ANNUAL REPORT

2004 - 2005

Pakistan Science Foundation

PAKISTAN SCIENCE FOUNDATION

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PAKISTAN SCIENCE FOUNDATION
CONSTITUTION AVENUE
ISLAMABAD

LETTER OF TRANSMITTAL

Dear Mr. Secretary,

I have the honour to enclose herewith the Annual Report of the Pakistan Science Foundation for the fiscal year 2004-2005, alongwith its audited accounts, as adopted by PSF Board of Trustees for submission to the National Assembly as required by the Pakistan Science Foundation Act No. III of 1973.

With regards

Yours Sincerely

Dr. N. M. Butt
Chairman
Pakistan Science Foundation
Islamabad

The Secretary
Ministry of Science and Technology
Government of Pakistan
Islamabad

PAKISTAN SCIENCE FOUNDATION

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LIST OF CONTENTS

LIST OF ABBREVIATIONS

Provinces

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

Sponsoring Institutions

AKU	The Aga Khan University, Karachi
ARIQ	Agriculture Research Institute, Quetta
PAU	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

Disciplines

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

EXECUTIVE SUMMARY

PAKISTAN SCIENCE FOUNDATION

Pakistan Science Foundation is the apex body for promotion and funding of scientific and technological research and science popularization in the country. The activities of the Foundation revolve around these objectives, some of which 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:-

1. SCIENCE PROMOTION

Research support is the principal programme of the Foundation for the promotion of basic and applied research relevant to socio-economic needs of the country. During 2004-2005, a total 427 projects in the fields of Agriculture, Biology, Biotechnology, Chemistry, Computer, Earth Sciences, Engineering, Medical Sciences and physics remained under consideration. Among these, 23 projects costing Rs. 18.01 million were sanctioned in various fields; while 151 remained under process and 253 (169 under non-development budget and 84 under development budget) remained on-going. An amount of Rs. 8.30 million was released on account of due installments of on-going projects (under non-development budget). In addition, six applied research projects were also approved at a total cost of Rs. 14.677 million and funds for their first installments were released.

Monitoring and evaluation of on-going projects sponsored by the Foundation is an important function of the research Support Porgramme. During the year 144 (60 Non-Development and 84 Development) technical reports of on-going projects including semi-annual and annual and final reports were received. The reports were evaluated by the subject experts.

Twenty four projects were completed during the report period. Based upon the results of projects as many as 60 research papers were published in national/international journals by the principal investigators. In addition. 09 M.Sc, 06 M.Phil and 07 PhD degrees were awarded to the research associates employed under PSF supported projects.

2. SCIENCE POPULARIZATION

Popularization of Science is one of the statutory functions of Pakistan Science Foundation. The Foundation is engaged in various science popularization activities at national level with the aim of increasing awareness of science education in the society.

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 the study of science. At present five Science Caravan Units are

operating, one each in Balochistan, Sindh, NWFP, Punjab and Federal areas. However, under a development project, four more Units have been added bringing the total to nine. These Caravan units continued their activities throughout the report period and organized science exhibitions in schools within their jurisdiction. In all, 37 exhibitions and film shows were arranged around the country where 498 schools participated and 83450 students were benefited.

3. PLANNING & DEVELOPMENT

During 2004-05, development funds amounting to Rs. 40.052 million were utilized against the total allocation of Rs. 45.90 million for the following development projects:

Under Financial Support to Scientific Societies in Pakistan, funds amounting to Rs. 5.00 million were paid to 11 Scientific Societies for holding of conferences/ seminars/workshops, publication of journals, establishing linkage with similar bodies abroad. To facilitate participation of scientists and technologists in International Conferences, Seminars and Workshops, 178 travel grant requests were received, of which 92 requests were approved at a total cost of Rs. 6.281 million. However, only 55 scientists could avail the grant amounting to Rs. 3.4 million. Under the Research Support Programme for Active Scientists and Technologists of Pakistan, applications received from scientists were evaluated by the PSF Technical Committees. Final selection was made by the National Committee headed by the Secretary, Ministry of Science and Technology. Research grant amounting to Rs. 31.652 million were provided to 37 scientists.

In addition, out of Non development budget, Rs. 0.537 million were paid to 15 organizations for holding of conferences/seminars/workshops, Rs. 0.315 million were paid to various organizations for the publication of nine (9) scientific journals. The Foundation, under its awards and Fellowships programme, granted fellowships to four (4) Ph.D. Scholars studying in various local universities @ Rs. 6,000/- per month. The first competition for awards to Inventors and Innovators was held in January 2005. Out of sixteen inventions/Innovations presented for the competition, three Inventions/Innovations were finally selected for awards.

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

Pakistan Museum of Natural History scientists and researchers remained engaged in the collection, curation and preservation of natural history specimens and research on flora, fauna and geology of Pakistan. Fieldwork was carried out in various localities of Sindh, Punjab, NWFP, Northern Areas and AJK under various projects granted by Pakistan Science Foundation and other agencies. Research was conducted on various aspects of the natural history of the country, which resulted in the production of many research articles. During this period, 24 research articles, 19 abstracts were published in national and international journals, 11 research papers submitted & 12 research papers presented in conferences.

Three development projects "Biodiversity of Pakistan: Databases and Global Networking" and "Virtual Orientation Gallery" have been completed. Hundreds of students, general public and foreigners visited PMNH Display Galleries. Four research projects funded by Pakistan Science Foundation are in progress, 4 more have been approved for funding and 5 others have been submitted for approval to PSF and Ministry of Science & Technology. PMNH officers also provided guidance and supervision to various organizations and guided in their research work.

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

PASTIC is a subsidiary of PSF, established to undertake extensive activities related to Scientific and Technological Information.

Pakistan Science Abstract 2003, Vol. 41(A-J), Directory of Scientific Periodicals of Pakistan and Union Catalogue of the scientific Periodicals in libraries of Pakistan Volume-I and II of PASTIC, about 2,604,865 impressions, 9112 pages and 14,3,430 copies were printed and produced by the Reprography Unit against 152 jobs received from 11 organizations.

International liaison is a prominent activity of PASTIC as it is the National Focal Point for International/Regional Information Networks, WINISIS, library software (English Version) was provided to eighty one organizations and Arabic Version to one organization. Trainings were also provided on WINISIS Package to Librarians from different organizations at Islamabad, Lahore, Peshawar and Karachi. Another development project entitled "Science awareness through TV Channels" was initiated. First training workshop on "Science in mass Media; Genetic and Allied Sciences" was organized in collaboration with Genetics Department, University of Karachi from 7-9 June, 2005 at Karachi.

A development project entitled "Establishment of National Science and Technology Database/Information Network at PASTIC" was also completed. PASTIC Library is being digitized and re-organized. PASTIC library added to its collection some 1408 issues of various S&T periodicals, 300 documents and 29 books. The subscription of 2 databases has been renewed.

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 applied 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.

ACTIVITIES & PROGRAMS

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.

(I) **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

(II) **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 2004-2005 is summarized in the following pages.

SCIENCE PROMOTION RESEARCH SUPPORT

I. SCIENCE PROMOTION: RESEARCH SUPPORT

Research Support is the principal programme of the Foundation for the promotion of basic and applied research relevant to socio-economic needs of the country. During 2004-2005, a total of 427 projects in the fields of Agriculture, Biology, Biotechnology, Chemistry, Computer, Earth, Engineering, Medical Sciences and Physics were handled. Among these, 23 projects (fig.1) costing Rs. 18.01 million were sanctioned in various disciplines, while 151 remained under process in the Foundation and the remaining 253 projects were on-going. An amount of Rs. 15.8 million [8.30 (Non-Dev) + 7.5(Dev)] was released on account of due installments of on-going projects.

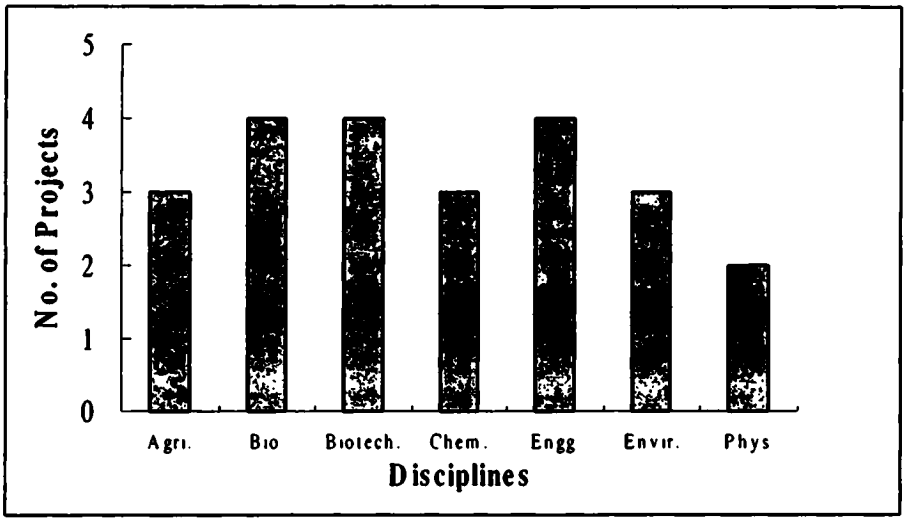

Fig.1: Newly approved projects during the year 2004-05.

Monitoring and evaluation of on-going projects sponsored by the Foundation is an important function of the research Support Programme. During the year 144 technical reports of on-going projects including semi-annual, annual and final reports were received. The PSF relevant staff scrutinized the semi-annual reports, and after initial scrutiny these were sent for evaluation to the subject experts.

During the year, 24 projects were technically completed. The subject experts evaluated these reports and subsequently will be 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 as many as 60 research papers were published in national/international journals by the principal

investigators of completed projects (fig.2). In addition, 09 M. Sc., 06 M. Phil. and 07 Ph. D. degrees were awarded to the research associates employed under PSF supported projects.

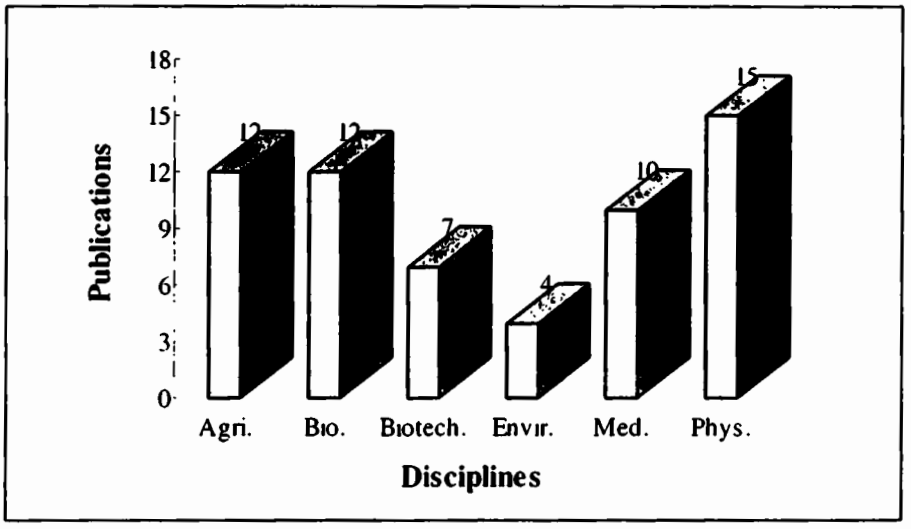

Fig.2: No. of publications produced in various disciplines during the year 2004-05.

A. INITIATION SECTION

During the report period, a total 174 project proposals remained under active consideration of the Foundation. Out of these, 82 were newly received while 92 were carried over from the previous year. Out of those, 23 projects succeeded in getting the approval of the Foundation at a total cost of Rs.18.01 million, in the fields of Agriculture, Biology, Biotechnology, Chemistry, Engineering, Environmental Sciences, and Physics. List of the approved projects is at Annexure-II.

Out of the reviewed projects, during the year, 20 succeeded in getting the recommendations of the PSF Technical Committees in the fields of Physics, Chemical, Engineering, Environmental and Medical Sciences.

B. RESEARCH MONITORING AND EVALUATION (Non-Development)

Research support (Implementation & Monitoring) is the principal programme of the Pakistan Science Foundation for the promotion of basic and applied research, having relevance to the socio-economic needs of the country. 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 review report from 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.

During the year 169 projects remained on going and an amount of Rs. 8.30 million was released on account of due installments. (fig.3)

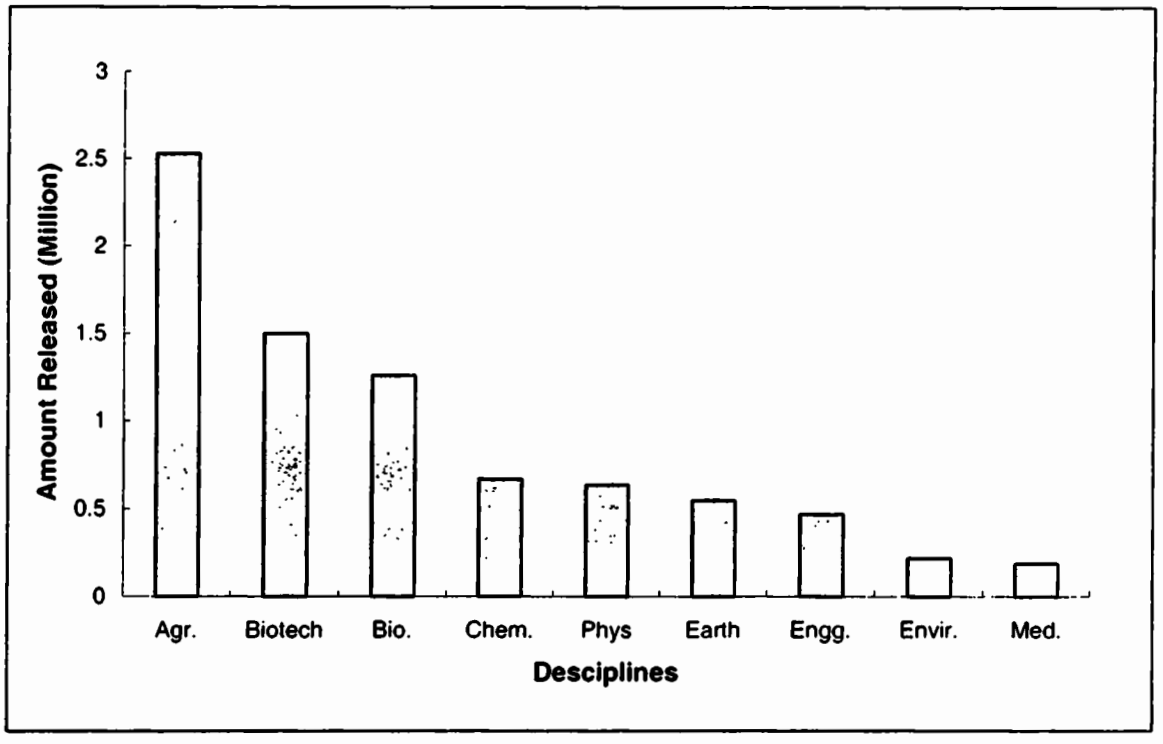

Fig.3: Amount released in various disciplines during 2004-05

1) On-Going Projects

The Foundation evaluates the technical progress as well as financial position of on-going projects continuously till the completion. During the year 60 reports (semi-annual, 1st & 2nd annual and final) 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 to assess the interim progress of the projects. It may be mentioned that due installments of on-going projects are released only if their interim progress at the end of each project year is satisfactory. An amount of Rs. 8.30 million was released on account of due installments of ongoing projects. A list of the semi-annual and annual reports is given in Annexure-III.

2) Completed Projects

Final Technical Reports of 12 (twelve) research projects were received during the year under report. The subject experts evaluated these reports and subsequently will be submitted along with their evaluation reports to the relevant forthcoming PSF Technical Committees for consideration and adoption. A list of the completed projects followed by their summaries is given below.

i) List of Completed projects

S. No.	Projects No.	Project Title
1.	S-PARC/Agr (277)	Investigations of plants parasitic nematodes and pseudomonas associated with datepalm in Balochistan and their management by organic amendments.
2.	P-PU/Bio (187)	Transformation studies of rice (Oryza Sativa).
3.	C-PMNH/Bio (315)	Ecological studies of the reptilian fauna of Cholistan desert.
4.	C-QU/Bio (323)	Identification of loci in Pakistan kindred with ectodermal dysplasia.
5.	Biotech/P-GC/Bio (37)	Optimization of cultural conditions on the biosynthesis of xylanase by locally violated aspergillums niger.
6.	B-BU/Chem. (346)	Leishmenia and leishmeniasis in Pakistan.
7.	C-PMNH/Earth (38)	Mineralization & petrogenetic study of rocks along Indus suture zone.
8	C-PINSTECH/Earth (67)	Geological studies of carbonate complexes of Northern Pakistan and their economic evolution in terms of rare metals, rare earth elements, phosphate & uranium.
9	C-QU/Envr (58)	Studies on the degradation of chlorinated phenolic compounds by *Pseudomonas Species.*
10	S-AKU/Med (185)	Role of vitamins B6. B12 and folate glutathione and cytokines in the development of coronary artery disease in a Pakistani population.
11	C-QU/Phys (119)	Generation and characterization of hydrogen, methane and oxygen-argon cold plasma.
12	C-QU/Phys (120)	Laser optogalvanic spectra of atoms.

ii) Brief Summaries of Completed Project

Project No. **S-PARC/Agr (277)**

Project Title: Investigations of Plants Parasitic Nematodes and Pseudomonas Associated with Datepalm in Balochistan and their Management by Organic Amendments

Duration: 3-Years.

Date of Initiation: 01-06-2001

Date of Completion: 31-05-2004

Final Report Received: 20-10-2004

Location of Scheme: Department of CDRI, PARC, Karachi University. Karachi.

Principal Investigator: Dr. Aly Khan.

Total Expenditure: Rs.458,622/-

Main Objectives:

- To determine the association of plant parasitic nematodes and *Pseudomonas* in Datepalm in Balochistan.
- To establish any interaction between nematodes and bacterium.
- To assess the effect pf some organic amendment on nematodes and *Pseudomonas* in Datepalm.

Summary of work done

Pakistan is ranked among the 5th leading producers of dates after Iraq, Egypt, Saudi Arabia and Iran. The Date palm trees are infected by a number of pathogens including nematodes which eventually reduce its yield.

During the study a total of six nematode species namely *Helicotylenchus Indus, H. multicinctus, Tylenchorhyncus brassicae, Meloidogyne incognita, Pratylenchus thornei,* and *P. penetrans* were recorded from Lasbela district. The nematodes recorded from Khuzdar district include *Tylenchus sps., Mrelinius khuzdarensis, M. brevidens, Helicotylenchus indicus, Psilenchus hilarulus, Xiphinema americanum, Aphelenchoides sps.,* and *Melidogyne incognita.*

The similarity between the localities based on the qualitative (presence/absence). Nematode data was calculated on the basis of Jaccard's co-efficient of similarity. A new species *Merlinius khuzdarensis* was recorded from soil around the roots of date-palm from Khuzdar.

The occurrence of endo- and ecto-parasitic nematodes with the roots of date palm in Lasbela district had significant effect on *Psuedomonas aeruginosa* in the rhizophere soil ($F=70.92$, $p < 0.01$). The rhizophere population of *P. aeruginosa* was

significantly (p>.01) higher when roots were only infected with endoparasitic nematodes.

Histological changes in the young date palm roots infected with the root-knot nematode, *Meloidogyne incognita*, collected from Khuzdar (Balochistan), revealed that the nematode larvae penetrated the roots of date palm by puncturing action of stylet and finally migrated into the cortex and endodermis layers where the cells were damaged. Hypertrophy, resulting in the formation of giant cells in the cortical and stellar regions of the roots, was recorded. Presence of gelatinous egg masses, hyperplasia of cells, with cells having relatively thick walls and shrunken basophilic cytoplasm were found in the infected roots.

Project No. **P-PU/Bio (187)**

Project Title: Transformation Studies of Rice (*Oryza sativa*).

Duration: 3-Years.

Date of Initiation: 01-07-1992.

Date of Completion: 30-06-1995

Final Report Received: 13-11-2004 (*Despite several reminders report was received late from the Principal Investigator*)

Location of Scheme: Centre for Molecular Biology, University of the Punjab Lahore.

Principal Investigator: Dr. Tayyab Hussain.

Total Expenditure: Rs.268,800/-

Main Objectives:

- Regeneration from tissues e.g., mesocotyles, leaf bases and scutella into whole plants.
- Regeneration of protoplasts calli and whole plants.
- Transformation of rice protoplasts using Ca^{++} and PEG.
- Establishment of tissue and protoplasts derived plants into the soil.

Summary of work done

Twelve varieties of *Oryza sativa* were screened for the evaluation of regeneration ability. Those varieties included RP 15, RP18, IR70, BR11, Taipei 309, Basmati Pak, Super Basmati, Jhona, IRR16, KS282, Bas 370 and Bas 385. All these varieties were subjected to callus induction. Leaf bases Mesocotyl, scutellum and root

explants were cultured on various media formulation. Variety Bas 370 and Super Bas gave best response in all the explants used for callus induction while IRR16 produced lowest callus formation in all the tissue explants studied. Out of twelve varieties, two, Bas 370 and IRR16 produced plant through callus formation. *Orzya sativa* vars. Bas 370, Bas Pak, Super Basmati, IRR16, Br11 and RP15 produced plants without callus formation.

Experiments were carried out to establish regeneration conditions of protoplasts of *Oryza sativa* Bas 370 and IRR16 calli were used to isolate protoplasts enzymatically with a mixture containing cellulose 10g/=/1, pectolyase 1.0g/1 and MES 5mM in CPW 13M salts. The protoplasts were purified by centrifugation at a speed of 80xg for 15 minutes.

Isolated protoplasts were either embedded in KPR medium containing sea-plaque agarose or cultured in liquid medium in the feeder layer plates. Cultures were kept in the dark at 25 $\pm$ 2 °C and were fed with fresh medium at 12-15 days interval using reduced osmoticum. The dividing protoplasts were observed after three days.

Conditions of transformation of rice protoplasts and explants were optimized by transient expression of foreign genes in these tissues. In the local varieties of rice, isolated protoplasts from leaf base of aseptically grown seedlings were used. Chemically induced DNA uptake procedure was used to transfer GUS gene in the isolated protoplasts. A GUS substrate MU (4-methl-umbeliferyl –D- glucuronide) was used and GUS activity was determined by examining the microtiter plates under UV. Fluorescence was observed in the extract of protoplasts after 48 hours. When leaf bases of rice seedlings were electroporated with DNA to transfer GUS gene and the explants were dipped in a solution containing X-Gluc (5-bromo-4-chloro-3-indolyl glucuronide) after 3 days. Blue colour was observed in transformed as well as non-transformed leaf base of rice seedlings.

Conditions were also established for transient as well as stable expression of genes into leaf bases and mature embryos of rice using home-made particle acceleration gun. Beta-glucoronidase gene was introduced into leaf base for transient expression. Leaf bases isolated from 5 days old etiolated seedlings of rice were kept on Petri plates containing MS medium solidified with1% agar and bombarded. About 70% of leaf bases showed transient expression. A selectable marker gene, *hph* which confer hygromycin resistance in transgenic tissues was used for stable transformation. Mature embryos excised aseptically and were kept on MS medium and bombarded with DNA-coated tungsten particles. After 5 days these embryos were transferred to selection medium containing hygromycin at concentration of 50ug/ml. The green fast growing plants were selected for Southern blotting to confirm the presence of marker gene in rice genome.

Under the optimized conditions of stable transformation of marker gene, the co-transformation of Bt gene, *Cry* I A (c) has been achieved. Mature embryos were bombarded with tungsten coated particles; DNA from plasmid prob 5 and ubi-*Cry*lA (c)

was mixed in 1:3 ratio and were used to coat tungsten particles. Leaf base (2mm) were excised from the resultant plants and cultured on medium containing hygromycin (30 μg/ml). Transgenic plants were identified by their ability to grow on selection medium while the non-transformed plants became necrotic and subsequently died. Putative transformants were multiplied in vitro and then transferred in 50:50 mixtures of peat moss and clay.

Under the objective © the regenerated plants of IRR16 were transferred to soil through and intermediate stage of semi- controlled condition in greenhouse. These plants bore viable seeds. The transgenic plants were grown at 29°C day temperature and 25°C at 100 lux. The photoperiod was gradually decreased to 10 hours day and 14 hours nights to get fertile spikelets viable seeds were germinated into R1 plants.

Project No. **C-PMNH/Bio (315)**

Project Title: Ecological Studies of the Reptilian Fauna of Cholistan Desert

Duration: 3-Years

Date of Initiation: 01-10-2001

Date of Completion: 30-09-2004

Final Report Received: 14-05-2005

Location of Scheme: Zoological Science Division, PMNH, Islamabad.

Principal Investigator: Dr. Khalid Javed Baig

Total Expenditure: Rs.200,945/-

Main Objectives:

- To estimate population trends of reptilian fauna and pave way for a continued monitoring programme for conservation of endemic species which run a higher risk of elimination to catastrophic declines and erosion of natural habitat than more normally ones.

- To identify composition of lizards assemblages and relative abundance of species component at some selected sites of Cholistan Desert. This will have an importance as prerequisite to other ecological studies.

- A comprehensive collection of specimens which includes all the animals in addition to the lizards will be obtained identified and deposited in the PMNH for reference and future investigations. This multi-taxa inventory will help to understand the integrated diversity picture.

Summary of work done

Cholistan being part of 'Great Indian Desert' is an extremely important area but unfortunately is least explored herpetologically. Present studies were aimed to carry out ecological studies of the reptilian fauna of the desert, enabling to know only the reptile wealth of the area but also to find out the association of different species with particular habitat.

Present report is based on the collection and observations made during the entire project period from October 2001 to October 2004. Thousands of specimens belonging to different species of reptile were observed and studied in the field. Specimens were collected, preserved and finally transported to Pakistan Museum of Natural History (laboratory)

More than 500 specimens, of which over hundred were belonging to 40 species of amphibians and reptiles, have so far been collected from the study area. It constitutes the largest collection of reptiles from Cholistan Desert anywhere in the world. Out of the collection made from the Cholistan Desert, one species of amphibia, one lacertid and scincid are expected to be new to the science.

Project No. **C-QU/Bio (323)**

Project Title: Identification of loci in Pakistani Kindreds with ectodermal Dysplasia

Duration: 3-Years.

Date of Initiation: 01-06-2000

Date of Completion: 31-05-2003

Final Report Received: 05-04-2005 (*Despite several reminders report was received late from the Principal Investigator*)

Location of Scheme: Department of Biological Sciences, Quaid-i-Azam University Islamabad

Principal Investigator: Dr. Wasim Ahmad

Total Expenditure: Rs.824,435/-

Main Objectives:

- Several candidate linkage loci for ectodermal dysplasia (ED) are known, and prior to a genome-wise search for linkage, can be easily tested for linkage. Five knee loci for autosomal dominant form of ED for either genetic linkage or exclusion of linkage using microsetellite markers in and around the candidate loci will be tested.

- Gene discovery and mutation identification will be studied, if it will not achieved the microsetellite of entire genome will be done.

Summary of work done

In the study equal allele frequencies were used in the linkage analysis. Only two alleles were observed to segregate for the markers in the studied chromosomal 17 region except for marker D17S1351. Thus, the lowest allele frequency, which was used in the analysis, was 0.33 for this marker. For linkage analyses, if the allele frequencies, which are used, are much lower than the true allele frequencies, a false-positive result may be observed. Therefore, a sensitivity analysis was carried out. The frequency of the allele that was segregating with the disease allele was varied between 0.2 and 0.8. For this range of allele frequencies, the multipoint maximum LaD score varied between 4.9 and 3.1. Given that the average heterozygosity of these markers is 0.77 (SD 0.07), it is highly unlikely that all of the marker alleles, which are segregating with the disease allele have a frequency of greater than 0.8, and therefore, linkage has falsely established. After excluding linkage with the keratin and other epidermally expressed candidate genes, we performed a genome-wide search to localize the gene for autosomal recessive nail dysplasia to the long arm of chromosome 17. This locus is distinct from the locus for another primary nail dysplasia namely autosomal dominant NDIC, which is located on the short arm of chromosome 17 (2). This is not surprising, because affected individuals with NDIC display longitudinal streaks and thinning of nail plates, features which are not observed in our family. A number of genes have been localized to the identified 3-MB region of homozygosity. The genes within this region include tylosis (MIM 148500), EVPL (MIM 601590), gelanin receptor-2 (MIM 603691), growth factor receptor-bound protein-2 (MIM 108355), integrin beta-4 (ITGB4, MIM 147557), cyelin-dependent kinase-3 (MIM 123828), sphingosine kinase-I (MIM 603730), solute carrier family-9, isoform A3, regulatory factor-I (MIM 604990), galactokinase-I (MIM 604313), and SEC14-like I (MIM 601504). Of these genes, there are two of interest, ITGB4 and EVPL. Integrins (MIM 147557) are transmembrane glycoprotein receptors that mediate cell-cell adhesion and transduced signals tha t regulate gene expression and cell growth. Mutations in ITGB4 had been demonstrated earlier in patients with epidermolysis bullosa with congenital pyloric atresia. EVPL (MIM 601590) is a membrane-associated protein expressed in human stratified squamous epithelia in skin, oral mucosa, esophageal mucosa, and cervical mucosa. EVPL is homologous to the keratin-binding proteins desmoplakin I and IIMIM 125647), bullous pemphigoid antigen-I (MIM 113810), and plectin (MIM 601282). It was suggested previously that EVPL might be a novel desmosomal component involved in anchoring keratin filaments to desmosonal Gs in stratified epithelia. All 22 exons of EVPL gene were sequenced in two affected individuals and an unaffected family member; however, no disease-causing mutation was detected. Further work is currently being carried out to identify the gene that is responsible for autosomal recessive hereditary nail dystrophy.

Project No.	**Biotech/P -GC/ Bio (37)**
Project Title:	Optimization of Cultural Conditions on the Biosynthesis of Xylanase by Locally Isolated *Asperigullus niger.*
Duration:	3-Years.
Date of Initiation:	01-09-2001
Date of Completion:	31-08-2004
Final Report Received:	14-04-2005
Location of Scheme:	Department of Botany, Govt. College Lahore
Principal Investigator:	Dr. Ikram-ul-Haq
Total Expenditure:	Rs.618,946/-

Main Objectives:

- Isolation and screening of xylanolytic *Asperigullus niger* from soil collected from different areas of Lahore.
- Production of xylanase by *Asperigullus niger* using different lignocellulosic substances as carbon source.
- Optimization of xylanase in potential *Asperigullus nigerfro* hyperproduction.
- Mutagenesis using Ultra Violet or chemical (NTG) of potential *Asperigullus niger* .
- Comparison of wild type and mutant strains for xylanase production.
- Scale up studies of xylanase production at fermenter level.

Summary of work done

The present study is concerned with isolation, selection and optimization of cultural conditions for the production of enzyme xylanase by Aspergillus niger. One hundred and four strains of Aspergillus niger were isolated from different soil samples and tested for the production of enzyme. Of all the strains tested, Aspergillus niger GCBT-35 gave maximum production of xylanase. This strain was selected for optimization of cultural conditions in shake flask. Among the four different culture media evaluated, the maximum enzyme production (225 Vlml) was obtained with M-4. Cultural conditions such as rate of enzyme synthesis (48 h) and pH (4.5) were optimized.

After optimization of the cultural conditions, the parental strain GCBT -35 was subjected to UV irradiation for 5-30 minutes. Ninety-four mutants were isolated by observing the zones of xylan hydrolysis due to xylanase activity in the Petri-plates. Of all the mutants tested for enzyme production, mutant BRCuv-45 gave maximum

production (319 Vlml) of xylanase. The selected UV mutated strain was further improved after treatment with MNNG (50-300 J.lglml) for 20 minutes. Seventy-four chemically mutated strains of Aspergillus niger were picked up and evaluated for xylanase production in 250 ml shake flask. Of the mutants examined, maximum enzyme production (467 Vlml) was obtained by Aspergillus niger GCBT MNNG-200 after MNNG treatment (200 J.lglml). Thirty-five mutants selected after treating GCBTMNNG-2o0 with MNNG for different time intervals (1040 min). The mutant Aspergillus niger strain GCBT MNNG-30, being a better producer of xylanase (493 Vlml) was selected for further studies. In shake flask, cultural conditions and nutritional requirements such as rate of enzyme synthesis (48 h), initial pH (4.5) and level of meat extract (1.0 %, w/v) as a nitrogen supplement were optimized. In another study, different agricultural by-products were tested for the production of enzyme by solid-state fermentation. Of all the substrates examined, wheat bran moistened with distilled water gave optimal production of xylanase (1850 Dig). The productivity of enzyme was further improved (2480 Dig) by the addition of starch (2 %) and ammonium sulphate (0.2 %) to the fermentation medium. The production of enzyme in solid-state fermentation was found to be maximum 72 h after inoculation. Scales up studies were carried out in a 7.5 L stirred fermentor. The cultural conditions such as incubation temperature (30°C), initial pH (4.0) and size of 24 h old vegetative inoculum (4.0 %, v/v) were optimized. The optimal production of xylanase (781.4 D/ml) was achieved 48 h after the inoculation when agitation intensity was kept at 200 rpm and air supply at 0.7 vvm (dissolved oxygen 15 %).

Project No. **B-BU/Chem (346)**

Project Title: Leishmenia and Leishmeniasis in Pakistan.

Duration: 3-Years.

Date of Initiation: 01-12-1999

Date of Completion: 30-11-2002

Final Report Received: 21-12-2004 (*Despite several reminders report was received late from the Principal Investigator*)

Location of Scheme: Institute of Biochemistry Sciences, University of Balochistan, Quetta

Principal Investigator: Prof. Dr. Masoom Yasinzai

Total Expenditure: Rs.819,218/-

Main Objectives:

- Collection of Leishmenia samples and their characterization.
- Development of potent chemotherapeutic agent for Leishmeniasis.

- Effects of compounds on promastigotes in-vitro and the interacellular amastigotes.
- Natural products to be tested for activity.
- Study the mode of action of antileishmanial natural products.

Summary of work done

Three representative isolates form Pakistan differ in both k-DNA and n-DNA from another. In the present study we come across the following interesting points; the PK-3 which is typed as *Lashmania infantum* on the basis of zymodeme pattern, shows greater similarity to L. infantum from China. This is important from the evolution point of view of Lieshmenia along the Pak-Sino corridor, the very ancient trade route. Also important in the connection is the similarity of PK-2 to L.tropica from Russia, which resembles with L. major from Iraq.

Hexadecyphosphorylcholine (HePC) and its analogs are anti-tumor agents, in this study these anti-tumor compounds especially HePC is used as inhibitor of Lieshmnial protein kinase. As the sand fly injects the parasite into the mammalian host, the transformation of the promastigotes into the amastigotes is very critical. The study shows, HePC has a countable effect on the transformation process, even at a concentration as low as 1.0μM, the differentiation of amastigotes to promastigotes has been suppressed. Dod. PC (Dodecylphosphorylcholine) is another analog of the HePC. This compound is known to be a non-inhibitor of the mammalian protein kinase and is used as a negative control in HePC topical therapy of the skin metastasis in breast cancer. During the study, it has been found that Dod-PC inhibits Lieshmanial protein kinase more effectively than HePC.

Project No. **C-PMNH/ Earth (38)**

Project Title: Mineralization & Petrogenetic Study of Rocks along Indus Suture Zone.

Duration: 2-Years.

Date of Initiation: 01-10-1990

Date of Completion: 30-09-1992

Final Report Received: 12-04-2005 (*Despite several reminders report was received late from the Principal Investigator*)

Location of Scheme: Institute of Geology,
University of Punjab, Lahore.

Principal Investigator: Prof. Dr. Muhammad Nawaz Chaudhry.

Total Expenditure: Rs.311,500/-

Main Objectives:

- Petrogenetic and petrotectonic study of the Southern suture zones in Mingora-Shangla area, Mohmand-Malakand Ophiolitic mélange and their extension in Bajour Agency and Southern parts of Dir district.

Summary of work done

A geological map on the scale 1:250,000 of about 5000 sq km of Besham, parts of Kohistan, upper Swat areas and Malakand, Bajaur and Mohmand agencies, covering the region between river Indus in the east and Afghan border to the west has been prepared from mapping carried out on 1:5000 to 1:50.000 scales after variably modifying and incorporating the already existing maps. This map was dovetailed into the existing maps further to the east across river Indus in Kaghan valley to produce the geological map of High Himalaya, Indus Suture Zone, parts of Kohistan and Lesser Himalaya from the Afghan border to the border areas of Azad Jammu and Kashmir.

The entire lithostratigraphic package of the mapped areas has been described, standardized and systematized replacing a plethora of local names.

The lithostratigraphic units east of Indus River in Kaghan were correlated with the corresponding lithostratigraphic units to the west up to Afghan border. The High Himalaya package, folded into N-S trending basins and domes, was divided into a basement upper amphibolites facies predominantly pelite-psammite rocks with anatectic migmatites in the core of the domes and granitoids (Manglaur group) overlain by a lower meta-turbidite unit with volcanic derived amphibolite towards the base (Salampur formation) and an overlying upper predominantly calc-pelite and marble (Tilgram formation), metamorphosed in upper amphibolite facies.

The High Himalaya is separated from the Lesser Himalaya by a crustal scale thrust, the Main Central Thrust (MCT), south of which occur E-W trending Palaeozoic marbles of Tursak formation and calc-pelites, graphitic pelites and marbles of Girari formation, metamorphosed in greenschist facies.

On the basis of geology, structure and geochemistry, the rocks occurring along the Indus Suture Zone have been divided into a Tethyan MOR/ fore-arc basin ophiolites in Kohistan, Besham, Alpurai and Dargai and sub-arc mantle rocks overlain by crustal gabbors across the Moho at Jijal Dubair and Spat, Kohistan. The geology and geochemistry of volcanic rocks associated with the Indus Suture Zone has been described and discussed. These rocks were formed either within a juvenile are setting or derived from oceanic mantle that had inherited an anomalously depleted signature from fossil subduction.

In Jijal-Dubair and Spat areas of Kohistan huge outcrops of subarc mantle and overlying crustal gabbors with a palaeo-Moho have been described and discussed. These rocks were described in the past as a part of the Indus Suture Zone.

On the basis of geology and geochemistry, the High Himalayan granitoids have been divided into peraluminous collisional granites of Proterozoic, Pan-African and Palaeozoic periods and Himalayan alkaline granites of Carbhoniferours-Triassic extensional regime.

