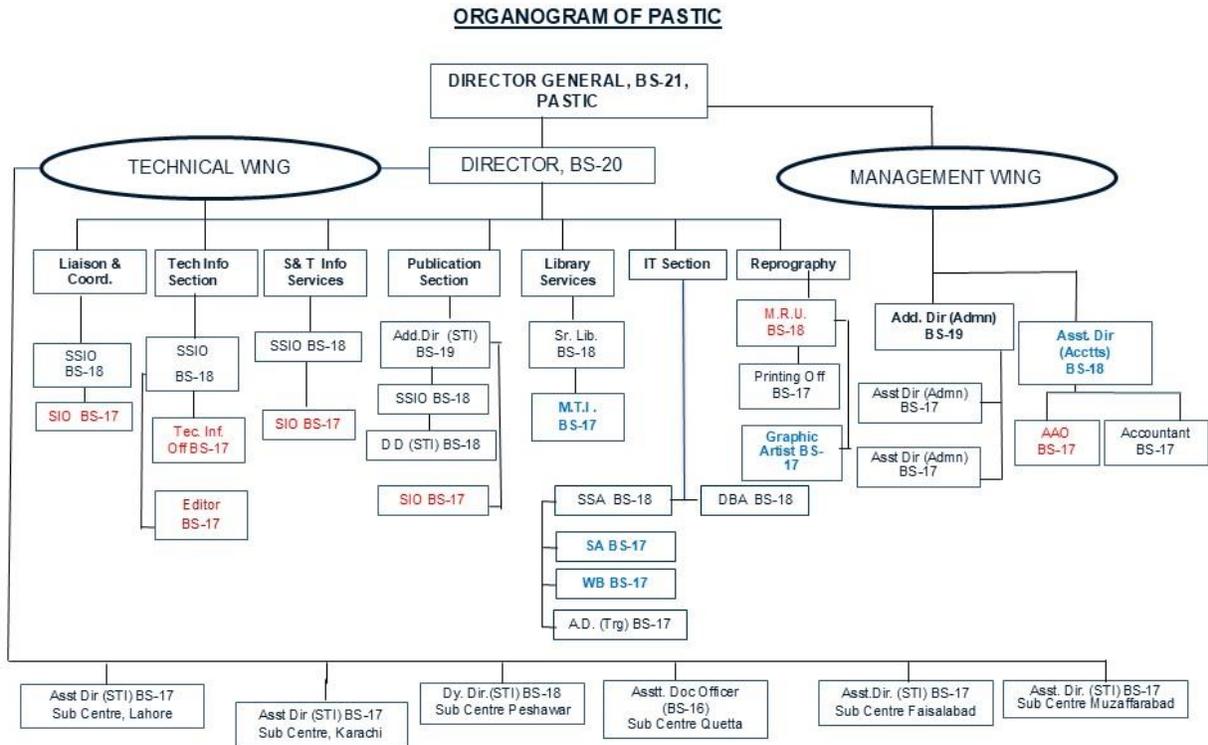
Sr. No	Post Nomenclature	BPS	Total	Filled	Vacant
1	Chairman	MP-1	1	-	1
2	Member Science	21	1	-	1
3	Member Finance	20	1	-	1
4	Secretary	20	1	1	-
5	Director (Research Support)	20	1	1	-
6	Director (Planning & Development)	20	1	1	-
7	Director (Science Popularization)	20	1	1	-
8	Director (International Linkages)	20	1	1	-
9	Deputy Secretary	19	1	-	1
10	Additional Director (F&A)	19	1	1	-
11	Principal Scientific Officer	19	5	2	3
12	Principal Science Promotion Officer	19	1	1	-
13	Additional Manager TIC	19	1	1	-
14	Additional Director (B&P)	19	1	1	-
15	Deputy Director (F&A)	18	1	-	1
16	Deputy Manager TIC	18	1	1	-
17	Deputy Director (Admin)	18	1	1	-
18	Deputy Director (Caravan)	18	3	3	-
19	Senior Scientific Officer	18	7	5	2
20	Internal Audit Officer	18	1	1	-
21	Sr. Mechanic for Instruments	18	1	1	-
22	Assistant Director (Accounts)	18	1	1	-
23	Assistant Director (Cord.)	17	1	-	1

24	Assistant Director (Estt)	17	1	-	1
25	Assistant Director (Legal)	17	1	-	1
26	Assistant Director (Caravan)	17	3	1	2
27	Scientific Officer	17	8	8	-
28	Scientific Officer (IT)	17	1	1	-
29	Science Promotion Officer	17	1	-	1
30	Web Manager	17	1	1	-
31	Accountant	17	1	1	-
32	PS to Chairman	17	1	1	-
33	Private Secretary	17	3	3	-
34	Sr. Photographer	17	1	1	-
35	Sr. Planetarium Assistant	17	3	3	-
<b>Sub-Total (BS-17 &amp; above)</b>		<b>-</b>	<b>60</b>	<b>44</b>	<b>16</b>
<b>Sr. No</b>	<b>Post Nomenclature</b>	<b>BPS</b>	<b>Total</b>	<b>Filled</b>	<b>Vacant</b>
36	Assistant Scientific Officer (HQ)	16	2	-	2
37	Audit & Accounts Assistant	16	2	1	1
38	Science Assistant (Caravan)	16	16	16	-
39	Assistant Private Secretary	16	4	3	1
40	Sr. Driver-Cum-Mechanic	16	6	6	-
41	Sr. Planetarium Assistant	16	4	4	-
42	Science Assistant (HQ)	16	5	5	-
43	Assistant Programmer	16	2	-	2
44	Assistant Admin	16	2	2	-
45	PA to Chairman	16	1	1	-

46	Superintendent	16	2	1	1
47	Graphic Artist	16	1	1	-
48	Cashier	16	1	-	1
49	Technical Assistant (IT)	16	1	1	-
50	Science Assistant Caravan	15	1	-	1
51	Science Assistant (HQ)	15	1	-	1
52	Assistant Admin	15	2	2	-
53	Storekeeper	15	1	1	-
54	Stenotypist	15	1	1	-
55	Stenotypist	14	2	-	2
56	Upper Division Clerk	13	10	9	1
57	Driver-Cum-Mechanic	12	1	1	-
58	Driver-Cum-Mechanic	11	2	1	1
59	Planetarium Assistant	11	2	2	-
60	Lower Division Clerk	11	8	6	2
61	Carpenter	9	1	-	1
62	Electrician	8	1	1	-
63	DMO	6	1	1	-
64	Driver/D.R	7	7	7	-
65	Driver	6	6	6	-
66	Driver	5	2	2	-
67	Driver	4	3	2	1
68	Mali	6	1	1	-
69	Mali	5	1	1	-

70	Mali	3	1	1	-
71	Qasid	6	3	3	-
72	Qasid	5	4	4	-
73	Qasid	4	3	3	-
74	Qasid	3	8	8	-
75	Naib Qasid	1	1	1	-
<b>Sr. No</b>	<b>Post Nomenclature</b>	<b>BPS</b>	<b>Total</b>	<b>Filled</b>	<b>Vacant</b>
76	Security Guard	6	1	1	-
77	Security Guard	4	4	4	-
78	Security Guard	3	8	8	-
79	Security Guard	2	1	1	-
80	Security Guard	1	2	-	2
81	Caravan Attendant	6	1	1	-
82	Caravan Attendant	4	5	5	-
83	Caravan Attendant	3	3	3	-
84	Sanitary Worker	4	2	2	-
85	Sanitary Worker	3	1	1	-
86	Sanitary Worker	2	1	1	-
	<b>Sub-Total (BS-16 &amp; below)</b>	-	<b>152</b>	<b>132</b>	<b>20</b>
	<b>Grand Total</b>	-	<b>212</b>	<b>176</b>	<b>36</b>

## 4.2 PASTIC Organizational Chart and Sanctioned Posts



**Detail Sanctioned Strength of BS-16 and above**

Sr.#	BS	Designation	Number of Posts		
			Total	Filled in	Vacant
1	21	Director General	1	1	0
2	20	Director	1	1	0
3	19	Additional Director (STI)	1	1	0
4	19	Additional Director (Admin)	1	1	0
5	18	Deputy Director (STI)	2	2	0
6	18	Sr. System Analyst	1	1	0
7	18	Senior Librarian	1	1	0
8	18	Manager Reprographic Unit	1	0	1
9	18	Database Administrator	1	1	0
10	18	Senior Scientific Information Officer	4	4	0
11	18	Assistant Director (Accounts)	1	1	0
20	17	Assistant Director (Admn)	2	2	0
12	17	Manager Technology Information	1	1	0
13	17	Assistant Director (Training)	1	1	0
14	17	Scientific Information Officer	4	3	1
15	17	Assistant Director (STI)	4	3	1
16	17	System Analyst	1	1	0
17	17	Web Manager	1	1	0
18	17	Printing Officer	1	0	1
19	17	Graphic Designer	1	1	0
21	17	Technology Information Officer (Marketing)	1	1	0
22	17	Editor	1	0	1
23	17	Assistant Accounts Officer	1	0	1
24	17	Accountant	1	1	0
25	16	Superintendent (Admin)	2	2	0
26	16	Assistant Scientific Information Officer	4	2	2
27	16	Assistant Documentation Officer	1	0	1
28	16	Assistant Programmer	2	2	0
29	16	Assistant Web Manager	1	0	1
30	16	Assistant Manager Reprographic Unit	1	1	0
31	16	Assistant Printing Officer	2	2	0
32	16	PA to D.G	1	1	0
33	16	Assistant Accounts	2	2	0
<b>Sub Total</b>			<b>51</b>	<b>41</b>	<b>10</b>

**Pakistan Scientific and Technological Information Centre, Islamabad**

**Detail Sanctioned Strength of BS-15 and below**

Sr.#	BS	Designation	Number of Posts		
			Total	Filled in	Vacant
1	15	Assistant (Admn)	7	7	0
2	15	Data Control Assistant	7	5	2
3	14	Marketing/Field Assistant	1	1	0
4	14	Graphic Assistant	1	1	0
5	14	Layout Artist	1	1	0
6	14	Mechanical Supervisor	1	1	0
7	14	Senior Offset Printer	2	1	1
8	14	Stenotypist	4	2	2
9	14	Data Entry Operator	4	3	1
10	12	Library Assistant	1	1	0
11	11	Technician	1	1	0
12	11	Photo Assistant	1	1	0
13	11	Offset Printer	1	1	0
14	11	Technical Assistant	1	1	0
15	11	Upper Division Clerk	10	10	0
16	9	Lower Division Clerk	11	11	0
17	9	Carpenter	1	0	1
18	7	Electrician	1	1	0
19	7	Assistant Offset Printer	1	1	0
20	5	Bindery Assistant	2	1	1
21	5	Offset Machine Assistant	2	2	0
22	4	Drivers	8	8	0
23	4	Dispatch Rider	1	1	0
24	4	Duplicating Machine Operator	1	1	0
25	3	Head Mali	1	1	0
26	2	Record Sorter	1	1	0
27	2	Photo Attendant	2	2	0
28	2	Qasid	1	1	0
29	2	Patent Attendant	2	2	0
30	2	Library Attendant	2	2	0
31	1	Sanitary Workers	3	3	0
32	1	Bindery Helper	3	3	0
33	1	Mali	2	2	0
34	1	Security Guard	8	7	1
35	1	Naib Qasid	17	14	3
<b>Sub Total</b>			<b>113</b>	<b>101</b>	<b>12</b>
<b>GRAND TOTAL</b>			<b>164</b>	<b>142</b>	<b>22</b>

## V. Photo Gallery and Press Clipping

### 1. PSF Photo Gallery



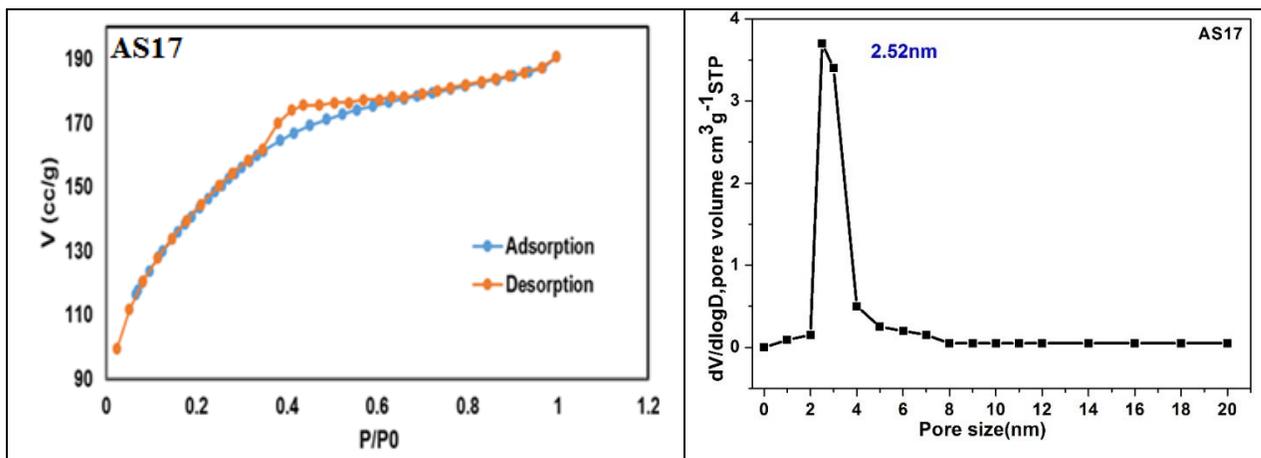
A PSF funded project “Development of Novel Early Cancer Bio-signatures in Breast and Stomach Cancers”



Principal Investigator (Dr. Faisal Rasheed) developing  $^{13}\text{C}$  Tests using nuclear technique for early cancer diagnosis



Student in a PSF funded project “Ordered Mesoporous Silica MCM-41 Derivatives: Control Synthesis, Characterization, and Environmental Applications”



Brunauer-Emmett-Teller (BET) and Barrett-Joyner-Halenda (BJH) surface area, pore size and volume analysis



**Fig. 1:** Scrutiny Committees for shortlisting the projects received under PSF-NSFC 5<sup>th</sup> R&D Call held on 07.11.2023(A), 10.11.2023(B) and 14.11.2023(C).



**Figure 2:** Joint Technical Committee with NSFC China being held on 25.04.2024



**Figure 3:** Visit of First Secretary of China to PSF



**Figure 4:** Visit of Minister Counsellor and Deputy Head of Mission, European Union to PSF



**Fig. 5:** Dr. Ahsan delivering answering the questions on STEM Education.



**Fig. 6:** Meeting between Dr. Baig (Chairman, PSF) and Principal Chen Wenxing regarding the promotion of Science and Technology in China & Pakistan during the conference

**Glimpse of Science Exhibition organized PSF Science Caravan Federal Unit**



**Science Caravan Balochistan Unit Quetta during Science Exhibition programme**



**PSF Science Caravan KPK Unit during Science Exhibition**



**Science Exhibition arranged by Science Caravan Sukkur Unit Sindh**



**PSF Science Caravan Faisalabad Unit during Science Exhibition**



## Science Exhibition organized by PSF Science Caravan Multan Unit



Group Photo of PSF along with Chief Guest Dr. Youssef Filali-Meknassi, Director UNESCO, Islamabad and key note speakers, Prof. Dr. Shahid Mahmood Baig, *S. I.*, Chairman PSF, Ambassador Dr. Mohammad Nafees Zakaria, Executive Director of COMSATS and Dr. Seyed Komail Tayebi, President, ECO Science Foundation, at the event of World Science Day for Peace and Development organized by PSF on 15<sup>th</sup> to 16<sup>th</sup> November 2023



Photo of winner student of Pakistani team in IJSO 2023 Bangkok Thailand from 1<sup>st</sup> to 10<sup>th</sup> December 2023. He won the bronze medal in IJSO 2023 Thailand.



**Glimpses of the Keynote speakers & organizers with the Chief Guest at Scientists Convention Karachi**

## **Competitive Research Programme**



## **12<sup>th</sup> Project Award committee**



## **Monitoring & Evaluation of research Projects**



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

**Meeting of the President/ General Secretaries of the PSF Registered Societies**





**Science Talent Farming Scheme (STFS) for Young Students – Phase I (Component-1)**

**Local Study visit of 6<sup>th</sup> Batch**







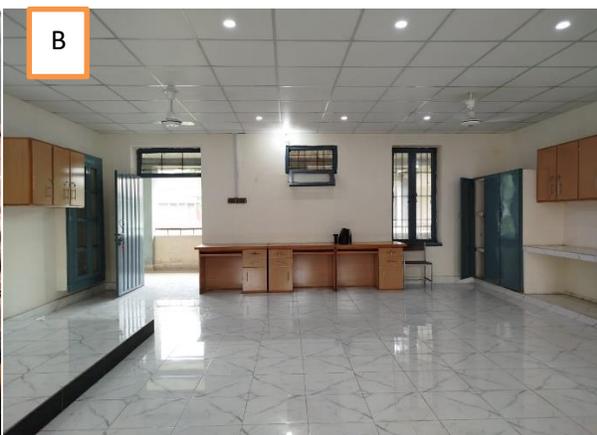
**Launching of STEM in Pakistan (Phase-I) Revised**



*Fig. 1: (A) STEM Project Management Unit.*

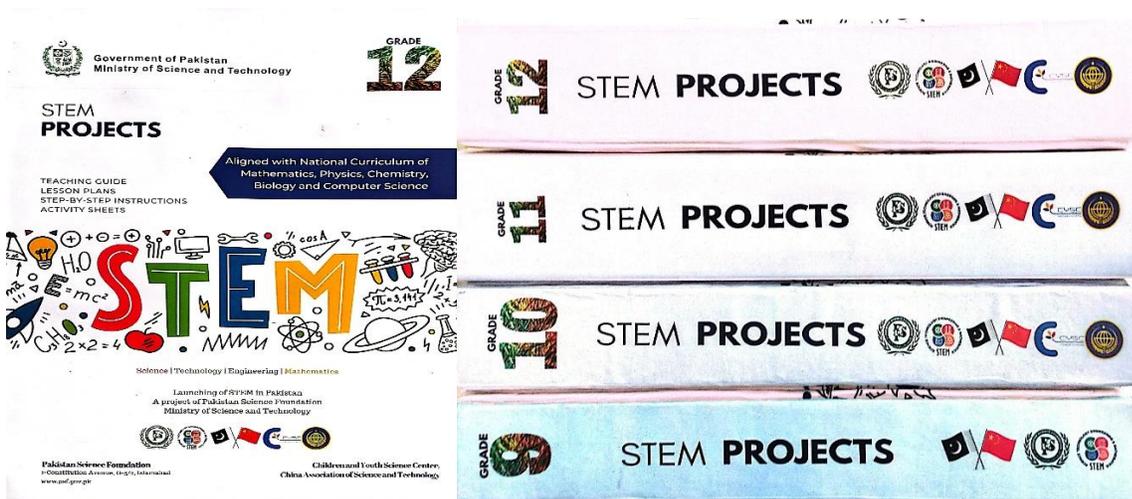


*(B) STEM Pilot Academy.*





**Fig. 2:** (A) FABLAB of Govt. CBHS School Latifabad, Hyderabad. (B) FABLAB of GOVT. CGHS SCHOOL, Lahore (C) Cadet College Petaro. (D) Govt. GHSS Lower Karez, Quetta.



**Fig. 3:** STEM Module books for grades 9-12.

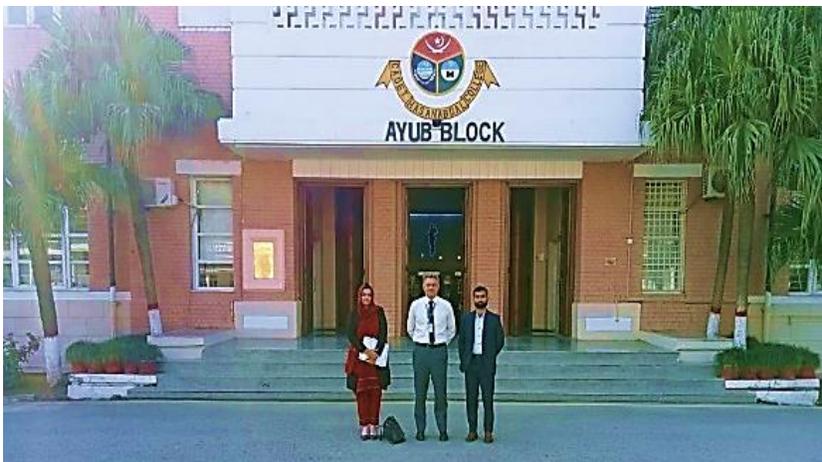


**Fig.4:** Prototypes of STEM modules and hands-on activities developed by STEM staff.





*Fig. 5: (A) Training of Master Trainers at PSF. (B) Training of Master Trainers at NIE.*



*Fig. 6: Monitoring visit of Cadet College, Hassanabdal.*

**Extension of Display Galleries, Collection Repositories Improvement, and Research Facilities Enhancement at Pakistan Museum of Natural History-PMNH**



**Figure 1: Site before initiation of the project**



**Figure 2: Operational block (III) existing column and beam dismantling**



**Figure 3: Operational Block (III) lower basement column, beam and slab laying**



**Operational block (III) upper basement floor column, beam and slab laying**



**Operational Block (III) and Display centre V concretion and brick work**



**Display centre-IV work and open court yard earth filing**

## 2. PASTIC Photo Gallery



Group photo of the participants of the Training Workshop on “*Project Management and Monitoring & Evaluation*” with Chairman, PSF on July 19, 2023



Ms. Ghazala Ali Khan, Additional Director PASTIC Sub-Centre, Peshawar delivering a lecture on PASTIC activities during the 3 days “*National Workshop on Utilization of Modern Techniques for Research and Librarianship*” held on July 21-

23, 2023



Group photo of the participants and organizers of Pre-Conference training workshop on SPSS at Rawalpindi Women University, Rawalpindi on August 22, 2023



Cover page of the Abstract Book of “9th Annual Neuroscience Conference (ANC-23)”

August 12-13, 2023 published & printed by PASTIC.



