ANNUAL REPORT

2007 - 2008

Pakistan Science Foundation

Islamabad

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2007-2008

PAKISTAN SCIENCE FOUNDATION
1 - Constitution Avenue
Islamabad

PAKISTAN SCIENCE FOUNDATION

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Note: The tenure of the PSF Board of Trustees expired on 11th May, 2008

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ABBREVIATIONS

AJK	Azad Jammu and Kashmir
B	Balochistan
C	Centre
F	Frontier (NWFP)
P	Punjab
S	Sindh

AKU	The Aga Khan University, Karachi
ARIQ	Agriculture Research Institute, Quetta
P-AU	Agricultural University, Faisalabad
BU	Balochistan University, Quetta
BZU	Bahauddin Zakaria University, Multan
CEMB	Centre of Excellence in Molecular Biology, Lahore
CEME	College of Electrical and Mechanical Engineering, Rawalpindi
CEWRE	Centre of Excellence in Water Resources Engineering, Lahore
GCU	Government College University, Lahore
GU	Gomal University, D.I. Khan
KU	Karachi University, Karachi
NARC	National Agricultural Research Centre, Islamabad
NIBGE	National Institute for Biotechnology and Genetic Engineering, Faisalabad
NSFC	National Science Foundation of China
PMNH	Pakistan Museum of Natural History, Islamabad
PINSTECH	Pakistan Institute of Nuclear Science and Technology, Islamabad
F-PU	Peshawar University, Peshawar
P-PU	Punjab University, Lahore
QAU	Quaid-i-Azam University, Islamabad
SALU	Shah Abdul Latif University, Khairpur, Sindh
SIUT	Sindh Institute of Urology & Transplantation, Karachi
SU	Sindh University, Jamshoro
PCCC	Pakistan Central Cotton Committee, Sakrand
UAA/UAAR	University of Arid Agriculture, Rawalpindi
COMSATS	Commission on Science and Technology for Sustainable Development in the South
COMSTECH	OIC Standing Committee on Scientific and Technological Cooperation

Agr	Agricultural Sciences
Bio	Biological Sciences
Biotech	Biotechnology
Chem	Chemical Sciences
Comp	Computer Sciences
Earth	Earth Sciences
Eng	Engineering Sciences
Envr	Environmental Sciences
Med	Medical Sciences
Phys	Physical Sciences

SSGC	Sui Southern Gas Company
NSLP	Natural Sciences Linkages Programme
P.I.	Principal Investigator
NSTC	National Science and Technology Commission
BISE	Board of Intermediate and Secondary Education
PSDP	Public Sector Development Programme
DDWP	Departmental Development Working Party
WWF	World Wild Life Fund

DETAILED ANNUAL REPORT

EXECUTIVE SUMMARY

PAKISTAN SCIENCE FOUNDATION (PSF)

Pakistan Science Foundation is the 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 following three broad categories.

i. **Science Promotion**
To promote basic and applied research in universities and researchnstitutes on scientific challenges & activities related to socio-economic needs/development of the country.

ii. **Science Popularization**
To increase public awareness about science through science popularization activities by establishing museums, clubs, herbaria and planetaria etc.

iii. **Scientific Centres**
To establish centers for comprehensive scientific and technological information systems and services.

Some of the activities pertaining to these objectives 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 the PSF Science Wing and are reflected as under:

RESEARCH SUPPORT:

Research support is the principal programme of the Foundation for the promotion of basic and fundamental research relevant to socio-economic needs of the country. During 2007-2008, a total 207 projects in the fields of Agriculture, Biology, Biotechnology, Chemistry, Computer, Earth Sciences, Engineering, Medical Sciences and Physics remained under consideration. Among these 68 remained underprocess, of which 32 projects costing Rs. 28.04 million were sanctioned. Rs. 13.02 million on account of first installments of these approved projects were

released. 139 project proposals remained on-going and an amount of Rs. 7.268 million was released on account of due installments of these on-going projects.

Monitoring and evaluation of on-going projects sponsored by the Foundation is an important function of the Research Support Programme. During the year, 88 technical reports of on-going projects including semi-annual, annual and final reports were received. The PSF relevant staff scrutinized the semi-annual reports, whereas the annual reports, after initial scrutiny, were sent for evaluation to the subject experts.

During the year, 28 projects were technically completed. The subject experts evaluated these reports which were subsequently submitted along with their evaluation reports to the relevant PSF Technical Committees for consideration and adoption.

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, 64 research papers were published in national/international journals by the principal investigators of completed projects. In addition, 18 Ph.D students have completed their research work and 40 M.Phil/M. Sc. (Hons) degrees were awarded to the Research Associates employed.

Natural Sciences Linkages Programme (NSLP) Endowment Fund

In view of expanding trade of agricultural commodities between the two countries, the Commodity Credit Corporation from United States of America and Ministry of Finance, Government of Pakistan singed an Agreement for Establishment of Natural Sciences Linkages Programme (NLSP) under PL-480 scheme. Under the agreement an Endowment Fund of Rs. 500 million has been created in PSF under the umbrella of Ministry of Science & Technology (MoST), Government of Pakistan.

The primary goals of this programme are:

- To increase the contact and collaboration among natural scientists and institutions of biological research, development and higher learning between the two nations.
- To provide researchers and institutions with opportunities to exchange information, ideas, skills and techniques.

- To enhance opportunities of collaboration in solving problems of common interest relating to natural sciences and
- To utilize special research and development facilities or opportunities available among the two countries.

During the report period, 74 proposals remained under active consideration of the Foundation. Nine (09) projects were approved by the Foundation at a total cost of Rs. 13.05 million and an amount of Rs. 4.586 million was released to these projects for the initiation of research work.

Science Promotion Activities

1. **Fnancial assistance for holding science conferences, seminars and workshops:**

   An amount of **Rs. 1.001** million was paid to 20 organizations for holding of onferences/seminars/workshops on important scientific topics.

2 **Publication of Scientific Journals:**

An amount of Rs.0.170 million was paid to various organizations for the publication of four (4) scientific journals.

3. **Awards and Fellowships:**

Fellowships were awarded to three (3) M.Phil students @ Rs.8000/- per month, studying in various local universities.

4. **Annual grant in aid to scientific societies:**

Funds amounting to Rs. 2.124 million were paid to 11 Scientific Societies for holding science conferences/seminars/workshops, publication of scientific journals and establishing linkages with similar bodies abroad.

INTERNATIONAL LIAISON:

- The Economic Cooperation Organization (ECO), an inter-governmental regional organization intends to establish "ECO Science Foundation" at Islamabad with the collaboration of Government of Pakistan. Pakistan Science Foundation is entrusted to work as its focal point in Pakistan. To meet its objectives, an Expert Group Meeting (EGM) was organized by PSF and Ministry of Science & Technology (MoST) at Best

Western Hotel, Islamabad from September 2-3, 2007. It was chaired by Dr. N. M. Butt, Chairman, PSF / Head of Pakistani delegation. The experts from ECO Secretariat and Member States i.e. Afghanistan, Azerbaijan, Iran, Pakistan, Turkey, and Uzbekistan participated in the meeting. The modalities for establishment of ECO Science Foundation Headquarter at Islamabad, Host Country Agreement and Charter of ECO Science Foundation were discussed in detail.

- US Officials visited Pakistan Science Foundation to discuss the implementation of NSLP Endowment Fund.

PLANNING AND DEVELOPMENT

During 2007-08, development funds amounting to Rs.13.654 million were utilized for the following development projects:

1. **Participation of Scientists and Technologists in International Conferences, Seminars and Workshops (Phase II)**

   A total of 130 travel grant requests for presentation of research papers and attending training courses abroad were received, out of which 65 travel grants were approved by the Foundation. However, 49 scientists could avail the grants. An amount of Rs. 5.975 million was utilized for the travel grants and payment of staff salaries etc.

2. **Automation of PSF Research Support Programme and other Activities**

   Funds amounting to Rs.7.679 million were utilized for procurement of computers, servers, scanners, electric generator, 29 UPS for servers and client machine, software along with other networking equipments and Air Conditioner etc. Except the Project Director, rest of the project staff has been recruited.

SCIENCE POPULARIZATION

Popularization and promotion of Science, increasing its awareness in the society and development of scientific culture in the country are some of the major functions entrusted to Pakistan Science Foundation. Also, under the action plan of the National Science Policy-1984, the task of popularization of science at grass root level in the country was assigned to

the Foundation. To achieve the aim of increased awareness of science, the Foundation is engaged in a number of activities, which are briefly described below:

Science Caravan is a Mobile Science Exhibition that has been designed to increase public awareness about science and to motivate the younger generation of the country towards study of science. The people living in rural/backward areas of the country are exposed to some of the most fascinating scientific and technical developments of the modern world through Science Caravans. Science Caravan vehicles transport display items like Panel Exhibits having photographs and write-ups, equipment like film projectors & VCRs for screening of documentaries and scientific films and Starlab Planetarium shows. Microscopes, computers, laser holograms and working models reflecting various phenomena of physics, chemistry, mathematics and biology are also included in Caravan Exhibitions. At present nine Science Caravan Units are in operation, two for each of the four provinces and one is stationed at Islamabad. During the report period the PSF Science Caravans organized Caravan Exhibitions for 454 days and more than 180,000 students of 822 schools visited these exhibitions.

17th Science Essay and Poster Competitions were organized for the students of all Boards of Intermediate and Secondary Education (BISE) of the country. PSF in collaboration with BISEs organizes Intra Board and Inter Board Competitions on regular basis, in which thousands of students from all over the country participate each year. Special emphasis was given to Mathematics this year, therefore the topics for essay and poster competitions were "Why Mathematics is Necessary" and "Mathematics/Geometry in Nature" respectively. A sum of Rs.500,000.00 was disbursed among 114 winner students of the 17th Science Essay & Poster Competitions.

Donation of **Popular Science Magazines and Scientific Books** is one of the regular and important activities of Science Popularization section. During the year, 200 copies of the book "One Hundred Reasons to be a Scientist", 100 copies of the book "Development of S&T in Pakistan of Muslim Ummah in the Light of its Cultural History & Temperament, Vol-I" and 20 copies of the book entitled "Science for Peace and Development – Life and Work of Abdus Salam" were procured and distributed among the selected organizations. More than 13,500 copies of Popular Science magazine "Monthly Global Science" were acquired and

donated to 1000 schools during the report period. In addition, about 15,000 copies of various scientific brochures were also distributed among the students.

PSF also provides **Financial Assistance** to High Schools working in Govt. Sector, specially in rural areas for strengthening of their Science Laboratories. Furthermore, in addition to its own Science Popularization activities, PSF also helps other S&T organizations in organizing such activities. During the year 2007-08, an amount of Rs.590,000.00 was sanctioned to fifteen (15) schools and S&T organizations for the purpose.

World Science Day for Peace and Development (WSDPD) is another important event being celebrated regularly by PSF on 10th of November of each year. WSDPD was declared by UNESCO in 2001 and since then the Foundation organizes Convention of Scientists & many other activities to commemorate the day. This year, PSF also organized Special poster competition on the theme "Mathematics/Geometry Nature" among the students of public and private schools of Rawalpindi and Islamabad. Sixty (60) students participated in the competition and all of them were awarded with certificates. Whereas, cash prizes were also given away by the Chief Guest, Dr. Ishfaq Ahmad, Special Advisor to the Prime Minister of Pakistan. In addition, an exhibition on "Scientific Teaching Aids" was also arranged by the science teachers of local schools. All units of PSF Science Caravans arranged special Science Exhibitions to highlight the importance of the use of Science for Peace and Development.

Training Program for the Officers and Staff of Science Caravans was arranged at PSF on 28-29 August, 2007. Caravan Incharges of all Caravan units alongwith their staff attended the program. Training on "Facilitation Skills" was provided by Mr. Munawar Raza Kazmi and Mr. Roshan Zada. Caravan Officers also presented their progress and discussed their problems with higher ups.

International Mathematics Exhibition **"Experiencing Mathematics"** was organized by PSF in collaboration with Embassy of France in Pakistan during April-May 2008 at Islamabad, Lahore and Peshawar. The exhibits of the exhibition includes feature posters, along with 27 interactive devices and models, placed on fifteen tables which the students can play with their own hands. The exhibits were organized around various themes in mathematics, including

shapes in nature, tiling and symmetries, filling spaces, graphs and connections, secret codes and cryptography etc. Some of the manipulative models illustrated the Pythagorean Theorem, the Square Drill, the Differential Gear, the Cradle Pinball Device, Tricycle with square wheels etc. The expo was aimed to be interactive and entertaining at the same time. More than 30,000 students and teachers from hundreds of schools and educational institutes visited this math Exhibition.

In addition, PSF Science Popularization section also provided its input in a number of other activities like; 13th Meeting of COMSTECH General Assembly (1-3 April 2008), UNESCO project "Breaking the Poverty Cycle of Women", Orientation Camp and Certificate Awarding Ceremony of the participants of Nobel Laureates Meeting and Expert Group meeting at Islamabad for establishment of ECO Science Foundation (September 2-3 2007).

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

The main objectives of PMNH include research and public education on the natural resources of the country. To improve the quality of the research work, PMNH pursued the policy of having more international interaction. US Director Office of Science and Technology Cooperation, a high level science and technology delegation of Thai Ministry of Science and Technology, and Turkish delegation visited PMNH and discussed possible cooperation on research with PMNH. PMNH scientists conducted field studies in various localities of Sindh, Punjab, NWFP, AJK, and the Northern areas of Pakistan. Some 6000 specimens of animals, plants, rocks, minerals and fossils were collected along with field data and photographs. These specimens were preserved, identified, catalogued and stored in the reference depository of PMNH for further research and future reference. One national research project was completed and 5 were continued. Work on 2 international research projects were carried out. Two books and 18 research articles were published in reputed national and international journals by the PMNH scientists. Some 50 technical reports were submitted to Pakistan Wetlands Programme (PWP) under a consultancy programme between PMNH and PWP. A two-day workshop on Pakistan Museum of Natural History: A Source of Informal Education was arranged by PMNH. The participants, mostly college teachers, were delivered lectures, shown documentaries and imparted practical lab and field training. Three officers conducted

viva-voce of Ph.D. and M. Phil. students of Quaid-i-Azam University, University of the Punjab and University of Peshawar, besides providing expert guidance to several university students. Three officers obtained international and four officers received national training. Construction of 25 animated exhibits in the display galleries of PMNH under a development project was carried out.

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

Main objective of PASTIC is to procure, process and disseminate information in all disciplines of science and technology. To meet this objective, PASTIC develops inter-library cooperation for sharing resources, establishes and maintains links with international/regional information networks/agencies. PASTIC provides training to information professionals in modern information handling and management techniques. Collaborations with different organizations and agencies enhance the scope of information that is offered to clients and help PASTIC to respond to the diverse needs of a broad community of users.

During 2007-08, PASTIC received 2107 requests for supply of S&T articles, against which 1948 were honored. Under bibliographic Information Service 439,092 references/abstracts from International Bibliographic Databases, both online and offline in all major disciplines of Science and Technology were supplied to 1834 researchers/users on request. During the period under review, Vol. 44 of Pakistan Science Abstracts was published in ten different disciplines and these were distributed among S&T/R&D organizations and academic institutions as part of information dissemination activities. Automation of PASTIC library remained in progress and is now in the completion phase.

During 2007-2008, more than 2000 books were classified subject wise and also computerized for easy access. Besides, the library received 955 issues of National and International journals. Approximately 150 issues of different national and international journals were received in exchange of Pakistan Science Abstracts, under international cooperation activities and on gratis basis, which has contributed to a considerable extent for strengthening of information resources of PASTIC.

PASTIC also acts as the National Focal Point for International/Regional Information Networks, like SAARC Documentation Center, WHO/CEHANET and UNESCO. During the year 2007-2008, information/data received from these organizations was disseminated among the relevant institutions and professionals. PASTIC officers also availed trainings under some of these programmes. In addition, the UNESCO developed WINISIS package (English Version) was provided to twelve organizations and a training course was also organized on WIN/ISIS Package for Librarians of different organizations of the Faisalabad region. A Seminar on "Role of Scientific Information & Communication in Promoting Research & Industry Collaboration" was also organized at Peshawar during May 2008, which was attended by representatives of Industry, Academia, Press and R&D Organizations.

The development project "Science Awareness through TV Channel", which had started in September 2004 was successfully completed on 31st December, 2007. The programme was successful in creating awareness among the populace about the socio economic impact of science in society. During the report period 20 S&T documentaries were aired (9 locally produced and 11 acquired from abroad) on PTV channel.

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 having a bearing on the socio-economic needs of the country. 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 economy of the country.

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) 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/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 given in the chapters that follow.

CHAPTER – 1

ACTIVITIES & PROGRAMMES

The activities and programmes undertaken by the Foundation for the performance of its statutory functions can be broadly divided into the following four categories:

i. Establishment of Comprehensive Scientific and Technological Information and Dissemination Centers.

ii. Promotion and Financing of Scientific Research in the Country and the Utilization of the Research Results.

iii. Promotion and Popularization of Science in Society.

iv. International Liaison.

The first activity is carried out through **Pakistan Scientific and Technological Information Centre (PASTIC),** a subsidiary organization of PSF. The other functions i.e., research support and science popularization etc., are performed by the Science Wing of the Foundation. Functions of the Science Wing of PSF are further subdivided as under.

Science Promotion Section is performing the following activities:

1. Research Support
    a) Grants for Research Projects
    b) 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. Planning and Development Program

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

In addition to PASTIC, the other subsidiary organization of PSF is the **Pakistan Museum of Natural History (PMNH)**, 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.

The progress of the work carried out by the Science Wing of the Foundation, PMNH and PASTIC during the year 2007-2008 is summarized in the following pages.

1. PAKISTAN SCIENCE FOUNDATION (PSF)

1.1 RESEARCH SUPPORT

1.1.1 Research Projects Funded from Non Development Budget

Research Support (Science Promotion) is the principal programme of Pakistan Science Foundation for the promotion of basic and fundamental research, having relevance to the socio-economic needs of the country. Therefore, projects of both basic and applied nature are supported by the Foundation. The criteria for funding of research projects by the Foundation are competence of the scientific personnel to carry out research, Institutional capabilities, i.e., availability of basic equipment and laboratory facilities, scientific merit of the proposed research projects and likelihood of completion of the proposed research within the stipulated time. Each proposal, after getting reviewed from an expert in the particular field, is placed before the relevant Technical Committee for technical evaluation and recommendations regarding provision of funds under various heads of expenditure proposed by the researchers. The proposal, if recommended by the Technical Committee, is then submitted to PSF Executive Committee for final approval. The projects are under regular non-development budget (ND) as well as under Natural Science Linkage Programme (NSLP) of the Foundation.

a. Under process Projects:

During the report period, 281 (207 ND + 74 NSLP) proposals remained under active consideration of the Foundation. Out of these, 67 (36 ND + 31 NSLP) projects were newly received, while 75 projects (32 ND + 43 NSLP) were carried over from the previous year. Out of which, 32 projects from non-development budget and 09 projects from NSLP budget were approved by the Foundation at a total cost of Rs. 41.09 million (Annexure-II), where as Rs. 17.606 million were released on account of first installments of these approved projects.

b. On-going Projects:

During the year, there were 148 on-going research projects (139 ND + 09 NSLP) and 88 progress reports of these projects (semi-annual, 1st and 2nd annual & final) were received. The PSF staff scrutinized the semi-annual reports, 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 on-going projects are released only if the interim progress of the projects at the end of each project year is satisfactory. An amount of Rs. 7.268 million was released on account of due installments and evaluation fee of ongoing projects. A list of the semi-annual and annual reports is given in Annexure-III.

c. Completed Projects:

During the year, 28 research projects funded under regular non development budget were completed. The subject experts evaluated the final technical reports of these projects which were subsequently placed before the respective PSF Technical Committees for consideration. The accounts of these projects have also been settled. A list of the completed projects followed by their scientific out put is given below.

i) List of Completed projects:

S. No.	Projects No.	Project Title
1.	P-NIAB/Agr (288)	Effect of soil salinity and nitrogen availability on photosynthate partitioning and growth of wheat.
2.	F-AU/Agr (291)	Development of sustainable rice-wheat cropping system through management of legumes.
3.	F-AU/Agr (295)	Weed management in wheat (*Triticum aestivum* L.) in NWFP.
4.	F-AU/Agr (296)	Integrated management of noxious weeds in chickpea (*Cicer arientinum* L.) in southern districts of NWFP (diagnostic phase).
5.	F-AU/Agr (299)	To assess the causes of ratoon failure in sugarcane and their control in NWFP.
6.	P-PU/Bio (204)	Biodegradation of DCP and TCE by tobacco.
7.	P-AU/Bio (286)	Taxonomy and ecology of spider communities of citrus orchards and role of spiders as predators.
8.	P-NIBGE/Bio (317)	Introduction of salinity tolerance in plants through the use of halotolorence conferring genes from bacteria and fungi- A transgenic approach.
9.	P-NIAB/Bio (324)	Use of isozyme markers in chickpea breeding.
10.	P-AU/Bio (326)	Evaluation of indigenous trivalent vaccines for the control of mastitis in buffaloes and cows.

11.	AJK-UCR/Bio (333)	Distribution, population and conservation of cheer pheasant (*Catreus wallichii*) in Jhelum valley, Muzaffarabad.
12.	S-SU/Bio (338)	Taxonomy and biology of *Hieroglyphus spp.* (Hemiacridinae: Acrididae: Orthoptera).
13.	P-BZU/Bio (340)	Conservation biology of larks (*Alaudidae*) in Pakistan.
14.	F-GU/Chem (351)	Emulsification of Oil/Water System
15.	S-KU/Chem (367)	Direct and Indirect electro-Chemical attack on Cancer Cells.
16.	C-QU/Chem (373)	Enantioselective Synthesis of Carbohydrate Building Blocks and Bio-Active Natural Products
17.	S-SU/Chem(381)	Capillary Gas Chromatographic Determination of Amines and Amino acids by Precolumn Derivatization Method.
18.	S-SU/Earth (65)	Detection of saline intrusions in the right bank coastal sediments of Southern Sindh.
19.	P-CEWRE/Engg(77)	Stochastic flood risk zoning (Mapping)
20.	C-PCRWR/Engg(78)	Assessment of water resources and development of strategic water utilization plan in pothwar region for its sustainable management.
21.	P-PU/Envr(36)	Assessment of Physiological and Genetic Defects in Human Population exposed to Industrial Pollutants in the Industrial Area of District Kasur, Punjab, Pakistan
22.	C-NARC/Envr(59)	Passerine birds in cotton based agro-ecosystem of Punjab: A preliminary study to investigate the risks of pesticides
23.	P-AU/Envr(62)	Studies on growth and bio-energetic of fish under heavy metals toxicity.
24.	PSF/ILG/002/03	Disbondment of epoxy coating and integrity of gas transmission pipeline.
25.	P-PU/Phy (117)	Investigation in CP Violation.
26.	C-QU/Phy (121)	Preparation and characterization of CdTe based solar cells and related thin film materials.
27.	C-QU/Phy (128)	Investigation about iron related defects in silicon.
28.	C-QU/Phy (130)	Study of Soliton formation, ITG modes and energy deposition by cluster ion-Beams in a dust contaminated plasma.

ii) Summaries of Completed Projects:

Project No.	**P-NIAB/Agr (288)**
Project Title:	Effect of soil salinity and nitrogen availability on photosynthate partitioning and growth of wheat.
Duration:	3-Years
Date of Initiation:	01-09-2002
Date of Completion:	28-02-2006 (Extension for 6 months)
Final Report Received:	03-12-2006
Location of Scheme:	Nuclear Institute for Agriculture & Biotechnology, Faisalabad
Principal Investigator:	Dr. Asma Hassan Principal Scientist
Total Expenditure:	Rs. 2,95,734/-

Main Objectives:

- Quantification and chemical characterization of N available for plant uptake in saline soils
- Plant uptake, assimilation of $NH4^+$, $NO3^-$ and N with a view to select appropriate form of N for application under saline conditions
- Photosynthate partitioning (using ^4C labeling of plants) under saline conditions and the role of rhizode position in mitigating negative effects of salinity

Summary of work done:

Salt-affected soils comprise about 10% of the world's arable lands. Of a total of 380 million hectares of saline soils, 140 million hectares are highly saline. In Pakistan alone, about 6.7 million hectares are affected by salinity of different extent and the problem is getting worse due to rapid salinization of originally productive soils mainly because of the agroclimatic conditions including high temperatures and surface irrigation. These soils are characterized by high salt contents (sometimes high pH as well) and low content of organic matter and nitrogen (N). Widely divergent approaches have been proposed and practiced to use these soils for agricultural activity. However, nutrient constraints that are characteristic of these soils have

generally received little attention. Information is particularly lacking on: i) forms and availability to plants of N under saline conditions and ii) the effect of N supply on photosynthate partitioning and the resultant changes in soil micro flora and microbial functions. Therefore, the objectives of the studies reported here were:

i) Quantification and chemical characterization of N available for plant uptake in saline soils.

ii) Plant uptake, assimilation of NH_4^+, NO_3^- and N with a view to select appropriate form of N for application under saline conditions.

iii) Photosynthate partitioning (using ^4C labeling of plants) under saline conditions and the role of rhizode-position in mitigating negative effects of salinity.

Under laboratory conditions, soil samples amended with 0.5% plant material *(Sesbania aculeata)* and salinized to EC_e 7, 9, and 18 dSm^{-1} (original EC_e was 5.0 dSm^{-1}) were incubated at 3 moisture levels (15, 30 and 45%, w/w) and three temperature regimes i.e., 20, 30 and 40°C for 8 weeks and sub-samples studied for i) NH4-N, ii) $N0_3$-N, iii) mineralizable N, iv) 6N HCI hydrolysable N, v) distribution of hydrolysable N in different fractions, and vi) alkali labile N. Ammonification of organic N (as determined by the accumulation of NH_4-N in soil) increased with moisture and temperature and decreased with salinity. The content of mineralizable N remained higher under high moisture conditions, while high salinity and temperature had a variable and negative effect. Complete loss of NO_3-N observed during incubation of soil samples was attributable to denitrification. Further analyses of soil samples revealed significant quantities of hydrolysable N in alkali labile fraction. This represented 14-15% of the organic N in soil and was significantly correlated with potentially mineralizable N determined by anaerobic incubation. The results suggested a common origin of the two forms of N. Hence alkali labile N could possibly be used as an index of plant available N.

In the greenhouse, a pot experiment was conducted to study the effect of form and availability of N on wheat. Nitrogen was applied as 15N-Iabelled NH_4 or NO_3 in the form of ammonium sulphate, potassium nitrate or ammonium nitrate; DCD was applied as nitrification inhibitor in one of the treatments. Among the different sources of N, ammonium sulphate proved better in affecting the growth of wheat; nitrification inhibition had a depressing effect. A decrease due to salinity was observed in the net amount of N harvested

by plants and thus the dry matter accumulation. The studies suggested that a good mix of NH_4 and NO_3 may be more appropriate for wheat under saline conditions.

Under hydroponic conditions, salinity of the rooting medium had a significant negative effect on growth of wheat; the effect was more severe in the presence of NH_4 than $N0_3$. The increase in NH_4 concentration in the medium led to a consistent decrease in biomass accumulation. Results of 14C pulse labeling experiment showed a positive effect of NH_4-N on rhizodeposition and a negative effect on respiration; reverse was true for NO_3-N. Salinity of the rooting medium had a positive effect on rhizodeposition and a negative effect on the amount of 14C respired. It appeared that inhibition of nitrification under saline conditions will have both direct and indirect effects on portioning of photosynthates to the root zone and hence the rhizospheric microbial functions.

Experiments conducted under greenhouse and filled conditions to study the effect of organic amendment on growth of wheat suggested that native mineral N is an important determinant of the plant responses to applied N. Sesbania that has a higher N content and narrow C/N ratio had some positive effect on wheat, but application of kallar grass (wide C/N ratio) significantly retarded plant growth either due to N immobilization or release of growth inhibitory factors. It was observed that plant residues having high N concentration and that are easily decomposable can substantially replace chemical fertilizers like urea. Chemistry of photo system-II was not significantly affected by different soil treatments.

Project No.	**F-AU/Agr (291)**
Project Title:	Development of sustainable rice-wheat cropping system through management of legumes.
Duration:	3-Years
Date of Initiation:	01-11-2002
Date of Completion:	31-10-2005
Final Report Received:	22-04-2006
Location of Scheme:	NWFP Agricultural University, Peshawar

Principal Investigator: Prof. Dr. Zahir Shah

Total Expenditure: Rs. 3,76,395/-

Main Objectives:

- To identify summer legumes that can fit successfully in the gap between harvest of wheat and planting of rice.
- To evaluate the effect of various summer legumes on yields of the subsequent rice and wheat crops.
- To assess the effect of summer legumes in rice-wheat system on soil quality including soil organic C, microbial biomass C and mineralizable N.
- To quantify N_2 fixation by summer legumes in rice-wheat system.

Summary of work done:

This study was aimed to assess if we can fit a suitable legume in the gap between harvest of wheat and planting of rice and that can improve the yields of rice and wheat, microbiological properties and soil quality. For this purpose, five legumes viz. cowpea, soybean, sesbania, guar and pigeon pea were tested in the rice-wheat cropping system at Agricultural Research Station, Mingora, Swat during 2002-2005. Legumes were grown for about 50 days immediately after wheat harvest and incorporated (green manured) in soil before planting of rice during both 2003 and 2004. It was observed that, on average, pigeon pea (1496 kg) and soybean (1374 kg) produced the maximum shoot biomass followed by cowpea (880 kg) and sesbania (831 kg) while guar (619 kg) produced the minimum biomass. The data obtained on the subsequent rice crop showed that both paddy and straw yields of rice were significantly ($P<0.05$) increased in the green manured compared with the un-manured fallow treatment. On average, the maximum increase in paddy and straw yields were observed in the pigeon pea while minimum in the guar treatment. The coefficient of correlation *(f)* on the average data suggested that 96 % increase in paddy yield and 95 % increase in straw yield of rice was due to green manuring of legumes. The positive effect of green manuring of legumes was also observed on the following wheat during both years. Like rice, the wheat yields (both grain and straw) were significantly ($P<0.05$) greater in the green manured than in the un-manured fallow treatment. The coefficient of correlation *(f)* on the average data suggests that 96-97% increase in wheat yield was due to green manuring of legumes.

Soil analysis at the end of the experiment showed that all of the fertility parameters were consistently greater in the legumes green manured than in the unmanured fallow treatment. The improvement in soil fertility variables by green manuring of legumes were 16 % in organic C, 24 % in total N, 46 % in AB-DTPA extractable K and 63 % in AB-DTPA extractable P. Microbial activity, microbial biomass C and bacterial population were also greater in the legume than in the fallow treatment. However, the effect of legume treatments on microbial biomass N and fungal population was inconsistent.

The economic analysis showed that the net benefit from the increase in rice and wheat yields due to green manuring of legumes was Rs. 18448/- per hectare. The benefit of legumes on soil health or residual soil fertility was in addition to the above economic benefits.

It could be concluded from this project that the gap of about 50 days between the harvest of wheat and transplantation of rice can be wisely used by growing and green manuring of any summer legume in general and of pigeon pea or soybean in particular in northern NWFP as the green manuring of such legumes had consistent beneficial effects on subsequent rice and wheat crops, and on microbiological properties and soil quality. The economic analysis showed that such practice is economical and is therefore recommended to the rice-wheat cropping system in the country in general and to the farming community of northern NWFP in particular.

Project No.	**F-AU/Agr (295)**
Project Title:	Weed management in wheat (*Triticum aestivum* L.) in NWFP.
Duration:	3-Years
Date of Initiation:	01-07-2003
Date of Completion:	31-12-2006
Final Report Received:	09-01-2007 (Extension for 6 months)
Location of Scheme:	NWFP Agricultural University, Peshawar
Principal Investigator:	Dr. Khan Bahadar Marwat Professor
Total Expenditure:	Rs. 3,76,395/-

Main Objectives:

- To evolve the Weed Management (WM) package for:
  - A: Rainfed wheat in the southern part of NWFP
  - B: Wheat inter-crop with sugarcane
  - C: Wheat grower of higher altitudes

Summary of work done:

The project was based on two main kinds of activities which were continuously conducted for three consecutive years. The two basic parts of the project were: (i) Survey and (ii) Research

(i) Survey

During the three years (2003-06) of the project, various surveys regarding weeds problem in wheat crop were conducted at different locations in the districts of Chitral, Mardan and Kohat in the mid and late seasons of wheat crop, using a specific format of a questionnaire. During interviews from the local farmers, the wheat fields were personally observed to identify the weeds actually present in the standing crop. Each year, a total of 100 farmers from five villages (20 farmers from each village) of each district were randomly interviewed, using the questionnaire. The surveys were conducted in District Chitral (Higher altitude area), District Mardan (An area of wheat-sugarcane intercropping) and District Kohat (A rainfed area)

(ii) Research (Experimentation):

During the three years of the project, field experiments were conducted each year at Chitral, Mardan, Kohat and Peshawar.

According to the results, Uqab was the best one among the varieties individually. Among the seed rates alone, 125 kg ha^{-1} and among planting patterns individually, the line sowing treatment was the best. The best first order interaction effect was observed in Uqab and 125 kg ha^{-1}, Uqab and line sowing, and 125 kg ha^{-1} and line sowing. Similarly the best second order interaction was observed in Uqab x 125 kg ha^{-1} x line sowing.

Project No.	**F-AU/Agr (296)**
Project Title:	Integrated management of noxious weeds in chickpea (*Cicer arientinum* L.) in southern districts of NWFP (diagnostic phase).
Duration:	1-Year
Date of Initiation:	01-03-2004
Date of Completion:	30-06-2005 (Extension)
Final Report Received:	07-12-2005
Location of Scheme:	NWFP Agricultural University, Peshawar
Principal Investigator:	Dr. Gul Hassan Professor
Total Expenditure:	Rs. 2,33,115/-

Main Objectives:

- To contemplate the relative importance of different weeds associated with different chickpea cropping systems.
- To search the world literature on the biology, ecology, physiology and management of chickpea weeds.
- To document the perception of chickpea growers in various ecological zones regarding the intensity of weed problem, weed management and its economics and constraints.
- To provide an insight into weed problem for further studies on control measures on weed in chickpea crop.

Summary of work done:

In Pakistan, unfortunately 38% of our population is living below poverty line; earning less than one dollar a day. Our 70% population resides in villages, thus people below poverty line are rural folks. Hence, a remunerative agriculture sector is *sine quo non*. The importance of chickpea in the districts like Lakki Marwat, Karak, Bhakkar and Mianwali etc. can not be overemphasized. The economy of these districts flourishes when the chickpea production flourishes and the economy declines, when chickpea production declines. Weeds are a serious threat to production of crops including chickpea, by reducing yield, deteriorating quality and increasing cost of production. The work envisaged in this document is comprised of three sections viz. weed identification and abundance, weed management studies in chickpea on farmers' fields, and lab. studies on wild onion, one of the worst chickpea weeds.

Our findings exhibit that in Karak 2-year data revealed wild onion (Piazi), common medic (maina) and bermuda grass (khabal) as the worst weeds infesting chickpea. In Lakki Marwat, *Astraglus*, common medic (maina) and fumitory (shahtra) were recognized as the most important weeds in 2003-4 but in 2004-5 studies exhibited wild onion (piazi), leafy spurge (zahar booti) and bermuda grass (khabal) as the most competitive weeds in chickpea. Similar studies in Dera Ismail Khan revealed common medic (maina), Indian clover (senji), meadow peavine (mattri) and wild edible pea (desi matter) as the worst weeds in chickpea. But, due to the peculiar morphology of wild edible pea it surrounds the chickpea plants like a blanket and deprives the access of light to the crop. The farmers are forced to sell/use their crop as a fodder consequently losing about 70% of their income. The problem weeds have been identified in chickpea in different regions. However, the ultimate aim is to devise effective control measures for these weeds.

In the isolation of best herbicide (s) for chickpea, our studies at Karak revealed Puma super 75 at 1.78 kg a.i. ha^{-1} and Topik 15WP at 0.16 kg a.i ha^{-1}. The increase in yield over the weedy check was registered to the tune of 44 and 17%, respectively. At Lakki Marwat, herbicides were used little late due to continual rains, hence all the tested herbicides were weaker on the wild onion; the predominant weed. Consequently, the differences among the herbicides were statistically non-significant but Topik 15 WP ranked as out yielder. The herbicidal studies initiated at Dera Ismail Khan revealed preemergence Stomp 330E as wild edible pea killer. Our group is credited to be the pioneer in discovering the selectivity of Stomp330E (pendimathlin) in chickpea giving 100% control of the most problematic wild edible pea. The use of isproturon and Sencor in chickpea is also credited to our group in Pakistan. Further testing and dissemination of technology to chickpea growers is suggested.

Identification of wild onion as one of the worst chickpea weeds gave us an impetus to launch a Ph.D project. The speculated thermo-sensitive germination of wild onion was investigated in laboratory conditions. Dormancy breaking chemicals GA_3, potassium nitrate, sodium azide and thiourea were also used at 0-800 ppm concentrations to decipher the germination of wild onion. The data revealed the differences among the 10, 20 and 30°C temperatures. The differences existed between the biotypes (collected from Karak, Lakki, Mianwali and Bhakkar) chemicals and concentrations. The temperature effect was the most pronounced. Managerial decisions in chickpea planting for managing wild onion could be made after thorough probing of our findings.

Project No.	**F-AU/Agr (299)**
Project Title:	To assess the causes of ratoon failure in sugarcane and their control in NWFP.
Duration:	3-Years
Date of Initiation:	01.07.2003
Date of Completion:	30-06-2006
Final Report Received:	12-08-2006
Location of Scheme:	Sugar Crop Research Institute, Mardan.
Principal Investigator:	Dr. Faqir Gul Plant Pathologist
Total Expenditure:	Rs. 7,32,887/-

Main Objectives:

- To investigate in detail the causes of ratoon failure in sugarcane.
- To improve ratoonability of sugarcane crop in reduced cost of production to get maximum benefits.

Summary of work done:

The project was based on investigations collected from sugarcane farmers of the area and data recorded on farmer fields during 1st year (2003-04). Experiments were planned for 2nd and 3rd year 2004-05 and 2005-06 respectively. Experiments on improved IPM practices with best management practices were carried out. PH value of soil was normalized with the application of FYM and balanced fertilizers. In IPM practices, cultural, mechanical, biological and chemical control measures were applied individually and in combination, following RCB design with 3 replications. Data recorded on different parameters were statistically analyzed. Results show that root borer and disease intensity were significantly minimized in treated plots. Cane and sugar yields were also significantly increased in the treated plots. Plots treated as combined IPM practices proved best in this regard. During last year (2005-06) experiments of second year were repeated for confirmation of the results. Data recorded during 2004-05 and 2005-06 were re-evaluated and analyzed statistically. Field day was arranged on 3.12.2005 at Gulbela (Peshawar), in which improved results were practically shown to growers in the demonstration plot. The package was communicated among the growers through various visits, radio talks etc. For

scientists and students, research papers on the project achievements were published/presented in R & D workshops at SSRI, Jhang. By utilization of improved technology, the farmers of the area will enhance their cane production and ultimately poverty will be minimized.

Project No.	**P-PU/Bio (204)**
Project Title:	Biodegradation of DCP and TCE by tobacco.
Duration:	3-Years
Date of Initiation:	01-07-1993
Date of Completion:	30-06-1996
Final Report Received:	20-10-2006
Location of Scheme:	Centre of Excellence in Molecular Biology (CEMB), University of the Punjab, Lahore.
Principal Investigator:	Dr. Zahoor Ahmed Associate Professor
Total Expenditure:	Rs. 270,841/-

Main Objectives:

- The transgenic plant will be examined for an enhanced ability to detoxify priority pollutants, especially halogenated phenols and chlorinated ethylenic solvents.
- The role of plants in physically removing pollutants particularly from underground sites will be investigated.

Summary of the work done:

The project was conducted to investigate the use of plants to sequester and degrade chlorinated phenols and chlorinated hydrocarbons.