On the basis of geological contact relations, mineralogical (Presence of pyrochlore) and geochemical criteria (REE) calc-silicate marbles and meta-limestones, some of which were described earlier as carbonatites, have been distinguished from carbonatites.

Chromite associated with sutural ultramafites show limited within group variation in their chemical composition and are either refractory (Al rich) or of chemical grade (Cr-Fe rich). Geochemical signatures suggest their formation under a spreading center, the chromite deposits associated with ultramafites, mainly dunites, of the sub-arc mantle are generally Al-poor, show quite heterogeneous compositions even acress single grains due to variable reconstitution and combination of melt consuming reactions coupled with ascending fluids from the subducting lithosphere. Mg in these is lower than those of sutural chromites.

Manganese mineralization associated with metacherts and greenschists has low values of Co, Ni, Cr, Zn etc and high Mn/Fe ratios and is considered to have formed by hydrothermal rather than hydrogenous process.

Emerald mineralization is due to the influx of Be, Al and Si bearing fluids, derived from the Himalyan beryliferous granites into Cr bearing talc-carbonates derived from mantle peridotites, of the Indus Suture Zone.

Exquisite peridot occurs in veins in association with talc, antigorite and magnesite and is confined to shear zones. Late stage, post tectonic hydrothermal fluids from the host rocks are considered responsible for peridot mineralization in Spat.

Field and geochemical studies suggest that rodingite acurring in the mafic-ultramafics of the Indus Suture Zone was formed due to metasomatic alteration of gabbros, since they contain fairly high values of Al and Ca.

Field relations (association with peridotites), petrography (relict olivine and pyroxene) and geochemistry (high values of Cr, Ni etc) suggest formation of huge talc deposits from ultramafites.

The gem quality epidote belongs to zoisite and epidote-clinozoisite and is crystallized in altered gabbros and metabasites, which often lack penetrative deformation, suggesting their formation under greenstone (schist) and epidote amphibolite facies hydrogenous metamorphism close to the spreading centre.

Green beryl is crystallized generally in calc-alkaline granitoids while blue Cs rich beryl is crystallized in alkaline granitoids. Quartz-mica-beryl, veins, crystallized

in greisenised zones represent fluids derived from rest pegmatitic magma due to pressure release.

Gem quality green grossular garnet discovered from the black schists-calcareous black shales of High Himalayan Crystalline basement near Jambil owes its color to high values of V and Cr in the metamorphosed balck schists.

Gem quality, rare and exquisite pink topaz crystallized into Lesser Himalayan reefal metalimestone due to the influx of F, Al and Si fluids, derived from High Himalayan granitoids in combination with Cr derived from sutural rocks through system of shears connected to the High Himalaya granitoids and Indus Zone ultramafics lying to the north.

Green dravite-uvite tourmaline crystallized into dolomitic marbles of the High Himalaya. The nearby granites contributed B, Si, and Al while the host dolomitic marbles provided the required Mg.

Project No. **C-PINSTECH/Earth (67)**

Project Title: Geological Studies of Carbonatite Complexes of Pakistan and their Economic Significance in terms of Rare Metals, Rare Earth Elements (REEs), Phosphate and Uranium.

Duration: 2-Years

Date of Initiation: 01-11-2001

Date of Completion: 31-01-2004 (3-months Extension)

Final Report Received: 24-03-2005

Location of Scheme: Physics Research Division, PINSTECH, P.O.Nilore, Islamabad.

Principal Investigator: Aziz Ahmed Qureshi

Total Expenditure: Rs. 283,686/-

Main Objectives:

- Sample collection and improvement of available maps of various carbonatite complexes of Pakistan.
- Petrographic studies of rocks.
- Determination of RMs, REEs, Phosphate and uranium contents.
- Rocks dating using fission track technique.

- Interpretation of data to resolve the problems related to petrogenesis, geochronology and tectonic evolution of various rocks units.

Summary of work done:

A 200 km long belt containing alkaline rocks and Carbonatites is found in the north of Peshawar that extends from Pak-Afganistan border to Mansehra through Loe Shilman, Warsak, Sedlai Patti, Shawa-Shahbaz Garhi, Ambela and Tarbela. The Carbonatites are found at Loe Shilman, Jawa, Sillai-Patti, Jambil, Koga-Narangi Kandao and Tarbela. The Carbonatites usually contain rare metals like Nb, Ta, Y, V. La etc., Rare Earth Elements (REEs), apatite and some times uranium in good quantities.

The REEs are a group of 14 elements (At. No. =58-71); 58Ce, 59Pr, 6oNd, 6/Pm, 62Sm, 63Eu, 64Gd, 65 Tb, 66Dy, 67Ho, 68Er, 69Tm, 70'Yb and 71Lu, known as lanthanides. However, 2/8c, 39Y and 57La are also included in the list because of their properties similar to 14 basic REEs. The rare metals, REEs, apatite and U have certain unique and special applications in first flourishing industries of transistor, photoelectric cells, computer, rectifier, X-rays, transmitters, radar, laser, thermonuclear, steel, chemical and many others. Pakistan does not have any proven reserve of these materials. However, there is a chance of existence of these materials in various Carbonatite complexes of Pakistan.

The study presents the geology, geochemistry, geochronology and economics of Carbonatites found in Northern Pakistan. The Loe Shilman Carbonatite Complex consists of sheet-like bodies of Carbonatites, syenites, granitoids and gabbroic rocks emplaced along a fault zone. The Carbonatite complex is more than 3 km long and 175 wide in the centre. The rocks in the north are mica schists and limestones of Paleozoic age while those in the south are slates/phyllites of Pre-Cambrian age. The Loe Shilman Carbonatite has good concentrations of Nb, Y, V and La and REEs like Ce, Pr, Nd, Gd and Tm, apatite and U. At Jawar a thin sheet of Carbonatite is exposed over a distance of about half a km with a thickness of 3-4 meters. This body does not have any economic potential due to small size and far off location. The Sillai Patti Carbonatite consists of extensive Carbonatite dykes, emplaced either within the metasediments or at the contact of metasediments and granite genesis. This Carbonatite has reasonable concentrations of Nb & La (& Y to some extent) and of some REEs like Ce, Nd, Gd, Dy, apatite and uranium. Small isolated sill like bodies and plugs of Carbonatites and fenites are exposed, about 10 km SE of Mingora in Jambil area. They intrude the Swat Granite Gneiss and Manglaur Formation. The Jambil Carbonatite is not of any economic importance due to low values of rare metals and REEs and small size of the Carbonatite bodies. Near Koga, the Carbonatites are exposed in area around Naranji Kandao as plugs, dikes/sills of small sizes. The Carbonatites contain low amounts of Nb, La, Ce and Nd. The small size of Carbonatite bodies does not warrant for the existence of any economically exploitable deposit. Some additional field work may help to locate new Carbonatite bodies in Naranji Kandao area for further exploration. On the western bank of Indus River near Power House at Tarbela, there is an occurrence of granites, albitites, Carbonatites and gabbroic rocks. These rocks are emplaced along a

3.5 km longfault. Presently, the area is covered due to the constructional work related to Tarbela Dam. Out of the above-mentioned six-Carbonatite complexes, the Loe Shilman and Sillai Patti Carbonatites are geologically and economically promising. They should further be explored by drilling, aditing and other means. Some geological work in Naranji Kandao area is recommended to explore the possibility of existence of new Carbonatite bodies for further exploration for rare metals, REEs and other possible metals/minerals.

Project No. **C-QU/Envr (58)**

Project Title: Studies on the Degradation of Chlorinated Phenolic Compounds by Pseudomonas Species

Duration: 2-Years.

Date of Initiation: 01-07-2000

Date of Completion: 30-06-2002

Final Report Received: 19-11-2003

Location of Scheme: Department of Biological Sciences, Quaid-i-Azam University Islamabad.

Principal Investigator: Dr. Safia Ahmed

Total Expenditure: Rs.312,772/-

Main Objectives:

- Isolation and selection of microorganism utilizing the chlorinated phenolic compound as sole of carbon and energy will give cholorophenole-degrading strains. This will help in exploring the potential of indigenous microbial strains for the biodegradation.
- Degradation of phenolic compounds in the liquids media with different concentration of the test compound will provide range of concentrations to be completely mineralized and partially degraded. This will also give the time for different concentrations to be mineralized.
- To test Cholophenolic compound degradation in cold and at high temperature using selected strains and their mixed cultures. Calibration of retention time, dissolved oxygen concentration in biofermentor will provide data for the design of any treatment system at the site.
- Immobilization of selected cholorophenol degradating strains will provide a continuous system and resistance to high concentration of phenols.

- Soil decontamination study will give a simple and easy system for removing pollutants from the adjacent environment.

Summary of work done

Pure culture of *Pseudomonas putida* was adapted to increasing phenolic concentration, and they were found best adapted to phenol. Better ability of the pure culture of P. *putida* to degrade phenol with respect to the mixed culture is also confirmed for concentrations (70 mg dm-3) and without any adaptation by the achievement of a higher degree of conversion after a shorter reaction time (6 days instead of 8-days).

Then phenol acclimatized pure culture of P. *putida* was used for immobilization purpose. Not only the surface of the sand particles revealed the coating of cells but also, the results obtained from CPU method evidenced that sand is well coated and is now ready to be filled in column. Immobilization of adapted cultures to some solid support is a successful step in wastewater treatment procedure. Compared with free cells of the mixed culture, the entrapped mixed microorganisms are able to degrade 1 g/L phenol faster. The higher degradation rate could be explained with regard to cell number and activities of the ring cleaving *Pseudomonas putida.* The entrapment in the gel matrices has offered a protection of the microorganisms, especially of *Pseudomonas putida* against the toxic compound polymer was also proposed by Bettman and Rehm, (1984).

Thus, the observed change of the dissolved oxygen concentration in the bulk liquid includes information on the phenol biodegradation rate by microbes. In the initial stages of degradation, the oxygen concentration decreased rapidly, then subsequently decreases linearly at a low rate to a minimum value. The oxygen concentration rapidly recovers to the initial standard level from a minimum value. The observed minimum dissolved oxygen concentration, which is the starting point of a drastic increase in the dissolved oxygen concentration, corresponds to the point at which the phenol is completely consumed by microbes.

The above mentioned investigation and results suggest that optimum conditions for the growth and biodegradation of phenol and phenolic compounds are almost searched now. The selected strains are successfully degrading chlorophenol. A successful attempt was made, by P. *putida* Fl cells, for degrading phenolic solution by using Bioreactor technique. Acclimatized cultures and immobilized cells in fluidized bed reactors can be used for degradative studies of phenolic waste waters.

Project No. **S-AKU/Med (185)**

Project Title: Role of vitamins B6, B12 folate, glutathione and cytokines in the development of coronary artery disease in a Pakistani population.

Duration: 2-Years

Date of Initiation: 01-01-2002

Date of Completion: 31-08-2004 (8 months extension)

Final Report Received: 28-03-2005

Location of Scheme: Department of Biological & Biomedical Sciences, Aga Khan University Karachi

Principal Investigator: Prof. Dr. M. Perwaiz Iqbal

Total Expenditure: Rs.486,111/-

Main Objectives:

- To compare the plasma levels of vitamins B6, B12 and folate in Pakistani patients with ischaemic heart disease (IHD) and normal healthy subjects .
- To compare the plasma and blood cell levels of glutathione (GSH) in patients with IHD and normal healthy subjects.
- To study if there is any antiatherogenic effect of GSH.
- To monitor the plasma levels of cytokines, such as interleukin-I (IL-I), tumor necrosis factor-ά (TNF –ά), tumor necrosis factor-β (TNF-β), granulocyte-macrophages colony stimulating factor ((G-CSF), γ-interferon (γ-IFN), interleukin-2 (IL-2) and platelet- derived growth factor (PDGF)in patient with IHD and in normal healthy subjects.
- To find out if there is any association between the plasma levels of cytokines with the degree of stenosis in the cornory arteries of IHD patients.

Summary of work done

Pakistani people belong to an ethnic group which has the highest rate of coronary artery disease (CAD). There is growing evidence to suggest that vitamins B6, B12 and folate and reduced glutathione (GSH) might be having a protective role against the development of CAD. Therefore, in order to investigate the protective role of these vitamins and GSH against the development of CAD in our population, it is monitored the serum/plasma levels of vitamins B6, B12, folate and homocysteine in 224 patients with acute myocardial infarction (AMI) and compared these with levels in 126 normal healthy subjects. The data show that AMI patients in Pakistani population have significantly lower levels of serum folate, serum B12 and plasma B6 and relatively higher levels of plasma homocysteine compared to normal healthy subjects. Higher levels of plasma homocysteine in Pakistani population of normal healthy subjects (16.4

± 4.9 /lmol/L) compared to normal levels of homocysteine in most Western populations < 15 /lmol/L). Percent deficiency values of folate, vitamin B6 and vitamin B12 in Pakistani normal adults were found to be 32.5%, 49.2% and 3.2%, respectively. In AMI patients, deficiency values were even higher (67.1 % for folate, 63.4% for vitamin B12 and 74.1 % for vitamin B6.

It is also monitored glutathione levels in erythrocytes of AMI patients and normal healthy subjects and found significantly more glutathione levels in erythrocytes of patients with AMI. Attempts to investigate the anti atherogenic activity of glutathione monoester using a mouse-model were successful. It appears that the strain of mice (Balb/c) used in this study was slow in developing the fatty streaks in aorta. However, a group of mice after remaining on atherogenic diet for 1 year developed well defined plaques in heart and aorta. These plaques were either totally absent or if seen in an animal were significantly small and diffused in the group of mice receiving glutathione monoester along with atherogenic diet. This indicates that glutathione monoester appears to reduce or inhibit development of plaque formation in mice. It is also determined the variability in lipid profile in 451 patients with AMI from two tertiary care hospitals in Pakistan and 323 normal healthy subjects. High prevalence rates of hypertriglyceridemia and low HDL-cholesterol were found to be the major abnormalities in Pakistani patients and normal adults. In order to investigate whether or not plasma levels of a lysosomal enzyme, N-acetyl I3-Dglucosaminidase (NAG) are raised in myocardial infarction, it is monitored plasma NAG activity in 69 patients with AMI and 135 normal healthy subjects. Plasma levels of NAG were found to be significantly elevated in AMI patients compared to normal healthy subjects. It is also found that after treatment with streptokinase, plasma levels of NAG in AMI patients (n=75) were further increased indicating that NAG could be a potential marker of myocardial reperfusion. In another study, it is compared the changes in plasma levels of NAG, proinflammatory cytokines, such as tumor necrosis factor alpha (TNFa), interleukin 6 (IL 6) and interleukin 8 (IL 8) and granulocyte-macrophage colony stimulating factor (GM-CSF) in 12 angina patients undergoing cardiopulmonary bypass. A significant increase in plasma levels of NAG (P= 0.001) and GM-CSF (P=0.045) was observed 5 days following coronary artery bypass grafting (CABG). The increase in GM-CSF on day 5 is suggestive of enhanced body's defense against infection.

The study illustrates that, vitamins supplements or devising drugs or agents which could decrease levels of homocysteine and increase the levels of HDL-cholesterol and endogenous GSH to control the development of CAD in high-risk individuals.

Project No. **P-GC/Phys (119)**

Project Title: Generation and Characterization of Hydrogen-Methane and Oxygen Cold Plasma.

Duration: 3-Years.

Date of Initiation: 01-11-2001

Date of Completion: 30-10-2004

Final Report Received: 25-05-2005

Location of Scheme: Centre for Advance Studies in Physics, Govt. College, Lahore

Principal Investigator: Dr. Riaz Ahmed

Total Expenditure: Rs.624,515/-

Main Objectives:

- Design and construction of stainless steel chamber.
- Low frequency cold plasma generation.
- Construction of Langmuir probe assembly.
- Optical emission spectroscopy.

Summary of work done

Plasma Device was designed and fabricated from the local market including its vacuum system. Langmuir probe was designed and fabricated in our Plasma Technology Lab and then plasma parameters were measured.

The plasma was successfully generated in Air, Argon and Nitrogen at different gas pressures in our Lab. The aim of the work is to have control on plasma parameters that will be starting point for plasma enhanced chemical processing such as deposition, modification of surfaces and etching of surface layers. We have demonstrated that nitriding on the steel samples improves the hardness of the surface and therefore the designed reactor could be used to improve the hardness of cutting tools, gears etc.

Project No. **PSF/Res/C-QU/Phys(I20)**

Project Title: Studies Laser Optogalvanic Spectra of Atoms

Duration: 3-Years

Date of Initiation: 01-08-2001

Date of Completion: 30-07-2004

Final Report Received: 09-03-2005

Location of Scheme: Department of Physics, Quaid-i-Azam University Islamabad.

Principal Investigator: Dr. M. Aslam Baig.

Total Expenditure: Rs.6,60,113/-

Main Objectives:

- To investigate the structure of atoms in the highly excited Rydberg states, to measure the energy levels of atoms and the ionization potentials accurately.

- To train the man power in the field of Atomic physics and Laser Spectroscopy to keep abreast with the latest developments in the field of Laser Isotopic Separation.

Summary of work done:

The study present the dominant physical processes responsible for the production, of Optogalvanic signal in the spectra of neon. We have investigated the effects on the Optogalvanic signal by scanning the dye laser across neon transitions in the DC discharge plasma. The time resolved spectra are obtained at a fixed wavelength of the dye laser tune in resonance with optically allowed transition. The temporal evolutions of the signals are registered on a storage oscilloscope. Three transitions from the 3s $[1I2]_2$ metastable state corresponding to the $\Delta J = \Delta K = 0, \pm 1$ dipole selection rules have been selected to investigate the dominant physical processes responsible for the Optogalvanic signals. The change in the signal amplitude as a function of the discharge current has been registered. In addition, the electron collisional ionization rate parameter ratios have been determined for the transitions corresponding to dipole selection rules $\Delta J = \Delta K = -1$, $\Delta J = \Delta K = 1$ and $\Delta J = \Delta K = 0$, as 1.64, 1.75 and 1 respectively. The affective lifetimes of the upper levels involving in the aforementioned transitions are also calculated as 58.8 μs, 28.00 μs and 12.85 μsrespectively.

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iii) Scientific Publications Produced through PSF Supported Projects

One of the main achievements and usefulness of any research is the publication of its results in scientific journals. Based upon the results of completed projects as many as 52 research papers were published in national/international journals by the principal investigators of completed projects. A list of these papers is placed at Annexure-IV.

iv) Higher Degrees earned through PSF Supported Projects

One of the major goals of the Foundation is the training of scientific manpower in the country. This in turn would result in strengthening of R&D infrastructure of various scientific organizations. In order to achieve this goal, the PSF has been developing scientific manpower, through its research projects. For this purpose, Research Associates are provided in the projects, they are required to register for Ph.D or M.Phil degrees. During the report period, 08 M.Sc., 06 M.Phil and 06 PhD degrees were awarded to research worker under PSF funded projects in the fields of Agricultural Sciences, Biological Sciences, Biotechnology & Genetic Engineering, Chemical Sciences, Earth Sciences, Environmental Sciences, Medical Sciences and Physics.

C. IMPLEMENTATION & MONITORING (Development)

a. Funding of Scientific and Technological Research in Universities and R&D Organizations.

The above development project was sanctioned by DDWP at a total cost of Rs.39.00 million over a period of three years. The main objective of the project is to strengthen the scientific and technological research activities in the Universities and other R&D Organizations by providing them more funds for:

(i) Undertaking basic and applied research on problems having direct relevance to the socio-economic needs of the country. Projects are funded in various disciplines of Science i.e. Agriculture, Biotechnology, Chemistry (Medical Chemistry, Biochemistry, Industrial Chemistry), Electronics, Engineering, Information Technology, Mathematics, Physics.

(ii) Procurement of specialized research equipment, chemicals and/or literature which are required by the research workers in different organizations for carrying out their research activities and they are unable to purchase these due to paucity of funds.

(iii) Training of manpower for undertaking scientific research on advanced laboratory techniques

During the year 2004-2005, Seventy eight (78) different progress reports of on-going projects under the PSDP project, were received and Rs. 7.5 M were released on account of due installments of on-going Projects.

b. Career Development of Young Scientists and Technologists

The above development project was sectioned by DDWP on 24.07.2001 at a total cost of Rs. 28 M for a period of five years. This project is aimed to award research grants to young scientists, both employed and unemployed, who have completed their Ph.D. during the last 5-years.The unemployed scientists are also provided living allowance @ Rs.15,000/- per- month. The main purpose of the project is to help the young scientists in their career development within Pakistan and reduce the brain drain.

The objectives of the project are:

(i) To utilize expertise of highly qualified S&T manpower for the development of science and technology in the country,

(ii) To provide career opportunities to young scientists and technologists and to encourage them to settle within Pakistan and

(iii) To arrest brain drain of highly qualified scientists and technologists of the country.

During the year 2004-05, Six (6) different progress reports of on-going projects under development project, were received and Rs. 0.650 million were released on account of due installments of on-going Projects.

c. Research Monitoring and Evaluation (Development)

The Foundation evaluates the technical progress as well as financial position of on-going projects continuously till the completion of the projects.

1) On-going Projects

During the year, 84 (78 R&D + 6 CDYST) reports (semi-annual, 1st annual and 2nd annual) 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 to assess the interim progress of the projects. It may be mentioned that due installments of on-going projects are released only if their interim progress at the end of each project year is satisfactory. A list of the semi-annual and annual reports received during report period is given in **Annexure-III.**

2) Completed Projects

Final Technical Reports of 12 research projects under R&D and CDYST projects were received during the year under report. The subject experts evaluated these reports that were subsequently submitted alongwith their evaluation reports to the relevant PSF Technical Committees for consideration and adoption. A list of the completed projects followed by their summaries is given below:

i) List of Completed Projects.

S.No.	Project No.	Project Title.
1.	R&D/S-CCRI/Agr (4)	Balanced Nutrient Management Studies for Cotton Wheat – Cropping System in Sindh.
2.	R&D/P-LPRI/Agr (30)	Simplification of Urea Treatment of Cereal Straw Method for its Easy Adoption by the Farmers.
3.	R&D/S-SAU/Agr (94)	An Assessment of the Impact of the Farm Advisory Services of Agricultural Extension and Other Allied Agencies in Sanghar & Mirpurkhas Districts of Sindh.
4.	R&D/F-NIFA/Agr (181)	Performance of Promising Mungbean (*Vigna Radiator (L) Wilczek*) Genotypes/Varieties on Formers Field in NWFP
5.	R&D/P-LPRI/Agr (229)	Epidemiological Investigation of *Leptospirosis* in Cattle and Buffalo
6.	R&D/P-AU/Bio (41)	Screening of Nematode Population of Beetal Goat for Development of Resistance Against Commonly Anthelmintics at Livestock Farms of Punjab

7.	CDYST/P-PRI/Bio (1)	Influence of Different Copper and Aluminum Levels on Feather Renewal and Production Characteristics of the Layers in the Second Production Cycle
8.	CDYST/S-KU/Bio (3)	Marine Nematodes as Pollution Indicator.
9.	CDYST/P-LPRI/Bio (6)	Preparation and Evaluation of Tick Vaccine
10.	CDYST/S-KU/Bio (14)	Biocontrol of Nematodes by Vesicular Arbuscular Mycorrhizal (VAM) Fungi.
11.	CDYST/F-NIFA/Bio (17)	Radiation Decontamination of Poultry Feed.
12.	CDYST/B-AZRI/Bio (18)	Ecological Studies on Artemisia *(Seriphidium quettensed)* in Highland Balochistan

ii) **Brief Summaries of Completed Projects.**

Project No. **R&D/S-CCRI/Agr (4)**

Project Title. Balanced Nutrient Management Studies for Cotton Wheat- Cropping System in Sindh

Duration: Two Years

Date of Initiation. 15.6.2002

Date of Completion. 14.6.2004

Location of Scheme: Central Cotton Research Institute, Sakrand, Distt. Nawabshah.

Principal Investigator: Dr. Abdul Wahid Soomro.

Total expenditure. Rs.3,58,672/-

Main Objectives:

- To investigate soil fertility status of the 3 cotton/wheat growing districts (Naushehroferoze, Sanghar and Hyderabad) of Sindh.
- To determine nature and extant of nutrient defiencies in cotton/ wheat in above districts.
- To determine fertilizer requirement of cotton/wheat cropping system.

Summary of the Work Done:

Cotton and wheat are important crops of Pakistan and efforts are required to rise per hectare yield and for that use of balanced fertilizers is an essential factor. To exploit maximum potential of soil, field experiments with various treatments of balanced fertilizer were conducted on cotton and wheat crops at various places in districts Naushehroferoze and Sanghar (Sindh) and it was observed that yield of seed cotton and wheat grain was significantly increased with the application of balanced fertilizer including nitrogen, phosphorus, Potassium, boron, and zinc. Boron and zinc application to deficient fields enhanced seed cotton yield by 23 to 36 percent and wheat grain yield by 8 to 34 percent over NPK treatment in the project area.

Soil and cotton plant samples were collected from 100 randomly selected growers in each district and were analyzed for macro and micronutrients. It was found that the soils of districts Naushahroferoz and Sanghar were alkaline and calcareous with low organic matter. The laboratory reports suggested that soils were deficient in nitrogen (95 to 98 percent), phosphorus (100 percent). Boron (40 to 49 percent) and zinc (14 to 38 percent) nutrient elements. The soils were adequate in iron, copper and manganese nutrient elements. Plant analysis also showed similar trend and were found deficient in nitrogen (100 percent), phosphorus (94 to 100 percent), potash (7 to 18 percent), boron (42 to 49 percent) and zinc (24 to 26 percent).

It is obvious that maximum yields can be obtained from these soils through the application of required nutrients in deficient soils. Soil application and foliar feeding of boron and zinc were found equally effective, further more, foliar application was observed more effective in terms of VCR (value cost ratio).

Our farmers are unaware about modern technology in agriculture; therefore they are getting poor yields from their crops. However, our findings suggest that maximum yields may be achieved through the adoption of integrated plant nutrient management (IPNM). Use of balanced fertilizer may also be beneficial for poverty alleviation.
As a result of this study, two research papers have been published in National Journals.

Project No.	**R&D/P-LPRI/Agr (30)**
Project Title.	Simplification of Urea Treatment Method for Cereal Straws for its Better Adoption by the Farmers
Duration:	Two Years
Date of Initiation.	1.7.2002
Date of Completion.	31.6.2004
Location of Scheme:	Livestock Production Research Institute,

Bahadurnagar, Okara

Principal Investigator: Dr. Makhdoom Abdul Jabbar.

.Total expenditure. Rs.2,17,698/-

Main Objectives:

- To develop simpler method of urea treatment of cereal straws for improving their nutritive value.
- To standardize the technique by fixing the parameters like level of urea, source of urease enzyme, length of incubation and level of moisture of straws to be treated etc.

Summary of the Work Done:

In Pakistan about 36 million tones of rice and wheat straw is produced annually which constitutes an important part of livestock feeding. Cereal straws have low protein contents and low digestibility. Hence, in spite of large volume they contribute little towards meeting the nutritional requirement of Livestock. In the past, efforts have been made to improve the nutritive value of straws through chemical treatment which included use of NaOH, anhydrous ammonia and hydrogen peroxide with different levels of success. Lately urea has been used for increasing the digestibility and protein contents of straws. However, in spite of significant improvement in the nutritive value by this method the adoption of technology by the farmers always remained low. Reason for low adaptability may be due to relatively tedious technology and involvement of labour.

To overcome this problem a new simple and easier method has been developed. The method involves weighing of urea @ 4% of straw to be treated, mixing it with the double amount of manure or *Acacia* leaves, giving some moisture by adding water, putting this mixture in bag, keeping the bag on ground where straw is to be treated, pilling the straw on bag, again moisting the straw with water (60% of straw) and incubating this material for one month under the cover of plastic sheet or mud plaster.

The method is slightly less efficient than the conventional one but very simple and involves very little labour as compared with conventional one. In the new method three steps including preparation of urea solution, sprinkling of solution on straw and pressing the straw during treatment process have been deleted which resulted in saving labour and time.

A research paper has been submitted for publication to a National Journal, in addition to this one M.Sc. dissertation has been completed on the basis of the project results.

Project No.	**R&D/S-AU/Agr (94)**
Project Title	An Assessment of the Impact of the Farm Advisory Services of Agricultural Extension and other Allied Agencies in Sanghar and Mirpurkhas Districts of Sindh
Duration:	One Year
Date of Initiation.	1.10.2003
Date of Completion.	30.9.2004
Location of Scheme:	Pakistan Agriculture Research Council (PARC), Islamabad.
Principal Investigator:	Dr. Zaheeruddin A. Mirani
Total expenditure.	Rs.1,68,674/-

Main Objectives:

- To study the effectiveness of the extension methods (Individual, Group and Mass Methods) as used by the agricultural extension and allied agencies advisory services.
- To assess the impact of farm advisory service of agricultural extension and allied agencies on the yield of wheat, cotton and sugarcane crops.
- To Study the difficulties faced by extension agents and field staff of pesticide/insecticide and fertilizer agencies in carrying out the advisory services.
- To know the opinion of the respondents for the improvement of advisory services.

Summary of the Work Done:

In Pakistan, agricultural production especially cotton and rice crops can contribute much more to the export earnings compared to what these crops are presently contributing, however, efforts should be made to fill the gaps between potential yields and yields obtained by farmers through proper utilization of agricultural extension techniques. Therefore, the research work was carried out in Sanghar and Mirpurkhas Districts of Sindh Province of Pakistan. The study was designed to assess the performance of farm advisory services of agricultural extension and pesticide/fertilizer companies. The study employed a survey method and 400 farmers (200 from each district). Seventy agricultural extension agents (35 from each district) and 30 pesticide/fertilizer agents (15 from each district) were determined as sample. Two

questionnaires were developed; one for farmers and other for extension and pesticide/fertilizer agents. The questionnaires were reviewed by renowned faculty staff of Sindh Agriculture University, Tandojam and high officials of agricultural extension and pesticide/fertilizer companies. Respondents of the study were personally interviewed by a Research Associate hired through the research project.

The most important finding of the study was the fact that farmers were not receiving new agricultural information from agricultural extension as most of the farmers did not receive any visit. This entails the fact that farmers are not alone responsible for non-adoption of improved practices. Pesticide/fertilizer agents were viewed as effective in transferring messages, however, they were limited to their product sales since they have the task to achieve targets rather farmers development. Dealers of the pesticide/fertilizer product sales were the most influential person of the area as indicated by the farmers. Dealer makes all the decisions of the farmers regarding the use of pesticide/fertilizer and/or seeds and other related inputs/products available in the market.

The study recommended that the number of visits should be increased. Diffusion is not just the end, the field staff should pay follow up visits for proper adoption. Demonstration method and farm visits should be used in addition to mass media. Area of jurisdiction of field assistant may be reduced to maximum of two Union Councils. Under District Government, the field staff should be given regular in service training to update their knowledge and skills to better delivery in the areas of technology transfer, sustainable agriculture, integrated pest management techniques, and communication skills. The field staff should be given the tasks to aware farmers about World Trade Regime and its implication to agriculture and farmers behavior.

Project No.	**R&D/F-NIFA/Agr (181)**
Project Title.	Performance of Promising Mungbean (*Vigna radiate* L. *Wilezek*) Genotypes/Varieties on Farmers Field in NWFP.
Duration:	Two Years
Date of Initiation.	1.5.2003
Date of Completion.	30.4.2005
Location of Scheme:	Nuclear Institute for Food and Agriculture (NIFA), Tarnab, Peshawar.
Principal Investigator:	Dr. Gul Sanat Shah.
Total expenditure.	Rs.1,84,110/-

Main Objectives:

Selection of high yielding mungbean genotypes/varieties with wider adoptability, which can be grown as monocrop in the major mungbean growing areas and intercrop to the orchards in NWFP

Summary of the Work Done:

Mungbean is the major kharif pulse crop grown in Pakistan. It can be easily cultivated on relatively light soils, marginal for cereal cultivation.

The project was carried out to evaluate mungbean promising varieties/genotypes on farmer's fields as monocrop in different agro-climatic conditions of NWFP and as intercrop in orchards only in Peshawar valley for two years during kharif 2003 and 2004. The main objective of this project was to recommend mungbean variety/genotype suitable for cultivation in the province. Replicated yield trials of five mungbean varieties/Genotypes (two popular mungbean varieties currently grown in mungbean growing areas of Punjab i.e. NM-92 and NM-98 in addition to three elite lines NFM-6-2, NFM-12-12 and NFM-13-2 developed at NIFA) were conducted as monocrop in three different agro-climatic condition i.e. NIFA research farm, Dir Bala and D.I. Khan. The same genotypes were evaluated as intercrop in 7 and 14 years old plum orchards during 2003 and in 8 and 15 years old orchards during 2004 in Peshawar valley.

In NWFP, mungbean research work is at the initial stages and is confined only to plant National Uniform Yield Trails (NUYTs) and some agronomic trials. NIFA initiated mungbean breeding work during 2002 using induced mutation and cross breeding techniques. The institute has developed high yielding mungbean genotypes suitable for local agro-climatic conditions These elite lines are in various stages of evaluation. The current project supported the evaluation of these elite lines along with popular mungbean varieties i.e. NM- 92 and NM-98 as monocrop in different sites in the province and as intercrop in plum orchard only in Peshawar valley. The results obtained from the experiments conducted under the present project revealed that the new elite line NFM-12-12 was the highest yielding among the genotypes evaluated in the trials. Mungbean inter-cropping in orchards at Peshawar valley indicated very poor performance due to the shading effect of plum trees.

The results achieved from two years (2003 and 2004) of evaluation of five mungbean genotypes as monocrop at three locations in NWFP indicated that the genotypes NFM-12-12 and NFM-6-2 were high yielding. The yielding genotype NFM-12-12 has also been evaluated in adaptation and NUYT during 2003 and 2004. It has shown good performance in these trials. The case for the approval of this line as commercial variety for the province of NWFP will be submitted to the provincial seed council meeting. The intercropping of mungbean in orchards in Peshawar valley in two trials produced very low seed yield. This means that mungbean is not suitable for intercropping in orchards in Peshawar valley. The evaluated genotypes exhibited

resistance to Mungbean Yellow Mosaic Virus (MYMV) disease. As a result of this study, two research papers have been published in National Journals.

Project No.	**R&D/PLPRI/Agr (229)**
Project Title.	Epidemiological Investigations of *Leptospirosis* in Cattle and Buffalo.
Duration:	One Year
Date of Initiation.	1.7.2003
Date of Completion.	30.6.2004
Location of Scheme:	Livestock Production Research Institute, Bahadurnagar, Okara.
Principal Investigator:	Dr. Rashid Ahmed
Total expenditure.	Rs.2,49,164/-

Main Objectives:

- To conduct epidemiological investigations in buffaloes & cattle affected with reproductive disorders.
- To monitor the bulls of semen production units for presence of *leptospirosis.*
- To understand the sero prevalence & distribution of *leptospirosis* in animals.
- To determine its association mastitis.
- To establish a *leptospirosis* lab. for:
  a) Disease diagnosis.
  b) Training of lab. Workers & practicing veterinarians.

Summary of the Work Done:

Leptospirosis is a disease of zoonotic importance, primarily infecting wild and domestic animals. The disease is a major cause of economic loss in the meat producing industry. Human are accidental or incidental hosts in which the disease has a wide spectrum of clinical manifestations that vary from illness to the severe citric form. Abortion is a common manifestation of acute *leptospirosis* in cattle leading to inflammatory and degenerative changes in the kidney and eyes in the chromic form of the disease.

The sera of *leptospira* consist of a group of spiral organisms, which are quite distinct from the treponema, or biorrelia of spirocheate. *Leptospira* interogans represents the parasitic *leptospirosis*.

The present project was designed to meet the dire need of epidemiological investigations of *leptopspirosis* to know the prevalence of this malady in cattle and buffalo especially the bulls maintained at Semen Production Units in Punjab as their semen is to be preserved and used on a large animal population. Moreover, out breaks of *leptospirosis* have been recorded in organized herds.

Blood samples from 200 buffalo, 200 cattle, 15 horses, 50 sheep and 50 goats were collected from Livestock Experiment Station, Bahadurnagar Distt. Okara, Livestock Experiment Station, Qadirabad Distt. Sahiwal and animals kept by the tenants of these experiment station. Similarly blood samples from 71 buffalo and 84 cow bulls from Semen Production Unit, Qadirabad Distt. Sahiwal. 120 buffaloes, 43 Sahiwal and 21 Cholistan Bulls from Semen Production Unit Karaniwala, Distt. Bahawalpur, 105 Buffaloes and 24 Sahjiwal Bulls from Semen Production Unit Kaiorkot, Distt. Bakhar were collected. These samples were processed through Rapid Macro Aggiutination Test (RMAT) amd Microl Agglutination Test (MAT). Ten out of 496 (2.02%) in buffaloes and eleven out of 351 (3.41%) in cattle were found positive for *leptospirois*. Eleven heprinized blood samples from suspected cases of *leptospirosis* were processed for the isolation of *leptospira* spp. and inoculated in modified Fletcher medium with 7% rabbit serum. Out of eleven, none of the sample was found positive for *leptospira spp.*

The study has revealed the presence of disease at various livestock farms and semen production units at very low percentage that could be eradicated through test and slaughter policy.

Project No.	**R&D/P-AU/Bio (41)**
Project Title.	Screening of Nematode Populations of Beetal Goats for Development of Resistance against commonly used Anthelmintics at Livestock Farms of Punjab.
Duration:	Two Years
Date of Initiation.	16.9.2002
Date of Completion.	31.12.2004
Location of Scheme:	University of Agriculture, Faisalabad.
Principal Investigator:	Dr. Zafar Iqbal
Total expenditure.	Rs.3,52,673/-.

Main Objectives:

- To evaluate resistance of important nematodes of beetal goats against levamisole, benzimidazole and ivermectin at various livestock farms of Punjab.
- To recommend the most effective anthelmintics to the farmers among the existing deformers.

Summary of the Work Done:

Nematodes are recognized as a major constraint to livestock production throughout the tropics. The chemical control of nematode has become increasingly difficult as a consequence of the appearance of nematode populations with resistance to commonly used anthelmintics. The present study was carried out to screen nematodes of Beetal goats for development of anthelmintic resistance (AR) against oxfendazole (benzimidazole), levamisole and ivermectin using facel egg count reduction test (FECRT) and/or egg batch assay (EHA). Of the total 34 Beetal goat flocks included in the study, 10 were found to harbour nematode population resistant to benzimidazole, levamisole or both. None of the flocks indicated resistant nematodes to ivermectin. Coprocultures of the experimental flocks invariably provided an evidence of *Haemonchus contortus* as major nematode following *Trichostrongylus colubrioformis Teladorsagia species* and *Cooperia curticei.*

It is concluded that resistance against benzimidazole and levamisole in gastrointestinal nematodes (GINs) of goats is sporadic in occurrence, but potential future threat to small ruminant production. Therefore, studies should be carried out to identify the factors contributing towards development of anthelmintic resistance (AR). However, appropriate measures should be taken for management of AR in the light of scientific literature.

