Patron

Prof. Dr. Muhammad Ashraf Chairman Pakistan Science Foundation

Chief Editor

M. Javed Igbal Education Programmer



PSFNEWS August 2015

Monthly Newsletter of Pakistan Science Foundation

Prof. Dr. Muhammad Ashraf, Chairman PSF, Mr. Stefano Gatto, Acting EU Ambassador to Pakistan

and Prof. Dr. Muhammad Qaiser, Vice Chancellor, University of Karachi at seminar on EU

Research & Innovation Programme HORIZON-2020"

Vol. 13 No. 8

From the Chairman



"Excellence is an art won by training and habituation. We do not act rightly because we have virtue or excellence, but we rather have those because we have acted rightly. We are what we repeatedly do. Excellence, then, is not an act but a habit," says Aristotle while Charles R. Swindoll is of the view, "If you are going to achieve excellence in big things, you develop the habit in little matters. Excellence is not an exception, it is a prevailing attitude.'

These are the parents and teachers who train students through different ways to learn and develop their habit for achieving excellence in their studies and later on in their careers as well as maintaining a positive attitude. And this training and learning process needs inspiration and motivation for students. Parents and teachers play a leading role

Continued on page 2



Awareness Seminar on EU Research & Innovation Programme HORIZON-2020" Pakistani scientists must avail EU funding for Research & Innovation Programme: Dr. Ashraf



Prof. Dr. Muhammad Ashraf, Chairman Pakistan Science Foundation (PSF), Mr. Stefano Gatto, Acting EU Ambassador to Pakistan and Prof. Dr. Muhammad Qaiser, Vice Chancellor, University of Karachi, address seminar on EU Research & Innovation Programme HORIZON-2020".

fund research projects under its Research & Innovation Programme HORIZON-2020, which is a great opportunity for Pakistani scientists to avail this funding through sound research proposals, said Prof. Dr. Muhammad Ashraf, Chairman Pakistan Science Foundation (PSF).

Pakistani students win six awards

in Asian Science Camp 2015

European Union (EU) will He was addressing "Awareness Seminar on EU Research & Innovation Programme HORIZON-2020" at University of Karachi, Karachi on August 19, 2015.

PSF, which was designated in March, 2015 as focal organization for Govt. of Pakistan to EU Research & Innovation Programme

ECO Science Foundation

delegation visits PMNH

HORIZON-2020, with the collaboration of University of Karachi organized the Seminar on EU funding.

Mr. Stefano Gatto, Acting EU Ambassador to Pakistan provided brief of the Programme. Prof. Dr. Muhammad Qaiser, Vice Chancellor, University of Karachi welcomed all the scientists from across Sindh. Mr. Denis Dembois. EU Counselor Scientific Affairs provided detail procedure to prepare research proposals. The faculty members and researchers were invited from all the public & public sector institutes across Sindh.

This seminar was third of its kind in Pakistan and earlier



From the Chairman

to develop this habit among students by becoming a role model who inspire and motivate them to excel.

Reward system also plays a key role to inspire and motivate students. This reward system could be in many forms. It could be in the form of appreciation or some prize etc. A word of encouragement and appreciation can do wonders to motivate students to learn and excel through hard work. Those educational institutions which focus on motivation and inspiration of students always give best results in exams and their students won laurels for them. Such schools and colleges create good leaders, scientists, doctors and engineers through capacity building and developing good habits and character of their students.

It is pertinent to mention that motivation and inspiration is a continuous process that requires new ways and means to sustain this process to achieve outstanding results.

The educational institutions have the major responsibility to play their role in creating a science culture in the country as without development of science technology no nation could progress. The educational institutions need to arrange such activities for student that motivate and inspire them to get engaged in the process of invention and innovation. The educational institutions can arrange such science related activities with the collaboration of Pakistan Science Foundation having many reward-based motivational programmes for the educational institutions, teachers as well as students.

two seminars were held in Lahore and Islamabad. The Chairman, PSF and EU Ambassador to Pakistan decided to conduct the series of such seminars across the

country. The next would held of research grants. in Ouetta and Peshawar within next few weeks.

EU HORIZON-2020 programme contains more than £70 billion in the shape

Pakistani researchers will collaborate with its global partners for joint research proposals through HORIZON-2020.