2,4-Dichlorophenol (DCP) and trichloroethylene (TCE) were used as model pollutants to determine the potential of plants to detoxify priority pollutans. Hydroponic conditions were standardized in the laboratory and aseptic plants regenerated through tissue culture successfully propagated in hydroponics for at least a week before exposure to pollutants. Tobacco plants of *N. tabacum* were exposed to pollutants for 24 hours in hydroponic system.

TCE metabolites were found through out the plant, while most of the metabolites of 2,4-DCP were immobilized in the root tissue. Major metabolites of TCE and DCP were detected by Gas Chromatography-mass spectrometry (GCMS) were dichloroethylene and monochlorophenol respectively. Dichloroethylene has been identified as major and free metabolite in root and leaves. There is an indication that cytochrome P-450 is not involved in the degradation of TCE and DCP because trichloroethanol is not found in metabolites of TCE. Trichloroethanol is one of the intermediary metabolite when cytrochrome P-450 enzyme system is involved in TCE degradation. Instead dechlorination process is observed in both cases when TCE and DCP were exposed to plants. It is believed that degradation of TCE and 2,4 DCP by tobacco plants may help to understand degradation of these chemical contaminants by other plants. Tobacco may function as a model laboratory plant to study the role of plants in environmental remediation. Tobacco and other plants like Poplar may play a part in the remediation of municipal and industrial waste.

Project No.	**P-AU/Bio(286)**
Project Title:	Taxonomy and ecology of spider communities of citrus orchards and role of spiders as predator.
Duration:	3-Year
Date of Initiation:	01-06-1999
Date of Completion:	31-05-2002
Final Report Received:	20-03-2006
Location of Scheme:	University of Agriculture, Faisalabad.
Principal Investigator:	Dr. Shakila Khalid Associate Professor
Total Expenditure:	Rs. 239,293/-

Main Objectives:

- To collect and study the spider communities inhabiting citrus orchards and plantations.

- To determine the sub-guild of the most dominant species and each sub-guild having high predation potentials which could be used for the control of insect pests.
- To assess the predatory potentials and predatory activities of spiders through rearing in lab and promoting their numbers by introduction in fields.
- To develop suitable methods for the conservation and cultivation of selected spider species having high predation potentials.

Summary of the work done:

The study was conducted to identify spider communities residing in citrus ground and on foliage of citrus fruit groves along with their prey and predator relationship, their feeding habits, life cycle and conservation in citrus orchards. The following four aspects were covered in this project

1. Documents information about diversity and relative abundance of ground dwelling spiders in citrus grove.
2. Deals with the relative abundance and diversity of foliage dwelling spiders in citrus groves.
3. Describe biological features of a couple of dominant species from ground and foliage of citrus groves.
4. Conservation.

Project No.	**P/NIBGE/Bio(317)**
Project Title:	Introduction of salanity tolerance in plants through the use of halotolerance conferring genes from bacteria and fungi: A transgenic approach.
Duration:	3-Years
Date of Initiation:	23-08-2001
Date of Completion:	30-06-2006 (extension)
Final Report Received:	17-08-2006
Location of Scheme:	National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad.

Principal Investigator: Zahid Mukhtar
Principal Scientist

Total Expenditure: Rs. 422,661/-

Main Objectives:

- Construction of plant expression vectors using binary vectors (e.g. pBin+) from Agrobacterium and cloning of halotolerance conferring genes under suitable promoters for the transformation of plants. Some enhance gene expression if and when required.
- Establishment of conditions for the transformation of tobacco (*Nicotiana tabacum* L.) through leaf disc method using *Agrobacterium tumefaciens* and regeneration of transgenic plants.
- *In-vitro* screening for salt tolerance and molecular analysis of transgenic plants for the deletion and expression of foreign genes in the transgenic plants.
- Identification of potential/candidate halotolerance conferring genes by testing and evaluation of the transgenic plants for salt tolerance under containment glass house condition.

Summary of work done:

Salinity is one of the most serious factors limiting the productivity of agricultural crops. Many organisms have evolved mechanisms to survive and grow under such extreme environments. These organisms provide us with a useful source of genes, which can be used to improve salt tolerance in plants. The present study aims at identification/cloning of useful halotolerance conferring genes from bacteria, fungi and plants and to develop salt tolerant transgenic plants. The present study describes the successful cloning of a Na^+/M^+ antiporter gene named AtNHXI (3016 bp) from Arabidopsis thaliana and transformation of tobacco with AtNHXI and HSRI (Yeast transcription factor known to confer salt tolerance in salt sensitive yeast) genes through Agrobacterium method.

Thirty-two and more than hundred transgenic plants were regenerated from tobacco explants transformed with Agrobacterium having either HSRI or AtNHXI genes, respectively. These plants were successfully established in soil. Four transgenic lines of tobacco each having either HSRI or AtNHXI gene were screened for salinity tolerance. These transgenic plants

were exposed to 150 and 200 mM NaCl. Two transgenic lines having HSRI gene showed tolerance to 150 mM NaCl while all the four lines transformed with AtNHXl gene were tolerant to 200 mM NaCl.

Project No.	**P-NIAB/Bio(324)**
Project Title:	Use of Isozyme markers in chickpea breeding.
Duration:	3-Years
Date of Initiation:	10-05-2002
Date of Completion:	09-05-2006
Final Report Received:	26-06-2006
Location of Scheme:	Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad.
Principal Investigator:	Hina Ali Syed Senior Scientist
Total Expenditure:	Rs.439,463/-

Main Objectives:

- To screen the variability present in plants populations produced through gamma irradiation and to select desirable genotype in the population.
- To identify both intrageneric and intergeneric hybrids.
- To screen backcross progeny for recurrent parent Isozyme genotypes.

Summary of work done:

The reasons for stagnation in the production of chickpea are susceptibility to insect, pests, pod borer, fungal pathogens, and low tolerance to drought etc. Among them fungal diseases like *Ascochyta* blight and *Fusarium* wilt are the major constraints in its productivity. Various insecticides and fungicides have been used to control insects and pathogens. Development of resistant cultivars is the most effective means to achieve long-term control of these diseases in chickpea. Improvement in resistance by conventional breeding is limited due to the lack of sufficient and satisfactory levels of genetic variability within cultivated chickpea germplasm.

Many wild annual *Cicer* species possess a wealth of agronomically desirable genes and some of them are crossable with cultivated varieties and are useful for transfer of desirable traits in cultivated genotypes.

To release a cultivar many generations must be grown and their evaluation often includes time-consuming field screening against diseases. To overcome these problems it is highly desirable to develop more efficient ways to screen available germplasm and promising lines.

Biochemical and molecular techniques allow more efficient use of space, time and resources available to the breeders. Isozymes have been used for the characterization of particular plant genotypes and in many innovative ways.

In this study the targeted objectives were:

- To study the genetic variation between wild and cultivated species using isozyme markers.
- Tagging of peroxidase isoform for screemng *Fusarium* wilt resistance and susceptible cultivars of chickpea.
- To study the expression of peroxidase isozyme profile at different growth stages.
- Screening of wild *Cicer* species and their accessions for wilt resistance using peroxidase isozyme for its utilization in wide hybridization.

Project No.	**P-AU/Bio(326)**
Project Title:	Evaluation of indigenous trivalent vaccines for the control of mastitis in buffaloes and cows.
Duration:	2-Years
Date of Initiation:	01-09-2002
Date of Completion:	31-08-2004
Final Report Received:	10-01-2007
Location of Scheme:	University of Agriculture, Faisalabad.
Principal Investigator:	Dr. Ghulam Muhammad Professor
Total Expenditure:	Rs. 310,525/-

Main Objectives:

- To evaluate the immunization response of indigenous monovalent vaccines against *Staph aureus.strep Agalactiae* and *Corynebacterium pyogenes* in rabbits.
- To compare the response between killed and oil-based trivalent vaccines in experimental conditions (on dairy goats).
- To evaluate the efficacy of the better trivalent vaccine(s) out of killed and oil-based vaccines on buffaloes and cattle under field conditions.
- To implement the best vaccine on buffaloes and cattle in the field.

Summary of work done:

Mastitis (visible or hidden) is economically the most important disease bedeviling the dairy farmers in Pakistan and elsewhere in the world. Studies conducted over the past several decades in Pakistan have repeatedly shown that at the very least every 4th cow/buffalo is afflicted with this disease. Mastitis control practices being used in developed countries are difficult to be adopted by our resource poor, non-progressive dairy farmers. As such, an alternative mastitis control strategy suited to the context of the small holders dairying in Pakistan is one of the most important animal health imperatives. This disease is caused by a wide variety of microorganisms, of which *Staphylococcus aureus*, *Streptococcus agalaetiae* and *Escherichia coli* are the most prevalent mastitis causing bacteria. In theory, vaccination against these three bacteria holds the promise of a suitable mastitis control strategy in Pakistan. During the first phase (year 1) of this PSF funded project, five different mastitis vaccines of *S. aureus*, *Str. agalaetiae*, and *E.coli* were prepared and evaluated in terms of sterility, safety and efficacy in laboratory animals, buffalo calves and nonnmastitic dairy goats. All five vaccines prepared were found sterile (free from live germs), and by and large safe in laboratory animals, buffalo calves and dairy goats. Concerning efficacy, all the vaccines demonstrated an ability to produce the substances (antibodies) that protect the body against these bacteria albeit they varied in this ability. The results achieved in laboratory animals, buffalo calves and dairy goats set the stage for the field evaluation of two (best and 2nd idlest) of the five vaccines in the target species i.e., buffalo and cow. As a final leg of the project (phase v; Field Trial) vaccines ranking the best (formalin inactivated dextran

sulphateealuminium hydroxide adjuvanted trivalent vaccine; FDAPV) and the second best (formalin inactivated dextran sulphate adjuvanted trivalent vaccine; FDPV) were evaluated under field conditions in a 180 days field trial on apparently mastitis free lactating buffaloes (n = 120) and cows (n = 120) that had calved 1.5 to 2.5 months earlier. One hundred and twenty similar buffaloes and cows (60 each) served as unvaccinated control (placebo group). All animals were hand milked. No mastitis control practices (e.g., post milking antiseptic teat dipping, dry period antibiotic therapy) were in place. Experimental buffaloes and cows (each) were randomly divided into 3 groups (Bl, B2, B3; Cl, C2, C3). Buffaloes of B1 and B2 were vaccinated with in inactivated dextran sulphate-aluminium hydroxide adjuvanted trivalent vaccine (FDPV) and formalin inactivated dextran sulphate- adjuvanted trivalent vaccine (FDPV), respectively while group B3 served as unvaccinated control (placebo group). Similarly, cows of popup Cl and C2 were vaccinated with formalin inactivated dextran sulphate-aluminium hydroxide adjuvanted trivalent vaccine (FDAPV) and formalin inactivated dextran sulphateealuminium hydroxide adjuvanted trivalent vaccine (FDPV), respectively where as cows of group C3 served as unvaccinated control (placebo group). These animal were vaccinated twice (at 30 day interval) with 5ml doses of the respective vaccine. Evaluation parameters included serum and milk whey Indirect heamagglutination test (IHA) antibody titers, skin hypersensitivity to Dinitrochlorobenzene (DNCB), milk yield, milk somatic cell count (SCC), milk protein and fat concentrations, Surf field mastitis test (SFMT) and California mastitis test based prevalence and incidence, vaccine efficacy, and cost-benefit analysis of mastitis control through vaccination. Cumulative mean serum antibody titers (CMT) for the entire study period of group B1 against *S. aureus, S. agalactiae* and *E. coli* were significantly higher than those of group B2, while the titers in group B3 were the lowest against all three vaccinal microrganisms. Cumulative mean milk whey antibody titers (CMT) against the three vaccinal organisms differed nonsignificantly between the two vaccinal groups (B1 & B2). However, animals vaccinated with either vaccine had significantly higher milk whey CMT than the nonvaccinated control (group B3). Maximum increase (9.2mm) in the skin thickness in response to DNCB application was observed in FDPV vaccinated buffaloes (group B2) followed by those vaccinated with FDAPV (9.0mmj group B1) and non-vaccinated (7.7mm; group B3) buffaloes. Nonetheless, a non significant difference was noted between vaccinal groups. The skin thickness was significantly higher in

DNCB topically treated buffaloes than in buffaloes treated with 2% acetone alone (control). As also, the highest increase (8.5mm) in the skin thickness in response to be DNCB application was observed in FDAPV vaccinated cows (group C1) followed by cows vaccinated with FDAPV (8.3mmj group C2), and non-vaccinated cows (7.8mmj group C3). The skin thickness was significantly higher ($P \leq 0.05$) in cows treated with DNCB than in cows treated with 2% acetone alone (control). When compared on the basis of overall milk production during 6 months, the highest mean milk yield (L/24 hr) was recorded in buffaloes of group B1 (9.10 ± 1.7) followed by those of group B2 (8.94 ± 1.3). Buffaloes of group B1 and B2 produced 204 and 171 liters additional milk, respectively when compared with control buffaloes (group B3) in 6 months. Both vaccines affected a reduction in milk somatic cell count (SCC). Over a period of 6-month, mean SCC was significantly ($P<0.05$) lower (1.66 ± 0.33, and 1.61 ± 0.33) for groups B1, and B2, respectively as compared to that of the control group (2.66 ± 0.77). Milk protein (g dL1) and milk fat (%) concentration differed non significantly in animals vaccinated with FDAPV (group B1), those vaccinated with FDPV (group B2) as well as those not vaccinated (control; group B3). Both vaccines were curative for the existing infections. Comparison between vaccinals (groups B1 & B2) and nonvaccinated control (group B3) in term of reactivity in SFMT and California mastitis test indicated that both vaccines (FDAPV & FDPV) affected an appreciable reduction in quarter point prevalence till day 120. Percent reduction in quarter point prevalence during this period ranged from 4.5-7.25 and 6.5-7.5 with FDAPV and FDPV, respectively. In both vaccinal groups, SFMT and California mastitis test-based quarter point prevalence at the two subsequent sampling points (day 150 & 180) tended to increase towards those recorded at day 0. Formalin inactivated dextran sulphate-aluminium hydroxide adjuvanted vaccine (FDAPV; group B1) and formalin inactivated dextran-sulphate adjuvanted vaccine (FDPV; group B2) had vaccine efficacies of 44% and 38%, respectively at the termination point (day 180) of the field trial. When compared with an unvaccinated control buffalo (belonging to group B3), each of the 60 buffaloes vaccinated with formalin inactivated dextran sulphate-aluminium hydroxide adjuvanted vaccine (FDAPV; group B1) produced 204 liters additional milk during the 180 day period of field trial. The corresponding value for a buffalo vaccinated with formalin inactivated dextran sulphate adjuvanted vaccine (FDPV) was 171 liters. Given a farm gate price of Rs. 15/ = per liter, additional milk produced by each buffalo vaccinated

with FDAPV would be valued at Rs. 3060/= and one vaccinated with FDPV at Rs. 2565/=. Two shots of FDAPV and FDPV were estimated to cost Rs. 500/- and 400/-, respectively. Thus, the cost-benefit ratio for an immunological control of mastitis with two shots of FDAPV translated into 1:6.1. The corresponding ratio for the dextran sulphate adjuvanted vaccine (FDPV) stood at 1:5.3.

Project No.	**AJK-UCR /Bio(333)**
Project Title:	Distribution, population status and conservation of cheer Pheasant (*Catreus wallichi*) in Jhelum valley, Muzzaffarabad, Azad Kashmir, Pakistan.
Duration:	2-Years
Date of Initiation:	01-12-2003
Date of Completion:	06-04-2006
Final Report Received:	10-05-2006
Location of Scheme:	University of Azad Jammu & Kashmir, Muzzaffarabad.
Principal Investigator:	Muhammad Siddique Awan Associate Professor
Total Expenditure:	Rs. 256,843/-

Main Objectives:

- To determine the distribution of cheer pheasant in the study area.
- To find out the present status of the species in the study area.
- To analyze the habitat requirement, predation and hunting pressure on the species in study area.
- To propose cheer conservation and management plan and to involve the local community in conservation activities.
- Involvement of the local people for the conservation efforts pertaining to the cheer pheasant and endangered species i.e. Musk Dear, Tragopan, Pir Punjal Markhor etc.

Summary of work done:

Cheer Pheasant (*Catreus wallichii*), listed as an endangered species in Red Data Book (IUCN), reported to have been extinct in all over Pakistan, but fortunately is present in some

areas of Azad Jammu and Kashmir, especially in Jhelum valley where it has patchy distribution. There is little scientific data on distribution and population status of this bird in Azad Kashmir, where it is reported to be declining due to hunting and habitat degradation, since the people are unaware of its importance. There is a dire need of the time to make some strategies for conservation of this precious bird.

The surveys were conducted from 1st December 2003 to 25th September 2005 in 13 main localities and 19 sub localities in District Muzaffarabad to study the distribution, population and habitat utilization of Cheer Pheasant. Each sub locality was further divided into calling sites of Cheer Pheasant. The maximum population density (17.311Km^2) during the first year was recorded from Cheetah-I and minimum (5.331Km^2) at Low Gali-II, however, during the second year the maximum (16.671Km^2) population density was recorded at Shinger-II and minimum (5.331Km^2) at Mirgran. A total of 38 calling sites were found in the study area with the total population of 249 birds. During the first year only 25 calling sites with the total population of 128 were recorded, while during the second year 13 new calling sites were explored with the increase of 121 more birds. The calling site density during the first year showed maximum value (2.88/km^2) at Cheetah-J and minimum (1.33/km^2) at Low Gali-I and Cheetah-II, while the maximum (n=3) calling sites at Cheetah-J and minimum (n=l) at Low Gali. During the second year Cheetah-I had the highest density (2.77 /km^2) for calling sites, with maximum 3 calling sites and Low Gali-I had minimum density (0.86/ Km^2) with only one calling site.

The phytosociological study at seven main localities showed that the *Pinus wallichiana*, among trees, *Plactranthus rugosus*, *Indigolera heterantha* and *Berberis lycium* among shrubs, while *Heteropogan contortus* and *Cynodon dactylon* among herb were common and characteristics of each habitat. Correlation analysis between Cheer Pheasant population and importance values of plant species showed the negative correlation with trees ($r=-0.167$, $P>0.05$), significant correlation with shrubs ($r=0.569$, $P<O.05$) and herbs ($r=0.632$, $P<0.05$).

Project No. **S-SU /Bio(338)**

Project Title: Taxonomy and biology of *Hieroglyphus spp.* (Hemiacridinae: Acrididae: Orthoptera).

Duration:	2-Years
Date of Initiation:	16-09-2003
Date of Completion:	09-12-2006
Final Report Received:	26-04-2007
Location of Scheme:	University of Sindh, Jamshoro.
Principal Investigator:	Dr. Muhammad Saeed Wagan Professor
Total Expenditure:	Rs. 552,758/-

Main Objectives:

- To make a critical taxonomic revision of genus *Hieroglyphus spp.* and to work out its biology, behavior and migration.
- The results obtained would enable to enrich our knowledge about the *Hieroglyphus*, a number of species, which constitute the pests in agriculture.

Summary of work done:

The present co-operative project was started during 16th September 2003 and ended in 15th September 2006 with the prime object to study the taxonomy and biology of *Hieroglyphus* and their distribution in various provinces of Pakistan.

The material was collected from the agriculture crops i.e. rice, maize, jowar and fodder crops and their surrounding vegetation of grasses. A total of 6529 nymphs and about 2205 adults were collected. The collected material was sorted out into five species namely *Hieroglyphus nigrorepletus* Bolivar, *H. perpolita* (Uvarov) and *H. oryzivorus* Carl while 2 species *H. badinesis* and *H. akbari* are described as new to science. The total number of species in the genus *Hieroglyphus* comes to 12. We also confirmed that genus *Miramia Uvarov* is a synonym of *Hieroglyphus*.

The most widely distributed and more dominant species are *H. perpolita* and *H. nigrorepletus* which are recorded in fair numbers from all over the country whereas large number of *H. oryzivorus* was collected from Larkana and Dadu district, Sindh. Two distinctly coloured form viz: shining yellow and green is being reported in *H. Peerpolita* for the first time. Certain brown spots present on abdomen were observed in *H. nigrorepletus* previously not reported.

There is only one generation in a year. The nymphs hatch in 205.28 ±16.15 days, 217.76 ±12.81 days and 228.66 ±17.71 days of *H. perpolita*, *Hinigrorepletus* and *Hioryzivorus* respectively. Maximum hatching is obtained within few weeks when the unopened egg-pods are watering during the monsoon season.

The shape and arrangement of the eggs with in egg-pod is also given. Besides, the ecological account, description of nymphal instars of *H. perpolita*, *H. oryzivorus and H. nigrorepletus* is also provided. Furthermore, duration of maturation, pre-oviposition and oviposition period, longevity of insects, egg pods per female and number of eggs per-pod by each female of species studied were recorded on different host plants.

In addition to this, simplified taxonomic keys based on the easily recognizable characters and supported by appropriate illustration are provided for the identification of adults and nymphs of the species of *Hieroglyphus* occurring in Pakistan. The result will be instrumental in understanding and devising the population management strategies to adopt control measure at appropriate time.

Project No.	**P-BZU/Bio (340)**
Project Title:	Conservation biology of larks (*Alaudidae*) in Pakistan.
Duration:	3-Years
Date of Initiation:	01-11-2002
Date of Completion:	30-10-2005
Final Report Received:	05-05-2007
Location of Scheme:	Bahauddin Zakariya University, Multan
Principal Investigator:	Dr. Aleem Ahmed Khan Associate Professor
Total Expenditure:	Rs. 174,840/-

Main Objectives:

- To study the food, feeding habits, parasitic analysis and habitat analysis of Larks in southern Punjab and Balochistan.

- To study the breeding biology and role of Larks as bio-indicators of environmental degradation or improvement.

Summary of work done:

The conservation biology including breeding biology, ethology and identification of larks have never been studied thoroughly in this region. There are 22 species of larks (*Alaudidae*) in the Subcontinent. During the course of study, Southern Punjab, Sindh and Balochistan were visited for the study of larks. All of the nine genera belonging to the Asian *Alaudidae* family are found from different parts of Pakistan. These genera of larks include: *Mirafra, Eremopterix, Ammomanes, Alaemon, Calandrella, Melanocorypha, Eremophila, Galerida, Alauda.* According to the recent findings a sum of 14 species and at least, 22 subspecies of larks are represented from Pakistan. Data on certain parameters including taxonomy, blood and tissue samples, habitat utilization, identification and other ecological aspects was also studied in the area. The parasitic analyses of the species studies could not reveal any of the haematozoans found in larks. In the present study the highest mean value was found in feathers (2197 ppm) followed by Kidney (953 ppm) and muscles (795 ppm). The toxic levels of iron in birds are> 2000 ppm. Mean concentration of iron in feather is just above the toxic level in all the species of Larks found from Pakistan, whereas the concentration of iron in other tissues like muscle and kidney is below toxic levels. Highest level of Zn was reported in feather samples (412ppm) followed by kidneys (291ppm) and muscles (19.8 ppm). When we compare mean concentration of zinc in feathers it is well above the toxic level, and also considerably high in kidney samples of larks species, Cu was detected only in feather samples, while Mn remained below detectable limits in all the samples analyzed detectable limits in all tissues analyzed.

Project No.	**F-GU/Chem (351)**
Project Title:	Emulsification of Oil/Water System.
Duration:	2-Years
Date of Initiation:	01-01-2003
Date of Completion:	31-12-2005
Final Report Received:	12-12-2005

Location of Scheme: Gomal University, Dera Ismail Khan.

Principal Investigator: Dr. Musa Kaleem Baloch
Professor

Total Expenditure: Rs. 537,540/-

Main Objectives:

- The emulsifications are widely used in different industries as stated in the narrative. However different industries use different emulsions depending upon their requirement/application. Further the extent of stability of emulsions needed by different industries extend our present work to study the role of shear rate upon de-emulsification of emulsions. Unless the mechanism of de-emulsification through shear forces is well understood, it is difficult to minimize or retard the process caused by these forces. Similarly the amount of liquid added as a dispersed phase and the ionic strength play a great role to stabilize the emulsion or to introduce instability in the de-emulsification process, caused by known shear forces. We propose a model, which can incorporate these facts. This will be carried out in the presence and absence of gravitational forces. Knowing these facts some measurements will be suggested through which one can minimize the de-emulsification process caused by shear forces, hence increase the stability in the system. Similarly by varying the amount of liquid dispersed and ionic strength a model will be proposed to give optimum conditions for the purpose and hence get suitable emulsion.

Summary of work done:

Emulsions being biphasic liquids have a number of industrial and medicinal applications. Therefore, it is need of the day to explore the emulsification and de-emulsification process. Emulsification of different oils dispersed in water has been carried out with and without the addition of SDS, using ultrasonification method. The process of emulsification has been monitored by microscopic, turbidity, surface tension and viscometric methods. The effect of oil contents concentration of SDS, its molecular mass, electrolytes and shear forces are investigated. Results obtained for emulsification in different systems conclude that the number increases whereas the size of droplets decreases with the time of ultrasonification and hence improving the quality of emulsion. Further the contents of oil; molecular mass of oil

has a significant impact over the quality of emulsion. Similarly the results obtained with the addition of SDS and electrolytes are conceived. The number of droplets increases up to CMC and then become constant while size shows an opposite trend to it with the increase in SDS contents. The turbidity of emulsion is found to increase as the SDS concentration increases. It is observed that the viscosity increases and surface tension of different systems decreases with the increase in SDS concentration. The CMC of SDS is found to increase with the oil contents. However, by the addition of 0.005N NaCl to the SDS/oil/ water system the number decreases whereas size increases as the concentration of SDS is increased which is contrary to the system with out salt. It has also been investigated that the effect of sodium chloride on turbidity and viscosity is very small and only the surface tension of the system increases.

In case of de-emulsification process, the system was monitored with time by using all the said techniques. For oil/ water system the rate of de-emulsification is more or less the same irrespective of oil contents and depends over the number and size of droplets formed during emulsification. The absorbance, surface tension and viscosity increase with de-emulsification time. The SDS/oil/ water system has been investigated only for the emulsion having SDS concentration 0.0005 (CMC) and 0.05 (> CMC) moles/liters. Due to long duration stability of emulsion having SDS shows very little effect over the measured parameters up to the period investigated. Therefore the turbidity and viscometric methods were found to be less sensitive as compared to surface tension in this respect. The role of shear forces was quite significant if these were reasonably higher than Brownian one. The rate of de-emulsification increases with the increase in shear rate. However, this aspect requires more detailed investigation.

Project No.	**S-KU/Chem (367)**
Project Title:	Direct and Indirect electro-Chemical attack on Cancer Cells.
Duration:	3-Years
Date of Initiation:	01-10-2001
Date of Completion:	31-12-2006 (27 months extension)
Final Report Received:	21-07-2007
Location of Scheme:	HEJ, University of Karachi, Karachi.

Principal Investigator:	Dr. Ahsana Dar Professor
Total Expenditure:	Rs. 806,311/-

Main Objectives:

- To carry out cyclic voltametric studies on normal as well as cancer cells.
- To study the reactions of (a) DNAs/ Proteins components (b) normal cells and (c) cancer cells with atomic iodine and bromine (free radicals).
- To carry out exhaustive/destructive electrolysis of normal and cancer cells and analyse their products.

Summary of work done:

The cyclic voltammetric behaviour of blood samples from donor A, who is above 60 years of age was found to be different from donors B, C and D who were in their late 20's or 30's. Methyl viologen was found toxic to skin and breast cancer cell lines. Its anticancer activity was evaluated using exponentially grown human breast cancer (MCF-7) and skin cancer (HT-144) cell lines. Triiodide completely reacted with cancer cell line HT-144 and had no interaction with culture (RPMI-1640 medium). The *in vitro* anticancer assay activity of triiodide indicated that it is effective anticancer agent killing 50 % HT -144 cell line at 2511M.

Project No.	**C-QU/Chem(373)**
Project Title:	Enantioselective Synthesis of Carbohydrate Building Blocks and Bio-Active Natural Products.
Duration:	3-Years
Date of Initiation:	01-11-2001
Date of Completion:	31-01-2005 (extension)
Final Report Received:	26-09-2006
Location of Scheme:	Quaid-i-Azam University, Islamabad.
Principal Investigator:	Dr. Farzana Latif Ansari Professor
Total Expenditure:	Rs. 971,202/-

Main Objectives:

- To develop new synthetic routes for the synthesis of new compounds having potential biological activity.
- To study the quantitative structure activity relationship through theoretical and computational studies which would help in complementing experimental work with the theoretical predictions.
- To test the cytotoxicity of synthesized compounds.

Summary of work done:

A facile one pot route to the synthesis of benzyl 3-chloro-3-deoxypentopyranosides and benzyl 3-C-allyl-3-depxypentopyranosides is reported. Three diastereomeric anhydropentopyranosides namely benzyl 2,3-anhydro-b-L-ribopyranoside 1, benzyl 2,3-anhydro-a-D-ribopyranoside 2 and benzyl 2,3-anhydro-a-D-lyxopyranoside 3 were used as substrates for the synthesis of title compounds and were synthesized according to the literature procedures. Benzyl 3-deoxy-3-chloropentopyranosides 4-6 were synthesized by the reaction of benzyl 2, 3- anhydropentopyranoside 1-3 with CITi (O-i-Pr)3, while benzyl 3-C-allyl-3-deoxypentopyranosides 7-9 were obtained by the reaction of benzyl 2,3-anhydropentopyransides 1-3 with allyl magnesium chloride respectively. The structures of the synthesized glycosides 4-9 and the configuration as well as conformations of different compounds were determined by their mass, ^{1}H and ^{13}C spectroscopic data as well as by their elemental analysis. The substitution occurred regioselectively at C-3 which was confirmed by 1H-1H COSY and $^{1}H - ^{13}C$ COSY experiments. Benzyl 2,3-anhydropentopyranosides 1-3 are known to exist in the half chair conformation preferably $^{0}H5$. However, the resulting glycosides 4, 7 and 9 were found to exist in $^{1}C_4$ conformation while glycosides 5 and 8 preferred $^{4}C_1$ conformation.

Project No.	**S-SU/Earth (65)**
Project Title:	Detection of saline intrusions in the right bank coastal sediments of Southern Sindh.
Duration:	3-Years
Date of Initiation:	01-10-2001

Date of Completion: 30-09-2004 (Extended up to 30.09.2005)

Final Report Received: 16-12-2006

Location of Scheme: University of Sindh, Jamshoro.

Principal Investigator: Dr. Saeed Soomro

Professor

Total Expenditure: Rs. 715,795/-

Main Objectives:

- To detect the quantity of chloride/salinity present at different depths in ground water (in Piezometers to be installed in coastal towns such as Ghora Bari, Mirpur Bathro and Thatta) during flood and winter season and establish the cause behind change in chloride during the two season.
- To measure vertical electrical soundings (VES) at different sites in and around these coastal towns and make an attempt to correlate surface formation resistivities measured through VES to chloride concentrations present in ground water and finally to prepare geo-electric sections, iso-resistivity & isochloride maps.
- To study the role played by sediment grain size, prorosity & permeability in over-all invasion of sea water.
- To prepare saline-fresh water interface contour maps which will exhibit the extent to which sea water has intruded inland
- To find through resistivity survey, the presence of fresh ground water packets, if any, in the aquifer of coastal towns
- To train man power leading to award of Ph.D. degree

Summary of work done:

Saline intrusions present a significant threat to water quality in coastal aquifer systems in the right bank coastal areas of southern Sindh. The aims and objectives of the study were to see the effects during the post flood and dry seasons for three years (September 2001 to June 2004) in the coastal sediments by saline intrusions investigated by stable isotope analysis and chemical analysis of groundwater samples obtained from various depths upto 80 feet, and

geophysical resistivity survey carried out on the ground surface. The results were based and applied on aquifer material derived with boring log control.

The stable isotope analysis and chemical (Cl/HCO_3 ratio) analysis on groundwater samples obtained from boreholes (piezometers) along with geophysical survey on the ground surface carried out during three years at six sites, two each at Thatta, Mirpur Sakro and Ghora Bari, have confirmed the existence and the severity of saline intrusion at three study areas.

The permeability values (ranging from 3.6×10^{-6} m/s to 9.3×10^{-5} m/s) of sediments obtained from three areas through boring, proved to be low. Such God gifted scenario has actually retarded the movement of saline intrusion over the years; else this menace would have extended deep inland even beyond Thatta area.

During dry seasons, when there was neither flow in the river Indus nor any worth mentioning rainfall, tendency of accelerated saline intrusion inland was observed. However, during wet seasons, when there was some flow/flooding of water in river Indus (generally around 2.0 MAF per year) brought about some decline in saline intrusion, excepting in year 2003 river flooding which reached at highest level i.e. more than 20 MAF, resulted into sizeable retardation in saline intrusion not only in wet season but continued its effect even beyond wet season to dry season.

Electrical resistivity probing (geophysical survey) has been used as one of the methods in study, and its results have been found in agreement with majority of results of isotopic and chemical analysis. And has proved its effectiveness and thus could be depended upon satisfactorily for similar studies in future.

The overall results have proved that even if major flow in river Indus viz. 20 MAF, pass every year during flood season which is generally from July to September, it would not halt saline intrusion completely, until and unless flood water is stored upstream and then its flow is regulated whole year round with say 1500 cusecs thus facilitating infiltration of fresh water subsurface continuously for whole year to halt saline intrusion inland in future. This set up would not only stop further saline intrusions but gradually would reclaim the affected land as well.

Project No.	**P-CEWRE/Engg(77)**
Project Title:	Stochastic flood risk zoning (mapping).
Duration:	2.5-Years
Date of Initiation:	14-09-2003
Date of Completion:	30-09-2004 (Extended up to 30.09.2005)
Final Report Received:	13-03-2006
Location of Scheme:	University of Engineering & Technology, Lahore.
Principal Investigator:	Engr. Dr. S. M. Saeed Shah Head of Hydrology Division
Total Expenditure:	Rs. 346,469/-

Main Objectives:

- Advancement in the techniques already in use for flood zonning in the country.
- Improvement in the reliability and usefulness of the techniques for flood control and mitigation planning.

Summary of work done:

For flood zones along the river, the HEC RAS model was applied. The model simulated the flows satisfactorily, with problems being standard cases. Followings are the conclusions, based upon the results obtained.

- HEC RAS can be efficiently used to simulate the floods of different magnitudes. Based upon the Energy equation, simulations obtained by employing HEC RAS are reliable.
- The results of simulated flows were sensitive but not much, because of flat area, to flood-plain topography, but the bank geometry had to be obtained very accurately since it determined the diverted flow locations.
- In this study it has been observed that the decision regarding prohibitive zone should be linked, because of sustainability of flow magnitudes range, with the floodway area of influence along with the respective return period.

- While in other cases floodway fringe zones could be decided employing the hydraulic parameters.
- This study also confirmed, even on small scale, that a comprehensive response to floods will comprise of Structural measures, Non-Structural measures & Emergency Action Plan, so, there is a true need to employ Non-Structural measures also at National level in Pakistan.
- Flood Risk Zoning can be done while using the different characteristics of flood. HEC RAS provides almost all flood properties within the reach, so, the modeler can define the zones with desiring properties.
- Sound Hydrologic study is urged to produce the efficient zones in real sense.
- The methodology developed/adopted/tested during this study, hopefully will work on similar areas very well.

There were a lot of problems while conducting the study. Accessibility to required data was a cumbersome job itself. Anyhow, the limitations that are directly concerned with Flood Risk Zoning are described as below:

- Steady flow simulation was performed using the peak value; unsteady flow simulation was not performed due to scope of work, therefore this work will be reasonably good guidelines for steady state conditions.
- Zones, once established are not final for ever. Zoning of an area must be revised on the basis of river behavior in this way unsteady conditions could be covered.
- Flood Risk Zoning is not a complete and final solution against floods. It is merely a basic tool for mitigation.
- Analysis for Flood Risk Zoning depends totally upon the vitality of Field Data. So Field Data must be error free as much as possible, as in this study it has been found that zoning techniques are sensitive to data.
- A Flood Risk Zone Map cannot cover all the flood characteristics at a time. If so desired, then it will be too complex to extract any useful information.

Project No.	**C-PCRWR/Engg(78)**
Project Title:	Assessment of Water Resources and Development of Strategic Water Utilization Plan in Pothwar Region for its Sustainable Management.
Duration:	3-Years
Date of Initiation:	18-07-2003
Date of Completion:	17-07-2006
Final Report Received:	09-10-2006
Location of Scheme:	Pakistan Council of Research in Water Resources, Islamabad.
Principal Investigator:	Dr. Ashfaq Ahmed Sheikh Deputy Director
Total Expenditure:	Rs. 1,012,084/-

Main Objectives:

- To assess the available water resources potential – both surface and ground water in the Soan Basin of Pothwar region.
- To devise strategies for sustainable management of water resources for agricultural and economic development of the area.

Summary of work done:

The assessment of water resources potential is imperative for sustainable management of available resources especially after continuous agricultural development and population growth in the region. This study was undertaken in the Soan Basin of Pothwar region with the main objective of assessing the status of water resources (both surface and subsurface) and development of a strategic water utilization plan for its sustainable management. The soan basin was divided into grids of 7km x 7 km depending on the basin topography and hydrological conditions. The project activities included: monitoring of stream flow at various reaches of Soan basin; rainfall record at nine different stations in the area, monitoring groundwater level from 193 points (open wells, tubewells, boreholes) selected in the area twice a year before and after monsoon; collection of historical record of discharge, rainfall and groundwatrer etc. A specially designed participatory appraisal survey was also conducted from each grid to collect information directly from the farmers/water users and community

members on the important aspects of the study area including general features, population, land use, major crops, source of irrigation, number and status of groundwater sources, mode and extent of water abstraction, socio-economic perameters, etc. Further, data on water resources development and management projects implemented in the area were also collected.

It has been observed that the average rainfall pattern has changed during 1981-2005 as compared to 1960-1980 over most parts of the study area with reduction in rainfall over some parts (e.g. Murree, Chakwal, Talagang) and increase in rainfall in others (e.g. Fateh Jang, Rawalpindi, Makhad). This change expands systematically over the basin. The basin outflow has reduced over the period of time especially after 1984 and the lowest outflow values were observed after 1997 which reached upto 50% of 45-year average annual flow. The reasons for this change are mainly: change in basin rainfall pattern, utilization through rainwater harvesting activities, increased groundwater abstraction and land use change.

The water balance analysis of the basin shows that the direct runoff outflows from basin is about 27.48% of the inflow (rainfall) and baseflow is 3.4% (25 years average). On average 3437 MCM (about 2.87 MAF) passes the Soan basin without any use. The 42 small dams constructed in Pothwar region (excluding Simly Dam) are harvesting 123 MCM (0.10MAF) out of total potential of 4320 MCM (3.50 MAF) and 40% small dams fall in the Soan basin. The total capacity of small and mini dams in Soan basin is about 106.21 MCM or 0.09 MAF (75 MCM by small dams,3.21 MCM by mini dams and 28 MCM of Simly Dam). The total population in the basin has increased from 2.49 million in 1981 to 4.84 million in 2005 with an increase of 95% over 25 year period and the urbanization has increased many folds. The total human water consumption in the area has also increased from 124 MCM to 272 MCM with 120% increase. The future trends show that population would be double in next 25 years and water demand would increase accordingly. The present contribution of groundwater for drinking purposes is about 50% whereas the remaining is met from dams (47%) and springs etc. (3%).

No significant increase in agricultural area occurred during the last twenty five years although some areas came under irrigated agriculture due to construction of small/mini dams and dugwells. The land development in one area was compensated with abandoning agriculture or

land deterioration in the other area. The race for development of housing societies since last decade has been major factor for limited agriculture development. However, still most of the agriculture is dependent on rainfall and traditional agricultural practices as the developed storage facilities are not being utilized to their full potential and lack of extension activities.

The inflow to main water supply reservoirs i.e. Simly and Rawal dams has reduced significantly. Therefore, water shortage is increasing in Islamabad and Rawalpindi-heavily urbanized- prompting exploration of alternate sources as the supplementary supply from Khanpur dam is still limited due to various management and technical reasons. Associated with changed rainfall pattern and reduced basin outflow, the water shortages in the basin have exerted pressure on groundwater resulting in declined water table. On an average, the water table in the basin has dropped 3.75 m (12.3 ft) with average drop of 0.15 m per year (0.50 ft per year). The number of dug wells, tube wells, and hand pumps has increased by about 39, 96 and 186%, respectively over the last 25 years (1981 to 2005).