Project No.	**CDYST/P-PRI/Bio (1)**
Project Title.	Influence of Different Copper and Aluminum Levels on Feather Renewal and Production Characteristics of the Layers in the Second Production Cycle
Duration:	Two Years
Date of Initiation.	1.7.2002
Date of Completion.	30.6.2004
Location of Scheme:	Poultry Research Institute, Rawalpindi
Principal Investigator:	Dr. Muhammad Yousuf

Total expenditure. Rs.2,16,010/-

Main Objectives:

- To determine the most effective mineral level for molt induction.
- To establish correlation of feather renewal to production performance of the birds.
- To determine the mineral residues in the meat and eggs.
- To determine the effect of these molting methods on the visceral organs.
- To work out the economics for the molt induction.
- To determine blood/excreta levels on minerals.

Summary of the Work Done:

In the egg industry commercial laying hens are kept for the production of eggs. These are sold at the end of production cycle as spent hens. These spent hens can be effectively utilized for more economic returns by induced molting which enables them to produce eggs for the second year. Feed deprivation is the most widely used method for induced molting. It results in severe stress, which lowers the immunity and increases mortality losses of the birds. Animal welfare societies in the world are emphasizing that this inhuman practice of induced molting of laying hens by feed deprivation should be stopped.

The present project was planned as an alternate strategy to the feed deprivation method for minimizing stress and lowering mortality. The results of the study revealed that mineral supplementation for the induced molting of the spent hens resulted in better egg production, improved egg quality, lower mortality and molt scoring (moderate molt scored layers performed better). Feed consumptions was same for all the replicates in the respective treatment groups but during molting period the hens in the feed deprivation treatment consumed significantly less feed as compared to the mineral supplementation treatments. A significant decrease in body weight of the hens was observed during molting period. Body weight loss was maximum in feed deprivation method followed by copper sulphate and aluminum oxide treatments, respectively. Maximum feather replacement (molt score) was observed in feed deprivation method followed by aluminum oxide method. The hens with higher molt score in the feed deprivation method showed lower production performance.

It is encouraging to note that the laying birds in the second production cycle produced eggs which were in close proximity to the number of eggs produced by the hens in the first production cycle. Aluminum oxide with lower levels (20 ppm) showed maximum egg production as compared to all treatment groups. The best quality was

observed in the aluminum oxide group followed by copper sulphate and minimum in feed deprivation method. Significant decrease in organ weights was noted at the molt stage. Maximum mortality was noted in the feed deprivation method especially during the molt period. So, mineral supplementation (especially low levels of aluminum) for induced molting proved to be a better policy with maximum economic returns as compared to feed deprivation method. It was concluded that inclusion of aluminum at low levels in the method of choice for the induced molting of the layers.

Project No.	**CDYST/S-KU/Bio (3)**
Project Title.	Marine Nematodes as Pollution Indicator
Duration:	Two Years
Date of Initiation.	1.7.2002
Date of Completion.	30.6.2004
Location of Scheme:	University of Karachi, Karachi
Principal Investigator:	Dr. Nasira Kazi.
Total expenditure.	Rs.2,28,245/-

Main Objectives:

- To make systematic studies of the marine nematodes to find out the relation between nematode diversity and the degree of pollution.
- Relationship of nematodes with the pollutants.
- Distribution pattern of the marine nematodes.

Summary of the Work Done:

Marine nematodes are one of the most widespread and abundant group of animals. They are present in sediments that extend from the tidal reaches of marshes and mud flats and the spray zone of open beaches to the abyssal plains. Despite their abundance and wide distribution, however, these animals have received relatively, little attention since they were first introduced into the scientific literature a century ago.

An attempt has been made to explore the fauna and species diversity of free-living marine nematodes along the coastline of Pakistan. One hundred and eighteen species of free-living marine nematodes have been found in the coastal waters of Pakistan. During the project period a number of sites of the coastal areas of Sindh and

Balochistan, which includes Sandspit, Hawksbay, Paradise Point, Korangi Creek, Ibrahim Haidry, Mubarak Village, Sonmiani and Gidani beaches were surveyed and samples were collected from a variety of source such as surface water from mangroves, stagnant water, wild grass, inter tidal and sub tidal sediments and from polluted and non polluted environments. The analysis of these samples has revealed a number of new and known nematode species which include three new species viz. *Gonionchus Arabica, Trissonchulus lichenii, Halalaimus gidanensis* and seven known species of free living marine nematodes viz, *Theristus atoplanabius* , *Theristus flevensis*, *Haliplectus dorsalis*, *Spilophorella canida*, *Viscose elegant*, *Anoplostoma sunderbanae* and *Trissonchulus benepapillosus* along with pollution indicator species viz. *Sabatiera spp. Microlaimus spp.* and *Anticoma spp.* were also identified. Beside these, list of total number of free living marine nematodes isolated, is also given along with their distribution. It was observed that 50 genera and 63 species belong to the order *Chromadorida*, 23 genera and 38 species to *Monhysterida*, 21 genera and 16 species to *Enoplida* while *Trefusiida* was represented by only one genus and one species. This indicates that the order *Chromadoprida* exhibits greatest diversity and *Trefusiida* the least.

Different species of marine nematodes appear to have variable distribution throughout the costal areas. Because of the large number of species and the extraordinary variety in food and feeding method, these nematodes are excellent candidates to serve as biological indicators of different environmental conditions. As a result of this study, three research papers have been published in National Journals.

Project No.	**CDYST/P-LPRI/Bio (6)**
Project Title.	Preparation and Evaluation of Tick Vaccine
Duration:	Two Years
Date of Initiation.	1.7.2002
Date of Completion.	30.6.2004
Location of Scheme:	Livestock Production Research Institute, Bahadurnagar, Okara.
Principal Investigator:	Dr. Tahir Yaqub
Total expenditure.	Rs.2,14,562/-.

Main Objectives:

- To develop a vaccine against *Boophilus microplus*

- To evaluate its efficacy against experimentally infested rabbits in terms of antibody titers and the percentage of tick rejection.
- To study comparative efficacy of vaccines prepared from midgut and from salivary glands of *Boophilus microplus*

Summary of the Work Done:

The role of ticks in the economy of a country merits special consideration for not only they are potential blood-sucking ecto-parasites, but in the summer season, they surpass all other arthropod parasites in number and types of diseases which they transmit to livestock, poultry and even to domestic pets. The most serious threat of ticks is their potential ability to transmit a large number of bacterial, viral, protozoal and rickettsial diseases.

Currently the principal tick control method is application of acaricides. But this approach is associated with a number of disadvantages such as the use of acaricides includes cost of acaricides, cost of labour, chemical pollution of food chain & environment. These limitations have necessitated the search for alternative tick control measures. Among the several alternative tick control measures considered to date, only the host vaccination against ticks has proved promising.

In the present study *Boophilus microplus* ticks were collected from Livestock Experiment Station, Qadirabad, District Sahiwal, Crossbreeding Section, Livestock Production Research Institute, Bahadurnagar and from the animals kept by the tenants of Livestock Experiment Station, Bahadurnagar. Three types of oil based vaccines viz midgut, whole tick and salivary gland were prepared. Four groups of crossbred calves (A, B, C and D), each comprising of 10 heads except control D group that had 5, were made. Group A, B, C and D were given midgut, whole tick, salivary gland vaccine and phosphate buffer saline (PBS), respectively through intra-muscular @ ml/50 kg body weight. All the treated groups were boosted 15 days after first injection. After 10 days of first injection tick rejection was checked. A number of 180-200 ticks were observed on salivary gland and control group, while only four to seven and two to four ticks were found in case of midgut and whole tick vaccine, respectively. Trial conducted under field conditions among the 300 Sahiwal and 84 Buffalo calves only two and one calves died from both the groups due to haemoparasites, respectively. The adult bulls that were vaccinated at Livestock. Experiment Station, Qadirabad, Sahiwal no mortality was recorded. Humoral response of was recorded in Sahiwal calves (male sucklers and female sucklers). Fifty six Sahiwal calves were selected and divided into four group. Blood samples were collected from the claves at zero day and then fortnightly for two consecutive months. These sera were assayed for antibody measurement through (AGPT (Agar gel precipitation test) and IHA (indirect haemagglutination test). It was observed that only whole tick and midgut vaccines were effective and it gave different Geometric Mean Titer (GMT) at different days.

It's an extra ordinary achievement in the field of livestock production being different and new approach towards tick control in Pakistan. Prospects of developing similar vaccine against other ixodid tick are very bright.

Project No.	**CDYST/S-KU/Bio (14)**
Project Title.	Biocontrol of Nematodes by Vesicular Arbuscular Mycorrhizal (VAM) Fungi.
Duration:	Two Years
Date of Initiation.	1.7.2002
Date of Completion.	30.6.2004
Location of Scheme:	University of Karachi, Karachi
Principal Investigator:	Dr. Feroza Kazi.
Total expenditure.	Rs.5,69,160/-

Main Objectives:

- To demonstrate a growth response of citrus, tomato and brinjal in the presence of a specific mycorrhizal fungus, *Glomus spp* particularly *G. fasciculate.*
- To compare the growth response of mycorrhizal and non-mycorrhizal plants of citrus, tomato and brinjal to *Tylenchulus semipenetrans* and root-knot nematodes respectively.
- To compare growth of *T. semipenetrans* and root-knot nematode populations in mycoirrhizal and non mycorrhizal citrus, tomato and brinjal.
- To determine the extent of development of the mycorrhizal fungus in the presence and absence of *T. semipenetrans* and root knot nematodes.
- To compare the nutrient status and crop yield of mycorrhizal and non-mycorrhizal plants either non infected with the respective nematodes.

Summary of the Work Done:

Vesicular arbuscular mycorrhiuza (VAM) fungi are an important group of soil borne microorganism that contribute substantially to the establishment, productivity, and longevity of natural or man-made ecosystems.

The study of vesicular arbuscular mycorrhizal (VAM) fungi in relation to nematodes has not yet received due attention and so far no work has been conducted in this aspect in Pakistan, although it could be of great importance in view of their potential in plant growth improvement. Since no report exists on the VAM- nematode association from Pakistan, the present research was under taken to study the interaction between plant parasitic nematodes and VAM fungi.

Due to the importance of the symbiotic association and uptake of phosphorus in nutrient deficient regions, a number of surveys were made for the detection of these endophytes and nematodes in different regions of Sindh which showed a wide spread presence of VAM mycorrhizal species through out the Sindh province. It is also evident from this study that type of infection and frequency of occurrence of these endophytes varies from place to place. Five different types of spores were observed in soil and plant roots. Most commonly occurring endophyte was identified as Glomus fasciculatum. Other types were identified as G. mnosseae, G. macrocarpus G. aggregatum and Acaulospora laevis.

Under the present detailed study, the impact of root-knot nematode Meloidogyme incognita on brinjal, in the presence and absence of VA M fungus Glomus fascicadatum was evaluated. Mycorrhizal inoculation was found to reduce the root-knoit infestation. Application of mycorrhiza prior to nematodes reduced nematodes infestation better than the simultaneous application of mycorrhiza plus nematodes or nematodes first followed by mycorrhiza. Mycorrhizal plants had increased quantities of phosphorus and other nutrients.

The Mycorrihza had little practical importance in agriculture. As a result of this study, one research paper has been published and one research paper has been submitted for publication in the national journal.

Project No.	**CDYST/F-NIFA/Bio (17)**
Project Title	Radiation Decontamination of Poultry Feed.
Duration	Two Years
Date of Initiation	1.9.2002
Date of Completion	31.8.2004
Location of Scheme	Nuclear Institute of Food & Agriculture, Tarnab.
Principal Investigator	Dr. Aurang Zeb
Total expenditure	Rs.196,209/-

Main Objectives:

- Determination of total fungi and total bacterial counts of different brands of broiler feeds available in the market.

- Determination of effect of gamma irradiation (SkGy dose) on the microbial load of these feed samples.
- Storage stability of radiation decontaminated poultry feed in comparison with untreated control feed samples.
- Determination of the effects of irradiation treatment on the nutritional quality of broiler feed, in terms of growth performance of broiler chicks fed on the treated feed.
- Testing of the results on pilot scale and working out cost economics of the irradiation processing of poultry feed.

Summary of the Work Done:

The non availability of locally produced soybean and soybean meal in substantial amounts, compels the local poultry feed producers to use combination of different animal feed concentrates as protein source. These commonly include fishmeal, meat meal, blood meal etc. The protein concentrates from animal sources are generally highly infested and carry heavy microbial loads. This leads to an unavoidable use of large quantities of antibiotic drugs. This on the one hand increases the feed cost, and on the other, increases the feed to gain ratio (FGR), which indicates a low feed efficiency. The use of these drugs in poultry feed can also potentially lead to the development of antibiotic resistant strains causing a public health risk.

The high protein content make the poultry feed a good medium for microbial growth resulting in very high microbial loads, making pathogenic contamination a widespread menace to the poultry raising in the country.

Gamma irradiation treatment of animal feed has been reported to improve its microbiological and nutritional quality. Present project was initiated to assess the technical feasibility of this processing technique. Poultry feeds (No. 4 and 14) of 10 different brands were given radiation treatment (5 kGy) and analyzed for microbial load against control samples. Results revealed high mean initial fungal (9.53 X 10) and bacterial (2.02 X 10) loads in feed samples. Irradiation treatment resulted in an almost complete elimination of the fungal and bacterial loads. Storage at room conditions resulted increase in both total fungal counts/g (TFC) and total bacterial counts/g (TBC) of the feed samples. However increase during storage was much higher in control samples than irradiated samples. *E. coli* and Mycoplasms contaminations were not found in any of the samples whereas Salmonella contaminations were noted in two of the samples, which were effectively eliminated by the radiation treatment.

A four weeks feeding trial on 200 broiler chicks was conducted to study the efficiency of feed irradiation in improving the biological performance of the consuming chicks. Results of the trial indicated that differences, between groups fed on control and irradiated feed, with respect to performance parameters like final weight, weight gain, feed consumption, feed to gain ration and dressing percentage were statistically non significant. Numerically the irradiated group performed better than the control group in

final weight, weight gain per chick per day and feed consumption. Feed consumption efficiency was slightly better than control group.

Project No.	**CDYST/B-AZRI/Bio (18)**
Project Title.	Ecological Studies on Artemisia (*Seriphidium quettense*) in Highland Balochistan.
Duration:	Two Years
Date of Initiation.	1.7.2002
Date of Completion.	1.7.2004
Location of Scheme:	Arid Zone Research Centre, Pakistan Agricultural Research Council, Quetta
Principal Investigator:	Dr. Sarfraz Ahmad
Total expenditure.	Rs.2,28,990/-

Main Objectives:

- To conduct ecological studies on *Artemisia herba alba* including seed ecology, germination, seedling recruitment, seedling survival, seedling establishment, defoliation response and nutritive analysis.

Summary of the Work Done:

In arid and semiarid rangelands, re-establishment of native important species is vital to maintain function, structure, diversity, and stability of the landscape. Native species have evolved under the prevailing stresses of the region and have the ability to exploit the limited available resources.

Seriphidium quettense is an important plant community in the arid rangeland ecosystem of highland Balochistan. This species provides forage as well as fuel wood source. Heavy grazing, removed for fuel wood, and harsh climatic conditions reduced the productivity and recruitment of Seriphidium quettense in ranges of highland Balochistan required understanding the vegetation dynamics of native dominant species. Limited information is available on the regeneration ecology of S. quettense in arid regions of Balochistan. Seed production, seed dispersal, soil seed bank dynamics and micro site availability have vital role in the regeneration of range species on disturbed and degraded areas., Therefore, a series of ecological studies on S. quettense including

seed ecology, germination, seedling recruitment, seedling survival, seedling establishment and defoliation response were conducted.

These studies were conducted at Hazarganji National Chiltan Park. Experiments indicated that *S. quettense* germination can be enhanced by using proper and at least one year old seed. *S. quettense* disperses most of the seeds around plant canopies. *S. quettense* has persistent soil seed bank and plant canopies retained highest soil seed ban than interspaces. Seedling emergence and survival was better around plant canopies than in open interspaces. Seedling mortality rate was high and seedling growth rate was also very slow. Fifty percent defoliation yields better forage production than 100% defoliation. *S. quettense* population and forage production can be enhanced by proper utilization and management in rangelands of Balochistan.

Miss Shameem Gul working under this project has been enrolled for M. Phil degree in Botany.

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iii) Scientific Publications Produced through PSF Supported Development Projects.

An important achievement of the Foundation is the research publications resulting from the research conducted under PSF funded projects. Through the projects completed during report period, 8 research papers were published or presented in National and/or International Conferences/Symposia. A list of these papers is placed at Annexure-IV.

iv) Higher Degrees Earned through PSF Supported Development Projects.

One of the major goals of the Foundation is the training of scientific manpower in the country. This in turn would result in strengthening of R&D infrastructure of various scientific organizations. In order to achieve this goal, the PSF has been developing scientific manpower through its research projects. For this purpose, Research Associates are provided in the projects. They are required to register for Ph.D. or M.Phil degrees. During the report period one M.Sc degree was awarded whereas one Research Associate has been enrolled for Ph.D under PSF funded projects in the fields of Agriculture. List of the scholars who obtained/enrolled the degrees is given below:

S.No.	Project No.	Name of Researcher	Degree awarded
1.	R&D/P-LPRI/Agr (30)	Mr. Haroon Muzaffar	M.Sc
2.	R&D/S-SAU/Agr (94)	Mr. Anwar-ul-Hassan	Ph.D (enrolled)

SCIENCE POPULARIZATION

II. SCIENCE POPULARIZATION

Popularization of Science is one of the statutory functions of Pakistan Science Foundation. The Foundation is engaged in various science popularization activities at national level with the aim of increasing awareness of science education in the society. In order to achieve this objective, the Foundation has initiated a number of programmes including science exhibitions, fairs, science film shows, popular science lectures, science quiz competitions, science essay and poster contests, establishing of science centers/corners and strengthening of laboratories of high schools etc. The programmes undertaken during the year under report are briefly highlighted below:

1. 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 the study of science. Through Mobile Science Exhibition, 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. All narrations are in national language and are accompanied by simple illustrations. At present five Science Caravan Units are operating, one each in Balochistan, Sindh, NWFP, Punjab and Federal Areas. However, under a development project, four more Units have been added bringing the total to 09. The number will further be enhanced to 15 in phases. These Caravan units continued their activities throughout the report period and organized the following science exhibitions in schools within their jurisdiction. In all, 37 exhibitions and film shows were arranged around the country where 498 schools participated and 83450 students were benefited. The details are given below:

DETAILS OF SCIENCE EXHIBITIONS

FEDERAL UNIT:

Exhibition Sites	Date of Exhibition	No of schools	No of students
Fazaia Degree College F-6, RF Kamra, Attock	30.08.2004 to 07.09.2004	14	2800
AJK University, Muzaffarabad	05.10.2004 to 10.10.2004	7+ General Public	1200
Festival "Village of Hope" organized by Lok Sanjh at NARC, Islamabad	04.12.2004	General Public	
Academy of Higher Secondary Education, Thoba, Banian and Jatta Hathial, Tehsil Rawalpindi	08.12.2004 to 14.12.2004	5	1100
Model College for Girls G-10/2, Islamabad	22.02.2005 to 24.02.2005	1	1200

Fazaia Inter College, Islamabad.	26.01.2005 to 02.02.2005	1	1200
Sun Rise Academic System Rawalpindi Schools-2 Students.	23.04.2005 to 26.04.2005	2	6000
Sherwan Distt. Abbottabad	04.05.2005 to 16.05.2005	5	3500
Fateh Jang	23.05.2005 to 31.05.2005	4	2100
National Library, Islamabad	20.06.2005 to 22.06.2005	Students (belong to community) invited by Plan Pakistan	1100
Sub total:	**63 Days**	**39 Schools**	**20,200 Students**

SINDH UNIT:

Exhibition Sites	**Date of Exhibition**	**No of Schools**	**No of students**
Taluka,Sukkur.	03.08.2004 to 11.09.2004	35	2800
Taluka, Ghotki.	15.09.2004 to 01.10.2004	35	2800
Mirpur Mathelo.	01.10.2004 to 15.10.2004	16	1300
Taluka Gambat and Sobho-Dero, Distt. Khairpur.	18.10.2004 to 01.11.2004 22.11.2004 to 30.11.2004	32	4600
Sobho-Dero, Distt. Khairpur.	02.12.2004 to 21.12.2004	13	1650
Ubauro, Distt. Ghotki.	27.01.2005 to 11.02.2005	17	1200
Taluka Kingri and Nara, Distt. Khairpur.	07.03.2005 to 29.03.2005	24	2350
Sub total:	***155 Days***	**172 Schools**	**16700 Students**

BALOCHISTAN UNIT:

Exhibition Sites	**Date of Exhibition**	**No of schools**	**No of students**
Geological Survey of Pakistan and Educational Institutions of Quetta City.	23.07.2004 to 13.08.2004	10	2500
Govt. Girls High School, Nechari.	16.08.2004 to 31.08.2004	6	3000
Secret Heart School, Quetta Cantt.	01.09.2004 to 20.09.2004	3	4000

Helper's School, Quetta.	09.05.2005 to 31.05.2005	4	2500
RLCs of IDSP at Momenabad Quetta (UNESCO Project)	01.06.2005 to 5.06.2005	14	400 learners
Sub total:	**107 Days**	**37 Schools**	**12400 Students**

PUNJAB UNIT:

Exhibition Sites	**Date of Exhibition**	**No of schools**	**No of students**
Okara.	09.09.2004 to 25.09.2004	14	800
Govt. Girls Junior Model School, Okara.	11.10.2004 to 23.10.2004	15	1500
Sahiwal	05.01.2005 to 19.01.2005	17	2000
Kasur	07.02.2005 to 17.02.2005	14	1600
Pak-German Institute.	21.02.2005 to 28.02.2005	8	1000
PCSIR "Image Pakistan Industrial Fair, 2005" at National Hockey Stadium Faisalabad.	01.03.2005 to 29.03.2005	General Public	-
Sahiwal.	11.04.2005 to 30.04.2005	19	2500
Sheikhupura.	09.05.2005 to 04.06.2005	27	3000
Sub total:	**140 Days**	**114 Schools**	**12,400 Students**

NWFP UNIT:

Exhibition Sites	**Date of Exhibition**	**No of schools**	**No of students**
Shangla (Swat).	05.08.2004 to 25.08.2004	*14*	2100
Malakand Agency.	23.09.2004 to 13.10.2004	*9*	3150
Malakand Agency.	01.10.2004 to 13.10.2004	*15*	1500
Takht Bhai, Distt. Mardan.	24.11.2004 to 21.12.2004	*33*	4500

Karak and Lucky Marwat.	25.01.2005 to 18.02.2005	*31*	4100
Dewana Baba Distt Buner.	18.04.2005 to 30.04.2005	*20*	3800
Mansehra.	19.05.2005 to 01.06.2005	*14*	2600
Sub total:	**134**	***136***	**21,750**

PAKISTAN: SUMMARY

Grand total:	**599 Days**	**498 Schools**	**83,450 Students**

2. BOOKS DONATED TO UNIVERSITIES/ R & D ORGANIZATIONS AND FUNDED FOR PUBLICATION

PSF encourages book reading and writing on scientific concepts and thus acquires and distributes books/magazines as well as sponsors book publication. During the year, 200 copies of the books entitled; **"History and Philosophy of Muslim Contribution to S & T (1996)"**, 100 copies of **"Fifty years of R & D in Pakistan (1987)"** and 10 copies of **"Entrepreneurship-A recipe for Economic Development"** were procured and distributed to various universities/R&D organizations of the country.

3. DONATION OF EQUIPMENT

An amount of Rs.50,000/- was sanctioned to the Educators, Kids Campus, Sahiwal and Pakistan Educational Alliance, Toba Tek Singh (Rs.25,000/- each) for purchase of Laboratory Equipment. Four high schools i.e. *Govt. High School Khanqah Sharif, Bahawalpur; Govt. Girls High School, 12/BC, Bahawalpur; Govt. High School Gumbat, Kohat and Govt. Girls High School, Shakar Darra, Kohat* were provided with Laboratory Equipments (measuring cylinder, vernier-caliper, spring balance, resonance tube, volt meter, glass prism, batteries, beakers, chemicals, test tube stands, test tubes, thistle funnel, watch glass, atomic model and microscope etc.) for strengthening of their Laboratories.

4. SCIENTIFIC LITERATURE TO HIGH SCHOOLS

As a regular programme, the Foundation donates scientific books and magazines to high schools particularly in rural areas. During the year, 12000 copies of Monthly magazine "Global Science" were donated to 1000 high schools and hundreds of Brochures and Posters were provided to various high schools and other organizations around the country.

Dr. M.D. Shami, Dr. Farid A. Malik and Dr. Bashir A. Sheikh on the occasion of
All Hands Meeting (Foundation Day) 2004

Mr. M. Usman, Ex Secretary PSF representing retired employee of PSF
on All Hands Meeting (Foundation Day) 2004

5. 14th INTRA and INTER BOARD SCIENCE ESSAY and POSTER COMPETITIONS THEME: "GENETIC ENGINEERING" and "HEPATITIS: AN EPIDEMIC TO BE CONTROLLED"

Pakistan Science Foundation as part of its programmes for popularization of science in the country especially among high school students has been organizing Intra and Inter Board Science Essay and Poster competitions. In this regard 14th Intra and Inter Board Science Essay and Poster Competitions were organized during report period and an amount of Rs.209,600/- was released to the winner students as prize money.

6. FINANCIAL SUPPORT TO NATIONAL MUSEUM OF SCIENCE & TECHNOLOGY FOR HOLDING 17th ANNUAL SCIENCE COMPETITION, 2004

The main objective of the 17th Annual Science Competition 2004 was to popularize Science and Technology among the students and general public. Constructing and displaying Science models based on understanding of Science and Technology by the presenters help disseminate knowledge of Science and its applications in daily life. In this regard an amount of Rs.35,000/- was released to the National Museum of Science and Technology, Lahore for holding the 17th Annual Science Competition, 2004 and 39 students were awarded cash prizes in this contest.

7. ALL HANDS MEETING

Pakistan Science Foundation organizes "All Hands Meeting" for the welfare of all PSF employees including the retired ones every year. This activity was initiated in 2003 and meeting of this year was successfully held on 05.07.2004 wherein 350 retired and in service Employees of PSF, PMNH and PASTIC participated.

There were two salient features of this Meeting;

1. In the morning, Annual Progress Review Meeting was held which was presided over by the Chairman, PSF wherein all the Sectional Heads of PSF, PMNH and PASTIC presented their goals, targets and achievements for the previous year and plans for the next year. The Incharges of PASTIC sub-centers and Science Caravan Units also presented their progress reports.

In the evening session, the Meeting was held at Hotel Holiday Inn, Islamabad. All the retired and serving employees (350) of PSF, PMNH and PASTIC participated in the Meeting. Thirty shields were distributed to the retired employees who rendered more than twenty years service to the PSF. PSF Ex-Chairmen Dr. M. D. Shami, Dr. Bashir A. Sheikh, Dr. Khalid Mehmood Khan were awarded Crests at this occasion. Dr. N. I. Hashmi Member, Crop Sciences, PARC received Crest on behalf of his father, the late Founder Chairman Dr. Z. A. Hashmi. Representatives of retired and in-service employees also spoke on the occasion. Dr. Khalid Mehmood Khan while representing the Ex-Chairmen of PSF delivered his speech and covered the past events as well as gave the guidelines for the future. Dr. Farid A. Malik, Present Chairman, PSF addressed the audience and presented the targets and achievements of PSF for the previous year.

8. WORLD SCIENCE DAY FOR PEACE and DEVELOPMENT

United Nations Educational, Scientific and Cultural Organization (UNESCO) during the General Conference at its 31st session proclaimed 10th of November each year as "World Science Day for Peace and Development (WSDPD)". In doing so, General Conference recognized that science is of major importance in the context of peace and development. The Foundation organized a symposium to celebrate "World Science Day for Peace and Development" (WSDPD) on 10th of November 2004 at Hotel Margalla, Islamabad in collaboration with UNESCO Office, Islamabad and Ministry of Science and Technology.

Federal Minister for Science and Technolgy Ch. Nouriaz Shakoor Khan was the Chief Guest of the event. Ms. Humala Khalid Consultant, UNESCO was also present. Eminent Scientists like Dr. Ishfaq Ahmed, Dr. Pervaiz Butt and Dr. J.A. Mirza and Prof. Dr. Atta-ur-Rehman delivered their talks on different important topics of Science and Technology.

A live talk show on PTV World in the morning was arranged in which Dr. Ishfaq Ahmed, Dr. Atta-ur-Rehman, Dr. Kausar Abdulla Malik and Dr. Farid A. Malik highlighted the importance of Science and Technology for peace and development.

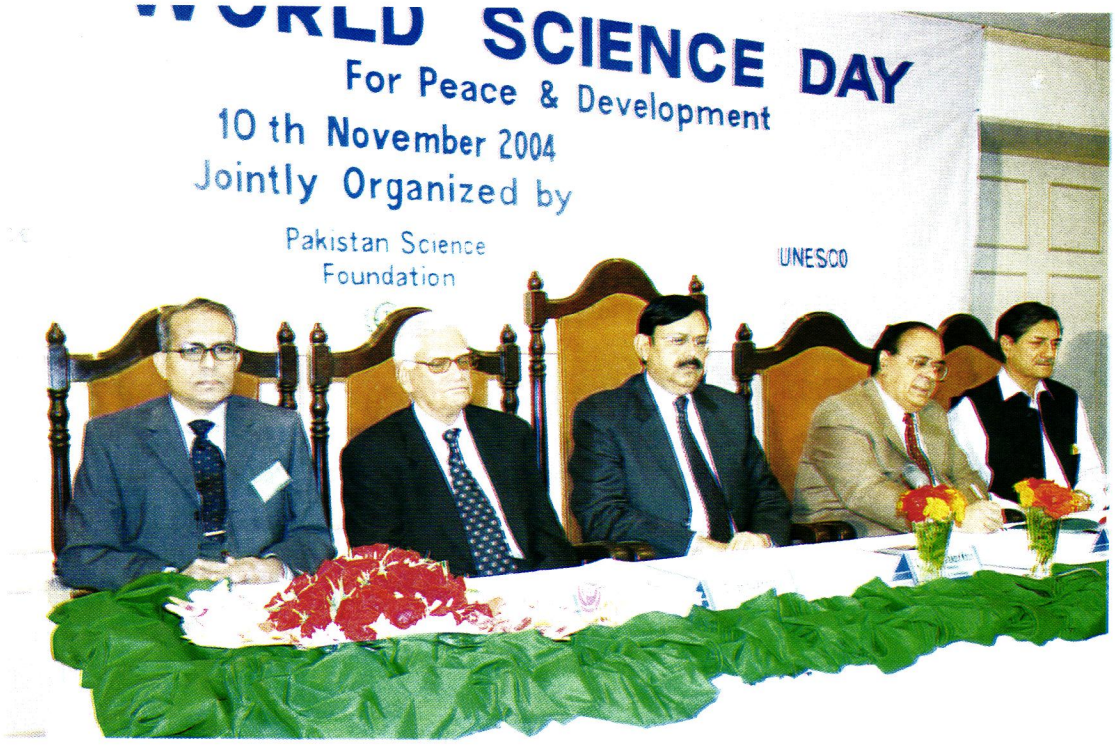
9. POPULAR SCIENCE LECTURES

Pakistan Science Foundation arranges series of lectures and workshops where eminent scientists and educationists express themselves for the benefit of the mixed audience comprising scientists, scholars, students and the general public. In this regard, following three popular science lectures were organized at PSF auditorium:

Topic	Delivered by	Date
Using I.T. for Better Agricultural Output	Mr. Ahsan Abdullah, Associate Professor/Head, Center for Agro-Informatics Research (CAIR), FAST	22.03.05
Tsunami Catastrophe	Prof. Dr. Saif-ul-Islam Saif	11.01.05
Global Change and its Impacts	Dr. Ishfaq Ahmed (NI, HI, SI) Special Advisor to Prime Minister	26.04.05

10. DEVELOPMENT PROJECT

Establishment of Four new Science Caravans under the development project "Popularization of Science in Rural Areas" have been completed. All the Equipment, Exhibition items, Caravan Trucks and Suzuki vans have been shifted to provincial



Dr. Farid A. Malik, Dr. Ishfaq Ahmed, Dr. Atta-ur-Rehman, and Kh. Zaheer Ahmed on the occasion of World Science Day for Peace and Development Nov.10, 2004 with the chief guest Ch. Nouraiz Shakoor Khan, Federal Minister for Science & Technology

Ch. Nouraiz Shakoor Khan, Federal Minister for Science & Technology addressing the audience on the occasion of World Science Day for Peace and Development, Nov.10, 2004

Dr. Ishfaq Ahmad , Special Adviser to Prime Minister during Question Answer session after his lecture on "Global change and its impacts"

Audience of the Lecture

Science Caravan units. Final Monitoring of the subject project was conducted by the Director General (Monitoring), Ministry of Science &Technology on 17.06.05.

11. UNESCO PROJECT "BREAKING THE POVERTY CYCLE OF WOMEN"

UNESCO under the "Eradication of Poverty" program initiated a project entitled "BREAKING THE POVERTY CYCLE OF WOMEN" in April 2002, empowering adolescent girls to become the agents of social transformation in South Asia. This innovative project has three salient features:

- Young girls/women (age 14-18) are considered as potential actors for social change and a decisive population group for national poverty eradication strategies.
- The project was conceived, developed and prepared in October, 2000 by a multi-sectoral group comprising staff from the education, science and communication sectors and youth communication unit of UNESCO.
- It combines action at four different levels.
- Transferring knowledge and skills, including in the field of micro finance to young girls and women.
- Sensitizing the local population in the capabilities and social contribution of young girls and women in order to create an enabling environment.
- Establishing infrastructures and structures for training and support services for the young girls and women as well as their communities.
- Providing national policy makers with data and experience gained from pilot projects.

First meeting of the "Scientific Committee" for UNESCO Project ***'Breaking the Poverty Cycle of Women'*** consisting of NGOs from all provinces, Science Caravan units and PSF Officers was held on February 17, 2005 in the PSF Committee Room. Dr. Farid A. Malik, Chairman, PSF presided over the meeting. The Chairman, PSF briefed the participants about the role of PSF in establishing linkages between Industry, R&D Institutions and Academia. He also discussed various Science Popularization activities of the Foundation. Ms. Farhat Rajpar, PSO/Project Director apprised the Members of the Scientific Committee about the subject UNESCO Project. It was also informed that the formation of a "Scientific Committee" is for better input and implementation of the Project. The Representatives of the NGOs viz CARE, BUNYAD, TRD, ARCADE-Pak and PLAN Pakistan also gave brief introduction of their organizations. It was mutually agreed that the Science Caravan units would be used, as Community Science Centres and the Science Caravan Exhibitions will be organized in collaboration with the NGOs in their respective areas. Dr. Humala Khalid, Consultant UNESCO/Coordinator of the project told the house about the objectives of the project and its various developmental

phases and meetings. The Chairman added that "Commercialization and Application of Technology" must also be included in the project objectives.

Booklets, Brochures and Posters on themes like; Renewable Energy Resources, Environment, Water, Healthcare and Sanitation, Daily Life Sciences, have been prepared and provided to partner NGOs. Science Caravan units are also being used as Community Science Centres.

Dr. Humala Khalid, Consultant UNESCO, Dr. Farid A Malik, Chairman PSF, Mrs. Farhat Rajpar, PSO(Project coordinator), Dr. Manzoor H. Soomro, CSO, in the 1" meeting of Scientific Committee of UNESCO Project "Breaking the Poverty Cycle of Women" held on February 17, 2004

Representatives of TRD, CARE, BUNYAD and ARCAD PAK *Partner NGOs,* in the 1st meeting of Scientific Committee of UNESCO Project

INDUSTRIAL LIAISON GROUP

III. INDUSTRIAL LIAISON GROUP FOR UTILIZATION OF RESEARCH RESULTS

The activities of the Industrial Liaison Group are ever increasing. Focusing on collaborative research and strong industrial linkages, ILG is bringing together researchers, end-users and the funding institution at one platform to create an environment of unified approach to solve identified industrial problems through applied research and Technology Transfer Mechanism.

Fourteen new projects were identified in the year **2004-2005**. Hence, the total number of Applied research projects which have been identified during the last three years are **45**. The complete list and the current status of these projects is attached as **Annexure-V.**

1. PROJECTS FUNDED UNDER INDUSTRIAL LINKAGES PROGRAMME:

Funds for the following six projects were released during the year 2004-2005,

1. Design and Manufacturing of Light Weight Composite Reinforced CNG Cylinders at a total cost of Rs. **4.00 Million**. SUPARCO is contributing Rs. 2.2 Million while Rs. 1.8 Million is provided by PSF.

2. Production of Iron and Steel from Kalabagh Iron Ore through Direct Reduction Process at a total cost of **Rs. 1,628,109/=**

3. Design and Development of Bicycle and Auto Rickshaw at a total cost of Rs. **3.00 Million**. This project is being jointly funded by PSF and NESCOM.

4. Pilot Plant for Processing Green Tea at a total cost of **Rs. 3,150,275/=**

5. Pharmacognosy of medicinal Plants of Pakistan at a total cost of **Rs. 898,860/=**

6. Commercial Production of Solar Dryers for Dehydration of Apricots in Northern Areas at a total cost of **Rs. 2,000,215/=**

In all, fifteen Applied Research Projects have so far been funded by the Foundation.

2. INTER-MINISTERIAL FOCUS GROUP:

An important area of activity during this year was to establish linkage between Public Sector Capability and the Private Sector Marketability. ILG constituted an Inter-ministerial Focus Group compromising of esteemed Public Sector Organizations like Pakistan Atomic Energy Commission (PAEC), National Engineering and Scientific Commission (NESCOM), Pakistan Ordinance Factories (P.O.Fs), Pakistan Aeronautical Complex (PAC), Pakistan Council of Scientific and Industrial Research (PCSIR),

Defence Production Division (DPD), Heavy Industries Taxila (HIT), and Kahuta Research laboratories (KRL). A complete directory of technologies available in the Public Sector organization has been prepared and circulated to the private sector. Some of the important projects identified under this programme are given below.

1. Design and Development of Bi-cycle and Auto-rickshaw.
2. Development of High Tech Rubber Rings and Rubber Seals.
3. Transfer of GIS/GPS Technology.
4. Development of Variable Drive Shafts.
5. CNG Cylinder Project.
6. Kalabagh Iron Ore Project.