PASTIC Sub Centre Karachi official giving briefing on PASTIC services to students on PASTIC services stall at Hamdard University, Karachi on September 20, 2023



Glimpse of participants during the seminar on the "Future of Robotics in Medical Sciences" at Hamdard University, Karachi on September 20, 2023.



View of participants during the workshop on “*KOHA: Problem Based session for Practitioners & Online Databases: Access & Usage*” on October 11-12, 2023 at Hamdard University, Karachi



Dr. Anum, oncologist from Shoukat Khanum Hospital sharing her views about breast cancer during an awareness seminar on October 4, 2023, at Hamdard University

Karachi



Group photo of the participants of SPSS training workshop with Director General



PASTIC, Prof. Dr. Muhammad Akram Shaikh on November 28-30, 2023.

Ms. Afsheen Tariq, Assistant Director (STI) PSCK visiting JCHEM Expo 2023 as a judge.



One Day Training Activity on Open Journal System for Punjab Region included a



group photo of the training participants with DG PASTIC on December 9, 2023

Prof Dr. M. Akram Shaikh, DG PASTIC, Prof Dr. Shahid Mahmood Baig Chairman PSF and Prof. Dr. M. Iqbal Choudhary, Coordinator General COMSTECH during MoU signing ceremony along with senior officials of PSF, PASTIC, and COMSTECH.



Prof. Dr. Iqbal Afridi, Chief Guest at IBRAS-24 presenting shield to Afsheen Tariq,



Assistant Director, PASTIC Sub Centre Karachi on Jan 25, 2024

Mrs. Ghazala Ali Khan, Additional Director (STI) PASTIC Sub Centre Peshawar presenting her session on “What is Research & How to write a research paper”. to undergraduates of Khyber College of Dentistry Peshawar.



Afsheen Tariq Assistant Director (STI) PASTIC Karachi, introducing PASTIC services during a one-day seminar on "*Research Ethics in Artificial Intelligence*" on February 22, 2024, at Pakistan Institute of Rehabilitation and Medical Sciences (PIRMS).



Group photo of participants of seminar along with the chief guest Prof. Dr. Shahana Urooj Kazmi President, Pakistan Society for Microbiology.



Mr. Saifullah Azim, Project Manager, addressing Journals editors on one-day training workshop on "Open Journal Management System (OJS)" held on March 7, 2024



Group photo of the training participants with Project Manager PASTIC at the Latif Ebrahim Jamal National Science Information Center (LEJNSIC), ICCBS, University of Karachi, Karachi, Pakistan



Group photo of panellists and organizers on the first All Pakistan University Libraries Convention in Bahria University Karachi on April 22, 2024



PSCK officials presenting PASTIC services at PASTIC stall during International World Book & Copyright Day celebration at Bahria University Karachi Campus on April 22, 2024



Group photo of participants of the One-day Training Workshop on Citation & Literature Management using EndNote with VC GCU, Lahore on May 23, 2024



Group photo of the participants of One Day Consortium/Awareness Seminar with Project Manager, Mr. Saifullah Azim PASITC at Bahauddin Zakariya University (BZU), Multan on May 6, 2024.



Dr. Maryum Ibrar, Additional Director (STI), PASTIC National Centre introducing

PASTIC information services to the participants at HDIP on June 01, 2024



Group photo of the Participants of One Day Project Awareness and Training Workshop for Sindh Region at University of Sindh, Jamshoro with VC, University of Sindh, Jamshoro on June 12, 2024



Dr. Syed Aftab Hussain Shah, Additional Director (STI), PASTIC receiving Expert shield from Project Director/Director, Dr. Asmat Ali, Survey of Pakistan at closing ceremony of Survey of Pakistan’s PSDP project “*Feasibility Study for Establishment of National Spatial Data Infrastructure (NSDI) for Pakistan*” held on June 28, 2024 at



Serena Hotel, Islamabad.

Chief Guest presenting shield to Afsheen Tariq Asst. Director (STI) PSCK on the occasion of Scientist Convention at IIEE, PCSIR, Karachi on June 24, 2024.

## پنجاب یو جی کیلئے اوپن جنرل اینجمنٹ سسٹم پر ترقیاتی سرگرمی کا انعقاد

یہ سرگرمی "پاکستانی جرائد میں شائع شدہ تحقیق کا قومی ڈیجیٹل آرکائیو" ترقیاتی منصوبے کے تحت کی گئی تھی۔ پرائیکٹ جرنلز پبلشرز کیونٹی کو تحقیقی جرائد میں شائع ہونے والی تحقیق کے تحفظ اور پھیلانے کے لیے واحد الیکٹرانک پبلٹ فارم فراہم کرتا ہے۔ فیصل آباد (سٹاف رپورٹر) پاکستان سائنس اور ٹیکنیکل معلومات کو جمع کرنے اور 09-12-2023 کو اوپن جنرل اینجمنٹ سائنٹفک اینڈ ٹیکنالوجیکل انفارمیشن سینٹر پھیلانے کا ایک واحد ادارہ ہے۔ (سٹم) OJS) پر ایک روزہ ترقیاتی سرگرمی (PASTIC) قومی سطح پر سائنسی کیونٹی کی PASTIC نے گورنمنٹ کالج یونیورسٹی کا انعقاد کیا تاکہ جرنل پبلشرز کیونٹی کو جرنل معلومات کی ضروریات کو پورا کرنے کے لیے فیصل آباد (GCUF) کے تعاون سے پبلشنگ کے (باقی صفحہ اندرونی نمبر 8)



فیصل آباد: ٹریڈنگ کے شرکا کا ڈائریکٹر جنرل پبلشنگ کے ساتھ گروپ فوٹو

8

جدید ٹولز اور ٹیکنیکوں سے تعارف کروایا جا سکے۔ ڈاکٹر عدنان اٹنہ لچک پر آئی ایم سائنسز، پشاور نے ریسورس پرن کی خدمات فراہم کی۔ فیصل آباد ریجن سے کنوینشن کے

بلان (52) امرائین نے ترقیاتی سرگرمی میں حصہ لیا۔ یہ سرگرمی "پاکستانی جرائد میں شائع شدہ تحقیق کا قومی ڈیجیٹل آرکائیو" ترقیاتی منصوبے کے تحت کی گئی تھی۔ پرائیکٹ اینٹیجر جناب سیف اللہ عظیم نے پرائیکٹ کی موجودہ کامیابیوں اور جاری منصوبوں کا مختصر تعارف کرایا۔ اختتامی تقریب کے دوران ڈائریکٹر جنرل پبلشنگ پروفیسر ڈاکٹر محمد اکرم شیخ نے پاکستان کی خدمات کا تعارف کرایا۔ انہوں نے پرائیکٹ کا مقصد بیان کرتے ہوئے کہا کہ پرائیکٹ جرنلز پبلشرز کیونٹی کو تحقیقی جرائد میں شائع ہونے والی تحقیق کے تحفظ اور پھیلانے کے لیے واحد الیکٹرانک پبلٹ فارم باہم فراہم کرتا ہے۔ اختتامی تقریب کے دوران ڈاکٹر شوہر شہزاد ڈائریکٹر ORIC نے GCUF کے شرکا کو سرٹیفکیٹس سے نوازا۔



جی سی یو ایف میں اوپن جرنل مینجمنٹ سسٹم پر ایک روزہ تربیتی سرگرمی کا انعقاد

اختتامی تقریب کے دوران ڈاکٹر شہزاد ادریکٹر GCUF، ORIC نے شرکا کو سرٹیفکیٹس سے نوازا

فیصل آباد (سٹی رپورٹر) پاکستان فیصل آباد (سٹی رپورٹر) پاکستان سائنٹفک اینڈ ٹیکنالوجیکل انفارمیشن سینٹر (PASTIC) قومی سطح پر سائنسی کمیونٹی کی معلومات کی ضروریات کو پورا کرنے کے لیے سائنسی اور ٹیکنیکی معلومات کو جمع کرنے اور پھیلانے کا ایک واحد ادارہ ہے۔ PASTIC نے گورنمنٹ کالج یونیورسٹی ایم ایس سائنسز، (باقی صفحہ اندرونی نمبر 11)

11

بشاوہ نے ریورس پرن کی خدمات فراہم کی۔ فیصل آباد رجین سے کنسورشیم کے باون (52) اراکین نے تربیتی سرگرمی میں حصہ لیا۔ یہ سرگرمی "پاکستانی جرائم میں شائع شدہ تحقیق کا قومی ڈیٹا بیس آرکائیو" ترقیاتی منصوبے کے تحت کی گئی تھی۔ پراجیکٹ مینیجر جناب سیف اللہ عظیم نے پراجیکٹ کی موجودہ کامیابیوں اور جاری منصوبوں کا مختصر تعارف کرایا۔ اختتامی تقریب کے دوران ڈاکٹر جرنل یاسک پروفیسر ڈاکٹر محمد اکرم شیخ نے پاکستان کی خدمات کا تعارف کرایا۔ انہوں نے پراجیکٹ 'مقصد بیان کرتے ہوئے کہا کہ پراجیکٹ جرنلز پبلشرز کمیونٹی کو تحقیقی جرائم میں شائع ہونے والی تحقیق کے تحفظ اور پھیلانے کے لیے واحد ایسٹراکٹ پلیٹ فارم فراہم کرتا ہے۔ اختتامی تقریب کے دوران ڈاکٹر شہزاد ادریکٹر نے GCUF، ORIC نے شرکا کو سرٹیفکیٹس سے نوازا۔

وفاقی دارالحکومت سے شائع ہونے والا مقبول وکثیر الاشاعت قومی اخبار

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راجہ جاوید اختر

جوائنٹ ایڈیٹر  
اسامہ امتیاز عباسی

پبلشر  
بھارت 07 نومبر 2023ء، عادی الاول 1445ھ عادی 4، قیمت 10 روپے

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تنظیم کی قائمہ سمیٹی برائے سائنسی اور تکنیکی تعاون (کاسٹیک) ایک بین الاقوامی تنظیم ہے جو اسلامی تعاون تنظیم کے رکن ممالک کے درمیان سائنسی اور تکنیکی سرگرمیوں کو فروغ دینے اور مربوط کرنے کے لئے قائم کی گئی ہے۔ کاسٹیک اور کاسٹیک نے باہمی دلچسپی کے شعبوں میں متعلقہ سرگرمیوں کے آغاز کے لئے ایک مشترکہ پلیٹ فارم کی تعمیر کے لئے ہاتھ بڑھایا ہے۔ دونوں اداروں نے 5 دسمبر 2023 کو کاسٹیک، اسلام آباد میں مشترکہ شعبوں میں ممکنہ تعاون کے لئے مفاہمت کی یادداشت پر دستخط کیے۔ پاکستان سائنس فاؤنڈیشن

## پاسٹک اور کاسٹیک میں مفاہمت کی یادداشت پر دستخط

دونوں اداروں نے مشترکہ پلیٹ فارم کی تعمیر کے لئے ہاتھ بڑھایا ہے

اسلام آباد (ماہنامہ شہر نامہ) پاسٹک اور کاسٹیک نے 5 دسمبر 2023 کو مفاہمت کی یادداشت پر دستخط کر کے پاکستان سائنس فاؤنڈیشن (پیس ایف) کا ایک ماتحت ادارہ ہے۔ جبکہ اسلامی تعاون (ہائی سٹیٹ) 27



اسلام آباد، پاسٹک اور کاسٹیک میں مفاہمتی یادداشت پر دستخط کے بعد دستاویزات کا تبادلہ کیا جا رہا ہے

کے چیئرمین پروفیسر ڈاکٹر شاہد محمود بیگ اور پروفیسر ڈاکٹر محمد اقبال چوہدری (مصطفیٰ لارنس، ہلال امتیاز، ستارہ امتیاز، ہمدرد امتیاز) کو آرڈینیٹر جنرل کاسٹیک نے متعلقہ معاہدے پر دستخط کیے۔ چیئرمین، پاکستان سائنس فاؤنڈیشن، پروفیسر ڈاکٹر شاہد محمود بیگ اور پروفیسر ڈاکٹر محمد اکرم شیخ، ڈائریکٹر جنرل پاسٹک نے امید ظاہر کی کہ دونوں ادارے محققین کی خدمات کے لئے باہمی اشتراک کو یقینی بنائیں گے۔ اس تقریب میں پاسٹک، پاکستان سائنس فاؤنڈیشن اور کاسٹیک کے اعلیٰ عہدیداران بھی شرکت ہوئے۔





پروفیسر ڈاکٹر اکرم شیخ ڈی جی پانسک، ڈاکٹر تنویر شہزاد ڈائریکٹر اور ڈی جی پانسک، ڈاکٹر کاشف ظفر ڈی جی پانسک اور دیگر شرکاء میں عقیدت تقسیم کر رہے ہیں

## GC یونیورسٹی فیصل آباد میں تحقیقی جرائد کے ایڈیٹرز کیلئے تربیتی ورکشاپ

پاکستان سائنس فاؤنڈیشن کے ذیلی ادارے پانسک نے 50 سے زائد یونیورسٹیوں کے جرائد کے ایڈیٹرز کو تربیت دی

پروفیسر ڈاکٹر اکرم شیخ GC پانسک، ڈاکٹر تنویر شہزاد ڈائریکٹر اور ڈی جی پانسک، سیف اللہ عظیم کی جرنل مینجمنٹ سسٹم بارے بریفنگ

ریسرچ پیپرز کے مختلف امور بتاواں خیال، ڈی ڈی ڈائریکٹر پانسک محمد حسنین، اسسٹنٹ ڈائریکٹر اور ڈاکٹر کاشف ظفر ڈی جی پانسک اور دیگر شرکاء میں عقیدت تقسیم

انے والے مختلف مسائل اور ان کے حل پر بتاواں خیال کیا اور ایڈیٹرز کو تربیت دی کہ ان مسائل کو کیسے حل کیا جائے۔ ایڈیٹرز نے اپنے مسائل کے بارے میں سوالات اٹھائے اور ریسپورس پر ان نے جامع انداز میں جواب دیے۔ آخر میں ڈائریکٹر جنرل پانسک نے کہا کہ یہ ہماری ٹیم کی مشترکہ کوشش کا نتیجہ ہے۔ انہوں نے کہا کہ میں اور میری ٹیم اس پروجیکٹ کے حوالے سے کسی بھی مسئلے کے حل کے لیے ہمیشہ دستیاب ہے۔ اس موقع پر ڈی ڈی ڈائریکٹر پانسک محمد حسنین اور اسسٹنٹ ڈائریکٹر اور ڈاکٹر کاشف ظفر ڈی جی پانسک اور دیگر بھی موجود تھے۔ آخر میں پروفیسر ڈاکٹر اکرم شیخ، ڈاکٹر تنویر شہزاد نے پانچ نظریات اور شرکاء میں عقیدت تقسیم کئے۔

14-12-2023

پانسک ڈائریکٹر اور ڈی جی پانسک، سیف اللہ عظیم کی جرنل مینجمنٹ سسٹم بارے بریفنگ

پانسک ڈائریکٹر اور ڈی جی پانسک، سیف اللہ عظیم کی جرنل مینجمنٹ سسٹم بارے بریفنگ

پانسک ڈائریکٹر اور ڈی جی پانسک، سیف اللہ عظیم کی جرنل مینجمنٹ سسٹم بارے بریفنگ

پروجیکٹ کے مختلف پہلوؤں پر روشنی ڈالی۔ ڈائریکٹر اور ڈی جی پانسک، جی جی یو ایف نے پانسک کی کوششوں کو سراہا۔ انسٹی ٹیوٹ آف مینجمنٹ سائنسز پشاور کے ڈاکٹر عدنان امین سہیل کے ریسپورس پر ان تھے۔ ریسپورس پر ان نے ریسرچ پیپرز جمع کروانے سے اس کی اشاعت تک پیش

فیصل آباد (سٹاف رپورٹر) آس آف ریسرچ انوویشن اینڈ کمرشلز نیشن، گورنمنٹ کالج یونیورسٹی فیصل آباد کے زیر اہتمام پاکستان سائنس فاؤنڈیشن کے ذیلی ادارے پانسک نے تحقیقی جرائد کے ایڈیٹرز کے لیے جرنل مینجمنٹ سسٹم کے بارے میں تربیتی ورکشاپ کا انعقاد کیا۔ اس ورکشاپ میں مختلف یونیورسٹیوں کے 50 سے زائد جرائد کے ایڈیٹرز نے شرکت کی۔ پروفیسر ڈاکٹر محمد اکرم شیخ ڈائریکٹر جنرل پانسک اسلام آباد اور ڈاکٹر تنویر شہزاد ڈائریکٹر اور ڈی جی پانسک کے مہمان خصوصی تھے۔ سیف اللہ عظیم پراجیکٹ مینجر نے پاکستان میں شائع ہونے والی ریسرچ کو ایک ہی جگہ پر مرتب کرنے کے لیے اس

★★★ ★ الَّذِي عَلَّمَ بِالْقَلَمِ: جس نے قلم سے لکھنا سکھایا (القرآن) ★★★

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چیف ایڈیٹر: میاں محمد شوکت

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جلد نمبر: 01 منگل 11 رجب المرجب 1445ھ، 23 جنوری، 10 ماگ 2080، صفحات 4 قیمت 20 روپے شمارہ نمبر: 176

23 January 2024 ☆☆☆☆ 360 ☆☆☆☆



ڈیجیٹل آرکائیو آف ریسرچ کی ترقی اور اسکوپس میں جرنلز کی اشاریہ کے موضوع پر ایک روزہ تربیتی سیمینار کے بعد شرکاء کا گروپ فوٹو

## بہاؤپنشن ڈیجیٹل آرکائیو ریسرچ کی ترقی اور اسکوپس میں جرنلز کی اشاریہ کے موضوع پر تقریب

تقریب وائس چانسلر سیکرٹریٹ بغداد الجدید کیمپس میں منعقد ہوئی اور اس کی صدارت وائس چانسلر پروفیسر ڈاکٹر نوید اختر نے کی۔ یونیورسٹی سٹڈی کیٹ کے منظور کردہ یونیورسٹی ایڈجسٹمنٹ پراپرٹی اور ریویو ڈسٹری بیوشن ماڈل کے بارے میں ریفلیکس دی گئی

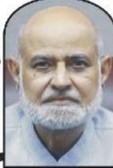
شائع ہونے والے نیشنل ڈیجیٹل آرکائیو آف ریسرچ پر ایک تفصیلی لیکچر دیا۔ مہمان مقرر ڈاکٹر محمد مروت، ڈائریکٹر، پشاور انسٹی ٹیوٹ آف ریسرچ نے اسکوپس کا بصیرت انگیز تعارف، اسکوپس جمع کرانے کے لیے پہلے سے تشخیصی معیار اور اسکوپس ٹو اوپن جرنل سسٹمز کی آن سائٹ ضروریات کے انضمام کے ذریعے گھر کو روشن کیا۔ وائس چانسلر پروفیسر ڈاکٹر نوید اختر نے اورک اسلامیا یونیورسٹی بہاول پور کی کوششوں کو سراہتے ہوئے تقریب کا اختتام کیا اور اس تربیتی ورکشاپ میں تعاون کرنے پر شریک میزبان کا شکریہ ادا کیا۔ انہوں نے مزید توقع ظاہر کی کہ اس طرح کی صلاحیت سازی کی تربیتیں آنے والے وقت میں ترتیب دی جائیں گی۔

جس کے بعد یونیورسٹی سٹڈی کیٹ کے منظور کردہ یونیورسٹی ایڈجسٹمنٹ پراپرٹی اور ریویو ڈسٹری بیوشن ماڈل کے بارے میں ریفلیکس دی گئی۔ انہوں نے اسلامیا یونیورسٹی بہاول پور ریسرچ جرنل سسٹمز پشون ماڈل کے حوالے سے اورک کی کارکردگی پیش کی جو نہ صرف یونیورسٹی بلکہ یونیورسٹی سے منسلک کالجوں کے لیے بھی ہم آہنگ ہے۔ اس کے بعد انہوں نے اسلامیا یونیورسٹی بہاول پور ای پورٹل میں لاگ ان کر کے اور ان لائن ڈیویوڈسٹری بیوشن ماڈل کا افتتاح کیا۔ ڈاکٹر سیف اللہ عظیم، پاکستان سائنٹیفک اینڈ ٹیکنالوجی سینٹر کے پروجیکٹ ڈائریکٹر نے پاکستانی جرنلز پراجیکٹ اوپننگ ایڈکسورٹیم میں