The proposed strategic water utilization plan for sustainable management in Pothwar region focus on: i) controlling urbanization and deforestation, ii) construction of more storage reservoirs to harvest available rainwater potential and help recharge depleting groundwater, iii) effective utilization of existing storage reservoirs to enhance cropped area as well as cropping intensity, iv) promotion of efficient land and water management practices to enhance cultivated area as well as cropping intensity, v) introduction of low cost, high efficiency irrigation system with back up support for farmers training and design, and vi) mass awareness campaign for water conservation in rainfed areas. The plan provides projects of short, medium and long term duration for water resources management leading to agriculture development and socio-economic uplift of the area.

Project No.	**P-PU/Envr(36)**
Project Title:	Assessment of Physiological and Genetic Defects in Human Population exposed to Industrial Pollutants in the Industrial Area of District Kasur, Punjab, Pakistan
Duration:	2-Years
Date of Initiation:	01-09-1996

Date of Completion:	30-10-1998
Final Report Received:	29-10-2003
Location of Scheme:	University of the Punjab, Lahore.
Principal Investigator:	Prof. Dr. A. R. Shakoori Distinguished National Professor& Director
Total Expenditure:	Rs. 228,499/-

Main Objectives:

- To analyze blood samples for various hematological (hemoglobin, WBC Count, RBC Count, ESR) as well as biochemical (liver function tests, total proteins, immunoglobulin "G" concentration etc) parameters and residues of heavy metals.

Summary of work done:

Chromium is one of such toxic heavy metals, which is extensively discharged in the environment through a large number of industrial operations such as metal finishing industries, petroleum refining, leather tanning etc. Chromium has binding affinities to biomolecules in living system and causes toxicity to biological life. The crucial amounts of Cr in the environment interact with biological life and cause cellular/DNA damages, mutation, cancer, genotoxicity, and organogenesis/fetotoxicity. Hexavalent form is about 100 fold more toxic than the trivalent form. Hexavalent Cr compounds are greatly soluble at neutral pH and easily cross the membranes of eukaryotic and prokaryotic cells via sulphate transport system.

To evaluate the clinical toxicity of chromium, 600 human blood samples were collected from Niaz Nagar and Din Ghar of District Kasur. These samples were categorized into three different age groups i.e. 1-20, 21-40, and 41-60 Years, and also sex wise (males and females). These blood samples were analyzed biochemically for albumin, alkaline phosphatases, alanine aminotransaminase, aspartate aminotransaminase, total bilirubin, total proteins and glucose and heamatologically for heamoglobin, white blood cell count, red blood cell count, erythrocyttic sedimentation rate, platelet count, heamatocrit or packed cell volume, mean corpuscular heamoglobin, mean corpuscular heamoglobin concentration. Total and hexavalent chromium was also estimated in blood serum and different water samples of Kasur.

About 100 samples were collected from Khanuspur, Ayubia as control samples because this area is free of industry. The doners of these samples were interviewed for their medical history with special reference to their reproductive abnormality, if any. The physiological abnormalities were also recorded and correlated with the amount of Cr present in different facets of food chain.

Almost all the parameters of liver function have been affected in the industrial area population and are significantly different from those of the normal population. The albumin, total protein and aminotransferases are higher, whereas bilirubin (direct and total) and glucose content are lower in exposed population. Total chromium showed higher values in the blood serum of exposed population.

There is a general trend of increased red blood cell count, platelets count packed cell volume in the exposed population, whereas, other parameters such as haemoglobin content, mean corpuscular haemoglobin concentration decreased in the exposed population. The white blood cell count, mean corpuscular volume and erythrocyte sedimentation rate remained unchanged.

The total chromium showed 327% and 1618 % highly significant increase in the population residing in industrial area as compared with the control population.
In workers and non-workers except for the albumin content and activity of alkaline phosphatases these are higher in younger age group, however all the other liver function tests were normal in the workers as well as non-workers.

The total chromium content of blood of workers of age group 1– 20 years showed significant increase i.e. 24 %, while the remaining two age groups showed insignificant increase, when compared with the non-workers.

There is general trend of decreased values in mean cell volume, packed cell volume and platelet counts in worker, while the haemoglobin, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration values were higher in workers as compared with that of non-workers. The white blood cell counts decreased in workers up to the age of 40 years, whereas in older population it showed slight increase.

Biochemical analysis of blood serum of exposed and unexposed male and female population showed that all the biochemical parameters viz. Albumin, alkaline phosphatases, alanine aminotransferases, aspartate aminotransferases and total protein of liver were positively affected in the exposed male and female population. The total bilirubin, direct bilirubin and blood serum glucose contents were however lower in the exposed population as compared with those of the control population.

Haematological values such as white blood cell count, red blood cell count, packed cell volume and platelets count of male and female population residing in industrial area of Kasur and also those of control area show a general increasing trend when compared with non-expected population. The other parameters such as haemoglobin concentration decreased in exposed population, while the mean cell volume and mean cell volume and erythrocyte sedimentation rate remain unchanged.

The total chromium and hexavalent chromium were significantly higher in the blood of exposed male and female population i.e. 569% and 78% respectively, as compared with the control population.

No definite pattern has been observed in different haematological and biochemical parameters. While comparing controls with exposed population, workers with non-workers, normal male with exposed males and normal females with exposed females. The different observation in various parameters is mostly insignificant. Even where the differences are significant the mean values obtained are well with in the normal ranges. Slight variation may be due to multitude of factors in addition to possible effects of chromium toxicity.

Project No.	**C-NARC/Envr(59)**
Project Title:	Passerine birds in cotton based agro-ecosystem of Punjab: A preliminary study to investigate the risks of pesticides
Duration:	2-Years
Date of Initiation:	01-10-2002
Date of Completion:	31-09-2004 (Extended till March 31, 2005)
Final Report Received:	17-08-2005

Location of Scheme: Institute of Plant & Environmental Protection, NARC, Islamabad.

Principal Investigator: Dr. Iftikhar Hussain
Principal Scientific Officer

Total Expenditure: Rs. 367,907/-

Main Objectives:

- Identification of frequently exposed (to pesticides) resident passerine bird species in cotton-wheat agro-ecosystem of Southern Punjab. (This will lead to selection of one or two insectivorous bird species of strategic trophic position).
- To quantify the extent to which the food of the selected bird species is derived from insect and plant sources that are under direct exposure of pesticides.
- To know if the frequent exposure to pesticides effect reproductive performance of the selected bird species.

Summary of work done:

The study was carried out from October 2002 to March 2005 in cotton-wheat based agro ecosystem of Multan. In total 11 field observation/samplings were carried during October 2002 to September 2003 to study the species identification, their population and food habits. Belt line-transect method was employed to estimate the populations and species identification. Mist-netting and shootings were carried out to complement the field observation and collection of gizzards for food habit analysis. A total of 32 bird species, including 31 Passeriformes and one Coraciiformes were recorded, of which 23 were resident while the remaining 9 were migrant. Three bird species i.e. Indian wren warbler, common myna and jungle babbler, were found more frequently than the others. Some species i.e. rosy pastor, jungle sparrow, yellow-throated sparrows were observed in large flocks but on few occasions. The small green bee-eater was present during the maturity stage of cotton crop and had a considerable population (0.8 birds/ha) and potential in insect predation. The Indian wren warbler, jungle babbler, common babbler and common myna, were recorded throughout the year. Combined population of these four species was estimated to 7.1 birds/ha. Red-breasted fly-catcher, white eye and lesser white throat were scored as rare species. The total estimated bird density was 14.6 birds/ha. More than one third (37%) of the bird species (including Indian wren warbler and small green bee-eater) exclusively derived their food from insect

source. In jungle babbler and common myna, the plant food was dominant during the wheat season but its proportion with insect food was almost balanced in the cotton season. Insects belonging to the orders Hymenoptera and Hemiptera formed the major proportion of arthropod based food. Common aphids and thrips dominated the food of increase in the birds populations in the cotton-wheat based agro-ecosystem of southern Punjab so that they could function as biological control agent of insect pests, an essential component of IPM strategies.

Based on information generated in the first part of this project (Hussain and Afzal, 2005), a second study was designed to investigate effect of pesticides on two insectivorous birdspecies i.e. jungle babbler (Turdoides striatus) and Indian wren warbler (Prinia subflava) inhabiting the cotton based agro-ecosystem of Multan. The birds for control samples were collected from the agro-ecosystem of Chakwal, an area where pesiticide use is believed to be at very low scale. A spectrophotometric method for determination of cholinesterase (ChE) enzyme activity in brain tissues of the birds (Trudear and Cartier, 2000) was used to carry out this study. Morphometric data of the sampled populations revealed comparatively larger body weights in the birds captured from the control area as compared to those of the cotton area. There were suppressions in the brain ChE enzyme activities in both the bird species captured during the cotton season as compared to the other sets of data i.e. non-cotton season and control values. The inhibition of ChE enzyme activities in jungle babbler were at 10.2% (cotton vs non-cotton) , 29.6% (non-cotton vs control) and 36.8% (cotton vs control). In Indian wren warbler this inhibition was 6.2% (cotton vs non-cotton), 39.2% (non-cotton vs control) and 42.9% (cotton vs control). The present levels of ChE inhibition in jungle babbler and Indian wren warbler provided evidence that insectivorous birds inhabiting the cotton based agro-ecosystem of Punjab are at considerable level of threat from the pesticides in use. This preliminary study suggests future investigations such as determination of pesticides residues level in the avifauna, reproductive potential and viability of the insectivorous bird species in this ecosystem.

Project No.	**P-AU/Envr(62)**
Project Title:	Studies on Growth and Bio-energetics of Fish under Heavy Metals Toxicity.

Duration:	3-Years
Date of Initiation:	01-09-2002
Date of Completion:	31-08-2005
Final Report Received:	30-12-2005
Location of Scheme:	University of Agriculture, Faisalabad.
Principal Investigator:	Prof. Dr. Muhammad Javed *(Izaz-i-Fazeelat)* Chairman, Department of Zoology & Fisheries.
Total Expenditure:	Rs. 709,995/-

Main Objectives:

- To study the tolerance limit of three fish species viz. *Catla catla, Labeo Rohita,* and *Cirrhina mrigala* against toxicity of heavy metals , viz. iron, zinc, lead, nickel and manganese in the laboratory.
- To identify the residual effects of heavy metals on the chemical composition and meat quality of three fish species.
- To study the growth performance and meat quality of metal stressed fish species in fertilized ponds.
- To study the phytoplankton (Algal) and zooplankton assay of originally fertilized ponds to see any change in the consumption of plankton by the metal stressed fish.

Summary of work done:

1) Studies on acute toxicity of metals to the fish:

Laboratory tests were conducted on three fish species viz. *Catla catla, Labeo rohita* and *Cirrhina mrigala* to estimate their sensitivity to 96-hr LC50 and lethal toxicity to iron, zinc, lead, nickel and manganese. These tests were performed, separately, at room temperature and with changing Ph, hardness and temperature of water. Three fish age groups (30, 60 and 90-day) were also tested for their sensitivity to metals toxicity at room temperature. The impacts of physico-chemical variables towards sensitivity of three fish species to metals toxicity have also been investigated.

The 96-hr LC50 concentrations of metals varied significantly among the three fish species with age. 30-day fish were more sensitive to metals toxicity, followed by 60- and 90-day respectively. Among the three fish species, *Catla catla* were more sensitive to zinc, lead,

nickel and manganese. However, *Cirrhina mrigala* appeared as a species that showed highest sensitivity to iron toxicity. At constant water hardness and low pH, the rise in temperature from 25 to 30 has resulted in significant decrease in 96-hr LC50 of metals for all the three fish species. However, fish were less sensitive to metals toxicity at high pH and hardness and low temperature. All fish species showed more sensitivity to metallic ions at high temperature, low ph and hardness of water. The ammonia excretion by the fish increased significantly, with concomitant increase in temperature, at higher metal concentrations while dissolved oxygen of the test medium decreased.

2) Growth responses and metal accumulation in fish during chronic exposures:

Laboratory studies were conducted with nine life stages of three fish species viz. *Catla catla, Labeo rohita* and *Cirrhina mrigala* to determine their feed intake, weight gains and feed conversion ratios under sub-lethal metals viz. ion, zinc, lead, nickel and manganese concentration. This investigation also focuses on the extent of metals bioaccumulations in fish organs viz. gills, kidney, liver, skin, muscle and scales during chronic toxicity exposures.

All the three fish species showed uniformity in their response towards feed intake, weight increment and feed conversion ratios under all the sub-lethal metal concentrations. Feed intake by all the three fish species increased significantly with metals exposure. However, significant increase in feed intake did not result in fish weight escalation and hence resulted in low feed conversion ratios. Sensitivity of the fish to all metals decreased with fish age. There were significant differences among all the fish age groups for the accumulation of all metals except iron and nickel. Three fish species performed similarly for the accumulation of all metals except iron in their bodies. However, metal's accumulation patterns varied significantly among fish organs. Liver and kidney were the organs that exhibited significantly higher tendency for the accumulation of metals. *Laheo rohita* showed significantly higher tendency for the accumulation of iron in its body than *Catla catla, Labeo rohita* and *Cirrhina mrigala.*

The accumulation of iron in fish gills, kidney and skin increased with fish age. Nickel accumulation in all the fish organs showed negative but nonsignificant correlation with fish age. The accumulation of manganese in fish gills, skin and scales had direct but non-

significant relationships with fish age. The accumulation of iron in fish gills, skin and muscle showed direct relationships with metallic ions of test medium. Lead bioaccumulation was predominantly found to be the highest in the kidney, followed by that of liver and gills. In general, the accumulation of metals in fish kidney showed direct relationships with both temperature and pH of water. However, decline in water hardness resulted in significant increase of metal accumulation in fish kidney.

3) Growth performance of metal stressed fish under semi-intensive poly culture System:

Three fish species viz. *Catla catla, Labeo rohita* and *Cirrhina mrigala* were exposed to sub-lethal metals viz. iron, zinc, lead, nickel and manganese concentrations and control (without metal stress) for 30 days in glass aquarium to see their growth performance and metals accumulation during metals exposure, separately, for each metal and species of fish. During these experiments fish were fed to satiation daily with the feed having digestible energy (DE) of 2.90 Kcal g-1 and 35 percent digestible protein (DP). After chronic metal exposure of 30 days, fish were transferred to out door 0.012 ha earthen ponds to check their growth performance under semi-intensive culture systems. Fish ponds were fertilized with broiler droppings and, supplementary feed was also provided to the fish. Metals stressed and control (without stress) fish were reared in earthen ponds for 22 fortnights.

30-day sub-lethal exposure stress of metals to the fish caused no mortality. However, average weight, fork and total length increments of three fish species varied significantly under stress of different metals. *Catla catla,* were significantly more sensitive to manganese than the other metals. *Labeo rohita* showed decrease in their weights under all metal exposures while *Cirrhina mrigala* lost its weight during zinc, nickel and manganese exposures. Metal exposures to the fish did not exert any significant effect on feed intake. However, the differences among three fish species were statistically significant. Chronic exposure of metals to both *Catla catla, Labeo rohita exerted* significant impact on the accumulation of higher quantities of iron, followed by that of zinc, lead, nickel and manganese in their bodies. However, in *Cirrhina mrigala* the accumulation pattern was: iron>zinc>manganese>lead>nickel.

The rearing of metal stressed fish under semi-intensive culture system showed variable responses. Iron stressed fish showed significantly better growth measured in terms of wet weight, fork and total lengths than rest of the fish stressed with zinc, lead, nickel, manganese and control regimes. However, there were non-significant differences among growth of iron, zinc and lead stressed fish, followed by that of control. The growth performances of nickel and manganese stressed fish were statistically at par. Three fish species showed significantly variable responses towards weight, fork and total length increments. However, an immediate response of fish after chronic metal stress was the most pronounced one as the physiological functions in stress free environment that exerted positive effect on fish growth, in ponds, to compensate the stressful conditions. The condition factor values of metal stressed fish did not fluctuate significantly. However, control fish exhibited significantly better condition factor values than that of metal stressed fish. Among the three fish species, *Catla catla,* had significantly higher average condition factor values, followed by that of *Labeo rohita* and *Cirrhina mrigala.* Nitrogen conversion ratios of fish did not change significantly among all metal stressed and control fish. Protein, fat, ash and carbohydrate (glycogen) contents of fish meat showed significant differences among metal stressed and control fish at final harvest. Three fish species showed significant differences for their response towards protein, fat, ash and carbohydrate accumulations during semi-intensive culture systems after metal stress. Among the three fish species, all proximate composition parameters showed significant differences as a function of species specificity. These differences were also attributed to the response of each pond towards planktonic productivity index as measured in terms of dry weight.

Project No.	**PSF/ILG/002/03**
Project Title:	Disbondment of Epoxy Coating and Integrity of Gas Transmission Pipeline.
Duration:	3-Years
Date of Initiation:	01-11-2004
Date of Completion:	31-10-2007
Final Report Received:	04-02-2008

Location of Scheme:	Institute of Chemical Engineering & Technology, University of the Punjab, Lahore.
Principal Investigator:	Dr. I. H. Khan Qarshi Research Fellow & Former Director
Total Expenditure:	Rs. 1,534,090/-

Main Objectives:

- Safety of the gas / oil pipeline infrastructure worth several hundred billions of rupees. This coating failure may be hazardous to environment, public safety and property.
- Transfer of Epoxy Coating- CP System technology to Pakistan
- Operators Qualifications and Certifications to avoid human factor in corrosion failures.
- Advancement of Corrosion Control Industry.
- Establishment of gas/oil pipeline integrity centre and manpower development.
- Maintenance and control of adequacy of CP systems and management Programmes to avoid corrosion failures.
- Post Graduate research in corrosion control and management leading to M.Phil and Ph.D.

Summary of work done:

Corrosion threat to Pakistan's 10,000 Km gas/oil transmission pipeline infrastructure is an engineering and economic problem. The coating costs represent only a small part of the overall project cost. However it protects a pipeline, which has high replacement cost and this in turn, protects the viability of much larger assets. SSGC and SNGPL have made use of two pre-dominant coating types in their networks.

1. The first, which has been used the longest, Coal Tar Enamel (CTE). It has serious health concerns during manufacturing and application.

2. The second, which has been used for just over 15 years or so, is the three layer coating system comprising of a fusion bonded epoxy primer, an adhesive layer and a top polyethylene layer, often referred to as 3LPE with a service life of 50 to 60 years.

The research work was conducted in detail including:-

1. Field visit by experts to the site of coating disbondment (10 excavations)
2. Site conditions analyses
3. Tests and studies in laboratories both in Germany as well as Pakistan

The objectives of the joint research project have been:-

- Characterization of coating disbondment (failure analysis)
- Consequential effects on long term integrity of pipelines.

No physical wetting with moisture was observed during peal test for all 3LPE field excavations except CET coating at the interface between the coating and the pipeline over a period of three years of research. One of the most significant results of this research is the fact that the interface between the pipeline steel outer-surface and the epoxy coating is the most crucial weak point, in addition to molecular water diffusion for disbondment of coating.

Epoxy resins on all coatings are not completely cross-linked as we can show by simulation of post-cure reaction that some reactive groups are still there in the epoxy coating. The interface of epoxy and hot melt shows various contaminants. All the research results and finding have been transferred to industry simultaneously in the form of technical reports and updates at every three monthly meetings among the research partners during this period.

These reports have been made available to management for adoption and adaptation. The research findings have been incorporated into the corporate engineering activities/practices though the R&D departments and training centers. The thickness of FBE primer which was initially 50 microns was increased to 100 microns initially and subsequently to 250-300 microns. Grit based surface profile is now being maintained between 50-70 microns.

A set of Standard Operating Procedures (SOPs) has been recommended for SSGC use and have been published separately. Comprehensive test reports from Dr. Amir Hussain, Comtech Germany have also been made available to the end user. For future projects, the end user as well as the applicator must ascertain the cross-linking of the epoxy resin through proper application of coating steps and quality control procedures. Future coating technology advancements will include the use of coupling agents on the steel surface after proper surface preparation.

The results and outcomes of this joint venture could be utilized in the forthcoming projects like Turkmenistan, Afghanistan, Pakistan (TPA) and Iran, Pakistan, India (IPI) which will add additional worth to the tune of more than $8 billion to the existing infrastructure. It may be kept in mind that no immediate corrosion threat was observed during the study.

It is concluded as an outcome of this research project that the pipeline owners or their representatives must be aware of these product differences and the way in which they impact service performance. This implies a through understanding of test protocols and significance of the results. They must also possess the ability to apply the knowledge skillfully in the coating selection, application specification, procedures of testing and inspection for quality control and ultimate acceptance and regular maintenance.

Project No.	**P-PU/Phy (117)**
Project Title:	Investigation in CP violation.
Duration:	3-Years
Date of Initiation:	21-04-2000
Date of Completion:	20-04-2003
Final Report Received:	29-03-2007
Location of Scheme:	University of the Punjab, Lahore.
Principal Investigator:	Dr. Haris Rashid Professor
Total Expenditure:	Rs. 310,328/-

Main Objectives:

- CP violation is a problem in the mainstream of Physics; its solution may change the entire approach towards the building block of nature. Our objective is to build up a model giving a comprehensive explanation of CP Violations.

Summary of work done:

The Standard Model of electroweak interaction can incorporate CP violation if we suppose that flavour eigen states of quarks are different from their mass eigen states. However, it is yet not decided whether the standard model can correctly produce the experimentally measured

CP violating parameter έ/ε or not. The observed non-zero value of έ/ε indicates that the observed CP violation is not merely produced by K° and K mixing through the mass matrix rather it exists in the decay amplitude, called direct CP violation. Remarkably the standard model is consistent with this scenario. But the real challenge is to correctly produce the value of έ/ε from the standard model. The literature was surveyed during the period for which the report is submitted and various theoretical techniques to calculate CP violating parameter έ/ε was critically examined. It is found that all the techniques based on the standard model produce the value of έ/ε much less than the measured one. However, the theoretical results contain large uncertainties and with some more accurate method it could be possible to obtain the measured value.

Project No.	**C-QU/Phy (121)**
Project Title:	Preparation and characterization of CdTe based solar cells and related thin film materials.
Duration:	3-Years
Date of Initiation:	01-07-2003
Date of Completion:	30-06-2006
Final Report Received:	12-08-2006
Location of Scheme:	Quaid-i-Azam University, Islamabad.
Principal Investigator:	Dr. Asghari Maqsood Professor
Total Expenditure:	Rs. 933,763/-

Main Objectives:

- Reducing the fabrication cost of the cell by trying to select the deposition parameters for low cost glass substrate available in market.
- Utilize the cheap deposition technique such as spraying for front contact (SnO_2 conductive film) close space sublimation to be used for FDS and CdTe films. Contact to CdTe using materials, which have low resistivity and ability to be doped. Such as ZuTe, HgTe etc. or reducing the sheet resistance of the CdTe by different chemical treatment.

- Transfer these selected parameters of deposition to production scale by making semiautomatic system to produce such type of cells (with the help of National Institute of Silicon Technology).

Summary of work done:

The unique properties of CdTe make it an ideal material for several applications: photovoltaic cells, nuclear detectors, high performance electro-optic modulators and photorefractive devices. It can exhibit both n and p types of conductivity, which makes diode technology and field effect transistors possible, and it can exhibit a semiinsulating state as well. CdTe-based semimagnetics, like CdMnTe, display properties which have not so far been completely explained. CdTe is a component of the ternary alloy CdHgTe, one of the major industrial materials for infrared detection. CdZnTe is used as a substrate for the epitaxial deposition of HgCdTe layers, and as nuclear detector, an application which has a tremendous potential, mainly for medical purposes. In order to fulfil these applications, considerable effort has been dedicated to the crystal groth of CdTe for more than forty years. CdTe has a direct band gap of 1.5 eV at room temperature, which is optimum for single junction solar cell efficiency. Because of the short optical absorption length in CdTe and the difficulty of forming a thin film shallow junction with a high conductivity surface layer, thin film CdTe solar cells are of the heterojunction configuration. A transparent conducting semiconductor (TCS) is used as the heterojunction partner. Essentially all known TCSs, nonstoichiometric or doped oxides and sulfides, such as cadmium sulfide (CdS), indium tin oxide (ITa), and zinc oxide (ZnO), are n type. P type CdTe films are therefore used as the absorber. CdS has been found to be best suited for thin film CdTe heterojunction solar cells. It has been reported on a CdTe / CdS solar cell with an efficiency of 16.5%. Because of its low sublimation temperature, cadmium telluride polycrystalline films can be prepared by several techniques etc. In efficient solar cells, CdS films are deposited by close-spaced sublimation, or vacuum evaporation, and CdTe films are deposited by close-spaced sublimation, electrodeposition, or spraying. The successful experimental approach will open a pathway for improving devices based on CdTe such as solar cells, 'Y and IR detectors and field effect transistors. The efficiency of these devices is strongly determined by the electrical and optical properties of the films. The systematic research on these properties in correlation with doping/excess of materials and with the film preparation conditions is still necessary for a more comprehensive

understanding of this correlation and for the control of the properties of these films. The closed space sublimation (CSS) technique is one of the various techniques that have produced encouraging results. The close-spaced sublimation (CSS) process offers the advantages of simple deposition apparatus and high transport efficiency conducted under low vacuum conditions at moderate temperatures, thus simplifying scale-up for high volume continuous processing. There have been many reports on CdTe films by several techniques. However, the potential of thin films CdTe solar cells has not been fully realized, and further work is underway at many organizations world-wide.

In this work, efficient thin film CdS/CdTe heterojunction solar cells have been prepared. The CdS and CdTe films have been deposited by close-spaced sublimation technique. The solar cell is of the back-wall configuration, i.e., films of CdS, p-CdTe, and an ohmic contact are deposited successively on to a ITO coated corning 1737 glass substrate with a sheet resistance of about 12-20 ohm per square is used to reduce the sheet resistance of CdS.

Project No:	**C-QU/Phy (128)**
Project Title:	Investigation about iron related defects in silicon.
Duration:	2-Years
Date of Initiation:	01-07-2003
Date of Completion:	30-06-2005
Final Report Received:	31-07-2006
Location of Scheme:	Quaid-i-Azam University, Islamabad.
Principal Investigator:	Dr. Akbar Ali, Professor.
Total Expenditure:	Rs. 1,048,812/-

Main Objective:

- Introduction of defects in semiconductors by transition metals continues to be one of the attractive areas of research. Even though a lot of work has been reported on defects induced by transition metals but there are many corners yet to be explored. Iron in silicon is one of them. Through this work, valuable information necessary for semiconductor technology will be obtained and the manpower trained will be very helpful

in future in the establishment of semiconductor technology which itself play a key role in the development of the country.

Summary of work done

The work can be divided into three parts. First part is concerned with the interfacing of the equipment and development of measuring techniques. In the second and third parts of the summary the detail of student trained under this project and measurements performed in the laboratory have been presented.

(1) Instrumentation:

(a) Interfacing of the following equipment with computer.

i) Pulse Generator.
ii) Capacitance meter.
iii) Multimeter.

(b) Development of the following techniques.

i) Computerized I-V and C-V measurement systems.
ii) Single Shot technique.
iii) Computerized DLTS.

(2) Measurements and results.

Deep level transient spectroscopy has been employed to study the deep levels introduced by iron related defects in silicon.

Activation energy and emission rates of different iron related levels have been measured. The response of such defects to annealing temperature was also measured to find their annealing characteristics. In addition to above measurements capture cross-sections of the iron related defects were measured. The data obtained for capture cross-sections of iron related defects from above measurements was presented in 8th international Symposium on Advanced Materials held in 2003.

Experimental Details Samples

The samples used in this work were p + n diodes fabricated on n-type vapour phase epitaxial silicon. The p + and n + layers were obtained by the implantation of boron and phosphorus,

respectively. The substrate material used in the preparation of all the diodes was Czochralski grown.

Project No.	**C-QU/Phy (130)**
Project Title:	Study of soliton formation, ITG modes and energy deposition by cluster-ion-beams in dust-contaminated plasma.
Duration:	3-Years
Date of Initiation:	01-07-2003
Date of Completion:	30-06-2006
Final Report Received:	07-09-2006
Location of Scheme:	Quaid-i-Azam University, Islamabad.
Principal Investigator:	Dr. Arshad M. Mirza, Professor.
Total Expenditure:	Rs. 272,048/-

Main Objectives:

To develop the field of plasma physics at Quaid-i-Azam University, Islamabad.

- To train manpower in fusion related problems.

Summary of work done:

i) The problem of soliton wave propagation in dust-contaminated plasma has been investigated by using Sagdeev potential approach, which is valid for arbitrary amplitude waves. We have also studied the obliquely propagating dust acoustic solitary waves in a hot, magnetized, two-ion temperature dust contaminated plasma.

ii) The influence of dust component on the electrostatic ion-temperature-gradient (ITG) mode has been investigated. The effect of charge fluctuations on the growth rate of various modes has also been investigated and the also seek the possibility of the formation of various types of vortices.

iii) We have addressed the problem of energy loss of test charge projectiles in self-gravitating dusty plasma. The effect of dust grain-size distribution on the energy loss has also been investigated both analytically as well as numerically.

1.1.2 Scientific Publications Produced through PSF Funded 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, 64 research papers were published details of which are at Annexure-IV

1.1.3 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. PSF 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. During the report period following students working on PSF supported research projects were awarded Ph.D/M.Phil./M.Sc. (Hons) degrees:

S. No.	Project No.	Name of Researcher	Degree awarded
1.	P-NIAB/Agr (288)	Mr. M.Arshad	M.Sc (Hons.)
2.	F-AU/Agr (291)	Mr. Rashid Ahmed	Ph.D
		Mr. Aamir Aman	M.Phil
3.	F-AU/Agr (295)	Mr. M. Azim Khan	Ph.D
		Mr. M. Saeed	M.Phil
		Ms. Shahida Bibi	M.Phil
4.	F-AU/Agr (299)	Mr. Faqir Gul	Ph.D
5.	P-PU/Bio (204)	Mr. Sajida Rashid	M.Phil
		Ms. Saleem-ud-Din	M.Phil
6.	P-AU/Bio (286)	Mr. M. Usman	Ph.D
		Mr. Abdul Razaq	M.Phil
		Mr. M. Tahir	M.Phil
		Mr. M. Saleem	M.Phil
		Ms. Nasreen Akhtar	M.Sc (Hons.)
		Ms. Zahara Ijaz Naqvi	M.Sc (Hons.)
		Mr. Liauat Ali Guyra	M.Sc (Hons.)
		Mr .M. Nawab	M.Sc (Hons.)
		Ms. Afshan Zafar	M.Sc (Hons.)
7.	P-NIBGE/Bio (317)	Mr. Arsalan Yousaf	M.Sc (Hons.)

8.	P-AU/Bio (326)	Mr. M. Atahar	M.Phil
		Mr. Mughal A.	M.Phil
		Mr. Abubakar A.	M.Phil
		Mr. Ibrahim Khan	M.Phil
9.	AJK-UCR/Bio (333)	Mr. Abdul Shakoor Khan	M.Phil
		Mr. Shahid Ashraf Chaudhary	M.Phil
10.	S-KU/Chem (367)	Mr. Iftikhar Ahmad Tahiri	Ph.D
11.	C-QU/Chem (373)	Mr. Shahid Ameen	M.Phil
		Ms. Sajida Sultana	M.Phil
12.	S-SU/Earth 65	Mr. Saeed Akhtar Bablahi	Ph.D
13.	PSF/ILG/002/03	Engr. Usman Majeed	Ph.D
		Engr. Imran Khan	M.Phil
14.	P-CEWRE/Engg(77)	Mr. M. Ateeq Rehman Tariq	M.Phil
15.	C-PCRWR/Engg(78)	Engr. Ali Bahzad	Ph.D
16.	P-PU/Envr(36)	Ms. Farah Aziz	Ph.D
17.	C-NARC/Envr(59)	Mr. M. Afzal	Ph.D
18.	P-AU/Envr(62)	Mr. M. Azhar Saeed	Ph.D
		Mr. Sajjid Abdullah	Ph.D
		Mr. Sikandar Hayat	Ph.D
19.	P-PU/Phy (117)	Atif Shahbaz	M.Phil
		Abdul Faiz Bhatti	M.Phil
		Nosheen Akhtar	M.Phil
20.	C-QU/Phy (121)	Mr. Nazir Abbas Shah	Ph.D
21.	C-QU/Phy (128)	Mr. M. Nawaz	Ph.D
22.	C-QU/Phy (130)	Ms. Anisa Qama	Ph.D
		Mr. Zahoor Ahmed	Ph.D
		Mr. M. Azeem	Ph.D
		Ms. Noor-e-Irum	M.Phil
		Ms. Sabooha Khan	M.Phil
		Ms. Asma Hasan	M.Phil
		Mr. M. Ismail	M.Phil
		Mr. Naveed Iqbal	M.Phil
		Mr. Khuram Razaq	M.Phil
		Mr. Faisal Jamil Qureshi	M.Phil

Mr. M. Kashif Ali	M.Phil
Mr. Majeed Khan	M.Phil
Ms.Aisha Ijaz	M.Phil
Ms.Leila Azimi	M.Phil
Mr. Qaisar Mukhtar	M.Phil

1.1.4 R & D Industry Programme:

R & D industry Programme was started in 2003 with the aim to establish linkages among Academia, R&D organizations and Industrial community to pave the way for achieving socio-economic development. Under the Programme, 16 projects were funded through Non-Development as well as Development funds and specific progress is reported in relevant sections above. However, the overall progress made under this programme during 2007-08 is highlighted below.

During the year, one project entitled "Disbondment of Epoxy Coating and Integrity of Gas Transmission Pipeline" was successfully completed. The final technical reports of this project have been adopted by PSF Technical Committee. Similarly, under another project, a pilot plant for processing green tea was installed at Shinkiari, District Mansehara, NWFP. Processed green tea costing an amount of Rs. 88200/- was sold to M/S Tapal Tea (Pvt) Ltd. Karachi. The PSF Executive Committee has decided to provide 100% income to the project implementing institution (National Tea Research Institute, Shinkiari) for purchase of equipment and uplift of the laboratory.

1.1.5 Natural Sciences Linkages Programme (NSLP) Endowment Fund:

In view of expanding trade of agricultural commodities between the two countries, the Commodity Credit Corporation from United States of America and Ministry of Finance, Government of Pakistan singed an Agreement for Establishment of Natural Sciences Linkages Programme (NLSP) under PL-480 scheme. Hence, the MoU between US Department of Agriculture, Foreign Agricultural Service and the Ministry of Science & Technology (MoST), Government of Pakistan was signed to create the Endowment Fund for US$ 10 million (in local currency) in PSF under the umbrella of MoST. The NSLP is governed by a Board of Governors, headed by the Minister for S&T, with members including Secretaries of MoST,

Ministry of Finance (MoF), Economics Affairs Division (EAD), Ministry of Food, Agriculture & Livestock (MINFAL), Chairman PSF, Chairman, PARC and Director, NIAB.

The primary goals of this programme are:

- To increase the contact and collaboration among natural scientists and institutions of biological research, development and higher learning between the two nations.
- To provide researchers and institutions with opportunities to exchange information, ideas, skills and techniques.
- To enhance opportunities of collaboration in solving problems of common interest relating to natural sciences and
- To utilize special research and development facilities or opportunities available among the two countries.

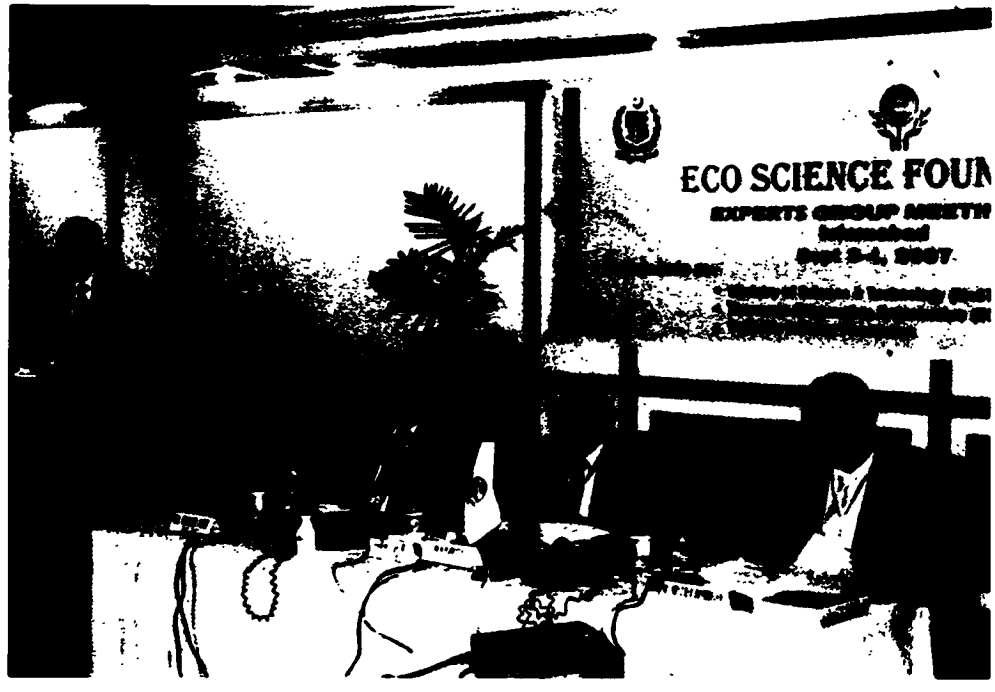
During the year 2007-08, 09 research projects were sanctioned costing an amount of Rs. 13.05 million and an amount of 4.586 million was released to these projects for the initiation of research work (Annex- II).

1.2. SCIENCE PROMOTION

1.2.1 International Liaison

a. Establishment of ECO Science Foundation- Expert Group Meeting at Islamabad

The Economic Cooperation Organization (ECO), an inter-governmental regional organization intends to establish "ECO Science Foundation" at Islamabad with the collaboration of Government of Pakistan. Pakistan Science Foundation is entrusted to work as its focal point in Pakistan. The basic purpose of the ECO Science Foundation is to build up a reservoir of highly skilled scientific and technical manpower and to strengthen scientific and research institutions in the ECO member states. To meet its objectives, an Expert Group Meeting (EGM) was organized by PSF and Ministry of Science & Technology (MoST) at Best Western Hotel, Islamabad from September 2-3, 2007. It was chaired by Dr. N. M. Butt, Chairman, PSF / Head of Pakistani delegation. The experts from ECO Secretariat and Member States i.e. Afghanistan, Azerbaijan, Iran, Pakistan, Turkey, and Uzbekistan participated in the meeting.



Dr. N M Butt, Chairman PSF presiding over ECO Expert Group Meeting

Participants of Expert Group Meeting

The modalities for establishment of ECO Science Foundation Headquarter at Islamabad, Host Country Agreement and Charter of ECO Science Foundation were discussed in detail. The budgetary requirements, mandatory contribution and creation of separate ECO fund were also discussed. The participants of EGM unanimously drafted an additional protocol, proposing amendments to the ECO Science Foundation Charter for consideration at forthcoming ECO Ministerial Meeting. Subsequently, annual budget of ECO Science Foundation and the contributions of the member states was worked out at the Foundation and sent to the ECO Secretariat, Tehran.

b. Visit of US Officials to PSF:

Dr. Caird E. Rexroad Jr., Associate Administrator, Agricultural Research Service, U.S. Department of Agriculture accompanied by Ms. Margaret E. Thursland, Agricultural Counsellor and Mr. Asmat Raza, Agricultural Specialist, USDA from US Embassy, Islamabad visited PSF on October 29, 2007 to discuss the implementation of NSLP Endowment Fund. On behalf of PSF, Dr. S. Azhar Hasan, Member Science and Acting Chairman PSF, Dr. Manzoor H. Soomro, Chief Scientific Officer, Mr. Subhanuddin, Director General (P&D), Dr. Farid A. Shaheen, Sr. Scientific Officer and Mr. Amjad Hussain, Deputy Scientific Adviser from the Ministry of Science & Technology participated in the meeting.