3. MoUs SIGNED:

MoUs for the following projects were signed during the year 2004-2005.

I. CNG Cylinder Project - Two MoUs.
II. Kalabagh Iron Ore Project.
III. Establishment of Tea Plantations in AJ&K – Three MoUs.
IV. Green Tea Project.
V. Solar Dryer Project.
VI. MoU with ICCI for collaborative research.

4. KASHMIR TEA CULTIVATION PROJECT:

ILG has initiated the "Kashmir Tea Cultivation Project". Under this project, huge parcels of land measuring approx. 3000 acres have been identified with the technical assistance of Govt. of AJ&K and National Tea Research Institute, Shinkiari. Three private sector entrepreneurs will invest up to Rs. 3.00 Billion to establish tea plantations. MoUs for this project amongst PSF, Govt. of AJ&K, Qarshi Foundation, Janoo Group and Khawaja Foods have already been signed on May 02,2005.

A detailed survey was carried out in this regard. PSF financed the publishing of the technical report entitled, "Application of Tea Technology in AJ&K".

5. TECHNOLOGY BASED DEVELOPMENT:

ILG has developed complete framework for the Technology Based Development of the country. In this connection, a seminar was organized on December

20, 2004 in which the International Approach and the Pakistani Approach to TBD were presented.

PSF has also developed the Technology Cycle which emphasizes on Research, Development and Commercialization.

RESEARCH	+ DEVELOPMENT	+ COMMERCIALIZATION
• LABORATORY SET UP & RESEARCH • DATA COLLECTION	• PILOT PLANT FABRICATION & TESTING • TRANSFER OF TECHNOLOGY (TOT) PACKAGE	• TRANSFER OF TECHNOLOGY • BUSINESS PLAN
PUBLIC SECTOR DOMAIN	PUBLIC-PRIVATE SECTOR DOMAIN	PRIVATE SECTOR DOMAIN

6. POTENTIAL ECONOMIC IMPACT OF APPLIED RESEARCH PROJECTS:

In the year 2004-2005, overall interaction with the Industrial Community increased to considerable extent and it is hoped that this activity will further strengthen in the future resulting in much needed socio-economic development.

The funding and the potential economic impact of different applied research projects is as under:

S. No.	Project Title	Stakeholders	Rs. (Mill)	Impact/Potential
1.	Enhancement in the Shelflife of Bread and Allied Products.	PCSIR & Bunny's (Pvt) Ltd.	0.996	Export potential of Rs.120 million to Middle Eastern States and Central Asia.
2.	Focus Balochistan Development of Model Farms	WWF & PMNH	3.209	Use of wind energy and drip irrigation for development.
3.	Production of Citric Acid from molasses by Genetic Modification.	NIBGE & Shafi Reso-chem	0.948	Saving of Rs.100 M in foreign Exchange.
4.	Application of solar drying technology for Apricots.	AKRSP & PCRET	2.00	Dried Apricots production enhanced to 5000 tons/year (Shelf value Rs.100 million)
5.	Design & Development of Bicycle & Auto-rickshaw	SOHRAB & NESCOM	3.00	Material savings of Rs.131 Million per annum.
6.	Disbondment of Expoxy Coating and Integrity of Gas Transmission Pipeline	SSGC & Punjab University	3.68	Integrity assured of gas pipeline 1200- 1500 km worth Rs.3 billion.
7.	Self sufficiency in tea: i. Pilot Plant for Processing Green Tea. ii. Establishment of Plantations for black tea.	PARC & Tapal Tea PARC, AJK Govt, Qarshi, Janoo Group, Khwaja Foods.	3.150	Self sufficiency in Green Tea. Self sufficiency in tea. Potential savings Rs.16 billion.
8.	Development of CNG Cylinders	SUPARCO & Pak Suzuki Motors Company Limited.	4.00	Savings of US $ 15 million in Foreign Exchange.

PLANNING AND DEVELOPMENT

IV. PLANNING AND DEVELOPMENT

A. Progress achieved under the on-going development projects.

During the report period following three development projects remained under execution in the Planning and Development Section.

(Million Rs.)

No	Name of Project	Project Cost	Utilization during the year
1.	Financial Support to Scientific Societies in Pakistan.	39.00	5.00
2.	Participation of Scientists and Technologists in International Conferences, Seminars and Workshops.	17.00	3.40
3.	Research Support Programme for Active Scientists and Technologists of Pakistan	39.50	31.652

Brief summary of the progress made under each of the above development project during the report period is as under:

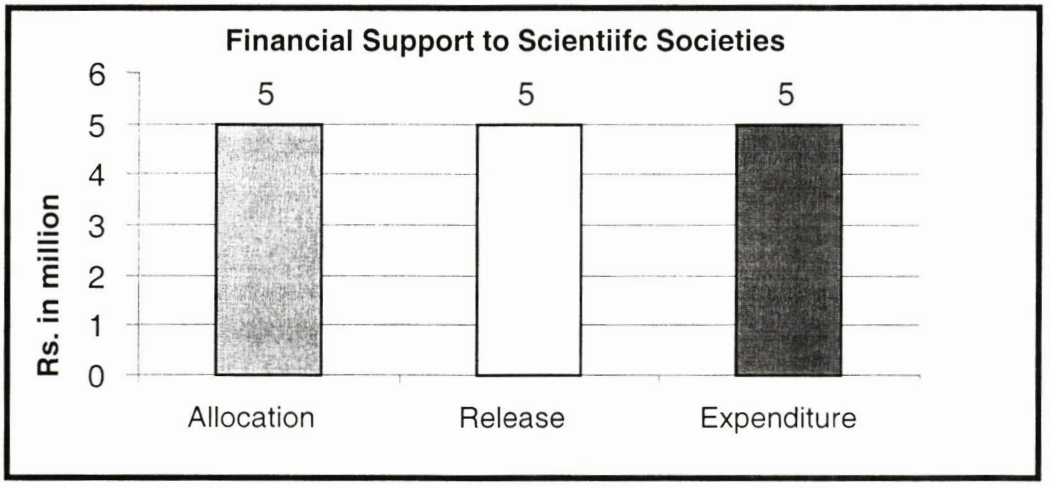
1. Financial Support to Scientific Societies in Pakistan

The Pakistan Science Foundation provides grant-in-aid to scientific societies and learned bodies under the above development project for the following activities:

- Holding of National and International conference, seminar workshop etc. on important scientific topics.
- Publication of scientific journals and newsletters.
- Development of linkages with their counterpart societies in the advanced countries to remain updated in the contemporary Science and Technology and to draw the benefit of R&D to Pakistan industry by adopting the ways and means as done by those countries.

During the year under report an amount of Rs. 5.00 million was utilized on the project as per details given below:

S. No.	Name of the Society.	Amount paid (Rs. million)
1.	Agricultural Foundation of Pakistan	0.271
2.	Chemical Society of Pakistan	0.977
3.	Horticultural Foundation of Pakistan	1.00
4.	Islamic Society of Statistical Sciences	0.195
5.	Pak Society for Semiconductor Science & Technology	0.13
6.	Pakistan Academy of Sciences	0.43
7.	Pakistan Association for the Advancement of Science	0.424
8.	Pakistan Botanical Society	0.50
9.	Pakistan Society of Nematologists	0.24
10.	Pakistan Thallesemia Welfare Society	0.121
11.	Zoological Society of Pakistan	0.55
	Expenses incurred on execution of the project.	0.17
	Total:	**5.00**

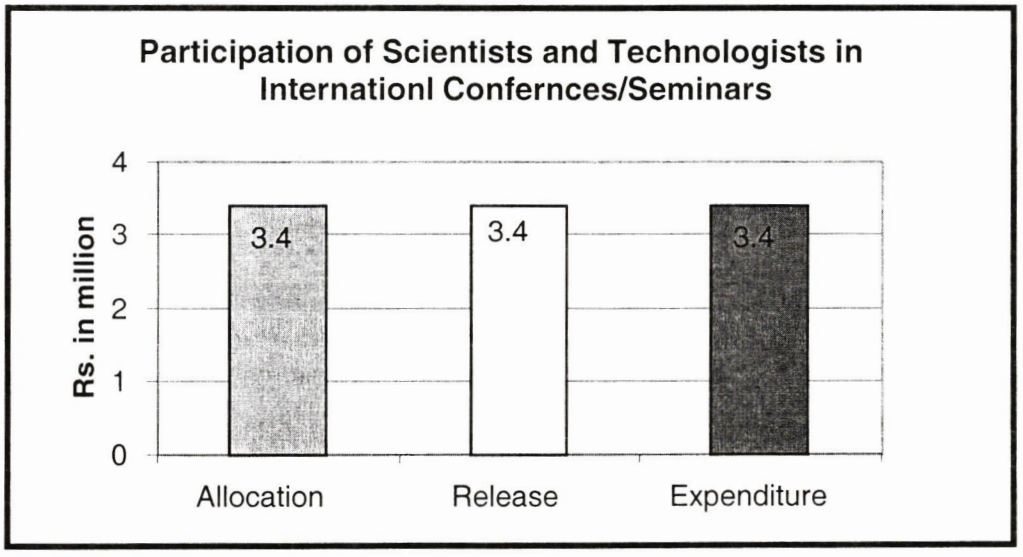


2. Participation of Scientists and Technologists in International Conferences, Seminars and Workshops

Pakistan Science Foundation provides financial assistance to scientists and technologists under the above development project for their participation and presentation of research findings in international conferences, seminars and workshops. The main objective of the project is to provide an opportunity to Pakistani scientist to interact with their counterparts abroad and learn about the latest research trends and techniques and adopt the same in their own labs for the development of science and technology in Pakistan.

During the report period, as many as 178 travel grant requests were received, out of which 92 requests were approved by the Foundation at a total cost of Rs. 6.281 million, However, only 55 scientists could avail the grants. Funds amounting to Rs. 3.40 million were utilized for the purpose.

The list of scientists who succeeded in availing the PSF grants is at **Annexure-VI.**



3. Research Support Programme for Active Scientists and Technologists of Pakistan

Most of the scientists/technologists in Pakistan have not been able to fully utilize their research capabilities due to lack of adequate research facilities, such as lab equipment, chemicals technical books/literature, accessories, computers and other related research supplies and materials. Pakistan Science Foundation, therefore, submitted a development project entitled, "Research Support Programme for Active Scientists and Technologists" to the Ministry of Science and Technology at a cost of Rs.39.50 million, which was approved.

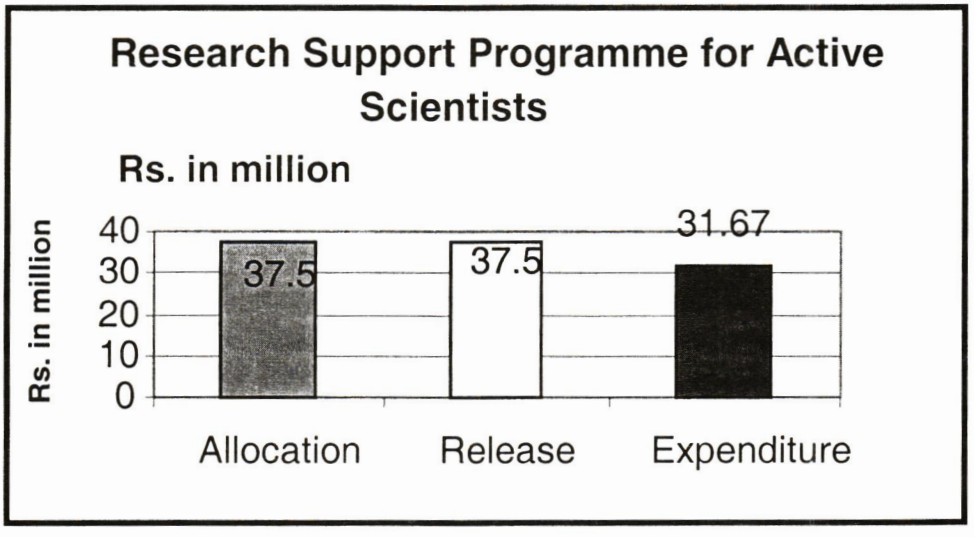
The grants provided under the project are meant to be utilized for procurement of lab equipment, literature and research material. The grants also cover local travel of the scientists and technologists for their participation in scientific conferences within Pakistan. The maximum limit of the grant is Rs.1.00 million per scientist/technologist. The eligibility criteria for the grants is as under:

- The scientist/technologist should have a fairly good number of international publications.
- They should be actively involved in research activities for at least last three years.
- They should have minimum impact factor of 25.
- For scientists/technologists engaged in development or project oriented activity a peer review of their work will be used as a criterion for selection

The main objective of the project is to strengthen the research capabilities of those scientists and technologists who are engaged in research activities by providing them financial assistance to for smooth and effective implementation of their research programmes.

Scientists and technologists will be in a position to play their role more effective in the development of science and technology in the country, which is imperative for the attainment of economic self-reliance.

The Programme was publicized through advertisement in the National dailies and to the Heads of Organizations. Applications were invited from eligible scientists, which were evaluated by the PSF Technical Committees, Final selection was made by the National Committee, which is headed by the Secretary, ministry of Science and Technology. An amount of Rs. 31.652 million was spent on the project. The list of scientists who received the grants is placed at **Annexure-VII.**



B. Progress achieved under the Science Promotion activities funded from the non-development budget.

1 Financial Assistance for holding of conferences, seminars and workshops:

The Foundation provides partial financial assistance to scientific organizations for holding of scientific conferences, seminars and workshops. During the report period an amount of Rs.5, 37,000/- was paid to 15 organizations for holding of the conferences listed below.

Sr #.	Name of organization	Conference title, date and venue	Amount paid
1.	University of Azad Jammu & Kashmir, Muzaffarabad.	Kashmir Corn Conference, on 23.6.2004 at Muzaffarabad.	Rs. 32,000/-
2.	University of Peshawar.	National Workshop on Research Methodology in Geography & Planning, on 03.7.2004, at Bara-Gali, Summer Campus.	Rs. 25,000/-
3.	University of Agriculture Faisalabad.	4th International Congress of Entomological Sciences, on 22-24 September, 2004 at University of Agriculture Faisalabad.	Rs. 25,000/-
4.	Nuclear Institute for Food and Agriculture, Peshawar.	21st training course on the use of Nuclear and other advanced Techniques in Food and Agricultural Peshawar, 13-24 September, 2004, NIFA, Peshawar.	Rs. 30,000/-
5.	University of Azad Jammu & Kashmir, Muzaffarabad	University Accreditation of Higher Learning Commission in the USA, on 18Dec, 2004 to 5Jan, 2005, Man Campus, Muzaffarabad.	Rs. 25,000/-
6.	PMNH, Islamabad	Field Techniques Training Workshop of PMNH Islamabad, 11-13 October, 2004, at PMNH, Islamabad.	Rs. 40,000/-
7.	Sindh Agriculture University, Tandojam.	National Conference on Agricultural and Animal Sciences, on 23-25 November, 2004, at Sindh Agriculture University, Tandojam.	Rs. 50,000/-
8.	Kashmir Information Resource Centre, Central Library, University of Azad Jammu & Kashmir.	Development of Tea Technology for Azad Jammu & Kashmir, at the University Campus, Muzaffarabad.	Rs. 50,000/-
9.	National Institute if Electronics, Ministry of Science & Technology, Govt. of Pakistan.	Seminar on Embedded system	Rs. 30,000/-

10.	University of Veterinary and Animal Sciences, Lahore.	A seminar on Livestock Poultry and Fisheries, on 22-23 November, 2004, at UVAS, Auditorium.	Rs. 25,000/-
11.	University of Sindh, Jamshoro	02-days, National Conference on the Fossil Fuel and Mineral Resources of Sindh, from 28 Feb to 1st March, 2005, at Department of Geology University of Sindh, Jamshoro.	Rs. 50,000/-
12.	University of Science and Technology, Bannu Road, Kohat.	3-days, workshop-training course to equip the participants with latest bio-informatics, on 15-18, March, 2005, at University of Science and Technology, Bannu Road, Kohat.	Rs. 25,000/-
13.	International Centre of Chemical Sciences, Institute of Chemistry University of Karachi.	The symposium will be followed by a workshop on Characterization of Proteins from 12-18 Jan, 2004, at Karachi.	Rs. 50,000/-
14.	COMSATS Institute of Information & Technology, Abbotabad.	1st International conference on Environmentally Sustainable Development from 26-28 June, 2005, Abbotabad.	Rs. 30,000/-
15.	Balochistan University of Information Technology & Management Sciences.	National conference on 'Information Technology and Applications' 21-22 April, 2005, at Takataoo Campus, BUITMS, Quetta	Rs. 50,000/-

2. Publication of Scientific Journals:

The Foundation provides financial assistance to scientific organizations for publication of scientific journals. During the year under report an amount of Rs. 3,15,000/- was utilized for publication of the following journals.

S. #	Name of Organization	Title of the journal	Amount paid Rs.
1.	University of Agriculture, Faisalabad.	Pakistan Veterinary Journal	35,000
2.	Khyber Medical College, Peshawar.	Pakistan Oral and Dental Journal	35,000
3.	University of Karachi, Karachi.	Pakistan Journal of Pharmaceutical Sciences	35,000
4.	Sindh Agriculture University, Tandojam	Pakistan Journal of Agriculture Engineering & Veterinary Sciences	35,000

5.	University of Arid Agriculture, Rawalpindi.	Journal of Arid Agriculture	35,000
6.	Pakistan Geographical Association, Islamabad.	Geographic Journal	35,000
7.	Farming Outlook, H # 39, St # 39, Islamabad.	Farming Outlook	35,000
8.	University of Balochistan, Quetta	Research Journal of Balochistan University	35,000
9.	Govt. College University, Lahore.	Journal of Natural Science & Mathematics	35,000

3. Awards and Fellowships.

The Foundation, under its Awards and Fellowships programme, granted fellowship to the following four Scholars.

Sr #	Name and address of Scholar	Degree	Amount per month
1	Mr. Javaid Iqbal, Ph. D. Scholar, Deptt. of Soil Sciences, Faculty of Agriculture, Gomal University, D.I. Khan.	Ph.D Student	Rs.6000/-
2	Ms. Nadia Ghani, D/o M. Arshad Ghani, Ph. D. Student, Deptt. of Zoology, University of the Punjab, Lahore.	Ph.D Student	Rs.6000/-
3	Ms. Feroza Soomro, D/o Din Muhammad Soomro, Deptt. of Parasitology, Faculty of Animal Husbandry & Veterinary Sciences, Sindh Agriculture University, Tandojam.	Ph.D Student	Rs.6000/-
4	Ms. Rahat Javed, D/o Javaid Iqbal, Deptt. of Chemistry, UET, Lahore	M.Phil Student	Rs.3000/-

4. Awards to Inventors and Innovators.

The Foundation has initiated a new programme of Awards to Inventors and Innovators. The award would be granted each year to three inventions/innovations securing 1st, 2nd and 3rd position. The amount of the award is as under.

1st. position holder: Rs.100,000/-

2nd. position holder: Rs.50,000/-

3rd. position holder: Rs.25,000/-

The first competition was held in January 2005. Sixteen inventions/Innovations were presented for the competition, which were evaluated by a Committee of Experts. The Inventors/Innovators were asked to make presentation before the Committee. The Following three Inventions/Innovations were selected for awards:

S.No.	Name of the Inventor/Innovator	Title of the Invention	Position
1.	Hassan Rashid Ramay Research Cente, 7, Cannal View Housing Society, Lahore	First Qur'an Software of the World, Qur'an System	1st
2.	Mr. Akhtar Ali Khan, House No. 626, Street 62, G-11/2, Islamabad	Building Management System (BMS)	2nd
3.	Majid ul Hassan, PCRET, Islamabad	Solar Hybrid Dryer for Apricot Dehydration	3rd

5. Seminars on Project Formulation:

The Director (Planning and Development), PSF conducted four seminars on Project Formulation in the following Universities/Colleges.

- Bahauddin Zakarya University, Multan;
- Kohat University of Science and Technology, Kohat;
- Gomal University, D.I.Khan;
- University of Animal and Veterinary Sciences, Lahore

The purpose of this endeavor is to enable the researchers in universities and R&D Organizations to write sound project proposals, both technically and financially, for acquiring funds from various local funding agencies.

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH) ISLAMABAD

Pakistan Museum of Natural History scientists and researchers remained engaged in the collection, curation and preservation of natural history specimens and research on flora, fauna and geology of Pakistan. Fieldwork was carried out in various localities of Sindh, Punjab, NWFP, Northern Areas and AJK under various projects granted by Pakistan Science Foundation and other agencies. About 3500 plant and animal specimens were preserved, identified and catalogued for PMNH. Research was conducted on various aspects of on the natural history of the country, which resulted in the production of many research articles/papers detail of which is as under:

DEVELOPMENT PROJECTS(COMPLETED):

1. BIODIVERSITY OF PAKISTAN DATA-BASE AND GLOBAL NETWORKING (BGN):

BGN project was completed during 2004-05 and now scientists from three scientific divisions like BSD, ZSD and ESD are busy for entry of scientific data in the BGN software.

PMNH is also associate participant of Global Biodiversity Information Facility (GBIF), an International Organization Working on World Biodiversity. Manager, BGN for the first time attended 10th governing board of GBIF in Belgium and GBIF accepted Pakistan suggestion for training of NODE preparation for sharing of data with GBIF. In this regard PMNH has already signed MOU with GBIF. BGN information is also available on PMNH website (www.pmnh.gov.pk) which was launched during the year.

2. ESTABLISHMENT OF VIRTUAL ORIENTATION GALLERY (VOG) AT PMNH:

The PMNH has established a Virtual Orientation Gallery (VOG) to utilize Information Technology (IT) as an enabler to disseminate information to the public and eventually to the world at large about PMNH. It is a creative achievement in the field of IT as per government priority. It involves a number of computers in a local network. Special interactive software has been developed, which is easy to operate. Touch screen technology has been utilized to provide detailed information to visitors about the exhibits at PMNH in a stimulating and instructive way.

VOG has provided an opportunity to get information about displays and exhibits as well as scientific information on the huge collection of natural history specimens, which could not be put on displays due to space and other constraints. Information is available bilingual in Urdu (National Language) and English for easy understanding & public awareness.

DEVELOPMENT PROJECTS (ON GOING):

1. Completion of Block II and strengthening of research and display activities of PMNH.
(Rs. 38.25 million for two years duration)

- Regularly submitted monthly Progress Report to MoST
- Regularly submitted Quarterly Progress Report to MoST.
- Regularly submitted Quarterly Review Report to MoST
- Submitted PSDP Review report of 2004-2005 to MoST
- Monitoring team from MoST visited PMNH to evaluate project progress .

Four research projects funded by Pakistan Science Foundation (PSF) are on going, 4 more are approved for funding and 5 others are submitted for approval to PSF and Ministry of Science & Technology.

PMNH officers provided guidance and supervision to M/o Environment, Fatima Jinnah Women University, Rawalpindi,WWF, IUCN, UAAR, QAU, Karachi University, Hamdard University, Azad Kashmir University, Hazara University, Malakand University, Baluchistan University, Forestry department NWFP and Punjab. Examined Ph D and M. Phil students at Quaid-I-Azam University, Islamabad and Fatima Jinnah Women University, Rawalpindi. Several University students were guided in their research work.

A Division-wise account of activities during the year 2004-05 is given below.

A. BOTANICAL SCIENCES DIVISION (BSD):

1. FIELD WORK:

- Scientists of BSDs conducted field tours out of PSF sponsored projects and botanized these localities of Northern Pakistan including Neelum Valley, Jhelum valley, Raishan, Leepa Valley , Chakar, Sudden Galli, Bagh, Rawalakot, Dir Kote etc (A. J. K.) , Batrasi, Balakot, Kewai, Jared, Paris, Mahandri, Kaghan, Naran , Saiful Maluke, Batta Kundi etc (Kaghan Valley), Sirren Valley Area, Chatar plain area, Battagram Area, Thakote Area, Shangla Par Area, Basham Area, Alpuri, Shanla top, Marghazar, Matta, Shahderi, Khabbal, Madian, Barikote, Shnku Village , Behrain , Kalam, Ushu, Mataltan, Mahodand, Uthror, Lower Gabral, Upper Gabral, Dir, Lowari top, Ziarat, Drosh, Shishi Valley, Kalash Valleys, Garam Chashma, Tirichmir Area, Buni, Mastuj, Laspur etc (Chitral District), Shandur top alt. 10500 m., Teru, Phander, Yasin, Guppis, Gaguch, Immit, Chatore Khand, Deosai plains alt 13300 m.,

Real tall, protected forest (*Abies pindrow*) and (*Cedrus Deodara*), Moist Temperate Zone, Northern Pakistan.

A medicinal herb commonly known as Zakhm-e- Hayat (*Berginea ciliata*) from rock Crevices, Kaghan Valley.

Gilgit, Hunza, Gulmit, Sost, Khunjerab top 16002 m, Baltistan , Skardu, Kaplu (Sia Chin Area) Chilas, etc (Northern Areas of Pakistan) North West Frontier Province, Punjab, Sindh and Islamabad. Collected 2200 plant specimens during work of Higher (Angiosperm and Gymnosperm) and Lower plants (Algae and Fungi) for PMNH Herbarium. All collected material has been preserved and identified for further scientific studies.

- BSD along with ZSD are carrying out three baseline studies projects on Flora and Fauna of Machiara National Park, a protected area of global significance in AJK. The studies will help in evolving strategies and plans for conservation of species and habitats.

2. LABORATORY WORK:

Identified 1600 higher plants and 600 lower plants preserved and mounted which is a continuous process.

3. TECHNICAL REPORTS/ DEVELOPMENT SCHEMES:

Completion of Block II and Strengthening of Research and Display Activitiesof the PMNH .

a. Submitted monthly, quarterly and PSDP quarterly review and progress reports to MoST

4. ON GOING PROJECTS:

b. Ethno botanical Studies, Taxonomy and Pictorial Encyclopedia of Economically Important Plants from Mountainous Regions of Northern Pakistan (PSF)
c. Documentation of Indigenous knowledge about Medicinal Plants (PSF)
d. Inventory of Flora of Margalla Hills (PSF).

5. PROJECT PROPOSALS SUBMITTED TO PSF FOR FUNDING:

- Taxonomic and Ethno-botanical studies of economically important plants of Galliat with special reference to their trade.(No.PSF/Res./ C-PMNH/ Bio-380)
- Algal Flora of Northern Areas of Pakistan (C-PMNH /Bio(266) (PSF).

6. EXTENSION WORK AND SERVICE TO OTHER ORGANIZATIONS:

PMNH officers provided guidance and supervision to M/o Environment, Fatima Jinnah Women University, Rawalpindi,WWF, IUCN, UAAR, QAU, Karachi University, Hamdard University, Azad Kashmir University, Hazara University,

Malakand University, Baluchistan University, Forestry department NWFP and Punjab.Examined Ph D and M. Phil students at Quaid-I-Azam University, Islamabad.

7. PUBLICATIONS:

- **M. R. Awan**, M. Shah and G. Akbar (2003) **Ethno-botanical studies from Karakuram Regions in Northern Areas of Pakistan.** Biodiversity of Northern Areas of Pakistan. Edited by Dr. Asghari Bano, Biological Sciences, Quaid-e-Azam University, Islamabad. Proceedings of an International Symposium held at Higher Education Commission (HEC), H-9, Islamabad, Pakistan from 8-10 September, 2003: 61-75

- **M. R. Awan** (2004). Museums and Science Centers in Pakistan. Proceedings of International workshop on The Changing Role of Science Centers and Museums in Developing Countries during October 20 – 22, 2004, Hanoi, Vietnam: 77-87.

- **Sultana, K.**, Qureshi, R. A. and Asad 2003. Diversity of Mushrooms and Toad Stools of Northern Pakistan. In proceedings of International Symposium on Biodiversity in Northern Area of Pakistan. : 52-60.

- **Sultana, K.**, Shah, M., T. M. Upson and Asad 2003. Altitudinal distribution of Grasses, Sedges and Rushes of Deosai Plateau: Pakistan. In the proceedings of International Symposium on Biodiversity in Northern Pakistan.: 43-51.

- Qureshi, R. A., M. A. Gufran and **Sultana, K.** 2003. Ethnobotanical studies of Economically Important Plants of Gilgit and surrounding areas. In proceedings of International Symposium on Biodiversity in Northern Area of Pakistan. 81-101.

- **Leghari, M.K.** and Shah Muqarrab. 2004. Water Chemistry and its relation with Algae of Lotus Lake, Islamabad. Jour. of P.A.R.C. Islamabad. Vol. 18 (1): 40-45.

- **Leghari, M.K.** and Shah, M. 2004. Comparative Ecological study of Phytoplankton Part II (chlorophyceae). Published in Journal of (PCSIR) Karachi. Vol.47(5): 358-369.

- **Leghari, M.K.** and S. M. Leghari 2004. Water Chemistry and its relation with Algae of Rawal Dam & Wah Garden in Sindh University, Res. Jour. (Sei. Ser). Vol.36(2): 29-48.

- **Leghari, M.K.** and Shah Muqarrab. 2004. Comparative Ecological study of Algal genera & Useful aquatic weeds from various localities of Pakistan published in Pak. Jour. of Water Resources (PCRWR), Islamabad Vol. 8 (2): 17-28.

Team of ZSD carrying out field studies in Machiara National Park,
Azad Jummu & Kashmir.

Group photo of the Participants and resource persons of "International Small Mammals Field Techniques Training Workshop"

- **Leghari, M.K.** and Shah Muqarrab. 2005. Ecological study of Blue green Algae from Rawal dam, Islamabad. Int. J. Phycol. Phyco-chem. 1(1): 5-12.

- **Leghari, M.K.** and Shah Muqarrab. 2005. Freshwater Algal species recorded from Gut content of Fish, *Labeo rohita* Hamilton from Rawal Dam, Islamabad. Published in J. Science, Technology & Development vol. 24(1): 41-48.

B. ZOOLOGICAL SCIENCES DIVISION (ZSD):

1. FIELD WORK:

Carried out baseline studies in three National Parks, namely Machiara, Chirtal Gol and Margalla pertaining to the research projects initiated on the request of end users and funded by GEF, WWF, and PSF. In addition, studies pertaining to ongoing going PSF funded research projects were continued on butterflies and reptiles of moist temperate and desert eco-zones respectively. Collected and preserved 5,300 insects, 11450 fish, 147 reptiles, 15 birds and 12 mammals.

2. LABORATORY WORK:

Mounted, labeled, identified and curated 2600 insects, 589 fish, 237 reptiles, 70 birds and 100 mammals. Also processed and complied biodiversity data of 500 specimens of insects, of 130 species; 100 specimens of 35 species of Reptiles & Amphibians; 120 specimens of 70 species of Fish; 150 specimens of 100 species birds; 150 specimens of 140 species Invertebrates; 35 specimens of 30 species of mammals pertaining to BGN project. Moreover, stuffed and skinned 77 birds and 7 mammals and repaired 10 birds.

3. RESEARCH PROJECTS:

i) BASELINE RESEARCH PROJECTS:

- Compilation of baseline data for zoological and wildlife studies of Machiara National Park. Pakistan Protected Area Management Project (PAMP)".
- Compilation of baseline data for ornithological studies of Machiara National Park. Pakistan Protected Area Management Project (PAMP)".

ii) END USER IDENTIFIED PROJECTS:

On the demand of CDA, two research projects "Bio-Ecology and Population Management of the House Crow (*Corvus splendens*) in Islamabad area" and "Inventory of Faunistic Diversity in Margalla Hills National Park" were undertaken. These projects are being funded by PSF.

iii) INTERNATIONAL COLLABORATIVE PROJECTS:

- Prepared and submitted a proposal of collaborative research on Lepidoptera by PMNH and Florida Museum of Natural History under an Executive Programme for scientific and technological cooperation between Pakistan and USA.
- Proposals prepared and submitted to develop collaboration in biodiversity research and conservation with Natural History musea of different countries including those in Malaysia, Thailand, Sri Lanka, Turkey.

4. PUBLICATIONS:

- **Hasan, S.A.** 2004 Butterfly diversity and distribution in the Moist-temperate Region of Pakistan. Presented at 24th Pakistan Congress of Zoology
- **Baig, K.J.** 2004. Some preliminary studies on the Herpetofauna of Cholistan Desert. Presented at 24th Pakistan Congress of Zoology
- **Rafique, M**. 2004. Studies on the fish fauna of the rivers of coastal areas of Baluchistan with special reference to its relationship with the fish fauna of Indus Drainage. Presented at 24th Pakistan Congress of Zoology
- **Ali, M.H.** 2004. An overview of the extension of distribution range of Barn Owl. Presented at 24th Pakistan Congress of Zoology
- **Feroze, A.** 2004. Some biochemical and pharmacological characteristics of venom from Saw-Scaled Viper (*Echis Carinatus*) of Pakistan Presented at 24th Pakistan Congress of Zoology
- **Hasan, S.A**. 2004. The importance of Integrating Social Monitoring with Biodiversity Monitoring. UNESCO Practical Guide for Social Monitoring in Biosphere Reserve (in Press).
- **Hasan, S.A.** 2004. Sustainable Eco-Tourism in Biosphere Reserves/ National Parks in Pakistan, presented at Second South and Central Asian MAB (SACAM) Network Meeting of Experts in Islamic Republic of Iran, in September 2004. (in Press)

5. TECHNICAL/ADVISORY SERVICES RENDERED:

- Rendered advisory services for conceptualizing, planning and development of a Biodiversity Park at Morgah, Rawalpindi. The project was funded by UNESCAP and implemented by Attock Oil Refinery and M/O Economic Affairs in collaboration with PMNH. The project is unique as it was undertaken in Public-Private Partnership to promote biodiversity conservation along with socioeconomic development of the local community.

- Rendered advisory and technical services to WWF, IUCN, UNESCAP, UNESCO, Linnaean Society, PAMP, HEC, PJZ, MoST, M/O Environment, M/O Economic Affairs, Wildlife departments Universities, Qarshi Industries, Attock Oil Refinery, CDA etc.

- Being on the Panel of Judges for Intel Science & Engineering Fair evaluated research projects undertaken by the students of schools and colleges of Islamabad.

6. SYMPOSIA / WORKSHOPS:

- Organized two International Workshops "Small Mammals Field Techniques Training" and "Zoo Management Techniques" in collaboration with Zoo Outreach and Capital Development authority.
- Organized International Workshop on "Advance Wildlife Management Techniques" organized in collaboration with European Union and Himalayan Wildlife Foundation.
- National Workshop on "Global Change Perspective in Pakistan: Challenges, Impacts, opportunities and Prospects" organized by APN.
- Zoological Sciences Division procured some extremely precious animals from Lahore Zoo.

7. DISPLAY AND EDUCATIONAL ACTIVITIES:

- Extended services for maintenance and repair of Displays, prepared Urdu write ups of the exhibits and also assisted in documentary preparation.
- Guide M. Sc. Students of the University of Arid Agriculture, Rawalpindi in the capacity of Co-Supervisor. Two thesis were successfully completed.
- Evaluated dissertations of two M. Phil students of Quaid-I-Azam University, Islamabad and conducted their Viva Voce examination.

8. TECHNICAL REPORT:

- Prepared and submitted PC-I of Biotechnology Entrepreneurship Development Centre (BEDC) to M/O Science & Technology.

- Prepared and submitted Technical Report entitled "Faunistic Diversity and Capacity Building of Morgah Biodiversity Park" to UNESCAP.

- Prepared and submitted Annual and Semiannual reports of the six research projects to funding agencies.

- Reviewed WTO related proposals for Provincial Coordination Committee (PCC).

9. AWARDS & DISTINCTIONS:

- For outstanding contribution in the field of Zoology, Dr. S. Azhar Hasan, Director Zoological Sciences Division, was conferred "**Zoologist of the Year Award-2004"** by the Zoological Society of Pakistan. He was also awarded Shields by UNESCAP and Intel for contribution in the Morgah biodiversity Park Project and Intel Science Olympiad.

- Dr. S. Azhar Hasan and Dr. Khalid Javed Baig were invited as Distinguished Scientists in Radio Pakistan Programme

- Dr. S. Azhar Hasan, Director ZSD was nominated as a Member of UNEP Expert Group on Technology Transfer and Technology Cooperation on Biodiversity Issues. He was also nominated as a Member of the UNESCO's Advisory Committee on Biosphere Reserves.

- Dr. S. Azhar Hasan, Director ZSD has been appointed as Secretary of the Man & Biosphere (MAB) Core Group by the M/O Science & Technology.

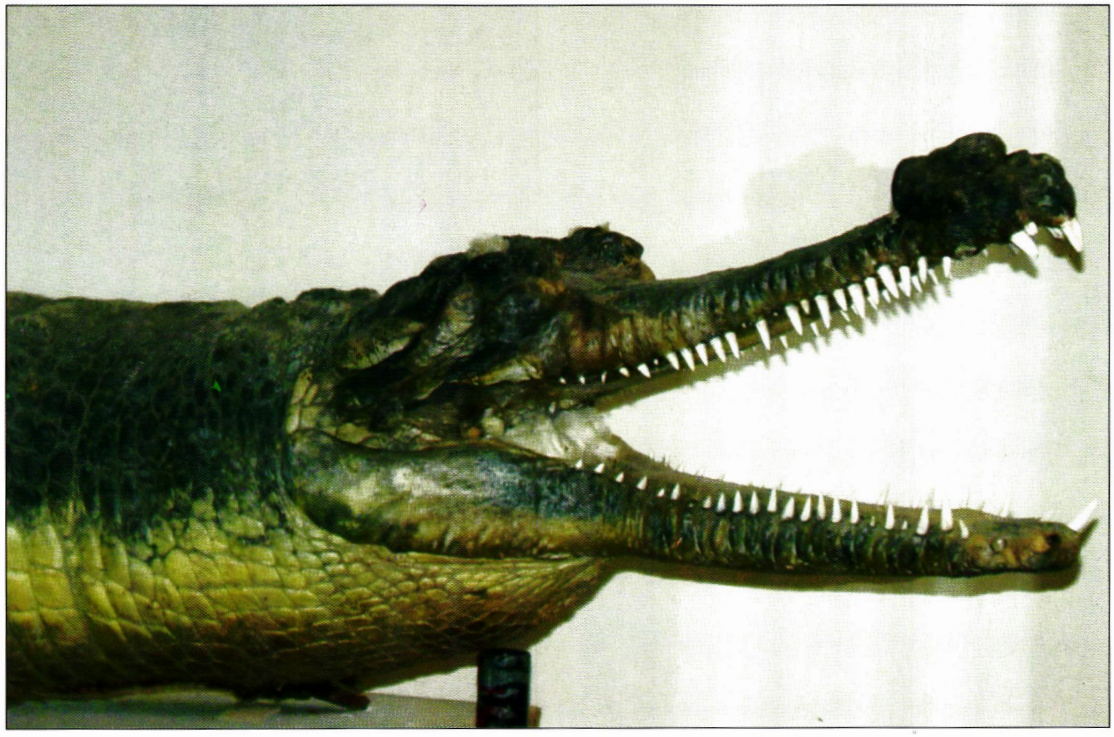
10. FOREIGN VISITS:

- Dr. S. Azhar Hasan, Director ZSD represented Pakistan as Representative of National MAB Committee at the Second South and Central Asian MAB (SACAM) Network Meeting of Experts in Islamic Republic of Iran, organized by UNESCO and Iran MAB Committee in September 2004.