بہاولپور (سٹاف رپورٹر) ڈائریکٹوریٹ آف اورک نے پاکستان سائنٹیفک اینڈ ٹیکنالوجی سینٹر، اسلام آباد کے تعاون سے اسلامیا یونیورسٹی بہاول پور میں پاکستانی جرنلز میں شائع ہونے والے نیشنل ڈیجیٹل آرکائیو آف ریسرچ کی ترقی اور اسکوپس میں جرنلز کی اشاریہ کے موضوع پر ایک روزہ تربیتی سرگرمی کا انعقاد کیا۔ یہ تقریب وائس چانسلر سیکرٹریٹ بغداد الجدید کیمپس میں منعقد ہوئی اور اس کی صدارت وائس چانسلر پروفیسر ڈاکٹر نوید اختر نے کی۔ تربیتی نشست میں اسلامیا یونیورسٹی بہاولپور کے تحقیقی جرائد کی ادارتی ٹیموں کے نامزد ارکان نے شرکت کی۔ ڈائریکٹوریٹ آف ریسرچ اورک پروفیسر ڈاکٹر محمد عاطف نے اپنے صدارتی خطاب میں تمام شرکاء کا خیر مقدم کیا



## سکون میں نلرز اشٹام پیہ و کشاہ میل واپس نلرز اشٹام پیہ و کشاہ



صداہ  
نلرز اشٹام پیہ و کشاہ



اسلامیہ یونیورسٹی بہاولپور

ترتبی نشست میں اسلامیہ یونیورسٹی بہاولپور کے تحقیقی جرائد کی ادارتی ٹیموں کے نامزد ارکان نے شرکت کی ڈائریکٹر اورک پروفیسر ڈاکٹر محمد عاطف نے خطاب میں وائس چانسلر پروفیسر ڈاکٹر نوید اختر کی کاوشوں کو سراہا

بہاول پور (نمائندہ سچن) ڈائریکٹوریٹ آف اورک نے پاکستان سائنٹیفک اینڈ ٹیکنالوجی سینٹر، اسلام آباد کے تعاون سے اسلامیہ یونیورسٹی بہاول پور میں "پاکستانی جرنلز میں شائع ہونے والے نیشنل ڈیجیٹل آرکائیو آف ریسرچ کی ترقی" اور "اسکوپس میں جرنلز کی اشاریہ" کے موضوع پر ایک روزہ تربیتی سرگرمی کا انعقاد کیا۔ یہ تقریب وائس چانسلر سیکریٹریٹ بغداد الحدید کی میزبانی میں منعقد ہوئی اور اس کی صدارت وائس چانسلر پروفیسر ڈاکٹر نوید اختر نے کی۔ تربیتی نشست میں اسلامیہ یونیورسٹی بہاولپور کے تحقیقی جرائد کی ادارتی ٹیموں کے نامزد ارکان نے شرکت کی۔ ڈائریکٹر اورک پروفیسر ڈاکٹر محمد عاطف نے اپنے صدارتی خطاب میں

تمام شرکاء کا خیر مقدم کیا جس کے بعد یونیورسٹی سنٹر کیپٹ کے منظور کردہ یونیورسٹی انسٹیٹیوٹ پر اپنی اور یونیورسٹی پبلسیشن ماڈل کے بارے میں بریفنگ دی گئی۔ انہوں نے اسلامیہ یونیورسٹی بہاول پور ریسرچ جرنل سبسکریپشن ماڈل کے حوالے سے اورک کی کارکردگی پیش کی جو نہ صرف یونیورسٹی بلکہ یونیورسٹی سے منسلک کالجوں کے لیے بھی ہم آہنگ ہے۔ اس کے بعد انہوں نے اسلامیہ یونیورسٹی بہاول پور ای پورٹل میں لاگ ان کر کے اور آن لائن ڈیمو درخواست جمع کر کے اسلامیہ یونیورسٹی بہاول پور ریسرچ جرنل سبسکریپشن ماڈل کا افتتاح کیا۔ ڈاکٹر سیف اللہ عظیم، پاکستان سائنٹیفک اینڈ ٹیکنالوجی سینٹر کے پروجیکٹ ڈائریکٹر نے پاکستانی جرنلز پراجیکٹ اوپنرز اینڈ

کنسورشیم میں شائع ہونے والے نیشنل ڈیجیٹل آرکائیو آف ریسرچ پر ایک تفصیلی لیکچر دیا۔ مہمان مقرر ڈاکٹر محمد مروت، ڈائریکٹر، پشاور انسٹی ٹیوٹ آف ریسرچ نے اسکوپس کا بصیرت انگیز تعارف، اسکوپس جمع کرانے کے لیے پہلے سے تشریحی معیار اور اسکوپس ٹو اوپن جرنل سسٹم کی آن سائٹ ضروریات کے انضمام کے ذریعے گھر کو روٹن کیا۔ وائس چانسلر پروفیسر ڈاکٹر نوید اختر نے اورک اسلامیہ یونیورسٹی بہاول پور کی کاوشوں کو سراہتے ہوئے تقریب کا اختتام کیا اور اس تربیتی ورکشاپ میں تعاون کرنے پر شریک میزبان کا شکریہ ادا کیا۔ انہوں نے مزید توقع ظاہر کی کہ اس طرح کی صلاحیت سازی کی تربیتیں آنے والے وقت میں ترتیب دی جائیں گی۔



بہاول پور ڈائریکٹوریٹ آف اورک اسلامیہ یونیورسٹی بہاول پور پاکستان سائنٹیفک اینڈ ٹیکنالوجی سینٹر اسلام آباد کے تعاون سے منعقد ہونے والی ورکشاپ کے شرکاء کا گروپ فوٹو

Di.  
DAILY BADALTA ZAMANA MULTAN

# روزنامہ بدلتا زمانہ

متان

منگل 28 شوال المکرم 1445ھ 07 اپریل 2024ء 25 ویں سال 2081 ب



ہذا والدین زکریا یونیورسٹی میں ایک روزہ آکاشی پراجیکٹ اور ریڈنگ کے موقع پر، اس پائلر پرفیسر ڈاکٹر جمیل شاہ، ڈاکٹر اورنگ پرویز اور ڈاکٹر محمد امجد علی پراجیکٹ ڈائریکٹر سید سید سعید علی نے خصوصی تقریریں کی اور ڈاکٹر شافیہ ارشد، شیوا رانیو ایس ایف ایچ پریس ریڈیو، ڈاکٹر مہتاب اللہ و دیگر خطاب کر کے ہیں

## جامعہ زکریا یونیورسٹی آگاہی ترقیاتی کمیٹی کا انعقاد پروفیسر محمد علی شاہ مہمان خصوصی

پنجابن جرنل پبلشرز کی شرکت، ڈاکٹر شافیہ ارشد، صدر ویسا اقدار یونیورسٹی پرنسپل، ڈاکٹر محمد امجد، ڈاکٹر مہتاب اللہ کی بھی شرکت  
تقریب کا مقصد جرنلوں کے پبلشرز کی کیونٹی کو تحقیقی جرائد میں شائع حقائق کے تحفظ، پھیلاؤ کیلئے ایکٹو ایک پلیٹ فارم فراہم کرنا  
متان (عمومی رپورٹر) جامعہ زکریا یونیورسٹی آگاہی ترقیاتی کمیٹی کا اجلاس منعقد کیا گیا، پراجیکٹ آکاشی اور ترقیاتی کمیٹی کے اجلاس کا اہتمام کیا گیا، (PASTIC) قومی سطح پر سائنسی پروگرام کی  
یونیورسٹی متان میں 6 مئی 2024 کو ایک روزہ پاکستان سائنس دانوں کی فیسولوشن انٹرنیشنل سائنس معلومات کی ضروریات کو (مستحق 55) جرنل پبلشرز (55)

**جامعہ زکریا**  
پارہ سے کے لیے سائنسی حقائق اور تحقیقی معلومات  
کے تعلق کرنے اور پھیلائے کا ایک اہم ادارہ  
ہے۔ (PASTIC) نے جامعہ زکریا  
یونیورسٹی متان کے تعاون سے 6 مئی  
2024 کو جرنل پبلشرز کی کمیٹی کو صدر جرنل پبلشنگ  
ڈاؤن اور تحقیقیوں سے بااختیار بنانے کے لیے ایک  
روزہ پراجیکٹ آگاہی اور ترقیاتی سرگرمی کا اہتمام  
کیا۔ پراجیکٹ آگاہی اور ترقیاتی کمیٹی کے  
قومی ڈیپارٹمنٹ آف سائنس کے عنوان سے ترقیاتی  
پراجیکٹ کے تحت اہتمام کی گئی جس کا مقصد جرنلوں  
کے پبلشرز کی کمیٹی کو تحقیقی جرائد میں شائع  
ہونے والی حقائق کے تحفظ اور پھیلائے کے لیے  
واحد ایکٹو ایک پلیٹ فارم فراہم کرنا ہے۔  
IUB (SDPI) اسلام آباد کی صدر ویسا اقدار ترقیاتی سرگرمی  
کی ریپورٹ پرنسپل۔ اس سرگرمی میں متان  
کے علاقے سے 55 جرنل پبلشرز نے  
حصہ لیا۔ پراجیکٹ کی موجودگی کا سامعین اور جاری  
مضمونوں کا تحفظ قرار دیا گیا۔ اختتامی تقریب  
کے دوران پروفیسر ڈاکٹر محمد علی شاہ (SI)  
(TI) پائلر جامعہ زکریا اختتامی تقریب کے  
مہمان خصوصی تھے۔ پروفیسر ڈاکٹر محمد امجد  
ڈاکٹر اورنگ پرویز اور ڈاکٹر مہتاب اللہ  
نے بھی اختتامی تقریب میں شرکت کی۔

روزنامہ میٹرو واچ

راولپنڈی/اسلام آباد

پاکستان 9 مئی کے واقعات پر مٹی  
پاکستان ٹیمیں ہو سکتا، بلاول بھٹو

پاکستان 9 مئی کے واقعات پر مٹی  
پاکستان ٹیمیں ہو سکتا، بلاول بھٹو

ٹوکس بھارت کے خلاف  
پنج ٹیمیں ورلڈ کپ جیتتا ہے: صائم ایوب

دورہ آئرلینڈ کیلئے محمد عامر  
کے ویزے کی منظوری دیدی گئی

ایڈیٹر  
زاہد فاضل ملک

جلد 13 دن: 051-2814325، 0300-8543929، 051-2814324 فکس

حصہ المہارک 10 مئی 2024ء، یکم ذی القعدہ، 27 صیما کو 2081 سب صفحات 8 قیمت 30 روپے

E-mail: dailymetrowatch@gmail.com شماره 87

# آل پاکستان لائبریریز کا دورہ پاسٹک این سی آر ڈی

## لائبریری میں موجود ڈیجیٹل ریسورس کے بارے میں آگاہی دی گئی

راولپنڈی (نامہ نگار) آل پاکستان لائبریریز کا دورہ پاسٹک این سی آر ڈی۔ پیشینہ سنٹر فار رولر ڈیولپمنٹ (اسلام آباد کی لائبریری میں لائبریرین کی

کے لیے ہفت روزہ ٹریننگ پروگرام (6 مئی تا 10 مئی) کروایا گیا، جس کا عنوان ماڈرن لائبریری سروسز ان ڈیجیٹل انوائز (باقی صفحہ 5 بقیہ نمبر 20)

ہمارے ذہن پر بھائے نہیں ہیں جس کے سامنے جو ہم سمجھتے ہیں وہی تحریر کرتے ہیں (دہ)

ہم سے ہم کی اور جو کچھ لکھتے ہیں، القرآن

روزنامہ اوصاف

Daily AUSAF

منگل، 28 شوال المکرم 1445ھ، 7 مئی 2024ء

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فکس: +92 51 2277832، 2828647

ausafarticles@gmail.com

چیف ایڈیٹر: مہتاب خان ایڈیٹر: محسن بلال خان

بہاول الدین زکریا یونیورسٹی ملتان اور پلاسٹک میٹرو اسلام آباد کے اشتراک سے ایک روزہ آگاہی پراجیکٹ اور ٹریننگ کا انعقاد



## National Centre of Excellence in Analytical Chemistry, University of Sindh, Jamshoro

ISO Certified 9001 - 2008, 14001 - 2004

### ***One Day Project Awareness and Training Workshop for Sindh Region at University of Sindh, Jamshoro on June 12, 2024***



*Pakistan Scientific and Technological Information Centre (PASTIC) is a premier organization for Collection and Dissemination of Scientific & Technological Information to cater to the information needs of the scientific community at National Level.*

Available at : <https://www.ceacsu.edu.pk/pastic.html>

### 3. PMNH Photo Gallery



Researchers of PMNH are providing informative insights into the displayed natural history specimens displayed at PMNH stall



Visit of a large number of students and children to PMNH Stall



BSD Scientist delivering a lecture to students on Plant Conservation and Biodiversity at Nathia Gali



Dr. Syed Aneel Ahmad Gilani (Curator BSD) presenting the lecture at the International Conference at Women University Rawalpindi as Resource Person.



Group photo of the BSD scientist with the workshop participants along with the UNESCO officials and the Chief Guest Mr. Jamal Shah (Federal Minister for Arts and Culture)



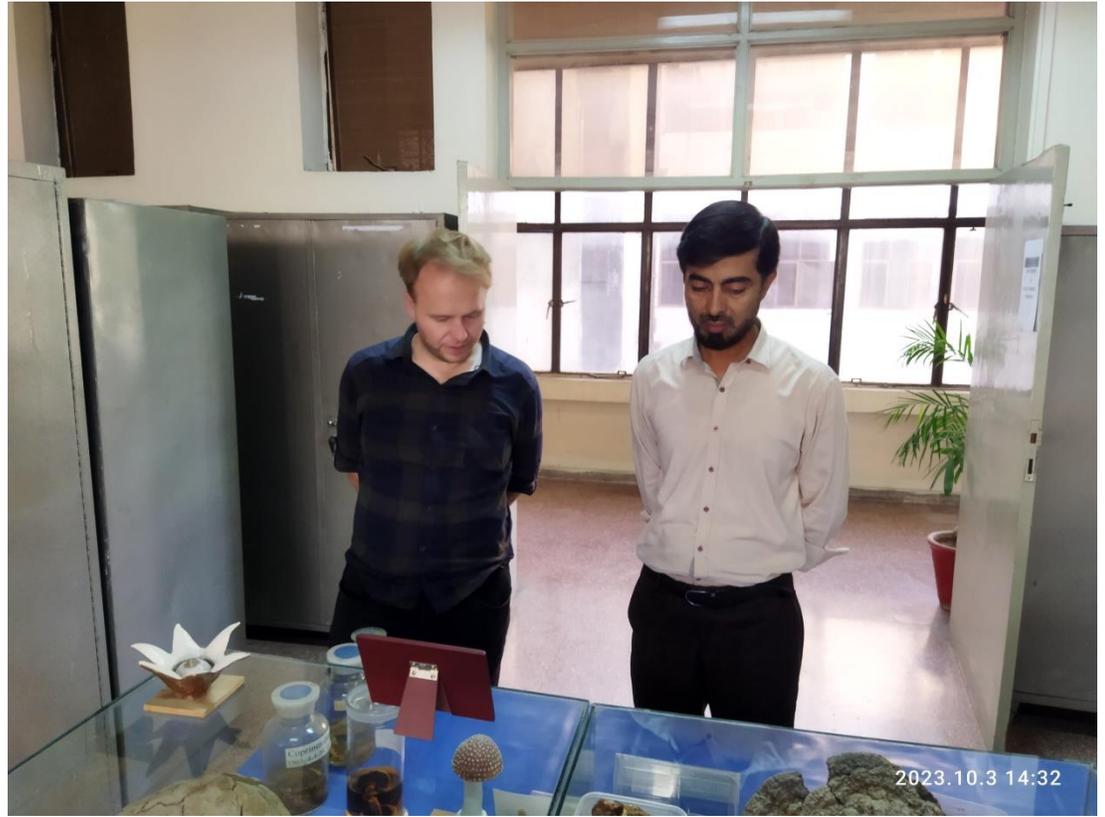
BSD Scientist during Plant Collection in field district Swat



FG Post Graduate College for Women Kashmir road RWP visit to BSD Herbaria



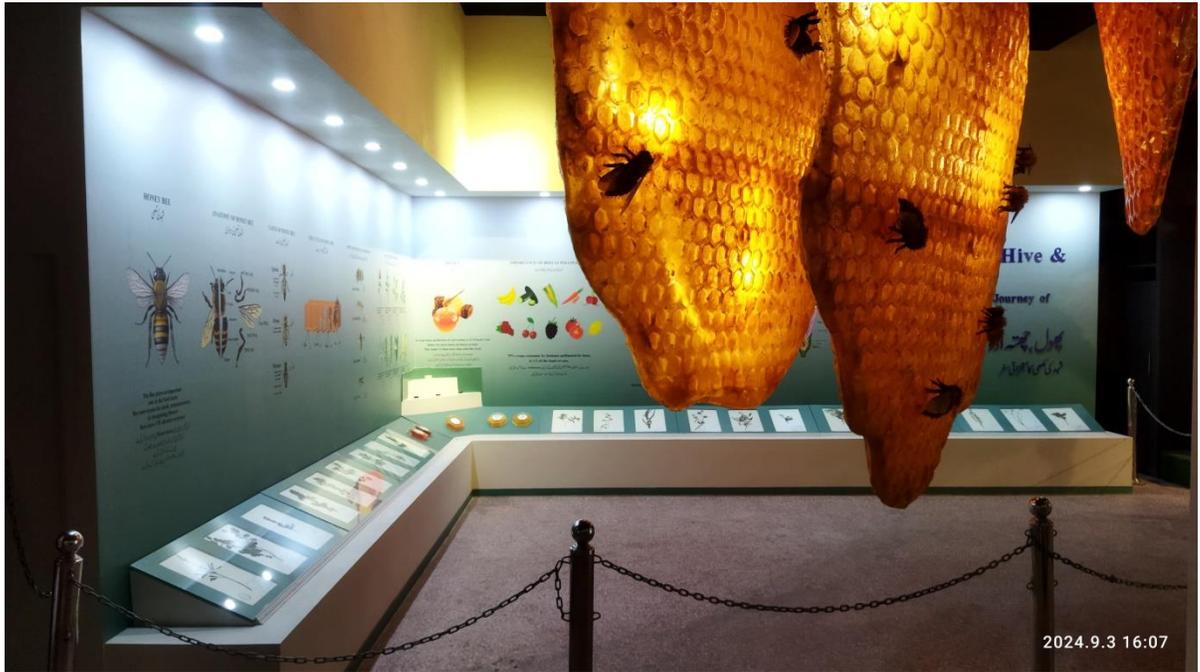
Biodiversity day celebrations by PMNH in collaboration with Islamabad Model School



**Prof. Daniel Jablonski of Comenius University Bratislava, Slovakia Visit to BSD Herbarium**



A Group photo of the Chinese delegates Of Kunming University of Science and Technology with Dr. Syed Aneel Gilani and BSD team during their visit to PMNH



New Addition of “Plant, Hive and Bee Diorama” at PMNH Display Gallery

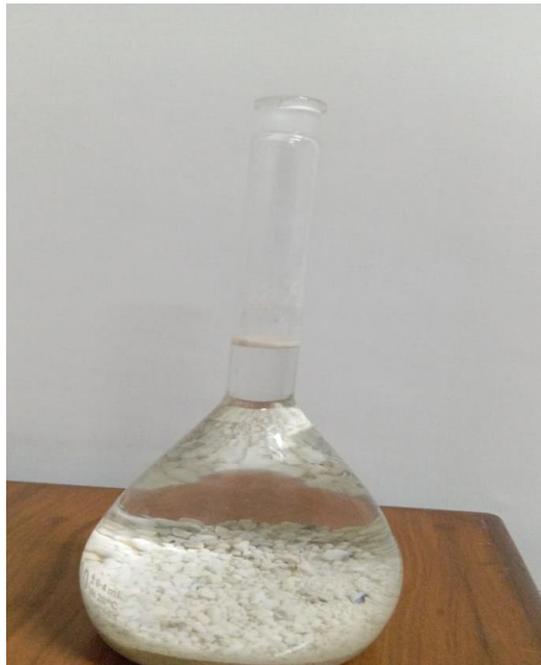


a)



b)

Fig. a and b: rock cutting and facing working for the preparation of thin section preparation in ESD, Thin section lab. of University of Malakand, Chakdara, Dir





c) complete set up for fine aggregate specific gravity  
Fig shows the ongoing testing of fine aggregate testing of Barite sample



a few snapshots from the Training Workshop on Natural Disaster Monitoring, Prevention, and Mitigation Technology along the CPEC





ESD staff engaged in Rock Cutting Machine, the Initial Step of Thin Section Preparation



Invertebrate Fossils of Pakistan Diorama



Aerial Photograph of up-graded Rock garden located at PMNH.



Photograph highlighting the newly constructed displays in the corridor of the Earth Sciences Division at the Pakistan Museum of Natural History, as part of recent updates.



Photograph showing the shifting and relocation of Baluchiterium, the largest mammal on Earth



“Plant, honey and Bee” Diorama a panoramic view

Group photo of the PMNH scientists after the successful completion of the Diorama



Scientist of ZSD during the field work of Karachi and Gawader



Collected large Barracuda from Gwader; preparation for mold through plaster of paris.