Ms. Margaret E. Thursland, Agricultural Councillor at US Embassy in Islamabad and Mr. Asmat Raza, Agricultural Specialist at the US Department of Agriculture (USDA) Islamabad visited PSF on January 31, 2008 for general discussion on PAK-US Natural Sciences Linkages Programme (NSLP). They held a meeting with PSF scientists led by its Chairman Dr. N.M. Butt and appreciated the efforts of the Foundation for implementation of the Endowment Fund.

1.2.2 Activities Funded from Non-Development Budget

a. Financial Assistance for Holding Science Conferences, Seminars, Symposia and Workshops

The Foundation provides partial financial assistance to universities and scientific organizations for holding of national and international science conferences, seminars and workshops. During the report period, an amount of **Rs. 1.001** million was paid to **20 organizations** for holding science conferences listed below.

Sr. #	Title of Conference, Workshop, Symposium	Name and address of the Chief Organizer	Amount Paid (Rs.)
1.	2nd International Conference on Environmentally Sustainable Development ESDev, 2007, from 26-28 August 2007, at COMSATS Institute of Information Technology (CIIT), Abbottabad. **Sc-Conf(140)/08**	Dr. Iftikhar Ahmad Raja Professor, CIIT Abbottabad.	**50,000/-**
2.	First International Workshop on Hydrogen Technologies, from 21-23 April 2008, at University of Baluchistan. **Sc-Conf(150)/08**	Prof. Dr. Syed Zafar Ilyas, Chairman Department of Environmental Sciences, University of Balochistan Quetta.	**50,000/-**
3.	3rd International Phytopathological Society Conference under the theme title: "Future Food Security", from 19-21 November 2007, at University of the Punjab, New Campus, Lahore. **Sc-Conf(151)/08**	Prof. Dr. Rukhsana Bajwa, Chairperson, Department of Mycology & Plant Pathology, University of Punjab, Lahore.	**50,000/-**

4.	1st Symposium on "Genomics, Proteomics, and Metabolomics: Recent trends in Biotechnology", held from 22-23 October, 2007 at University of Punjab, Lahore. **Sc-Conf(154)/08**	Prof. Dr. Shahida Hasnain, Chairperson, Department of Microbiology and Molecular Genetics University of Punjab, Lahore.	**50,000/-**
5.	4th International Symposium on Biotechnology & 1st Pak-China-Iran International Conference on Biotechnology-Bioengineering-Biophysical Chemistry, held from 4-8 November, 2007, at University of Sindh, Jamshoro. **Sc-Conf(155)/08**	Prof. Dr. Muhammad Umar Dahot, Director Institute of Biotechnology & Genetic Engineering University of Sindh, Jamshoro.	**50,000/-**
6.	1st International Conference on Agriculture Food & Animal Sciences, held from 27-29 November, 2007 at Sindh Agriculture University Tandojam. **Sc-Conf(156)/08**	Prof. Dr. Moula Bux Kumbhar Chairman Conference Organizing Committee, Sindh Agriculture University, Tandojam.	**40,000/-**
7.	International Conference on Statistical Sciences with Special reference to Survival Data Analysis, from 7-8 November 2007, at GC University, Lahore. **Sc-Conf(157)/08**	Prof. Dr. Khalid Pervaiz Chairman Organizing Committee, Deptt. Of Statistics, GC. University, Lahore.	**50,000/-**
8.	International Symposium on "Emerging Trends in Food Science & Technology", held from 5-8 November, 2007 at Iqbal Auditorium, National Institute of Food Science & Technology, University of Agriculture, Faisalabad. **Sc-Conf(158)/08**	Prof. Dr. Faqir Muhammad Anjum Director General National Institute of Food Science & Technology University of Agriculture, Faisalabad.	**50,000/-**
9.	First International Conference on "Engineering Management " held from 9-10 January, 2008 at Mehran University of Engineering & Technology, Jamshoro. **Sc-Conf(159)/08**	Prof. Muhammad Soomar Khatri, Chairman Department of Civil Engineering, MUET, Jamshoro, Sindh.	**41,000/-**

10.	Symposium on "Science And Muslim Civilization, held on 04 November 2007, at Aiwan-e-Iqbal, Lahore. **Sc-Conf(160)/08**	Prof. Dr. Saadat Anwar Siddiqui President Khwarzimic Science Society, Centre of Solid State Physics, Punjab University, Lahore.	**50,000/-**
11.	International Conference on "Emerging Technologies (ICET 2007)", held from 12-13 November, 2007 at Pearl Continental, Rawalpindi. **Sc-Conf(161)/08**	Dr. Sharif Bhatti, Dean Faculty of Engineering & Applied Sciences, Ripah International University, I-14, Islamabad.	**50,000/-**
12.	International Symposium/Workshop on " New Horizons in Microbiology, Genetics & Biotechnology " held from 28-29 December 2007, at Department of Microbiology, Karachi University. **Sc-Conf(162)/08**	Dr. Nusrat Jamil, Professor & Chairperson, Department of Microbiology, University of Karachi.	**50,000/-**
13.	International Workshop on "Protected Horticulture" held from 28-31 January, 2008, at University of Arid Agriculture, Rawalpindi. **Sc-Conf(163)/08**	Dr. Nadeem Akhtar Abbasi, Chairman, Department of Horticulture, University of Arid Agriculture, Muree Road, Rawalpindi	**50,000/-**
14.	"Medical Research Society of Pakistan 18th Annual Meeting" held on 29th December, 2007, at Sindh Institute of Urology and Transplant (SIUT), Karachi. **Sc-Conf(165)/08**	Dr. Faisal Sultan, Consultant Infectious Diseases, Deptt. of Internal Medicine, Shaukat Khanum Memorial Cancer Hospital & Research Centre, General Secretary MRSP	**40,000/-**
15.	4th International Symposium on Fisheries of Pakistan, Fisheries Society, from 15-16 April, 2008, at University of Punjab, Lahore. **Sc-Conf(166)/08**	Dr. Muhammad Ayub, General Secretary, Pakistan Fisheries Society, Director General Fisheries, Punjab, Lahore.	**50,000/-**
16.	National Conference on Consumer Protection in Pakistan, "Science & Technology for Promoting Quality and Standards", held on 15th March 2008, at Hotel Avari Tower, Karachi. **Sc-Conf(167)/08**	Mr. Abdul Hamid Maker, Chairman, Helpline Trust, 15-C, 12th Ittehad Lane, Phase-II Ext., DHA, Karachi.	**100,000/-**

17.	2nd National Conference on "Information and Communication Technology" held on 28th May 2008, at University of S&T, Bannu. **Sc-Conf(168)/08**	Mr. Aurangzeb Khan, Coordinator IIT, University of Science & Technology, Bannu.	**45,000/-**
18.	1st International Conference on "Energy for Sustainable development-ESD 2008", from 10-12 August, 2008, at Dawood College of Engineering & Technology, Karachi. **Sc-Conf(169)/08**	Mr. Abdul Waheed Bhutto, Assistant Professor & Editor in Chief, Dawood College of Engineering & Technology, Karachi.	**45,000/-**
19.	International Symposium & Exhibition on Renewable Energy Resources held on 20th May 2008, at Peshawar Club, Peshawar. **Sc-Conf(170)/08**	Mr. M. Khalid, Director, Directorate of Science & Technology, University Town, Peshawar	**45,000/-**
20.	"Response to Challenges of Globalization in Agriculture" held from 2-7 July 2008, at Bara Gali (Peshawar University Summer Camp), Near Nathia Gali. **Sc-Conf(173)/08**	Prof. Dr. Zahir Shah, Professor/President, Agriculture University Teachers Association (AUTA), Department of Soil and Environmental Sciences, NWFP Agricultural University, Peshawar.	**45,000/-**

b. Publication of Scientific Journals

The Foundation provides financial assistance to scientific organizations for publication of scientific journals. During the report period, an amount of **Rs. 170,000/-** was utilized for publication of the following **four (4)** scientific journals.

S. #	Name of Organization	Title of the journal	Amount paid Rs.
1.	Khyber Medical College, Peshawar.	Pakistan Oral and Dental Journal.	35,000/-
2.	University of Karachi, Karachi.	Pakistan Journal of Pharmaceutical Sciences.	50,000/-
3.	Farming Outlook, House # 39, St. # 39, I-8/2, Islamabad.	Farming Out Look.	50,000/-

4.	University of Arid Agriculture, Rawalpindi.	Pak Journal of Arid Agriculture	35,000/-
		Total	**170,000/-**

c. Awards and Fellowships

The Foundation, under its Awards and Fellowships programme, granted fellowship to the following **three (3) M. Phil Students @ Rs. 8,000/- per month.**

Sr. #	Name and address of Scholar	Amount paid
1.	Syed Zeeshan Haider, M. Phil Student, Department of Microbiology, Faculty of Biological Sciences, Quaid-i-Azam University, Islamabad.	**Rs. 48,000/-** *(Ist Installment)*
2.	Mr. Sehroon Khan, M. Phil student, Department of Microbiology, Faculty of Biological Sciences, Quaid-i-Azam University, Islamabad	**Rs. 48,000/-** *(Ist Installment)*
3.	Miss. Aqsa Arshad, M.Phil Student, Department of Physics, Quaid-i-Azam University, Islamabad.	**Rs. 48000/-** *(Ist Installment)*
	Total	**Rs. 144,000/-**

d. Annual Grant in Aid to Scientific Societies

Pakistan Science Foundation provides financial assistance to Scientific Societies for carrying out their scientific activities specified in their charters for the development of Science and Technology in Pakistan. The development project initiated on 18th January 2001 has been completed on 30th June 2007 at a total cost of Rs. 39.0 million. PC-I for Phase II of the project at a total cost of Rs.36.00 million for a period of three years has been submitted for Govt. approval. During 2007-08, PSDP funds were not available therefore, funds amounting to Rs. 2,124 million were paid to 11 scientific societies out of the Non-Development Budget. The cumulative achievements of the Societies include holding of 10 national and international science conferences/seminars/workshops, publication of 15 volumes of 05 scientific journals, 01 newsletters/pamphlets and payment of linkages fee to one scientific society. The list of societies which received the grant during 2007-08 is given at **Annex- VI**

1.2.3 Activities Funded From Development Budget

During the report period, following development projects remained under implementation:

1. Participation of Scientists and Technologists in International Conferences, Seminars and Workshops (Phase II).

2. Automation of PSF Research Support Programme and other Activities.

The progress made under each project is summarized below:

a. Participation of scientists and technologists in International Science Conferences, Seminars, Workshops and Training Abroad (Phase-II):-

Pakistan Science Foundation provides financial assistance to Scientists and Technologists for their participation and presentation of research papers in International conferences, seminars, workshops and short term training courses. The main objective of the activity is to provide an opportunity to Pakistani Scientists to interact with their counterpart scientists abroad and learn about the latest research trends and techniques and to adopt the same in their own labs for the development of science and technology in Pakistan.

During the report period, as many as 130 travel grant requests were received, out of that 65 requests were approved by the Foundation at a total cost of Rs. 8.447 million, however, only 49 scientists could avail the grants. Funds amounting to Rs. 5.335 million were utilized for the purpose.

The list of Scientists who received grants during the year is given at **Annex-V**

b. Automation of PSF Research Support Programme and other Activities.

The approved cash plan for the year 2007-08 and annual progress report for the year 2006-07 were submitted to the MoST. Six posts provided in the project were filled in through a transparent selection process. The inspection/verification of the equipment purchased under the project was conducted. Tender Notice and Tender Documents for purchase of the remaining equipment, software and furniture were prepared and floated in the national dailies. Four UPS for Servers, 25 UPS for Client machines, licensed antivirus, Electric Generator/earthing and 2 air conditioners for Server Room were purchased. Wide Area

Network between PSF, PMNH and PASTIC, and Local Area Network and Server Room were established at the Foundation. System analysis for development of a database for research support programme, travel grant and science popularization was carried out and incorporated in the PSF newly designed Website. The redesigned/upgraded PSF website was officially launched. The redesigned Website contains up to date information about the Foundation and various on-line forms submission systems of PSF business processes.

1.3 SCIENCE POPULARIZATION

Popularization of Science is broadly understood as the system of measures aimed at the dissemination, appropriation, and valuing of science and technology goods, which include critical thought, ideas and values, the history and sociology of scientific knowledge, how science is practiced, and the results of scientific research and technological development. It aims to involve individuals in the excitement of Science. inorder to increase the public understanding of science through the use of interactive exhibits and every day examples. Public should be able to see the link between science and technology that has penetrated into every aspect of our lives.

In this broad spectrum, the popularization of science plays a central role in the socioeconomic, cultural, and environmental development of any country. In socioeconomic terms, the popularization of science makes it possible to encourage talent for scientific research, technological development, and intellectual endeavors in general. It fosters creativity and innovation, contributes to producing better trained human resources, expands social opportunities, and strengthens the educational system. Culturally and environmentally, the popularization of science enhances the critical sense of the population, by increasing its involvement in decision-making and contributing to sustainable development.

The popularization of science also helps to enhance personal satisfaction and self-esteem in the population. At present, with the growing importance that science and technology has taken on in all arenas of social life, the popularization of science is increasingly becoming a very significant strategic issue.

In recent decades, the number of popularization programs and initiatives in Europe and Americas has mushroomed. Countless new science centers and museums have been prepared for popularization of science.

One of the functions entrusted to Pakistan Science Foundation is Popularization of Science in the country. Major focus is to increase the awareness among the students about scientific developments and to encourage them to adopt careers in Science.

To achieve this objective, Pakistan Science Foundation undertakes a number of activities including:

- Science Caravans (Mobile Science Exhibitions)
- Establishment of Science Centers, Museums, Herbaria & Planetaria
- Strengthening of the Laboratories of the Govt. High Schools of rural areas
- Organization of S&T Fairs and Expos
- Preparation and Distribution of science posters for schools
- Organizing Science Poster, Essay and Quiz Competitions
- Holding Popular Science Lectures
- Donation of Popular Science Magazines and Scientific Books to Schools, Universities and S&T Organizations
- Preparation and Dissemination of Scientific Literature in the form of Leaflets
- Booklets and Brochures
- Financial Assistance for publication of Scientific Books
- Financial Assistance for Science Popularization activities of other organizations

Brief activities undertaken during the year 2007-08 are given below:

a. Science Caravans (Mobile Science Exhibition)

Science Caravan is a Mobile Science Exhibition that has been designed to increase public awareness about science and to motivate the younger generation of the country towards study of science. Through Mobile Science Exhibition the students of rural/ backward areas of the country are exposed to some of the most fascinating scientific and technical developments of the modern world. All narrations are bilingual (Urdu and English) and accompanied with simple illustrations. Microscopes, computers, laser holograms and working models reflecting

various phenomena of physics, chemistry, mathematics and biology through simple exhibits and Planetarium/film shows are the main components of Caravan Exhibitions. At present nine Science Caravan Units are in operation. Eight units are stationed in the four Provinces (two for each) and one is stationed at Islamabad. Keeping in view the demand for Science Caravan Exhibitions, the Foundation has prepared and submitted a new PC-I to the Ministry of Science & Technology for preparation of six additional Science Caravans.

All Caravan Units continued their activities throughout the report period and organized Caravan Exhibitions in 37 centres for 439 days in various schools countrywide. More than 180,032 students of 822 Schools visited these exhibitions. Summary of exhibitions is given below:

Summary of Exhibitions by PSF Science Caravans

Area/Province	Days	Schools	Students and Visitors
Federal	80	247	53,300
Sindh	118	92	37,861
Punjab	128	216	44,150
NWFP	110	265	44,086
Balochistan	18	2	635
Total	**454**	**822**	**180,032**

Detail of the Caravan exhibitions carried out by all Caravan units is placed at Annexure-VII.

b. Donation of Scientific Literature to High Schools

As its regular programme, the Foundation donates popular science magazine "Monthly Global Science" (published by Global Science Multi-publications, Karachi) to 1000 high schools since last more than ten years. The contents of the magazine are highly appreciated by the student community and its demand is increasing day by day. Keeping in view the interest and demand of the students in "Global Science", the Foundation has increased the bulk purchase from 1000 to 1500 copies for each month. During the year 2007-08, 13500 copies of the Magazine were provided to 1500 Schools of the Country on regular basis. Similarly about 15,000 copies of scientific brochures and posters were also sent to high schools.

c. Promotion of Scientific Books

With a view to encourage and promote scientific book reading and writing, PSF purchases books on various scientific themes and distributes them free of cost to educational, scientific & technological and research & development organizations. It also provides financial support to the authors for publishing their scientific books. During the year 2007-08, PSF purchased a number of books including:

- Two hundred copies of the book entitled "One Hundred Reasons to be a Scientist" published by the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (ICTP) for distribution among colleges, universities and S&T organizations.
- Twenty copies of the book entitled "Science for Peace and Progress - Life and Work of Abdus Salam" published by Intercultural Forum, San Diego, California 92129, USA for distribution to selected universities of the country.
- One hundred copies of the book entitled "Development of S&T in Pakistan of Muslim Ummah in the light of its Cultural History & Temperament, Vol. I: The Muslim Epoch in Science & Technology" published by Pakistan Association for History & Philosophy of Science and PCST, Islamabad for distribution among the universities of the country.

d. 17th Intra and Inter Board Science Poster and Essay Competitions

Organizing Science Essay and Poster Competitions are regular and very successful activities of the Foundation. PSF in collaboration with all Boards of Intermediate & Secondary Education (BISEs) of the country organizes the Competitions between the students of high schools each year. So far the Foundation has conducted seventeen Essay and Poster contests, in which thousands of students have participated from all over the country.

In the first phase, the Boards of Intermediate and Secondary Education arrange Science Essay and Poster Competition within their jurisdiction on the theme allocated by the Foundation and submit the results of the Intra Board level to the Foundation. After receipt of the results from all Boards, PSF organizes "Inter Board Contest" (the final) at PSF Head Office, Islamabad each year. Judges consisting of professors, scientists and artists evaluate the essays and posters received from all over the country for best three positions (winner of the winners). To encourage the students, PSF awards merit certificates and cash prizes to the winner students. The amount of prize money for the best three students of Intra Board level is Rs.5,000.00,

Rs.3,000.00 & Rs.2,000.00 and that of for Inter Board level is Rs.10,000.00, Rs.6,000.00 and Rs.4,000.00 respectively.

17th Science Essay Competition was organized during 2007-08, the theme of the year was "Mathematics/Geometry in Nature". The essay competition was organized in three languages (English, Urdu & Sindhi). Hundreds of students participated in the competition from all Boards, out of them seventy three students were selected as winners. Details of the winner students of Intra Board Science Essay Contest are placed at Annexure-VIII. Cash prizes were awarded to the winner students. Final contest (Inter Board) was organized by PSF at Islamabad. A panel of Judges consisting of the following evaluated the essays for the best three positions in each language.

- Mr. Muhammad Hamid Chaudhary, Associate Professor
- Mrs. Farrukh Junaid, Associate Professor (R)
- Mr. Maqsood Ahmed Shaikh, Senior Scientific Officer,PSF

List of the winners of Inter Board level is given below:

English Language

1.	Sumera Naz, Iqra Huffaz Secondary School, North Nazimabad, Karachi	First
2.	Reema Asghar, Mari Gas Higher Secondary School, Daharki, Sukkur	Second
3.	Rushda, Divisional Public School & College, Lahore	Third

Urdu Language

1.	Sanee Ahmed, Fauji Foundation Model High School, Mirpur, AJK.	First
2.	Marriyam Noreen, Wapda Girls High School, Steam Power Station, Faisalabad.	Second
3.	Ambreen Zaman, Govt. Higher Secondary School, Bala, Bannu	Third

Sindhi Language

1.	Sooraj Abbasi, Saint Joseph High School, Larkana.	First
2.	Uzma Ishaq, P.N. Model Secondary School, Hanif SRE, Karsaz, Karachi	Second
3.	Duaa Jokhio, The American Foundation Secondary School, Gulistan-e-Johar, Karachi	Third

In total an amount of Rs.317,000.00 was paid to the winner students of Essay Competition.

17th Science Poster Competition was held on the theme "Why Mathematics is Necessary". Forty four students were declared as winners of Intra Board competition. Detail of the winner students of Intra Board Science Poster Contest is placed at Annexure-IX. Cash prizes were awarded to the winner students. Final contest (Inter Board) was organized by PSF at Islamabad. A panel of Judges consisting of the following evaluated the posters for the best three positions:

1. Dr. Syed Azhar Hasan
   Member Science, PSF
2. Mr. Jamal Shah
   Senior Artist, Hunerkada, Islamabad
3. Ms. Tallat Sohail,
   Lecturer (Fine Arts),
   Islamabad College for Arts and Sciences, Islamabad

List of the winners of Inter Board Science Poster Competition is given below;

1.	Arooj Afzal, The Punjab School, Sher Shah Road, Kot Khawaja Saeed, Lahore	First
2.	Freeha Abid, Sialkot Grammer School, Bhopawala, District Sialkot	Second
3.	Amin ul Haq, Working Folks Grammar School, Aman Garh, Nowshera	Third

In total an amount of Rs.183, 000.00 was given to the winner students as prize money.

e. Financial Assistance to High Schools and Other Organizations

In addition to its own Science Popularization activities, the Foundation provides financial assistance to high schools/other institutions for their science propagation activities. PSF also helps the schools in strengthening of the Laboratories. In this respect, a number of grants were provided to schools/various institutions. A sum of Rs.590,000/- was sanctioned to fifteen schools/organizations for strengthening of labs and other science popularization activities. Detail is placed at Annexure-X.

f. World Science Day for Peace & Development (WSDPD)

UNESCO (United Nations Educational, Scientific and Cultural Organization) during the General Conference at its 31st session (2001) proclaimed November 10 each year to be celebrated as "World Science Day for Peace and development (WSDPD)". The purpose of the WSDPD is to renew the national as well as international commitment to science for peace and development and to stress the importance of science for the benefit of mankind.

Pakistan Science Foundation, as the premier organization for the development, promotion and popularization of science in the country celebrates World Science Day for Peace and development each year with full zeal and zest. In accordance with the recommendations of UNESCO General Conference, PSF arranged the following programmes for commemoration of WSDPD;

CONVENTION OF SCIENTISTS

This year, the "Convention of Scientists" was jointly organized by PSF, MoST, Federal Directorate of Education and UNESCO at Hotel Holiday Inn, Islamabad. Dr. Ishfaq Ahmad, N.I., H.I., S.I., Special Advisor to the Prime Minister was the Chief Guest. Dr. N.M. Butt, Chairman PSF delivered the welcome address. The Chief Guest, Dr. Ishfaq Ahmad and Engr. Parvez Butt, Secretary, MoST, emphasized the need to adopt more scientific attitude towards our problems. Mr. Ichiro Miyazawa, Program Specialist, UNESCO Islamabad read the message of Secretary General, UNESCO. The "Convention" was focused on study of mathematics, as it is the language of technology and no technology can survive without mathematical understanding and calculations. Prof. Dr. Qaiser Mushtaq, President, Pakistan Mathematical Society gave his talk on "Importance of Mathematics". It is world wide fact that

due to the method of teaching, mathematics has remained a worrisome subject for students. Ms. Nabeela Shahid, Mathematics teacher, very convincingly discussed this issue in her speech on "Ideas to make teaching of Mathematics more interesting". Ms. Sania Hameed, Student from Islamabad College for Girls, Islamabad gave an interesting account of students' problems in her speech "Why are students afraid of studying Mathematics?"

At the end, the Chief Guest gave away cash prizes, medals and certificates to winner students of various competitions organized by PSF and its partners at various occasions. Prizes were also awarded to the winners of 17th Inter Board Science Essay and Poster Competitions. Dr. S. Azhar Hasan, Member Science, PSF thanked the participants and stakeholders for their cooperation in organizing all these activities.

SPECIAL POSTER COMPETITION

Poster Competition was held with the collaboration of Federal Directorate of Education (FDE), Pakistan Mathematical Society and private sector schools at Govt. Girls Model School, G-6/2, Islamabad. The Theme for Competition was "Mathematics/Geometry in Nature". More than 60 students, most of them girls took part in the poster competition.

A Panel of Judges comprising a scientist, a mathematician and an artist evaluated the posters for best three positions. Ms. Shayyan Qaiser and Ms. Maliha Khalid of Beaconhouse School System, H-8/4, Islamabad were awarded 1st and 2nd prizes. Posters prepared by Ms. Monifa Ahmed of IMCG, F-7/4, Islamabad and Ms. Itrat Usman of IMS, G-6/1-3 Islamabad won third position. Merit Certificates were awarded to all the participating students. Cash prizes amounting to Rs.5,000.00, Rs.3,000.00 and Rs.2,000.00 were given to the first, second & third position holders during the "Convention of Scientists".

SCIENTIFIC TEACHING-AIDS EXHIBITION

Teachers of Physics, Chemistry, Biology and Mathematics from the local schools displayed their hand made/indigenous scientific teaching-aids/models as part of the celebrations of World Science Day for Peace and Development. The teachers displayed their Models and Teaching-aid material in the Hall of Govt. Girls Model School, G-6/2, Islamabad on 10th November 2007. More than 3000 students and teachers from Rawalpindi/Islamabad witnessed

the activities. The students took keen interest in the Teaching Aids and Models. For appreciation and encouragement of stall holder teachers, PSF awarded Rs.5,000/- each to the three stall holder teachers as detailed below;

Mathematics Models

1. Mr. Nisar Ahmed,
   Principal, F.G. Model, G-9/4, Islamabad

Biology/Chemistry Models

2. Ms. Ruqia Parveen,
   Vice Principal, F.G. Girls Model School,
   I-8/4, Islamabad

Physics Models

3. Mr. Khan Karim,
   TGT, F.G. Boys Model School,
   G-9/4, Islamabad

SCIENCE EXHIBITION

Scientific Exhibitions play an important role in the success of such events. Like every year, the Federal and Provincial units of Science Caravans arranged exhibition of scientific models, planetarium and science films shows, quiz competitions and speech contests in their respective areas, with special emphasis on "Science for Peace and Development".

g. Training Program of Science Caravans

The Foundation arranged Training Program for the Officers and staff of Science Caravan units on 28-29, August, 2007 at PSF Committee Room, Islamabad. The Caravan Incharges of Federal and Provincial units presented the Annual Reports, detail of Caravan Exhibitions, Plans for 2007-08 and the Budgetary Requirements. Formats for annual and tour progress reports were discussed. Various administrative and financial problems being faced by the Caravans were also placed before the Chief Scientific Officer and Member Science. Training on accounts handling, purchasing and income tax/GST deductions was also arranged.

During the program, training on "Facilitation Skills" was also provided by Mr. Munawar Raza Kazmi and Mr. Roshan Zada, National IPM Experts, NARC. In the concluding session Dr. N.M. Butt, Chairman, PSF addressed the participants. He informed that the Foundation is

enhancing its Science popularization activities and going to establish six (6) new Science Caravans, 500 Science Clubs & 15 Science Centers in the country through development projects.

h. Science Teacher Training Workshop

PSF in collaboration with Intel Education Initiative Pakistan and Ministry of Education organized Science Teacher Training workshop w.e.f. 21-23 August 2007 at PSF Committee Room. The Chairman PSF briefed the participants about the science popularization activities of the Foundation. Programme for providing financial assistance to the public sector schools for preparation of science models (especially Mathematics) was also chalked out.

i. Screening of Science Films on Large Scale

In continuation of its activities for popularization of Science among the masses, the Foundation provided fifty four (54) CDs of Science films to National Museum for Science & Technology (NMST), Lahore. The films will be screened for the students and general public in the Hall of NMST, Lahore on regular basis.

j. 13th COMSTECH General Assembly Meeting

In connection with the 13th COMSTECH General Assembly Meeting held from 1-3 April, 2008, the Chairman, PSF was designated as Head of Conference Hall Sub Committee by the MoST. The Foundation successfully made necessary arrangements regarding the Hall Management like the Seating Plan for the delegates, Display of Banners/projection screens, decoration of Hall & provision of allied facilities to the participants.

k. Experiencing Mathematics: International Mathematics Exhibition

During April-May 2008, PSF with the support of Embassy of France in Pakistan got an opportunity to arrange International Mathematics Exhibition in Pakistan. This traveling exhibition was designed by a team led by UNESCO, which began its world tour in July 2004. Over the years, the exhibition has been held in more than 30 European, Asian, African and Latin American countries. Before coming to Pakistan the exhibition was held till end of March, 2008 in various cities of India.

The exhibits included feature posters, along with some 27 interactive devices and models, placed on fifteen tables which the students can play with their own hands. The exhibits were

organized around various themes in mathematics, including shapes in nature; tiling and symmetries; filling spaces; graphs and connections; secret codes and cryptography etc. Some of the manipulative models illustrated the Pythagorean Theorem, the Square Drill, the Differential Gear, the Cradle Pinball Device, Tricycle with square wheels etc. The expo was aimed to be interactive and entertaining at the same time.

The exhibition was arranged in Islamabad from May 9-21, 2008 at Islamabad Model College for Girls, F-7/4. The inaugural ceremony was attended by Chairman PSF, Dr. N.M. Butt, and scientists and educationists working in various scientific institutions. The concluding ceremony held on April 21, 2008 was presided over by the French Ambassador, H.E. Regis de Belenet. Dr. N. M. Butt, Chairman PSF thanked the Embassy of France, Islamabad for its help in bringing this exhibition to Pakistan. AVM Matin, Joint Advisor, MoST, Brig. Javed Iqbal, Director General, Federal Directorate of Education and Dr. S. Azhar Hasan, Member Science, PSF also spoke on this occasion.

The exhibition was subsequently shifted to Lahore to be displayed from April 25 to May 11, 2008 at National Museum of Science and Technology (NMST). Lt. Gen (R) M. Akram Khan, Vice Chancellor, UET, Lahore inaugurated the exhibition. The Director NMST, Mr. Sajid Malik and Ms. Farhat Rajpar PSO, PSF also spoke on this occasion. The students and teachers belonging to the colleges as far away as Faisalabad, Gujranwala, Sialkot, Okara, etc. visited the exhibition.

Peshawar was the third and last city where the exhibition was held from May 17-28, 2008 at Government High School No.1. Syed Imtiaz Hussain Gillani, Vice Chancellor, UET, Peshawar inaugurated the exhbition. Dr. N.M. Butt, Chairman PSF, Dr. Manzoor H. Soomro, CSO, PSF and Syeda Batool Nasir, Member, Provincial Assembly spoke on this occasion.

The concluding ceremony was presided over by Sardar Hussain Babak, Minister of Education (Schools & Literacy), NWFP. Dr. N. M. Butt, Chairman PSF and Dr. Manzoor H. Soomro, CSO PSF also addressed the audience.

More than 30,000 students and teachers from hundreds of schools and educational institutes visited this math Exhibition. The Exhibition was widely covered by the print and electronic

media. In view of the importance of Mathematics and the interest shown by students and teachers, PSF is planning to add some Mathematical Models in its Science Caravans.

l. Collaboration with UNESCO: International Workshop on Women Networking for Poverty Alleviation in Rural Areas (Training for Trainers)

Lahore College for Women University, Lahore in collaboration with UNESCO-ISESCO organized an International Workshop "Women Networking for Poverty Alleviation in Rural Areas (Training for Trainers) w.e.f 27.5.2008 to 29.5.2008 at Lahore. The Chairman, PSF was the Chief Guest on the occasion. During his address the Chairman, PSF highlighted PSF activities, achievements and future programs. Dr. Bushra Mateen, V.C. LCWU, Prof. Dr. K.J. Cheema, Ms. Renee Clair (UNESCO France), Mr. Mehdi Rabi (ISESCO, Iran) also addressed the audience. At the end of the Workshop, Dr. Butt gave away Souvenirs & Certificates to the Participants of the Workshop. Science Caravan Punjab Unit also arranged a Science Exhibition during the workshop.

m. Orientation Camp for Participants of Nobel Laureates Meeting

Annual meeting of Nobel Laureates with young students and scholars is a regular and very successful activity which is on going from last more than fifty years at Lindau, Germany. 58th Meeting of Nobel Laureates was held from June 29 to July 4, 2008. About 20 Nobel Laureates shared their knowledge and discoveries with more than 550 outstanding young scientists from 66 countries. This international event is organized annually to provide an opportunity to brilliant students to interact with Nobel Laureates and young scholars gathered from all over the world.

Pakistan Science Foundation is selecting and sending five (5) brilliant students/young scholars from various universities and research institutions since last five years. On June 25, 2008, PSF in collaboration with PINSTECH and HEC arranged an orientation programme for the selected students for Nobel Laureates meeting at Lindau Germany. Dr. N. M. Butt, Chairman PSF and a number of other eminent scientists delivered their lectures and talks to prepare the participating students for representing Pakistan in an efficient and dignified way during the meeting.

n. Certificate Awarding Ceremony for Participants of Nobel Laureates Meetings

Pakistani students have been participating in "Nobel Laureates Meetings" in Lindau Germany since 2003. As a token of recognition of participation of Pakistani students in the Lindau meetings, PSF in collaboration with PINSTECH arranged a Certificate Awarding Ceremony on June 24, 2008 at Islamabad. About 150 scientists, educationists and students from institutions of higher education attended this event. Dr. N. M. Butt, Chairman PSF delivered welcome address. Dr. Waqar Butt, Chief Scientists, PINSTECH presented five years report of this activity for the period 2003-07. Ms. Katharina Lack from German Embassy and participating students also spoke on important aspects of Nobel Laureates Meetings. The Chief Guest, Dr. Atta-ur-Rahman awarded certificates to participants of the Lindau meetings held from 2004-07. In appreciation of his efforts, the young scholars presented a shield to Dr. N. M. Butt, the main figure behind this programme.

A view of BoT meeting held on May 10, 2008

Ms. Amy Freitas, Mr. Asmat Raza from USDA discussing NSLP projects with Dr. N.M. Butt, Chairman and senior officers of PSF on June25, 2008

Science Caravan Sindh: Exhibition arranged in Distt. Hala from March 25 to April9, 2008

Students are being briefed about the panels and models of Science Caravan

A foreign delegate is observing an interesting model of Science Caravan "Insect Eye or compound Eye"

A teacher experiencing the Gyroscopic force by using Gyroscope model during her visit of Science Caravan

Learning Scientific themes at Science Caravan Exhibition held in Distt. Sarghodha

Inside view of Starlab System, students, teachers and delegates are showing keen interest in the Planetarium show

Dr. N.M. Butt, Chairman, PSF inaugurating the International Math Exhibition at Islamabad Model College for Girls, F-7/4 (9 April 2008)

A never ending queue of students visiting the International Math Exhibition

French Ambassador, H.E. Regis de Belenet as Chief Guest with Chairman, PSF Dr. N.M. Butt, AVM Mateen (MoST), Brig. Javed Iqbal (FDE), Dr. Azhar Hasan, MS at Islamabad on April 21, 2008

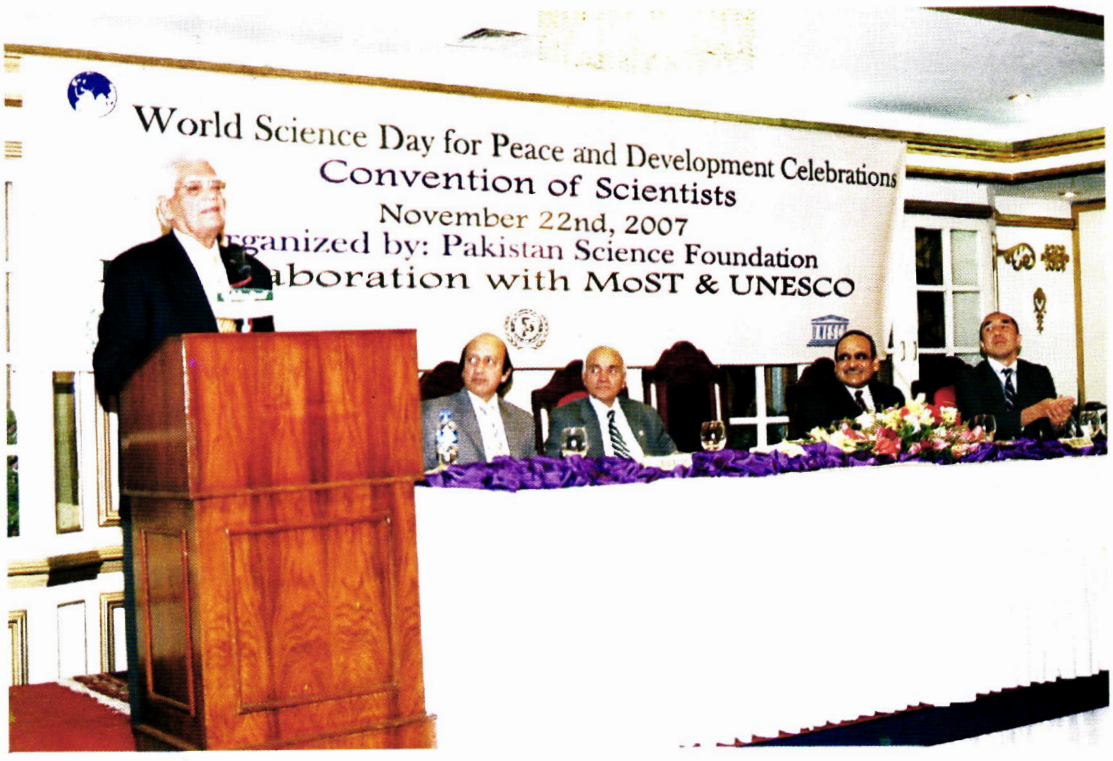
Audience at closing ceremony of Mathematics exhibition on April 21, 2008 at Islamabad

French Ambassador enjoying an exhibit at Mathematics exhibition at Islamabad (April 9-21, 2008)

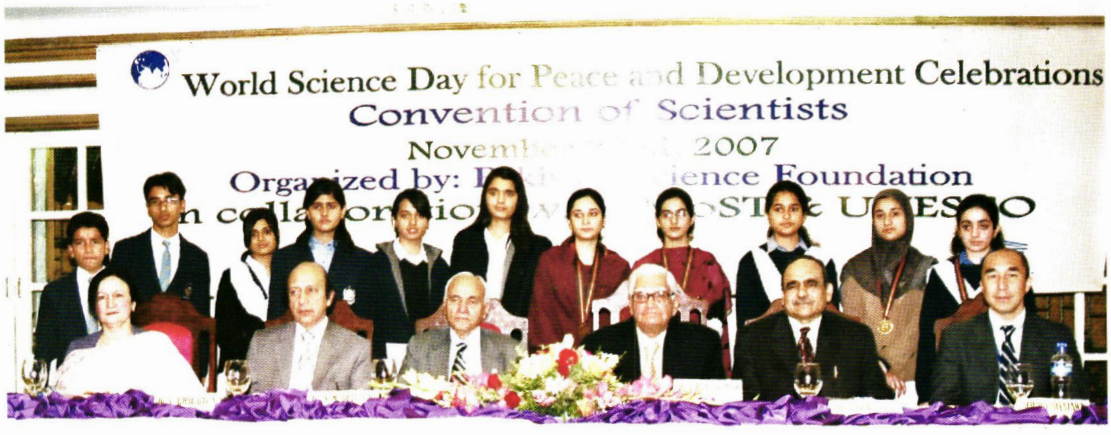
Students are trying to assemble an interesting model of International Math Exhibition at Islamabad (April 9-21, 2008)

Mr. Sajid Anwar Malik, Director NMST, Lt. Gen. ® M. Akram Khan, VC, UET as the Chief Guest & Mrs. Farhat Rajpar, PSF at inaugural ceremony, Lahore on April 25, 2008

Mr. Hashmat Siddiqui, Dr. NM Butt, S. Imtiaz Hussain Gillani (Chief Guest), Dr. Manzoor Soomro & Mr. Mehboob during Inauguration at Peshawar (May 17, 2008)



Dr. Ishfaq Ahmad speaking at "Convention of Scientists" organized as part of World Science Day for Peace and Development celebrations November 22, 2007



Winners of various competitions after receiving their prizes during "Convention of Scientists"

Students at Poster Competition on "Mathematics/Geometry in Nature" held on November 10, 2007

Dr. S. Azhar Hasan, Dr, Manzoor Soomro & Ms. Farhat Rajpar visiting the Scientific Teaching-Aids Exhibition organized by Science Teachers on November 10, 2007

Group photo of the stall holder teachers with the honorable guests during Convention of Scientists organized on 22.11.2007 as part of WSDPD celebrations

Dr. N.M. Butt & Dr. Azhar Hasan with Mr. Jamal Shah, Ms. Talat Hasan (Judges) and other officers after evaluating posters (Inter Board) at PSF June 23, 2008

A view of Science Caravan Training Session (Islamabad, August 28-29, 2007)

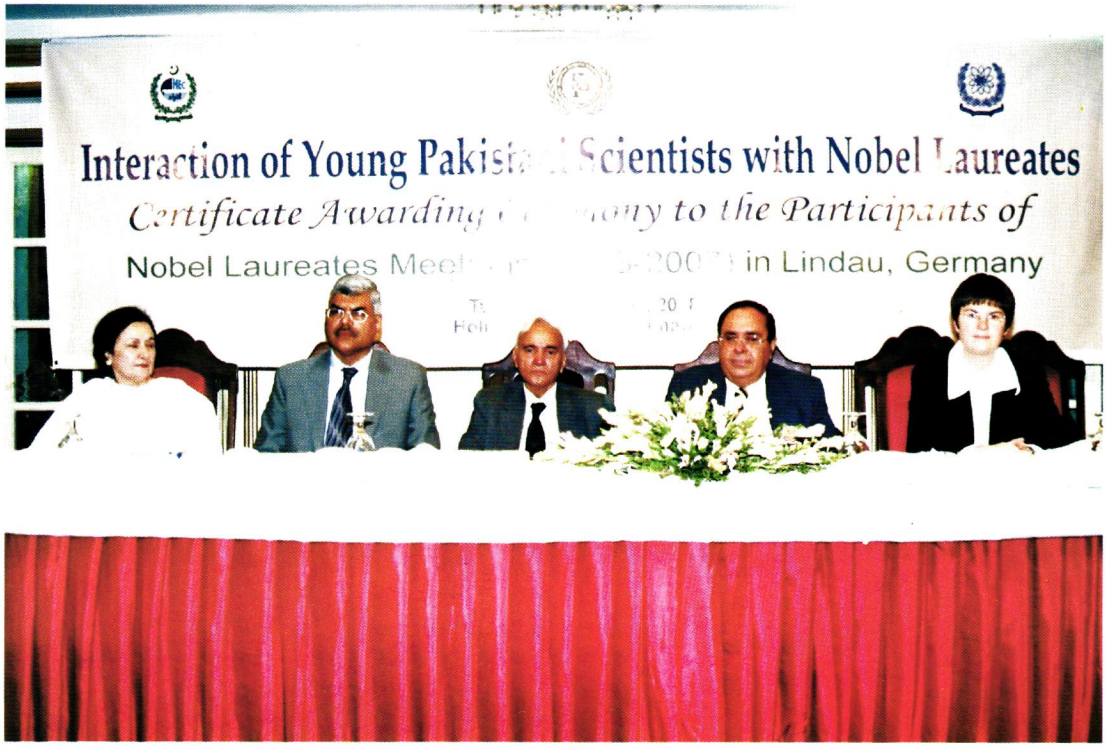
Participants of Science Caravan Training Workshop with Chairman, Member Science & Chief Scientific Officer, PSF (August 29, 2007)

Chairman, PSF presiding over a session of Science Teacher Training Workshop organized by PSF and Intel (21-23 August 2007)

Dr. N.M. Butt, Chairman, PSF awarding Certificate to a teacher after Science Teacher Training workshop

Group photo of the delegates of ECO member states during Expert Group Meeting for establishment of ECO Science Foundation (2-3 September, 2007)

Dr. N.M. Butt, Chairman, PSF expressing his views during Expert Group Meeting for establishment of ECO Science Foundation (2-3 September, 2007)



(R-L) Ms. Katharina Lack, Dr. Atta-ur-Rahman, Dr. N.M. Butt, Dr. Aslam & Ms. Farhat Rajpar during certificate awarding ceremony held (Islamabad, June 24, 2008)

Turkish scientists holding meeting with PSF Scientists on March 6, 2008

Dr. N.M. Butt, presiding over the closing session of International Workshop "Women Networking for Poverty Alleviation" (27-29 May 2008) Lahore College for Women University, Lahore

Dr. S.Azhar Hasan, MS, PSF with the participants of the workshop held at Johannesburg, South Asia (Feb, 2008)

2. PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

The statutory functions of Pakistan Museum of Natural History include research on the natural resources of the country like Flora, Fauna, Geology, Mineralogy, etc. besides public education on these aspects. PMNH has four Divisions, namely Botanical Sciences, Earth Sciences, Zoological Sciences Divisions and Public Services Division. The first three Divisions are mainly engaged in research activities while the fourth carries out development of display exhibits and arranges activities pertaining to public education. Keeping in view the statutory functions of PMNH, its scientific and technical staff remains busy carrying out various scientific projects funded by Pakistan Science Foundation and other agencies. International collaborative research projects are also being run by PMNH scientists and their foreign counterparts. The results of research work are published in the form of Books and research articles in reputed national and international journals. As part of educational activities PMNH scientists arrange various workshops and training programmes for the students and teachers of educational institutions. Lectures on scientific topics are also delivered by the officers of PMNH. Following are the details of the activities carried out during the year.