C. Earth Sciences Division (ESD):

1. FIELD WORK:

- Carried out three different fieldworks and collected research and museum samples from Chilas, Gilgit, Yasin and Mastuj areas, under a collaborative research project between PMNH/ETH (Zurich)/Punjab University.
- Completed 3 years research project in collaboration with ETH, Zurich, Switzerland and University of Montpellier, France.
- Lead International Geological Expedition to Northern Areas on the request of International Geological Congress, France.
- 15 days field work for International Collaborative Research Project with ETH (Zurich), Switzerland and University of Montpellier, France.
- Organized / participated in Joint International Expedition of PMNH/ETH (Zurich), Switzerland



Gavial, an extinct reptile in Pakistan is on display at PMNH

Vertebrate Fossils from Sulaiman Range, Dera Ghazi Khan

2. PUBLICATIONS

- Lindsay E.H., Flynn L.J., **Cheema I.U.**, Barry J.C., Downing K.F., **Rajpar A.R.** and S.M.Raza. 2005. *Will Downs and the Zinda Pir Dome*. Journal of "Paleontologia Electronica", USA. Vol: 8(1) 1-19. Available online at http://palaeo-electronica.org

- Barry J.C., Cote. S., Maclatchy L., Lindsay E.H., Kityo. R. and **A. R. Rajpar**. 2005. *Oligocene and early Miocene Ruminants (Mammalia, Artiodactyla) from Pakistan and Uganda*. Journal of "Paleontologia Electronica", USA. Vol: 8(1) 1-29. Available online at http://palaeo-electronica.org

- Marivaux L., Antoine P. O., **Baqri S. R. H.**, Benammi M., Chaimanee Y., Crochet, J. Y., Franceschi D de, **Iqbal. N**, Jaeger J. J., Metais, **Roohi, G**. and J.L. Welcomme 2005. *Anthropoid primates from the Oligocene of Pakistan (Bugti Hills): Data on early anthropoid evolution and biogeography*. National Academy of Sciences, USA.. Vol: 102(24) 8436-8441. Available online at www.pnas.org/cgi/do.

- Burg. J. P., Arbaret, L., Chaudhry, M. N., **Dawood, H., Hussain, S. S.,** Zeilinger, G., 2005. *Share strain localization from the upper mantle to the middle crust of the Kohistan arc (Pakistan). In: High strain zones: structure and physical properties. Bruhn, D. & Burlini, L. (eds.).* Geological Society London, Special Publications, No. 245: 25-38.

- "Geological map of the Karakoram – Kohistan suture zone in Pakistan – Hindu Kush mountain range" covering Drosh, Shishi Valley and Laspur–Mastuj areas of Chitral. This map is published (ISBN 3-7281-2965-8) jointly by the geoscientists of Swiss Federal Institute of Technology (ETH) and Pakistan Museum of Natural History, Islamabad.

3. LABORATORY WORK:

- Prepared 110 thin sections of rocks (sedimentary, igneous and metamorphic). Carried out petrographic studies. Prepared rock chips and materials for geochemical studies to be carried out in the University of Montpellier, France. Also prepared 20 slides (random and oriented) for clay mineral studies. Soaked and washed 500 kg of sediments collected from localities Z-149 and Z-135, Sulaiman Range, Dera Ghazi Khan and collected vertebrate (small mammals) fossils.

4. DESIGN/DISPLAY:

Displayed fossils of Proboscidean and Rhinoceros. Prepared write-ups.

5. TECHNICAL SUPPORT/DEVELOPMENT SCHEMES:

- Submitted the following two development schemes (PC-1), and 2 research projects.

6. DEVELOPMENT PROJECTS:

1. Marble-Granite Finishing Institute

   Prepared a PC-1 on establisment of "Marble-Granite Finishing Institute of Pakistan" and submitted this development scheme for financial grant.

2. Copper Ore

   Installation of Pilot-plant for Processing of Copper Ore of Waziristan in collaboration with University of Engineering and Technology Peshawar.

7. RESEARCH PROJECTS:

- The early evolutionary stages of an island arc: the dunite-pyroxenite-gabbro association of Sapat, Kohistan, NE Pakistan. This is a collaborative research project between PMNH and Swiss Federal Institute of Technology (ETH) Zurich, Switzerland.
- Prepared and submitted Annual Progress Report of PSF Funded Project CPMNH-E/74 entitled "Geology and economic resources of Jurassic to early Cretaceous rocks of Upper Indus Basin, Pakistan".
- Initiated a new 03 years international collaborative research project with Swiss Federal Institute of Technology (ETH) Zurich.
- Initiated Focus Balochistan Project and acquired 05 acre land for Establishing Model Agricultural Farm using wind energy and drip irrigation system.

D. Public Services Division (PSD):

1. DESIGN AND DISPLAY ACTIVITIES:

- Designed PMNH & VOG project Brochures.
- Designed, prepared & installed PMNH road side signboard.
- Designed all Web-pages including graphics for PMNH Website.
- Designed & prepared a new Florescent Minerals Display Exhibit in the display galleries of PMNH.
- Designed certificates, medals, banners, name tags, folders, abstract volumes, letter-heads and invitation cards for different events organized by PMNH.
- Carried out maintenance of PMNH displays, A.V. Center and
- PMNH building.

Students visiting Paleo gallery

2. PROVISION OF DESIGNING & DISPLAY SERVICES TO OTHER ORGANIZATIONS:

- Planning, designing & execution of Science & Technology Float, 2005.
- Designed brochures, logos & leaflets for PSF's S&T promotion activities.
- Provided design services to TIPS/ PASTIC for various printing materials.
- Designed "Presidential Medal" for the Scientists for MoST.
- Designed brochure of Focus Balochistan Project.
- Designed logo, signboard & other printing material for PINS.

3. EDUCATIONAL ACTIVITIES:

- 63,598 visitors (20,633 students, 39,106 general public and 671 foreigners) visited PMNH Display Galleries.
- Arranged lectures/film shows in and outside PMNH for students from schools, colleges and universities.
- Carried out correspondence with different educational institutions for visiting PMNH.
- Arranged guided tours of PMNH for a large number of students/ VIPs.
- Participated in TV Programme on Gemstones as panelist.

4. PHOTOGRAPHY/ FILM MAKING:

- Carried out photography of 300 plant specimens of Northern areas of Pakistan for the Encyclopedia on Medicinal Plants.
- Covered all functions arranged by PMNH and important visits to PMNH.

5. UP-KEEPING & MAINTENANCE OF VOG & BGN PROJECT:

- Carried out data verification through PMNH Scientists and updating of BGN Database.
- Provision & maintenance of Internet facility to PNMH.
- Carried out rechecking / quality assurance of scientific data.
- Got improved software for VOG.

6. PUBLICITY:

- Arranged electronic and print media coverage for PSF, PMNH & PASTIC functions.

PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

Pakistan Scientific and Technological Information Centre (PASTIC), is the premier organization in the field of information dissemination serving thousands of researchers. It is a unit of Pakistan Science Foundation, an autonomous organization under the Ministry of Science & Technology.

PASTIC evolved from the erstwhile Pakistan National Scientific and Technological Documentation Centre, PANSDOC, which was established in 1957 at Karachi with the assistance of UNESCO, under the Pakistan Council of Scientific and Industrial Research. In 1974 PANSDOC was transferred to Pakistan Science Foundation (PSF) and was renamed as Pakistan Scientific and Technological Information Centre (PASTIC).

The National Centre is housed in its own building situated in the Quaid-i-Azam University Campus, Islamabad. It has six Sub-Centres at Karachi, Lahore, Peshawar, Faisalabad, Quetta and Muzaffarabad. It employs about 157 persons includes Technical and Administrative Staff.

AIMS & OBJECTIVES

- To procure, process and disseminate scientific and technological information to the researchers.
- 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 provide bibliographic and translation service.
- To compile Directory of S&T Periodicals of Pakistan, Union Catalogue of Scientific Periodicals in the libraries of Pakistan and Technology Information Bulletin.
- To publish an abstracting and indexing journal entitled "Pakistan Science Abstracts".

SERVICES AND ACTIVITIES

The activities undertaken during the period, July 2004 to June 2005 are briefly described below:

ISO 9000 CERTIFICATION

ISO Certification of PASTIC

PASTIC has acquired ISO 9001:2000 certification for all its activities and the services offered by all departments. The Audit/Registration was carried out by DET NORSKE VERITAS (DNV) a Dutch firm.

ISO Certification Facilitation to other Public Sector Organizations

After successful certification of PASTIC Public Services, PASTIC/PSF received requests from other Public Sector Organizations to guide them in ISO Certification Process. Thus PASTIC /PSF is facilitating organizations like Ministry of Science & Technology, National Accountability Bureau, Pakistan Museum of Natural History, Govt. College University, University of Azad Jammu & Kashmir, Muzaffarabad and STEDEC. PASTIC also facilitated PSF and PMNH in acquiring ISO-9001 Certification.

DOCUMENT PROCUREMENT AND SUPPLY SERVICE

Under the Document Procurement and Supply Service, queries were received from different R&D organizations for supply of reprints of research articles,patents, conference papers and reports etc. which were procured either from local sources or from abroad. PASTIC Documentation Section has now started a new Digital Documentation Supply Service (DDSS) through which the time of supply of the order has been reduced to only 2 hour instead of 12 days.

This service enables PASTIC to supply documents through e-mails or gives access to the clients to the domain through a secure password to download the required information. A total number of 1764 S&T documents were procured and supplied against 2213 requests received from scientists, researchers and other R&D workers.

BIBLIOGRAPHIC INFORMATION SERVICE

References from International Databases on CD-ROM were supplied to users according to their research topics on request. About 3,60,870 references on various S&T topics were supplied to 1430 researchers during year 2004-2005. Following International Databases on CD-ROM have been acquired and are having maintained at PASTIC for this service.

MEDLINE: (1950 to date with Abstracts): This database is the premier source for Biomedical Literature including clinical practice, administration, policy issues and health care services.

POLTOX (1966 to 2004/03 with Abstracts): It provides global information on all aspects of environmental pollution, hazardous materials, toxicology and related environmental issues.

Panel Discussion under the project Science Awareness through TV Channels aired on PTV World during August, 2005

Participants during the Workshop on "Library Automation of S&T Organization" from 4-7 October, 2004, at Karachi

LIFE SCIENCES (1982 to 2004/03 with Abstracts): This database is for life sciences professionals who seek interdisciplinary coverage in Biological Sciences.
PROQUEST (1992 to 1998 with Abstracts): It contains abstracts from world's prestigious Journals on Physics and related fields.

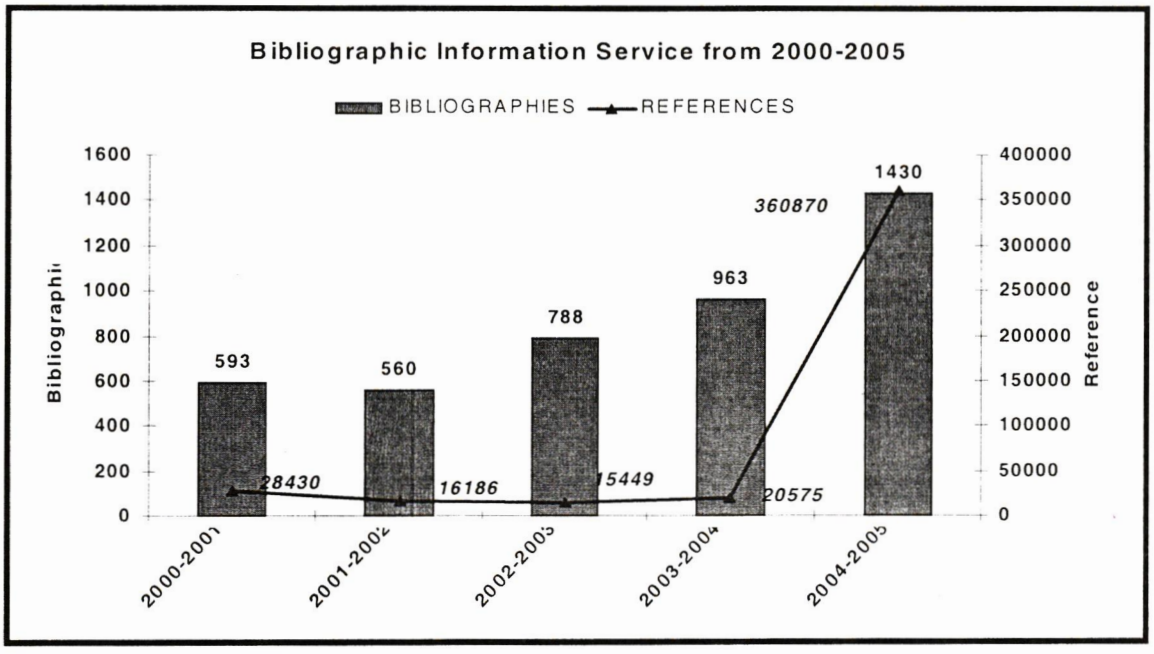
APPLIED SCIENCE & TECHNOLOGY INDEX (1993 to date): It contains abstracts on Applied Sciences and Technological fields.

SOCIOFILE (1963 to June 1999): It contains abstracts of World's serial literature in Sociology and related disciplines.

SCIENCE CITATION INDEX (2002 to date with abstracts): This database reports articles cited by researchers in their published material.

INSPEC (2000 to 2002 with abstracts): This database reports world's scientific and technical papers in physics, electrical engineering, electronics, communications, control engineering, computing and information technology.

DERWENT BIOTECHNOLOGY ABSTRACTS (2001 to 2004 with abstracts): This database contains abstracts on tissue culture, stem cells and biomedical etc.



ABSTRACTING AND INDEXING SERVICE

i. PAKISTAN SCIENCE ABSTRACTS

PASTIC provides abstracting and indexing service by publishing an abstracting journal entitled "Pakistan Science Abstracts" 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

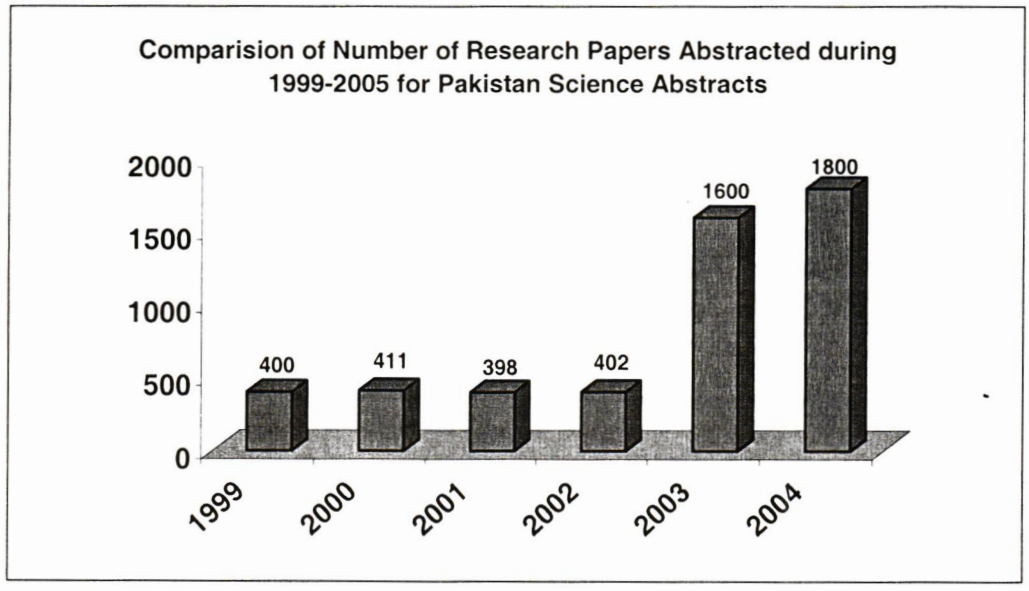
journals is documented in this secondary journal. The abstracts of research articles along with detailed author index and keyword index were published in Pakistan Science Abstracts.

Under this activity this year was utilized for abstracting maximum journals of 2003 and 2004 and covering the backlog instead of publishing one combined Pakistan Science Abstract for 2003 the Pakistan Science Abstract, 2003 Vol. 41(A-J) was published in the following ten disciplines:

1. Agricultural Sciences
2. Biochemistry and Biotechnology
3. Chemical & Pharmaceutical Sciences
4. Animal Sciences
5. Earth & Environmental Sciences
6. Physics
7. Maths & Statistics
8. Medical Sciences
9. Information Communication and Engineering Sciences
10. Plant Sciences

All the sub-centres also contributed in this activity by collecting journals published during 2003-2004 from different libraries.

All the processing for compiling and publishing of Pakistan Science Abstracts, 2004 Vol. 42 (A-J) have been completed during the report period.



PSA 2003 (published in May, 2005)
PSA 2004 (to be published in October, 2005

ii. DIRECTORY OF SCIENTIFIC AND TECHNOLOGICAL PERIODICALS OF PAKISTAN

PASTIC brings out Directory of Scientific and Technological Periodicals of Pakistan with a view to identify the scientific periodicals being published in Pakistan. This publication serves as an important reference information tool for research scholars, scientists, R&D workers, information workers and other connected with the field of scientific and technological endeavor.

Directory of Scientific Periodicals of Pakistan 2004 having the data of 300 periodicals was published and launched on PASTIC website.

iii. UNION CATALOGUE

PASTIC undertakes screening and survey of the libraries of scientific institutions and universities of the country to gather information about the serial holdings collection of these libraries. The information collected from these libraries is thus standardized, computerized and published in the form of "Union Catalogue".

Union Catalogue of the Scientific Periodicals in libraries of Pakistan Volume-I & II were published and launched on PASTIC website and now it is accessible to users on Internet. Also CD version of Union Catalogue of 200 libraries of Pakistan was prepared.

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 especially document supply service, bibliographic information service, abstracting and indexing service, technological information service etc.

PASTIC library is in progress towards digitization and re-organization. During 2004-2005, 665 data entry sheets for books were filled and computerized using WIN/ISIS software. 600 books and 78200 periodicals were rearranged for easy access. The collection of all local journals was also initiated to strengthen the library collection. Computerization of patents was initiated and also established digital library SDI Services.

During reported period a total number of 1737 issues of library material including 1408 issues of Periodicals, 300 issues of Document and 29 books, etc., were received and processed. Regarding Information Services of library, 1015 references articles have been supplied to 756 visitors/users during this period.

50 users were served from the full text on line journals subscribed by HEC on its Educational Network. The subscription of following databases on CD-ROM has been renewed during the report period.

1. Medline
2. Wilson Applied Science & Technology

REPROGRAPHIC SERVICES

The Reprographic Section of PASTIC has facilities ranging from photocopying to offset printing. During the period July 2004 to June 2005 about 2,604,865 impressions, 9,112 pages and 143,430 copies were printed and produced by the Reprography Unit against 152 jobs received from 11 organizations.

IT RELATED ACTIVITIES

A development project entitled "Establishment of National Science and Technology Database/Information Network at PASTIC" is completed. Under this project following activities were carried out during the period under review.

- Redesigned PASTIC and PSF websites. PASTIC databases are launched with online searching facility. URL:http://www.pastic.gov.pk
- For the publication of Pakistan Science Abstract developed mobile scanning lab, and data entry pool for scanning and entry.
- For the publication of Union Catalogue, data of 200 libraries merged, prepared CD format and launched on website with online searching facility.
- Established high speed internet connectivity at PASTIC with HEC network.
- Established networking facility at Pakistan Science Foundation.
- Software developed for the computerization of PASTIC and PSF staff salary.

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, UNESCO/ASTINFO and AIT/ ENSICNET. The following collaborating activities were undertaken under international liaison activities.

ASTINFO/UNESCO: It is a UNESCO supported Network for the Exchange of Experience and Information in Science and Technology in Asia and the Pacific. Its aim is to build and strengthen the information infrastructure in the Member States. Under this network, PASTIC is responsible for the distribution of UNESCO developed software/packages such as CDS/ISIS and IDAMS as well as provision of training on CDS/ISIS package. In view of these objectives following activities were undertaken during the reported period.

- WINISIS Package (English Version) supplied to 81 organizations and Arabic Version to 1 organization.
- Project proposals on "National Information Repository" and "S&T Information Policy" to be funded under UNESCO assistance were prepared.

INFORMATION FOR ALL PROGRAMME OF UNESCO (IFAP)

PASTIC has been designated the Focal Point for Information for All Programme of UNESCO. The IFAP was established in 2001 to meet challenges of the emerging global knowledge society and to provide equitable access to information in view of the role information plays in generating wealth and that participation in the "global knowledge society" is essential for development. It envisages that all developing countries should have IFAP National Committees, which should develop a National Information Policy and an appropriate infrastructure for information system and services. Accordingly, PASTIC constituted a National Committee for IFAP, which has representatives from Information Ministry, Science & Technology, NGOs, Information & Broadcasting, Library & Information professions. First Meeting of the Committee was held on June 29, 2004.

WIPO: The World Intellectual Property Organization (WIPO) has launched a programme, "WIPO University Initiative" which is aimed to increase awareness about Intellectual Property (IP) issues in universities and R&D organizations. The NED University of Engineering and Technology, Karachi and Quaid-i-Azam University, Islamabad have been nominated as "University Intellectual Property Coordinator" and PASTIC is designated as "IP Focal Point" for this programme.

BILATERAL COOPERATION: Proposal Prepared for 17th Protocol on S&T Cooperation with China with regards to exchange of S&T Information. Proposals were also submitted for S&T cooperation with countries such as Thailand, South Africa, Turkey, Myanmar, Vietnam and Syria.

SAARC DOCUMENTATION CNTRE: SAARC Documentation Centre (SDC) is a regional centre of SAARC. It was established in 1994 to act as an effective information system of Member States that enables exchange of information in various fields. Another objective of the SDC is to develop human resources in the Member States in the areas of information science, technology, management systems and services.

In this regard following activities were undertaken during the period under report.

- About 400 copies of SDC Newsletter were distributed to S&T organizations.
- 21 titles of International Research Journals of CSIR were acquired on complimentary basis under SDC-Cooperative activities. These constitute an important part of PASTIC library.

TRADE & TECHNOLOGICAL INFORMATION PROMOTION SYSTEM (TIPS): Technological Information Promotion System based at PASTIC has been regularly publishing weekly and fortnightly bulletins in Pakistan which provides up-to-the-minute detailed information on technology and trade opportunities in the developing countries. It covers fourteen different sectors and has the largest database in the world on trade/technology information from the developing countries.

The sectors are (i) Agro-Industries (ii) Energy (iii) Electronics (iv) Pharmaceuticals (v) Business Opportunities (vi) Food Processing (vii) Machinery (viii) Bio-Technology (ix) Textiles (x) Fisheries (xi) Building Materials (xii) Chemicals (xiii) Mining (xiv) Packaging.

The following activities were undertaken during the report period:

- Sectoral subscribers increased to 19.
- TIPS website designed
- Pakistani Information sent to Regional Office
- Monthly Bulletins based on Foreign Technologies and Trade offers were prepared and dispatched.

PATENT INFORMATION AND PROMOTION SERVICES

PASTIC provided information and guidance to the scientists from Kahuta Research Laboratories, PCSIR Sustainable Development Centre, Parachinar, NUST and University of Agriculture, Peshawar.

1. In order to promote patent culture and create awareness with regards to IP PASTIC organized a seminar in collaboration with NED University on "**Creation of an Intellectual Property Culture**" at Karachi from 9-10 February, 2005. The seminar focused on the importance of IP for socio-economic development and also discussed patentability issues in software, biotechnology and pharmaceuticals as well as enforcement.

HUMAN RESOURCE DEVELOPMENT

One of the important activities of PASTIC is to impart training on computer applications for Office & Library automation as well as to organize workshops and seminars on diverse topics.

Training/Workshop organized:

1. Organized a workshop on WIN/ISIS Package from September 12-23, 2004 at PASTIC. Ten participants from different organizations attended the workshop.
2. Workshops on "Library Automation of S&T Organizations" in collaboration with Dr. Mahmud Hussain Library, University of Karachi, from 04-07 October, 2004 at Karachi.
3. Organized training Workshop on "Library Automation of S&T Organizations" in collaboration with Department of Information and Library Science, University of the Punjab from 13-16 December, 2004 at Lahore.
4. Training on WIN/ISIS Package from 7-19 February, 2005 at Islamabad.
5. PASTIC /PSF jointly organized a workshop on "Creating Value in Scientific & Technological Research" on May 03, 2005 with the purpose to create awareness

Dr. Farid A. Malik, Chairman, PSF presenting a shield to Prof. Dr. S. Salahuddin Hyder of NED University at the Seminar on "Creation of an Intellectual Property Culture", Karachi, 9-10 Feb, 2005

Prof. Dr. Pirzada Qasim, Vice Chancellor University of Karachi addressing at the inaugural ceremony of the workshop on "Library Automation of S&T Organizations", Karachi, 4-7 Oct, 2004

Syda Arjumund, Ms. Nuzhat Yasmeen, Dr. Farid A. Malik & Mr. Khalid Bhutto during the closing session of the workshop on "Library Automation of S&T Organizations", Karachi, 4-7 Oct, 2004

about the benefits of patentable applied research and to tap the vast innovative potential of the innovators, entrepreneurs and researchers, helping them to experiment with new approaches to innovation. Dr. Sarfaraz K. Niazi, Patent Attorney in the US, was the Resource person

6. Workshops on "Library Automation of S&T Organizations" from 09-11 May, 2005 at Peshawar.
7. Training on WIN/ISIS Package from 20-29 May, 2005 at Islamabad.
8. Two Training Workshops on WIN/ISIS Package from 20-22 June, 2005 & 23-25 June,2005 at Peshawar.
9. Training Workshops on WIN/ISIS Package from 23-25 June, 2005 at Peshawar.

WORKSHOPS ATTENDED & TRAININGS RECEIVED BY PASTIC OFFICERS

- Two Officer from PASTIC received training on "MS-ACCESS" organized by Pakistan Computer Bureau from 23rd Nov to 7th Dec, 2004.
- Chief Editor attended One week National Orientation course on "Research Methodology for Investing Socio-economic Issues" from 1-8 February, 2005 at Pakistan Management Institute, Islamabad.
- Director PASTIC attended a workshop on IPR on February 23, 2005 organized by Centre for Advanced Research in Engineering.
- Additional Director attended training on "HRD Planning" from 1-12 March, 2005 at Pakistan Manpower Institute, Islamabad.
- Chief Editor attended "Public Private Partnership for Development" at Preston University, Islamabad.
- Sr. Librarian attended training on "Library Management Skills".
- Two officers from PASTIC attended training course on "HTML and Java Script" at Pakistan Computer Bureau.
- Two officers attended Workshop on "**Library Resource Sharing**", organized by NARC, from April 11-15, 2005.
- Director PASTIC, attended training course on "Assessors of Quality Awards", 18-22 April, 2005 organized by National Productivity Organization, at Lahore.

MISCELLANEOUS ACTIVITIES

ORIENTATION PROGRAMME

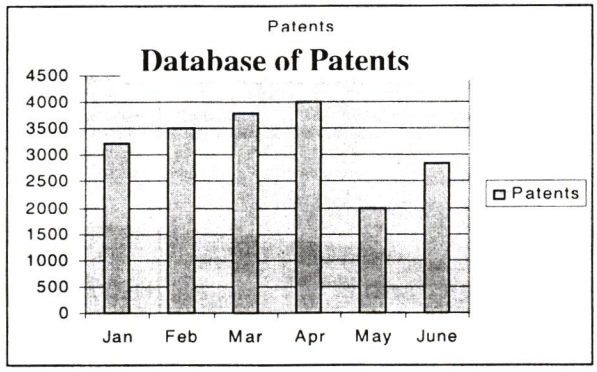
Orientation Sessions were arranged for orientation of newly inducted officer/officials at PSF/PMNH/PASTIC. Under this programme orientation of 25 officers/officials appointed in the PSF, PASTIC and PMNH was carried out during the report period.

QUALITY CIRCLES

PASTIC/PSF organized First Quality Circles Convention on 15 February, 2005. All quality circles of PASTIC presented their progress reports. PASTIC Public Service Section quality circle secured 3rd position.

IN-HOUSE DATABASES DEVELOPED

- A database developed for the computerization of patents in WIN/ISIS Package.



PAPERS/BOOKLETS PRESENTED & PUBLISHED BY PASTIC OFFICERS

- Syed Aftab Shah and Ms. Nageen Ainuddin. "*PASTIC and the Concept of Resource Sharing and Networking between Libraries*" paper presented in NARC Workshop on Library Resource Sharing, organized by NARC on April, 2005.

- An article by Ms.Nageen Ainuddin, on "Maintaining International Standards" published in 'The Nation'on April 18, 2005.

- A booklet entitled "Organizational Development Through Quality Circles" by Dr. Farid A. Malik, Mr. Maajid Maqbool & Ms. Nageen Ainuddin.

- A research paper entitled "Consanguinity and family history: risk factors of cardiovascular diseases" by Syed Aftab Hussain Shah, Scientific Information Officer has been published in the Pakistan Journal of Zoology, 2004.

PROGRAM(S) INITIATED DURING 2004-2005

"Science Awareness Through T.V. Channels"

OVERALL AIM:

Creation of awareness and interest in science and technology through multimedia, specially the TV, Leading to socio-economic development and better quality of life of common people in the country.

OBJECTIVES

1. Disseminate scientific information through T.V Channels to key stakeholder, i.e., students, scientists, researchers, industrialist, entrepreneurs, politicians and community representatives to motivate them to join in national socio-economic development activities.
2. Publicize basic and applied scientific concepts using film, video clips and documentaries.
3. Organize panel discussion on various national issues of Science and Technology with inputs from multi sector panelists.
4. Reinforce panel discussion on T.V with telephonic and e-mail participation of general public.
5. Produce documentaries in local languages on various popular Science and Technology Themes.
6. Stimulate the sense of enquiry on S&T, of common masses.
7. Enhance the capacity of Scientists and Researchers for presenting their point of view through Mass Media.

The project includes four main programmes for implementation, which are as under:

Programme-1: Acquisition, translation and dubbing of S&T films and documentaries on important aspects of science and technology.

Programme-2: Production of S&T films and documentaries on important S&T issues and their possible solutions for the economic development of the country.

Programme-3: Panel discussion on TV among scientists and eminent scholars and representatives from other walks of life for clarification of scientific concepts and technological impact on society.

Programme-4: Training of young scientists for popularization of science through mass media.

ACHIEVEMENTS

Programme No.1: Acquisition, translation and dubbing of S&T films and documentaries on important aspects of science and technology.

Under this component the following activities were carried out

1. Constituted Advisory Committee and First meeting of the Advisory Committee was held on 16th September 2004.

The names of the members of the Advisory Committee are given as follows:

ADVISORY COMMITTEE (AC)

Dr. Farid A.Malik, Chairman, PSF — Chairman

Dr. S. R.H. Baqri, Director General, PASTIC

(i) Mr. Aslam Azhar, Ex-Chairman, PTV, Islamabad

(ii) Dr. S. K. Hasnain, Prof. of Physics, Quaid-i-Azam University, Islamabad

(iii) Dr. Tariq Bashir, Assistant Chief (Science), PCST, Islamabad

(iv) Prof. Dr. M. A. Hafeez, Fellow PAS, Islamabad

(v) Mr. Raoof Hasan,Chief Executive, Danyaal & Associate (Pvt.) Ltd., Islamabad

(vi) Dr. Isa Daud Pota, Project Manager, COMSTECH, Islamabad

(vii) Prof. Dr. Mujahid Kamran, Dean, Faculty of Sciences, University of the Punjab, Lahore

(viii) Ms. Wasima Shehzad, National University of Science & Technology, Rawalpindi.

(ix) Dr. Shakil-ur-Rehman Farooqui, Assistant Prof., Department of Genetics, University of Karachi, Karachi

(x) Mr. Tariq Saeed, Controller Programmes, Pakistan Television Corporation Ltd. Islamabad

(xi) Dr. Pervez Hoodbhoy,Professor of Physics, Quaid-i-Azam University, Islamabad

(xii) Mr. Amjad Hussain.Dy Scientific Advisor, Ministry of Science and Technology, Islamabad

(xiii) Mr. Gul Muhammad Memon,Dy. Scientific Advisor, Ministry of Science and Technology, Islamabad.

2. The first meeting of the Technical Advisory Committee was held on 27th September 2004.

3. The PC-1was revised for the re-appropriation of funds to implement the programmes successfully.

4. The 2nd meeting of Technical Advisory Committee was held on 7th March, 2005.

5. The list of the approved films to be acquired according to PC-1 was circulated amongst the members of the Advisory Committee who selected/rejected the films from the list and accordingly sixty films were finalized for procurement.

6. List of films on environment with broadcasting rights finalized and codal formalities carried out for the acquiring of 10 documentaries.

Programme No.2: Production of S&T films and documentaries on important S&T issues and their possible solutions for the economic development of the country.

Under this programme the following activities were carried out:

1. First meeting of the production houses was conducted on 3rd November 2004
2. Visited production houses for their technical evaluation by the in house committee.
3. Selection of production houses finalized and approved.
4. Seal bids received from production houses.
5. Case processed for outsourcing the production of two science documentaries to the following production Houses.
    - M/S World Wide Vision, Islamabad
    - M/S Hi Vision Production (HMA), Islamabad.
6. Script writing on selected topics for documentaries started.

Programme No.3: Interviews with eminent scientist, technologist, scholars and holding panel discussions with them on TV, to create country wide impact.

This activity was considered to be the priority activity, therefore, full concentration was given to it and concentrated efforts, with team spirit and sincere efforts resulted in 100 % implementation of this component. Ten panel discussion programmes were finalized and agreement with PTV for recording and airing signed.

- Three (3) Panel discussions recorded and one aired during the report period.
  Under this activity the consultant interviewed the selected invited panel experts/eminent scientists and framed the following series of ten Panel discussions.

SERIES OF PANEL DISCUSSIONS
"SCIENCE FOR DEVELOPMENT"
"SCIENCE BARAE TARRAKI"

List of titles of panel discussions:

1. Entrepreneurship and Socio-economic Development
2. Gems & Gemstone and National Development (I)
3. Gems & gemstones and National Development (II)
4 Biodiversity and National Development
5 Commercialization of Indigenous Technology for Development
6 Textile Technology & Trade for National Development
7 Medicinal Plants of Economic Importance and National Development
8. Intellectual Property Rights and National Development
9. Importance of Industrial Minerals & Rocks for National Development
10. Wind up of the Series of Panel Discussion "Science for Development"

Programme No.-4: Training of young scientists for popularization of science through mass media.

PASTIC organized first training workshop on "Science in mass Media: Genetics and Allied Sciences" in collaboration with Genetics Department, University of Karachi from 7-9 June, 2005 at Karachi. This workshop was design to bring together scientist, journalists, television producers, public relation persons to bridge the gap of communication between the two groups i.e. the scientists and the media people. Attempt was made to create better understanding of the kind of reciprocal support they need from each other for effective promotion of science and technology. The workshop was expected to do the much needed job of capacity building of both scientists and the media people.

The objectives of the workshop were to

1) Define how science should be covered/ promoted in the National Mass Media. The scientific field of genetics was selected for this workshop, which was first workshop of this kind and the first one of the series that will be conducted in other cities.
2) Develop a model for similar other workshops in other cities

Ms. Shaheen Khan, Secretary, PSF signing agreement with PTV for the recording and airing of Panel Discussions

Dr. Farid A. Malik, Chairman, PSF, addressing at the ceremony of the workshop on "Library Automation of S&T Organizations", Lahore 13-16 Dec. 2004.

Prof. Azhar Ikram, Vice Chancellor, University of the Punjab, Lahore, distributing certificates among the participants at the closing Ceremony of the "Library Automation of S&T Organizations", Lahore 13-16 Dec. 2004.