Remora: ray-finned fish that use to hold on to larger marine animals.



Prepared molds of fishes for replica purposes



Foundation Stone Laying Ceremony by Dr. Khalid Maqbool Siddiqui, Federal Minister for Science & Technology Government of Pakistan June 06, 2024.



Dr. Khalid Maqbool Siddiqui, Federal Minister for Science & Technology Government of Pakistan visited PMNH galleries on June 06, 2024.



Dr. Khalid Maqbool Siddiqui, Federal Minister for Science & Technology Government of Pakistan inaugurated PMNH skeletons diorama on June 06, 2024.



Islamabad Model School visited PMNH



Students being briefed by PMNH Staff during their visit to museum



Celebration of International Museum Day 2024 at Pakistan Museum of Natural History



Free Museum Entry For all on International Museum Day



Celebration of Biodiversity Day with IMCG NIH colony college



The Skeleton Diorama



The "Ocean Biodiversity & Whale Shark" diorama



The "Dendrochronology" diorama



The "Flower, Hive & Honey" diorama



Relocation of Baluchitherium

# DAWN

TODAY'S PAPER | MAY 26, 2024

HOME LATEST PAKISTAN OPINION BUSINESS  



THE life size model of *Ratucitharum*, an extinct giant rhinoceros which lived on Earth about 50 million years ago, is being relocated to a new plaza within the Pakistan Museum of Natural History's premises. This relocation is part of an ongoing project aimed at expanding and improving the museum's display exhibits and research facilities. — White Star

## VI. ANNEXURES

### Annexure I

#### **PAKISTAN SCIENCE FOUNDATION ACT 1973**

**National Assembly of Pakistan Islamabad, the 2nd February 1973**

The following Acts of the National Assembly received the assent of the President on the 31<sup>st</sup> January 1973 and hereby published for general information.

#### **Act No. III of 1973**

*An Act to provide for the establishment of the Pakistan Science Foundation.*

Whereas it is expedient to provide for the establishment of the Pakistan Science Foundation and for matters ancillary there to,

It is hereby enacted as follows:-

1. **Short title, extent and commencement.** (1) This Act may be called the Pakistan Science Foundation Act, 1973.
  - 2) It extends to the whole of Pakistan
  - 3) It shall come into force at once.
2. **Definitions.** In this Act, unless there is anything repugnant in the subject or context.
  - a) “Board” means the Board of Trustees of the Foundation;
  - b) “Chairman”: means the Chairman of the Foundation; and
  - c) “Foundation” means the Pakistan Science Foundation established under this Act.
3. **Establishment of the Foundation.** (1) As soon as may be after the commencement of this Act, the Federal Government may, by notification in the official Gazette, establish a Pakistan Science Foundation to promote and finance scientific activities having a bearing on the socio-economic needs of the country.
  - (2) The Foundation shall be a body corporate by the name of the Pakistan Science Foundation, having perpetual succession and a common seal, with power, subject to the provision of this Act, to acquire, hold and dispose of property, both movable and immovable, and shall be the said name sue and be sued.

(3) The Head Office of the Foundation shall be at Islamabad.

**4. Functions of the Foundation: (1)** The Foundation shall function as a financing agency for

- i) The establishment of comprehensive scientific and technological information and dissemination centers;
- ii) The promotion of basic and fundamental research in the universities and other institutions on scientific problems relevant to the socio-economic development of the country;
- iii) The utilization of the results of scientific and technological research including pilot plant studies to prove the technical and economic feasibility of processes found to be promising on a laboratory scale;
- iv) The establishment of science centers, clubs, museums, herbaria and planetaria,
- v) The promotion of scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular;
- vi) The organization of periodical science conferences, symposia and seminars;
- vii) The exchange of visits of scientists and technologists with other countries;
- viii) The grant of awards, prizes and fellowships to individuals engaged in developing processes, products and inventions of consequence to the economy of the country;  
and
- ix) Special scientific surveys not undertaken by any other organization and collection of scientific statistics related to the scientific effort of the country.

(2) The Foundation shall also:

- i) Review the progress of scientific research sponsored by it and evaluate the results of such research;
- ii) Maintain a National Register of highly qualified and talented scientists of Pakistan including engineers and doctors, in or outside the country and to assist them, in collaboration with the concerned agencies in finding appropriate employment; and
- iii) Establish liaison with similar bodies in other countries.

(3) In the performance of its functions, the Foundation shall be guided on questions of policy by the instructions, if any, given to it by the Federal Government which shall be the sole judge as to whether a question is a question of policy.

**5. Board of Trustees.** (1) The general direction, conduct and management of the affairs of the Foundation, including administration of its funds, shall vest in a Board of Trustees consisting of the following members namely;

***Whole-time members***

- i) the Chairman;
  - ii) one eminent scientist;
  - iii) the Director of Finance;
- to be appointed by the President;

***Part-time members***

- iv) the Chairman of the National Science Council;
- v) four scientists to be nominated by the National Science Council; and
- vi) eleven eminent scientists to be nominated by the President

(2) The remuneration and other terms and conditions of service of the Chairman and the two other whole-time members of the Board shall be such as may be determined by the President.

**6. Chairman of the Board** (1) The Chairman of the Board shall be the Chairman of the Foundation and shall be appointed from amongst the eminent scientists of the country having experience of research and scientific administration.

(2) The Chairman shall, subject to sub-section (3), hold office for a term not exceeding three years and shall be eligible for re-appointment.

(3) The President may at any time terminate the appointment of the Chairman without notice and without assigning any reason.

**7. Term of Members of the Board.** (1) The members of the Board, other than the ex-officio member, shall subject to sub-section (3), hold office for a term not exceeding three years and shall be eligible for re-appointment or re-nomination, as the case may be.

(2) A member, other than an ex-officio member, may at any time resign his office by writing under his hand addressed to the President but shall continue to perform his functions until his resignation has been accepted.

(3) The President may at any time terminate the appointment or, as the case may be, nomination of any member of the Board without notice and without assigning any reason.

**8. Meetings of the Board.** (1) The meeting of the Board shall be held at least twice a year and shall be presided over by the Chairman or, in his absence, by its whole-time scientist member.

(2) All decisions at a meeting of the Board shall be taken by a majority of the votes of the members present and voting.

**9. Quorum at the Meeting of the Board.** To constitute a quorum at a meeting of the Board not less than nine members shall be present.

**10. Executive Committee.** There shall be an Executive Committee consisting of the Chairman and the two whole-time members of the Board.

**11. Delegation of Powers.** The Board may, from time to time, delegate the Chairman or the Executive Committee such of its power and functions as it may consider necessary.

**12. Adhoc Committees.** The Foundation may set up adhoc committees consisting of university professors and other leading scientists and experts to scrutinize applications for financial assistance for carrying out scientific research submitted to the Foundation by the universities or other institutions or by individual scientific workers or groups of scientific workers and to review and evaluate the results of research sponsored by the Foundation.

**13. Funds.** The funds of the Foundation shall consist of:

- a) Grants made by the Federal Government and the Provincial Governments;
- b) Donation and endowments; and
- c) Income from other sources

(As amended vide Ordinance No XIII of 1979, Published in the Gazette of Pakistan Extra, Feb 24, 1979) Part I,

14. **Budget.** The Foundation shall cause to be prepared and approve a statement of its receipt and expenditure for each financial year.

15. **Accounts and Audit.** (1) The funds of the Foundation shall be kept in a personal ledger account of the Foundation with the State Bank of Pakistan or with any Branch of the National Bank of Pakistan acting as an agent of the State Bank.

(2) The accounts of the Foundation shall be maintained in such form and manner as the Auditor-General of Pakistan may determine in consultation with the Federal Government.

(3) The accounts of the Foundation shall be audited by one or more auditors who are chartered accountants within the meaning of the Chartered Accountants Ordinance., 1961 (X of 1961) and are appointed by the Foundation in consultation with the Auditor-General of Pakistan.

16. **Appointment of Officers and Servants.** (1) The Foundation may appoint such officers and servants and engage such consultants or experts, as it may consider necessary for the efficient performance of its functions, on such terms and conditions as it may deem fit.

(2) In fixing the terms and conditions of service of its officers and servants, the Foundation shall, as nearly as may be, conform to the scales of pay, allowances and conditions of service applicable to the corresponding class of employees of the Federal Government.

17. **Annual Reports.** (1) The annual report of the Foundation, which shall among other things, clearly bring out the benefits accruing to the nation as a result of the activities sponsored by the Foundation, shall be prepared by the Chairman and submitted through the Board to the Federal Government along with the audited accounts of the Foundation.

(2) The annual report along with the audited accounts of the Foundation shall be laid before the National Assembly.

18. **Regulations.** The Foundation may make regulations for the efficient conduct of its affairs.

19. **Repeal.** The Pakistan Science Foundation Ordinance, 1972 (LII of 1972), is hereby repealed.

**Annexure II****LIST OF PROJECTS APPROVED BY EXECUTIVE COMMITTEE DURING 2023-24**

<b>Sr. #</b>	<b>Project Title &amp; No.</b>	<b>P.I. Name, Designation &amp; Address</b>	<b>Total Cost in Pak. Rs.</b>
<b>1.</b>	PSF/Res/P-CUI/Chem (604)  Electrochemical Immunosensor for Highly Sensitive Detection of Ovarian Cancer Biomarker CA125	Dr. Mustansara Yaqub Associate Professor Interdisciplinary Research Centre in Biomedical Materials (IRCBM) COMSATS University Islamabad Lahore Campus	3,395,920/-
<b>2.</b>	PSF/Res/P-LUMS/Chem (617)  Development of Next Generation Microtubule Targeting Lead Capable of Overcoming Multidrug Resistance in Cancer Cells	Dr. Rahman Shah Zaib Saleem Associate Professor Department of Chemistry and Chemical Engineering Lahore University of Management Sciences (LUMS) Lahore	3,757,450/-
<b>3.</b>	PSF/Res/P-GCU/Chem (623)  Photosensitization of CAM and in Vivo Tumor Model in the Presence of NIR and Cytotoxic Drug	Dr. Muhammad Yasir Ali Assistant Professor Department of Pharmaceutics Govt. College University (GCU) Faisalabad	3,505,000/-
<b>4.</b>	PSF/Res/P-PU/Chem (625)  Development of Luminescent Sb (III) and Bi (III) Complexes as Precursors for LEDS	Dr. Muhammad Imran Associate Professor School of Chemistry University of Punjab (PU) Lahore	2,494,000/-
<b>5.</b>	PSF/Res/S-ICCBS/Chem (618)  Identification of Novel Protein-Protein Interaction Inhibitors of Intracellular $\alpha_2c$ –Adrenoceptors	Prof. Dr. Maqsood A Chotani Dr. Panjwani Center for Molecular Medicine and Drug Research International Centre for Chemical and Biological Sciences (ICCBS) University of Karachi Karachi	6,272,976/-
<b>6.</b>	PSF/Res/GB-UB/Earth (106)  Study of Ice Tower Farming as Adaptive Strategy to Conserve Water and its Socio-Economic Impacts Karakorum and Himalayan Belt of Baltistan, Pakistan	Dr. Ghulam Raza Associate Professor/Head Department Biological Sciences University of Baltistan (UoB) Skardu	1,723,800/-

7.	PSF/Res/B-BUITEMS/Earth (100)  An Integrated Modelling Approach used to Estimate the Impact of Climate Change and Human-induced Pressure on Stressed Groundwater Resources of Quetta Sub-Basin, Balochistan	Dr. Malik Muhammad Akhtar Assistant Professor Department of Environmental Sciences Balochistan University of Information Technology, Engineering and Management Sciences (BUIITEMS) Quetta	5,415,000/-
8.	PSF/Res/KPK-UET/Earth (103)  Development of Hydrometallurgical Process to Extract Copper and Associated Valuable Metals from Saindak Smelter Slag (PHASE-I)	Engr. Prof. Dr. Nisar Mohammad Department of Mining Engineering University of Engineering and Technology (UET) Peshawar	3,226,000/-
9.	PSF/Res/KPK-PU/Earth (104)  Integrated Mineralogical / Geochemical and Geophysical Techniques for Economic Evaluation of Placer Deposits from Tarbela /Kund along River Indus, Pakistan	Dr. Liaqat Ali Director/Associate Professor National Centre of Excellence in Geology University of Peshawar (UoP) Peshawar	4,576,966/-
10.	PSF/Res/S-MUET/Engg (199)  Development of a Membrane Distillation System Driven by Low Energy/Waste Heat for the Production of Freshwater	Dr. Mujeeb Iqbal Soomro Associate Professor Department of Mechanical Engineering Mehran University of Engineering and Technology (MUET) Jamshoro, Khairpur Mirs Campus	3,596,800/-
11.	PSF/Res/S-ZU/Med (554)  Comprehensive Mapping of Adaptive Immune Responses among Vaccinated and Non-vaccinated Covid-19 Infected Patients	Prof. Dr. Shamim Mushtaq Department of Biochemistry Ziauddin University (ZU) Karachi	4,205,000/-
12.	PSF/Res/S-ICCBS/Med (552)  Discovery and X-Ray Structural Analysis of New Inhibitors of $\beta$ -lactamase Enzyme - A Way Forward Towards the Global Battle against Bacterial Infections	Dr. Saima Rasheed Assistant Professor Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD) International Center for Chemical and Biological Sciences (ICCBS) University of Karachi Karachi	1,989,867/-

13.	PSF/Res/KPK-KUST/Med (557)  Natural Therapeutic Approach Towards Cystic Echinococcosis: A Neglected Emerging Zoonosis	Prof. Dr. Shahid Niaz Khan Dean Faculty of Biological Sciences Kohat University of Science & Technology (KUST) Kohat	2,998,402/-
14.	PSF/Res/S-AKU/Med (535)  Genetic Investigations of Inherited Epilepsies in Pakistan: A Step Towards Diagnostic Gene Panel	Dr. Ambrin Fatima Assistant professor Department of Biological and Biomedical Sciences Aga Khan University (AKU) Karachi	3,943,618/-
15.	PSF/Res/S-ICCBS/Med (555)  Establishment of <i>In-Ovo (In-vivo)</i> Chick Embryo Chorioallantoic Membrane Cancer Models: An Approach to assess the Pre-Clinical Efficacy of Synthesized Pharmacophore as Anticancer and Anti-Metastatic Agents with Molecular Mechanism Studies	Dr. Ayaz Ahmed Assistant Professor Dr. Panjwani Center for Molecular Medicine and Drug Research (PCMD) International Center for Chemical and Biological Sciences (ICCBS) University of Karachi Karachi	2,479,000/-
16.	PSF/Res/KPK-UoS/Med (558)  Elucidating the Genetic Architecture and Pathophysiology of Intellectual Disability in Consanguineous Pakistani Families	Dr. Zafar Ali Assistant Professor Center for Biotechnology and Microbiology University of Swat (UoS) Swat	3,255,000/-
17.	PSF/Res/KPK-CUI/Med (559)  To Assess the Role of CYP11B2 Gene in the Management of Hypertension by Determining its Complex Genetic Architecture in a Subset Pakistani Population	Dr. Nabi Shah Assistant Professor Department of Pharmacy COMSATS University Islamabad (CUI) Abbottabad Campus	3,987,500/-
18.	PSF/Res/P-AAU/Med (546)  Molecular Investigation of Inherited Neurodevelopmental Disorders in Pakistani Families	Dr. Uzma Abdullah Assistant Professor University Institute of Biochemistry and Biotechnology PMAS-Arid Agriculture University (AAUR) Rawalpindi	4,000,000/-
19.	PSF/Res/C-PMNH/Comp (70)  Adoption and Application of QR Code, Display Audio Guide using QR (Quick Response)	Mr. Ubaidullah Azeem Senior System Analyst Department of Information Technology Section Pakistan Museum of Natural History (PMNH) Islamabad	6,005,437/-

## Annexure-II

### Details of Monitoring and Evaluation of On Going Projects During 2023-2024

- **Non Development Budget**

- j. Semi Annual Technical Reports**

Sr #	Project No.	Project Title	Report
1.	PSF/Res/P-GCU/Agr (500)	Replacement of Fish Meal with <i>Pistia Stratiotes</i> and <i>Lemna Minor</i> in Feed of Carps for Sustainable Food Security	1 <sup>st</sup> Semi Annual
2.	PSF/Res/B-BAC/Agr (505)	Mediation of R Genes Regarding Abiotic Stresses (Drought) in Tomato Crop through Molecular Techniques in Balochistan (MRDTC-MTB)	1 <sup>st</sup> Semi Annual
3.	PSF/Res/S-KU/Bio (676)	Assemblage of Marine Polychaete Worms in Mangrove Forests along Coastal Areas of Sindh	1 <sup>st</sup> Semi Annual
4.	PSF/Res/P-PU/Bio (677)	Investigation on Identification of Phosphine Resistance Gene for Effective Control of Stored Grain Pest, <i>Trogoderma granarium</i>	1 <sup>st</sup> Semi Annual
5.	PSF/Res/KPK-AU/Bio (680)	Development of Passive Immunotherapy and Chemotherapy against Enterotoxaemia for Effective Prevention and Control in Small Ruminants	1 <sup>st</sup> Semi Annual
6.	PSF/Res/C-PMNH/Bio (681)	Birds/Wildlife Aircrafts Strike Hazards and Prevention	1 <sup>st</sup> Semi Annual
7.	PSF/Res/P-NIBGE/Biotech (240)	Elucidation of the Genetic Basis of Congenital Heart Defects in Pakistani Population	1 <sup>st</sup> Semi Annual
8.	PSF/Res/C-CUI/Chem (607)	Fabrication of Electrochemical Nano biosensor	1 <sup>st</sup> Semi Annual
9.	PSF/Res/KPK-AWKU/Chem	Preparation of an Innovative and	1 <sup>st</sup> Semi Annual

	(611)	Effective Pozzolana to Reduce the Cost of Portland Cement and Emission of Greenhouse Gases	
10.	PSF/Res/P-EU/Chem (612)	Synthesis and Photovoltaic Applications of Novel Porphyrins and Metalloporphyrins	1 <sup>st</sup> Semi Annual
11.	PSF/Res/C-QAU/Chem (616)	Ordered Mesoporous Silica MCM-41 Derivatives: Control Synthesis, Characterization, and Environmental Applications	1 <sup>st</sup> Semi Annual
12.	PSF/Res/KPK-PU/Earth (102)	Vulnerability Assessment of Swat, Dir and Chitral with respect to Earthquakes of PAMIR-Hindu Kush Region	1 <sup>st</sup> Semi Annual
13.	PSF/Res/S-DUHS/Med (543)	<i>In vitro</i> Modulation of Wnt signaling Pathway and its Associated Molecules in Glioblastoma Stem Cells to Combat Therapeutic Resistance and Tumor Relapse	1 <sup>st</sup> Semi Annual
14.	PSF/Res/P-UVAS/Med (549)	Formulation Development And Non-Invasive <i>In-vivo</i> Evaluation of Dermatological Creams Containing Plant Extracts in the Treatment of Various Dermatological Disorders	1 <sup>st</sup> Semi Annual
15.	PSF/Res/C-NUST/Med (550)	Development of Self-responsive Glucose Dependent Insulin Patch (Insupatch)	1 <sup>st</sup> Semi Annual
16.	PSF/Res/P-BZU/ Med (551)	Pharmacological Effects of Zn-Oxide Flavonoids Nanoparticles on D-Galactose Induced Aging in Rats	1 <sup>st</sup> Semi Annual
17.	PSF/Res/C-PIEAS/Phys (218)	Controlled Synthesis of Drug Encapsulated Metallopolymer Nanocomposites Using Microfluidic Platform for Targeted Cancer Therapy	1 <sup>st</sup> Semi Annual
18.	PSF/Res/P-PU/Biotech (239)	Gene Discovery for Skeletal Dysplasia, Protein Localization and <i>in-vitro</i> Variant Pathogenic Analyses	2 <sup>nd</sup> Semi Annual
19.	PSF/Res/S-ICCBS/Chem (610)	Fragmomics-based Lead Optimization of Novel Immuno-Suppressive Agents	2 <sup>nd</sup> Semi Annual
20.	PSF/Res/P-CUI/Med (520)	Fabrication of RNA Nanoparticles for the Regression of MYCN/TERT Overexpressing Human Cancers	2 <sup>nd</sup> Semi Annual

21.	PSF/Res/KPK-KUST/Med (523)	Improvement and Upgradation of Pakistan Genetic Mutation Database (PGMD): A Step Towards Effectiveness	2 <sup>nd</sup> Semi Annual
22.	PSF/Res/S-AKU/Med (524)	Role of PGI2 Analogue in Curbing the Disease Pathogenesis of Type 2 Diabetes mellitus	2 <sup>nd</sup> Semi Annual
23.	PSF/Res/KPK-NUST/Engg (188)	Design, Development and Wind Tunnel Testing of a Low Aspect Ratio Wing to Study Wing Rock Phenomenon at Low Reynolds Number for Micro Aerial Vehicle Applications	2 <sup>nd</sup> Semi Annual