The main objectives of PMNH are:

- Providing public education on the natural resources of the country
- Creation of a national repository of natural history specimens like animals, plants, rocks, minerals and fossils.
- Research on the Flora, Fauna, Geology and Paleontology of the country and publishing the research results in the form of books, monographs, research papers, etc.
- Depicting the natural history of the country in the form of dioramas, exhibits, etc.
- Provide expert guidance on natural history research to Colleges, Universities, research organizations, professionals, foreign visitors and non-Government organizations.

2.1. VISITS TO PMNH

Thai Science and Technology Delegation visits PMNH

A high level science and technology delegation headed by Mr. Pathom Yamkate, Deputy Permanent Secretary of Thai Ministry of Science and Technology, visited Pakistan Museum

of Natural History on September 12, 2007 and held discussions in the areas of mutual interest with the PMNH officials.

US Director Office of Science and Technology Cooperation visits PMNH

Mr. Bruce Howard, Director Office of Science and Technology Cooperation, US Department of State to Organizations of Ministry of Science and Technology, visited the PMNH on September 13, 2007. PSF Chairman Dr. N.M. Butt and PMNH Director General Dr. M. Rashid Awan briefed the US official on the PMNH activities. Both sides discussed and explored the areas of mutual interest for cooperation in the field of science and technology. Mr. Howard also visited various galleries and laboratories of the PMNH and appreciated the museum's research and educational pursuits.

Turkish delegation visits PMNH:

A four-member delegation from Turkey visited the PMNH on March 3, 2008. The delegation was in Pakistan to attend the ECO scientists meeting. Pakistan Science Foundation Chairman Dr. N.M. Butt accompanied the guests, who took a round of the PMNH Display Galleries and Scientific Divisions' research laboratories. They appreciated the displays and PMNH repositories. Later, Dr. N.M. Butt gave a presentation to the guests about the PMNH activities. PMNH Director General Dr. M. Rashid Awan and Director Public Services Division Dr. S. Shahid Hussain were also present on this occasion.

1.2 RESEARCH ACTIVITIES

a. FIELD WORK:

The geologists of PMNH Carried out a total of 50 days fieldwork in various localities of Attock, Mianwali, Kohistan districts, Kaghan valley and Neelum valley for stratigraphic, paleontological, petrological and structural studies and collection of rock and fossil sample for PMNH repository and research. Fossil maxilla and mandible of *Sivapithecus,* a rare hominoid, were collected, which is a significant contribution to the repository of PMNH (Pic. 3). Some 230 rock and vertebrate fossil samples were collected during these field tours. A large number of samples were also collected for laboratory studies and display at PMNH.

The Botanists of PMNH conducted field studies in Sialkot, Lahore, Multan, Bahawalpur, Chashma Barrage, Pai forest, Chotiari dam, Keti Shah Bella, Salt Range, Mansehra district, Galiat, Chitral, Northern Areas and Neelum valley, AJK. About 2000 specimens of plant specimens consisting of Higher and Lower plants were collected along with ecological data. In some of these tours, the PSD Photographer also participated and captured photos of plants in the field.

The Zoologists of PMNH carried out field work in localities of Salt Range, Taunsa Barrage, Sukkar, Bahawalpur, Karachi, Pasni, Makran coast, Nagar Parkar, Raan-of-Kuch, Peshawar, Kohat, Karak, Charsadda, Azakhal, Warsak, Northern Areas, Neelum valley, AJK and Islamabad. About 3500 animal samples were collected during these field trips.

b. LABORATORY WORK:

- Carried out petrographic studies of 25 thin sections under microscope. Compilation of geological field observations & processing of geochemical data for reports, joint international research papers were also done.
- Identified 450 specimens of higher plants of PMNH Herbarium.
- Systematically arranged 3000 specimens of higher plants of PMNH Herbarium.
- Identified 600 specimens of Algae
- Entered data of about 2500 specimens of plants and animals for the Biodiversity and Global Networking (BGN) project.
- Identified and catalogued 2400 fish, 45 mammalian and 30 wasp specimens.
- Prepared and preserved skeleton of one Blue Bull and one Lion.
- Stuffed three crocodile for PMNH display received as donation from CDA Zoo, Islamabad.
- Prepared descriptions of some seven new species of Ensign Wasps
- Catalogued 2320 insect specimens belonging to different insect orders
- Took morphometric measurements and pholidosis data of reptile samples.
- Catalogued 1500 freshwater and 246 marine and brackish water fishes.

c. RESEARCH PROJECTS ON-GOING:

Research projects completed:

Bio-ecology and population management of House Crow *Corvus splendens* in Islamabad area

Research projects on-going:

- Studies on algae of major rivers of Punjab (Pakistan) with special emphasis on its consumption by economically important fishes. Funded by PSF.
- Inventory of Faunistic Diversity in Margalla Hills National Park. Funded by PSF.
- Studies on algae of major rivers of Punjab (Pakistan) with special emphasis on its consumption by economically important fishes. Funded by PSF
- Indus for All Programme. (collaborative programme with WWF-Pakistan)
- Biodiversity of Wetland of Pakistan (collaborative programme with Pakistan Wetlands Project)

International Collaborative Research Projects:

- "Early Triassic biostratigraphy and carbon isotope stratigraphy of the Salt Range" in collaboration with paleontologists of Institute & Museum of Paleontology, University of Zurich (PIMUZ). National Science Foundation (NSF), Switzerland provided funds for fieldwork (Pic. 4).
- "The early evolutionary stages of an island arc: the dunite-pyroxenite-gabbro association of Sapat, Kohistan, NW Pakistan" in collaboration with Swiss Federal Institute of Technology (ETH), Switzerland and CNRS, Montpellier University, France.

Projects approved by PSF for funding:

- Taxonomic and Ethnobotanical studies of Economically Important Plants of Potwar plateau and the Galiat with reference to their trade.
- Taxonomy and Systematics of fruitflies of Pakistan.
- Sedimentology and depositional environment of Datta Formation in western Salt Range of the Potwar sub-basin.
- Biostratigraphic zonation of the Lockhart Limestone of the Paleoceneage in the Nilawahan & kalarwahan areas of Salt Range.

On-going Development Project of PMNH:

The construction of **25** animated exhibits in the display galleries of PMNH under development projects titled "Construction of two floors of Block-II of PMNH building: Strengthening of PMNH research and educational activities" is in progress and likely to be

completed within the next 2-3 months. It is expected that these exhibits, after completion, would be a source of attraction for visitors.

d. RESEARCH PUBLICATIONS:

Research Articles Published:

- Heuberger, S., Schaltegger, U., Burg, J. P., Villa, I.M., Frank, M., **Dawood, H., Hussain, S. S.,** & Zanchi, A., 2007. Age and isotopic constraints on magmatism along the Karakoram – Kohistan suture zone, NW Pakistan: Evidence for subduction and continued convergence after India –Asia collision. Swis Jour. Geoscience, **100**: 85-107. doi. 10.1007/s00015-007-1203-7.

- Garrido, C. J., Bodinier, J.-L., Dhuime, B., Bosh, D., Chanefo, I., Burguier, O., **Hussain, S. S., Dawood, H.,** Burg, J. P., 2007. Origin of the island arc Moho transition zone via melt-rock reaction and its implications for intracrustal differentiation of island arcs. Evendence from the Jijal complex (Kohistan complex, northern Pakistan). Geology, **35(8)**: 683-686. doi.: 10.1130/G23675A.1.

- Jagoutz, O., Muntener, O., Ulmer, P., Pattke, T., Burg, J. P., **Dawood, H.,** & **Hussain, S. S**., 2007. Petrology and mineral chemistry of lower crustal intrusions: The Chilas complex, Kohistan (NW Pakistan). Jour. Petrol. **48 (10)**: 1895-1953.

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- **Leghari, M.K., Shah, M.**, Hussain, F. 2007. Freshwater algae of mountainous areas of Chitral. International Journal of Phycology and Phycochemistry, Karachi. **3(2)**: 183-188.
- Butt, F. **Leghari, M. K.** and Rehman, S. 2007. Seasonal variation of algal species from Bemkhurma Mirpur Azad Kashmir. International Journal of Phycology and Phycochemistry, Karachi. **3(2)**: 199-204.

Books published:

PMNH scientists edited the following books during the report period

- Ashraf, M., **Hussain, S. S., Dawood, H**. 2007. Proceedings of the 5th Pakistan Geological Congress (organized in Islamabad in 2004). National Geological Society of Pakistan, Pakistan Museum of Natural History, Islamabad.
- **Hussain, S. S., Dawood, H.** 2007. Proceedings of Workshop on Geological Materials and Aggregates of Pakistan (organized in Islamabad in 2004). National Geological Society of Pakistan, Pakistan Museum of Natural History, Islamabad.

Technical Reports:

PMNH scientists submitted some 50 baseline reports to Pakistan Wetlands Programme, on various groups of the Fauna and Flora of aquatic habitats like Tanda Dam, Kohat District; Chashma Barrage, Mianwali, District; Salt Range Wetlands Complex including Khabbeki, Jhaler, Ucchali, Nammal and Kalar Kahar lakes; alpine lakes of Northern Areas namely Handrap, Shandur, Seosar, Rama and Krumber Lakes.

2.3 EDUCATIONAL ACTIVITIES

Workshop/Seminars Organized:

PMNH organized a two-day workshop titled "Pakistan Museum of Natural History: A Source of Informal Education" on June 25-26, 2008, in its premises. A total of 27 teachers from different institutions participated in the workshop. The Workshop was an effort to strengthen the PMNH relationship with educational institutions and familiarize teachers with the educational facilities available at the PMNH. It was also a refresher course for teachers to update them about developments in the field of natural history.

The workshop comprised of different technical sessions spanning on two days. In the technical sessions, the PMNH scientists delivered talks and presentations on different aspects of natural history. The technical sessions were followed by a short field work demonstration at Daman-e-Koh to apprise the participants about techniques of natural history specimens' collection and preservation etc. At the end of the closing ceremony, certificates were awarded to the participating teachers.

Qualification improved:

- Dr. Mirza Habib Ali, Associate Curator, Zoological Sciences Division, PMNH has comleted his Ph.D. degree from University of Agriculture, Faisalabad. Title of his thesis was, "Behaviour and ecology of the House Crow (*Crovus splendens*) in Islamabad-Rawalpindi and adjoining areas".

2.4 DESIGN AND DISPLAY ACTIVITIES

Design and display:

- Animated exhibits including dinosaurs, earth globe and volcanoes were developed at PMNH through Development Project.
- Prepared and submitted for approval PC-I of S&T section, National Monument Museum, Shakarparian Islamabad.

- Designed and composed S&T Expo 2007 Report for PSF.
- Prepared a new Gavial display at Virtual Orientation Gallery (VOG)
- A few new exhibits pertaining to animals are also being added to the PMNH Display Galleries.

Guided tour of PMNH/Educational activities:

- The number of visitors to PMNH from July 2007 to June 2008 stood at 18,817 people including 12,895 students and teachers, 5,733 general visitors and 189 foreigners.
- Guided tours were arranged for a large number of student groups and eminent visitors.
- Arranged lectures/film shows in and outside PMNH for students of various Schools, Colleges and Universities.

2.5 SERVICES RENDERED TO OTHER ORGANIZATIONS

- Dr. M. Rashid Awan, Director General, conducted viva-voce of two Ph. D. and five M. Phil. students of the Department of Plant Sciences, Quaid-i-Azam University, Islamabad.
- Dr. S. Shahid Hussain, Director, PSD worked as Member, Board of Studies at the Institute of Geology, University of the Punjab.
- Dr. S. Shahid Hussain, Director, PSD conducted viva voce and open defense for the award of Ph. D. degree to two candidates at the College of Earth & Environmental Sciences, University of the Punjab, Lahore.
- Dr. M. K. Leghari, Curator, BSD conducted viva-voce of two M. Phil. students of Department of Plant Sciences, Quaid-i-Azam University, Islamabad, and one M. Phil. student of Department of Botany, University of Peshawar.
- Dr. Saleem Ahmad, Curator, BSD, provided expert guidance in their thesis work to two Ph. D., two M. Phil. and four M. Sc. students from Quaid-i-Azam University, Islamabad and University of Azad Jammu and Kashmir, Muzaffarabad
- Prepared and submitted a proposal for holding S&T Fair in Karachi in collaboration with Expo Centre Karachi.
- Designed and prepared S & T Float for Pakistan Day Parade 2008.
- Started renovation work of Natural History and Physical Sciences sections of Faisalabad Science Centre.
- Prepared interior designing plan for PSF offices at Pakistan Academy of Sciences building, Islamabad.
- Stuffed one Deer and another Deer skin for President House, Islamabad; Stuffed one Leopard for Army House, Rawalpindi; stuffed one Deer for Joint Chief of Army Staff, Rawalpindi.

Dr. N.M. Butt, Chairman, PSF briefing the delegation of Director Office of Science and Technology Cooperation, USA about activities of PMNH. September 13, 2007.

Dr. M. Rashid Awan, Director General, PMNH, briefing members of the Turkish delegation about botanical collections March 3, 2008

Fossil teeth of Sivapithecus collected from Attock district: left male, right female

PMNH and PIMUZ geoscientists during joint fieldwork in the Salt Range

Inaugural ceremony of workshop "Pakistan Museum of Natural History: A Source of Informal Education" held on June 25-26, 2008

Participants of the workshop "Pakistan Museum of Natural History: A Source of Informal Education" receiving field training. June 26, 2008

3. PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

PASTIC is ISO 9001: 2000 Certified Information Provider in the field of S&T information management. It is the oldest organization in the field of information dissemination that serves as a gateway for access to and delivery of S&T information catering to the information needs of the researchers in all areas of Science and Technology. Users of PASTIC services include researchers, entrepreneurs, academicians, relevant scientists, engineers, industry, policy makers and planners. Collaboration with different organizations and agencies enhances the scope of information that is offered to clients and help PASTIC to respond to the diverse needs of a broad community of users.

PASTIC National Centre is housed in its own building at Quaid-e-Azam University Campus, Islamabad with comprehensive collections of publications in different fields of science and technology. The sub-centres are working in different cities at Karachi, Lahore, Peshawar, Quetta, Faisalabad and Muzaffarabad. Its sanctioned strength is 158 including Technical and Administrative Staff.

The aims and objectives of PASTIC are as under:

- To procure, process and disseminate scientific and technological information to the researchers.
- To provide bibliographic information service and document supply service.
- To interact with regional and international information agencies/networks.
- To develop inter-library cooperation, resource sharing at national level.
- To train information personnel in contemporary techniques and methods of information handling.
- To develop and strengthen the National Science Reference Library.
- To compile, publish and update reference information publications, i.e., Union Catalogue of Scientific Periodicals in the libraries of Pakistan, Directory of S&T Periodicals of Pakistan, and Technology Information Bulletin, etc.
- To publish an abstracting and indexing journal entitled "Pakistan Science Abstracts".

3.1 ACTIVITIES AND SERVICES

The activities undertaken during the period, July 2007 to June 2008 are briefly described below:

3.1.1 Document Procurement and Supply Service

Under the Document Procurement and Supply Service, 2107 requests were received from different R&D organizations for supply of reprints of research articles, conference papers and reports etc. In order to fulfill this demand of clients reprints of 1948 articles required were procured either from local sources or from abroad, during the year 2007-08. Major user organizations include Quaid-i-Azam University, Islamabad, University of Arid Agriculture Rawalpindi, Azad Jammu and Kashmir University, Muzaffarabad, Dr. A.Q. Khan Research Labs, PIEAS, LUMS, Army Medical College, PCSIR Labs, University of Punjab, HEJ Research Institute of Chemistry, University of Karachi, University of Agriculture, Faisalabad, etc.

3.1.2 Bibliographic Information Service

PASTIC has a collection of international online and offline S&T databases. References from these databases are searched and supplied to users according to their research topics on request. A total of 43, 9092 abstracts/references on various S&T topics were supplied to 1834 research workers and other users during the period under review from the following databases;

Sr. No	Name of Database	Years
1	Medline	1950-2006/05
2	Life Science	1982-2004/-03
3	Poltox	1966-2004/03
4	Applied Science &Technology	1983-2008/02
5	Derwent Biotech. Abstracts	1982-2004/09
6	Proquest (Full text)	1982-1998
7	INSPEC	1999-2002/12
8	Sociological Abstracts	1963-2007/05
9	Sociofile	1974-1998
10	Science Citation Index	2002-2004/12
11	Compendex Site Enhance	1995-2004/03
12	Ulrich's International Periodical Directory	2004
13	Em-Biology Online	1982-2008
14	CSA Pollution Abstract Online	1982-2006

For further strengthening of the bibliographic information service and resources of PASTIC and its Sub-Centres, following online bibliographic databases were purchased.

Sr. No	Name of Database
1	EM biology 1980-present (On Line)
2	Health and Safety Science Abstracts (On Line)
3	Abstracts in New Technologies & Engineering (On Line)

3.1.3 Abstracting and Indexing Service

a) Pakistan Science Abstarcts (PSA)

PASTIC provides abstracting and indexing service by publishing an abstracting journal entitled "Pakistan Science Abstracts" in ten different scientific disciplines, which serves as a secondary information source to give support to research and development activities in the country. The scientific information generated in Pakistan or abroad and published in Pakistani S&T journals is documented in the form of abstracts along with detailed author index and keyword index in this secondary journal.

In this regard all processing for compilation and publishing ten issues of Pakistan Science Abstracts was carried out, completed and Pakistan Science Abstracts of following disciplines were published during the year 2007-08.

- Agricultural Sciences, 2006, Vol.44-A
- Animal Sciences, 2006, Vol.44-D
- Biochemistry & Biotechnology, 2006, Vol.44-B
- Chemical & Pharmaceutical Sciences, 2006, Vol.44-C
- Earth & Environmental Sciences, 2006, Vol.44-E
- Information Communication & Engineering Sciences, 2006, Vol.44-I
- Mathematics & Statistics, 2006, Vol.44-G
- Medical Sciences, 2006, Vol.44-H
- Plant Sciences, 2006, Vol.44-J
- Physics, 2006, Vol.44-F

These subject wise publications of Pakistan Science Abstracts have proved to be more useful for diverse nature of users. Pakistan Science Abstracts of all the above disciplines were

distributed among S&T and R&D organizations and academic institutions as part of information dissemination activities.

b) Technology Information Service

Trade and Technological Information Promotion System (TIPS) has been recently renamed as Technology Information Section. This Technology Information Section is aimed at provision and dissemination of Technological Information Service particularly to Engineers, Entrepreneurs, SMEs and the Industry. The aim is to facilitate growth, potential and competitiveness among SMEs at national and international levels.

To achieve this goal following activities were carried out.

- Development of a dynamic website (with a huge database) has been started for dissemination of information on local technologies and technological products and services developed by R&D organizations, SMEs, Entrepreneurs in order to promote indigenous technologies. The contents of the website were finalized and work was outsourced to COMSATS. This website would also provide information to SMEs on latest technologies and their adoption.

- Digitization of available data of Technology Information Section for development of database was initiated.

- Dissemination of information on patents to Researchers, Engineers, Entrepreneurs and Industry through patent search and patent facilitative activities was also carried out.

To expand the service, it is intended to bring out a six monthly bilingual Technology Bulletin in which company profiles, success stories, information on new technologies/products, events, etc., would be published. Seminars would also be organized for the Technology and Industrial sector for promotion of Technology Information and IPR. The sub-centres would also be assigned the task to collect technology related data for the website and the Bulletin.

3.1.4 PASTIC National Science Reference Library

PASTIC National Science Reference Library is aimed at providing reference and referral service to the users and strengthening of all the services of PASTIC particularly document supply service, bibliographic information service, abstracting and indexing service, technological information service etc. In this context, automation of PASTIC library was started which is now in the completion phase and it is planned to make it the National

Resource Centre for all type of Scientific and Technological literature published in the country. PASTIC library has a collection of about 9000 books, 1558 titles of journals (27,8002 issues) and 8904 miscellaneous documents and reports.

During 2007-2008, more than 2000 books were classified subject wise and computerized for easy access. About 530 users visited PASTIC Library for reference purpose, reading and photocopying services. Library also received 955 issues of different national and international journals. Out of these 150 issues were received in exchange of Pakistan Science Abstracts, under international liaison activities and on gratis basis, which has contributed to a considerable extent for strengthening of PASTIC information resources. In addition 80 books, reports, miscellaneous documents, etc. were acquired, processed and shelved for use. Under current awareness service six issues of Fresh Arrivals Vol. 4 No. 1-6 were published during the period under review and distributed to the relevant circles.

3.1.5 Reprographic Service

The Reprographic Section of PASTIC has facilities ranging from photocopying to offset printing. During the year 2007-2008 about 82 printing jobs were undertaken for 10 R&D organizations including composing, offset and laser printings.

PASTIC is also in the process of strengthening its Reprographic Unit (Printing Press), regarding its facilities for providing efficient printing service to other S&T organization. In this regard some small machines/equipment has been acquired and for heavy machines a project entitled "Strengthening and Enhancement of PASTIC Reprographic Services" was submitted to the Ministry and was approved in DDWP meeting held on 19 April, 2008 at a total cost of Rs. 37.00 million.

3.1.6 IT Support Service

IT serves as the backbone of PASTIC information services and during the period following activities was undertaken for providing support to PASTIC services.

- 815 records of Library material using WIN/ISIS software package were computerized.
- 550 records of Canadian Patents were entered in the Patents Database.
- Scanned, composed and indexed 1416 abstracts from different primary journals for completion of abstracting journals (PSA's) of 2006

- Uploaded different services, activities and tenders of PASTIC on PASTIC website
- Provided Technical Consultancy to PSF and PMNH for their different Projects
- Developed and implemented database of Bibliographic Information Service and Document Supply Service

3.1.7 International Liaison

PASTIC is the National Focal Point of International/Regional Information Centres and Networks like, SAARC Documentation Centre, WHO/CEHANET and UNEP/INFOTERRA. PASTIC is also the Coordinating/Collaborating Centre for UNDP/TIPS and UNESCO/IFAP. The following collaborating activities were undertaken under international liaison activities.

a) **UNESCO:** PASTIC is responsible for the distribution of UNESCO developed software/packages such as WIN/ISIS and IDAMS as well as provides training on this package. The WIN/ISIS Package was supplied to 12 organizations, which include Pakistan Institute of Labour, Education and Research Karachi; Council of Social Sciences, National Law University, Karachi; Chiniot Islamia School and College; Allama Iqbal Open University, Regional centre, Faisalabad; Forestry Research Institute Faisalabad; NIAB Faisalabad; Divisional Model College Faisalabad; Punjab Wildlife Research Institute, Faisalabad; M.A Jinnah College of Commerce Faisalabad; Library Advocate General Office Peshawar; Ayub Agriculture Research Institute Faisalabad; Law Parliamentary Affairs and Human Rights, Department Library Peshawar and WAPDA Engineering Academy Faisalabad.

b) **SAARC DOCUMENTATION CENTRE:** SAARC Documentation Centre (SDC) is a regional centre of SAARC to facilitate exchange of information in various fields of S&T and to develop human resource in the Member States in the area of information science, technology, management systems and services. PASTIC is the National Focal Point of SAARC Documentation Centre in Pakistan and coordinates with SDC in all information exchange and human resource development programmes. In this regard following activities were undertaken during the year 2007-08.

- Ms. Nageen Ainudin, Director PASTIC, participated in 13th Meeting of Governing Board of SAARC Documentation Centre held from 12-13 December 2007 at New Dehli, India.

- Mr. Mohammad Aqil Khan, Additional Director (Doc), presented a country paper pertaining to PASTIC services and overall information scenario of Pakistan and SDC-NFP activities in 5th SDC-NFP Coordinator's Meeting held from 29-30 Nov, 2007 at New Dehli, India.

- Proceedings of the "SAARC Workshop on Access to Information and Intellectual Property Rights Issues" held at Islamabad from 19th Dec to 22nd Dec 2006 was prepared, compiled, edited and finalized for printing.

- Under SDC-NFP coordination activities 21 titles of scholarly primary research journals and abstracting journals of 2007-2008 of major disciplines of science and technology being published by National Institute of Science Communication and Information Resources (NISCAIR) were regularly received.

- The following seven officers of PASTIC, PSF, PMNH and MoST were sent for different trainings and participation in workshop/courses in the area of "Information Technology for Information Management" and "Digital Libraries and Digital Data Repositories" under SDC human resource development program.

  1. Dr. Raja Razi-ul-Hassnain, Sr. Scientific Information Officer and Mr. Mohammad Altaf, Bibliographic Officer attended Ist batch of training course on "Information Technology for Information Management" from May 23-June 28, 2007 at SAARC Documentation Centre (SDC), New Delhi, India

  2. Syed Habib Akhter Jaffri, Sr. Librarian attended an attachment training program on "Information Technology for Information Management" from May 23-August 26, 2007 at SAARC Documentation Centre (SDC), New Delhi, India

  3. Mr. Mohammad Khalid, Officer In-charge Karachi subcentre participated in the 2nd batch of training course on "Information Technology for Information Management" from Sep 12-October 17, 2007at SAARC Documentation Centre (SDC), New Delhi, India

  4. Ms. Khalida Parveen, Principal Librarian, PSF and Dr. Saima Tanveer, Sr. SIO attended SDC workshop on Digital Libraries and Digital Data Repositories from 16-20 Dec, 2007 at Khatmandu, Nepal.

  5. Syed Jaffar Hussain Naqvi, Assistant Librarian and Mohammad Umar Daraz, PS to Secretary MoST attended short term training course on WINISIS from 4-8 December, 2007 at SAARC Documentation Centre (SDC), New Delhi, India.

3.1.8 Bilateral Cooperation:

PASTIC initiated collaboration with EXPEDO- France and a project proposal was prepared and submitted for strengthening of collaboration with Government of France for enhancement of PASTIC activities in the field of Data Mining and Data Warehouses.

3.1.9 Human Resource Development

Another important activity of PASTIC is to impart training to information professionals on computer applications for library automation and information management as well as organization of workshops and seminars on related diverse topics.

a) Trainings/Workshops/Seminars organized

- A 2-day workshop on "WIN/ISIS" from 12th to 13th June 2008 at University of Agriculture, Faisalabad. The workshop was attended by forty one (41) participants.
- A seminar on "Role of Scientific Information & Communication in Promoting Research & Industry Collaboration" on 28th May, 2008 at Peshawar in collaboration with the Directorate of Science & Technology, Government of NWFP, SMEDA and Delta Pharma Pvt. Ltd.

b) PASTIC Information Service Stalls at the Doorstep of Universities

PASTIC arranged stalls at the following universities taking information services to the doorstep of these institutions.

- Fatima Jinnah Women University, Rawalpindi.
- University of Gujrat, Gujrat.
- University of Sarghodha, Sarghodha.
- University College of Agricultural and Food Technology Rawalakot, Azad Kashmir.
- Bannu University of Science and Technology, Bannu.
- Kohat University of Science and Technology, Kohat.

An overwhelming response of students, researchers and faculty members was seen in all these universities. About 700 research scholars availed the services of PASTIC through this activity. This initiative has given a good boost to PASTIC services.

c) Lectures Delivered

- Ms. Nageen Anniudin, Director PASTIC participated as Resource Person in a workshop on "Women Network for Poverty Alleviation in Rural Areas" from 11-14

March 2008 at Lahore College for Women University, Lahore. Director PASTIC delivered two presentations on "Role of PASTIC in Dissemination of S&T Information" and "Science Awareness through TV Channels" during the workshop.

- Ms. Ghazala Yasmeen, Officer In-charge Peshawar delivered a seminar on "Role of PASTIC in Science and Research on Ist Feb 2008 organized by the Chemical Society at the Institute of Chemical Sciences, University of Peshawar.

d) Meetings/Workshops/Trainings Attended

- Ms. Nageen Ainudin, Director, Ms. Kausar Sohail, Sr. Bibliographic Officer and Syed Aftab Hussain Shah, SIO attended the workshop on "Promoting University-Industry Relationship through Technology Incubation" organized by NUST and HEC on September 12, 2007 at HEC.

- Mr. Mohammad Aqil Khan, Additional Director Doc. attended the meeting organized by IPO Pakistan on "Second Phase of the EU-TRTA Programme for Pakistan" on 22nd May 2008 at IPO head quarter Islamabad.

- Mr. Mohammad Aqil Khan, Additional Director Doc. attended a National Workshop on "Science and Technology Statistics: International Practices and their Applications" from 15th to 16th April, 2008 at PCST Islamabad.

- Dr. Shaheen Shahzad, Chief Editor attended a Training Workshop on "E-Commerce for Beginners" from 21-26, Jan 2008 at Pakistan Manpower Institute Islamabad.

- Syed Habib Akhter Jaffri, Senior Librarian and Mr. Obaid Anwar, Bibliographic Officer attended the course of "Library Management Skills" from 04-09 Feb, 2008 at AHK National Centre for Rural Development, Chak Shahzad, Islamabad.

- Syed Asif Ali Shah, Scientific Information Officer participated in a Training Workshop on "Office Automation with MS-Office" from 18-23 Feb, 2008 at Pakistan Manpower Institute Islamabad.

- Mr. Saifullah Azim, Senior System Analyst and Mr. Naveed Noor, System Analyst, completed Semester Study and Research work from 18th Nov to 23rd Dec, 2007 in the field of Data Mining at French Universities of Cergy Pontoise-Paris, LIRRM-Montpellier and LG12P Ecole des Mines d'Ales-Nimes, France.

- Dr. Saima Tanveer, Sr. Scientific Information Officer attended a WIPO National Seminar on "Legal Options and Flexibilities under the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement from 27-28 Nov, 2007 organized by the World Intellectual Property Organization (WIPO) in collaboration with Intellectual Property Organization Pakistan (IPO- Pakistan).

- Mr. Saifullah Azim, Sr. System Analyst and Mr. Javed Mukhtar, MTI participated in one day Training Workshop on "Agriculture Decision Support System (ADSS)" on 28th May 2008 at FAST-NU Islamabad.

3.1.10 Miscellaneous Activities

- Proceedings of the 2nd Meeting of Nobel Laureates with Pakistani Students/Young Scholars Islamabad/Lahore, 27-31 March 2007 was prepared, compiled, edited and finalized for printing.
- Report of the Ist ECO Expert Group Meeting on Establishment of ECO Science Foundation was prepared, complied, edited, and published.
- Coordinated in preparation, compilation, editing and printing of the book entitled "Young Pakistani Scholars Meet Nobel Prize Winners in Lindau (Germany), Vol. V, 2007.
- Coordinated in preparation, compilation, editing and printing of the book entitled "Five Years of Interaction with Nobel Prize Winners: 2003-2007.
- Information pertaining to PASTIC regarding award of IDB prize for S&T 2007 was gathered and compiled according to the prescribed format of IDB.
- Initiated collection of data in the following areas for development of database.
    - Ongoing projects on S&T
    - Databases available in the country
    - Conferences/Seminars/Workshops details and their proceedings.

3.1.11 Development Project

a) Science Awareness through TV Channel

Public awareness of science is absolutely necessary if it is to be utilized as instrument for improving the quality of life of the people of country. It has been realized all over the world that public support for science is related to public understanding of science. Therefore, PASTIC executed a project entitled "Science Awareness Through TV Channel" for Public understanding of Science and Science Popularization. In this regard following programmes were initiated under this project for popularization of science through TV channels.

- Acquisition, translation and dubbing of S&T films
- Production of S&T films/documentaries on important issues
- Panel discussion on TV among scientist and scholars
- Training of young scientists and Mass media professionals

Main objective of the project was creation of awareness and interest in science and technology through mass media, specially the TV. leading to socio-economic development and better quality of life in Pakistan.

Main Achievements

- Acquired, translated, dubbed 62 English S&T documentaries.

- Aired 11 foreign S&T documentaries after translation and dubbing in urdu during March to June on PTV News Channel on topics such as biology, innovation, technology, health and environment.

- Produced and aired following S&T documentaries in Urdu during Jan-March 2008 on PTV Channel.

    - Salt Range (Khewra Mines)
    - Our River Systems
    - Earth Quake prone areas of Pakistan
    - Deforestration and its impact on environment
    - Environmental Heath Hazards
    - Medicinal Plants in Pakistan
    - Biotechnology in Pakistan
    - Space Research in Pakistan
    - S&T Museum in Pakistan

- Science and Technology awareness was created in the public at large and motivated young scientists towards entrepreneurship

- By airing the Urdu dubbed and translated S&T films acquired from abroad PASTIC has popularized S&T and introduced innovative techniques and technologies to local viewers.

- Locally produced films aired on national TV channels has created awareness and interest in all the key stakeholders in scientific & industrial sectors as well as the common public mainly students.

- Panel discussion on important national issues has stimulated a sense of scientific inquiry into local intermediate & long term problems and their solutions.

- Through capacity building component of this project PASTIC made effort to remove the gap of communication between the scientists & mass media, bringing them together to present science & technology in easily understandable manner for the public.

A seminar on "Role of Scientific Information & Communication in Promoting Research and Industry Collaboration" on 28th May, 2008 at Peshawar

(R-L) Prof. Khalid Khan, Syed Imtiaz Hussain Gillani, Dr. N.M. Butt, Prof. Dr. Yaseen Iqbal and Ms. Nageen Ainuddin at inaugural session of the Seminar on May 28, 2008 at Peshawar

Dr. N.M. Butt, Chairman PSF, addressing the audience during the inaugural session of the Seminar at Peshawar

Mr. Asaf, President Chamber of Commerce NWFP, Peshawar presenting shield to Prof. Khalid Khan during the closing session of the workshop at Peshawar

Mr. Asaf, President Chamber of Commerce NWFP, Peshawar distributing certificate among the participants of the workshop

PASTIC Information Service Stalls

PASTIC stall at Kohat University of Science and Technology

Literature search being carried out at PASTIC stall at Fatima Jinnah Women University, Rawalpindi

"WIN / ISIS" from 12th to 13th June 2008 at University of Agriculture, Faisalabad

Recitation from Holy Quran during inaugural ceremony of the training / workshop on WIN/ISIS at Faisalabad on June 12, 2008

Dr. N.M. Butt, S.I. Chairman, Pakistan Science Foundation, addressing the audience during inaugural ceremony of the training / workshop on WIN/ISIS at Faisalabad on June 12, 2008

Concluding ceremony of the training / workshop on WIN/ISIS at Faisalabad

Prof. Dr. Muhammad Ashraf, Dean Faculty of Sciences distributing certificate among the participants

4. INTERNATIONAL LIAISON

4.1 FOREIGN VISITS OF CHAIRMAN, PSF.

Dr. N.M.Butt, Chairman, Pakistan Science Foundation, Islamabad visited a number of countries to attend the following Conferences/Meetings.