ORGANIZATION
&
ADMINISTRATION

CHAPTER-2

ORGANIZATION AND ADMINISTRATION

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

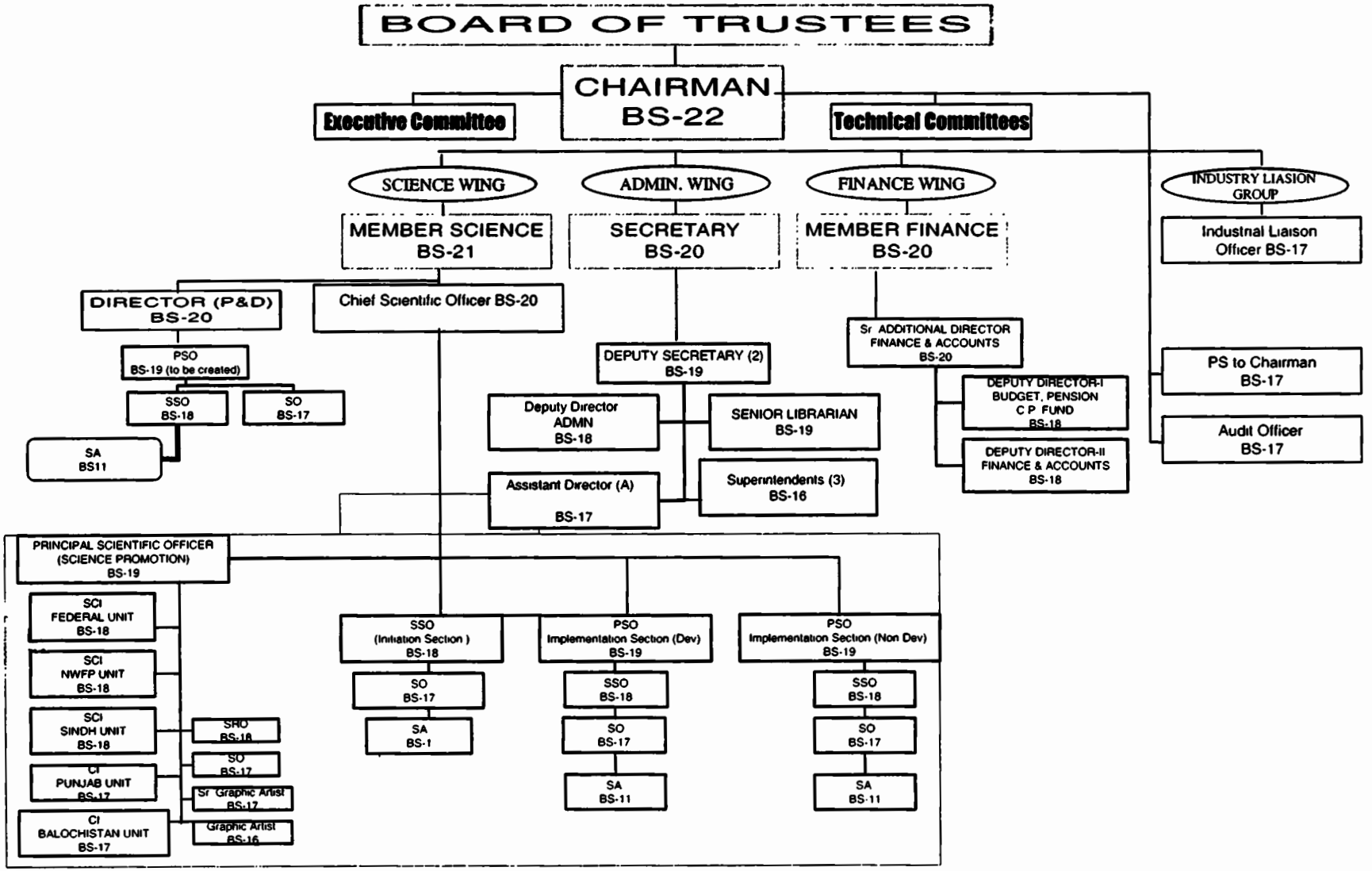
PAKISTAN SCIENCE FOUNDATION

SANCTIONED STRENGTH FOR THE YEAR 2004-2005 (BS-16 & ABOVE)

S.No	Designation	Number
1	Chairman	1
2	Member Science	1
3	Member Finance	1
4	Secretary	1
5	Director (P&D)	1
6	Chief Scientific Officer	1
7	Principal Scientific Officer	4
8	Additional Director (F&A)	1
9	Deputy Secretary	1
10	Sr. Scientific Officer	3
11	Sr. Research Officer	2
12	Dy. Director (F&A)	2
13	Sr. Librarian	1
14	Sr. Caravan Incharge	2
15	Dy. Director (Admn)	1
16	Audit Officer	1
17	Caravan Incharge	3
18	Scientific Officer	4
19	Asstt. Director (Admn) –1 Asstt. Director (Estt) –1	2
20	Sr. Graphic Artist	1

21	PS to Chairman	1
22	PS to Chief Scientific Officer	1
23	Liaison Officer	1
24	Asstt. Research Officer	1
25	Superintendent	3
26	Accountant	4
27	Graphic Artist	1
28	PA to Chairman /Director (P&D)	2
29	Mechanic for Instruments	1
30	Sr. Driver-Cum-Mechanic	2
	Supporting Staff	**123**
	Total	**174**

PAKISTAN SCIENCE FOUNDATION
ORGANIZATIONAL CHART
2004-2005



PAKISTAN MUSEUM OF NATURAL HISTORY

SANCTIONED STRENGTH FOR THE YEAR 2004-05

DIRECTOR GENERAL'S OFFICE

Sr. NO	Designation	BS	No of Post	In Position	Vacant
1.	Director General	21	1	1	--
2.	PA to the D.G.	16	1	1	--
3.	Naib Qasid	1	1	1	--
		Total	**3**	**3**	**--**

BOTANICAL SCIENCES DIVISION

Sr. No.	Designation	BS	No of Post	In Position	Vacant
1.	Director	20	1	1	--
2.	Senior Curator	20	1	1	--
3.	Curator	19	1	1	--
4.	Associate Curator	18	4	3	1
5.	Research Associate	17	4	4	--
6.	Assistant Research Associate	16	2	--	2
7.	Stenographer	15	1	1	--
8.	Senior Collection Incharge	9	1	1	--
9.	Collection Incharge	7	1	1	--
10.	Drying & Fumigating Assistant	7	2	2	--
11.	Field Assistant	5	4	4	--
12.	Helper	1	1	1	--
13.	Naib Qasid	1	1	1	--
		Total	24	21	3

ZOOLOGICAL SCIENCES DIVISION

Sr. No.	Designation	BS	No of Post	In Position	Vacant
1.	Director	20	1	1	--
2.	Curator	19	1	1	--
3.	Associate Curator	18	3	3	--
4.	System Analyst	17	1	1	--
5.	Research Associate	17	6	5	1
6.	Senior Taxidermist	17	1	1	--
7.	Taxidermist	16	1	1	--
8.	Stenotypist	12	1	1	--
9.	Senior Skeleton Preparator	12	1	1	--
10.	Incharge Embalming	8	1	1	--
11.	Skeleton Preparator	7	1	--	1
12.	Field Assistant	5	4	3	1
13.	Helper	1	1	1	--
14.	Naib Qasid	1	1	1	--
	Total		**24**	**21**	**3**

EARTH SCIENCES DIVISION

Sr. No.	Designation	BS	No of Post	In Position	Vacant
1.	Director	20	1	1	--
2.	Curator	19	2	2	--
3.	Associate Curator	18	4	2	2
4.	Research Associate	17	4	3	1
5.	Casting Staff	15	1	1	--
6.	Stenotypist	12	1	1	--
7.	Fossil Preparator	11	1	1	--
8.	Senior Collection Incharge	9	1	1	--
9.	Collection Incharge	7	1	1	--
10.	Tracer	7	1	--	1
11.	Field Assistant	5	4	4	--
12.	Helper	1	1	1	---
13.	Naib Qasid	1	1	1	--
	Total		**23**	**19**	**4**

PUBLIC SERVICES DIVISION

Sr. No.	Designation	BS	No of Post	In Position	Vacant
1.	Director PSD	20	1	1	--
2.	Operational Manager	19	1	1	--
3.	Exhibit Designer	18	1	1	--
4.	Graphic Designer	17	1	1	--
5.	Associate Artist	16	1	1	--
6.	Teacher Guide	16	1	--	1
7.	Children Education Programmer	16	1	1	--
8.	Senior Photographer	16	1	1	--
9.	Modeler	15	1	1	--
10.	Calligrapher	12	1	1	--
11.	Computer Operator	12	1	1	--
12.	Painter	11	1	1	--
13.	Electrician	7	1	1	--
14.	Lath Machine Operator	7	1	1	--
15.	Helper	1/2	2	2	--
16.	Naib Qasid	1	1	1	--
	Total:		**17**	**16**	**1**

ADMINISTRATIVE SERVICES DIVISION

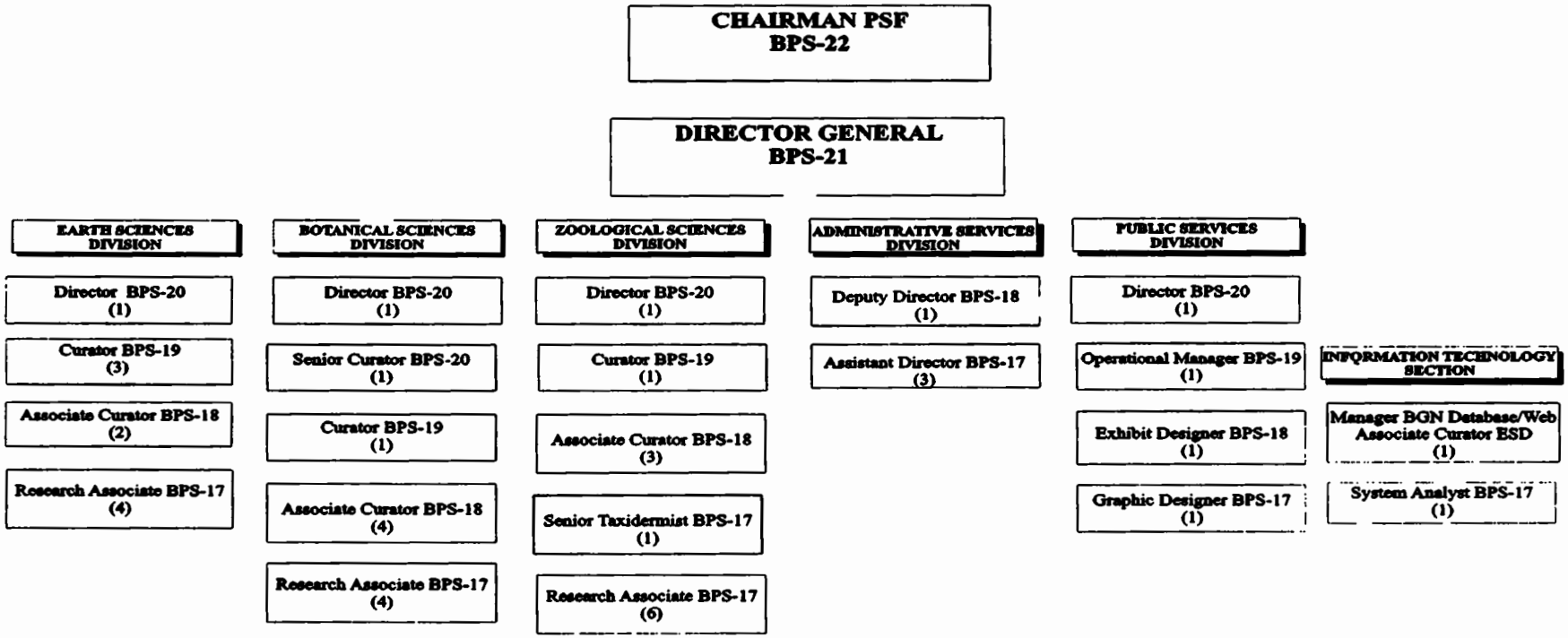
Sr. No.	Designation	BS	No of Post	In Position	Vacant
1.	Deputy Director (Admin)	18	1	1	--
2.	Assistant Director (Admin-I)	17	1	1	--
3.	Assistant Director (Admin-II)	17	1	1	--
4.	Assistant Director (Accounts-III)	17	1	1	--
5.	Accountant	16	1	1	--
6.	Assistant Librarian	16	1	1	--
7.	Office Assistant	11	1	1	--
8.	Cashier	11	1	1	--
9.	Purchase Assistant	11	1	--	1
10.	Accounts Assistant	11	1	1	--

11.	Carpenter	9	1	1	--
12.	U.D.C.	7	2	2	--
13.	Store Keeper	7	1	1	--
14.	Driver	7 SS	4	4	--
15.	L.D.C.	5	2	2	--
16.	Driver	5 SS	1	1	--
17.	Dispatch Rider	4	1	1	--
18.	D.M.O.	4	1	1	--
19.	Naib Qasid	1	2	1	1
20.	Security Guard	1/2	14	11	3
21.	Gardener	2	1	1	--
22.	Sanitary worker	1/2	5	5	--
	Total		**45**	**40**	**5**

Total Sanctioned Posts: 136
Filled: 121
Vacant 15

PAKISTAN MUSEUM OF NATURAL HISTORY

EXISTING ORGANIZATIONAL CHART



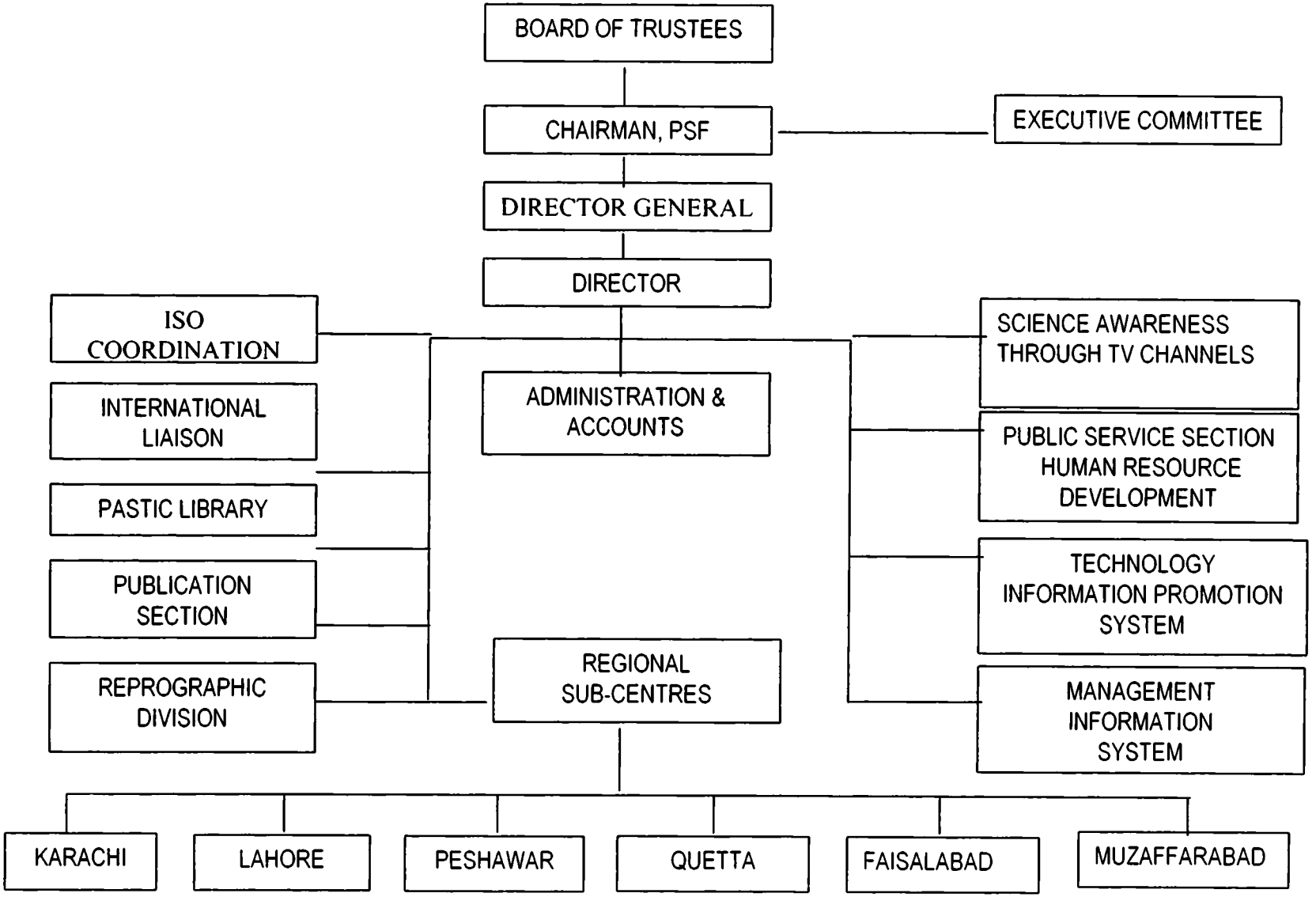
PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMAITON CENTRE ISLAMABAD

SANCTIONED STRENGTH FOR THE YEAR 2004-05

BPS	Designation	Number of Posts		
		Total	Filled in	Vacant
21	Director General	1	1	0
20	Director	1	1	0
19	Deputy Director (Doc)	1	0	1
19	Additional Director (A&F)	1	1	0
19	Chief Liaison Officer	1	1	0
18	Chief Liaison Officer	1	1	0
18	Sr. Translating Officer	1	0	1
18	Manager Reprographic Unit	1	1	0
18	Sr. System Analyst.	1	1	0
18	Sr. Documentation Officer	1	0	1
18	Chief Editor.	1	1	0
18	Sr. Information Officer.	1	1	0
18	Sr. Bibliographic Officer	1	1	0
18	Sr. Librarian.	1	1	0
17	Scientific Information Officer.	9	9	0
17	Bibliographic Officer.	2	2	0
17	System Analyst.	2	1	1
17	Manager Technology Information.	1	1	0
17	Assistant Director (Admn)	1	0	1
17	Assistant Director (Accounts)	1	0	1
17	Printing Officer	1	1	0
17	Graphic Artist	1	1	0
16	Asstt Accounts Officer	1	1	0
16	PA to Director General.	1	1	0
16	Superintendent (Reprographic Unit)	1	1	0
16	Superintendent (Admn)	1	0	1
16	Asstt. Scientific Information Officer.	2	1	1
16	Asstt. Documentation Officer.	2	1	1
16	Asstt: Programmer.	3	1	2
16	Asstt. Manager Reprographic Unit	1	1	0
16	Asstt. Printing Officer	3	1	2
16	Accountant	2	2	0
	Total	**49**	**36**	**13**

BPS	Designation	Number of Posts		
		Total	Filled in	Vacant
15	Sr. Data Control Assistant	2	2	0
14	Data Control Assistant.	4	4	0
14	Layout Artist.	1	0	1
14	Photographic Asstt.	1	0	1
14	Mechanical Supervisor.	1	0	1
14	Sr. Offset Printer.	2	1	1
12	Stenotypist.	5	3	2
11	Technician.	1	1	0
11	Offset Printer.	1	1	0
11	Photo Assistant.	2	1	1
11	Assistant.	8	7	1
10	D.E.O.	4	4	0
7	Asstt. Offset Printer.	1	1	0
7	U.D.C.	9	3	6
7	Electrician.	1	1	0
6	Carpenter.	1	1	0
5	L.D.C.	11	5	6
5	Bindery Assistant.	2	1	1
5	Offset Machine Assistant	2	2	0
4	Drivers.	8	8	0
4	D.M.O.	1	1	0
3	Head Mali	1	0	1
2	Record Sorter.	1	1	0
2	Photo Attendant.	1	0	1
2	Lab. Attendant	1	1	0
2	Patent Attendant.	2	1	1
2	Library Attendant.	3	2	1
1	Sanitary Workers.	3	3	0
1	Mali	2	2	0
1	Security Guard	9	9	0
1	Naib Qasid.	15	15	0
1	Bindery Helper.	3	3	0
	Total	**109**	**84**	**25**
	GRAND TOTAL	**158**	**120**	**38**

Organizational Structure of PASTIC (2004-2005)



AUDITOR'S REPORT

CHAPTER-3

PAKISTAN SCIENCE FOUNDATION
FINANCIAL STATEMENTS
JUNE 30, 2005.

AUDITORS' REPORT TO THE BOARD OF TRUSTEES

We have audited the annexed balance sheet of M/s **PAKISTAN SCIENCE FOUNDATION** as at June 30, 2005 and the related receipts and expenditure statement, cash flow statement and statement of changes in accumulated fund together with notes forming part thereof for the year then ended.

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 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, the financial statements give the information as required and present fairly in all material respects the financial position of the Foundation as at June 30, 2005 and of its surplus/(deficit) and cash flow for the year then ended in accordance with the approved accounting standards as applicable in Pakistan.

Ilyas Saeed & Co.
23/12/2005.

(ILYAS SAEED & CO.)
Chartered Accountants

Islamabad ; 20th November, 2005

PAKISTAN SCIENCE FOUNDATION

BALANCE SHEET

AS AT JUNE 30, 2005

GRANTS & LIABILITIES	NOTE	2005 RUPEES	2004 RUPEES	PROPERTY & ASSETS	NOTE	2005 RUPEES	2004 RUPEES
GENERAL FUND	3	22,663,092	22,722,931	FIXED ASSETS At Cost less Depriciation	7	19,654,764	20,424,049
RESEARCH SUPPORT GRANT	4	71,296,146	67,634,432	DEVELOPMENT PROJECTS At Cost less Depriciation	8	14,245,402	16,604,007
DEVELOPMENT FUND GRANTS	5	15,398,150	17,635,279	RESEARCH PROJECTS IN PROGRESS	4	71,296,146	67,634,432
				LONG TERM DEPOSITS	9	1,637,195	1,637,195
CURRENT LIABILITIES				CURRENT ASSETS			
Accrued & Other Liabilities	6	651,949	467,538	Advances, Deposits & Prepayments	10	897,030	383,694
				Cash & Bank Balances	11	2,278,800	1,776,803
						3,175,830	2,160,497
		110,009,337	108,460,180			110,009,337	108,460,180

Note These financial statements should be read in conjunction with the annexed notes which form an integral part thereof

Islamabad November 20 2005

TRUSTEE _____ 20/12/05

CHAIRMAN _____ 22/12/05

PAKISTAN SCIENCE FOUNDATION
RECEIPT AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED JUNE 30, 2005

	NOTE	2005 RUPEES	2004 RUPEES
RECEIPTS			
Grant From Federal Government		49,175,000	45,000,000
Other Income		58,538	15,698
		49,233,538	45,015,698
EXPENDITURES			
Statutary Scientific Functions	12	21,079,622	18,657,397
Administrative Expensive	13	28,214,905	26,971,340
		49,294,527	45,628,737
SURPLUS / (DEFICIT) OF RECEIPTS OVER EXPENDITURE		(60,989)	(613,039)
PRIOR YEAR ADJUSTMENTS	14	1,150	66,267
NET SURPLUS / (DEFICIT) OF RECEIPTS OVER EXPENDITURE		(59,839)	(546,772)

Note : These financial statements should be read in conjunction with the annexed notes which form an integral part thereof.

TRUSTEE _____ CHAIRMAN _____

Islamabad November 20, 2005

PAKISTAN SCIENCE FOUNDATION
CASH FLOW STATEMENT
FOR THE YEAR ENDED JUNE 30, 2005

	2005 RUPEES	2004 RUPEES
CASH FLOW FROM OPREATING ACTIVITIES		
Surplus / (Deficit) for the year	(59,839)	(546,772)
Adjustment for non Cash Charges		
Depreciation - Fixed Assets	1,155,710	1,217,778
Adjustment of Bicycle		1
Depreciation - Development Projects	2,866,461	3,362,009
Surplus / (Deficit) Before Working Capital Changes	4,022,171	4,579,788
	3,962,332	4,033,016
Working Capital Changes		
(Increase) / Decrease In Current Assets		
(Increase) in LongTerm Deposits		
Decrease In Advances and Prepayments	(513,336)	733,714
	(513,336)	733,714
Increase / (decrease) in current liabilities		
Increase In Accrued and Other Liabilities	184,411	307,842
	184,411	307,842
Net Working Capital Changes	(328,925)	1,041,556
NET CASH FLOW FROM OPERATING ACTIVITIES	3,633,407	5,074,572
CASH FLOW FROM INVESTING ACTIVITIES		
Purchases of Fixed Assets	(894,282)	(17,691,679)
NET CASH FLOW FROM INVESTING ACTIVITIES	(894,282)	(17,691,679)
CASH FLOW FROM FINANCING ACTIVITIES		
Development Fund Grants - Net	(2,237,129)	12,520,415
NET CASH FLOW FROM FINANCING ACTIVITIES	(2,237,129)	12,520,415
NET INCREASE / (DECREASE) IN CASH AND CASH EQUIVALENTS	501,996	(96,692)
CASH AND CASH EQUIVALENTS AT THE BEGINNING OF THE YEAR	1,776,803	1,873,495
CASH AND CASH EQUIVALENTS AT THE END OF THE YEAR	2,278,800	1,776,803

TRUSTEE _____ 20/12/05

CHAIRMAN _____ 22/12/05

Islamabad November 20, 2005

PAKISTAN SCIENCE FOUNDATION
STATEMENT OF CHANGES IN ACCUMULATED FUND
AS AT JUNE 30, 2005

PARTICULARS	2005 RUPEES	2004 RUPEES
Balance as at July 01	22,722,931	23,269,703
Surplus / (Deficit) for the year	(59,839)	(546,772)
Balance as at June 30	**22,663,092**	**22,722,931**

TRUSTEE _____ 20/12/05

Islamabad , November 20, 2005

CHAIRMAN _____ 22/12/05

PAKISTAN SCIENCE FOUNDATION
NOTES TO THE ACCOUNTS
FOR THE YEAR ENDED JUNE 30, 2005

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 of its establishment are to promote and finance scientific activities having a bearing on the socio-economic needs of the country.

2. SIGNIFICANT ACCOUNTING POLICIES

These financial statements comply with International Accounting Standards, where applicable, in all material respects. The principal accounting policies, which have been adopted in the preparation of these financial statements, are as follows: -

2.1 ACCOUNTING CONVENTION

These financial statements have been prepared under 'historical cost convention' and do not reflect the impact of specific price changes and the general level of prices.

2.2 GRANTS RECEIVED

The Grants from the Government of Pakistan have been accounted for on receipt basis

2.3 RESEARCH SUPPORT GRANT

The Research Support Grant has been accounted for on payment basis.

2.4 FIXED ASSETS

Fixed assets have been valued at cost less accumulated depreciation except leasehold land, which is stated at cost. Depreciation on fixed assets is charged on reducing balance method. Full year's depreciation is charged on assets acquired during the year and no depreciation is charged on assets disposed off during the year.

Maintenance and normal repairs are charged to income as and when incurred. Major renewals and improvements are capitalized. Gains and losses on disposal of assets are taken to profit and loss account.

2.5 TAXATION

The Foundation enjoys tax exemption. Thus, no charge of tax is provided for in the accounts for the period.

			2005 RUPEES	2004 RUPEES
3	**GENERAL FUND**			
	Balance As On July 01		22,722,931	23,269,703
	Surplus / (Deficit) For The Year		(58,039)	(546,772)
			22,664,892	22,722,931
4	**RESEARCH SUPPORT GRANT**			
	Balance As At July 01		67,634,432	60,435,715
	Add: Disbursements During The Year	4.1	8,796,331	10,021,669
			76,430,763	70,457,384
	Less: Projects Completed During The Year	4.2	5,134,617	2,822,952
			71,296,146	67,634,432
4.1	**Disbursements During The Year**			
	I. L. G.		-	1,129,060
	Biotech Sciences		47,576	884,596
	Mathematics & Computer Sciences		2,800	-
	Physical Sciences		708,113	1,557,457
	Chemical Sciences		1,309,078	1,181,363
	Biological Sciences		1,275,013	674,725
	Earth Sciences		558,359	75,799
	Environmental Sciences		731,820	352,475
	Engenieering Sciences		896,948	411,414
	Agricultural Sciences		2,380,253	3,177,619
	Medical Sciences		698,984	577,161
	Board / Committee Meeting		187,387	-
			8,796,331	10,021,669
4.2	**Projects Completed During The Year**			
	Physical Sciences		1,134,374	-
	Chemical Sciences		405,192	2,356,840
	Biological Sciences		1,807,628	-
	Earth Sciences		682,384	245,499
	Environmental Sciences		204,070	-
	Agricultural Sciences		900,969	220,613
			5,134,617	2,822,952
5	**DEVELOPMENT FUND GRANT**			
	Opening Balance		17,635,279	5,114,864
	Add: Development Project Grants	5.1	55,550,000	43,458,900
			73,185,279	48,573,764
	Less: Development Project Functions	5.2	57,787,129	30,938,485
	Closing Balance	5.4	15,398,150	17,635,279
5.1	**Development Project Grants**			
	Financial Support To Scientific Societies		5,000,000	7,000,000
	Popularization of Sciences In Rural Areas		1,500,000	16,212,000
	Participation of Scientists And Technologists In Conferences		3,400,000	5,400,000
	Career Development of Young Scientists And Technologists		650,000	1,300,000
	Funding of Scientific Research In Universities And Other Organizations		7,500,000	13,050,000
	Research Program for Active Scientists & Technologists		37,500,000	-
	Core Group on Life Sciences			-
	Peer Review Work NCST Projects			450,000
	Peer Review Work PTCL Projects			46,900
			55,550,000	43,458,900

			2005 RUPEES	2004 RUPEES
5.2	**Project Wise Development Expenditure**			
	NCST Monitoring Cell		-	200
	Financial Support To Scientific Societies		5,000,000	7,000,000
	Popularization of Sciences In Rural Areas		1,500,000	16,212,000
	Participation of Scientists And Technologists In Conferences		3,400,000	5,400,000
	Career Development of Young Scientists And Technologists		650,000	1,300,000
	Funding of Scientific Research In Universities And Other Organizations		7,500,000	13,050,440
	Research Program for Active Scientists & Technologists		37,500,000	-
	Core Group on Life Sciences		-	112,165
	Peer Review Work NCST Projects		-	316,480
	Peer Review Work PTCL Projects		-	14,980
			55,550,000	43,406,265
	Less: Charged To Fixed Assets		(507,857)	(15,829,789)
	Add: Depriciation		2,866,461	3,362,009
		5.3	57,908,604	30,938,485
5.3	**Development Project Functions**			
	TA/DA & Evaluation Fee		2,743,690	4,024,910
	Office Equipment Donation		-	55,800
	Financial Support To Societies		4,839,473	6,923,806
	Computer Equipment Donation		-	4,000
	Grants For Research		38,506,386	14,011,967
	Registration Fee		560,936	702,506
	Postage & Stationary		200,516	134,234
	Advertisement		365,596	73,881
	Internet Charges		-	-
	Utilities		127,749	10,547
	Depreciation		2,866,461	3,362,009
	Salary to Staff		729,500	235,208
	Entertainment		25,934	-
	Vehicle Running And Maintainance		125,499	21,408
	Bank Charges		-	-
	Miscellaneous		283,542	239,340
	Amount Surrendered To FTO / Treasury		5,848,264	440
	Living Expenses		439,674	1,051,301
	On Site Monitoring		-	16,000
	Material & Supplies Contigent Expense		123,909	71,128
			57,787,129	30,938,485
5.4	**Reconciliation of Closing Development Fund Grant**			
	Closing Balance		15,398,150	17,635,279
	Represented By.			
	Fixed Assets (Net)		14,245,402	16,604,007
	Cash At Banks		1,211,789	1,210,639
	Advances		-	-
	Payables		-	(121,475)
	Prior Year Adjustment		(59,041)	(57,892)
			15,398,150	17,635,279
6	**ACCRUED AND OTHER LIABILITIES**			
	Accrued Expenses		199,802	303,313
	Audit Fee Payable		20,000	20,000
	Security Deposits		30,500	22,750
	Payable To Suppliers (Development Fund)		-	121,475
	Other Liabilities		401,647	-
			651,949	467,538

7 FIXED ASSETS

PARTICULARS	COST				DEPRECIATION					BOOK VAI
	AS AT 01 - 07 - 2004	ADDITIONS	(DELETION)	TOTAL 30 - 06 - 2005	RATE %	AS AT 01-07-2004	FOR THE YEAR	ADJUSTMENT FOR DISPOSAL	ACCUMUL-ATED AS AT 30-06-2005	AS AT 30-06-20
LAND - LEASEHOLD	3,713,418	-	-	3,713,418	0	-	-	-	-	3,71
BUILDING	19,484,540	-	-	19,484,540	5	7,204,420	614,006	-	7,818,426	11,66
MOTOR VEHICLES	3,706,809	-	-	3,706,809	20	3,457,057	49,950	-	3,507,007	19
OFFICE EQUIPMENT	3,743,736	283,695	-	4,027,431	15	2,676,207	202,684	-	2,878,891	1,14
SCIENCE EQUIPMENT	2,919,275	-	-	2,919,275	15	1,748,425	175,628	-	1,924,053	99
FURNITURE & FIXTURE	2,046,229	79,091	-	2,125,320	6	1,077,120	62,892	-	1,140,012	98
AIR CONDITIONERS	194,974	-	-	194,974	20	190,275	940	-	191,215	
LIBRARY BOOKS & FILMS	1,532,671	23,639	-	1,556,310	5	564,099	49,611	-	613,710	94
BICYCLE	-	-	-	-	20	-	-	-	-	
RUPEES 2005	37,341,652	386,425	-	37,728,077		16,917,603	1,155,710	-	18,073,313	19,65
RUPEES 2004	35,933,772	1,408,560	(680)	37,341,652		15,700,504	1,217,778	(679)	16,917,603	20,42

8 DEVELOPMENT PROJECTS

PARTICULARS	COST				DEPRECIATION					BOOK VAI
	AS AT 01 - 07 - 2004	ADDITIONS	(TRANSFER) / (DELETION)	TOTAL 30 - 06 - 2005	RATE %	AS AT 01-07-2004	FOR THE YEAR	ADJUSTMENT	ACCUMUL-ATED AS AT 30-06-2005	AS AT 30-06-20
MOTOR VEHICLES	6,494,293	-	-	6,494,293	20	1,739,183	951,022	-	2,690,205	3,80
OFFICE EQUIPMENT	13,507,373	397,459	-	13,904,832	15	2,169,869	1,760,244	-	3,930,113	9,97
COMPUTER EQUIPMENT	944,330	110,398	-	1,054,728	33	618,110	144,084	-	762,194	29
FURNITURE & FIXTURE	199,287	-	-	199,287	6	14,115	11,110	-	25,225	17
RUPEES 2005	21,145,283	507,857	-	21,653,140		4,541,277	2,866,461	-	7,407,738	14,24
RUPEES 2004	4,862,164	16,283,119	-	21,145,283		1,179,267	3,362,009	-	4,541,276	16,60

			2005 RUPEES	2004 RUPEES
9	**LONG TERM DEPOSITS**			
	Electricity		1,472,195	1,472,195
	Gas		145,000	145,000
	Mobile Phone		20,000	20,000
			1,637,195	1,637,195
10	**ADVANCES AND PREPAYMENTS**			
	Advances to Staff			
	- For Vehicles		-	1,600
	- For House Rent		897,030	382,094
	- For Furniture		-	-
	Advances For Fabrication		-	-
			897,030	383,694
11	**CASH AND BANK**			
	Cash At Bank - Saving Accounts		960,111	499,925
	Cash At Bank - Current Accounts		70,795	63,245
	Cash At Bank - PSF Development Fund Current Account		1,211,789	1,210,639
	Cash In Hand		33,111	-
	UNESCO Coupons		2,994	2,994
			2,278,800	1,776,803
12	**STATUTARY SCIENTIFIC FUNCTIONS**			
	Research Support Grant	4.1	8,796,331	10,021,669
	Research Support Functions		70,620	1,834,468
	Scientific Societies & Professional Bodies		250,000	280,000
	Scientific Conferences Meetings & Seminars		619,550	581,156
	Operation of Science Caravan		4,476,880	3,850,782
	International Liaison		-	30,000
	Science Promotion Activities		1,627,719	1,352,934
	Utilization of Results of Research & Transfer of Technology & Pilot Plant Study		5,082,594	568,270
	Awards, Prizes & Fellowship		155,928	108,118
	Scientists Pool / Senior Scientists Emeritus		-	30,000
			21,079,622	18,657,397
13	**ADMINISTRATIVE EXPENSES**			
	Salaries & other Benefits		19,051,660	17,602,501
	Travelling		310,034	307,349
	House Rent Facility		3,605,296	3,534,086
	Ground Rent To CDA		17,944	17,944
	Electricity, Gas & Water		573,371	743,863
	Postage,Telephone & Telegram		1,009,422	1,034,618
	Printing & Stationery		248,799	282,400
	Vehicle Running & Maintenance		1,186,782	1,031,270
	Newspaper & Advertisement		75,450	112,327
	Liveries & Uniforms		54,601	41,842
	Entertainment		182,314	111,682
	Repair & Maintenance of Office Equipment		65,557	133,720
	Contingent Expenses		-	208,733
	Audit Fee		20,000	20,000
	Professional Charges		210,000	50,000
	Depreciation		1,155,710	1,217,778
	Maintenance of Office Building		131,808	214,209
	Staff Welfare Fund		100,000	60,000
	UNESCO Coupon Utilized		-	11,349
	Advertisement & Publicity		95,227	189,351
	Miscellaneous		120,930	46,318
			28,214,905	26,971,340
14	**PRIOR YEAR ADJUSTMENTS**			
	Other Liabilities			(8,376)
	Bycycle			1
	Peer Review Work PTCL Projects		(1,150)	-
	NCST		-	(1,200)
	Core Group Of Life Sciences		-	(56,692)
			(1,150)	(66,267)

15 FINANCIAL INSTRUMENTS AND RELATED DISCLOSURE

AMOUNT IN RS.

DESCRIPTION	INTEREST / MARK-UP BEARING			NON INTEREST / MARK-UP BEARING			TOTAL	
	Maturity up to one year	Maturity after one year	Sub Total	Maturity up to one year	Maturity after one year	Sub Total	2005	2004
FINANCIAL ASSETS								
Advances, Deposits & Prepayments	-	-	-	897,030	-	897,030	897,030	383,694
Cash & Bank Balances	-	-	-	2,278,800	-	2,278,800	2,278,800	1,776,803
	-	-	-	3,175,830	-	3,175,830	3,175,830	2,160,497
FINANCIAL LIABILITIES								
Expenses Payable	-	-	-	651,949	-	651,949	651,949	467,538
	-	-	-	651,949	-	651,949	651,949	467,538

15.1 Financial instruments and risk management

Overall, risks arising from the Foundation's financial instruments are limited.

15.1.1 Concentration of Credit Risk

Credit risk represents the accounting loss that would be recognized at the reporting date if counter parties failed completely to perform as contracted.
The Foundation applies credit limit to its beneficiaries and does not have significant exposure to individual beneficiaries.

15.1.2 Interest Rate Risk

Interest rate risk arises from the possibility that changes in interest rates will effect the value of financial instruments.
The Foundation is not exposed to any Interest Rate Risk.
The effective interest rates as at June 30, 2004 for the financial instruments are given in the relevant notes, if any.

15.1.3 Foreign Exchange Risk Management

Foreign currency risk arises mainly where receivables and payables exist due to transaction with foreign undertakings
The Foundation believes that it is not exposed to major foreign exchange risk

15.2 Fair Value of Financial Instruments

The Carrying amounts of financial assets and financial liabilities approximates to their fair value.

16 NO. OF EMPLOYEES

Total number of employees at the year end	175	174

17 DATE OF AUTHORISATION OF ISSUE

These financial statements were authorised for issue on November 20, 2005 by the Board of Trustees.

18 GENERAL

- Corresponding figures for the previous year have been re-arranged, wherever necessary, for the purpose of comparison.
- Figures have been rounded off to the nearest rupee.