#### k. First Annual Technical Reports

S.#	Project No.	Project Title
1.	PSF/Res/S-KU/Bio (676)	Assemblage of Marine Polychaete Worms in Mangrove Forests along Coastal Areas of Sindh
2.	PSF/Res/P-PU/Biotech (239)	Gene Discovery for Skeletal Dysplasia, Protein Localization and <i>in-vitro</i> Variant Pathogenic Analyses
3.	PSF/Res/P-NIBGE/Biotech (240)	Elucidation of the Genetic Basis of Congenital Heart Defects in Pakistani Population
4.	PSF/Res/C-QU/Biotech (241)	Generation of Zebrafish Models for BCR-ABL-Induced Leukemogenesis and Development of fast and robust real-time assay for its diagnosis and mutation detection based to Pakistani Population
5.	PSF/Res/S-ICCBS/Chem(598)	Anti-obesity Effects of Medicinal Plants Extracts, Natural and Synthetic Compounds- A Strategy to Control the Epidemic of Metabolic Disorders
6.	PSF/Res/P-PCSIR/Chem ( 606)	UF and MF Membranes Fabrication Technology Development for Water Purification
7.	PSF/Res/S-ICCBS/Chem (609)	Investigating Interaction of Hydrophobic Gentamicin with Polymeric Nanomaterials to form a Drug Delivery System for <i>Brucellosis</i>
8.	PSF/Res/S-ICCBS/Chem (610)	Fragmomics-based Lead Optimization of Novel Immuno-suppressive Agents
9.	PSF/Res/P-EU/Chem (612)	Synthesis and Photovoltaic Applications of Novel Porphyrins and Metalloporphyrins
10.	PSF/Res/S-NED/Engg (195)	Cost-Effective Synthesis of Tetra ethylene Glycol Dimethyl Ether (TEGDME) for the

		Development of Highly Efficient Energy Storage Devices
11.	PSF/Res/C-NILOP/Envr (150)	Portable LIBS Sensor for On-line Monitoring of Air Pollution
12.	PSF/Res/S-AKU/Med (524)	Role of PGI2 Analogue in Curbing the Disease Pathogenesis of Type 2 Diabetes Mellitus
13.	PSF/Res/C-NUST/Med (550)	Development of Self-responsive Glucose Dependent Insulin Patch (Insupatch)

## 1. Second Annual Technical Reports

S.#	Project No.	Project Title
1.	PSF/Res/C-QU/Med (516)	Identification of Molecular Determinants of Breast Cancer in Pakistan

## d. Final Technical Reports

S.#	Project No.	Project Title
1.	PSF/Res/KPK-HU/Biotech (238)	Development of an Optical Aptasensor for the Detection of Microbial Agents from Food Samples
2.	PSF/Res/C-RIU/Chem (583)	Design, Synthesis and Pharmacological Screening of Novel 2-mercapto Benzimidazole Derivatives as Potential Anti-ulcer Agents
3.	PSF/Res/P-CUI/Chem (600)	Fabrication of Bio-mimic Photosensitive thin Film for Efficient Tissue Adhesion
4.	PSF/Res/S-MUET/Engg (187)	Computational Investigations on Novel 2D Monatomic Hexagonal Boron Nitride (h-BN) and Transition Metal Nitride (TMN) Materials for Hydrogen Storage Applications
5.	PSF/Res/C-QU/Med (516)	Identification of Molecular Determinants of Breast Cancer in Pakistan
6.	PSF/Res/P-AMC/Med (519)	Genomic Landscape of Myelodysplastic Syndrome Patients in Pakistan
7.	PSF/Res/KPK-KUST/Med (523)	Improvement and Upgradation of Pakistan Genetic Mutation Database (PGMD): A Step Towards Effectiveness
8.	PSF/Res/S-AKU/Med (525)	Identification of Serum miRNA as a Potential Cost-effective Biomarker of

		Glioblastoma
9.	PSF/Res/P-LCWU/Phys (214)	To Investigate the Various Instabilities as Energy Source in Quantum and Classical Plasmas

#### e. Technical Reports Adopted by Technical Committee

S. #	Project No.	Project Title	Report
1.	PSF/Res/P-PU/Biotech (239)	Gene Discovery for Skeletal Dysplasia, Protein Localization and <i>in-vitro</i> Variant Pathogenic Analyses	1 <sup>st</sup> Annual
2.	PSF/Res/P-NIBGE/Biotech (240)	Elucidation of the Genetic Basis of Congenital Heart Defects in Pakistani Population	1 <sup>st</sup> Annual
3.	PSF/Res/C-QU/Biotech (241)	Generation of Zebrafish Models for BCR-ABL-Induced Leukemogenesis and Development of Fast and Robust Real-Time Assay for its Diagnosis and Mutation Detection Based to Pakistani Population	1 <sup>st</sup> Annual
4.	PSF/Res/S-ICCBS/Chem (610)	Fragmomics-based Lead Optimization of Novel Immuno-suppressive Agents	1 <sup>st</sup> Annual
5.	PSF/Res/S-ICCBS/Chem(598)	Anti-obesity Effects of Medicinal Plants Extracts, Natural and Synthetic Compounds- A Strategy to Control the Epidemic of Metabolic Disorders	1 <sup>st</sup> Annual
6.	PSF/Res/S-ICCBS/Chem (609)	Investigating Interaction of Hydrophobic Gentamicin with Polymeric Nanomaterials to form a Drug Delivery System for <i>Brucellosis</i>	1 <sup>st</sup> Annual
7.	PSF/Res/P-EU/Chem (612)	Synthesis and Photovoltaic Applications of Novel Porphyrins and Metalloporphyrins	1 <sup>st</sup> Annual
8.	PSF/Res/P-CUI/Chem (600)	Fabrication of Bio-mimic Photosensitive thin Film for Efficient Tissue Adhesion	1 <sup>st</sup> Annual

9.	PSF/Res/KPK-NUST/Engg (188)	Design, Development and Wind Tunnel Testing of a Low Aspect Ratio Wing to Study Wing Rock Phenomenon at Low Reynolds Number for Micro Aerial Vehicle Applications	1 <sup>st</sup> Annual
10.	PSF/Res/C-NIOP/Envr (150)	Portable LIBS Sensor for On-line Monitoring of Air Pollution	1 <sup>st</sup> Annual
11.	PSF/Res/P-CUI/Med (520)	Fabrication of RNA Nanoparticles for the Regression of MYCN/TERT Overexpressing Human Cancers	1 <sup>st</sup> Annual
12.	PSF/Res/S-AKU/Med (524)	Role of PGI2 Analogue in Curbing the Disease Pathogenesis of Type 2 Diabetes Mellitus	1 <sup>st</sup> Annual
13.	PSF/Res/C-NUST/Med (521)	Development of Biodegradable Sutures for Surgical Incisions and Wounds	1 <sup>st</sup> Annual
14.	PSF/Res/KPK-KUST/Med (523)	Improvement and Upgradation of Pakistan Genetic Mutation Database (PGMD): a Step Towards Effectiveness	1 <sup>st</sup> Annual
15.	PSF/Res/S-AKU/Med (525)	Identification of Serum miRNA as a Potential cost-effective Biomarker of Glioblastoma	1 <sup>st</sup> Annual
16.	PSF/Res/P-LCWU/Phys (214)	To Investigate the Various Instabilities as Energy Source in Quantum and Classical Plasmas	1 <sup>st</sup> Annual
17.	PSF/Res/C-QU/Med (516)	Identification of Molecular Determinants of Breast Cancer in Pakistan	2 <sup>nd</sup> Annual
18.	PSF/Res/C-RIU/Chem (583)	Design, Synthesis and Pharmacological Screening of Novel 2-mercapto Benzimidazole Derivatives as Potential Anti-ulcer Agents	2 <sup>nd</sup> Annual
19.	PSF/Res/C-RIU/Chem (583)	Design, Synthesis and Pharmacological Screening of Novel 2-mercapto Benzimidazole derivatives as	Final

		Potential Anti-ulcer Agents	
20.	PSF/Res/S-MUET/Engg (187)	Computational Investigations on Novel 2D Monatomic Hexagonal Boron Nitride (h-BN) and Transition Metal Nitride (TMN) Materials for Hydrogen Storage Applications	Final
21.	PSF/Res/P-AMC/Med (519)	Genomic Landscape of Myelodysplastic Syndrome Patients in Pakistan	Final
22.	PSF/Res/S-AKU/Med (525)	Identification of Serum miRNA as a Potential cost-effective Biomarker of Glioblastoma	Final
23.	PSF/Res/S-AKU/Med (506)	Development of Mouse Model of Heart Fibrosis after Myocardial Infarction to Study the Molecular Contributions of Wnt-signaling Proteins and Galectin-3	Final

**Scientific Publications Produced Through PSF Supported Completed Projects During 2023-24**

S. No.	Project No.	Publications
1.	PSF/Res/KPK-PU/Earth (96)	<ul style="list-style-type: none"> <li>• Ali, F., Qiang, J., Ahmad, S., Khan, S., <b>Hanif, M.</b>, &amp; Jan, I. U. (2019). Sedimentological and geochemical analysis of the middle Jurassic Shinawari Formation, upper Indus basin, Pakistan: implications for paleoenvironmental and hydrocarbon assessment. <i>Arabian Journal for Science and Engineering</i>, 44(7), 6465-6487.</li> <li>• Ali, F., <b>Hanif, M.</b>, Zhang, S., Latif, K., Ahmad, S., Jan, I. U., &amp; Khan, H. (2020). Ooid fabric in the Jurassic of the Indus Basin, Pakistan: control on the original mineralogy. <i>Current Science</i>, 119(5), 831.</li> <li>• Ali, F., Zhang, S., Abbas, S., <b>Hanif, M.</b>, Zhang, Y., &amp; Mohibullah, M. (2022). Discovery of the Lower-Middle Jurassic high potential source rocks based on the geochemical investigation from the Indus Basin, Pakistan. <i>Journal of Petroleum Science and Engineering</i>, 208, 109374.</li> </ul>
2.	PSF/Res/P-UET.TX/Engg (152)	<ul style="list-style-type: none"> <li>• Ahsan Raza Khan and <b>Sarmad Sohaib</b></li> </ul>

		<p>(2021) “Cooperative NOMA, Prototyping and Experimental Evaluation Using SDR”, IEEE Transactions on Vehicular Technology, Volume 70 (03), 2872-2876</p> <ul style="list-style-type: none"> <li>• SyedMohsin Bokhari , <b>Sarmad Sohaib</b>, Ahsan Raza Khan, Muhammad Shafi and Atta ur Rehman Khan(2021) “DGRU Based Human Activity Recognition Using Channel State Information Measurement” <a href="#">Measurement</a>, <a href="#">Volume 167</a>, 108245-108249</li> </ul>
3.	PSF/Res/ P-UHS/Med (478)	<ul style="list-style-type: none"> <li>• Nasim H, <b>Ghafoor S.</b> Proteins regulating salivary and lacrimal flow in xerostomia and dry eye syndrome. J Pak Dent Assoc 2019;28(2):92-97. doi:<a href="https://doi.org/10.25301/JPDA.282.92">https://doi.org/10.25301/JPDA.282.92</a></li> <li>• Talal A, <b>Ghafoor S.</b> Aquaporins; systemic, functional and therapeutic correlations in health and disease,. J Pak Med Assoc. 2021 Apr;71(4):1228-1233. doi: 10.47391/JPMA.01-063.</li> <li>• <b>Ghafoor S.</b> AQP-5 levels in salivary DM-I patients</li> </ul>

### Annexure III

Sr. No.	Project Number	P.I Address	1 <sup>st</sup> Installment
1.	<b>PSF/CRP/S-MUET/Constrm-172</b> Design of a Vascular Analysis Framework for Automated Quantification of Non-Calcified Coronary Plaques	Dr. Moazzam Jawaid Associate Professor Department of Computer Systems Engineering Mehran University of Engineering and Technology, Jamshoro	1,111,946
2.	<b>PSF/CRP/Constrm-114</b> Integrative Omics Studies of Environmentally and Medically Important Lichens of Pakistan	Dr. Arslan Ali Assistant Professor Dr. Panjwani Center for Molecular and Drug Research University of Karachi, Karachi	1,295,000
3.	<b>PSF/CRP/3/P-UET/PPE/50</b> Development of Economical Nanocomposites through Upcycling of Personal Protective Equipment (PPE) Waste for Automotive and Electronics Applications	Dr. Yasir Qayyum Gill Assistant Professor Department of Polymer & Process Engineering University of Engineering & Technology, Lahore	4,219,900
4.	<b>PSF/CRP/P-UAF/Constrm-(313)</b>	Dr. Nabeel Khan Niazi	5,602,200

	Developing Innovative and Low-Cost Biochar-Based Materials for Filtration of Arsenic from Drinking Water	Assistant Professor Institute of Soil and Environmental Sciences University of Agriculture Faisalabad	
5.	<b>PSF/CRP/TH/4/P-UET/717</b> Development of Bricks and Wall-Panels using Sustainable Construction Materials for Low-Cost Housing Sector of Pakistan	Dr. Muhammad Irfan-ul-Hassan Associate Professor Department of Civil Engineering University of Engineering & Technology, Lahore	2,129,200
6.	<b>PSF/CRP/P-GCU /Constrm-579</b> Development and Lead Optimization of Novel Me2 and 6PGD Inhibitors that Halts Fibroblast Accelerated Migration of Cancer Cells	Dr. Azhar Rasul, Assistant Professor Department of Zoology Government College University, Faisalabad	6,935,000
7.	<b>PSF/CRP/P-GCU/Constrm-92</b> Multifunctional Scaffold Materials for Highly Efficient Hybrid Halide Perovskite Solar Cells	Dr. Muhammad Ikram Assistant Professor Department of Physics Government College University Lahore	7,032,500
8.	<b>PSF/CRP/S-AKU/Constrm-220</b> Early Detection of Oral Pre-Cancerous Lesions among Smokeless Tobacco Users, Adolescents by Analyzing Salivary Metabolites and Cytokines	Dr. Shafquat Rozi Assistant Professor Department of Community Health Sciences The Agha Khan University Karachi	2,592,000
9.	<b>PSF/CRP/SP/C-PMNH/03</b> Establishment of a DNA Barcode Reference Bank for the Marine and Freshwater Fishes in Pakistan	Dr. Shabir Ali Amir Associate Curator Zoological Sciences Division Pakistan Museum of Natural History Islamabad	5,910,000
10.	<b>PSF/CRP/KPK-GU/Constrm-46</b> Identification of Genetic factors responsible for variable Phenotypes of Thalassemia Patients in KP, Pakistan	Dr. Jabbar Khan Assistant Professor Department of Biological Sciences Gomal University, D. I. Khan	2,100,000
11.	<b>PSF/CRP/C-QAU/TH-70</b> Piloting and Commercialization of the Indigenous Probiotic for Food and Feed Application	Dr. Muhammad Imran Associate Professor Department of Microbiology Quaid-i-Azam University Islamabad	13,484,000
12.	<b>PSF/CRP/P-NIBGE/Constrm-431</b> Diagnosis and Newborn Screening of Treatable Aminoacidopathies in Pakistani Patients	Dr. Fazli Rabbi Awan Principal Scientist Health Biotechnology Division National Institute for Biotechnology and Genetic Engineering (NIBGE) Faisalabad	3,715,000

13.	<b>PSF/CRP/P-CU/Constrm-(365)</b> Cohort: A 32-bit Configurable Digital Signal Processor for Industrial Control Applications	Prof. Dr. Nadia Nawaz Qadri Department of Electrical and Computer Engineering COMSATS University Islamabad, Wah Campus	965,000
14.	<b>PSF/CRP/Constrm-(142)</b> Development of Smartphone Based Point of Care Device for Rapid Infection Disease Detection	Dr. Jahan Zeb Gul Assistant Professor Department of Mechatronics and Biomedical Engineering Air University, Islamabad	3,305,000
15.	<b>PSF/CRP/C-QU/T-helix-08</b> Development, validation and commercialization of a viral nucleic-acid isolation assay: A product with enormous potential in the clinical diagnostic sector of Pakistan	Dr. Muhammad Rizwan Alam Assistant Professor Department of Biochemistry Quaid-i-Azam University, Islamabad	2,115,078
16.	<b>PSF/CRP/TH/4/CFP/708</b> Development of a gel-based topical nano-laced patch for quick relief of pain	Dr. Adeel Masood Butt Assistant Professor Institute of Pharmaceutical Sciences University of Veterinary and Animal Sciences, Lahore	3,697,200
17.	<b>PSF/CRP/S-UOK/Constrm-636</b> Exploration of Coastal Areas of Baluchistan for Faunistic Diversity, Inventorying and Monitoring	Dr. Qadeer Muhammad Ali Incharge, Marine Reference Collection and Resources Centre University of Karachi, Karachi	2,420,000
18.	<b>PSF/CRP/Constrm-(676)</b> Development of Silver (I)-N-Heterocyclic Carbene based Cubosome Hydrogels for Topical Treatment of Burns	Dr. Muhammad Adnan Iqbal Assistant Professor Department of Chemistry University of Agriculture, Faisalabad	1,420,000
19.	<b>PSF/CRP/Constrm-(754)</b> Establishment of Certified Huanglongbing (HLB) free citrus nurseries through advance metabolomics technologies	Dr. Fozia Saleem Assistant Professor Center for Agriculture Biotechnology and Biochemistry (CABB) University of Agriculture, Faisalabad	1,497,500
20.	<b>PSF/CRP/SP/B-UoB/07</b> Commercialization of Eye Smart Helmet for Coal Miner's Safety	Dr. Waheed Noor Assistant Professor Computer Science and IT University of Balochistan, Quetta	7,645,000
21.	<b>PSF/CRP/TH/4/KP-PAF-IAST/465</b> Development of Fully Mechanized Shearer/Coal Cutter Prototype to Mine the Thin Coal Seams of Pakistan	Dr. Rana Muhammad Asad Khan Assistant Professor Department of Mining Engineering Pak-Austria Fachhochschule Institute of Applied Sciences and Technology, Mang, Haripur	2,144,000
22.	<b>PSF/CRP/6/E/Indv-277</b> Fabrication of Highly Stable Perovskite and All Oxide Solar Cells for Their Application as Solar	Dr. Muhammad Talha Masood Assistant Professor Department of Materials Engineering	1,546,860

	Windows for Renewable Electricity Generation	National University of Sciences and Technology Islamabad	
23.	<b>PSF/CRP/6/E/Constrm-76</b> Low Cost Durable Electric Bicycle and Bike	Dr. Muhammad Rauf Assistant Professor Department of Electronic Engineering Dawood University of Engineering and Technology, Karachi	640,000
24.	<b>PSF/CRP/6/E/Indv-405</b> Portable Hybrid Electric Power Generator for low power applications	Mr. Syed Qaisar Abbas Rizvi Principal Engineer, PINSTECH, Pakistan Atomic Energy Commission, Islamabad	890,000
25.	<b>PSF/CRP/C-QU/Cons-308</b> An Integrated Approach Towards Wastewater Bio-Sensing, Bio-Decontamination And Energy (Electrical) Harvesting In Self-Automated Microbial Fuel Cell	Dr. Naeem Ali Associate Professor Department of Microbiology Quaid-i-Azam University Islamabad	3,915,000
26.	<b>PSF/CRP/6/E/Constrm-(305)</b> Development of coatable super-hydrophobic, anti-dust as well as UV blocking solution for the enhancement of life, performance and stability of already installed solar panels	Dr.-Ing. Iftikhar Ahmed Channa Assistant Professor Department of Metallurgical Engineering NED University of Engineering and Technology, Karachi	2,210,000
27.	<b>PSF/CRP/6/E/Constrm-(289)</b> Hybrid Concentrated Solar Power for Industrial and Domestic Applications	Prof. Dr. Adeel Waqas Principal U.S. Pakistan Center for Advanced Studies in Energy National University of Science & Technology, Islamabad	2,325,000
28.	<b>PSF/CRP/6/E/Indv-234</b> Design and Fabrication of Generator for Counter Rotating Wind Turbine Application	Dr. Faisal Khan Assistant Professor Electrical and Computer Engineering Department COMSATS University Islamabad, Abbottabad campus	2,168,000
29.	<b>PSF/CRP/6/E/Th-(357)</b> Design, Development and Commercialization of Metal Organic Framework (MOF) based Efficient Perovskite Solar Cells	Dr. Hafiz Muhammad Asif Javed Assistant Professor Department of Physics University of Agriculture, Faisalabad	3,425,000
30.	<b>PSF/CRP/6/E/Constrm-(177)</b> Fresnel Lens Concentrating Solar PV Modules	Engr. Dr. Mumtaz A. Qaisrani, Assistant Professor Department of Mechanical engineering Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan	3,515,000
31.	<b>PSF/CRP/P-NUMS/Constrm (48)</b>	Dr. Fazli Subhan	5,290,000

	Immune defence augmentation effect of fish collagen peptides on the human skin commensals microbiome against pathogenic bacteria	Assistant Professor Department of Biological Sciences National University of Medical Sciences (NUMS) Rawalpindi	
32.	<b>PSF/CRP/P-UoG/Cons-239</b> Development of proto type Platform for Production of Proteases Involved in Ecofriendly Leather Processing in Pakistan	Dr. Nadia Zeeshan Assistant Professor Department of Biochemistry and Biotechnology University of Gujrat, Gujrat	3,616,545
33.	<b>PSF/CRP/7/AI/Indv-63</b> Innovative Robotic Rehabilitation System for Upper Limb Motor Impairments: Robo-Litation	Prof. Dr. Arfan Jaffar Department of Computer Science Superior University Lahore	2,097,492
<b>Total</b>			<b>112,974,421</b>