- Nanotechnology Laboratories in Dayton, University of Dayton, USA from Oct 27-29, 2007.
- National Science Foundation, Washington D.C. From Oct 30-31, 2007
- University of Illinois, ILL from Nov 1-3, 2007
- 4th International Congress of Nanotechnology ICNT-2007, San Francisco, USA. From Nov 5-7, 2007 & presented a paper.
- "Asia-Pacific Regional Forum for Popularization of Science-Fostering Role of Science Centres and Science Museums, Seoul" Republic of Korea from Nov 15-17, 2007 and also presented a paper.
- "International Seminar on "North-South Dialogue on "Migration and Development" from Dec 29-31, 2007 in Cairo, Egypt from Dec 29-31, 2007 & presented a paper.
- Two Days Regional Workshop on "Nanotechnology" and delivered a lecture on "Nanotechnology and its Current Status organized by Sultan Qaboos University in Oman from 13-14 Jan, 2008

4.2 FOREIGN VISITS OF PSF SCIENTISTS

- Dr. S. Azhar Hasan, Member Science, PSF visited Johannesburg, South Africa in connection with 5th International Workshop on " Enhancing change through Science Centres" held on 25-28 February, 2008 NAM Science and Technology Center and presented a paper entitled "Science Awareness Campaigns.
- Ms. Ghazala Roohi, Curator, ESD/ Manager, BGN project and Dr. Khalid Mahmood, Associate Curator, ZSD, attended the meeting of Global Biodiversity Information Facility (GBIF) 9th Node Managers Committee Meeting held on 14th October 2007, at Amsterdam, the Netherlands.
- Ms. Ghazala Roohi, Curator, ESD/Manager, BGN and Mr. Ubaidullah Azeem, System Analyst participated in GBIF Computer training for the smooth running of new protocol TAPIR, on 15th October 2007, at Amsterdam, the Netherlands.
- Mr. S. Jaffer Hussain Naqvi, Assistant Librarian, PMNH attended an international training course on Short Term Programme on WINISIS during 4-8 December, 2007 at SAARC Documentation Centre, New Delhi, India.

- Ms. Nageen Ainudin, Director PASTIC, participated in 13th Meeting of Governing Board of SAARC Documentation Centre held from 12-13 December 2007 at New Dehli, India.

- Mr. Mohammad Aqil Khan, Additional Director (Doc), presented a country paper pertaining to PASTIC services and overall information scenario of Pakistan and SDC-NFP activities in 5th SDC-NFP Coordinator's Meeting held from 29-30 Nov, 2007 at New Dehli, India.

- The following officers of PASTIC, PSF, PMNH and MoST were sent for different trainings and participation in workshop/courses in the area of "Information Technology for Information Management" and "Digital Libraries and Digital Data Repositories" under SDC human resource development program.

  a. Dr. Raja Razi-ul-Hassnain, Sr. Scientific Information Officer and Mr. Mohammad Altaf, Bibliographic Officer attended Ist batch of training course on "Information Technology for Information Management" from May 23-June 28, 2007 at SAARC Documentation Centre (SDC), New Delhi, India

  b. Syed Habib Akhter Jaffri, Sr. Librarian attended an attachment training program on "Information Technology for Information Management" from May 23-August 26, 2007 at SAARC Documentation Centre (SDC), New Delhi, India

  c. Mr. Mohammad Khalid, Officer In-charge Karachi subcentre participated in the 2nd batch of training course on "Information Technology for Information Management" from Sep 12-October 17, 2007 at SAARC Documentation Centre (SDC), New Delhi, India

  d. Ms. Khalida Parveen, Principal Librarian, PSF and Dr. Saima Tanveer, Sr. SIO attended SDC workshop on Digital Libraries and Digital Data Repositories from 16-20 Dec, 2007 at Khatmandu, Nepal.

  e. Syed Jaffar Hussain Naqvi, Assistant Librarian and Mohammad Umar Daraz, PS to Secretary MoST attended short term training course on WINISIS from 4-8 December, 2007 at SAARC Documentation Centre (SDC), New Delhi, India.

4.3 INTERNATIONAL COLLABORATION

- PMNH carried collaborative research on "Early Triassic biostratigraphy and carbon isotope stratigraphy of the Salt Range" with paleontologists of Institute & Museum of Paleontology, University of Zurich (PIMUZ). National Science Foundation (NSF), Switzerland provided funds for fieldwork.

- PMNH continued collaborative research project entitled "The early evolutionary stages of an island arc: the dunite-pyroxenite-gabbro association of Sapat, Kohistan, NW Pakistan" with Swiss Federal Institute of Technology (ETH), Switzerland and CNRS, Montpellier University, France.

- Organised an International Mathematics Exhibition **"Experiencing Mathematics"** in collaboration with Embassy of France in Pakistan during April-May 2008 at Islamabad, Lahore and Peshawar. The exhibits of the exhibition includes feature posters, along with 27 interactive devices and models, placed on fifteen tables which the students can play with their own hands. The exhibits were organized around various themes in mathematics, including shapes in nature, tiling and symmetries, filling spaces, graphs and connections, secret codes and cryptography etc. Some of the manipulative models illustrated the Pythagorean Theorem, the Square Drill, the Differential Gear, the Cradle Pinball Device, Tri-cycle with square wheels etc. The expo was aimed to be interactive and entertaining at the same time. More than 30,000 students and teachers from hundreds of schools and educational institutes visited this math Exhibition.

5. CAPACITY BUILDING

5.1 TRAINING RECEIVED

- Dr. Mirza Habib Ali and Dr. Khalid Mahmood attended training course on Human Resource Planning & Economic Development at Pakistan Manpower Institute, Islamabad, from 29th October to 3rd November 2007.

5.2 CONFERENCES/WORKSHOPS AND SEMINARS ATTENDED

- Dr. Muhammad Rashid Awan, Director General, Pakistan Museum of Natural History attended the Brainstorming Session of the Workshop on Taxonomy organized by the Directorate of Science and Technology, NWFP, on 29 th February, 2008
- Dr. Khalid Mahmood, Associate Curator, Zoological Sciences Division, attended a workshop on Farmers Open Day at Barani Agricultural Research Institute, Chakwal, on 24 th March, 2008.
- Ms. Nageen Ainudin, Director, Ms. Kausar Sohail, Sr. Bibliographic Officer and Syed Aftab Hussain Shah, SIO attended the workshop on "Promoting University-Industry Relationship through Technology Incubation" organized by NUST and HEC on September 12, 2007 at HEC.
- Mr. Mohammad Aqil Khan, Additional Director Doc. attended the meeting organized by IPO Pakistan on "Second Phase of the EU-TRTA Programme for Pakistan" on 22nd May 2008 at IPO head quarter Islamabad.
- Mr. Mohammad Aqil Khan, Additional Director Doc. attended a National Workshop on "Science and Technology Statistics: International Practices and their Applications" from 15th to 16th April, 2008 at PCST Islamabad.
- Dr. Shaheen Shahzad, Chief Editor attended a Training Workshop on "E-Commerce for Beginners" from 21-26, Jan 2008 at Pakistan Manpower Institute Islamabad.
- Syed Habib Akhter Jaffri, Senior Librarian and Mr. Obaid Anwar, Bibliographic Officer attended the course of "Library Management Skills" from 04-09 Feb, 2008 at AHK National Centre for Rural Development, Chak Shahzad, Islamabad.
- Syed Asif Ali Shah, Scientific Information Officer participated in a Training Workshop on "Office Automation with MS-Office" from 18-23 Feb, 2008 at Pakistan Manpower Institute Islamabad.
- Mr. Saifullah Azim, Senior System Analyst and Mr. Naveed Noor, System Analyst, completed Semester Study and Research work from 18th Nov to 23rd Dec, 2007 in the field of Data Mining at French Universities of Cergy Pontoise-Paris, LIRRM-Montpellier and LG12P Ecole des Mines d'Ales-Nimes, France.

- Dr. Saima Tanveer, Sr. Scientific Information Officer attended a WIPO National Seminar on "Legal Options and Flexibilities under the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement) from 27-28 Nov, 2007 organized by the World Intellectual Property Organization (WIPO) in collaboration with Intellectual Property Organization Pakistan (IPO- Pakistan).

- Mr. Saifullah Azim, Sr. System Analyst and Mr. Javed Mukhtar, MTI participated in one day Training Workshop on "Agriculture Decision Support System (ADSS)" on 28th May 2008 at FAST-NU Islamabad.

5.3 LECTURES DELIVERED

Dr N.M. Butt, S.I., Chairman, PSF, delivered the following lectures:

1. Lecture on **"Nanotechnology and its Wonders"** in the Department of Physics, Quaid-i-Azam University, Islamabad. July 20, 2007

2. Lecture on **"Nanotechnology and its Current Status"** in the Auditorium of Pakistan Academy of Sciences July 31, 2007

3. Lecture on **"Nanotechnology and Diffraction from Materials"** presented at National Workshop on Crystal Structure Determination using Powder X-Ray Methods, 15-17 August 2007, Center for Solid State Physics, Punjab University Lahore August 15, 2007

4. Lecture on **"Overview of Nanobiotechnology and Biotechnology in Pakistan"** in the Inaugural ceremony of Nanobiotech seminar at NIBGE, Faisalabad on 10.9.2007

5. Presented a paper in the 4th International Congress of Nanotechnology ICNT-2007, San Francisco, USA. From Nov 5-7, 2007

6. Presented a paper in the "Asia-Pacific Regional Forum for Popularization of Science-Fostering Role of Science Centres and Science Museums, Seoul" Republic of Korea from Nov 15-17, 2007.

7. Lecture on **"Nano-technology in Physics"** in Bio- Physics Department at CIIT Chakshahzad Campus, Islamabad on Nov 29, 2007

8. Lecture on **"Nanotechnology & Medicine"** at the Sir Syed Memorial Society, Islamabad on Dec 8, 2007.

9. Attended & presented a paper in the "International Seminar on "North-South Dialogue **on "Migration and Development"** from Dec 29-31, 2007 in Cairo, Egypt from Dec 29-31, 2007

10. Attended Two Days Regional Workshop on "Nanotechnology" and also delivered a lecture on **"Nanotechnology and its Current Status** organized by Sultan Qaboos University in Oman from 13-14 Jan, 2008

11. Lecture on **"Nano Technology and its Applications in the Labour Market"** in the "Regional Experts Meeting in the Field of University Scientific Research and the Labour Market" in the Hotel Margala, Islamabad on Feb 25, 2008

12. Lecture on **"Overview of Nanomedicine"** in the International Workshop on" Nanomedicine" in the COMSTECH Auditorium from March 13-16, 2008.

13. Lecture on **"Nano-technology for Quality and Standards for Consumer Goods"** in the 4th National Conference on "Lack of Consumer Protection in Pakistan" organized by Helpline Trust at Avari Towers Hotel, Karachi on March 15, 2008

14. Lecture on **"Applications of Nanotechnology in Agriculture"** at Hotel Holiday Inn, Islamabad arranged by National Commission of Biotechnology Institute on March 18, 2008.

15. Lecture on **"Nanotechnology and Why for Developing Countries"** in the 2-Days Workshop on Nano-Science and Catalysis, Quaid-i-Azam University, Islamabad. On March 24, 2008.

16. Lecture on **"Nanotechnology and Livestock"** International Livestock and Poultry Congress 2008, Awain-e-Iqbal, **Lahore,** April 22, 2008

17. Lecture on "**An Overview of Nanotechnology"** Workshop on Nanomaterials and Regional Meeting of Nanomaterials Forum April 23, 2008, Peshawar

18. Lecture on **"Popularizing of Nanotechnology"** in PASTIC Seminar on 28th May, 2008.

19. Lecture on **"Nanotechnology and its Need for Pakistan"** in the 2-Days Seminar/Workshop on Topics in Semiconductor Materials and Nanodevices at Islamia University at Bahwapur from 2-3 June, 2008.

20. Lecture on **"Nanotechnology and its Activities in Pakistan"** Physics Department, Bahauddin Zakaria University, Multan on June 4, 2008.

21. Lecture on **"An Overview of Nanotechnology"** at PINSTECH on 11th June, 2008.

22. Lecture on **"Mission and Role of Pakistan Science Foundation"** at Military College of Signals, Rawalpindi Cantt. on 17th June,2008

ORGANISATION
&
ADMINISTRATION

CHAPTER-2

ORGANIZATION AND ADMINISTRATION

The organizational structure of Pakistan Science Foundation, Pakistan Museum of Natural History & Pakistan Scientific & Technological Information Centre is given in the forthcoming pages. The staff position in the Foundation, PMNH and PASTIC during the report period is as under:

PAKISTAN SCIENCE FOUNDATION

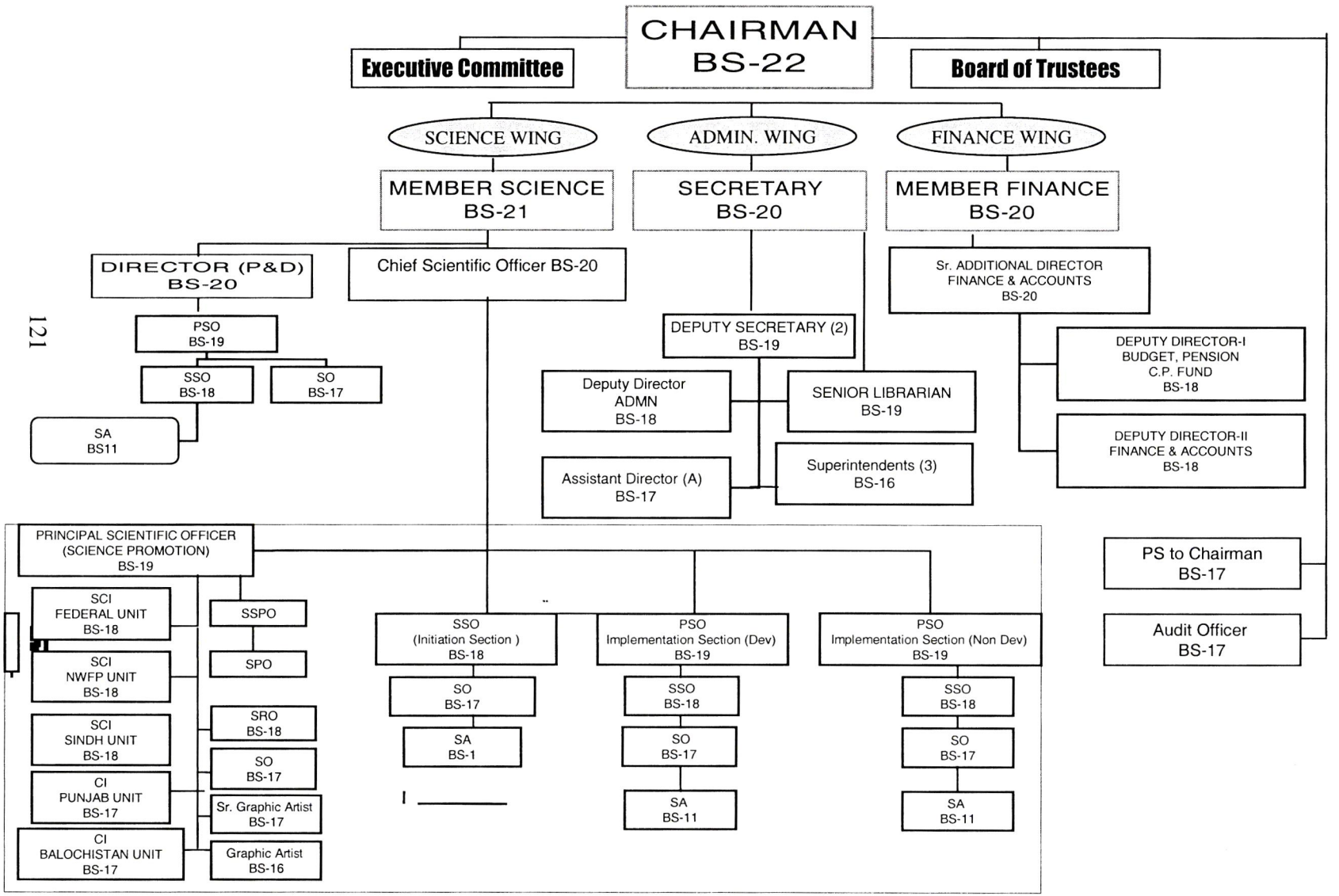
SANCTIONED STRENGTH OF PSF FOR THE FISCAL YEAR 2007-08 (AS PER NIS)

S. No.	Name of Post	BS	No. of Posts
1	Chairman	22	1
2.	Member Science	21	1
3.	Member Finance	20	1
4.	Secretary	20	1
5.	C.S.O.	20	1
6.	Director (P&D)	20	1
7.	Sr. Additional Director (F&A)	20	1
8.	PSO	19	4
9.	Deputy Secretary	19	1
10.	Sr. Librarian	19	1
11.	Deputy Director (F&A & Budget)	18	2
12.	Senior Research Officer	18	2
13.	Senior Scientific Officer	18	4
	Sr. Science Promotion Officer	18	1
14.	Deputy Director (Admn)	18	1
15.	Sr. Caravan Incharge	18	2
16.	Personal Secretary to Chairman	18	1
17.	Assistant Director (Admn)	17	2
18.	Caravan Incharge	17	3
19.	Internal Audit Officer	17	1
20.	Personal Secretary to C. S. O.	17	1
21	Liaison Officer	17	1
22.	Scientific Officer	17	6
23.	Sr. Graphic Artist	17	1
24.	Science Promotion Officer	17	1
25.	Accountants	16/17	4

26.	Superintendents	16	3
27.	Sr. Driver-Cum-Mechanic	16	2
28.	Sr. Caravan Assistant	16	4
29.	Graphic Artist	16	1
30.	Mechanic for Instruments	16	1
31.	Assistant Research Officer	16	1
32.	PA to Chairman & Director (P&D)	16	2
		Sub Total:-	**60**
33	Stenographer	15	6
34	Caravan Assistant	14	11
35	Photographer	14	1
36	Stenotypist	12/14	5
37	Asstt:/A.A.A./Cashier	11	5
38	Planetarium Assistant	11/15	5
39	Science Assistant	14	5
40	Technical Assistant	14	1
41	Caligrapher	11	1
42	Driver-Cum-Mechanic	11	3
43	Sr. Electrition	11	1
44	Carpenter	9	1
45	U. D. C.	7	4
46	Telex Operator	7	1
47	LDC/Typist/Telephone Operator	5/7	12
48	Driver/D. R.	4	14
49	D. M. O.	4	1
50	Mali	1/2	2
51	N/Quasid/Quasid	1/2/3	19
52.	Guards	1/2/3	15
53.	Caravan Attendant	1/2	5
54.	Sanitary Worker	1/2	4
		Sub Total:	**122**
		Grand Total:	**182**

ORGANIZATIONAL CHART
2007-08

PAKISTAN SCIENCE FOUNDATION



PAKISTAN MUSEUM OF NATURAL HISTORY

SANCTIONED STRENGTH FOR THE FISCAL YEAR 2007-08 (AS PER NIS)

Sr. No	Name of Post	BPS	No. of Post
1.	Director General	21	1
2.	Director	20	4
3.	Sr. Operational Manager	20	1
4.	Curator	19	8
5.	Additional Director (Admin)	19	1
6.	Associate Curator	18	6
7.	Exhibit Designer	18	1
8.	Assistant Director (Admin)	17	1
9.	Assistant director (Accounts)	17	1
10.	Research Associate	17	16
11.	Graphic Designer	17	1
12.	Sr. Taxidermist	17	1
13.	System Analyst	17	1
14.	Assistant Research Associate	16	2
15.	P.A. to the Director General	16	1
16.	Associate Artist	16	1
17.	Teacher Guide	16	1
18.	Children Education Programmer	16	1
19.	Sr. Photographer	16	1
20.	Accountant	16	2
21.	Assistant Librarian	16	1
22.	Taxidermist	16	1
23.	Superintendent	16	1
24.	Sr. Modeler	16	1
25.	Casting Staff	16	1
26.	Fossil Technician	16	1
	TOTAL		**58**
	Supporting Staff		**78**
	GRAND TOTAL		**136**

PAKISTAN MUSEUM OF NATURAL HISTORY

EXISTING ORGANIZATIONAL CHART

CHAIRMAN PSF
BPS-22

DIRECTOR GENERAL
BPS-21

EARTH SCIENCES DIVISION	BOTANICAL SCIENCES DIVISION	ZOOLOGICAL SCIENCES DIVISION	ADMINISTRATIVE SERVICES DIVISION	PUBLIC SERVICES DIVISION	
Director BPS-20 (1)	Director BPS-20 (1)	Director BPS-20 (1)	Deputy Director BPS-18 (1)	Director BPS-20 (1)	
Curator BPS-19 (3)	Senior Curator BPS-20 (1)	Curator BPS-19 (1)	Assistant Director BPS-17 (3)	Operational Manager BPS-19 (1)	INFORMATION TECHNOLOGY SECTION
Associate Curator BPS-18 (2)	Curator BPS-19 (1)	Associate Curator BPS-18 (3)		Exhibit Designer BPS-18 (1)	Manager BGN Database/Web Associate Curator ESD (1)
Research Associate BPS-17 (4)	Associate Curator BPS-18 (4)	Senior Taxidermist BPS-17 (1)		Graphic Designer BPS-17 (1)	System Analyst BPS-17 (1)
	Research Associate BPS-17 (4)	Research Associate BPS-17 (6)			

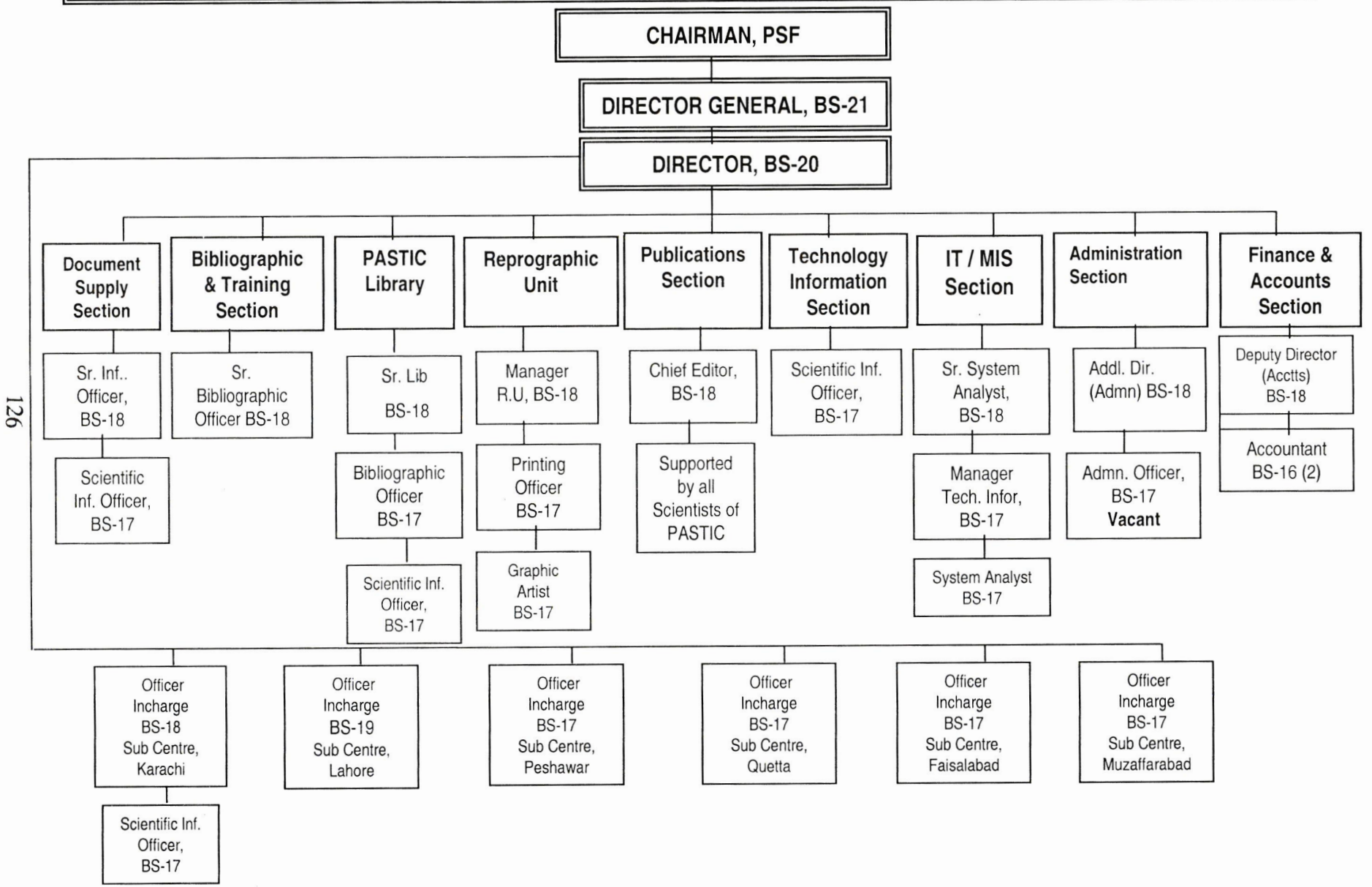
PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMATION CENTRE, ISLAMABAD

SANCTIONED STRENGTH FOR THE FISCAL YEAR 2007-08 (AS PER NIS)

S. No.	➢ Name of Post	BS	No. of Posts
1.	Director General	21	1
2.	Director	20	1
3.	Additional Director (A&F)	19	1
4.	Deputy Director (Doc)	19	1
5.	Chief Liaison Officer	18	2
6.	Sr. Bibliographic Officer	18	1
7.	Manager Reprographic Unit	18	1
8.	Sr. System Analyst.	18	1
9.	Sr. Documentation Officer	18	1
10.	Sr. Information Officer.	18	1
11.	Sr. Librarian.	18	1
12.	Sr. Scientific Information Officer	18	1
13.	Chief Editor.	18	1
14.	Assistant Director (Accounts)	17	1
15.	Scientific Information Officer	17	8
16.	Bibliographic Officer.	17	2
17.	System Analyst	17	2
18.	Manager Technology Information.	17	1
19.	Printing Officer	17	1
20.	Graphic Artist	17	1
21.	Assistant Director (Admn)	17	1
22.	Asstt Accounts Officer	16	1
23.	PA to Director General.	16	1

24.	Superintendent (Reprographic Unit)	16	1
25.	Superintendent (Admn)	16	1
26.	Asstt. Scientific Information Officer	16	3
27.	Asstt. Documentation Officer.	16	2
28.	Asstt: Programmer.	16	3
29.	Asstt. Manager Reprographic Unit	16	1
30.	Asstt. Printing Officer	16	3
31	Accountant	16	1
		Total:	**48**
	Supporting Staff		**110**
	Grand Total		**158**

Pakistan Scientific & Technological Information Center (PASTIC)
Organizational Chart



AUDITOR'S REPORT

CHAPTER – 3

PAKISTAN SCIENCE FOUNDATION
FINANCIAL STATEMENTS
JUNE 30, 2008

Amir Alam Khan & Co.
Chartered Accountants
55/1, Bank Road, Rawalpindi
Tele: 5563483, 5563256
Fax : 5517358
E-mail: aakco@brain.net.pk

AUDITORS' REPORT TO THE MEMBERS

We have audited the annexed balance sheet of **PAKISTAN SCIENCE FOUNDATION** as at June 30, 2008 and the related income and expenditure account and cash flow statement together with notes forming part thereof (here-in-after referred to as financial statements) for the year then ended, and we state that we have obtained all the information and explanations which, to the best of our knowledge and belief, were necessary for the purposes of our audit

It is the responsibility of the management to establish and maintain a system of internal control, and prepare and present the financial statements in conformity with the approved accounting standards as applicable in Pakistan. Our responsibility is to express an opinion on theses financial statements based on our audit

We conducted our audit in accordance with the auditing standards as applicable in Pakistan Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatements. An audit includes examining, on a test basis, evidence supporting the amount and disclosures in the financial statements. An audit also includes assessing the accounting policies used and significant estimates made by management, as well as, evaluating the overall presentation of the financial statements. We believe that our audit provides a reasonable basis for our opinion and after due verification, we report that;

In our opinion and to the best of our information and according to the explanation given to us, these financial statements give the information as required and present fairly in all material respects the financial position of the **PAKISTAN SCIENCE FOUNDATION** as at June 30, 2008 and of its (deficit) and cash flow for the year then ended in accordance with the approved accounting standards as applicable in Pakistan.

(Amir Alam Khan & Co.)
Chartered Accountants

Rawalpindi,

30-03-09

PAKISTAN SCIENCE FOUNDATION
BALANCE SHEET AS AT JUNE 30, 2008

	Note	2008 (Rupees)	2007 (Rupees)
FUNDS			
General fund	3	24,819,941	25,538,679
Development fund	4	17,523,331	14,620,787
Expo fund	5	-	889,916
Fair fund	6	236,727	233,916
Nobel fund	7	-	20,993
Miscellaneous funds	8	1,194,387	1,273,892
		43,774,386	42,578,183
NON-CURRENT LIABILITIES			
Research support grant - Contra		88,399,170	85,515,816
CURRENT LIABILITIES			
Accrued and other liabilities	9	30,300	351,395
		132,203,856	128,445,394
NON-CURRENT ASSETS			
Property, plant and equipment	10	39,754,381	37,050,058
Long term deposits	11	1,617,195	1,617,195
Research projects in progress - Contra	12	88,399,170	85,515,816
		129,770,746	124,183,069
CURRENT ASSETS			
Advances	13	663,569	1,410,996
Cash and bank balances	14	1,769,541	2,851,329
		2,433,110	4,262,325
		132,203,856	128,445,394

The annexed notes form an integral part of these financial statements.

Islamabad,
28-03-09

TRUSTEE

CHAIRMAN

PAKISTAN SCIENCE FOUNDATION
INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED JUNE 30, 2008

	Note	2008 (Rupees)	2007 (Rupees)
INCOME			
GRANT FROM FEDERAL GOVERNMENT		**87,153,000**	85,000,000
OTHER INCOME		**-**	24,731
		87,153,000	85,024,731
EXPENDITURES			
STATUTORY SCIENTIFIC FUNCTIONS	15	**(36,794,293)**	(32,734,453)
ADMINISTRATIVE EXPENSES	16	**(51,028,411)**	(47,999,701)
PRIOR YEAR ADJUSTMENTS	17	**(49,034)**	(616,950)
SURPLUS/(DEFICIT) OF INCOME OVER EXPENDITURE TRANSFERRED TO GENERAL FUND		**(718,738)**	3,673,627

The annexed notes form an integral part of these financial statements.

Islamabad,
[illegible]-09

28/3/09
TRUSTEE

28/3/09
CHAIRMAN

PAKISTAN SCIENCE FOUNDATION
CASH FLOW STATEMENT
FOR THE YEAR ENDED JUNE 30, 2008

	2008 (Rupees)	2007 (Rupees)
CASH FLOWS FROM OPERATING ACTIVITIES		
Surplus/(deficit) for the year	(718,738)	3,673,627
Adjustments for non cash charges:		
Depreciation	5,111,114	4,683,983
Loss on sale of vehicles	4,369	-
Prior year adjustment	-	746,123
Surplus/(deficit) before working capital changes	4,396,745	9,103,733
Working capital changes		
(Increase)/ Decrease in current assets:		-
Advances	747,427	(565,930)
Increase/ (Decrease) in current liabilities:		
Accrued and other liabilities	(321,096)	114,751
Net working capital charges	426,331	(451,179)
Net cash generated from operating activities	4,823,076	8,652,554
CASH FLOWS FROM INVESTING ACTIVITIES		
Property, plant and equipment	(7,819,804)	(10,994,929)
Net cash used in investing activities	(7,819,804)	(10,994,929)
CASH FLOWS FROM FINANCING ACTIVITIES		
Development fund	2,902,543	2,497,467
Expo fund	(889,916)	889,916
Fair fund	2,811	233,916
bel fund	(20,993)	20,993
Miscellaneous funds	(79,505)	431,156
Net cash from financing activities	1,914,940	4,073,448
NET (DECREASE)/ INCREASE IN CASH AND CASH EQUIVALENTS	(1,081,788)	1,731,073
CASH AND CASH EQUIVALENTS AT BEGINNING OF THE YEAR	2,851,329	1,120,256
CASH AND CASH EQUIVALENTS AT END OF THE YEAR	1,769,541	2,851,329

The annexed notes form an integral part of these financial statements.

Islamabad,
28 - 03 - 09

TRUSTEE

CHAIRMAN

PAKISTAN SCIENCE FOUNDATION
NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED JUNE 30, 2008

1. THE FOUNDATION AND ITS OPERATIONS

Pakistan Science Foundation is a statutory organization established under Pakistan Science Foundation Act, 1973 on February 02, 1973. The main objects are to promote and finance scientific activities having a bearing on the socio-economic needs of the country.

2. SIGNIFICANT ACCOUNTING POLICIES

The principal accounting policies which have been adopted in the preparation of these financial statements are summarized as under:

2.1 ACCOUNTING CONVENTION

These financial statements have been prepared under the historical cost convention.

2.2 BASIS OF PREPARATION

These financial statements have been prepared under cash receipt and payment method of accounting.

2.3 PROPERTY, PLANT AND EQUIPMENT

These are stated at cost less accumulated depreciation except leasehold land, which is stated at cost. Depreciation is charged on reducing balance method of written down values depending upon the class of property, plant and equipment. Full year's depreciation is charged on additions while no depreciation is charged on deletions during the year.

Normal repairs and maintenance are charged to income as and when incurred. Major renewals and improvements are capitalized. Gain on disposal of property, plant and equipment is taken to income and expenditure account.

		2008 (Rupees)	2007 (Rupees)
3. GENERAL FUND			
Opening balance		**25,538,679**	21,865,052
Surplus/ (Deficit) for the year		**(718,738)**	3,673,627
		24,819,941	25,538,679
4. DEVELOPMENT FUND			
Opening balance		**14,620,787**	12,123,320
Grants received during the year	4.1	**14,767,000**	26,450,000
		29,387,787	38,573,320
Expenditure incurred during the year	4.2	**(11,864,456)**	(23,952,533)
		17,523,331	14,620,787
REPRESENTED BY:			
Property, plant and equipment		**17,321,129**	14,418,585
Cash at banks		**279,463**	287,063
Prior year adjustment		**(77,261)**	(84,861)
		17,523,331	14,620,787

			2008 (Rupees)	2007 (Rupees)
4.1	**DEVELOPMENT PROJECT GRANTS RECEIVED**			
	Financial support for scientific societies		-	9,500,000
	Participation of scientists and technologists in conferences		**5,975,000**	6,000,000
	Funding of scientific research in universities and other organizatio		-	5,950,000
	Automation of PSF research support program and other activities		**8,792,000**	5,000,000
			14,767,000	26,450,000
4.2	**DEVELOPMENT PROJECT EXPENDITURES**			
	TA/DA and evaluation fee		**3,165,868**	1,577,679
	Financial support of societies		-	9,458,771
	Grants for research		-	4,558,897
	Registration fee		**701,022**	547,627
	Postage and stationery		**213,380**	215,866
	Advertisement		-	426,572
	Depreciation	10 1	**3,224,446**	2,789,766
	Staff salary		**1,411,054**	-
	Miscellaneous		**482,111**	72,544
	Amount surrendered to FTO/ Treasury		**1,112,438**	3,576,968
	Living expenses		**1,468,687**	727,843
	Software		**85,450**	-
			11,864,456	23,952,533
5.	**EXPO FUND**			
	Opening balance		**889,916**	-
	Grants received during the year		-	12,837,610
			889,916	12,837,610
	Expenditure incurred during the year		**(889,916)**	(11,947,694)
			-	889,916
	REPRESENTED BY:			
	EXPO 2006 current a/c # 257-42		-	889,916
			-	889,916
6.	**FAIR FUND**			
	Opening balance		**233,916**	-
	Grants received during the year		**2,811**	8,130
	Prior year adjustment		-	225,786
			236,727	233,916
	Expenditure incurred during the year		-	-
			236,727	233,916
	REPRESENTED BY:			
	Fair saving a/c # 13459-1		**236,727**	233,916
			236,727	233,916

		2008 (Rupees)	2007 (Rupees)
7.	**NOBEL FUND**		
	Opening balance	**20,993**	-
	Grants received during the year	**-**	1,000,000
		20,993	1,000,000
	Expenditure incurred during the year	**(20,993)**	(979,007)
		-	20,993
	REPRESENT BY:		
	Nobel current a/c # 484-03	**-**	20,993
		-	20,993
8.	**MISCELLANEOUS FUNDS**		
	Opening balance		
	Endowment	**210,767**	415,321
	UNESCO	**1,005,238**	299,168
	World Science Day	**57,887**	15,979
		1,273,892	730,468
	Grants received during the year		
	Endowment	**13,008**	16,601
	UNESCO	**245,920**	1,102,796
	World Science Day	**60,488**	60,479
		319,416	1,179,876
	Expenditure incurred during the year		
	Endowment	**(30,763)**	(221,155)
	UNESCO	**(249,783)**	(396,726)
	World Science Day	**(118,375)**	(18,571)
		(398,921)	(636,452)
	Closing balance		
	Endowment	**193,012**	210,767
	UNESCO	**1,001,375**	1,005,238
	World Science Day	**-**	57,887
		1,194,387	1,273,892
	REPRESENT BY:		
	Misc. fund saving a/c # 840-09	**1,194,387**	1,273,892
		1,194,387	1,273,892
9.	**ACCRUED AND OTHER LIABILITIES**		
	Accrued expenses	**-**	301,095
	Audit fee	**-**	20,000
	Security deposits payable	**30,300**	30,300
		30,300	351,395

10. PROPERTY, PLANT AND EQUIPMENT

PARTICULARS	COST			RATE	DEPRECIATION				W.D.V
	AS AT JULY 01, 2007	ADDITIONS	AS AT JUNE 30, 2008		AS AT JULY 01, 2007	ADJUSTMENT	FOR THE YEAR	AS AT JUNE 30, 2008	AS AT JUNE 30 2008
Land Leasehold	3 713 418		3 713 418						3 713 418
Building	19 484 540		19 484 540	5%	8 955 872		526 433	9 482 305	10 002 235
Motor vehicles	5 692 515	1 373 692	[illegible]	20%	[illegible]	-	435 [illegible]46	[illegible]	[illegible] 015
		(417 200)				(412 831)			
Office equipment	4 675 442	177 000	4 852 442	15%	3,309,826		231 392	3 541 218	1,311 224
Science equipment	6 558 040		6 558 040	15%	2 745 041		571 800	3 317 841	3,240,199
Furniture and fixture	2 343 893	89,206	2 423 099	5%	1,272 718		69 022	1 341 740	1,081 349
Air conditioners	194 974	-	194 974	20%	192 568		481	193 049	1,925
Library books and others	1 616 763	52 916	1 669 679	5%	709,798		47,994	757 792	911 887
2008 - Rupees	**43 675,575**	**1,692,814**	**44 951,189**		**21 044,100**	**-**	**1,886,668**	**22,517,937**	**22,433,252**
		(417 200)				**(412 831)**			
2007 - Rupees	37 967 879	5 707,696	43 675 575		9,149 485		1,934 217	21,044,102	22 631 473
DEVELOPMENT PROJECTS									
Motor vehicles	6 494 293		6 494 293	20%	4 059,677		486 923	4 546 600	1,947 693
Office equipments	18 952 193	5,998 150	24 950 360	15%	7 449 201	-	2 624 277	10 073 478	14,876 882
Computer equipments	1 300 068		1 300,068	15%	1 017 480		93 254	1 110,734	189 334
Furniture and fixtures	253 107	128 800	381 907	6%	48 715		19 992	68 707	313 200
2008 - Rupees	**26,999,658**	**6,126,990**	**33,126,648**		**12,581,073**	**-**	**3,224,446**	**15,805,519**	**17,321,129**
2007 - Rupees	21,712 425	5,287 233	26,999 658		9 791 307	-	2 789,766	12,581,073	14,418 585
2008 - Rupees Consolidated	**70 675,233**	**7,819,804**	**78,077,837**		**33,625,173**	**-**	**5,111,114**	**38,323,456**	**39,754,381**
2007 - Rupees Consolidated	**59 687 304**	**10,994 929**	**70,675,233**		**28 941 152**	**-**	**4 683 983**	**32 625 175**	**37 050 058**

	2008 (Rupees)	2007 (Rupees)
10.1 DEPRECIATION ALLOCATION		
Development projects	**3,224,446**	2,789,766
Administrative expenses	**1,886,668**	1,894,217
	5,111,114	4,683.983

11. LONG TERM DEPOSITS

	2008 (Rupees)	2007 (Rupees)
Electricity	**1,472,195**	1,472,195
Gas	**145,000**	145,000
	1,617,195	1,617,195

12. RESEARCH PROJECTS IN PROGRESS

	Note	2008 (Rupees)	2007 (Rupees)
Opening balance		**85,515,816**	69,862,611
Add. Disbursements during the year	12.1	**20,765,079**	19,088,422
		106,280,895	88,951,033
Less: Projects completed during the year	12.2	**(17,156,846)**	(2,809,025)
Expenses for projects	12.3	**(724,879)**	(626,192)
		(17,881,725)	(3,435,217)
		88,399,170	85,515,816

	2008 (Rupees)	2007 (Rupees)
12.1 DISBURSEMENTS DURING THE YEAR		
Institutional support	-	300,000
Biotech sciences	**2,335,968**	4,603,336
Evaluation fee	**158,400**	148,800
Physics sciences	**2,032,975**	1,151,152
Chemical sciences	**2,632,433**	1,958,015
Biological sciences	**3,824,324**	4,046,282
Earth sciences	**659,856**	229,090
Environmental sciences	**2,567,739**	427,828
Engineering sciences	**1,927,307**	1,590,807
Agricultural sciences	**707,469**	626,414
Medical sciences	**2,875,540**	1,638,833
Board/Committee meetings	**566,479**	177,392
Utilization of results of research and transfer of technology and pilot plant study	**476,589**	2,190,473
	20,765,079	19,088,422
12.2 PROJECTS COMPLETED DURING THE YEAR		
Biotech sciences	**2,793,883**	2,809,025
Agricultural sciences	**3,971,367**	-
Chemical sciences	**3,208,066**	-
Earth sciences	**388,278**	-
Engineering	**1,367,153**	-
Environmental sciences	**1,310,001**	-
Physical sciences	**2,578,451**	-
Natural gas pipelines integrity	**1,539,647**	-
	17,156,846	2,809,025
12.3 EXPENSES FOR PROJECTS		
Institutional support	-	300,000
Board/committee meetings	**566,479**	177,392
Evaluation fee	**158,400**	148,800
	724,879	626,192
13. ADVANCES		
Advances - staff		
For vehicles	**352,299**	150,000
For house rent	-	1,245,996
For cycle	**11,270**	15,000
To CMH Rawalpindi	**300,000**	-
	663,569	1,410,996

		2008 (Rupees)	2007 (Rupees)
14. CASH AND BANK BALANCES			
Cash in hand		**31,663**	30,325
Cash at bank - current account # 052-8		**27,301**	112,230
PSF development fund - current accounts		**279,463**	287,063
EXPO 2006 current a/c # 257-42		**-**	889,916
Fair saving a/c # 13459-1		**236,727**	233 916
Nobel current a/c # 484-03		**-**	20 993
Misc. fund saving a/c # 840-09		**1,194,387**	1,273,892
UNESCO coupons		**-**	2,994
		1,769,541	2,851,329

14 1 Bank balances are net-off un-presented stale cheques amounting to Rs.22,543,324. (2007 . Rs 1,115,408)

15. STATUTORY SCIENTIFIC FUNCTIONS			
Research support grant	12 1	**20,765,079**	19,088,422
Scientific societies and professional bodies		**2,296,413**	280,000
Scientific conferences. meetings and seminars		**1,001,000**	840,000
Operation of science caravan		**8,540,608**	7.026,795
Science promotion activities		**2,276,562**	1.828.183
Science fair		**1,278,171**	3,550.000
Awards, prizes and fellowship		**244,000**	72,000
Information, documentation, publication and library materials. subscription to international organization and UNESCO coupons		**117,904**	
Science centre herbaria planteria		**274,556**	49,053
		36,794,293	32.734.453

15.1 Advances for expenditures are charged to the current year's expenditures.

		2008 (Rupees)	2007 (Rupees)
16. ADMINISTRATIVE EXPENSES			
Salaries and other benefits		**35,388,710**	32,038,941
Traveling		**236,022**	328,192
House rent facility		**7,387,903**	5,194,957
Ground rent to CDA		**126,426**	1,333,745
Electricity, gas and water		**748,280**	1,419,483
Communication		**1,223,218**	1,477,423
Printing and stationery		**557,818**	388,120
Vehicle running and maintenance		**948,499**	1,540,607
Newspapers and magazines		**95,747**	89,007
Liveries and uniforms		**38,845**	62,550
Entertainment		**169,858**	157,750
Repair and maintenance		**829,771**	985,005
Audit fee		**-**	20,000
Professional charges		**106,660**	220,000
Staff welfare fund		**700,000**	300,000
Advertisement and publicity		**307,203**	460,449
Miscellaneous		**192,414**	89,255
Unforeseen expenses		**80,000**	-
Depreciation	10.1	**1,886,668**	1,894,217
Loss on sale of vehicles		**4,369**	-
		51,028,411	47,999,701

16.1 Advances for expenditures are charged to the current year's expenditures.

17. PRIOR YEAR ADJUSTMENTS		
Contingent expenses	**49,034**	(208,733)
Contingent liability funds	**-**	842,736
Other income	**-**	(17,053)
	49,034	616,950

OFF BALANCE SHEET ITEMS

The foundation has received a sum of Rs.500,000,000 as endowment fund from the Government of Pakistan. This sum being given exclusively for endowment has not been reflected in these financial statements. Similarly the corresponding investment of this fund and income earned thereon are also not reflected in these financial statements

19. DATE OF AUTHORIZATION FOR ISSUE

These financial statements have been authorized for issue on _____ by the Board of Trustees.