PSF, DoST sign MoU for developing science culture in country

Pakistan Science Foundation (PSF) and Directorate of Science and Technology (DoST), Khyber Pakhtunkhwa (KP) Province, signed a Memorandum of Understanding (MoU) on August 7, 2015, for stringent developments in S&T and developing science culture in the country.

The MoU was signed at an impressive ceremony. PSF Chairman Prof. Dr. Muhammad Ashraf was the Chief Guest while Secretary S&T and IT Department, KP, Ms Farah Hamid Khan was Guest of Honour on this occasion. Senior officers from Federal Ministry of Science and Technology, Pakistan Science Foundation, Pakistan Museum of Natural History and Pakistan Scientific and Technological Information Center were present.

PSF Member Science Prof. Dr. Muhammad Akram Sheikh



PSF Chairman Prof. Dr. Muhammad Ashraf and Secretary Pakistan Academy of Sciences Dr. Zabta Khan Shinwari witness the MoU signing ceremony while PSF Member Science Prof. Dr. Muhammad Akram Sheikh and Director DoST Mr. Zahoorul Haq sign the MoU on behalf of their respective organizations.

and Director DoST Mr. Zahoorul Hag signed the MoU on behalf of their respective organizations.

The MoU is aimed at developing cooperation and collaboration between the two organizations for stringent development in S&T through collaborative activities to

improve the economic condition of the country.

Under the MoU PSF and DoST will work together for identification of core areas of mutual cooperation, sharing their expertise for science propagation activities. PSF will help DoST in establishing science laboratories in some deserving schools of KP and provide trainings to science teachers in already established labs in 24 districts of KP.

PSF Chairman Dr Ashraf addressing on this occasion stressed the need for focusing on human resource development as without it progress in national development could not be achieved. He highlighted some priority areas of the Foundation for funding research projects.



signed the MoU exchange documents after signing the MoU on behalf of their respective organizations.

Onote of the Month

"Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world. Science is the highest personification of the nation because that nation will remain the first which carries the furthest the works of thought and intelligence."

PSF NEWSLETTER

The PSF Chairman assured his the province. full support to DoST for

Hamid Khan, PSF Member Secretary S&T and IT Science Prof. Dr. Akram Sheikh developing science culture in Department, KP, Ms Farah and Director DoST Mr. Zahoorul

Hag also spoke on mandate, activities and achievements of their respective organizations.

Pakistani students win six awards in Asian Science Camp 2015

Pakistan Science Foundation (PSF) has the mandate to popularize and promote science at grassroot level in the country. Capacity-building of Pakistani youth and sponsoring them for participation in international scientific events is one of the important activities of the Foundation. PSF, being a focal organization for Asian Science Camp (ASC), coordinated with the organizers of the Camp for participation of Pakistani students in ASC-15. This year ASC was held in Pathumthani, Thailand.

The idea of ASC was proposed after the Lindau Science Meeting 2005 by Prof. Yaun-Tseh Lee, the 1986 Nobel Laureate in Chemistry and Prof. Masatushi Koshiba 2002 Nobel Laureate in Physics to enlighten Science Talented Youth. The ASC International Advisory Committee approved that Thailand should host the ASC in 2015. ASC-2015 was 9th in the series. Following successful camp at Taipei (2007), Bali (2008), Tsukuba (2009), Mumbai (2010), Daijeon (2011), Jerusalem (2012), Tasukuba (2013) and Singapore 2014, the Asian Science Camp 2015 was held from August 2 to 8. 2015 at the Convention Center and Sirindhorn Science Home at the Thailand Science Park. National Science and Technology Development Agency (NSTDA) in



A group photo of Pakistani delegate with eminent Physicist Prof. Hitoshi Murayama during ASC-15, in Thailand.

Pathumthani. Over 270 students from 29 Asian countries participated in the event. The Pakistani delegation

comprising seven students along with the Team Leader Dr. Naushaba Atta, Principal Scientific Officer (PSO), PSF left for Thailand on 1st August, 2015. Prior to their departure for Thailand, a sendoff/orientation session was held at PSF on 1st August, 2015 in which PSF high officials, eminent scientists and educationists shared their experiences with the students and guided them for the intended visit. The students enthusiastically participated in the forum.

The students who participated in the ASC-15 included Asad Jamil, Danial Amin, Maryam Khan, Muhammad Shoaib Butt, Aamir Zaryab, Hamna Ashraf and Muhammad Farhan Uddin Salik.