#### Annexure IV

#### Research Projects Recommended by the PSF-NSLP Technical Committee

Sr. #.	Project No. and Title	Name, Designation & Address of PI
1.	Development of antibacterial socks using banana fibers extracted from fruit stick and other cellulosic fibers  PSF/NSLP/CP/P-NTU (1076)	Dr. Zulfiqar Ali, Associate Professor,  Department of Textile Engineering, National Textile University Faisalabad

	PSF/NSLP/P-NTU(917)	
2.	Development of local attractive bait matrix and toxin delivery foraging stations for control of Pakistani subterranean termites species  PSF/NSLP/CP/KP-NIFA(1122)  PSF/NSLP/KP-NIFA(939)	Mr. Muhammad Irfan  Jr. Scientist (Regular)  Nuclear Institute for Food and Agriculture (NIFA), G.T. Road, Tarnab, Peshawar
3.	Commercialization Of Heat Tolerant Cotton Through Public-Private Partnership  PSF/NSLP/CP/P-NIBGE (1173)  PSF/NSLP/P-NIBGE (970)	Dr. Mehboob-ur- Rahman, Deputy Chief Scientist, National Institute for Biotechnology & genetic Engineering Faisalabad
4.	Development and Introduction of Production Technology of Morels (Guchhi mushroom) in Mountain Region Gilgit-Baltistan Pakistan”  PSF/CRP/TH/4/CFP/292  PSF/NSLP/GB-KIU (981)	Dr. Azhar Hussain, Assistant Professor, Department of Agriculture and Food Technology, Karakorum International University, Gilgit.
5.	Development of green and innovative Micro-extraction techniques for the determination of emerging toxic trace species in drinking water and human food stuffs in Gilgit-Baltistan.  PSF/NSLP/CP/GB-KIU (1243)  PSF/NSLP/GB-KIU (1017)	Dr. Shaukat Ali  Associate Professor, Environmental Sciences, Karakoram International University, Gilgit.
6.	Development of tobacco varieties with improved sugar content and leaf area for enhanced productivity.  PSF/NSLP/CP/KP-UoH (1276)  PSF/NSLP/KP-UoH (1033)	Dr. Khurram Shahzad  Assistant Professor  Department of Plant Breeding and Genetics, Haripur, The University of Haripur
7.	Improve egg production potential, antioxidant status and immunity of chicken by dietary supplementation of nano-	Dr. Nisar Ahmed Ujjan, Assistant Professor, Lasbela University of Agriculture, Water and Marine Sciences,

	<p>selenium</p> <p>PSF/NSLP/CP/B-LUAWMS (1230)</p> <p>PSF/NSLP/B-LUAWMS (1007)</p>	Uthal
8.	<p>The evaluation of proximate analysis and waxy gene alleles as determinants of glycaemic index variation in indigenous Pakistani rice varieties</p> <p>PSF/NSLP/CP/AJK-UOAJK (1224)</p> <p>PSF/NSLP/AJK-UOAJK (1003)</p>	Abdul Rehman Khan, Professor, Department of Chemistry, King Abdullah Campus, University of Azad Jammu and Kashmir.
9.	<p>Overproduction of glutathione via sulfur metabolic engineering for enhanced phytoremediation and improved iron nutrition.</p> <p>PSF/NSLP/CP/KP-IBGE (1264)</p> <p>PSF/NSLP/KP-IBGE (1028)</p>	Dr. Muhammad Sayyar Khan, Associate Professor, Institute of Biotechnology and Genetic Engineering, Recombinant DNA Technology Division, The University of Agriculture Peshawar
10.	<p>Bio-fortification and enhanced rice production using Iron Oxide and Zinc Oxide Nanoparticles</p> <p>PSF/NSLP/CP/KP-UAP(1142)</p> <p>PSF/NSLP/KP-UAP(952)</p>	<p>Dr. Mian Afaq Ahmed Assistant Professor</p> <p>Institute of Biotechnology and Genetic Engineering,</p> <p>The University of Agriculture, Peshawar</p>
11.	<p>Comparative molecular evaluation and biodegradation potential by mealworms (<i>Tenebrio Molitor</i>) gut microbiota and rhizospheric bacteria in Styrofoam feeding trials</p> <p>PSF/NSLP/CP/KP-UAP (1163)</p> <p>PSF/NSLP/KP-UAP (962)</p>	Dr. Noreen Asim Assistant Professor Institute of Biotechnology and Genetic Engineering, The University of Agriculture Peshawar
12.	<p>Development of Nematotoxic Botanical Product utilizing Nanotechnology against phytonematodes with special reference to virus vector nematodes</p> <p>235</p>	Dr. Erum Adeel Biological Sciences National Nematological Research Centre, University of Karachi, Karachi

	PSF/NSLP/CP/S-UoK (1291) PSF/NSLP/S-UoK (1039)	
13.	Development of bioelectrochemical system platform for rapid metabolic monitoring of bacteria for industrial applications PSF/NSLP/CP/C-NUST(1292) PSF/NSLP/C-NUST(1040)	Dr. Waheed Miran, Assistant Professor, School of Chemical & Materials engineering (SCME), National University of Sciences & Technology (NUST) Islamabad
14.	Development of in-vitro culture facility for <i>Theileria annulata</i> and production of <i>Theileria annulata</i> surface protein (TaSP): a step toward the control of tropical theileriosis PSF/NSLP/CP/KP-LSDDR (1305) PSF/NSLP/KP-LSDDR (1045)	Dr. Said Sajjad Ali Shah, Research Officer, Directorate of Livestock and Dairy Development (KPK), Livestock and Dairy Development (Research), Peshawar
15.	DNA fingerprinting and barcoding of commercially important field crops PSF/NSLP/CP/P-NIAB (1350) PSF/NSLP/P-NIAB (1062)	Dr. Amjad Hameed Principal Scientist Nuclear Institute of Agriculture and Biology, PAEC, Faisalabad

## LIST OF PROGRESS REPORTS RECEIVED FROM DURING 2023-2024

### A. Semi-annual reports

Sr. No.	Project No.	Project Title	Reports
1.	PSF/NSLP/P-UVAS (813)	Treatment of Abattoir Sludge for the Control of Parasitic Infection and Efficient Usage as Organic Fertilizer	1 <sup>st</sup>
2.	PSF/NSLP/P-UVAS (833)	Surveillance and pathobiological investigations against Contagious Ecthyma Virus	1 <sup>st</sup>
3.	PSF/NSLP/P-NIAB (853)	Breeding high yielding tomato hybrids resilient to diseases and drought 236	1 <sup>st</sup>
4.	NSLP/P-UAF	Determination of Weed crop competition time and	1 <sup>st</sup>

	(873)	economic threshold of weeds in major crops	
5.	PSF/NSLP/KP-UAP (891)	Molecular Characterization of local isolates of <i>Mycoplasma gallisepticum</i> for the development of improved diagnostics, treatment and efficient vaccine	1 <sup>st</sup>
6.	PSF/NSLP/S-KU (902)	Isolation, preparation, formulation and application of novel nematicidal compound Chloro - Trifloromethyle Phenyl for the control of plant parasitic nematodes	1 <sup>st</sup>
7.	PSF/NSLP/KP-UAP (909)	Low cost green synthesis of selenium nanoparticles (SeNPs) and its impact on egg and meat-type birds	1 <sup>st</sup>
8.	PSF/NSLP/KP-UAP (912)	Development of local toxin binder for the prevention and control of mycotoxicosis in poultry	1 <sup>st</sup>
9.	NSLP/P-AAUR (913)	Molecular Identification and Biopolymeric Encapsulation of Lactic Acid Bacteria	1 <sup>st</sup>
10.	PSF/NSLP/P-NIAB(919)	Development of high yielding, disease resistant and herbicide tolerant lentil genotypes through conventional and marker assisted breeding approaches	1 <sup>st</sup>
11.	PSF/NSLP/P-NIAB (925)	Development of forecasting model for early warning system of leaf and yellow rust diseases in wheat	1 <sup>st</sup>
12.	PSF/NSLP/P-NIAB (927)	Assessment of silver and zinc oxide nanoparticles for the management of a bacterial and fungal disease of rice	1 <sup>st</sup>
13.	PSF/NSLP/P-CUVAS (933)	Development of rapid multiplex PCR assays for verification of commercial food products in Pakistan	1 <sup>st</sup>
14.	PSF/NSLP/P-IUB (940)	Application of Thermal Imaging Technique to Monitor the Reproductive Cycle and Early Pregnancy in Nili-Ravi Buffaloes	1 <sup>st</sup>
15.	PSF/NSLP/KP-KUST (941)	Characterization of fish skin mucus for antibacterial peptides and their therapeutic use against multi drug resistant bacteria	1 <sup>st</sup>
16.	PSF/NSLP/KP-UAP (945)	Development Of Local Variants Based Infectious Bronchitis Virus (Ibv) For Local Variants Based Infectious Bronchitis Virus (Ibv) For The Control Of	1 <sup>st</sup>

		Major Threat To Local Poultry Inditry	
17.	PSF/NSLP/KP-UoH (947)	Production of Biogas from Organic Waste using Microbially Triggered Clay Minerals as an Accelerant	1 <sup>st</sup>
18.	PSF/NSLP/P-NIBGE (960)	CRISPR-Cas9 based precise excision of TaHyPRP1 domain(s) to generate salt stress tolerance in wheat.	1 <sup>st</sup>
19.	PSF/NSLP/P-MNSUAM (961)	Design and development of integrated partial automatic potato digger	1 <sup>st</sup>
20.	PSF/NSLP/KP-UoP (997)	Efficacy of clay mineral sorbents for toxic elements and antibiotics removal from industrial effluents	1 <sup>st</sup>
21.	PSF/NSLP/P- FCC (1030)	Exploring the metagenome of Hudicara drain for potential bioremediation, and to determine antibiotic resistant genes along with multidrug-resistant pathogenic bacteria	1 <sup>st</sup>
22.	PSF/NSLP/KP/AW KUM (827)	Large Scale Reclamation of Farm Land Using Innovative Bio-solid Fertilizer from Different Agro-waste, Sewage Slurry and Microbes	2 <sup>nd</sup>
23.	PSF/NSLP/P-BARI(843)	Establishment of Vermiculture and Vermi-Composting Production Units and Technology Transfer to the Farmers	2 <sup>nd</sup>
24.	NSLP/P-CUVAS (861)	Traceable beef production: An innovative production system to develop consumer trust on food safety through traceability	2 <sup>nd</sup>
25.	PSF/NSLP/KP-NIFA (904)	Sustainable Approach for Effective Control of Peach Stone Replant Disorders	2 <sup>nd</sup>
26.	PSF/NSLP/P-IUB (929)	Molecular identification of <i>M. bovis</i> induced mortality in calves and antibacterial susceptibility testing of Cholistani herbs along with vaccine discovery	2 <sup>nd</sup>
27.	PSF/NSLP/KP-UAP (932)	Management studies of noxious weed ( <i>Asphodelus tenuifolius</i> -Wild onion) in chickpea growing areas of District Karak, Khyber Pakhtunkhwa, Pakistan	2 <sup>nd</sup>
28.	PSF/NSLP/S-KU (735)	Production and characterization of modified starches from mango processing waste.	3 <sup>rd</sup>
29.	PSF/NSLP/C-CIIT (820)	Development of probiotic formulation to mitigate mycotoxicity and fortify the growth potential of livestock feed	3 <sup>rd</sup>

## B: First Annual Reports

Sr. No.	Project No.	Project Title
1.	PSF/NSLP/ GB- PARC (727)	Promotion of Improved Varieties of Buckwheat through Seed Production Villages Temperate Area of Gilgit-Baltistan
2.	PSF/NSLP/GB- KIU(756)	Phytochemical Investigation of Seabuckthorn ( <i>Hyphophea rhmodies L.</i> ) and Development of value added products
3.	PSF/NSLP/P- UVAS(780)	Facile synthesis of Iron oxide nanoparticles as nutraceuticals for application in Livestock and Poultry Industry
4.	PSF/NSLP/P- UVAS(813)	Treatment of Abattoir Sludge for the Control of Parasitic Infection and Efficient Usage as Organic Fertilizer
5.	PSF/NSLP/P-UVAS (833)	Surveillance and pathobiological investigations against Contagious Ecthyma Virus
6.	PSF/NSLP/P- NIAB(853)	Breeding high yielding tomato hybrids resilient to diseases and drought
7.	PSF/NSLP/S- SIBA(862)	Weed Control in vegetable farms via Microwave Irradiation
8.	NSLP/P- CUVAS(874)	<i>Citrullus Colocynthis</i> as a potential growth promoter in poultry
9.	PSF/NSLP/C- CUI(880)	Feed-grade Nano-additives to Control the Salmonellosis and Campylobacteriosis
10.	PSF/NSLP/KP- UAP(887)	Development of effective diagnostics and vaccine for the control of <i>Mycoplasma bovis</i> (local strain) infections in cattle and buffaloes
11.	PSF/NSLP/KP- UAP(891)	Molecular Characterization of local isolates of <i>Mycoplasma gallisepticum</i> for the development of improved diagnostics, treatment and efficient vaccine
12.	PSF/NSLP/KP-UoS (892)	Isolation of novel selective enzyme inhibitors from <i>Pistacia integerrima</i> galls for Development of Enzymes Inhibitory drug
13.	PSF/NSLP/P- AAU(893)	Nutraceutical Characterization and Storage Stability Assessment of Indigenous Guava ( <i>Psidium guajava L.</i> ) Cultivars in response to different post-harvest interventions
14.	PSF/NSLP/S-KU (902)	Isolation, preparation, formulation and application of novel nematicidal compound Chloro - Trifluoromethyle Phenyl for the control of plant parasitic nematodes
15.	PSF/NSLP/KP-UAP	Developing a climate resilient sustainable agricultural system

	(903)	through improved and healthier soil-plant-microbes synergism
16.	PSF/NSLP/P-UAF(908)	Treatment of Mastitis by nanoparticles and egg yolk antibodies
17.	PSF/NSLP/KP-UAP(909)	Low cost green synthesis of selenium nanoparticles (SeNPs) and its impact on egg and meat-type birds
18.	PSF/NSLP/KP-UAP(910)	Fertility determination of local achai cattle semen using crocin and salvianic acid as extender
19.	PSF/NSLP/KP-UAP(912)	Development of local toxin binder for the prevention and control of mycotoxicosis in poultry
20.	NSLP/P-AAUR(913)	Molecular Identification and Biopolymeric Encapsulation of Lactic Acid Bacteria
21.	PSF/NSLP/P-NIAB(916)	Adaptation of Fine Grain Rice to Multiple Adversities Stress, Heat, and Drought, under Changing Climate Scenario
22.	PSF/NSLP/KP-UAP(918)	Exploring the In-vitro and In-vivo antibacterial role of Herbal Medicine (6-Gingerol) to Treat Mastitis in small ruminants
23.	PSF/NSLP/P-NIAB(919)	Development of high yielding, disease resistant and herbicide tolerant lentil genotypes through conventional and marker assisted breeding approaches
24.	PSF/NSLP/P-NIAB(925)	Development of forecasting model for early warning system of leaf and yellow rust diseases in wheat
25.	PSF/NSLP/P-NIAB(927)	Assessment of silver and zinc oxide nanoparticles for the management of a bacterial and fungal disease of rice
26.	PSF/NSLP/KP-UAP(932)	Management studies of noxious weed ( <i>Asphodelus tenuifolius</i> -Wild onion) in chickpea growing areas of District Karak, Khyber Pakhtunkhwa, Pakistan
27.	PSF/NSLP/P-IUB(940)	Application of Thermal Imaging Technique to Monitor the Reproductive Cycle and Early Pregnancy in Nili-Ravi Buffaloes
28.	PSF/NSLP/KP-KUST(941)	Characterization of fish skin mucus for antibacterial peptides and their therapeutic use against multi drug resistant bacteria
29.	PSF/NSLP/KP-UoH(947)	Production of Biogas from Organic Waste using Microbially Triggered Clay Minerals as an Accelerant
30.	PSF/NSLP/P-NIBGE	CRISPR-Cas9 based precise excision of TaHyPRP1 domain(s) to generate salt stress tolerance in wheat.

	(960)	
31.	PSF/NSLP/C-QAU (1019)	Biofortification of Bread Wheat for iron (Fe) and Zinc (Zn) by CRISPR/Cas9 Genome Editing
32.	PSF/NSLP/P-FCC(1030)	Exploring the metagenome of Hudiana drain for potential bioremediation, and to determine antibiotic resistant genes along with multidrug-resistant pathogenic bacteria

### C: Second Annual Progress Reports

Sr. No.	Project No.	Project Title
1.	PSF/NSLP/P-GCUF(769)	Development of Bacteriophage Therapy against Multi Drug Resistant Avian Pathogenic <i>E coli</i> causing Colibacillosis in Poultry
2.	PSF/NSLP/P-UVAS(798)	Development and production of bio pesticides for the control of tick infestation in cattle in Pakistan
3.	PSF/NSLP/P-UAF(822)	Establishing Phenological and Genetic Responses to Seasonal Shifts in Guava ( <i>Psidium guajava</i> L.) Germplasm
4.	PSF/NSLP/C-CUVAS(825)	Way forward to the commercial farming of grey francolin ( <i>Francolinus pondicerianus</i> ) at CUVAS, Bahawalpur
5.	PSF/NSLP/P-BARI(843)	Establishment of Vermiculture and Vermi-Composting Production Units and Technology Transfer to the Farmers
6.	NSLP/P-UAF(857)	Treatment of Acute Mycotoxicosis in Poultry and Animals Through Development of Indigenous Mycotoxins Inactivating Liquid Product
7.	NSLP/P-CUVAS(861)	Traceable beef production: An innovative production system to develop consumer trust on food safety through traceability
8.	PSF/NSLP/KP-UAP(887)	Development of effective diagnostics and vaccine for the control of <i>Mycoplasma bovis</i> (local strain) infections in cattle and buffaloes
9.	NSLP/C-PCRWR (901)	Exploring Potential of Saline Fish Farming at the Foothills of Salt Range Using Saline Groundwater

### D: Final Reports

Sr. No.	Project No.	Project Title
1.	PSF/NSLP/P-UAF (670)	Spectrochemical Studies of Pollutants in Soil, Water and Vegetation Using Laser Induced Breakdown Spectroscopy

2.	PSF/NSLP/P-BZU(713)	Formulation, Fabrication and Characterization of Self Assembling Bioreducible Chitosan Based Nanoparticles for Biomedical Applications
3.	PSF/NSLP/C-QAU(720)	Commercial Scale Production of High Quality DNA Extraction Kits for Plant and Blood Samples
4.	PSF/NSLP/C-NUST (746)	Design and Development of A Multipurpose Agribot for Smart Farming
5.	PSF/NSLP/P-GCUF (750)	Enrichment of <i>Omega</i> ( $\Omega$ ) Fatty Acids in Edible Oils using Ultrasound Technology
6.	PSF/NSLP/B-LUAWMS(763)	Investigate the effect of <i>in ovo</i> feeding of amino acids and trace elements on immunity and production performance of post-hatch broiler chicken
7.	PSF/NSLP/KP-UAP(768)	Development of a phyto-protease and its comparative assessment with different commercial proteases used in poultry feed production
8.	PSF/NSLP/P-UVAS(780)	Facile synthesis of Iron oxide nanoparticles as nutraceuticals for application in Livestock and Poultry Industry
9.	PSF/NSLP/P-UAF(783)	Development, evaluation and commercialization of potato culls and processing wastes as concentrate source in animal feed for cost effective feed formulation
10.	PSF/NSLP/P-NIAB(785)	Effect of antioxidant resveratrol supplementation to semen extender on post-thawed sperm quality and fertility in mixed beetal goats
11.	PSF/NSLP/C-CIIT(820)	Development of probiotic formulation to mitigate mycotoxicity and fortify the growth potential of livestock feed
12.	PSF/NSLP/P-UVAS(840)	Assessment of water conservation strategies for cooling dairy animals during summer
13.	PSF/NSLP/KP/AWK UM (827)	Large Scale Reclamation of Farm Land Using Innovative Bio-solid Fertilizer from Different Agro-waste, Sewage Slurry and Microbes
14.	NSLP/P-UAF(845)	Development and Characterization of Biodegradable Food Packaging Films from Indigenous Agricultural Residues
15.	NSLP/P-CUVAS(874)	<i>Citrullus Colocynthis</i> as a potential growth promoter in poultry
16.	PSF/NSLP/C-QAU (895)	Production of microalgal biomass, as potential biofertilizer, using wastewater leading to removal of pollutants and pathogenic load.
17.	PSF/NSLP/P-	Devising and Validating Pen-side Hematological Tests as an