20. FIGURES

In these financial statements figures have been rounded off to the nearest rupee and of the previous year have been re-arranged and re-grouped wherever necessary to facilitate comparison

Islamabad,

TRUSTEE 28/3/09

CHAIRMAN 28/3/09

PAKISTAN S NCE FOUNDATION
STATEMENT OF DEVELOPMENT FUNDS RECEIPT AND PAYMENT
FOR THE YEAR ENDED JUNE 30, 2008.

	CGLS RUPEES	PRNCST RUPEES	PRPTCL RUPEES	TOTAL RUPEES
Opening balance B/F	1,080	235,863	50,120	287,063
Less: Expenses (prior year adjustment)	-	-	(7,600)	(7,600)
Closing balance	1,080	235,863	42,520	279,463

Islamabad.
28-05-09

TRUSTEE 28/3/09

CHAIRMAN 28/3/09

PAKISTAN SCIENCE FOUNDATION
STATEMENT OF STATUTORY SCIENCE FUNCTIONS FUNDS RECEIPT AND PAYMENT
FOR THE YEAR ENDED JUNE 30, 2008.

	PSF EXPO RUPEES	PSF FAIR RUPEES	PSFNL RUPEES	TOTAL RUPEES	MISCELLANEOUS A/C 840			
					FUND A/C RUPEES	UNESCO RUPEES	WSD RUPEES	TOTAL RUPEES
Opening balance B/F	889,916	233,916	20,993	1,144,825	210,767	1,005,238	57,887	1,273,892
Funds received during the year	-	2,811	-	2,811	13,008	245,920	60,488	319,416
FUNDS AVAILABLE DURING THE YEAR	**889,916**	**236,727**	**20,993**	**1,147,636**	**223,775**	**1,251,158**	**118,375**	**1,593,308**
PAYMENTS								
Functions/Meeting expense	-	-	-	-	27,918	-	21,653	49,571
Honorarium	-	-	-	-	-	-	-	-
Travelling and daily allowance	-	-	-	-	-	37,084	82,397	119,481
Printing and stationery	64,482	-	-	64,482	-	149,051	14,325	163,376
Advertisement	-	-	-	-	-	-	-	-
Vehicle running	-	-	-	-	-	43,375	-	43,375
Bank charges	-	-	-	-	-	273	-	273
Postage	-	-	-	-	-	10,000	-	10,000
Entertainment	20,287	-	-	20,287	-	10,000	-	10,000
Miscellaneous	-	-	-	-	-	-	-	-
Refunds to the donors	-	-	12,967	12,967	-	-	-	-
Prior year adjustments	805,147	-	8,026	813,173	2,845	-	-	2,845
	889,916	**-**	**20,993**	**910,909**	**30,763**	**249,783**	**118,375**	**398,921**
CLOSING BALANCE	**-**	**236,727**	**-**	**236,727**	**193,012**	**1,001,375**	**-**	**1,194,387**

Islamabad.

TRUSTEE 28/3/09

CHAIRMAN 28/3/09

PAKISTAN SCIENCE FOUNDATION
ACT-1973

Annexure-1

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 31st 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;

iv) 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 Presedent 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 Presidnednt 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.

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

(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

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 with in 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 alongwith the audited accounts of the Foundation.

(2) The annual report alongwith 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.

LIST OF PROJECTS APPROVED DURING 2007-08

Annexure -II

LIST OF PROJECTS APPROVED DURING THE YEAR 2007-2008

A: Non-Development Budget

S. No.	Project No.	Project title	Name & Address of PI	Sanctioned Cost (Rs.)
1.	C-PMNH/Bio (380)	Taxonomic and ethnobotanical studies of economically important plants of Potwar Plateau and the Galiat with reference to their trade.	Dr. Saleem Ahmad, Curator, Botanical Sciences Division, PMNH, Islamabad.	7,36,358/-
2.	P-UAAR/Bio (397)	Detection of multiple anthelmintic resistances of nematodes in small ruminants grazing in Barani Region.	Dr. Mazahar Qayyum Associate Professor, Dept. of Zoology, PMAS Arid Agriculture University, Rawalpindi.	12,08,700/-
3.	C-QU/Bio (402)	Study of the microbes and their role (ecological linkages) in moist temperate coniferous forests Ecozones in Murree hills range.	Prof. Dr. Asghari Bano, Dept. of Plant Sciences, Faculty of Biological Sciences, Quaid-I-Azam University, Islamabad.	10,59,780/
4.	F-AU/Bio (403)	Effect of sperm concentration, season and extenders on goat's semen integrity and fertility.	Prof. Dr. Subhan Qureshi, Chairman, Dept. of Livestock Management & Reproduction,NWFP Agricultural University, Peshawar	10,97,010/-
5.	P-PUF/Bio (408)	Preparation and characterization of legumes protein isolates to improve the nutritional and functional properties of baked products.	Dr. Masood Sadiq Butt, Associate Professor, National Institute of Food Sciences & Technology, University of Agriculture, Faisalabad.	10,03,680/-
6.	Biotech/C-IBGE/ Med (87)	Prevalence, molecular genetics and diagnosis of fragile X mental retardation in Pakistan.	Dr. Kehkashan Mazhar, PSO, Institute of Biomedical & Genetic Engg. KRL, Islamabad.	11,68,920/-

7.	S-HEJ/Chem (403)	Design synthesis and characterization of Þ-octiphenyloctacalix [4] arane a supramolecular multifunctional pore having practical applications in medicine and mechanics.	Dr. M. Raza Shah Assistant Professor International Center for Chemical Sciences HEJ Research Institute of Chemistry, University of Karachi, Karachi.	11,50,560/-
8.	P-PU/Chem (406)	Pilot scale production and quality evaluation of bio diesel from indigenous vegetable oil resources.	Dr. Farooq Anwar Assistant Professor Dept. of Chemistry University of Agriculture, Faisalabad.	6,18,120/-
9.	C-QU/Chem (408)	Molecularly designed precursors for the chemical vapor deposition of ceramic materials.	Prof. Dr. M. Mazhar, Dept. of Chemistry Quaid-I-Azam University, Islamabad.	9,23,100/-
10.	F-KUST/Chem (409)	Phytochemical investigation and biological activity of genus *Sonchus* with emphasis on biologically active constituents.	Dr. Javid Hussain Assistant Professor, Dept. of Chemistry Kohat University of Science & Technology, Kohat	10,12,860/-
11.	S/SU/Chem (411)	Capillary gas chromatographic determination of glyoxal, methylglyoxal and dimtethylglyoxal from biological fluids dn fermented food.	Prof. Dr. M. Y. Khuhawar Faculty of Natural Scineces, Dr. M. A. Kazi Instt. of Chemistry, Univerisity of Sindh, Jomshoro.	2,51,400/-
12.	S-KU/Earth (76)	Geological mineralogical and geochemical studies of China clay deposits of Nagar Parkar for their diversified and value added industrial application.	Prof. Dr. Viqar Husain, Department of Geology, University of Karachi, Karachi	8,89,440/-
13.	C-PMNH/Earth (79)	Biostratigraphic zonation and the economic significance of the Lockhart Limestone of Paleocene age in the Nammal, Nilawahan and Kalarwahan areas of salt range Pakistan.	Mr. Amir Yaseen, Research Associate, ESD, PMNH, Islamabad.	3,50,943/-

14.	C-PMNH/Earth (81)	Micro Facies and distribution of Datta formation in western salt range and Surghar range of the upper Indus Basin.	Mr. Khalid Mirani,Research Associate, PMNH, Islamabad.	3,82,979/-
15.	P-AU/Engg/(53)	Decision support system for better crop productivity and environmental quality.	Prof. dr. Allah Bakhsh, Dept. of Irrigation & Drainage, University of agriculture, Faisalabad.	3,21,000/-
16.	P-PCRWR/Engg (80)	Effect of land leveling on land use intensity, water use and water use and water application efficiencies.	Dr. Muhammad Ashraf, Chief Research (WM), PCRWR, Khyaban-e-	5,13,060/-
17.	P-PCRWR/Engg (81)	Water management practices fro major crops under drought.	Mr. Zia-ul-Haq, Director Research, Regional Office, PCRWR, Lahore.	1,42,800/-
18.	F-GIK/Engg (101)	Development of a GPS and sensors based mobile robot, a test bed for research in autonomous navigation and GPS applications.	Dr. Muhammad Asim Assistant Professor Faculty of Mechanical Engg. GIK Institute of Engg. Sciences & Technology, Topi, Sawabi.	7,80,300/-
19.	F-GIK/Engg.(102)	Design, fabrication and installation of photovoltaic system with load controller for the generation of 4-5 KW power.	Dr. Muhammad Abid Associate Professor Faculty of Mechanical Engg. GIK Institute of Engg. Sciences & Tech., Topi, Sawabi	3,77,400/-
20.	S-KU/Envr (78)	Biodiversity, systematics and ecology of free-living marine nematodes of Arabian Sea from Pakistan.	Dr. Nasira Kazi SO, national Nematological Research Center, University of Karachi, Karachi.	13,39,260/-
21.	S-PCSIR/Envr(86)	Hydrochemical studies and development of indigenous defluoridation technology for fluoride contaminated ground water in the Thar Desert, Pakistan.	Dr. Tanzil haider Usmani Director General, PCSIR Lab Complex, Karachi	16,47,300/-

22.	C-PINSTECH/Env (87)	Measurement of air borne radioactive pollutants (natural and fallout) in major cities of Pakistan.	Dr. Parveen Akhtar, Head, Health Physics Division, PINSTECH, Islamabad.	8,28,240/-
23.	P-GCU/Envr(89)	Comparative Study of Genotoxic Effects of Heavy Metals on Indian Major Carps by Bioassays in the Indus River.	Prof. Dr. Shahid Mahboob Rana Dean Faculty of Science & Technology G C University, Faisalabad	11,78,100/-
24.	S-AKU/Med (232)	Molecular epidemiology of AIDS in Pakistan.	Dr. Syed Ali, Assistant Professor, Dept. of Biological & Biomedical Sciences, The Aga Khan University, Karachi.	9,11,880/-
25.	S-ZMU/Med (238)	Association of interleukin 6, adiponectin and blood lipid levels in ischemic stroke patients.	Dr. Anita Jaleel, Dept. of Biochemistry, Ziauddin Medical University, ST-4/B, Block 6, Clifton, Karachi.	2,81,520/-
26.	S-AKU/Med(249)	Role of TFB2 (transcription factor-B2) in *Sulfolobus slofataricus* gene expression.	Dr. Sohail A. Qureshi, Associate Professor, Faculty of Health Sciences Medical College, The Aga Khan University, Karachi.	12,04,620/-
27.	C-QU/Med (255)	Effect of peripheral administration of puberty onset protein "Kisspeptin" on male sex hormones and spermatogenesis in prepubertal stages: an *in vitro* and *in vivo* investigation in laboratory rats.	Dr. Irfan Zia Qureshi Assistant Professor, Dept. of Animal Sciences, Quaid-i-Azam University, Islamabad.	19,76,760/-
28.	C-QU/Phy (134)	Measurements of photo ionization cross section of atom.	Dr. M. Aslam Baig (*S.I, T.I*), Dept. of Physics, Quaid-i-Azam University, Islamabad.	8,65,980/-

29.	P-COMSATS/Phy (135)	Fabrication and characterization of proton exchange membrane fuel (PEMFC).	Prof. Dr. M. Ashraf Chaudhry, Dept. of Physics, Bahauaddin Zakariya University, Multan.	8,51,700/-
30.	C-QU/Phy (136)	Investigation of the scope of plasma focus and radiation source for material processing surface treatment.	Dr. Muhammad Shafique Assistant Professor, Dept. of Physics, Quaid-i-Azam University, Islamabad	9,94,000/-
31.	C-QU/Phy (138)	Developing a proto-type processing reactor for plasma lonitriding of steels.	Prof. Dr. M. zakaullah, Dept. of Physics, Quaid-i-Azam University, Islamabad.	9,73,080/-
32.	C-PINSTECH/Phy (140)	Search for light magnetic monopoles (SLIM) using solid state nuclear track detector.	Dr. M. Ikram Shahzad, Principal Scientist, Physics Division, PINSTECH, Nilore, Islamabad.	9,99,600/-
			Total:	2,80,40,450/- **28.040M**

B: NSLP Budget

S. No.	Project No.	Project title	Name & Address of PI	Sanctioned Cost (Rs.)
1.	PSF/NSLP/S-PARC(1)	Nematodes Associated with Almond (*Prunus amygdalus* Batsch) and Pomegranate *(Punica granatum* L.) and their Management using Oil-Cakes in Khuzdar and Kalat Districts.	Dr. Aly Khan, Director/Principal Scientific Officer, Crop Diseases Research Institute, Pakistan Agricultural Research Council, University of Karachi, Karachi	1347,216/-
2.	PSF/NSLP/P-BARI (4)	Production of Germplasm and Breeding Material of Wheat for Drought and Heat Tolerance.	Dr. Abid Mahmood, Director, Barani Agricultural Research Institute, Chakwal	1011,840/-
3.	PSF/NSLP/P-NIAB (14)	Insecticide Resistance Management of Lepidopteron Pests of Cotton.	Dr. Mushtaq Ahmad, Deputy Chief Scientist, Nuclear Institute for Agriculture & Biology (NIAB), Faisalabad	1724,616/-

4.	PSF/NSLP/P-NIBGE (19)	Exploration of Cotton Germplasm Potential Against Drought Stress Using Genomic Approaches.	Dr. Mehboob ur Rehman, Group Leader, Plant Genomics & Molecular Breeding Labs, National Institute for Biotechnology & Genetic Engineering, Faisalabad	2,000,000/- (additional amount of Rs.80,596/- be obtained by P.I. from his parent department
5.	PSF/NSLP/F-AU (25)	Quantification of Economic Gain from Chickpea Crop Sown on Irrigated Fields in Southern NWFP & Its Implication for Agricultural Extension.	Dr. Khalid Nawab, Associate Professor, Extension Education & Communication, NWFP Agricultural University, Peshawar	839,256/-
6.	PSF/NSLP/C-NARC (28)	Identification of Genes for Resistance to Bacterial Blight (*Xanthomonas oryzae* pv. Oryze) in Rice *Oryza sativa* and in Other Wild Species of the Genus *Oryza.*	Dr. Fida Muhammad Abbasi, Senior Scientific Officer, National Agricultural Research Centre, Park Road, Islamabad	878,016/-
7.	PSF/NSLP/C-NARC (30)	Aflatoxin Contamination in Rice.	Mr. Rauf Ahmad, Senior Scientific Officer, Rice Programme, CSI, National Agricultural Research Centre, Park Road, Islamabad	1889,856/-
8.	PSF/NSLP/P-UAA (35)	Identification of Chemically Defined Extenders for Cryopreservation of Buffalo Bull Spermatozoa.	Dr. Shamim Akhter, Assistant Professor, Department of Zoology Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi	1368,636/-
9.	PSF/NSLP/S-SAU (40)	Assessment of Pesticide Residues form Selected Vegetables through Traditional Processing.	Prof. Dr. Saghir Ahmed Sheikh, Department of Food Technology, Sindh Agriculture University, Tandojam	2,000,000/- (The additional amount of Rs.81,616/- be obtained by P.I. from his parent department)
			Total:	**13,059,436/- 13.059 Million**

DETAILS OF MONITORING AND EVALUATION OF ON-GOING PROJECTS DURING 2007-08

Annexure -III

DETAILS OF MONITORING AND EVALUATION OF ON-GOING PROJECTS DURING 2007-08

a. Semi-annual Reports

S. No	Project No.	Project Title	Reports
1.	F-NIFA/Agr (310)	Effect of mineral and organic nitrogen yield nitrogen deciduous palm fruit orchards	1st
2.	P-AU/Agr (316)	Survey, biology and integrated control measures of citrus slow decline and spreading decline of (Litchi chinesis Sonn) in Punjab	2nd
3.	P-AU/Agr (318)	An efficient and economic means of enhancing wheat yield under water deficit conditions: use of osmoprotectants	2nd
4.	P-AU/Agr (319)	Potential use of Co_2 as foliar fertilizer for wheat yield enhancement under salt stress strategies for the future	1st
5.	S-PCSIR/Bio (221)	Preparation of products of economic importance (Chitin & Chitosan) from shellfish waste.	1st
6.	F-NIFA/Bio (141)	Mushroom cultivation and popularization as cottage industry in NWFP, Pakistan.	1st
7.	P-AU/Bio (355)	Pharmacological evaluation of two anti-hyperlipidaemic indigenous medicinal plants in albino rabbits and determination of their mechanisms of action.	1st
8.	P-AU/Bio (356)	Surveillance and pathogenicity of chickens.	1st
9.	S-AKU/Bio (365)	Role of testosterone and cytokines interactions in fertility regulation.	1st
10.	P-AU/Bio (350)	Development, standardization and evaluation of probiotics in poultry.	1st
11.	S-SU/Bio (287)	Formulation of low cost quality fish feed from indigenous raw material and its effects on growth and survival of major carps.	1st
12.	S-KU/Bio(360)	Hatchery culture of commercially important oysters.	1st

13.	S-AKU/Bio (377)	Studies on effects of indigenous medicinal plants on hypercholesterolemia, hypertension and endothelial dysfunction.	1st
14.	F-NIFA/Bio (141)	Mushroom cultivation and popularization as cottage industry in NWFP, Pakistan.	2nd
15.	S-KU/Bio (342)	Biology of edible crabs (Portunus pelagicus and P. sanuinolentus) occurring in the coastal waters of Karachi.	2nd
16.	P-AU/Bio (352)	Molecular epidemiology and immunohistochemistry of Enteropathogenic Escherichaia coli (EPEC) in bovine and human neonates.	2nd
17.	Biotech/P-NIAB/Agr (44)	Characterization of Pakistani Wheat Varieties by Microsatellite Markers	2nd
18.	Biotech /P-NIBGE/Ind (47)	Development of Hyper Producer Cephalosporin C Producing Strain of Acremonitun Chrysogum by RNA Interference Technique"	2nd
19.	Biotech /P-NIBGE/ Med (50)	Detection of Y Chromosome Micro deletions Associated with Infertility in Different Geographic/ Ethnic Groups In Pakistan.	2nd
20.	Biotech /P-NIBGE/Agr (52)	Bacteriocin Production & its Role in Competition in Rhizobial Inoculants from a Sustainable Agriculture Perspective.	2nd
21.	Biotech/P-NIBGE/MED (58)	Cloning expression & characterization of INGAP encoded gene: A rospective means of Amelioration of Diabetes.	1st
22.	Biotech/P-NIBGE/Med (76)	Studies on genetics & Mutations of low density lipoprotein receptor gene (LDLR); Implication in diagnosis, prognosis, treatment & management of familial hypercholesterolemia in Pakistan	1st
23.	Biotech/ S-KU/Med (80)	Production of monoclonal antibodies for rapid diagnosis of hepatitis-C	1st
24.	R&D/C-QU/Chem (270)	Studies of Vanadium-Organic Ligand Systems Containing Peptide Linkage: Synthesis Structural Elucidation and Biological Applications.	1st
25.	C-QU/Chem (395)	Stereo-Selective Total Synthesis of Some Antimalarial, Antituberculous Antifungal	1st

		and Cytotoxic Dihydroisocoumarin Metabolites.	
26.	P- PCRWR/Engg(80)	Effect of Land Leveling on Land Use Intensity, Water Use and Water Application Efficiencies.	1st
27.	C-PINSTECH/Engg(66)	Groundwater Flow and Containment Transport Modeling and Assessment of Potable Groundwater Quality of Lahore Aquifer.	1st
28.	F-UET/Engg (87)	Design and Development of Sugarcane Planter for Small and Medium Land Holders of Pakistan.	2nd
29.	S-PCRWR/Engg(184)	Crop Response under Different Water Management Strategies in Irrigated areas of Sindh.	2nd
30.	F-NIFA/Engg(216)	Design and Fabrication of a Laboratory Size Screw Extruder for Conversion of Agro-based Materials into Value added Food and Feed Products.	1st
31.	P-KRL/Engg(284)	Synthesis and Characterization of Piezo-Electric BaTiO3 Crystals.	2nd
32.	P-DGF/Env(65)	Pollution in Hadiara Drain-its Direct and Indirect Impact on Human Health through Food Chain	1st
33.	C-PINSTECH/Env (87)	Measurement of Air-borne radioactive pollutants (Natural and fallout radionuclides) in major cities of Pakistan.	1st
34.	C-COMSATS/ Med (220)	Epidemiological Investigation of Pertussis Infection in Pakistan the First Ever Report of This Type from Pakistan .	1st
35.	C-QU/Phys (122)	The study of superconducting properties of CU1-x, TlxBa2Ca2Cu3O10-y.	2nd
36.	C-QU/Phys (129)	An investigator of collective excitation in density modulated nano-structures in magnetic field.	2nd
37.	P-PU/Phys (131)	Nonlinear Electromagnetic Wave Propagation in Plasma Like Media.	1st
38.	C-QAU/Phys (138)	Developing A Prato type Processing Rector for Plasma Untidily of Steets.	1st

b. First Annual Reports

39.	P-AU/Agr (316)	Survey, biology and integrated control measures of citrus slow decline and spreading decline of (Litchi chinesis Sonn) in Punjab.
40.	P-AU/Agr (318)	An efficient and economic means of enhancing wheat yield under water deficit conditions: use of osmoprotectants.
41.	F-NIFA/Bio (141)	Mushroom cultivation and popularization as cottage industry in NWFP, Pakistan.
42.	S-KU/Bio (342)	Biology of edible crabs (Portunus pelagicus and P. sanuinolentus) occurring in the coastal waters of Karachi.
43.	P-AU/Bio (352)	Molecular epidemiology and immunohistochemistry of Enteropathogenic Escherichaia coli (EPEC) in bovine and human neonates.
44.	S-AKU/Bio (244)	The effect of ursodeoxycholic acid (UDCA) therapy on in-vitro gallbladder smooth muscle contractility.
45.	P-AU/Bio (356)	Surveillance and pathogenicity of chickens.
46.	Biotech/P-AU/Med(24/1)	Technologies Development for the Production of Gonadotropin from Animal Sources
47.	Biotech/P-NIAB/Agr (44)	Characterization of Pakistani Wheat Varieties by Microsatellite Markers
48.	Biotech /P-NIBGE/ Med (50)	Detection of Y Chromosome Micro deletions Associated with Infertility in Different Geographic/ Ethnic Groups In Pakistan.
49.	Biotech /P-NIBGE/Agr (52)	Bacteriocin Production & its Role in Competition in Rhizobial Inoculants from a Sustainable Agriculture Perspective.
50.	AJK-UAJK/Biotech(196)	Genetic Analysis and Field Evaluation of Potato (Solanum tuberosum L.) Genotype in Azad Kashmir.
51.	S-KU/Chem (182)	Investigation of Pharmacological active substances from Marine flora and fauna.
52.	S-PCSIR/Chem (292)	Economic viability of pesticidal residues and PCBS free fishery products.
53.	P-PU/Earth (242)	Sedimentology Petroleum Bearing Carbonate Rocks of Paleocene Age Kohat Potwar Area of Upper Indus Basin.
54.	S-SU/Earth (251)	Paleoenvironmental Study of Early Cretaceous Lower Goru Formation, Sindh Monocline, Lower Indus Basin.
55.	S-PCRWR/Engg(184)	Crop Response under Different Water Management Strategies in Irrigated areas of Sindh.

56.	PSF/Res/P-DGF/Env(65)	Pollution in Hadiara Drain-its Direct and Indirect Impact on Human Health through Food Chain.
57.	F-AU/Env(202)	Residual Behavior of Pesticides in Crops.
58.	C-QU/Phys (129)	An investigator of collective excitation in density modulated nano-structures in magnetic field.
59.	P-PU/Phys (131)	Nonlinear Electromagnetic Wave Propagation in Plasma Like Media.
60.	C-QAU/Phys (138)	Developing A Prato type Processing Rector for Plasma Untidily of Steets.
61.	P-GCU/Phys (246)	AC magnetic measurement.

c. Second Annual Reports

62.	S-KU/Chem (182)	Investigation of Pharmacological active substances from Marine flora and fauna.
63.	AJK-UAJK/Earth (70)	Biostratigraphy and Tectonic Analysis of Paleogene Rocks of Neotethys Ocean in Azad Jammu and Kashmir and Hazara of the Himalayas of Pakistan.
64.	F-UET/Engg (87)	Design and Development of Sugarcane Planter for Small and Medium Land Holders of Pakistan.
65.	F-PU/Env(201)	Heavy Metal Contamination of Soil, Water, Fruit and Vegetables through Sewage Water.

d. Final Technical Reports

66.	B-ARIQ/Agr (238)	Study of Orobanche spp. and its control in Balochistan.
67.	P-AU/Agr (242)	Utilization of the genetic potential existing in Sorgum bicolor Moench for the development of genotype tolerant to salinity.
68.	P-AU/Agr (244)	Screening of germplasm for genetic improvement of wheat in relation to salinity stress.
69.	C-NARC/Agr (270)	Characterization and monitoring of banana bunchy top virus (BBTV).
70.	AJK-UCR/Agr (275)	Studies on the establishment and improvement of clovers Trifolium sp. for nitrogen availability and soil condition of Azad Kashmir.
71.	P-AU/Agr (283)	Epidemiological and pathological study on tuberculosis in food animals and its association with human infection.
72.	C-QU/Agr (292)	Ethnobotanical studies of economically important plants of Northern Areas of Pakistan and their taxonomy.

73.	F-AU/Agr (295)	Weed management in wheat in NWFP.
74.	F-AU/Agr (299)	To assess the causes of ratoon failure in sugarcane and their control in NWFP.
75.	S-KU/Bio (344)	Seed dormancy mechanisms in coastal halophytes of Karachi.
76.	P-AU/Bio (347)	Development and molecular characterization of genotype vaccine (local isolates) against Avian coccidiosis.
77.	S-AKU/Bio (281)	Effect of anxiety and tolerance development induced by ansiolytic on reproductive function in rats.
78.	Biotech/P-NIBGE/Med (39)	Development of Multiplex PCR for diagnosis of salmonelta typhi and detection of its drug resistance.
79.	Biotech/P-NIBGE/Med (43)	DNA finger printing approaches to study draught tolrance in cotton.
80.	Biotech/P-NIBGE/Agr (52)	Bacteriocin Production & its Role in Competition in Rhizobial Inoculants from a Sustainable Agriculture Perspective.
81.	C-QU/Chem (203)	Synthesis of variably substituded chalcones, thiochalcones and iminochalcones having potent industrial application.
82.	S-KU/Chem (343)	Isolation of potent antimalerial and resistance reversal compounds from medicinal plants of Pakistan.
83.	S-KU/Chem (367)	Direct and indirect electro-chemicals attack on cancer cells.
84.	C-QU/Chem (376)	Synthesis and Biological Evaluation of β-Hexapeptide Analog of Neurotensin (NT-8-13)
85.	S-SU/Chem (381)	Capillary gas chromatographic determination of biologically active amines and amino acids by precolumn derivatization.
86.	C- PINSTECH/Earth (69)	Geochronological, Tectonic uplift and Cooling Histories of Alkaline Complex from Peshawar Plain Alkaline Igneous Province Pakistan with the help of Petrographic and Fission Tracking Dating Techniques.
87.	PSF/Res/US-NSF/C-QU/Phys(18)	Magnetic and structural studies of nano particles.
88.	C-QU/Phys (127)	Laser induced breakdown spectroscopy.

SCIENTIFIC PUBLICATIONS PRODUCED THROUGH PSF SUPPORTED COMPLETED PROJECTS DURING 2007-08

Annexure -IV

SCIENTIFIC PUBLICATIONS PRODUCED THROUGH PSF SUPPORTED COMPLETED PROJECTS DURING 2007-08

Sr. No	Project No.	Publication
1.	P-NIAB/Agr (288)	1. Lodhi A., Mahmood A., Sajjad M. H. and Azam F. 2004. Growth and dry matter partitioning in wheat *(Triticum aestivum* L.) as affected by salinity and nitrogen availability. Pak. J. Soil. Sci.23: 48-53.
2.	F-AU/Agr (295)	2. Marwat K.B., Saeed Z.M. and Gul B. 2005. Chemical weed management in wheat in rainfed areas-I. Pak. J. Weed Sci. Res. 11(1-2): 31-36.
		3. Marwat K. B., Hussain Z., Saeed M., Gul B. and Noor S. 2005. Chemical weed management in wheat at higher altitudes-I. Pak. J. Weed Sci. Res. 11(3-4): 103-108.
		4. Marwat K. B, Hussain Z., Gul B. and Saeed M.2006. Chemical weed management in wheat intercropped with sugarcane. Pak. J. Weed Sci. Res. 12(3):145-150.
		5. Marwat K. B, Saeed M., Gul B. and Hussain Z. 2006. Performance of different herbicides in wheat *(Triticum aestivum* 1.) under rainfed conditions of Kohat Pakistan. Pak. J. Weed Sci. Res. 12(3): 163-168.
		6. Marwat K. B., Hussain Z., Gul B. and Saeed M. 2006. Survey on weed problems in wheat in District Mardan. Pak. J. Weed Sci. Res. 12(4): 353-358.
		7. Hussain, Z. and K. B. Marwat. 2007. Integrated weed management in wheat *(Triticum aestivum* L.) under rainfed conditions. Proc. 21st Asian Pacific Weed Sci. Soc. (APWSS) Conf., Colombo, 2-6 Oct 2007. pp 157-162.
		8. Marwat K. B. 2007. Integrated weed management in wheat at higher elevations. Proc. 21 sl Asian Pacific Weed Sci. Soc. (APWSS) Conf., Colombo, 2-6 Oct 2007. pp 290-296.
		9. Saeed M., Marwat K. B., Hhssain Z. and Gul B. 2007. Chemical weed management in wheat *(Triticum aestivum* L.) in rainfed areas of Pakistan.

Proc. 21 sl Asian Pacific Weed Sci. Soc. (APWSS) Conf., Colombo, 2-6 Oct 2007. pp 419-423.

3. F-AU/Agr (296)

10. Hassan G. and Khan I. 2007. Post emergence herbicidal control of *Asphodelus tenuifolius* in desi chickpea, *Cicer arietinum* L. at Lakki Marwat Pakistan. Pak. J. Weed Sci. Res. 13 (1 2):33-38.
11. Hassan G., Khan I .and I. A. Khan. 2006. Studies on floristic composition of chickpea weeds in District Karak, Pakistan. Iranian J. Weed Sci. 2(1):69-80.
12. Hassan G. and I. Khan. 2007. Post emergence herbicidal control of *Asphodelus tenuifolius* in desi chickpea, *Cicer arietinum* L. at Lakki Marwat Pakistan. Pak. J. Weed Sci. Res. 13 (1 2):33-38.
13. Hassan G., Tanveer S. and Munir M. 2006. Studies on GA_3 and $KN0_3$ in two biotypes of *Asphodelus tenuifolius* Cav. collected from Karak and Mianwali, Pakistan. Pak. J. Weed Sci. Res. 12 (3):235-42.
14. Hassan G., Khan I.and I. A. Khan. 2006. Studies on floristic composition of chickpea weeds in District Karak, Pakistan. Iranian J. Weed Sci. 2(1):69-80.
15. Hassan G., Khan I. and Rauf A. 2006. Survey of divergent weed flora of chickpea in District Karak, NWFP. Sarhad J. Agric. 22 (3):523-527.
16. Hassan G. and Khan I. 2006. Phytosociology of chickpea weeds in District Karak, Pakistan.Turkish J. Weed Sci. 9(1):1-8.
17. Hassan G., Khan I. and Khalil M. R. 2006. Efficacy of different herbicides for controlling noxious weeds in chickpea in District Karak. Pak. J. Weed Sci. Res. 12 (4):293-298.

4. F-AU/Agr (299)

18. Khan P. and Gul F. 2004. Investigations on ratoon failure in sugarcane crop in NWFP. Pak.Sug. Jor. XIX (06): 18-21.
19. Gul F. and Zainullah. 2003. Investigation on ratoon failure of sugarcane crop in NWFP and their control. Pak. Sug. Jor.XVIII (06): 52-55.

20. Gul F. 2006. Role root borer *Emmalocera deprissella* in sugarcane ratoon failure and their integrated control in NWFP. Presented in 5th workshop on R & D at SSRI, Jhang on 28th November, 2006 & published in PSIXXII (01): 82-87.

5. P-PU/Bio (204)

21. Ahmed Z., Din S., Gordon M.P., and Riazuddin S. 1998. Metabolism and trichloroethylene and dichloroethane by poplar plants (*Populus deltoites*). Pak. J. Biochem. & Mol. Bio.2: 51-56.

6. P-NIAB/Bio (324)

22. Syed H., Haq M. A., Iqbal N., Babar M. A., Alam S. S. and Shah T. M. 2003. Study for Fusarium wilt resistance in chickpea by using peroxdase. Pak. J. Biochem. & Mol. Bio. 36(4): 195-199.

7. P-AU/Bio (326)

23. Rehman S., Athar M., Shakoor M., Muhammad G., and Butt A. A. 2003. Standardization of indirect haemagglutination test for titeration of antibodies against *Staphylococcus aureus*, *Staphylococcus agalactiae* and *E. coli* isolated form bubaline mastitis. Int. J. Agri. Biol. 1: 185-187.

8. F-GU/Chem (351)

24. Baloch M. K. and Hameed G. 2005. Emulsification of oil in water as affected by different parameters. J. Coll. & interf. Sci. 285:804-813.

9. C-QU/Chem (373)

25. Ansari F. L., Sultana S., Andrea M. C. and Pervez M. 2006. 2,3,4,6-Tetra-O-acetyle-O-(p-tert-butylphenyl)-ß-D-glucopyranosides. Acta. Crys. E62:03139-03141.

26. Ansari F. L. 2005. Synthesis and biological activities of chalcones and 1,5-benzothiazpine derivatives: Promising new free radical scanvengers and esterase, urease and α-glucosidase inhibitors. Chem. & Biodiv. (2):487-496.

27. Ansari F. L., Hussain L., Nasir S. and Sultana S. 2005. Rapid Commun. Mas. Spec.(19):1200-1206.

10. C-PCRWR/Engg(78)

28. Ahmed A., Ashraf M. and Khokhar M. I. A. 2003. Integrated land and water resources management in Pothwar. Sci. Int. 15(1):87-92.

11. C-NARC/Envr(59)

29. Hussain I. and Afzal M. 2005. Insectivorous birds and their significance in cotton wheat based agro-ecosystem of Punjab, Pakistan. Pak. J. Zoo. 37(2):133-134.

30. Hussain I., Naureen H. and Ahmed I. 2006. A preliminary study on risk analysis of pesticides to insectivorous birds inhabiting cotton based agro-ecosystem of Punjab, Pakistan. Pak. J. Zoo. 38(3):355-360.

12. P-AU/Envr(62)

31. Javed M. 2005. Growth responses of Catla catla, Labeo rohita and Cirrhina mrigala for bioaccumulation of Zinc during chronic exposure. P. J. Biol. Sci. 8(10):1357-1360.