PAKISTAN SCIENCE FOUNDATION

STATEMENT OF DEVELOPMENT FUNDS RECEIPT & EXPENDITURE

FOR THE YEAR ENDED JUNE 30, 2005

PAKISTAN SCIENCE FOUNDATION DEVELOPMENT FUND	NCST	PSTIC	CDYST	FOSTRUAOO	PSRA	ESSS	RPASTP	CGLS	PRNCST	PRPTCL	TOTAL
OPENING BALANCE	851,426	Nil	Nil	Nil	Nil	Nil	Nil	1,080	326 163	31,970	1,210,639
REFUND OF EXPENSE (Prior year adjustmer	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1,150	1,150
FUNDS RECEIVED DURING THE YEAR	Nil	3,400,000	650,000	7,500,000	1,500 000	5,000,000	37,500,000	Nil	Nil	Nil	55,550,000
INTER PROJECTS TRANSFERS	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	(74,000)	74,000	-
FUNDS AVAILABLE DURING THE YEA	**851,426**	**3,400,000**	**650,000**	**7,500,000**	**1,500,000**	**5,000,000**	**37,500,000**	**1,080**	**252,163**	**107,120**	**56,761,789**
											-
EXPENDITURE											-
TA/DA & Evaluation Fee			14,800	200,286	16,200		193,529				424,815
Salary of Scientists & Technologists											-
Office Equipment				29,498	518,934		80,900				629,332
Transport											-
Computer Equipment - Transferred											-
Office Equipment - Transferred											-
Financial Support to Societies						4,839,473					4,839,473
Grant for Research			512 147	7,094,459			30,899,780				38,506,386
Participation in Conferences											-
Travel Expenses (Abroad)		2,318,875									2,318,875
Evaluation Fee & Technical Meetings											-
Conference Reg Fee		560,936									560,936
Living Expenses		439,674									439,674
Stationary & Postage		22,035	27,074	34,375	32,900	41,714	42,418				200,516
Advertisement					144,638		220,958				365,596
On Site Monitoring											-
Material Supplies & Contigent Exp					123 909						123,909
Consultancy											-
Telephone											-
Salary to Staff		50,320	8,250		485 952		184,978				729,500
Entertainment			1,175		1,816		22,943				25,934
POL/Repair of Vehicles		4,860	4,860		106 059	4,860	4,860				125,499
Bank Charges											-
Advance for Expenses - Furniture											-
Advance for Fabrication											-
Miscellaneous		3,300	57,265	141,382		80,225	1,370				283,542
Surrendered to FTO							5,848,264				5,848,264
Utilities			24,429		69,592	33,728					127,749
Transport											-
Total	**-**	**3,400,000**	**650,000**	**7,500,000**	**1,500,000**	**5,000,000**	**37,500,000**	**-**	**-**	**-**	**55,550,000**
											-
Balance	**851,426**	**-**	**-**	**-**	**-**	**-**	**-**	**1,080**	**252,163**	**107,120**	**1,211,789**

ANNEXURE-I

PAKISTAN SCIENCE FOUNDATION ACT-III, 1973

Annexure-I

PAKISTAN SCIENCE FOUNDATION ACT 1973
National Assembly of Pakistan Islamabad, the 2nd February 1974

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;

iii) the Director of Finance; to be appointed by the President;

Part-time members

iv) the Chairman of the National Science Council;

v) four scientists to be nominated by the National Science Council; and

vi) eleven eminent scientists to be nominated by the President

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

6. Chairman of the Board. The Chairman of the Board shall be the Chairman of the Foundation and shall be appointed for a term of three years from amongst the eminent scientists of the country having experience of research and scientific administration.

7. Term of Members of the Board. The members of the Board, other than the ex-officio member, shall hold office for a term of three years and shall be eligible for re-appointment or re-nomination, as the case may be.

8. Meetings of the Board. (1) The meeting of the Board shall be held at least twice a year and shall be presided over by the Chairman or, in his absence, by its whole-time scientist member. (2) All decisions at a meeting of the Board shall be taken by a majority of the votes of the members present and voting.

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

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

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

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

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

a) Grants made by the Federal Government and the Provincial Governments;

b) Donation and endowments; and

c) Income from other sources

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.

ANNEXURE-II

LIST OF PROJECTS APPROVED UNDER NON-DEVELOPMENT BUDGET DURING 2004-2005

Annexure-II

LIST OF PROJECTS APPROVED UNDER NON-DEVELOPMENT BUDGET DURING 2004-2005

AGRICULTURAL SCIENCES

S. No.	Title and Project Number.	Name of P.I. and the Organization Supported	Project Cost
1.	Integrated Weed Management in Wheat under Rain-fed Conditions of NWFP R&D/F-AI/Agr (129)	Dr. Muhammad Khan, Director, Cereal Crop Research Institute, Pirsabak, Nowshera.	7,59,573/-
2.	Effect of Mineral and Organic Nitrogen Yield Nitrogen Deciduous Palm Fruit Orchards F-NIFA/Agr (310)	Syed Mahmood Shah Principal Scientist Nuclear Institute for Food& Agriculture (NIFA), Peshawar.	8,19,355/-
3.	Use of Ethylene for Enhancing Salinity and Drought Stress in Wheat and Cotton. P-NIAB/Agr (327)	Dr. Farooq-e-Azam Chief Scientific Officer, NIAB, Faisalabad.	7,35,451/-

BIOLOGICAL SCIENCES

4.	Mushroom Cultivation and Popularization as Cottage Industry in NWFP Pakistan. PSF/R&D/F-NIFA/Bio (141)	Dr. Fazal Mahmood, Principal Scientific Officer, NIFA, Peshawar.	7,13,275/-
5.	Biology of Edible Crabs (*Portunus pelagicus* and *Portunus sanguinolentus*) Occurring in the Coastal Waters of Karachi. S-KU/Bio (342)	Prof. Dr. Javed Mustaquim Dept. of Marine Biology University of Karachi, Karachi	6,96,007/-

6.	Pharmacological Evaluation of two Anti-hyperlipidaemic Indigenous Medicinal Plants in Albino Rabbits and Determination of their Mechanisms of Action. P-AU/Bio (355)	Dr. Ijaz Javed Hasan, Associate Professor, Department of Physiology and Pharmacology, University of Agriculture, Faisalabad.	9,98,784/-
7.	Pigeon Newcastle Disease virus: Surveillance, Pathogenicity for Chickens and Development of Vaccine for Control. P-AU/Bio (356)	Dr. Farzana Rizvi Associate Professor, Department of Veterinary Pathology, University of Agriculture, Faisalabad.	9,34,269/-

BIOTECHNOLOGY & GENETIC ENGINEERING

8.	Microbiological Leaching of Uranium, Copper and Vanadium from Low-grade Graphitic_Schist Ores. Biotech/C-PINSTECH/Ind(51)	Prof. Dr. Tariq Mahmood Bhatti, Biotechnology Laboratory. PINSTECH, Islamabad.	10,10,992/-
9.	Technologies Development for the Production of Gonadotropin from Animal Sources. Biotech/P-AU/Med (24/1)	Dr. Nafees Akhtar, Associate Professor, Dept. of Animal Reproduction, University of Agriculture Faisalabad	7,59,635/-
10.	Development of Hyper Producer Cephalosporin C Producing Strain of *Acremonitun Chrysogum* by RNA Interference Technique. Biotech /P-NIBGE/Ind (47)	Ms. Kalsoom Akhtar, Senior Scientific Officer, NIBGE, Faisalabad.	9,84,439/-
11.	Use of Induced Somatic Mutation & Biotechnology for the Geneic Improvement of Sugar Cane (*Saccharum sp.* Hybrid).S-NIA/Biotech (134)	Mr. Imtiaz Ahmed Khan, Nuclear Institute of Agriculture, Tandojam, Sindh.	7,07,186/-

CHEMICAL SCIENCES

12.	Development of Processing Method for Pectin as Value Added Product from Citrus Peel Waste. R&D/F-NIFA/Chem (138)	Mr. Muhammad Ashraf Chaudhry,	8,51,788/-
13.	Clinical Applications of Electro Generated Chemiluminescence's Detection using Tris (2-2-Bipyridine) Ruthenium (II) with Flow Injection Analysis. B-BU/Chem (252)	Prof. Dr. Abdul Nabi, Department of Chemistry, University of Balochistan, Quetta.	9,99,049/-
14.	Stereo Selective Total Synthesis of Some Antimalarial Antituberclauses Antifungal and Cytotoxic Dihydroisocoumarin Metabolites. C-Qu/Chem (395)	Dr. Amir Saeed Bhatti, Assistant Professor Department of Chemistry, Quaid-i-Azam univerasity, bIslamabad.	644,426/-

ENGINEERING

15.	Groundwater Flow and Containment Transport Modeling and Assessment of Potable Groundwater Quality Of Lahore Aquifer. R&D/C-PINSTECH/Engg (66)	Dr. Naiz Ahmed, Principal Geologist, Radiation & Isotope Application Division, PINSTECH, Islamabad.	8,01,891/-
16.	Critical Analysis and Impact of Controlling in Upper Indus Basin on Water Resources of Pakistan. P-CEWRE/Engg (95)	Engr. Dr. S. M. Saeed Shah, Head, Hydrology Division, Centre of Excellence in Water Resources Engineering (CEWRE), University of Engineering & Technology, Lahore.	7,56,024/-
17.	Development of Magnetic Annealing System. P-KRL/Engg (283)	Dr. Ashraf Ali, Principal Engineer, Dr. A. Q. Khan Research Laboratories,Kahutta, Rawalpindi.	9,18,587/-

18.	Synthesis and Characterization of Piezo-Electric BaTiO3 Crystals. R&D P-KRL/Engg (284)	Dr. Muhammad Muneeb Asim, Sr. Scientific Officer, Dr. A. Q. Khan Research Laboratories, Kahutta, Rawalpindi.	10,19,910/-

ENVIRONMENTAL SCIENCES

19.	Development of A Biotechnological Approach to Remediate Metal Polluted Wastewater. C-Comsats/Env (72)	Dr. Rani Faryal COMSATS, Institute of Information Technology, Islamabad.	1,045,500/-
20.	Survey and Monitoring of Noise Pollution in Lahore City. P-PCSIR/Envr (64)	Dr. Tahira Shafiq, Head, CEPS, PCSIR Labs Lahore.	4,71,884
21.	Pollution in Hadiara Drain-its Direct and indirect Impact on Human Health Through Food Chain. P-DGF/Envr (65)	Dr. Muhammad Ayub Director General Department of Fisheries 2-Sanda Road Lahore-54000	5,02,942/-

PHYSICS

22.	An Investigation of Collective Excitation in Density Modulated Nanostructure Ina Magnetic Field. C-QU/Phys (129)	Kashif Sabeeh, Department of Physics, Quaid-i-Azam University, Islamabad.	4,47,647/-
23.	Nonlinear Electromagnetic Wave Propagation in Plasma Like Media. P-PU/Phys (131)	Dr. Rashid Ali, Department of Physics, University of the Punjab, Lahore	4,.34,306/-

Total Cost: 18,012,920/-

ANNEXURE-III

DETAILS OF MONITORING AND EVALUATION OF ON-GOING PROJECTS

Annexure-III

DETAILS OF MONITORING AND EVALUATION OF ON-GOING PROJECTS DURING 2004-2005

I. NON-DEVELOPMENT

a) Semi-annual Reports

S. No.	Project No.	Project Title	Reports
1.	B-ARIQ/Agr (247)	Determination of Insecticidal resistance in codling moth and spotted spider. serious pest of apple in Balochistan.	3rd semi-annual
2.	AJK-UCR/Agr (275)	Studies on the establishment and improvement of clovers (*Triflium* spp.) for nitrogen availability and soil management under agro-climatic conditions of Azad Kashmir.	2nd semi-annual
3.	S-KU/Agr (285)	Studies on the field efficacy of the entomopathogenic nematodes as biopesticides.	3rd semi-annual
4.	P-NIAB/Agr (288)	Effect of Soil Salinity and Nitrogen Availability on Photosynthate Partitioning and Growth of Wheat.	3rd semi-annual
5.	F-AU/Agr (291)	Development of sustainable rice wheat cropping system through management of legumes.	2nd semi-annual
6.	C-QU/Agr (292)	Ethnobotanical studies economically important plants of Northern areas of Pakistan and their taxonomy.	2nd semi-annual
7.	F-AU/Agr (295)	Weed Management in Wheat (*Triticum astivum* L. em Thell) in NWFP.	2nd semi-annual
8.	F-AU/Agr (296)	Integrated weed management in chick pea (*Cicer aritinum*).	1st semi-annual
9.	F-AU/Agr (299)	To assess the causes of ratoon crop failure in sugar cane in NWFP province.	1st semi-annual

10	C-QU/Chem (203)	Synthesis of variably substituded Chalcones, Thiochalcones and Iminochalcones having potent industrial application.	1st semi-annual
11	F-GC/Chem (351)	Emulsification of Oil/Water System.	2nd semi-annual
12	C-QU/Chem. (373)	Enantioselective Synthesis of Carbohydrate Building Blocks and Bioactive Natural Products.	3rd semi-annual
13	C-QU/Chem.(376)	Synthesis and Biological Evaluation of β-Hexapeptide Analog of Neurotensin (NT-8-13).	2nd semi-annual
14	AJK-Earth (70)	Biostratigraphic & Tectonic analysis of paleogene Nocus of Neatothys Ocean in Azad Jammu & Kashmir and Hazara of the Himalayes of Pakistan.	2nd semi-annual
15	P-PU/Engg (54)	Controlled Drainage for Crop Production and water quality Enhancement.	2nd semi-annual
16	P-CEWRE/Engg (77)	Stochastic Flood Risk Mapping (Zoning).	1st semi-annual
17	C-PCRWR/Engg (78)	Assessment of water resources and development of strategic water utilization plan in Pothowar region for its sustainable management.	2nd semi-annual
18	P-AU/Env (62)	Studies on Growth and Bioenergetics of Fish under Heavy Metal Toxicity.	2nd semi-annual

b) First Annual Reports

19	F-AU/Agr (295)	Weed Management in Wheat (*Triticum aestivum* L. em Thell) in NWFP.
20	F-AU/Agr (299)	To Assess the Causes of Raton Crop Failure in Sugar-cane in NWFP Province.
21	F-AU/Agr (300)	Estimating Slope Steepness in Corporate Residue and FYM Effects on Runoff, Erosion, Soil Properties and Soil Fertility Buildup in Eroded Lands of Northern NWFP.

22	P-AU/Bio (326)	Evaluation of Indigenous Trivalent Vaccine for the Control of Mastitis in Buffaloes and cows.
23	P-NIAB/Bio (329)	Production and evaluation of Immunopotentiator oil adjuvanted Vaccine against foot & mouth disease.
24	S-SU/Bio (338)	Taxonomy & Biology of hieroglyphus spp. (Hemiacridinae: Acrididae: Orthoptera) (Conducted Under Pakistan science Foundation.
25	S-PCSIR/Bio(339)	Assessment of Omega-3 Polyunsaturated fatty acid in tropical fish and shellfish.
26	BS-KU/Bio (344)	Seed Dormancy Mechanisms in Coastal Halophytes of Karachi, Pakistan.
27	S-KU/Bio (345)	Germination Capacity of Stored Pollen of some economically important plants and their maintains.
28	Biotech/S-KU/Med (42)	Antipsychotic Drug Blood Dyscrasias and Hematological Safety.
29	P-LCWU/Ind (41)	Production of Enzyme Phytasfor for Improving the Nutritional Value of Defatted oil seed cakes in Poultry feed.
30	C-NARC/Agr (36)	Multiplications of Virus free Banana plants and their field assessment.
31	S-KU/Chem.(343)	Isolation of potent antimalerial and resistance reversal compounds from medicinal plants of Pakistan.
32	C-QU/Chem.(376)	Synthesis and Biological Evaluation of β-Hexapeptide Analog of Neurotensin (NT-8-13).
33	C-PINSTECH/Engg (39)	Study of bonding between Virally and Stainless Steel.
34	P-CEWRE/Engg (77)	Stochastic Flood Risk Mapping (Zoning).
35	C-PCRWR/Engg (78)	Assessment of water resources and development of strategic water utilization plan in Pothowar region for its sustainable management.

c) Second Annual Reports

36	P-AU/Agr (242)	Utilization of the genetic potential existing in sorghum bicolor (L) Moench for the development of genotype tolerance to salinity.
37	P-NIAB/Agr (288)	Effect of soil salinity and nitrogen availability on photosynthate partitioning and growth of wheat.
38	F-AU/Agr (291)	Development of sustainable rice wheat cropping system through management of legumes.
39	C-QU/Agr (292)	Ethnobotanical studies economically important plants of Northern areas of Pakistan and their taxonomy.
40	P-AU/Agr (283)	Epidemiological and pathological study on tuberculosis in food animals and its association with human infection.
41	S-KU/Agr (285)	Studies on the field efficacy of the entomopathogenic nematodes as biopesticides.
42	Biotech/P-AU/Env (31)	Hyper Expression of lysine and transfer of cellulose genes in Bravibacterium feavum for recycling of agronidustrial waters.
43	B-BU/Earth (57)	Facies Distribution Paleoenvironmental Analysis and petroleum prospects of the Foreland Basin Sediments in the Kirthar Fold Beea Balochistan.
44	P-AU/Env (62)	Studies on Growth and Bioenergetics of Fish under Heavy Metal Toxicity.

d) Final Reports

45	F-GU/Agr (158)	Evaluation of the economics of various rice based cropping systems under Dera Ismail Khan condition.
46	P-AU/Agr (236)	Identification on resistant sources against major potato viruses and their diagnosis based on serological tests.
47	P-AU/Agr (244)	Screening of Germplasm for genetic improvement of wheat in selection to salinity stress.
48	C-NARC/Agr (266)	Identification, characterization and distribution of phytoplasmal disease of potato in Pakistan.
49	F-AU/Agr (268)	Evaluation of morphological and physiological plant traits that adopt forage grasses to stresses.
50	S-KU/Agr (269)	Use of Rhizobia in the biological control of Root Knot diseases of crop plant.

51	C-NARC/Agr (270)	Characterization and monitoring of *Banana bunchy top virus* (BBTV).
52	F-AU/Agr (282)	Evaluation and assessment of germination, stands establishment and yield of legume and cereals before and after seed storage using osmoconditioning techniques.
53	P-PU/Bio (187)	Transformation studies of the rice (*Oryza sativa*).
54	C-PMNH/Bio (315)	Ecological studies of the reptilian fauna of Cholistan desert.
55	C-QU/Bio (323)	Identification of loci in Pakistan kindred with ectodermal dysplasia.
56	Biotech/P-GC/Bio (37)	Optimization of cultural conditions on the biosynthesis of xylanase by locally violated aspergillums niger.
57	B-BU/Chem(346)	Leishmenia and Leishmeniasis in Pakistan.
58	C-PMNH/Earth (38)	Mineralization & Petrogenetic study of Rocks along Indus Suture zone.
59	F-PU/Earth (66)	Structural and Stratigraphic analysis of Himalayan Fold-Thrust belt in Kohat, Karak and Bannu, North Pakistan.
60	S-AKU/Med (185)	Role of vitamins B6. B12 and folate glutathione and cytokines in the development of coronary artery disease in a Pakistani population.

II. DEVELOPMENT

a) Semi-Annual Reports.

Sr. No.	Project No.	Project Title.	Reports.
1.	R&D/F-AU/Agr (107)	Validation of Milk-Urea as on-farm Diagnostic Test for Evaluating Protein Status of Milking Cows and Buffaloes.	3rd semi-annual
2.	R&D/P-AU/Agr (74)	Developing Forecasting Models for Major Crops.	2nd semi-annual
3.	R&D/F-NIFA/Agr (181)	Perormance of Promising Mungbean (*Vigna Radiata* (L)Wilczek Genotypes/Varieties in NWFP.	2nd semi-annual
4.	R&D/F-NIFA/Agr (151)	Bread wheat Improvement for Drought Tolerance and High Yield Potential.	2nd semi-annual

5.	R&D/P-AU/Agr (44)	Impact of Sanitary and Phytosanitary Requirements of WTO on Agricultural Experts from Pakistan.	1st semi-annual
6.	R&D/P-AU/Agr (52)	Impact of World Trade Liberalization on the production and export of Kinnow Prospects and Problems.	1st semi-annual
7.	R&D/S-SAU/Agr (29)	Cotton Plant Compensation to Pest Stress as affected by Plant Nutrients, Growth Regulatory and Cultural Practices.	1st semi-annual
8	R&D/F-AU/Agr (170)	Utilization of Improvement of Wheat in Salt affected areas of Peshawar.	1st semi-annual
9.	R&D/Q-PARC/Agr(105)	Incidence of Internal. External and Blood Parasites and Hydatid Cysts sheep and goats Slaughtered at the Quetta, Kachlak (Distt. Pishin) and mastung slaughter houses.	2nd semi-annual
10	R&D/P-UAARAgr(70)	Integrated Management of stored chickpea *Collosobruchus chinensis* Linnaeus.	2nd. Semi-annual
11	R&D/P-UAAR/Agr.(71)	Management of Black scruff of Potato.	2nd. Semi-annual
12	R&D/F-NIFA/Agr (152)	Development of oilseed Brassica Genotypes for Industrial uses through induced mutations classical breeding and in vitro culture Techniques.	2nd. Semi--annual
13	R&D/C-QU/Phys. (199)	(i) Generation of Cold Plasma by 13.56 MHz RF source and its Characterization by optical Emission Spectroscopy and Longmuir Probe (ii) Study of X-rays Emitted from a Compact Diode and a Plasma Focus.	1st and 2nd semi annual
14.	R&D/P-INMOL/Chem(157)	Synthesis, Labeling, Characterization & Biodistribution of Cheme Tadic Peptiets for Inflammation Scientigraphy.	1st semi annual
15.	R&D/F-GU/Chem(173)	Comparative studies of Acid Phosphorus from Fish liver and Eggs. Isolation. Purification, some Kinetic Properties, Amino Acid Composition and Binary Structure.	1st semi-annual
16.	R&D/C-QU/Chem (218)	Synthesis & Structural Characterization of Bimetallic precursor for Chemical Vapour Deposition.	1st semi-annual

17	R&D/F-GIK/Engg (76)	Experimental and Analytical studies of Gasketed and Non-gasketed Flanged Pipe Joints to Determine the Joint load Capacity for improved scanning Capability and their Implementations.	1st semi annual
18.	R&D/C-QU/Bio (165)	Molecular and biological analysis for characterization of genetic diversity in barley raue from west Asia and north Africa	2nd semi-annual
19.	R&D/UA/AK/BIO (124)	Improvement and Establishment of Seabackthorn (*Hypophae rhammaides* L) a Multipurpose plant in Mountainous regions of Azad Kashmir.	2nd semi-annual
20.	R&D/C-PMNH/BIO (166)	Ecology and Zool-geography of butterfly fare of moist-temperate man tare of Pakistan.	3rd semi-annual
21.	R&D/F-NIFA/BIO (147)	Biological control of maize stem Borer	2nd semi-annual
22.	R&D/P-CSIR/BIO (130)	Ideation, Identification and Bioactivity of Natural Product, from Murray panic late etc.	2nd semi-annual
23.	R&D/C-NARC/BIO (127)	Study on the wilt Disease of chickpea for identification of resistance	2nd semi-annual
24.	R&D/C-NARC/BIO (106)	anti nutritional factors in cereals and legumes and their possible removal	1st semi-annual
25.	R&D/S-Ku/Bio(194)	Studies on the Biomonitors of trace Metal in Coastal & Estuarine water of Karachi	1st semi-annual
26.	R&D/S-HEJ/Biotech (93)	The Use of DNA Fingerprinting to Evaluate The Genetic Stability of Banana Plants Produced Via in Vitro Culture	1st semi-annual
27.	R&D/P-AU/BIO (55)	Effects of different wearing protocols on the immune system in buffalo calves and prophylactic application of levaminsol	1st semi-annual
28.	R&D/C-NARC/BIO (1)	Assessment of texinogenic fungi and mycotoxic contamination in Stored Food Grain	2nd semi-annual
29.	R&D/C-NARC/BIO (18)	Collection, Conservation and Characterization of Vegetable Crop Biodiversity.	3rd semi-annual

30.	R&D/P-BZU/BIO (34)	Some studies to improve litter size and meat production in sheep	2nd semi-annual
31.	R&D/C-PMNH/Bio(225)	Documentation of indigenous Knowledge about Medicinal Plant of Peshawar	2nd semi-annual
32.	R&D/S-Ku/Bio(194)	Studies on the Biomonitors of trace Metal in Coastal & Estuarine water of Karachi	1st semi-annual
33.	R&D/C-PMNH/Bio(181)	Ethno-Botanical Studies, Taxonomy and Pictorial Encyclopedia of Economically Important Plants from Mountainous Regions of Northern , Pakistan.	2nd semi-annual
34.	R&D/ S-AKU/BIO (178)	Studies On Calcium channel Blocking activities of indigenous medicinal plants	2nd semi-annual
35.	CDYST/Bio (40)	Relationship of Adiponectin,Leptin,IGF11 and lipid profile to diabetes and diabetic complication ie Ischemic Heart Disease in Pakistani females	1st semi annual
36.	CDYST/Bio (17)	Radiation Decontamination of Poultry Feed	2nd semi-annual

b) First Annual Reports.

Sr. No.	**Project No.**	**Project Title.**	**Reports.**
37.	R&D/C-NARC/Agr(115)	Management of Soil Born Diseases in Vegetable Nurseries using Solarization and Amendments.	1st annual
38.	R&D/P-AU/Agr (74)	Developing Forecasting Models for Major Crops.	1st annual
39.	R&D/F-AU/Agr (72)	Grain and Nutrient Production Potential of Maize- bean Intercropping in Mountain Agriculture.	1st annual
40.	R&D/P-LPRI/Agr (31)	Genetic Evaluation of Nili Ravi Buffaloes to Enhance Milk Production.	1st annual
41.	R&D/P-UAAR/Agr (69)	Promotion of High Yielding and Drought Resistant Canola Cultivars in Pothwar.	1st annual

42.	R&D/P-UAAR/Agr (71)	Management of Black scruff of Potato.	1st annual
43.	R&D/P-UAAR/Agr (70)	Integrated management of Stored Chickpea Beetle *Callosobruchus Chinesis* Linnaeus.	1st annual
44.	R&D/F-AUAgr (128)	Restoring Productivity of Eroded lands Through Integrated Plant Nutrient Management for Sustained Production.	1st annual
45.	R&D/F-NIFA/Agr (181)	Performance of Promising Mungbean (*Vigna radiator* (L) Wilczek) Genotypes/Varieties on Formers field in NWFP.	1st annual
46.	R&D/S-SSRI/Agr (161)	Appropriate of Composting Technology for Rice-Wheat System in Internal & Salt Affected Soils.	1st annual
47.	R&D/F-NIFA/Agr (151)	Bread wheat Improvement for Drought tolerance and High Yield Potential.	1st annual
48.	R&D/Q-PARC/Agr (105)	Incidence of Internal, External and Blood Parasites; and Hydatid Cysts in Sheep and Goats Slaughtered at the Quetta, Kuchlak (Distt. Pishin) and Mastung Slaughter-Houses.	1st annual
49.	R&D/F-NIFA/Agr (152)	Development of oilseed *Brassica* Genotypes for Industrial uses through Induced Mutations , Classical Breeding and In-vitro Culture Techniques.	1st annual
50.	R&D/UA/AK/BIO (124)	Improvement and Establishment of Seabackthorn (*Hypophae rhammaides L*) a Multipurpose plant in Mountainous regions of Azad Kashmir.	1st annual
51.	R&D/F-NIFA/BIO (147)	Biological control of maize stem Borer	1st annual
52.	R&D/P-CSIR/Bio (130)	Ideation, Identification and Bioactivity of Natural Product, from Murray panic late etc.	1st annual

53.	R&D/C-NARC/BIO (127)	Study on the wilt Disease of chickpea for identification of resistance	1st –annual
54.	R&D/C-NARC/BIO (106)	anti nutritional factors in cereals and legumes and their possible removal	1st annual
55.	R&D/P-BZU/BIO (34)	Some studies to improve litter size and meat production in sheep	1st annual
56..	R&D/C-PMNH/Bio(225)	Documentation of indigenous Knowledge about Medicinal Plant of Peshawar	1st annual
57.	R&D/FAU/agr (183)	True potato seed, a seed source of potato production in NWFP	1st annual
58.	R&D/P-NIBGE/ BIO(168)	Development of Replicasc Mediated CLCUD Cotton leaf curl disease resistance in cotton	1st annual
59.	CDYST/S-PCSIR/Bio (24)	Panaeid Shrimp Maturation in Capativity.	1st annual

c) 2nd Annual Reports.

60.	R&D/C-NARC/Agr (14)	Integrated Management of Powdry scab of Potato in Pakistan.	2nd annual
61.	R&D/F-AU/Agr (36)	Evaluation of Phytobiocides for control of Powdry Mildew in Pea.	2nd annual
62.	R&D/P-UAAR/Agr (85)	Potential of Mungbean and Mashbean to fix Nitrogen and Benefit the Subsequent Wheat crop in Peshawar.	2nd annual
63.	R&D/F-AU/Agr (107)	Validation of Milk urea as On-farm Diagnostic Test for Evaluating Protein status of Milking Cows and Buffaloes.	2nd annual
64.	R&D/C-ARC/Agr(115)	Management of Soil Borne Diseases in Vegetable Nurseries using Solarization and Amendments.	2nd annual
65.	R&D/C-QU/Bio (165)	Molecular and biological analysis for characterization of genetic diversity in barley raue from west Asia and north Africa	2nd annual
66.	R&D/C-PMNH/BIO (166)	Ecology and Zool-geography of butterfly fare of moist-temperate man tare of Pakistan.	2nd annual

67.	R&D/C-QAU/Bio(164)	Association of Rhizobiam and Plant Growth proportion Bacteria on Rice Growth, Nitrogen fixation a field.	2nd annual
68.	R&D/P-AU/BIO (46)	Enhancing nutritional worth of low quality crop resistance through chemical and biological treatments and its influence of palatability , voluntary feed intake, digestion kinetics and production performance of buffaloes	2nd annual
69.	R&D/P-AU/BIO (42)	Studies on the prevalence , biology, control and economics significance of hypoderma ssp in some hilly districts of Punjab	2nd annual
70.	R&D/C-NARC/BIO (1)	Assessment of texinogenic fungi and mycotoxic contamination in Stored Food Grain	2nd annual
71.	R&D/C-NARC/BIO (18)	Collection, conservation and characterization of vegetable crop biodiversity	2nd annual
72.	R&D/ S-AKU/BIO(178)	Studies On Calcium channel Blocking activities of indigenous medicinal plants	2nd annual
73.	CDYST/C-NARC/Bio (4)	Identification of Drought Tolerant Chickpea Genotyps using Physiological and Agronomic Traints.	2nd annual
74.	CDYST/C-NARC/Bio(11)	Gene Transfer Technology for the Induction of Disease Resistance in Rice.	2nd annual
75.	CDYST/Bio (12)	Developing disease Resistance in Tomato through Genetic Engineering	2nd annual

ANNEXURE-IV

LIST OF PUBLICATIONS PRODUCED THROUGH PSF FUNDED PROJECTS

Annexure-IV

LIST OF PUBLICATIONS PRODUCED THROUGH PSF FUNDED PROJECTS COMPLETED DURING 2004-2005

1. Non Development:

Project No.	Publication
S-PARC/AGR (277)	i. Khan, A., Bilqees, F.M., Samad, M.A., Khatoon, N. and Rizwan, A.G., 2002. Histopathology of date-plan roots infected with pratylenchus penetrans root-lesion nematode. Pakistan J. Nematology (20(1): 35-40. ii. Shaukat, S. S., Khan, A., Islam, S. and Akram, M., 2002. Effect of aeruginosa in Date-plalm. Sarhad J. Agri. Vol. 18(4): 439-442. iii. Khan, A., Shaukhat, S.S. and Islam, S., 2004. Co-ocurrence of palm. International j. Biol. Biotech 1(1): 45-48. iv. Khan, A., Samad, M. A., Bilqees, F.M., Khatoon, N. and Soomro, M.H., 2003. Histopathology of Date-palm roots infected with Root-knot nematode, Meloidogyne incognita (Kofoid and White, 1919) Chitwood, 1949. Bulletin of Pure and Applied Sciences, India, 22: 169-172. v. Khan, A., Samad, M.A. and Bilqees, F.M., 2004. Histological changes in young date-date-palm roots following infection by Meloidogyne incognita. Sarhad J. Agriculture, 20(I): 149-152. vi. Khan, A., Khatoon, N. and Soomro, M.H., 2003. Histopathology of young date-palm roots infected with root-lesion nematodes in Balochistan. Bangladesh J. Sci. Ind. Res. (Submitted). vii. Khan, A., Islam, S. and Shaukat, S.S., 2004. Nematodes associated with date-palm (phoenix dactylifera L.) and their management using Marigold (Tagetsercta L.) and their management using Marigold (Tageteserecta L.) Sarhad J. Agriculture, Vol. 20 (3): 447-451.

	viii.	Khan, A., Samad, M.A., Shaukat, S.S. and Aqil, T., 2004. Management of nematodes associated with date-palm using oil-cakes. Pakistan J. Nematology (Accepted for publication).
P-PU/BIO (187)	i.	Husnain, T., Khanum, S. and Gordon, M.P. (1995). Transformation of Basmati rice (Oryza sativa) sativa) with bacterial gene by particle bombardment. Pakistan Journal of Plant Sciences 1(2): 219-228.
	ii.	Riazuddin, S., Husnain, T., Khan, E., and Khanum, F. (1995). Insect resistant transgenic Basmati rice. Rice Biotechnology Quarterly 23.77-8.
	iii.	Riazuddin's Husnain, T., Khan, E., Malik, K., Karim, S, Khanum, F., Makhdoom, R and Altosaar,I. (1995) Transformation of Indica rice with Bt pesticidal genes Proceeding of Fourth International Symposium/workshop, April 8-11, Lahore.
	iv.	Riazuddin, S., Husnain, T., Khan, E., Karim, S., Khanum, F., Makhdoom, R. and Altosaar, I., (1996) Transformation of indica rice with pesticidal gene In: Rice Genetics III. Proceeding of the third international Rice Genetics symposium 16-20 October 1995, Manila, Philippines IRRI PP.730-734.
	v.	Khanum, F., Husnain, T., Rizauddin, S. and Gordon, M.P. (1997) In Vitro regeneration of Basmati rice. Pakistan Journal of Biochemistry and Molecular Biology 30 22-26.
	vi.	Hussain, T., Khanum, F., Khan, E. and Riazuddin, S. and Altosaar I. (1998) Transformation of indca rice with synthetic cry 1A© gene. Biologia 44(1&2) 180-142.
C-QU/Bio (323)	i.	Rafique, M.A., M. Ansar, S. M. Jamal, S. Malik, M. Sohial, M. F. Haque, S. Haque, S.M. Leal, and W. Ahmed. 2003. A locus for hereditary hypotrichosis localized to human chromosome 18 q 21.1.
	ii.	Rafique, M. A., Ansar, M., Pham, T., Amin, D. M., Anwar, M., Haque, S., et al., 2004. Localization of a novel locus for hereditary nail dysplasia to chromosome 17q 25.1- 17q 25.3.