	IUB(931)	Enhanced Approach to the Diagnosis of Anemia in Cholistani Livestock (Camels and Cattle)
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Sr. No.	Project No	Publications
1.	PSF/NSLP/C-CUI(880)	Zafeer, N., ... , Imran, M. Interconnecting Human, Animal and Environmental Health: One Health Concept (Under Write-up). <i>Poultry Science</i> , Impact factor 4.01.
2.	PSF/NSLP/C-CUI(880)	Zafeer, N., ... , Imran, M. Nano-encapsulation of Cinnamon Essential Oil Exert Potent Antimicrobial and Antibiofilm Activity against Zoonotic Pathogens (Under Write-up). <i>Journal of Zoonotic Diseases</i> , Impact factor. 2.523.
3.	PSF/NSLP/P-GCUF (750)	“Muhammad Faizan Afzal (Research Associate), W. Khalid, M.A. Khalid, M. Zubair, S. Akram, S. Kauser, S. Noreen, A. Jamal, Muhammad Kamran Khan (corresponding author) & A. Al-Farga. Recent industrials extraction of plants seeds oil used in the development of functional food products: A Review. <i>International Journal of Food Properties</i> , 2022, 25(1), 2530–2550.”
4.	PSF/NSLP/P-GCUF (750)	“Muhammad Kamran Khan, Muhammad Faizan Afzal. Canola and Rapeseed Oil Blends. In book “Edible Oil Blends: Chemistry, Functionality and Health Aspects” edited by Mohamed Fawzy Ramadan. Elsevier – 2024.”
5.	PSF/NSLP/KP - AWKUM(827)	Sardar, S.W., Rehman, S.A.U., Nawab, J. et al. Quantification of potentially toxic elements in degraded mining soils and medicinal plants: a case study of Indus Kohistan region Northern Pakistan. <i>Environ Earth Sci</i> 80, 641 (2021). <a href="https://doi.org/10.1007/s12665-021-09927-6">https://doi.org/10.1007/s12665-021-09927-6</a>
6.	PSF/NSLP/KP - AWKUM(827)	Bhatti, Z.I., Ishtiaq, M., Khan, S.A., Nawab, J., Ghani, J., Ullah, Z., Khan, S., Baig, S.A., Muhammad, I., Din, Z.U. and Khan, A., 2022. Contamination level, source identification and health risk assessment of potentially toxic elements in drinking water sources of mining and non-mining areas of Khyber Pakhtunkhwa, Pakistan. <i>Journal of Water and Health</i> , 20(9), pp.1343-1363. (IF: 2.264)
7.	PSF/NSLP/KP - AWKUM(827)	Sarwar, T., Khan, S., Nawab, J. et al. Arsenic Speciation in Rice, Mechanisms and Associated Health Risk Through Rice Consumption in Various Districts of Khyber Pakhtunkhwa, Pakistan. <i>Expo Health</i> (2022). <a href="https://doi.org/10.1007/s12403-022-00491-3">https://doi.org/10.1007/s12403-022-00491-3</a> (IF: 8.87)
8.	PSF/NSLP/KP - AWKUM(827)	Ghani, J., Nawab, J*. Khan, S., Khan, M.A., Ahmad, I., Ali, H.M., Siddiqui, M.H., Funari, V. and Dinelli, E., 2022. Organic amendments minimize the migration of potentially toxic elements in soil–plant system in degraded agricultural lands. <i>Biomass Conversion and Biorefinery</i> , pp.1-19. IF: 4.944
9.	PSF/NSLP/KP - AWKUM(827)	Nawab, J*. Rehman A., Ghani, J., et al., 2022. "Drinking Water Quality Assessment of Government, Non-Government and Self Based Schemes in the Disaster Affected Areas of Khyber Pakhtunkhwa, Pakistan", has been accepted for publication in <i>Exposure and Health</i> IF: 8.835
10.	PSF/NSLP/KP - AWKUM(827)	Ullah, I., Khan, S., Nawab, J*., Khan, M.A. and Jehan, S., 2022. Hardwood modified and unmodified biochar amendments used for saline alkali soil remediation: phosphorus availability and its plant uptake. <i>Arabian Journal of Geosciences</i> , 15(9),

**Annexure - V****Projects Approved under 5<sup>th</sup> PSF-NSFC Joint R&D CALL**

<b>S#.</b>	<b>Title</b>	<b>Pakistani PI and University</b>	<b>Chinese PI and University</b>
1.	Regulating electrode-electrolyte interfaces through cellulose graft chemistry toward sustainable, durable, and practical paper-based aqueous zinc ion batteries <b>PSF-NSFC/202307/149</b>	Aamir Razaq COMSATS University Islamabad	Chen Chaoji Wuhan University
2.	Developing a coupled strategy for synthesis of highly efficient photocatalysts for overall water splitting to produce hydrogen fuel <b>PSF-NSFC/202307/135</b>	Muhammad Nasir COMSATS University Islamabad, Lahore Campus	Zhang Jinlong East China University of Science and Technology
3.	Rational Designed high power and long-life Electrodes for Zn-Br <sub>2</sub> flow battery <b>PSF-NSFC/202307/223</b>	Syed Shoaib Ahmad Shah National University of Sciences and Technology	Zai Jiantao Shanghai Jiao Tong University
4.	Hydrogen-Electric Energy Storage Mechanisms and Robustness Enhancement Research in Standalone Renewable Energy Systems with Wind and Solar <b>PSF-NSFC/202307/429</b>	Tahir Abdul Hussain Ratlamwala National University of Sciences and Technology	Liu Haifeng Tianjin University
5.	Design and printing of self-healing flexible perovskite solar cell devices <b>PSF-NSFC/202307/138</b>	Muhammad Bilal Khan Niazi National University of Science and Technology, Pakistan	Hu Xiaotian Nanchang University
6.	The Rare Earth Luminescent Nanotechnology for Diagnosis and Minimal Residual Disease Monitoring of Pediatric Acute Lymphoblastic Leukemia	Saima Sadaf University of the Punjab, Lahore  245	Li Fuyou Shanghai Jiao Tong University

	<b>PSF-NSFC/202307/173</b>		
7.	Coupling solar-fuels generation and aquatic micropollutants oxidation with photoactive membrane reactor <b>PSF-NSFC/202307/357</b>	Muhammad Naeem Ashiq Bahauddin Zakariya University Multan	He Tao National Center for Nano Science and Technology of China, Chinese Academy of Sciences
8.	Nanotechnology-Polymer Fusion for Revolutionizing Energy Storage and Socioeconomic Growth <b>PSF-NSFC/202307/19</b>	Mohsin Ali Marwat Ghulam Ishaq Khan Institute of Engineering Sciences and Technology	Zhang Haibo Huazhong University of Science and Technology
9.	Tailoring Exciton Dynamics in Transition Metal Dichalcogenide Heterostructures and its Applications in Quantum Technology <b>PSF-NSFC/202307/86</b>	Muhammad Rafiq Pakistan Institute of Engineering and Applied Sciences (PIEAS)	Xu Xiulai Peking University
10.	Large-area and patterned growth of perovskite micro-/nano single crystal arrays for high-performance light-emitting diodes <b>PSF-NSFC/202307/427</b>	Zafar Hussain Ibupoto University of Sindh	Jie Jiansheng Soochow University

**Annexure-VI**

**EXPENDITURES FOR TRAVEL GRANT ACTIVITY 2023-24 UNDER NON-DEVELOPMENT BUDGET**

<b>Sr. No.</b>	<b>TG No.</b>	<b>Name / Designation / Organization</b>	<b>Field Specialization</b>	<b>Amount (Rs.)</b>
<b>1.</b>	TG-ND(882)/23	<b>Dr. Qamar Shakil</b> <b>Senior Scientist</b> <b>(SORGHUM)</b> Fodder Research Substation, AARI, Faisalabad	Plant Breeding and Genetics	<b>275,000</b>
<b>2.</b>	TG-ND(877)/23	<b>Dr. Sehar Shakir</b> <b>Assistant Professor</b> Department of Energy System Engineering, NUST, Islamabad	Experimental Physics	<b>300,000</b>
<b>3.</b>	TG-ND(903)/23	<b>Dr. Isma Hamid</b> <b>Assistant Professor</b> Department of Computer Science, National Textile University, Faisalabad, Pakistan	Computer Science	<b>75,000</b>
<b>4.</b>	TG-ND(912)/23	<b>Mr. Javed Hussain</b> <b>PSO</b> National Centre for	Applied Physics	<b>250,000</b>

		Physics Islamabad		
5.	TG- ND(906)/23	<b>Dr. Sajjad Hyder</b> <b>Assistant Professor</b> Department of Botany, Government College Women University Sialkot, Pakistan	Plant Pathology	<b>210,000</b>
6.	TG- ND(884)/23	<b>Dr. Sajid Anwar</b> <b>Professor</b> Institute of Management Sciences, Peshawar	Information Technology & Applications	<b>250,000</b>
7.	TG- ND(900)/23	<b>Dr. Salman Khan</b> <b>Tenured Associate</b> <b>Professor</b> Department of Pharmacy, Faculty of Biological Sciences, Quaid-i-Azam University, Islamabad	Biological Sciences	<b>250,000</b>
8.	TG- ND(914)/23	<b>Dr. Mudassar Fiaz</b> <b>Associate Professor</b> Department of Pediatric Surgery, Rawalpindi Medical University Hospital, Holy Family Hospital Rawalpindi	Medical Sciences	<b>500,000</b>
9.	TG- ND(921)/23	<b>Prof. Dr.</b> <b>Muhammad Ishtiaq</b> <b>Ali</b> <b>Professor</b> Department of Microbiology, Quaid-i-Azam University, Islamabad.	Plant and Environmental Health Sciences	<b>125,000</b>
10.	TG- ND(922)/23	<b>Dr. Rana Manzoor</b> <b>Ahmad</b> <b>Assistant Professor</b> Department of Zoology Government College University, Lahore.	Ecology and Evaluation Biology	<b>200,000</b>
11.	TG- ND(925)/23	<b>Dr. Hafiz</b> <b>Muhammad Rizwan</b> <b>Assistant Professor</b> Department of	Holistic Animal Health Sciences	<b>250,457</b>

		Pathobiology, KBCMA College of Veterinary and Animal, Narowal		
<b>12.</b>	TG-ND (941)/24	<b>Dr. Samander Ali Malik</b> <b>Associate Professor (BPS-20)</b> Department of Textile Engineering, Mehran University of Engineering and Technology, Jamshoro	Engineering / Textile Engineering	<b>210,919</b>
<b>13.</b>	TG- ND(947)/24	<b>Dr. Iram Murtaza Professor</b> Department of Biochemistry, Quaid- i-Azam University, Islamabad	Biochemistry / Microbiology	<b>310,000</b>
<b>14.</b>	TG- ND(948)/24	<b>Abdul Hadi</b> <b>Principal Research Officer</b> National Institute of Electronics, Plot 17, Street No. 6, H-9, Islamabad	Automotive Electronics	<b>210,000</b>
<b>15.</b>	TG- ND(937)/23	<b>Dr. Antaash Najib</b> Assistant Professor Head of PG Programme (ES) NUST-PNEC, Karachi	Environmental Sciences	<b>240,000</b>
<b>16.</b>	TG-ND (950)/24	<b>Dr. Khalid Saifullah</b> Professor (Tenured) Department of Mathematics, Quaid- i-Azam University, Islamabad	Mathematics / Theoretical Physics	<b>400,000</b>
<b>Total</b>				<b>Rs. 4,056,376 4.056376 million</b>

### Details of Newly Initiated Projects in FY 2023-24

Sr. No.	Project Number	P.I Address	1 <sup>st</sup> Installment	Quarter
	<b>PSF/CRP/S-MUET/Constrm-172</b> Design of a Vascular Analysis Framework for Automated Quantification of Non-Calcified Coronary Plaques	Dr. Moazzam Jawaid Associate Professor Department of Computer Systems Engineering Mehran University of Engineering and Technology, Jamshoro	1,111,946	1 <sup>st</sup>
	<b>PSF/CRP/Constrm-114</b> Integrative Omics Studies of Environmentally and Medically Important Lichens of Pakistan	Dr. Arslan Ali Assistant Professor Dr. Panjwani Center for Molecular and Drug Research University of Karachi, Karachi	1,295,000	1 <sup>st</sup>
	<b>PSF/CRP/3/P-UET/PPE/50</b> Development of Economical Nanocomposites through Upcycling of Personal Protective Equipment (PPE) Waste for Automotive and Electronics Applications	Dr. Yasir Qayyum Gill Assistant Professor Department of Polymer & Process Engineering University of Engineering & Technology, Lahore	4,219,900	2 <sup>nd</sup>
	<b>PSF/CRP/P-UAF/Constrm-(313)</b> Developing Innovative and Low-Cost Biochar-Based Materials for Filtration of Arsenic from Drinking Water	Dr. Nabeel Khan Niazi Assistant Professor Institute of Soil and Environmental Sciences University of Agriculture Faisalabad	5,602,200	2 <sup>nd</sup>
	<b>PSF/CRP/TH/4/P-UET/717</b> Development of Bricks and Wall-Panels using Sustainable Construction Materials for Low-Cost Housing Sector of Pakistan	Dr. Muhammad Irfan-ul-Hassan Associate Professor Department of Civil Engineering University of Engineering & Technology, Lahore	2,129,200	2 <sup>nd</sup>
	<b>PSF/CRP/P-GCU /Constrm-579</b> Development and Lead Optimization of Novel Me2 and 6PGD Inhibitors that Halts Fibroblast Accelerated Migration of Cancer Cells	Dr. Azhar Rasul, Assistant Professor Department of Zoology Government College University, Faisalabad	6,935,000	2 <sup>nd</sup>
	<b>PSF/CRP/P-GCU/Constrm-92</b> Multifunctional Scaffold Materials for Highly Efficient Hybrid Halide Perovskite Solar Cells	Dr. Muhammad Ikram Assistant Professor Department of Physics Government College University 250 Lahore	7,032,500	2 <sup>nd</sup>

<b>PSF/CRP/S-AKU/Constrm-220</b> Early Detection of Oral Pre-Cancerous Lesions among Smokeless Tobacco Users, Adolescents by Analyzing Salivary Metabolites and Cytokines	Dr. Shafquat Rozi Assistant Professor Department of Community Health Sciences The Agha Khan University Karachi	2,592,000	2 <sup>nd</sup>
<b>PSF/CRP/SP/C-PMNH/03</b> Establishment of a DNA Barcode Reference Bank for the Marine and Freshwater Fishes in Pakistan	Dr. Shabir Ali Amir Associate Curator Zoological Sciences Division Pakistan Museum of Natural History Islamabad	5,910,000	2 <sup>nd</sup>
<b>PSF/CRP/KPK-GU/Constrm-46</b> Identification of Genetic factors responsible for variable Phenotypes of Thalassemia Patients in KP, Pakistan	Dr. Jabbar Khan Assistant Professor Department of Biological Sciences Gomal University, D. I. Khan	2,100,000	2 <sup>nd</sup>
<b>PSF/CRP/C-QAU/TH-70</b> Piloting and Commercialization of the Indigenous Probiotic for Food and Feed Application	Dr. Muhammad Imran Associate Professor Department of Microbiology Quaid-i-Azam University Islamabad	13,484,000	2 <sup>nd</sup>
<b>PSF/CRP/P-NIBGE/Constrm-431</b> Diagnosis and Newborn Screening of Treatable Aminoacidopathies in Pakistani Patients	Dr. Fazli Rabbi Awan Principal Scientist Health Biotechnology Division National Institute for Biotechnology and Genetic Engineering (NIBGE) Faisalabad	3,715,000	3 <sup>rd</sup>
<b>PSF/CRP/P-CU/Constrm-(365)</b> Cohort: A 32-bit Configurable Digital Signal Processor for Industrial Control Applications	Prof. Dr. Nadia Nawaz Qadri Department of Electrical and Computer Engineering COMSATS University Islamabad, Wah Campus	965,000	3 <sup>rd</sup>
<b>PSF/CRP/Constrm-(142)</b> Development of Smartphone Based Point of Care Device for Rapid Infection Disease Detection	Dr. Jahan Zeb Gul Assistant Professor Department of Mechatronics and Biomedical Engineering Air University, Islamabad	3,305,000	3 <sup>rd</sup>
<b>PSF/CRP/C-QU/T-helix-08</b> Development, validation and commercialization of a viral nucleic-acid isolation assay: A product with enormous potential in the clinical diagnostic sector of Pakistan	Dr. Muhammad Rizwan Alam Assistant Professor Department of Biochemistry Quaid-i-Azam University, Islamabad	2,115,078	3 <sup>rd</sup>

<b>PSF/CRP/TH/4/CFP/708</b> Development of a gel-based topical nano-laced patch for quick relief of pain	Dr. Adeel Masood Butt Assistant Professor Institute of Pharmaceutical Sciences University of Veterinary and Animal Sciences, Lahore	3,697,200	3 <sup>rd</sup>
<b>PSF/CRP/S-UOK/Constrm-636</b> Exploration of Coastal Areas of Baluchistan for Faunistic Diversity, Inventorying and Monitoring	Dr. Qadeer Muhammad Ali Incharge, Marine Reference Collection and Resources Centre University of Karachi, Karachi	2,420,000	3 <sup>rd</sup>
<b>PSF/CRP/Constrm-(676)</b> Development of Silver (I)-N-Heterocyclic Carbene based Cubosome Hydrogels for Topical Treatment of Burns	Dr. Muhammad Adnan Iqbal Assistant Professor Department of Chemistry University of Agriculture, Faisalabad	1,420,000	3 <sup>rd</sup>
<b>PSF/CRP/Constrm-(754)</b> Establishment of Certified Huanglongbing (HLB) free citrus nurseries through advance metabolomics technologies	Dr. Fozia Saleem Assistant Professor Center for Agriculture Biotechnology and Biochemistry (CABB) University of Agriculture, Faisalabad	1,497,500	3 <sup>rd</sup>
<b>PSF/CRP/SP/B-UoB/07</b> Commercialization of Eye Smart Helmet for Coal Miner's Safety	Dr. Waheed Noor Assistant Professor Computer Science and IT University of Balochistan, Quetta	7,645,000	3 <sup>rd</sup>
<b>PSF/CRP/TH/4/KP-PAF-IAST/465</b> Development of Fully Mechanized Shearer/Coal Cutter Prototype to Mine the Thin Coal Seams of <u>Pakistan</u>	Dr. Rana Muhammad Asad Khan Assistant Professor Department of Mining Engineering Pak-Austria Fachhochschule Institute of Applied Sciences and Technology, Mang, Haripur	2,144,000	3 <sup>rd</sup>
<b>PSF/CRP/6/E/Indv-277</b> Fabrication of Highly Stable Perovskite and All Oxide Solar Cells for Their Application as Solar Windows for Renewable Electricity Generation	Dr. Muhammad Talha Masood Assistant Professor Department of Materials Engineering National University of Sciences and Technology Islamabad	1,546,860	3 <sup>rd</sup>
<b>PSF/CRP/6/E/Constrm-76</b> Low Cost Durable Electric Bicycle and Bike	Dr. Muhammad Rauf Assistant Professor Department of Electronic Engineering Dawood University of Engineering and Technology, Karachi	640,000	3 <sup>rd</sup>

<b>PSF/CRP/6/E/Indv-405</b> Portable Hybrid Electric Power Generator for low power applications	Mr. Syed Qaisar Abbas Rizvi Principal Engineer, PINSTECH, Pakistan Atomic Energy Commission, Islamabad	890,000	3 <sup>rd</sup>
<b>PSF/CRP/C-QU/Cons-308</b> An Integrated Approach Towards Wastewater Bio-Sensing, Bio-Decontamination And Energy (Electrical) Harvesting In Self-Automated Microbial Fuel Cell	Dr. Naeem Ali Associate Professor Department of Microbiology Quaid-i-Azam University Islamabad	3,915,000	3 <sup>rd</sup>
<b>PSF/CRP/6/E/Constrm-(305)</b> Development of coatable super-hydrophobic, anti-dust as well as UV blocking solution for the enhancement of life, performance and stability of already installed solar panels	Dr.-Ing. Iftikhar Ahmed Channa Assistant Professor Department of Metallurgical Engineering NED University of Engineering and Technology, Karachi	2,210,000	3 <sup>rd</sup>
<b>PSF/CRP/6/E/Constrm-(289)</b> Hybrid Concentrated Solar Power for Industrial and Domestic Applications	Prof. Dr. Adeel Waqas Principal U.S. Pakistan Center for Advanced Studies in Energy National University of Science & Technology, Islamabad	2,325,000	3 <sup>rd</sup>
<b>PSF/CRP/6/E/Indv-234</b> Design and Fabrication of Generator for Counter Rotating Wind Turbine Application	Dr. Faisal Khan Assistant Professor Electrical and Computer Engineering Department COMSATS University Islamabad, Abbottabad campus	2,168,000	3 <sup>rd</sup>
<b>PSF/CRP/6/E/Th-(357)</b> Design, Development and Commercialization of Metal Organic Framework (MOF) based Efficient Perovskite Solar Cells	Dr. Hafiz Muhammad Asif Javed Assistant Professor Department of Physics University of Agriculture, Faisalabad	3,425,000	4 <sup>th</sup>
<b>PSF/CRP/6/E/Constrm-(177)</b> Fresnel Lens Concentrating Solar PV Modules	Engr. Dr. Mumtaz A. Qaisrani, Assistant Professor Department of Mechanical engineering Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan	3,515,000	4 <sup>th</sup>
<b>PSF/CRP/P-NUMS/Constrm (48)</b> Immune defence	Dr. Fazal Subhan Assistant Professor Department of Biological	5,290,000	4 <sup>th</sup>

	augmentation effect of fish collagen peptides on the human skin commensals microbiome against pathogenic bacteria	Sciences National University of Medical Sciences (NUMS) Rawalpindi		
	<b>PSF/CRP/P-UoG/Cons-239</b> Development of proto type Platform for Production of Proteases Involved in Ecofriendly Leather Processing in Pakistan	Dr. Nadia Zeeshan Assistant Professor Department of Biochemistry and Biotechnology University of Gujrat, Gujrat	3,616,545	4 <sup>th</sup>
	<b>PSF/CRP/7/AI/Indv-63</b> Innovative Robotic Rehabilitation System for Upper Limb Motor Impairments: Robo-Litaton	Prof. Dr. Arfan Jaffar Department of Computer Science Superior University Lahore	2,097,492	4 <sup>th</sup>
<b>Total</b>			<b>Rs.112.974 Million</b>	