13. C-QU/Phy (121)

32. Shah N. A., Ali A., Aqili A. K. S. and Maqsood A. 2006. Physical Properties of Ag doped cadmium telluride thin films fabricated by closed space sublimation technique. J. Cry. Gro. 290: 452-458.

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14. C-QU/Phy (128)

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TRAVEL GRANTS 2007-08

Annexure -V

Travel grants paid during 2007-08

Sr. No.	Name and Address of Applicant	Title of the Conference	Amount Paid (Rs.)
1.	Dr. Syed Nasir Hussain Shah, Director, Center of Animal Biotechnology at Veterinary Research Institute, Bacha Khan Chowk, Veterinary Research Institute, NWFP Peshawar. **T.G (22) /07**	8th world Buffalo Congress, from 19-22 Oct. 2007, at Caresta, Italy. *"Prolong Calving Interval in Nili Ravi Buffaloes"*	66,240
2.	Dr. Syed Zafar Ilyas, Chairman, Department of Environmental Sciences, University of Balochistan, Quetta. **T.G (67)/07**	2nd International Hydrogen Energy Congress & Exhibition from, 13-15 July, 2007, at Istanbul, Turkey. *"Infrastructure for Transition to Hydrogen Energy in Pakistan".*	89,520
3.	Dr. Jasmin Shah, Associate Professor, Institute of Chemical Sciences, University of Peshawar, Peshawar. **T.G (68)/07**	12th Asian Chemical Congress (12 ACC), from August 23-25, 2007 at Kualalumpur, Malaysia. *"Spectrophotometric Determination of Atrazine by Pyridine Alkali Method and its Application in Real Samples"*	85,262
4	Ms. Mubeena Akhtar Rajput, Assistant Professor, Govt. Girls College, Hyderabad. **T.G (70)/07**	3rd International Conference on Environmental Science & Technology, from 6-9 August, 2007, at Texas, USA. *"Utilization of Organic By-Products for the Removal of Organophosphorous Pesticide from Aqueous Media"*	93,263 (Partial payment released in 2006-07
5	Mr. Qamar-ul-Haque, Pr. Scientist, Theoretical Plasma Physics Division, PINSTECH, Nilore, Islamabad **T.G (74)/07**	Summer College on Plasma Physics, from 30 July to 24 August 2007, at Trieste, Italy.	52,100
6	Dr. Alia Bano Munshi, Principal Scientific Officer, Center for Environmental Studies, PCSIR Labs. Complex University Road, Karachi. **T.G. (76)/07**	XI International Congress of Toxicology, from 15-19 July, 2007, at QC H3A 3L8, Canada. *"Level of pesticides residues contamination in imported, exported and locally consumed food commodities in Pakistan"*	172,859

7	Mr. Iftikhar Ahmed, Scientific Officer, Crops Science Institute, National Agricultural Research Centre (NARC), Park Road, Islamabad. **T.G (81)/07**	Training Course on "Molecular Aspects of Salt and Drought tolerance in crops (plants)" from September 1-8, 2007, at Cairo (Egypt).	63,296
8	Prof. Dr. M. Ashfaq, Chairman, Deptt. of Agri-Entomology, University of Agriculture, Faisalabad. **T.G. (84)/07**	International Conference of Insect Biotechnology and Industry (ICIBI 2007), from August 19-24, 2007, at Daegu, Korea. 1. *"Assessment of spray technology for the control of desert locust, Schistocerca grgaria (Orthoptera: Acrididae) to establish minimum requirements."* 2. *"IPM; a strategy to control resistance of Helicoverpa armigera (Hub.) caterpillars to insecticides on chickpea (Cicer ariethinum L.) at Rawalpindi Punjab, Pakistan"*	165,521
9	Dr. Furqan Ali, Medical Officer, INOR, Cancer Hospital Main Mansehra Road, Abbottabad. **T.G. (88)/07**	6th Annual General Meeting of ARCCNM & International Conference on Radiopharmaceutical Therapy (ICRT-2007), from September 3-7, 2007, at Ulaanbaatar, Mongolia. *"Utility of Brain SPECT Tc 99m-HMPAO scintigraphy for the evaluation of regional cerebral blood flow changes in patients suffering from dissociative amnesia DA and dissociative motor disorders DMD (previously termed as Hysteria)"*	101,000
10	Dr. Saima Chaudhary, Research Scholar (HEC), Deptt. Of Oral Health Science, Shaikh Zayeh FPGMI, Lahore. **T.G. (91)/07**	2007 FDI Annual World Dental Congress, from 24-27 October 2007, at Dubai. *"Effect of Adrenaline Containing Local Anesthesia on Uncontrolled Hypertensive; Evidence Based Approach."*	36,022
11	Dr. Abdul Ghaffar, Progeny Testing Expert (PTE) Livestock and Dairy Development Board, 76-W, Umer Plaza, Blue Area, Islamabad. **T.G (94)/07**	VIII World Buffalo Congress, from 19-22 October, 2007, at Caserta, Italy. *"Daughter performance based buffalo bull ranking for boosting milk production in Pakistan"*	122,524
12	Prof .Dr. Khan Bahadar Marwat Dean/Meritorious Professor	Weed Science for sustainable development of the 21st century, integration and utility of biotechnology in weed science, from 2-6 October	93,968

	Facility of Crop Protection Sciences, NWFP Agricultural University, Peshawar. **T.G. (96)/07**	2007, at Colombo, Sri Lanka. *"Integrated weed Management in wheat at Higher elevations."*	
13	Mr. Ghulam Murtaza Arain, Ph. D, Scholar, Hightech Central Resources Laboratory University of Sindh, Jamshoro, Sindh. **T.G. (98)/07**	Colloquium Sepctroscopium International XXXV 2007 from 23-27, September 2007, at Xiamen, China. *"Liquid Chromatographic Determination of Mercury (II) and Cadmium (II) using Dimethylglyoxal bis-(4-phenyl-3-thiosemicarbazone) as Derivatizing Reagent"*	62,513
14	M. Shahid, Lecturer, Deptt. of Chemistry & Biochemistry, University of Agriculture, Faisalabad. **T.G. (100)/07**	55th International Congress and Annual Meeting of the Society of Medicinal Plants, from 2-6 September 2007, at Graz, Austria. *"Medicinal Plants: the untapped source of bioactive peptides/proteins"*	127,879
15	M. Shuaib, Project Coordinator, CIPMP, Under of PRSP (Ms/P), 7th Floor LDA Plaza, Egerton/Kashmir Road, Lahore. **T.G. (102)/07**	8th African Crop Scientific Society Conference, from 27-31 October 2007, at El Mina, Egypt. *"Effect of different factors on Population dynamics of insect pests on cabbage crop (Brassica oleracea L.)*	73,254
16	Dr. Shamta Sufia, Research Scholar (Ph. D), Deptt. Of Oral Health Science, Shaikh Zayeh FPGMI, Lahore. **T.G. (106)/07**	19th International Congress of Pediatrics, from 18-22 October, 2007, at Tehran, Iran. *"Oral Health practices & dental health status of preschool children in relation to maternal characteristics"*	44,674
17	Dr. Anwar Ahmad Senior Scientist, Nuclear Institute for Food & Agriculture (NIFA) PO Box 446, Peshawar. **T.G. (108)/07**	Training workshop on Food safety-China from 10-29 September, 2007. *"Shelf life extension of Meals Ready to Eat (MRE) by irradiation and improved packaging materials."*	55.040
18	Dr. N. M. Butt, Chairman, Pakistan Science Foundation, Islamabad. **T.G (110)/07**	4th International Congress of "Nanotechnology 2007" from 5-8 November, 2007, at California, USA. *"Nano-materials of Fe-Pd and Fe-Co and Mossbauer studies"*	252,074

19	Muhammad Yahya Deputy Director (Laboratory), Environmental Protection Agency, Sindh. **T.G (115)/07**	12th World Lake Conference from 28th October-2nd November 2007, at Jaipur, India. *"The lost Paradise (Manchar Lake)*	74,863
20	Mr. Himayat Ullah Manager (Tech), National Development Complex, P.O Box 2216, Islamabad, **T.G (119)/07**	MultiPhysics 2007, from 12-14 December, 2007 at Manchester, U.K. *"Buckling Failure of thin Walled Cylindrical Shells under axial Compression".*	114,989
21	Dr. M. Asghar Hashmi, Professor of Physics, B.J. Campus, Islamia University of Bahawalpur. **T.G (123)/07**	4th International Symposium on High Capacity Optical Network and Enabling Techniques, from 18-20 November, 2007 at Madinat Jameirah Hotel, Dubai. *"Study of Electrical Properties of Al/SrTiO3/n-Si Interfaces using Capacitance Measurements".*	68,844
22	Mr. Javed Iqbal Senior Engineer (Civil), NSD-DNPES-P.O. Box 3297, Islamabad. **TG (127)/07**	First International Conference on Modern Design, Construction & Maintenance of Structures, from 10-11 December, 2007, at Hanoi, Vietnam. *"Seismic Considerations in Designing: An Underground Shell Structure"*	114,432
23	Mr. Fida Hussain, Zonal Project Manager, CDWA, Ministry of Industries, Production & Special Initiatives, Islamabad. **T.G (128)/07**	Water under 2008, "4th International Conference on Water Resources and Environment Research (ICWRER)" from 14-17 April, 2008, at Adelaide, Burnsid, South Australia. *"An analysis of Water Losses and Gains in Indus River System of Pakistan."*	181,444
24	Prof. M. Qasim Jan, Vice Chancellor, Quaid-e-Azam University, Islamabad. **TG (130)/07**	5th Nepal Geological Congress on Geology, Environment and Natural Hazard Mitigation: Key to National Development, from 26-27 November, 2007, at Kathmandu. *"Tectonic Configuration of Gemstones of Pakistan"*	10,980
25	Miss. Amber Rehana Solangi, Lecturer, NCAEC, University of Sindh, Jamshoro. **TG (131)/07**	Pure and Applied Chemistry Conference 2008 from 30th Jan- 01 Feb, 2008, at Bangkok, Thailand. *"Simultaneous Determination And Separation of Seven Structurally Different Drugs using Capillary Electrophoresis".*	69,066

26	Dr. M. Akhyar Farrukh, Senior Research Officer, Pakistan Council of Science & Technology, Shahrah-e-Jamhuriat,G-5/2, Islamabad. **TG(132)/07**	10 Fruhjahrssymposium, 10th young Scientist Conference on Chemistry from 27-29 March, 2008, at Rostock, Germany. *"Anions Binding to Micelles and Effect of Sulfobetaine Micelles in Nucleophilic Reactions".*	86,962
27	Dr. Farhan Saif, Associate Professor (TTS), Department of Electronics, Quaid-e-Azam University, Islamabad. **TG(133)/07**	"The Second International Conference on Mathematics: Trends and Developments (ICMTD 2007)" from 27-30 December, 2007, at Al-Azhar Univ., Cairo, Egypt. *"Engineering Entangled Noon States in two Modes of Cavity Field"*	58,690
28	Mr. Muhammad Bilal. Lecturer, College of Agriculture, Islamia University, Bahawalpur. **TG(134)/08**	First International Veterinary Poultry Conference of Iran" from 19-20 February 2008 at Tehran, Iran. *"Effect of different levels of Cornoil Soapstock as Energy source on Performance of Broiler Chicks".*	49,215
29	Dr. Sheikh Saeed Ahmad, Assistant Professor, Environmental Sciences Department, Fatima Jinnah Women University, The Mall, Rawalpindi. **TG(135)/08**	Health GIS 2008 Geo information Technology for better Health, from 14-16 January, 2008 at Mountain River Side Hotel Bangkok, Thailand. *"GIS/Remote Sensing"*	73,760
30	Mr. Fahim Gohar Awan, Assistant Professor, Department of Electrical Eng., Room # 19, U.E.T, Lahore. **TG(137)/08**	5th International Conference on Information Technology: New Generations- ITNG 2008, from 07-09 April, 2008, at LV, Nevada, USA. *"A Unified View of Information Theoretic Aspects of Cognitive Radio"*	176,059
31	Mr. Aqib Perwaiz, Department of Computer Eng., College of E&ME (NUST), Peshawar Road, Rawalpindi. **TG(138)/08**	10th International Conference on Computer Modeling & Simulation, from 1-3 April, 2008, at Emmanuel College, Cambridge, England. *"Least Mean Square Bit Stream Adaptive Filter Design".*	117,078
32	Mrs. Sabiha Bakhtyar, Deputy Chief Scientist, Directorate of Nuclear Power Engineering Reactor (DNPER), PAEC, P.O Box	ICRS-11-11th International Conference on Radio station Shielding & RPSD-2008-the 15th Topical Meeting of the Radio Protection and shielding Division of American Nuclear Society, from 13-18 April, 2008. at Callaway Gardens, Pine Mountains,	202,852

	3140, Islamabad. **TG(140)/08**	Georgia, USA. *"Characteristic Parameters and Radiations Doses from a PWR spent Fuel Assembly"*	
33	Mr. Mahmood-ul- Hassan, Senior Scientist, Mutation Breeding Division, Nuclear Institute for Agriculture and Biology (NIAB), P.O Box 128, Faisalabad. **TG (144)/08**	Advanced Training Course on Recent Trends in Conservation Agriculture under Mediterranean Conditions, from 31 March to 04 April, 2008, at Zaragoza, Spain.	136,250
34	Mr. Abdul Razaque Farhad Rind, Lecturer, IMCB, F-10/3, Islamabad. **TG (147)/08**	6th Annual Conference on Communication Networks and Services Research (CNSR 2008), from 05-08 May 2008, Halifax, Nova Scotia, Canada. *"Performance Comparison of TCP Variants under Mobility based APN Hybrid Network"*	203,520
35	Mr. Shafqat Faaruq, Dy. Chief Scientist, Nuclear Medicine Oncology and Radiotherapy Institute (NORI), G-8/3, Islamabad. **TG(150)/08**	16th International Conference on Medical Physics, from 14-16 April, 2008, at Dubai, UAE. *"Optimization of Image Quality and patient dose in Mammography"*	50,610
36	Prof. Dr. Syed Sakhawat Shah, Chairman, Department of Chemistry, Quaid-e-Azam University, Islamabad. **TG(153)/08**	3rd Euro-Asian Conference on Hazardous Waster & Human Health, from 26-30 March, 2008, at Istanbul, Turkey. *"Removal of Some Hazardous metals from aqueous solution by micellar-enhanced ultrafiltration (MEUF) technique".*	90,059
37	Dr. Tayyaba Ijaz, Medical Technologist and Infection Control Officer, In charge Microbiology Lab, Mayao Hospital, Lahore. **TG (154)/08**	Emerging Technologies of Medical Importance for the Diagnosis of Infectious Diseases and the Detection of Pathogenic Microbes, from 6-10 April, 2008 at Beijing International Hotel, Beijing, China. *"Epidemiological Profile of Nosocomial Infections in a Public Sector Tertiary Care Hospital of Pakistan".*	132,810
38	Mr. Rashid Amin, Lecturer, Comsats Institute of Information Technology, Lahore. **TG(155)/08**	International Workshop/Training on Preservation-Technique of Plastination, from 5-9 May 2008, at Institute of Pathology, Munich, Germany.	166,860

39	Dr. Rahkshanda Bilal, Dy. Chief Scientist, Pakistan Atomic Energy Commission Headquarter, Islamabad. **TG(156)/08**	16th European Congress of Psychiatry, from 5-9 April 2008, at Nice, France. *"Breast Milk intake in infants: Comparison between deuterium dilution and test weighing and comparison with other population".*	97,888
40	Engr. Liaqat Ali Qureshi, Professor, Department of Civil Engineering, U.E.T, Taxila. **TG(157)/08**	Durability of Building Materials and Components, from 11-14 May 2008, at Dedeman Hotel, Istanbul, Turkey. *"Repair and Rehabilitation of Initially Cracked RCC Beams by CFRP".*	78,170
41	Shahab Khushnood, Chairman, Mechanical Engineering Department, University of Engineering and Technology Taxila **TG (160)/08**	16th International Conference on Nuclear Engineering - ICONE16, from 11-15 May, 2008 at Orlando, Florida, USA *"Failure of Heat Exchanger Tube in Bundle: An Improvement in Design Guidelines"*	161,024
42	Mr. M. Saeed Akbar, Incharge Advanced Computer & GIS Lab, Faculty of Agriculture, University of Agriculture, Faisalabad. **TG(163)/08**	4th International Conference on Mobile Computing and Ubiquitous Networking (ICMU 2008), from 11-13 June 2008, at Miraikan, Tokyo, Japan. *"Mobility Aware transmission control Protocol (MA-TCP)*	198,184
43	Dr. Jamshaid Ali, Manager Technical, Project Management Organization, National Engineering & Scientific Commission (NESCOM), H-11/4, Islamabad. **TG(167)/08**	17th IFAC World Congress, from 6-11 July, 2008, at Seoul, Korea. *"Realization of Initial Alignment Algorithm for Strap down Inertial Navigation System using Central Difference Filter".*	170,382
44	Mr. M. Ikhlaq Khattak, Associate Professor, College of E&ME (NUST), Rawalpindi **TG(169)/08**	6th International Fuel Cell Science, Engineering & Technology Conference, from 16-18 June, 2008, at Denver Colorado, USA. *"Reduction of* Parasitics *in Design of Hydrogen Fuel Cell Auto Rickshaw".*	142,920
45	Dr. Syed M. Jafar Rizvi, Principal Engineer, Instrumentation, Control and Computer Complex (ICCC), PAEC, St 1, H-8/1, Islamabad. **T.G(178)/08**	International Lexical-Functional Grammar Annual Conference 2008, from 4-6 July 2008, at Sydney, Australia. *"Development of Algorithms and Computational Grammar of Urdu".*	141,848

46	Dr. Abdul Hameed, Lecturer in Biology, Government Islamia College, Lahore Cantt. **T.G(179)/08**	11th International Conference on Applied Phycology, from 21-27 June 2008, at National University of Ireland, Galway, Ireland. *"Role of nonprotein thiols as a mechanism of chromium detoxification in cyanobacteria isolated from polluted areas of Pakistan".*	80,600
47	Dr. Shahid Hussain, Principal Scientist, National Tokamak- Fusion Programme, House No 296, Street No. 40, F-10/4, Islamabad. **TG(180)/08**	19th International Conference on Spectral Line Shapes, from 15-20 June 2008, at University of Valladolid, Spain. i) *"Measurement of Oscillator Strength distribution in the discrete and continuous spectrum of lithium."* *ii) "Comparative study of RF and dc discharge based laser optogalvanic spectroscopy of helium Rydberg States".*	94,073
48	Dr. G. Murtaza, Salam Chair in Physics, GC University, Lahore. **TG(182)/08**	International Workshop on the Frontiers in Modern Plasma Physics, from 14-25 July 2008, at ICTP Trieste, Italy. *"Weibel Instabilityon Non-Maxwellian Plasmas".* (Invited speaker)	62,080
49	Ms. Saira Zahid, Research Engineer, College of Electrical and Mechanical Engineering, National University of Sciences and Technology (NUST), Rawalpindi. **TG(190)/08**	The 14th International Conference of Women Engineers and Scientists (ICWES-14) from 15-18 July 2008 at Lille, France. *"A Generic Framework for Analyzing Nature Inspired Routing Protocols"*	46,536
50	Dr. M. Masoom Alam, Assistant Professor, Institute of Management Sciences (IMS), Phase 7, Hayatabad, Peshawar. **TG(194)/08**	ACM Symposium on Access Control Models and Technologies (SACMAT 2008), from 11-13 June 2008, at ESTES Park, Colorado, USA. *"Model-Based Behavioral Attestation".*	125,520
		Total Rs.	**5,335,577**

ANNUAL GRANTS IN AID TO SCIENTIFIC SOCIETIES DURING 2007-08

Annexure -VI

Annual Grant in Aid to the Scientific Societies during 2007-08

Sr.No	Name of Society	Amount Released (Rs.)
1.	Pakistan Thalassaemia Welfare Society.	**124,000/-**
2.	Islamic Society of Statistical Sciences.	**200,000/-**
3.	Zoological Society of Pakistan.	**300,000/-**
4.	Pakistan Veterinary Medical Association.	**200,000/-**
5.	Agriculture Foundation of Pakistan.	**200,000/-**
6.	Soil Science Society of Pakistan.	**100,000/-**
7.	Horticultural Foundation of Pakistan.	**300,000/-**
8.	Pakistan Society of Nematologists.	**200,000/-**
9.	Pharmacology Society of Pakistan.	**100,000/-**
10.	Botanical Society of Pakistan.	**200,000/-**
11.	Pakistan Mathematical Society.	**200,000/-**
	Total	**2,124,000/-**

SCIENCE CARAVAN EXHIBITIONS ORGANIZED DURING 2007-08

Annexure -VII

SCIENCE CARAVANS EXHIBITIONS ORGANIZED DURING 2007-08

FEDERAL UNIT

S.No	Exhibition Site	Dates	No. of Days	No. of Schools	No. of Students/ visitors
1.	Bahria College, Islamabad	27.08.07 to 29.08.07	3	1	3000
2.	Govt. High School Rawat, Tehsil Murree	03.09.07 to 13.09.07	11	12	4500
3.	F.G. Girls Model School, G-6-1/2, Islamabad on World Science Day, 2007.	10.11.2007	1	2	700
4.	Film and planetarium show at Ujala School System Rawalpindi	26.11.2007 to 27.11.2007	2	7	3250
5.	Film and planetarium show at F.G. Boys Secondary School Marrir Hasan, Rawalpindi	28.11.2007to 29.11.2007	2	2	1500
6.	Planetarium show at Institute of Space Technology on World Space Week 2007	7.11.2007	1	3	1200
7.	Planetarium show at Convention Centre, Islamabad.	1.12.2007 to 2.12.2007	2	8	6600
8.	Govt. Boys High School Saghri Tehsil Jand, Distt. Kohat	10.12.2007 to 18.12.2007	9	5	2000
9	Read Education System, Simly Dam Road, Bara Kahu, Islamabad	21.02.08 to 23.02.08	3	1	250
10..	Siddique Public School, Rawalpindi	25.02.08 to 28.02.08	4	1	300
11.	International Math Exhibition "Experiencing Mathematics" at Islamabad Model College for Girls, F-7/4, Islamabad	09.04.08 to 21.04.08.	13	65	10000
	Total		**51**	**107**	**33,300**

SINDH UNIT

S.No.	Exhibition Site	Dates	No. of Days	No. of Schools	No. of Students/ visitors
1.	Science Caravan Exhibition at Govt. Girls High School, Tando Bago and Matli, Sehwan Sharif Distt. Badin	8.09.2007to 28.09.2007	21	15	4415
2.	Science Caravan Exhibition at the schools of Taluka/District Tando Allahyar	5.11.2007 to 30.11.2007	26	18	8691
3.	Science Caravan Exhibition at the schools of Taluka/District Tando Muhammad Khan	4.12.2007 to 21.12.2007	18	9	5365
4.	Science Caravan Exhibition at Govt. High School, Mithi	15.01.08 to 18.01.08	4	7	3190
5.	Science Caravan Exhibition at Govt. Boys Schools, Taluka Nau Kot and Juddo, Distt. Mirpur Khas	28.01.08 to 13.02.08	17	17	6735
6.	Science Caravan Exhibition at Govt. Girls Schools, Taluka Nau Kot and Juddo, Distt. Mirpur Khas	25.02.08 to 11.03.08	15	12	3270
7.	Science Caravan Exhibition at the Schools of Taluka Hala Distt. Matiari	24.3.08 to 10.4.08.	17	14	6195
	Total:		**118**	**92**	**37,861**

PUNJAB UNIT

S.No.	Exhibition Site	Dates	No. of Days	No. of Schools	No. of Students/ visitors
1.	Science Caravan Exhibition at Islamic Science College for Women 172 GB, Faisalabad	06.08.07 to 25.08.07	20	13	3650
2.	Science Caravan Exhibition at Govt. High School Chak No.237, Tehsil Chiniot, Distt. Jhang	18.09.07 to 03.10.07	16	14	4500

3.	Science Caravan Exhibition at Distt. Nankana Sahib	06.12.07 to 15.12.07	10	12	5500
4.	Science Caravan Exhibition at Pak Garrison Public High School Distt. Nankana sahib	28.01.08 to 08.02.08	12	12	3500
5.	International Math Exhibition "Experiencing Mathematics" at National Museum for Science and Technology (NMST) Lahore	25.04.08 to 11.05.08.	17	70	10000
6.	Science Caravan Exhibition at Lahore College for Women University, Lahore	26.05.08 to 31.05.08.	14	70	4,000
	Total:		**89**	**191**	**31,150**

NWFP UNIT

S.No.	Exhibition Site	Dates	No. of Days	No. of Schools	No. of Students/ visitors
1.	Science Caravan Exhibition at the Govt. High School Chakisar Distt. Shangla	03.09.07 to 13.09.07	11	12	886
2.	Science Caravan Exhibition at the Schools of Totalai District Buner	22.10.2007 to 3.11.2007.	13	13	4,000
3.	GHSS Shakardara Distt. Kohat and GGHS No.3 Kohat City	27.11.2007 to 6.12.2007.	20	19	5,400
4.	Science Caravan Exhibition at Govt. Higher Secondary School, Mayar Distt. Mardan	01.02.08 to 13.02.08	13	15	2500
5.	Govt. High School No.1, Peshawar	17.05.08 to 28.05.08.	12	70	10000
6.	Govt. High School Harrio, Azizabad Distt. Abbottabad	19.06.08 to 29.06.08	11	1	1,300
	Total:		**80**	**130**	**24,086**

BALOCHISTAN UNIT

S. No.	Exhibition Site	Dates	No. of Days	No. of School	No. of Students/ visitors
1.	Science Caravan Exhibition at Girls/Boys Schools of Mominabad, Quetta	05.04.08 to 22.04.08	18	2	635
	Total:		**18**	**2**	**635**
	Grand Total:		**356**	**522**	**105,432**

RESULT OF 17TH INTRA BOARD SCIENCE ESSAY COMPETITION ON "WHY MATHEMATICS IS NECESSARY"

Annexure -VIII

RESULTS OF 17TH INTRA BOARD SCIENCE ESSAY COMPETITION ON "WHY MATHEMATICS IS NECESSARY"

BISE ABBOTTABAD

Name of student with language of essay	School	Position
Asim Raza *(English)*	Pakistan Scouts Cadet College Batrasi Mansehra	1st
Ghazia Arjumand *(English)*	Mansehra Public School & College, Mansehra	2nd
Yasir Jahngeer *(English)*	Govt. Post Graduate College Haripur	3rd

BISE BANNU

Fida Hussain *(English)*	Knowledge Public School Lakki	1st
Ambreen Zaman *(Urdu)*	GHSS S.K. Bala, Bannu	2nd
Muhammad Arif *(Urdu)*	Al-Hafiz Public School, Lakki	3rd

BISE D.G. KHAN

Tallah Yasin *(English)*	PAEC Higher Secondary School D.G. Khan	1st
Muhammad Nouman Saleem S/O Muhammad Saleem *(English)*	PAEC Higher Secondary School D.G. Khan	2nd
Muhammad Nouman Saleem S/O Ashfaq Ahmed *(English)*	PAEC Higher Secondary School D.G. Khan	3rd

BISE FAISALABAD

Marriyam Noreen *(Urdu)*	WAPDA Girls High School Steem Power Station Colony Faisalabad	1st
Hussain *(Urdu)*	Govt. Comprehensive New Model High School, Satellite town Jang.	2nd
Sidrah Saeed *(English)*	Govt. Girls High School Kamalia	3rd

BISE GUJRANWALA

Huma Riaz *(English)*	Allama Iqbal Public High School, Masjid Road, Sialkot Cantt	1st
Syeda Zaria *(English)*	University of Gujrat Marghzar Colony, Gujrat	2nd

Faseeh Ahmed *(English)*	Quaid-e-Azam Public College, Gujranwala	3rd
Samreen Shahid *(English)*	Oxford Grammer Public High School Near Water tank No.2, Daska	3rd
Beenish Majeed *(English)*	Quaid Grammar Girls High School, Sook Kalan, Gujrat	3rd

BISE HYDERABAD

Nirmal Chandan *(English)*	St. Bonaventure's High School, Hyderabad	1st
Ummama Khan *(English)*	Govt. Girls High School Uint No.6, Latifabad, Hyderabad	2nd
Fizza Khan *(English)*	Govt. (N) Hani Girls High School, Latifabad, Hyderabad	3rd
Sundus Mushtaq *(Urdu)*	Govt. Girls High School Court Road, Nawabshah	1st
Faria *(Urdu)*	Govt. Apwa Girls High School, Latifabad No.8, Hyderabad	2nd
Rabia Ibrahim *(Urdu)*	St. Mary's Girls High School, Hyderabad	3rd
Ibadat Mangrio *(Sindhi)*	Govt. Girls High School Court Road, Nawabshah	1st
Saba Manzoor *(Sindhi)*	Govt. Himayat ul Islam Girls High School, Hyderabad	2nd
Abdul Hamid *(Sindhi)*	Darul-ul-Uloom High School Tando Mohammad Khan	3rd

FBISE, ISLAMABAD

Sarosh-e-Dost *(English)*	Punjab College of Commerce, 661 Peshawar Road Near Golra More Rawalpindi Cantt.	1st
Sanee Ahmed *(Urdu)*	Fauji Foundation Model High School, Mirpur Azad Kashmir	2nd
Syeda Arshia Zainab Kazmi *(Urdu)*	Fauji Foundation Model School, Westridge-II Campus Rawalpindi Cantt.	3rd

BSE KARACHI

Aiman Siddiqui *(English)*	Aisha Bawany Academy (Girls Section), Shahrah-e-Faisal Karachi	1st
Sumera Naz *(English)*	Iqra Huffaz Girls Secondary School, N. Nazimabad, Karachi	2nd
Zeenat Qadeer *(English)*	H.E.F. Hussainabad B.G.P.S.S. (Evening) F.B. Area, Karachi	3rd
Arfa Naeem *(Urdu)*	Mount Sinai Secondary School, North Nazimabad, Karachi	1st

Yumna Safdar *(Urdu)*	Gulistan Shah Abdul Latif Girls Secondary School, S.M.C.H. Society Karachi	2nd
Maira Asif *(Urdu)*	Falcon House Grammar School, Campus-5, North Nazimabad, Karachi	3rd
Dua Jokhio *(Sindhi)*	The American Foundation Secondary School, Gulistan-e-Jouhar, Karachi	1st
Uzma Ishaque *(Urdu)*	P.N. Model Secondary School, Hanif SRE, Karsaz, Karachi	2nd
Maheen Makna *(Urdu)*	Rukaiya Hajiani High School, Bantva Nagar, Karachi.	3rd

BISE KOHAT

Muhammad Shahab *(English)*	St. Joseph Convent Public High School, Kohat Cantt	1st
Sumbel Shereen *(English)*	St. Joseph Convent Public High School, Kohat Cantt	2nd
Shahzeb *(English)*	St. Joseph Convent Public High School, Kohat Cantt	3rd
Syed Uzair Ahmed *(English)*	St. Joseph Convent Public High School, Kohat Cantt	4th
Salimullah Khan *(Urdu)*	St. Joseph Convent Public High School, Kohat Cantt	1st
Umar Muhammad Afridi *(Urdu)*	St. Joseph Convent Public High School, Kohat Cantt	2nd

BISE LAHORE

Rushda *(English)*	Divisional Public School & Intermediate College Model Town, Lahore	1st
Ayesha Jalil *(English)*	The Punjab School Township, Lahore	2nd
Muhammad Asad Ch. *(English)*	Society Public School Mughal Pura, Lahore	3rd
Awais Ahmed *(Urdu)*	Govt. College Township, Lahore	1st
Muhammad Ahmad Toor *(Urdu)*	Govt. Central Model School Samanabad, Lahore	2nd
Dania Butt *(Urdu)*	The Punjab School, Township, Lahore	3rd

BISE LARKANA

Samia Naz *(English)*	Govt. Girls English Medium Model High Schools Larkana	1st
Maria *(Sindhi)*	Govt. Girls English Medium Model High Schools Larkana	2nd
Sooraj *(Sindhi)*	Saint Joseph High School, Larkana	3rd

BISE MARDAN

Salman Yousaf *(English)*	Peshawar Model School Mardan Branch	1st
Nadia Gul *(English)*	PLF. Public High School, Risalpur, District Nowshera	2nd
Taimur Khan Khattak *(English)*	The Fazle Haq College, Mardan	3rd
Farzana Sardar *(Urdu)*	Ghazali College for Women Mardan	1st
Rizwan Riaz *(Urdu)*	PLF. Public High School, Risalpur, District Nowshera	2nd
Ghulam Mustafa Soomro *(Sindhi)*	PLF. Public High School, Risalpur, District Nowshera	3rd

BISE MULTAN

Hussain Danish *(English)*	Punjab College of Information and Technology Multan	2nd
Sonia Iqbal *(Urdu)*	Govt. Girls High School Chak Bedi Pakpattan	1st
Hamna Tahir *(Urdu)*	Govt. Girls Comprehensive Higher Secondary School Gulgasht Colony, Multan	3rd

BISE QUETTA

Masooma Yawari *(English)*	Govt. Sardar Hasan Musa Girls College, Gulistan Town, Quetta	1st
Firshta M. Tahir *(English)*	Govt. Sardar Hasan Musa Girls College, Gulistan Town, Quetta	2nd

BISE SARGODHA

Amlash Bilal *(English)*	Dar-e-Irqam Model High School, Sargodha	1st
Maida Ali *(English)*	Divisional Public School, Sargodha	2nd
Sara Ishtiaq *(English)*	Govt. Comprehensive Girls High School, Sargodha	3rd

BISE SUKKUR

Reema Asghar *(English)*	Mari Gas Higher Secondary School, Daharki	1st
Nazima Nawaz *(English)*	Mari Gas Higher Secondary School, Daharki	2nd
Madiha Agha *(English)*	Public School Sukkur	3rd

RESULT OF 17TH INTRA BOARD SCIENCE POSTER COMPETITION ON "MATHEMATICS / GEOMETRY IN NATURE"

Annexure -IX

RESULTS OF 17TH INTRA BOARD SCIENCE POSTER COMPETITION ON "MATHEMATICS/GEOMETRY IN NATURE"

BISE ABBOTTABAD

Name	School	Position
Umer Sajjad	Sky International PS & College, Mansehra	1st
Fatima Nawaz Khan	Quaid-e-Azam PS & College KTS, Haripur	2nd
Hina Khalid	Mansehra Public School & College, Mansehra	3rd

BISE FAISALABAD

Hafiz Muhammad Abdullah	Govt. Comprehensive New Model High School, Satellite Town, Jhang	1st
Aasma Shahid	Laboratory Girls High School, Faisalabad	2nd
Sana Idrees	Divisional Model College, Faisalabad	3rd

BISE GUJRANWALA

Nimrah Farooq	Spring Field Public High School, Peoples Colony, Gujranwala	1st
Salak Nazeer	Spring Field Public High School, Peoples Colony, Gujranwala	2nd
Fareeha Abid	Sialkot Grammer School, Bhopalwala, Distt. Sialkot	3rd

BISE HYDERABAD

Sonia Aijaz	Govt. Girls High School Latifabad No.10, Hyderabad	1st
Zohra	Govt. Himayatul Islam Girls Hyderabad	2nd
Huda Piyar Ali	Agha Khan School, Hyderabad	3rd

FBISE, ISLAMABAD

Mahwish Sarwar	F.G. College for Women F-7/2, Islamabad	1st
Nimra Yousaf	F.G. Girls Model School G-9/3, Islamabad	2nd
Abeera Tariq	F.G. Post Graduate College for Women, Kashmir Road, Rawalpindi	3rd

BSE KARACHI

Abdullah Hussain	Lady Bird Grammer School, Block N, North Nazimabad, Karachi	1st
Saad Hussain	Wood Land Secondary School, North Karachi, Karachi	2nd
Mifra Hassan	K.B.V.C.A.A Model School #3, Airport, Karachi	3rd

BISE KOHAT

Fakhar Zaman	St. Joseph Convent High School Kohat Cantt.	1st
Aimen Gill	St. Joseph Convent High School Kohat Cantt.	2nd
Wajahat Akhtar	St. Joseph Convent High School Kohat Cantt.	3rd

BISE LAHORE

Arooj Afzal	The Punjab School Sher Shah Road Kot Khawaja Saeed, Lahore	1st
Ufaq Altaf	Queen Marry College, Lahore	2nd
Arfa Shabu	Queen Marry College, Lahore	3rd

BISE LARKANA

Sabira Hassan	Govt. Girls English Medium Model High Schools Larkana	1st
Batool Zuhra	Saint Joseph High School Larkana	2nd
Faisal Raza	Cadet College Larkana	3rd

BISE MARDAN

Amin ul Haq	Working Folks Grammar School, Amangarh, Nowsehra	1st
Taimur Khan Khattak	The Fazle Haq College, Mardan	2nd
Baseer Ahmed	The Fazle Haq College, Mardan	3rd

BISE, MIRPUR

Sundas Riaz	Govt. Girls Degree College Afzl Pur, Distt. Mirpur	1st
Irum Choudhry	Govt. Girls High School No.2, Kotli	2nd
Rehana Maqbool	Govt. Girls Higher Secondary School, Chattar Pari, Distt. Mirpur	3rd

BISE MULTAN

Ramesha Fatima	District Public School, Pakpattan	1st
Amna Sher	Govt. Girls Comprehensive Higher School, Multan	2nd
Iqra Rustam	Saint Marys Convent Girls Higher Secondary School, Multan	3rd

BISE QUETTA

Firshta M. Tahir	Govt. Sardar Hasan Musa Girls College, Gulistan Town, Quetta	1st
Masooma Ali	Govt. Sardar Hasan Musa Girls College, Gulistan Town, Quetta	2nd
Tahira Ali	Govt. Sardar Hasan Musa Girls College, Gulistan Town, Quetta	3rd

BISE SARGODHA

Waleed Bin Mehdi	Dar-e-Irqam Model High School, Sargodha	1st
Anum Abbas	Divisional Public School & College, Sarghodha	2nd

BISE SUKKUR

Areesha Shahzado	Model School, Shah Abdul Latif University, Khairpur Mirs	1st
Zoya Shafquat	Mari Gas Higher Secondary School, Daharki	2nd
Wardah Afzaal	Mari Gas Higher Secondary School, Daharki	3rd

DETAIL OF FINANCIAL ASSISTANCE

Annexure -X

DETAIL OF FINANCIAL ASSISTANCE

Name of Institution	Purpose/Activity	Amount
Govt. High School, Sahiwal	Purchase of Lab Equipment/ computers	Rs.25,000.00
Govt. High School, Budh, Muzaffargarh	Purchase of Lab. Equipment	Rs.25,000.00
National Museum of Science and Technology, (NMST) Lahore	Prize Money for 20th Annual Science Competition, 2007.	Rs.40,000.00
Govt. High School Saghri, Attock	Purchase of Lab. Equipment	Rs.20,000.00
Sir Syed Memorial Society, Islamabad	Purchase of Multimedia Projector, Screen, Computer / or PA system for the hall of Sir Syed Memorial Society, Islamabad.	Rs.100,000.00
Govt. High School Sher-Rai Sadullah, Fateh Jang	Purchase of Lab. Equipment	Rs.50,000.00
Intel Education, Islamabad	Prize Money to the winners students and Teachers for "National Science Fair-2008"	Rs.55,000.00
Govt. High Secondary School #1, Peshawar City	Purchase of Computer	Rs.30,000.00
Govt. Centennial School No.3, Mardan	Purchase of Lab Equipment	Rs.20,000.00
Yar Muhammad Samejo, English Public High School, Usta Muhammad, Balochistan	Purchase of Computer and Library Books	Rs.70,000.00
Govt. Boys High School, Jhuddo, Distt. Mirpurkhas, Sindh	Purchase of Computer set	Rs.35,000.00
Pak Garrison Public High School, Nankana Sahib	Purchase of Lab. Equipment	Rs.20,000.00
Govt. High School, Adhi Sarqal, Khushab	Purchase of Lab. Equipment	Rs.10,000.00
Govt. Girls Higher Secondary School, Lady Grifth, Peshawar	Purchase of Computer	Rs.40,000.00
Adventure Foundation, Pakistan	To hold 7th Mountain Conservation Meet-2008	Rs.50,000.00
	Total:	**Rs.590,000.00**