Biotech/P-GC/Bio (37)	i. Waseem Ahmed Butt, Ikram-ul-Haz, Sikander Ali, A\Qadeer M.A. and Javed Iqbal. 2001. Production of xylanase by solid-State fermentation by *Aspergillus niger*. Pak. J. Bot., 33(special issue): 581-585. ii. Haq, I., Ayesha Khan, W.A. Butt, S. Ali and M.A. Qadeer. 2002. Enhanced 5-production of xylanase by mutant s train of *Aspergillus niger* under soiled state fermentation conditions. Ind. J. plant Scis., 1(1): 5-8. iii. Ikram-ul-Haq, Ayesha Khan, Waseem Ahmad Butt, Sikander Ali and M.A. Qadeer. 2002. Effect of carbon and nitrogen sources on xylanase production by mutant strain of *Aspergillus niger* GCBMX-45. Online J. Biol. Scis., 2(2): 143-144. iv. Waseem Ahmad Butt, Ikram-ul-Haq, Ikram-ul-Haq and Javed Iqbal. 2002. Biosynthesis of xylanase by UV-treated mutant strain of *Aspergillus niger* GCBMX-45. Biotechnology, 1(1):10-14. v. Amna Ehsan, Ikram-ul-Haq, Waseem Ahmad Butt, Hamad Ashraf, Sikander Ali and M.A. Qadeer. 2002. Nutritional studies for xylanase biosynthesis by submerged fermentation from *Aspergillus niger*. ind. J. Plant scis., 1(4): 372-375. vi. Ikram-ul-Haq, Amna Emna Ehsan, Waseem Ahmad Butt and Sikander Ali. 2002. Studies on the biosynthesis of enzyme xyzyme xylanase by submerged fermentation from *Aspergillus niger* GCBMX-45. Pak. J. Biol. Scis., 5(12): 1309-1310. vii. Ayesha Khan, Sikander Ali Ikram-ul-Haq. 2003. Effect of time course, temperature and pH on xylanase production by mutant strain of *Aspergillus niger* GCMBS-45. J. Natural Scis & Math., 43(2): 119-126.
C-QU/Envr (58)	i. Bashir. S., and S. Ahmed. A natural isolate of Pseudomonas aeruginosa CP-1 which degrades chlorinated phenols. (Submitted in Canadian Journal of Microbiology). ii. Bashir. S., A. Hameed., and S. Ahmed. Aerobic degradation of monochlorophenols by pseudomonas aeruginosa CP-1". (Submitted in Journal of Biodegradation).

	iii.	Bashir. S., A. Hameed.., and S. Ahmad. Degradation of 2-6-dichlorophenol by a newly isolated bacterial strain". Presented in the Fourth International Biennial Conference of Microbiology and abstract published).
	iv.	Bashir.S., and S. Ahmed ."Isolation and Identification Chlorophenol Degrading Bacteria". (Submitted).
S-AKU/Med (185)	i.	Iqbal, M. P., Mehboobali, N. and Sheikh, S.R. An enzyme-linked immunosorbent assay, for human granulocyte-macrophage ecology stimulating factor. Pakistan J. Zool. 34-303-308, 2002.
	ii.	Iqbal, M. P., Khan, A., H. and Yousuf, F. A: A simple and sensitive radio enzymatic assay for pyridoxal-5phosphate in human plasma. J. Zool. 35(3): 231-235, 2003.
	iii.	Iqbal, M. P., Ishaq, M., Kazmi, K.A., Yousuf, F.A., Mehboobali, N., Ali, S. A., Khan, A.H. and Waqar, M. A. Role of vitamins B6-B12 and folic acid on hyperhomocysteinemia in a Pakistani population patients with acute myocardial infarction. Nutr Metab Cardivase Dis (In press, 2005).
	iv.	Iqbal, M. P., Ishaq, M. and Mehboobali, N. Increased levels of erythrocytre glutathione in acute myocardial infarction: An antioxidant defense J. Pak Med Assoc. 54)(5):254-258,2004.
	v.	Iqbal, M. P., Shafiq, M., Mehboobali, N., Iqbal, S. P. and Abbadi,: Variability in lipid profile in Pakistani patients with acute myocardial infarction. J. Pak Med Assoc. 54(11): 544-549, 2004.
	vi.	Iqbal, M. P., Shafiq, M, Mehboobali, N., Iqbalm S.P. , Abbasi, K., Azam, I. aand Kazmi, K.A. Hyppertriglyceridemia and low HDL-cholesterol are the major lipid abnormalities in normal Pakistan adults: are these contributing to the high rates of coronary artery disease in this population Pak. J. Med. Sci 20(4): 385-391, 2004.
	vii.	Iqbal, M. P., Kazmi, K. A., Jafri, H. R. and Mehboobali, N: N-Acetyt-D-glucosaminidase in acute myocardial infarction. Exp. Mol. Med. 35(4): 275-278, 2003.

	viii.	Iqbal, M. P., Kazmi, K.A. and Mehboobali N: Is N-acety 1-B- glucosaminidase a marker of reperfusion or a prognostic indicator in patients with acute myocardial infarction. Acta Cardiologica (In press, 2005)
	ix.	Iqbal, M.P., Sharif, H. M., Mehboobali, N., Yousuf, F.A. and Khan, A. H: N-acety1-B-D-glucosaminidase-a marker for end –organ damage and its relationship to inflammatory response in cardiac surgery. (Submitted).
	x.	Iqbal, M. P., Mehboobali, N and Pervez, S. Glutahione monoester reduces plaque formation in mice fed on Atherogenic diet (Submitted).
C-QU/Phy (120)	i.	D. Klar, M. Aslam, M.A. Baig, K. Ueda, M.-W. Ruf and H. Hotop. High resolution measurements & MQDT analysis of the Kr 4p5 (2p ½) nd J=2,3 autoionizing resonances. J. Phys. B: Atom Mol Opt Phys. (UK), 34, 1549-1568, 2001.
	ii.	Ali Nadeem, S.A. Bhatti, N. Ahmad and M. A. Baig. Two-step laser excitation of the even parity 5p ½ np, nf j=1 and 2 Rydberg levels of tin. J. Phys B: Atom Mol opt Phys (Uk0, 34,2407-2718-2001.
	iii.	M. Keil, A. Khdell, A. M. Baig, W. Meyer and W. Demtroder. The Hyperfine Structure of the Pseudorotating Lithium Trimer. J. Chem. Phys. 115, 2590, 2001.
	iv.	M. Yasin Raheel Ali, S. A. Bhatti and M. A. Baig. Two-color three-photon resonant excitation spectrum of strontium in the autoionization Region. E.J. Physics. D: P20, 177-189, 2002.
	v.	M. A. Zia, B. Suleman and MA Baig. Two photon Laser Optogalvanic Spectroscopy of the Rydberg States of Mercury by RF dischare. J. Phys B: Atom Mo9l Opt phys. (UK) 36-,4631-4639, 2003
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	viii.	M. Riaz, anwar-ul-Haq, Raheel Ali and MA Baig. Resonance enhanced Two-photon excitation Spectra of Atomic Thallium. Optics Communication 233, 323-332, 2004.
	ix.	M. Shaukat, M. Anwar M. Riaz and MA Baig. Temporal and Spatial Evolution of the Optogalvanic Spectra in inert gases. Optics Communication 233, 411-417, 2004.
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	xii.	M. Nawaz Ali Nadeem, S.A. Bhatti, and M. A. Baig Two-step laser excitation of 4sn3 D2 and 4sns 3S1 even parity staties in Zinc / E/Phys. J.D. Atom Mol Opt Phys. (in press), 2004.
	xiii.	M. Anwar-ul-Haq, Shaukat Mahmood, R. Ali and M. A. Baig. On the first ionization Potential of Lithium. J. Phys. B: Atom Mol Opt Phys. (UK),. 37 (in press), 2004
	xiv.	Ahad, A. Nadeem, S.A. Bhatti and M. A. Baig Three step laser-reexcitation of the 6p 3/2 ns, nd, ng autoionizing Rydberg levels via 6p5 f[5/2]2 level of lead. E.Phys J. D: Atom Mol Opt Phys. (in press), 2004.
	xv.	Nasir Amin, Shaukat Mahmood, M. Anwar-ul-Haq, M. Riaz, R. Ali and M. A. Baig. Measurement of the photoionization cross section of the 3p 2p ½, 3/2 Excited Levels of Sodium Optics Communication (in press), 2004.

2. Development:

Project No.	Publication
R&D/S-CCRI/Agr(4)	i. Soomro, A.W. and G. M. Dahri. 2003. Response of cotton to balanced fertilization in Naushahroferoz district of Sindh. Indus J. Plant Sci., 2(2): 280-285. ii. Soomro, A.W. and G.M. Dahri. 2004. Balanced nutrition management for better cotton crop through soil and plant analysis in taluka Moro, Sindh. Indus J. Plant Sci., 3(1): 18-23.
R&D/F-NIFA/Agr(181)	i. Khattak, G. S. S., M. Ashraf and M.S. Khan. 2004. Assessment of genetic variation for yield and yield components in mungbean (*Vigna radiata* (L) Wilezek) using generation mean analysis. Pak. J. Bot., 26 (3): 583-588. ii. Khattak, G. S. S., M. Ashraf and R. Zamir. 2004. Gene action for synchrony in pod maturity and indeterminate growth habit in mungbean (*Vigna radiata* (L.) Wilezek) Pak. J. Bot., 26(3): 589-594.
CDYST/S-KU/Bio (3)	i. Nasira, K. and T. A. Turpeenniemi. 2004. *Heliplectus dorsalis* Cobb in Chitwood, 1956 and *Spilophorella candida* Gerlach, 1951 (*Nematoda: Chromadorida*) from Arabian sea of Pakistan. Pak. J. Nematol., 22: 19-25. ii. Nasira, K. and T. A. Turpeenniemi, 2003. New and known marine nematodes of the family Xyalidae (Nematoda: Monhysterida) from Arabian sea of Pakistan. Pak. J. Nematol., 21:1-9. iii. Nasira, K and T. A. Turpeenniemi. 2002. Description of *Trissonchulus lichenil* and *Halalaimus gidanensis n.sp.* with observations on three known species (Nematoda: Enoplida) from Northern Arabian Sea, Pak. J. Nematol., 20: 1-16.
CDYST/S-KU/Bio (14)	i. Firoza, K. ,F, Shahina and Q. M. K. Anwar, 2004. Detection of VAM fungi in cotton fields of Sindh, RADS., 1(2): 11

ANNEXURE-V

LIST OF INDUSTRY LIAISON GROUP - PROJECTS WITH UPDATES

Annexure-V

INDUSTRY LIAISON GROUP
LIST OF PROJECTS WITH UPDATES

S. No	Project Title	Area of Research	Organizations Involved	Status/Development
1.	Pilot scale Development of Ethane Diol from Ethylene Gas	Chemicals	PCSIR Karachi	Contract Agreement received.
2.	Disbondment of Epoxy Coating and Integrity of Gas Transmission Pipelines	Corrosion Engineering	ICET PU, Lahore	**First installment released.**
3.	Gasification studies of Coke Dust and Pakistani Lignite	Oil &Gas	FRC,PCSIR Karachi	PSF Technical Committee Recommended for Revision.
4.	Recycling of used Lubricating Oil	Fuels & Lubricants	FRC & ARL	Recommended for funding by Technical Committee.
5.	Development of DDVP	Agrochemicals	NARC Islamabad	Recommended for funding by Technical Committee.
6.	Development of Fenofibrate	Pharmaceutical	------	----------
7.	Development and Manufacturing of Pour Point Depressant(PPD)	Chemicals	PRDF Karachi	**Revised proposal received.** NOC from ministry received.
8.	Development and Manufacturing of Methyl Ethyl Ketone (MEK)	Chemicals	PRDF Karachi	**Revised proposal received.** NOC from ministry received.

9.	Development and Manufacturing of Bio-Diesel	Petro-Chemicals	ARL Rawalpindi	Recommended for funding by Technical Committee.
10.	Preventive Hygiene in Hospital Management and Agricultural sector	Health	UAA Rawalpindi	Identification of links being carried out

ICET: Institute of Chemical Engineering & Technology, Punjab University,Lahore
FRC: Fuel Research Center, Karachi
ARL: Attock Refinery Limited, Rawalpindi
PRD: PERAC R & D Foundation
DDVP: Dimethyle 2, 2, Dichloro Phosphate

S. No	Project Title	Area of Research	Organizations Involved	Status/Development
11	Development of Techniques to reduce Post Harvest Losses in selected Medicinal Herbs in Pakistan	Herbal Medicines	PMNH	PC-I has been submitted in Ministry for funding.
12	Pilot scale study for the Development of Ferro-Chrome	Iron & Steel	PS QCA Lahore	Contract Agreement sent to P.I.
13	Enhancement in the Shelf-Life of Bread and Related Products	Food Sciences	FBRC, PCSIR Lahore	**Second installment Released. Additional amount released.**
14	Studies on Lead Detoxifying of Ascorbic acid in Urban Adolescent Population	Food Sciences	Agha Khan Uni & WHO	Printing of vitamin C Charts has been completed. End user TBD
15	Proposal for Potash-Bed Studies	Mineral Development	PMDC Islamabad	**MoU signed. First installment released. Project initiated.**
16	Focus Baluchistan	Sustainable Agriculture Development	PSF & WWF	**Second installment released.**

17	Wild Boar containment in Islamabad	Wildlife management	UAF & CDA	**Second installment released.**
18	Bio-Ecology & Population Management of House Crow in Islamabad.	Wildlife management	PMNH & CDA	**Additional amount released. Second installment released.**
19	Inventory of Faunistic Diversity in Margalla Hills National Park	Environment	PMNH & CDA	**Additional amount released.**
20	Lab level production of citric-acid by genetic modification	Bio-Technology	NIBGE Faisalabad	**Second installment released. Transfer of technology under way.**

PSQCA = Pakistan Standard & Quality Control Authority
FBRC = Food and Bio-Technology Research Center
PMDC = Pakistan Mineral Development Corporation Islamabad
PMNH = Pakistan Museum of Natural History, Islamabad
NIBGE = Nuclear Institute of Biology &Genetic Engineering

S. No	Project Title	Area of Research	Organizations Involved	Status/Development
21.	Lab level production of Citric-acid by fermentation	Bio-Technology	GCU	**First installment released.**
22.	Production and application of Industrial Cellulases	Bio-Technology	NIBGE	Identification of end user is underway.
23.	Application of Solar Drying Technology for Apricots	Development of Technology in Rural Areas	PCRET & AKRSP	**Test Trials completed. Funds released.**
24.	Inventory of Flora of Margalla Hills National Park	Environment	PMNH & CDA	**Second installment released. Additional amount released.**
25.	Development of mutant for industrial production	Bio-Technology	NIBGE	Identification of end user underway.

	of L-lysine through fermentation of Molasses			
26.	Pilot Plant for Processing Green Tea	Tea Technology	Tapal & PARC	**MoU signed .Funds released.**
27.	Production of Iron & Steel from Kalabagh Iron Ore through Direct Reduction Process	Iron and Steel	PCSIR	**Mo U signed. Funds released.**
28.	Power generation on low heads	Power Engineering	Frontier Foundries	Identification of links being carried out.
29.	Pharmacognosy of Medicinal Plants of Pakistan	Herbal Medicine	Medicinal Botanic Center	**First installment released.**
30.	Design and Development of Bicycle	Engineering	NESCOM	**First installment released.**
31.	Design and Development of Auto-rickshaw	Engineering	NESCOM	**First installment released.**
32.	Development and manufacturing of Rubber seals and O Rings	Rubber Technology	PCSIR	Contract Agreement received.
33.	Development of Directly Reduced Iron(DRI)	Iron and Steel	Mangla Metals	Revised PC-I received from PSQCA
34.	Development of Spring steel in Pakistan	Iron and Steel	Mangla Metals	Transfer of Technology is underway.
35.	Development of CNG cylinders	Engineering	SUPARCO	**MoU signed. Funds released.**
36.	Light Engineering Services Center(LESC)	Engineering	ICCI /NUST	Revised proposal awaited.
37.	Development of industrial Affluent treatment plant	Chemical Engineering	NIBGE	**Research proposal has been Submitted to HEC for funding**

38.	Transfer of GIS/GPS technology	Engineering	NESCOM	Identification of links being carried out
39.	Commercial Exploitation of Waziristan Copper deposits	Minerals	UET Peshawar	**Research proposal has been submitted in the MoST**
40.	Water Resources Assessment in Islamabad.	Water Resource Management	PCRWR	Research proposal has been submitted in the MoST
41.	Biotechnology Entrepreneurship Development Center (BEDC)	Bio-technology	PMNH	Research proposal has been submitted in the MoST
42.	Environmental studies of industrial units of Islamabad /Rawalpindi	Environment	ICCI/NUST	Approved by PSF T C. Replies to TC observations received.
43.	Development of Marble Finishing Technology	Engineering	PMNH/ICCI	Research proposal has been prepared.
44.	Development of ticketing kiosk at NUST Institute of Information Technology (NIIT)	Information Technology	NIIT	**Research proposal has been Submitted to HEC for funding**
45.	Network performance monitoring & management system	Information Technology	NIIT	**Research proposal has been Submitted to HEC for funding**

ANNEXURE-VI

TRAVEL GRANTS

Annexure-VI

Travel Grant 2004-05

Sr. No	Name & Address of Applicant	Title of Conference Attended and paper presented	Amount Utilized
1	Dr. Muhammad Fatahullah Khan, National Coordinator, Animal Sciences Institute, NARC, Islamabad. T.G (382)	8th International Conference on Goat, 4-9 July, 2004 at Pretoria, South Africa. *"Prospects of Goat as Dairy Animals in Pakistan"*	Rs. 100,000/-
2	Dr. Ehsan Ullah Khan, Chief Scientific Officer, PRD, PINSTECH, Nilore, Islamabad. T.G (385)	22nd International Conference on Nuclear Tracks in Solids 23-27 August, 2004 at University de Barcelona, Spain. ➢ *Measurement of Neutron fluence in CR-39 using Spectrophotometer.* ➢ *ii) Study of etching characteristics of Na2CO3-mixed NaOH solution.*	Rs.63,000/-
3	Dr. Jamshed Hussain Zaidi, Nuclear Chemistry Division, PINSTDCH, Nilore, Islamabad. T.G (402)	6th International Conference on Nuclear and Radiochemistry (NRC-6, 29th August to 3rd Sept.2004 at Aachen, Germany. "Fission Spectrum Averaged Cross Section Measurements of some Neutron Threshold Reactions of Relevance to Medical Radionuclide Production".	Rs. 46,100/-
4	Prof. Dr. Vaqar Hussain Department of Geology, University of Karachi, Karachi. T.G (414)	32nd International Geological Congress, 20-28 August, 2004 at Florence, Italy. "A new Approach to Geosciences Education and Research is Necessary to Suit Needs of the Rapidly Changing World in 21st Century: A Case Study from Pakistan".	Rs.31390/-
5	Dr. Abdul Haque Principal Scientific Officer, National Institute for Biotechnology and Genetic Engineering, Faisalabad T.G (415)	World Conference on Anti-infective, 10-14 September, 2004 at Nuremburg, Germany. *"Multiplex PCR for Detection of Drug Resistance in Typhoid Cases"*	Rs. 47,355/-

6	Dr. Shahnaz A. Khanum, Principal Scientific Officer, Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad. T.G (423)	8th International Conference on Goats 2004, 3-9 July, 2004 at University of Pretoria, South Africa. *"Studies on Reproductive Physiology and Endocrinology of Female Dwarf Goat in Pakistan*	Rs.75,000/-
7	Dr. Muhammad Shahid Chief Resident,Emergency Medicine, Department of Medicine,Aga Khan University Hospital,Stadium Road, Karachi. T.G (424)	XVII International Congress International Association for Cross-Cultural Psychology from 2-6 August, 2004 at Xian, China ."Anxiety and Depression Among Young Adults Presenting with Chest Pain"	Rs.64,255/-
8	Prof. Dr. Muhammad Ibrahim Institute of Horticultural Sciences, University of Agriculture, Faisalabad. T.G (427)	International Symposium on Horticultural Education Extension and Training "Recent Advances in Horticultural Education" from 18-21 August, 2004 at City Hotel, Perth, Western, Australia. "Horticultural Education, Extension and Training System in Pakistan".	37,129/-
9	Dr. Rehanul Haq Siddiqui Assistant Director,Geosciences Advance Research Laboratories, Geological Survey of Pakistan, Shahzad Town, Islamabad. T.G (429)	32nd International Geological Congress from 20-28 August, 2004 at Florence, Italy. "Mesozoic Intra-Plate volcanism in the Muslim Bagh Area and its relationship with the break-up of Gondwana"	Rs.21,000/-
10	Ms. Ghazala Roohi Associate Curator,Earth Sciences Division, PMNH,Islamabad. T.G (430).	19th Himalaya-Karakoram-Tibet Workshop (HKT-19) from 10-12 July, 2004 at Niseko, Hokkaido, Japan."The Importance of Nummulites and Assilina in the Correlation of Middle and Upper Eocene Rocks"	Rs.17,850/-
11	Prof. Dr. Amir Khan Chairman,Department of Geography,Urban & Regional Planning,University of Peshawar,Peshawar. T.G (432)	International Geographical Union (IGU) from 15-20 August, 2004 at Glasgow, UK ."Environmental and Socio-cultural Impacts of Water Resource Development Project: A Case Study of Ghazi – Barotha Hydropower Project (GBHPP), Pakistan".	Rs.100.000/-
12	Liaqat Ali Qureshi Assistant Professor,Department of Civil Engineering,University of Engineering & Technology, Taxila.T.G (435)	Developing Concrete to SeruePractical Needs from 13-14 October, 2004 at ESKOM, Midrand, South Africa. "Effect of Longitudinal Reinforcement on Shear Capacity of High Strength Concrete Beams"	Rs. 66,700/-

13	Dr. Shafiq Ahmad Mujahid Principal Scientific Officer,Physics Research Division,PINSTECH, P.O. Nilore,Islamabad. T.G (437)	22nd International Conference on Nuclear Tracks in Solids from 23-27 August, 2004 at Barcelona, Spain. "Measurement of Radon in Soil using Active and Passive Methods"	Rs.64,000/-
14	Ijaz Ahmed Assistant Professor,Department of City and Regional Planning, University of Engineering and Technology,Lahore. T.G (441)	40th ISoGaRP Congress from 18-22 September, 2004 at Geneva, Switzerland. "Growing Needs of Planning in Pakistan: A case Study of Punjab Province"	Rs. 39,600/-
15	Kamran Muzaffar Khan Assistant Professor,Department of Civil Engineering,University of Engineering and Technology, Taxila .T.G (442)	29th Conference on Our World in Concrete & Structures from 25-26 August, 2004 at Hotel New Otani, Singapore. "Effect of Blending of Portland Cement with Ground Granulated Blast Furnace Slag on the Properties of Concrete"	Rs. 89,000/-
16	Prof. Dr. Saeed Ahmad Department of Civil Engineering,University of Engineering and Technology, Taxila. T.G (443)	29th Conference on Our World in Concrete & Structures from 25-26 August, 2004 at Hotel New Otani, Singapore . 1. "Variation in Fineness of Facto Cement and its Effects on other Properties of Cement and Concrete" 2. "Effect of Water Reducing Concrete Admixtures on the Properties of Concrete"3. "Investigation on Extreme Weather Concreting"	Rs. 94,482/-
17	Dr. Asghari Bano Associate Professor,Department of Biological Sciences, Quaid-i-Azam University, Islamabad. T.G (445)	18th International Conference on Plant Growth Substance from 20-24 Sept. 2004 at Manning Clark Centre of the Australian National University, Canberra, Australia. "Changes in Abscisic Acid (ABA) and Cytokinins in Rice under Salt Stress"	Rs.100,000/-
18	Prof. Dr. M. Afzaal Malik Department of Mechanical Engineering, College of Electrical and Mechanical Engineering, National University of Sciences and Technology, Rawalpindi. T.G (448)	ASME/STLE International Joint Tribology Conference from 24-27 October, 2004 at Hilton Long Beach, Long Beach California, USA. "Surface Roughness Effects on Hydrodynamic Lubrication and Scuffing Failure Analysis of Axially Grooved Plunger of a Rotary Diesel Fuel Injection Pump"	Rs. 83,900/-

19	Kashif Mahmood Rajpoot Research Associate,Faculty of Computer Science & Engineering,Ghulam Ishaq Khan Institute of Engineering & Technology, Topi, NWFP. T.G (450)	Medical Image Computing and Computer Aided Intervention (MICCAI)-2004 from 26-30 September, 2004 at Stmaco, France. "SVM Optimization for Hyper spectral Colon Tissue Cell Classification"	Rs.66,422/-
20	Dr. Khalida Khurshid Senior Medical Officer, Noori Hospital,P.O. Box NO.1590, G-8/3, Islamabad. T.G (454)	8th Asia & Oceania Congress of Nuclear Medicine and Biology from 9-13 October, 2004 at Beijing, China. "Utility of Semiquantitative Analysis of Tc-99m-MIBI for Breast Cancer Recurrences"	Rs. 35,000/-
21	Muhammad Irfan ullah Lecturer,Computer Science Department,Muhammad Ali Jinnah University, Jinnah Avenue, Islamabad. T.G (458)	28th Annual International Computer Software and Applications Conference COMPSAC 2004 from 28-30 September, 2004 at Hong Kong "An Approach for Software Reliability Model Selection"	Rs. 69,800/-
22	Dr. Muhammad Sohaib Senior Medical Officer,Department of Medical Sciences,Pakistan Institute of Engg. and Applied Sciences (PIEAS), P.O. Nilore, Islamabad. T.G (460)	8th Asia & Oceania Congress of Nuclear Medicine and Biology from 9-13 October, 2004 at Beijing China. "Changes in DMSA Scan after PCNL Procedure in Children with Renal Calculi"	Rs. 50,740/-
23	Mr. Muhammad Nawaz Coordinator/Assistant Professor,GIS Centre, Department of Geography, University of the Punjab, Lahore. T.G (461)	ARAB MAP 2004 from 6-7 September, 2004 at Cairo, Egypt. "Location Based Service (IBS) to Support Mobile Users"	Rs. 48,000/-
24	Dr.Malik Mohammad Ashfaq CSO, Isotope Production Division, PINSTECH, Nilore, Islamabad. T.G (462)	European Symposium on Radio Pharmacy and Radiopharmaceuticals, from 9-12 Sept, 2004 mat Hotel Haffner, Gdansk, Poland. 177-Lu Potential therapeutical Radiopharmaceutical - Preparation and Quality control of 177 Lu-EDTMP and 177-Lu-DOTA-Tyr3 O)ctreotato Complexes	Rs.56,220/-
25	Pro. Dr. Ghulam Habib NWFP, Agricultural University, Peshawar. T.G (463)	7th World Buffalo Congress, from 20-23 October,2004, at Manila, Philippines "Rethinking of feeding Mnagement of Urban & Peri-Urban Buffaloes in Pakistan"	Rs.75159/-

26	Dr. Muhammad Shehzad Afzal Senior Medical Officer,Punjab Institute of Nuclear Medicine (PINUM),P.O. Box.1029, Faisalabad.T.G (469)	8th Congress of Asia Oceania Federation of Nuclear Medicine and \Biology from 9-13 October, 2004 at Beijing, China. "Role of Myocardial Perfusion Scintigraphy in Type II Diabetic Patients: A Multicentre Study"	Rs. 16,600/-
27	Dr. Shahid Mahmood Baig, Principal Scientific Officer,NIBGE, P.O. Box. No.577,Faisalabad. T.G (491)	The Human Genome Variation Society Scientific and Annual General Meeting from 26-30 October, 2004 at Toronto, Canada. "Molecular characterization of Mutations causing B-thalassemia in Pakistan using amplification refractory mutation system (ARMS) and allele specific oligonucleotide (ASO) Hybridization"	Rs.100,000/-
28	Mr. Tauqeer Hussain Research Associate,Department of Computer Sciences, LUMS, DHA, Lahore. T.G (500)	19th Annual ACM Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA) from 24-28 October, 2004 at Vancouver, Canada ."Improving Quality in Conceptual Modeling"	Rs. 88,900/-
29	Muhammad Saeed Akhtar Principal Medical Officer,Punjab Institute of Nuclear Medicine (PINUM), P.O. Box. No.2019, Faisalabad. T.G (501)	8th Asia & Oceania Congress of Nuclear Medicine and Biology from 8-13 October, 2004 at Beijing, China. "99m Tc-labeled Antimicrobial Peptide Ubiquicidin (29-41) Accumulates less in E-Coli Infection than in S-aureus infection".	Rs 12,000/-
30	Prof. Dr. Azhar Mansur Khan National Program Manager/Professor At case, Ministry of Environment CDA Block IV Islamabad. T.G. (506)	Analytical Study of Emotional Intelligence in Selected Project Organizations of Pakistan. " PM Days 04 Projects and Emotional Intelligence"	Rs 50,000/-
31	Prof. Dr. Ikram-ul-Haq Department of Botazny,Govt. College University,Lahore .T.G (459)	Second International Conference on Artificial Intelligence in Engineering and Technology-2004 from 3-5 August, 2004 at Sabah Kota Kinabalu ."Optimization of cultural Conditions for the Production of Alkaline Proteases by Bacillus sp. In a Bioreactor using Fuzzy Logic Control"	Rs 85,245/-

32	Dr. Ahmad Badar Associate Professor,Department of Physiology,Ayub Medical College,Abbottabad. T.G (499)	2nd Regional Conference on Medical Journals in the WHO Eastern Mediterranean Region"from 10-12 October, 2004 at Armed Forces Hospital Riyadh ."Countering Plagiarism In The Net Age"	Rs. 32,300/-
33	Dr. Sohail Hameed Principal Scientific Officer,NIBGE, P.O. Box.577, Jhang Road, Faisalabad. T.G (504)	14th International Congress on Nitrogen Fixation from 27 Oct. to 1st Nov. 2004 at Beijing, China ."Nodule On-occupancy of Agro- bacterium and Bradyrhizobium with Potential Benefit to Legume Host"	Rs. 52,020/-
34	Dr. Mehboob-ur-Rehman Senior Scientific Officer,National Institute for Biotechnology & Genetic Engineering (NIBGE) P.O. Box.577, Faisalabad. T.G (519)	Plant Animal Genome Cotton Workshop from 16.1.2005 at Town & Country Convention Centre San Diego, California, USA ."Overview of Cotton Genomics Studies in Pakistan"	Rs. 80,000/-
35	Mr. Javaid Iqbal Siddiqui Senior Engineer, DSD- DRE,Pakistan Atomic Energy Commission, P.O. Box.1138,Islamabad. T.G (520)	2nd International Conference on Protection of Structures Against Hazards from 2-3 December, 2004 at Singapore. "Evaluation of Control Building Doors Against Shock Overpressures"	Rs.45,000/-
36	Dr. M. Kaleem Akthar Qureshi Director,Geological Survey of Pakistan,Trade Centre, Phase-II, Johar Town, Lahore T.G (523)	24th International Association of Sedimentologists Meeting (JAS-2005) from 10-13 January 2005 at Muscat-Uman ."The Jurassic Carbonate Platform Deposit from the Kala Chitta Range Lesser Himalayas, Pakistan"	Rs.60,000/-
37	Prof. Dr. M. Iqbal Bhanger Director,National Centre of Excellence in Analytical Chemistry,University of Sindh,Jamshoro. T.G (527)	Bangladesh Chemical Congress 2004 from 9-11 December 2004 at University of Dhaka, Dhaka ."Chromatographic Separation of Metal Complexes of Schiff Bases and Dithiocarbamates"	Rs. 19,470/-
38	Dr. Hamid Rashid Senior Scientific Officer,Agriculture Biotechnology Programme (IABGR),National Agriculture Research Centre, Park Road, Islamabad. T.G (530)	5th International Plant Tissue Culture & Biotechnology Conference organized from 4 to 6 December 2004 at Dhaka, Bangladesh. "Improvement of Basmati Rice for Disease Resistance by Agro bacterium Mediated Transformation"	Rs.23,755/-

39	Aish Muhammad Scientific Officer,Agriculture Biotechnology Programme (IABGR),National Agriculture Research Centre, Park Road, Islamabad. T.G (531)	5th International Plant Tissue Culture & Biotechnology Conference organized from 4 to 6 December 2004 at Dhaka, Bangladesh. "Rehabilitation of BBTV-Affected Fields in Pakistan".	Rs.23,755/-
40	Muhammad Abdul Qadir Associate Professor,Faculty of Enggg. Sciences,Muhammad Ali Jinnah University, Islamabad Campus, 74-E Jinnah Avenue, Islamabad. T.G (533)	The Australasian Workshop on Grid Computing and e-Research (AusGrid 2005) from Jan. 30 to 4th Feb. 2005 at University of Newcastle, Australia ."Intelligent Cache Management for Data Grid"	Rs. 100,000/-
41	Dr. Tasawar Hussain Khan Associate Professor, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan. T.G. (551)	Biennial Joint Meeting of the UK Fertility Societies at Warwick University, UK. From 3-6 April,2005 "The effects of dalmazin (PGF) on luteal cysts and dalmerdin on follicular cysts in cross-breed cows"	Rs.87,224
42	Dr. Muhammad Hanif Assistant Professor(Physics), College of E & ME (NUST), Peshawar Road, Rawalpindi. T.G (554)	17th International Conference on Laser Spectroscopy, 19-24 June, 2005, Scotland, UK ."Laser Optogal Vanic Observation and Multichannel Quantum Defect Theory Analysis and even Parity Autoionizing Resonances in Xenon".	Rs.53,000/-
43	Mr. Anwar-Ul-Haque Manager (Aerospace), Project Management Organization (PMO) Nescom, Opposite EME College Peshawar Road, Rawalpindi, T.G (564)	International Conference on Computational Ballistics on 18-20 May, 2005 Corboba Spain. "Study of Asymmetric Vartical Flow on Forebodes at high Angle of Attack.	Rs.46,750/-
44	Dr. Abdul Razzaq Ghumman Dean Faculty of Civil & Environmental Engineering, University of Engineering and Technology Taxila. T.G (567)	International Conference on advanced remote sensing for earth observations, systems techniques and applications in Riyadh Kingdom of Saudi Arabia, (8-11 May, 2005). Investigation of Water Logging and Salinity using Geographical Information system.	Rs.39,760/-

45	Dr. M. Afzaal Malik Professor, Department of Mechanical Engineering, College of Mechanical and Engineering, National University of Sciences and Technology, Rawalpindi. T.G (570)	13th International conference on Nuclear Engineering ICONE-13 on 16-20 May,2005 Beijing China, "Analysis of Mechanical Autofrettage in Thick Cylinders (Paper No. ICONE 13-50417)	Rs. 50,300/-
46	Mr. Shahab Khushnood Principal/Professor, Wah Engineering College, Pakistan Ordinance Factories (POFS) Wah Cantt. T.G (571)	13th International Conference on Nuclear Engineering ICONE-13 on 16-20May 2005 .Experiments on Flow Induced Vibration in a Heat Exchanger Tube Bundle (Paper No. ICONE 13-50413)"	Rs.63,080/-
47	Mr. Qamar-ul-Haque Principal Scientist, PRD PINSTECH, P. O. NILORE, ISLAMABAD T.G. (576)	4th International Conference on the Physics of Dusty Plasmas. "Dust Waves in Rotating Planetary Magnetospheres.	Rs.47,890/-
48	Ayesha Roohi Associate Professor, Department of Statistics, Lahore College for Women University, Lahore. T.G. (364)	International Conference on distribution theory order statistics and inference from 16-18 June, 2004 at University of Cantabria, Santander, Spain.	Rs.100,000/-
49	Dr. Muhammad Arif Associate Professor, Department of Geology, University of Peshawar. T.G (387)	32nd International Geological Congress from 20-28 August, 2004 at Florence, Italy. "Host rock characteristics and source of chromium and beryllium for emerald mineralization along the Indus suture zone in Swat, NW Pakistan"	Rs 58,300/-
50	Shahzad Mahmood Senior Scientific Officer, Physics Research Division, PINSTECH, Nilore, Islamabad. T.G (388)	Workshop on Theoretical Plasma Physics from 5-16 July, 2004 at ASICTP, Trieste, Italy. "Auroral Electrostatic Structures in the Presence of Hot Ions Precipitation that the Workshop"	Rs.62,000/-
51	Prof. Tahira Ahmed Deptt. of Biological Sciences, Quaid-i-Azam University, Islamabad.. T.G (401)	6th International Wildlife Ranching Symposium from 6-9 July, 2004 at Paris, France. "Sustainable use & Conservation of Wild sheep in Pakistan".	.Rs. 45,850/-

52	Nimat-ullah Khattak Principal Geologist, P.R.D. PINSTDCH, P.O. Nilore. Islamabad. T.G (403)	22nd International Conference on Nuclear Tracks in Solids from 23-27 August, 2004 at University de Barcelona, Spain. "Emplacement Time of Jawar Carbonatite from NW Pakistan: Constraints from Fission-Track Dating"	Rs. 23,000/- (Additional amount)
53	Dr. Lalarukh Kamal Associate Professor, Department of Mathematics, University of Baluchistan, Quetta. T.G (409)	World Renewable Energy Congress VIII from 29 August to 3-Sept. 2004 at Denver, Colorado, USA. "Application of Artificial Neural Networks for Prediction of Wind Energy"	Rs.100,000/-
54	Prof. Dr. Mudasir Asrar Department of Botany, University of Balochistan, Quetta. T.G (410)	Botany 2004 Conference of American Society for Botany. USA from 31 July to 5-August, 2004 at Utah, USA. i)"Allelopathic Effects of Vincetoxicum Stockssi and Zygoj Fabago" ii)"Ethnobotanical Studies and Screening of Medicinal Plants of Quetta, Pakistan"	Rs. 100,000/-
55	Dr. M. Akram Kahlown Chairman, PCRWR, House No.3&5, Street No.17, F-6/2, Islamabad. T.G (353)	Research Basins and the Hydro9logic Planning from 22-21 March, 2004 at HefeiCity (Anhui) China. "Groundwater Development and Management in Indus Basin: Issues and Challeges"	Rs. 10,680/- (Additional amount).

ANNEXURE-VII

RESEARCH SUPPORT GRANT FOR ACTIVE SCIENTISTS & TECHNOLOGISTS

Annexure-VII

List of Scientists who have availed Research Support Grant under the Development Project "Research Support Program for Active Scientists and Technologists"

S. No	Name & Address of Applicant	Amount released (Rs. in million)
1.	Dr. Alam Khan (TI) Dept. of Human Nutrition NWFP Agricultural University, Peshawar	0.990
2.	Prof. Dr. M. Ajmal Khan Dept. of Botany University of Karachi . Karachi	1.0
3.	Dr. Yusuf Zafar Plant Biotechnology Division NIBGE, Faisalabad	1.0
4.	Sheikh Riazuddin CEMB. University of the Punjab, Lahore	1.0
5.	Dr. Shagufta Khaliq Biomedical & Genetic Engg. Division, Dr. A. Q. Khan Research Lab, Islamabad	0.590
6.	Dr. Shaheen Khan CAMB University of the Punjab. Lahore	1.0
7.	Dr. Aisha Mohyuddin Biomedical & Genetic Engg. Division, Dr. A. Q. Khan Research Lab., Islamabad	0.686
8.	Qasim Ayub Biomedical & Genetic Engg. Division, A.Q Khan research Lab. G-9, Islamabad	0.540
9.	Dr. Shahid Mansoor Plant Biotechnology Division NIBGE, Faisalabad	1.0

10.	Dr. Muhammad Ibrahim Rajoka Industrial Bio-technology Division NIBGE, Faisalabad	1.0
11.	Dr. Anwar-ul-Hassan Gilani Aga Khan University, Karachi	0.984
12.	Prof. Dr. M. Iqbal Chaudhry HEJ, Res. Institute of Chemistry, University of Karachi, Karachi	0.45
13.	Prof. Viqar uddin Ahmad, HEJ Research Institute, University of Karachi, Karachi.	0.40
14.	Dr. Abdul Malik HEJ, Research Institute of Chemistry, University of Karachi , Karachi	0.584
15.	Prof. Dr. Bina S.Siddiqui HEJ Research Institute of Chemistry, University of Karachi , Karachi	0.660
16.	Dr Shaheen Faizi HEJ Research Institute of Chemistry. University of Karachi , Karachi	0.912
17.	Dr. Sabira Begum HEJ Research institute of Chemistry, University of Karachi , Karachi	0.950
18.	Dr Khalid Mohammad Khan H.E.J Research Institute of Chemistry, University of Karachi , Karachi	0.50
19.	Dr. Saqib Ali Dept. of Chemistry Quaid-i-Azam University, Islamabad	0.584
20.	Prof. Dr. Zahid Hussain Chohan Dept. of Chemistry Bahauddin Zakaria University, Multan	0.445
21.	Dr. Mohammad Rasul Jan Dept. of Chemistry University of Peshawar, Peshawar	1.0

22.	Dr. Nighat Afza PCSIR Lab Complex, Karachi	0.998
23.	Prof. Dr. M. Arfan Dept. of Chemistry University of Peshawar, Peshawar	0.992
24.	Dr. Shahnaz Parveen PCSIR Lab Complex Karachi	0.779
25.	Dr. Saeed Ahmad PCSIR Labs Complex, Lahore	1.0
26.	Prof. M.Aslam Baig Dept of Physics Quaid-i-Azam University, Islamabad	1.0
27.	Prof. Dr..M..Zakaullah, Dept of Physics Quaid-i-Azam University, Islamabad	1.0
28.	Dr.Asgari Maqsood Dept of Physics Quaid-i-Azam University, Islamabad	1.0
29.	Dr. Jamshaid Hussain Zaidi NCD, PINSTECH, Nilore, Islamabad	1.0
30.	Prof. Dr. Muhammad Ashraf Dept. of Botany University of Agriculture, Faisalabad	0.998
31.	Dr. Amin Badshah Dept. of Chimistry, Quaid-i-Azam University, Islamabad	0.546
32.	Dr. Ahmad Mukhtar Khalid Director, NIBGE, Faisalabad	1.0
33.	Dr. M. Sajjad Mirza NIBGE, Faisalabad	1.0

34.	Dr. Zaheer ul Haq HEJ Research Institute, University of Karachi, Karachi	0.990
35.	Dr. Abdul Rashid, CSO, Land Resources Research Programme, NARC, Islamabad	0.320
36.	Dr. Fauzia Y. Hafeez, CSO, Bio-fertilizer Division, NIBGE, Faisalabad	1.0
37.	Dr. Faiz-ul-Hassan Nasim, Associate Professor, Dept. of Chemistry, Islamia University, Bahawalpur	1.0