### **Scientific Conferences/ Seminars/ Symposia/ Workshops Funded**

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

<b>Sr. No</b>	<b>Topic</b>	<b>Nature of the Event</b>
1.	Advanced Robotics Manufacturing Workshop	Workshop 2
2.	8th Annual Conference of the Pakistan Society of Nuclear Medicine” Nuclear Medicine in Pakistan Generation Next	Conference
3.	“Emerging Trends in Nuclear Medicine-Molecular Imaging & Theranostics”	Symposium
4.	Radioiodine Therapy in Thyroid Diseases Current Trends and Future Directions	Symposium
5.	Soil Health: A Key to Food Security	Conference
6.	Vacuum Application in Applied Surface Sciences	Workshop
7.	Renewable Energy and Sustainability	Conference
8.	Advanced Field Training and Workshop in Salt Rang Area	Workshop
9.	Water Awareness Week	Conference
10.	Tropical Cyclone & Tsunami to Pakistan Coast and Our Preparation	Seminar
11.	Better Heart Health on International World Heart Day	Seminar
12.	Capacity Development of Provisional food Regulatory Authorities in Policy formulation for Health Diet	Conference 4
13.	Global Evidence and Policy Formulation for Health Diet	Symposium
14.	Tobacco Control Policy Analysis and Way Forward on International World No Tobacco Day	Symposium
15.	42 <sup>nd</sup> Pakistan Zoological Conference	Congress
16.	Quality of Engineering Education <sub>254</sub>	Symposium
17.	Industrialization in Pakistan	Symposium
18.	Nuclear Hydrogen	Symposium

19.	Introduction of New Technology and Role of Consulting Engineers	Symposium
20.	Thar Coal for Energy	Lecture
21.	Geothermal Potential of Laki Shah Sadar, Sindh	Lecture
22.	Generative AI tools for Beginners	Workshop
23.	Web Security	Workshop
24.	Agile Project Management	Workshop
25.	Innovation Commercialization Cycle for Startups	Workshop
26.	Advances in Nematology and Emerging Threats”	Symp cum W.shop
27.	Thalassemia Day	Symposium
28.	4 <sup>th</sup> International Conference on Emerging Trends in Earth and Environmental Sciences	Conference
29.	Nuclear Technology in Pakistan	Symposium
30.	Improving in crops varieties by Nuclear Techniques	Symposium
31.	PNS Awareness session on Nuclear Technology	Symposium
32.	PNS College Conference	Conference
33.	S&T for Women in Nuclear and Allied Disciplines”	Conference
34.	Commercial Potential and Societal Impact of Nano Technology	Symposium
35.	Industrial Application of Nuclear Techniques	Symposium
36.	15 <sup>th</sup> Biennial Conference of the Society	Conference
37.	Role of Artificial Intelligence in Public Health and Medicine	Conference
38.	National Workshop on Plant Taxonomy and its Role in Plant Research	Workshop

### **International Linkage fee to International Federations**

Sr. No	Society	International Federation
1.	Pakistan Society for Biochemistry and Molecular Biology	<ul style="list-style-type: none"> <li>• The International Union of Biochemistry and Molecular Biology (IUBMB)</li> <li>• The Federation of Asian and Oceanian Biochemists and Molecular Biologists, (FAOBMB)</li> </ul>
2.	Soil Society of Pakistan	International Union of Soil Sciences
3.	Pakistan Vacuum Society	International Union for Vacuum Sciences Techniques and Application
4.	Pakistan Academy of Engineering	International Council of Academies of Engineering and Technological Sciences, Inc

<b>Sr. No</b>	<b>File No.</b>	<b>Name / Institute</b>	<b>Field/ Specialization</b>	<b>Amount</b>
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1.	PSF/P&D/TG-PSDP (23)/2023-24	<b>Dr. Fazal Said</b> Assistant Professor AWKU, Mardan	Entomology	375,000
2.	PSF/P&D/TG-PSDP (30)/2023-24	<b>Dr. Shujaul Mulk</b> Professor QAU, Islamabad	Plant Ecology and Conservation	350,000
3.	PSF/P&D/TG-PSDP (35)/2023-24	<b>Prof. Dr. Tariq Mahmood</b> Professor, QAU, Islamabad	Plant Sciences	450,000
4.	PSF/P&D/TG-PSDP (25)/2023-24	<b>Ms. Hira Saleem</b> PhD Scholar PMAS Arid Agriculture University, Rawalpindi	Environmental Sciences	387,000
5.	PSF/P&D/TG-PSDP (31)/2023-24	<b>Dr. Abdul Qayyum</b> Assistant Professor Haripur University, KP	Agronomy	260,000
6.	PSF/P&D/TG-PSDP (38)/2023-24	<b>Dr. Shazia Fatima</b> Director KIRAN Hospital, Islamabad	Nuclear Medicine	165,000
7.	PSF/P&D/TG-PSDP (40)/2023-24	<b>Mr. Sohail Hassan</b> PhD Scholar/Lecturer UVAS, Lahore	Microbiology	300,000
8.	PSF/P&D/TG-PSDP (42)/2023-24	<b>Prof. Dr. Khan Bahadar Marwat</b> Professor/President of Weed Science Society of Pakistan	Weed Sciences	300,000
9.	PSF/P&D/TG-PSDP (61)/2023-24	<b>Dr. Samiullah</b> Associate Professor QAU, Islamabad	Microbiology	430,000
10.	PSF/P&D/TG-PSDP (58)/2023-24	<b>Dr. Sobia Kanawal</b> Assistant Professor AIOU, Islamabad	Biochemistry & Molecular Biology	500,000
11.	PSF/P&D/TG-PSDP (51)/2023-24	<b>Dr. Shanawer Niaz</b> Assistant Professor Thal University, Punjab	Physics	274,383
12.	PSF/P&D/TG-PSDP (49)/2023-24	<b>Ms. Aamenah Siddiqui</b> PhD Scholar, QAU, Islamabad	Electronics	329,981
13.	PSF/P&D/TG-PSDP (60)/2023-24	<b>Dr. Fazal Said</b> Assistant Professor AWKU, Mardan	Entomology	330,000
14.	PSF/P&D/TG-PSDP (53)/2023-24	<b>Mr. Farooq Aslam</b> PhD Scholar, IST, Islamabad	Aeronautics	260,000
15.	PSF/P&D/TG-PSDP (57)/2023-24	<b>Ms. Sehrish Gul</b> University of Agriculture, Faisalabad	Microbiology	270,000
	<b>Total</b>			<b>4,981,364</b>

## VII. Financial Statements

### 1. PSF Financial Statement

#### SUMMARY

Detail Object Desc	Budget Allocation 2023-24	Re-Appropriation (+)	Re-Appropriation (-)	Revised Budget Allocation 2023-24	Released Budget 2023-24	Progressive Expenditure upto 30.6.2024	Release Balance 30.6.2024
A01111-Pay of Officers	90,000,000		1,300,000	88,700,000	88,700,000	88,608,048	91,952
A01160-Pay of Staff	50,000,000		6,700,000	43,300,000	43,300,000	43,040,655	259,345
A0121X-Regular Allowances	67,570,000	4,000,000		71,570,000	71,570,000	71,570,000	0
A01298-Other Allowances	55,500,000	2,650,000	150,000	58,000,000	58,000,000	57,917,555	82,445
A03985-Operating Expenses	52,645,000	169,106,000	3,405,000	218,346,000	218,346,000	218,223,356	122,644
<b>Total</b>	<b>315,715,000</b>	<b>175,756,000</b>	<b>11,555,000</b>	<b>479,916,000</b>	<b>479,916,000</b>	<b>479,359,614</b>	<b>556,386</b>

Head of Account	Budget Allocation 2023-24	Re-Appropriation of funds +	Re-Appropriation of funds -	Revised Budget Allocation 2023-24	Released Budget 2023-24	Progressive Expenditure upto 30.6.2024	Release Balance 30.6.2024
<b>EMPLOYEES RELATED FUND</b>	<b>263,070,000</b>	<b>6,650,000</b>	<b>8,150,000</b>	<b>261,570,000</b>	<b>261,570,000</b>	<b>261,136,258</b>	<b>433,742</b>
<b>Pay</b>	<b>140,000,000</b>	<b>-</b>	<b>8,000,000</b>	<b>132,000,000</b>	<b>132,000,000</b>	<b>131,648,703</b>	<b>351,297</b>
<b>Pay of Officers</b>	<b>90,000,000</b>	<b>-</b>	<b>1,300,000</b>	<b>88,700,000</b>	<b>88,700,000</b>	<b>88,608,048</b>	<b>91,952</b>
Basic Pay	89,860,000		1,300,000	88,560,000	88,560,000	88,468,048	91,952
Special Pay	75,000		258	75,000	75,000	75,000	-

Qualification Pay	65,000			65,000	65,000	65,000	-
<b>Pay of Other Staff</b>	<b>50,000,000</b>	<b>-</b>	<b>6,700,000</b>	<b>43,300,000</b>	<b>43,300,000</b>	<b>43,040,655</b>	<b>259,345</b>
Basic Pay	50,000,000		6,700,000	43,300,000	43,300,000	43,040,655	259,345
Special Pay	-				-	-	
<b>Allowances</b>	<b>123,070,000</b>	<b>6,650,000</b>	<b>150,000</b>	<b>129,570,000</b>	<b>129,570,000</b>	<b>129,487,555</b>	<b>82,445</b>
<b>Regular Allowances</b>	<b>67,570,000</b>	<b>4,000,000</b>	<b>-</b>	<b>71,570,000</b>	<b>71,570,000</b>	<b>71,570,000</b>	<b>-</b>
Senior Post Allowance					-	-	101,028
House Rent Allowance					-	-	2,636,414
Conveyance Allowance					-	-	5,997,201
Qualification Allowance					-	-	995,667
Medical Allowance					-	-	3,598,663
Hardship Allowance					-	-	-
Entertainment Allowance					-	-	71,056
Computer Allowance					-	-	22,500
Orderly Allowance					-	-	1,366,834
Deputation Allowance					-	-	214,044
Integrated Allowance					-	-	326,194
Transport Monetization					-	-	563,085
Audit & Account Allowance					-	-	-
Utilities					-	-	

						162,972	
Disparity Reduction Allowance 25% 2021				-	-	15,696,672	
Desparity Reduction Allowance-2022				-	-	9,871,888	
Adhoc Relief Allowance 15% 2022				-	-	9,887,036	
Adhoc Relief Allowance 35 & 30% 2023				-	-	20,058,746	
<b>Other Allowances</b>	<b>15,000,000</b>	<b>2,650,000</b>	<b>150,000</b>	<b>16,050,000</b>	<b>16,050,000</b>	<b>16,049,218</b>	<b>782</b>
Over Time Allowance	1,000,000			1,000,000	1,000,000	999,218	782
Honorarium	8,250,000		50,000	8,200,000	8,200,000	8,200,000	-
Medical charges	5,750,000	1,100,000		6,850,000	6,850,000	6,850,000	-
<b>EMPLOYEES RETIREMENT BENEFIT</b>	<b>40,500,000</b>	<b>1,550,000</b>	<b>100,000</b>	<b>41,950,000</b>	<b>41,950,000</b>	<b>41,868,337</b>	<b>81,663</b>
Pension Contribution	38,500,000		100,000	38,400,000	38,400,000	38,400,000	-
Reimbursement of Medical charges Pensioners	2,000,000	1,550,000		3,550,000	3,550,000	3,468,337	81,663
<b>Project Preinvestment analysis</b>	<b>-</b>	<b>150,000,000</b>	<b>-</b>	<b>150,000,000</b>	<b>150,000,000</b>	<b>149,939,684</b>	<b>60,316</b>
<b>Research &amp; Survey (Statutory Functions)</b>	<b>-</b>	<b>150,000,000</b>	<b>-</b>	<b>150,000,000</b>	<b>150,000,000</b>	<b>149,939,684</b>	<b>60,316</b>
Research & Survey	-	150,000,000	-	150,000,000	150,000,000	149,939,684	60,316
<b>OPERATING EXPENSES</b>	<b>52,645,000</b>	<b>19,106,000</b>	<b>3,405,000</b>	<b>68,346,000</b>	<b>68,346,000</b>	<b>68,283,672</b>	<b>62,328</b>
<b>COMMUNICATION</b>	<b>2,780,000</b>	<b>-</b>	<b>500,000</b>	<b>1,700,000</b>	<b>1,700,000</b>	<b>1,700,000</b>	<b>-</b>
Postage & Telegraph	280,000	260		100,000	100,000	100,000	-

Telephone & Trunk Call	2,500,000		500,000	1,600,000	1,600,000	1,600,000	-
<b>UTILITIES CHARGES</b>	<b>6,200,000</b>	<b>-</b>	<b>500,000</b>	<b>5,700,000</b>	<b>5,700,000</b>	<b>5,700,000</b>	<b>-</b>
Gas Charges	1,000,000			1,000,000	1,000,000	1,000,000	-
Water Charges	200,000			200,000	200,000	200,000	-
Electricity Charges	5,000,000		500,000	4,500,000	4,500,000	4,500,000	-
<b>OCCUPANCY COST</b>	<b>29,400,000</b>	<b>11,400,000</b>	<b>-</b>	<b>41,380,000</b>	<b>41,637,862</b>	<b>41,637,862</b>	<b>-</b>
Rent for Residential Building	29,000,000	11,400,000		40,980,000	41,237,862	41,237,862	-
Rates & Taxes	400,000			400,000	400,000	400,000	-
<b>TRAVEL &amp; TRANSPORTATION</b>	<b>5,900,000</b>	<b>200,000</b>	<b>-</b>	<b>6,100,000</b>	<b>6,100,000</b>	<b>6,100,000</b>	<b>-</b>
Traveling Allowance	700,000	200,000		900,000	900,000	900,000	-
Petrol, Oil & Lubricant Charges	5,000,000			5,000,000	5,000,000	5,000,000	-
Conveyance Charges	200,000			200,000	200,000	200,000	-
<b>GENERAL</b>	<b>2,365,000</b>	<b>800,000</b>	<b>505,000</b>	<b>2,660,000</b>	<b>2,660,000</b>	<b>2,660,000</b>	<b>-</b>
Stationery	750,000			750,000	750,000	750,000	-
Printing Publication	300,000			300,000	300,000	300,000	-
Newspapers	40,000			40,000	40,000	40,000	-
Uniform & Protection Cloth	100,000			100,000	100,000	100,000	-
Advertisement & Publicity	200,000		200,000	-	-	-	-
Law charges	100,000	261 800,000		900,000	900,000	900,000	-

Others	800,000		300,000	500,000	500,000	500,000	-
Light Refreshment during official meeting	75,000		5,000	70,000	70,000	70,000	-
Grants Subsidieze & Loan Advances/Others	-	<b>6,706,000</b>		<b>6,706,000</b>	<b>6,448,138</b>	<b>6,389,784</b>	<b>58,354</b>
Grants Domestics	-	6,706,000		6,706,000	6,448,138	6,389,784	58,354
<b>Finance Package for families of Civil Servants (expired during service)</b>		<b>6,706,000</b>		<b>6,706,000</b>	<b>6,448,138</b>	<b>6,389,784</b>	<b>58,354</b>
<b>Other Transfer Payment</b>	<b>2,000,000</b>	-	-	<b>2,000,000</b>	<b>2,000,000</b>	<b>1,996,026</b>	<b>3,974</b>
(CPF Contribution & Staff Welfare Fund)	2,000,000			2,000,000	2,000,000	1,996,026	3,974
<b>REPAIRS &amp; MAINTENANCE</b>	<b>4,000,000</b>	-	<b>1,900,000</b>	<b>2,100,000</b>	<b>2,100,000</b>	<b>2,100,000</b>	-
<b>Transport</b>	<b>900,000</b>	-	-	<b>900,000</b>	<b>900,000</b>	<b>900,000</b>	-
Transport	900,000			900,000	900,000	900,000	-
<b>Machinery &amp; Equipment</b>	<b>900,000</b>	-	<b>400,000</b>	<b>500,000</b>	<b>500,000</b>	<b>500,000</b>	-
Machinery & Equipment	900,000		400,000	500,000	500,000	500,000	-
<b>Furniture &amp; Fixtures</b>	<b>500,000</b>	-	<b>300,000</b>	<b>200,000</b>	<b>200,000</b>	<b>200,000</b>	-
Furniture & Fixtures	500,000		300,000	200,000	200,000	200,000	-
<b>Building &amp; Structure</b>	<b>1,700,000</b>	-	<b>1,200,000</b>	<b>500,000</b>	<b>500,000</b>	<b>500,000</b>	-
Office Buildings	1,700,000		1,200,000	500,000	500,000	500,000	-
Other Repair	-				-	-	
<b>GRAND TOTAL :</b>	<b>315,715,000</b>	<b>175,756,000</b>	<b>11,555,000</b>	<b>479,916,000</b>	<b>479,916,000</b>	<b>479,359,614</b>	<b>556,386</b>

				479,916,000			
<b>A02 (A to C)</b>	<b>Project Pre investment analysis (Statutory Functions)</b>	<b>150,000,000</b>	<b>150,000,000</b>	<b>150,000,000</b>	<b>150,000,000</b>	<b>149,939,684</b>	<b>60,316</b>
<b>GRANT FOR RESEARCH SUPPORT TO BE UTILIZED BY RESEARCH SUPPORT &amp; IL SECTION HEADED BY DIRECTOR (R.S) &amp; DIRECTOR (IL)</b>							
<b>Grant for Res- &amp; Instit-Support</b>		<b>118,000,000</b>		<b>118,000,000</b>	<b>125,557,832</b>		-
Biotech						1,819,006	
Math & Computer Sciences.						700,000	
Physical Sciences.						270,000	
Chemical Sciences.						19,026,587	
Biological Sciences.						3,445,034	
Earth Sciences.						10,786,624	
Environmental Sciences.						2,930,000	
Engineering Sciences						54,972,931	
Agricultural Sciences						1,591,700	
Medical Sciences.						30,015,950	
<b>Sub-Total (a)</b>	<b>-</b>	<b>118,000,000</b>	<b>-</b>				

				118,000,000	125,576,148	125,557,832	18,316
Utilization of Results Research & Pilot Plant Study							-
Information, documentation Publication & Library Material, Subscription to International Organization & UNESCO Coupons	-			-			-
Scientists Pool/Senior Scientist Emertues	-			-	-	-	-
Scientific Societies & Professional Bodies	-			-	-	-	-
Science Conferences Seminar, Workshop & Symposia		4,000,000		4,000,000	4,636,813	4,616,813	20,000
Awards Prizes & Fellowships.	-			-	-	-	-
Special Scientific Survey & Collection of Statistics		500,000		500,000	60,000	60,000	-
International Liasion		500,000		500,000	-	-	-
Inovations & Inventions		500,000		500,000	-	-	-
Institutional Support.		500,000		500,000	-	-	-
Evaluation Fee		1,000,000		1,000,000	555,000	533,000	22,000
Board/Committee Meetings.		1,000,000		1,000,000	538,800	538,800	-
<b>Sub-Total (b)</b>	<b>-</b>	<b>8,000,000</b>	<b>-</b>	<b>8,000,000</b>	<b>5,790,613</b>	<b>5,748,613</b>	<b>42,000</b>
<b>SCIENCE PROMOTION ACTIVITY SECTION: HEADED</b>			264				

<b>BY PSO (S.P)</b>							
Science Popularization Activities		9,000,000		9,000,000	7,523,475	7,523,475	-
Science Centre,Herberia Planetaria		1,000,000		1,000,000	228,444	228,444	-
Science Fair					-	-	-
Science Caravan.		8,000,000		8,000,000	6,832,988	6,832,988	-
<b>Sub-Total (c)</b>	<b>-</b>	<b>18,000,000</b>	<b>-</b>	<b>18,000,000</b>	<b>14,584,907</b>	<b>14,584,907</b>	<b>-</b>
<b>PLANNING &amp; DEVELOPMNET SECTION: HEADED BY DIRECTOR (P&amp;D)</b>							
Exchange of Visits of Scientists & Technologists		6,000,000		6,000,000	4,048,332	4,048,332	-
<b>Sub-Total (d)</b>	<b>-</b>	<b>6,000,000</b>	<b>-</b>	<b>6,000,000</b>	<b>4,048,332</b>	<b>4,048,332</b>	<b>-</b>