The ASC-2015 was



A group photo of students with their awards at the closing ceremony of ASC-15.

inaugurated by Her Royal Highness Princess Maha Chakri Sirindhorn on 3rd August, 2015. She delivered a keynote address highlighting the importance of science education. Afterwards, the formal sessions of the Camp started. The Camp included seven plenary lectures by the Nobel Laureates, Panel Discussion, Group discussions and Poster presentations. The Students were encouraged to ask questions or discuss with lecturers at every scientific session in ASC-2015. The best question in each session was selected by the lecturer and declared for the "Best Question Award". The prizes were given away to the selectees at the end of each day during the ASC-15. The students also prepared posters based on the information obtained from the lectures and

presentations. At the Poster Presentation session, the committee members closely observed all the posters and appreciated students' presentations. The committee selected 18 most creative posters for the poster awards, including 3 Gold Awards, 3 Silver Awards, 9 Bronze Awards and 3 Honorable Mentions. Four Pakistani students won these awards. In addition, cultural activities were also arranged including cooking, flower making, petal folding, boxing, dancing and cloth dying for the participants.

The closing ceremony was held on 7th August, 2015. On this occasion, the winners of the Best Question Awards and Poster presentations were announced. All the participants were also awarded certificates. By the Grace of Almighty Allah, the Pakistani students were able to win six awards as per detail given below;

- Ms. Maryam Khan won the Best Question Award and Honorable Poster Mention
- Danial Amin got Best **Ouestion Award and Bronze** Poster Award
- Muhammad Shoaib Butt and Aamir Zaryab won Bronze Poster Award

The students along with their team leader returned to Pakistan on 8th August, 2015.



Pakistani students presenting their posters during ASC-15, in Thailand.

Celebration of Independence Day

Jaffarabad Unit arranged different activities in Ziarat district, Balochistan, during Caravan Exhibition to celebrate Independence Day on 14th August, 2015. Mr. Abdul

The PSF Science Caravan Khalique, ASO/ Incharge Science Centre, Faisalabad, delivered a lecture on the was also decorated with of Independence Day. occasion. Muhammad Annan. Manager Admin/Focal Person, Al-Hijrah Residential School & College, Ziarat, appreciated the activity. The building of



A view of Independence Day celebration by Science Caravan Jaffarabad Unit in Ziarat District, Balochistan on August 14, 2015.

colourful lights on the occasion



The Science Centre, Faisalabad beautifully decorated with colourful lights on the occasion of Independence Day of Pakistan on August 14.

Science Caravan Exhibitions

Jaffarabad: The PSF Science Caravan Jaffarabad Unit arranged an exhibition at Al-Hijrah Residential School and College, Ziarat District on August 4-19, 2015, in which 5,032 students along with their teachers from 24 schools participated.



A view of Science Caravan Exhibition at District Ziarat, Balochistan

Peshawar: The PSF Science Caravan Peshawar Unit arranged an Exhibition at GCMHS-Dir Upper on August 24-31, 2015 and 1,446 students along with 38 teachers from eight schools visited it.



The students are being briefed during science exhibition arranged by the Peshawar Science Caravan Unit.

Pakistan Museum of Natural History (PMNH)

Editor: Muhammad Ismail Bhutti

Research study on wild mushrooms of Thar Desert

The Thar Desert is the largest among all and mostly falls under the territory of province Sindh, Pakistan. The approximate area of Greater Thar Desert is around 200,000 square Kilometer, of which around 50,000 square kilometer falls in Pakistan

territory, covering the districts of Tharparker, Mirpurkhas, Umerkot, Khairpur Mirs, Sukkur and Ghotki in Sindh province. Thar Desert is among the most populated deserts of the world. According to 1998 census 4.5 million people live in these desert

districts.

The Desert harbors a treasure of fungal diversity especially, wild mushrooms having unique taste to eat and medicinal properties and locals use them for both purposes. These macro fungi appear during the monsoon

season

A 2-member team of PMNH Botanical Sciences Division including Dr. Muhammad Ismail, Associate Curator (Mycology) and Muddassar Fida (Sr. Collection Incharge) carried out 12-day research activity in the area in August



and interviewed local people

2015 to find the hidden secrets of this unique fungus(Genus Podaxis). The team collected more than 250 specimens of different macro fungi, took photographs of natural habitat

who are used these macro fungi since centuries.

It was observed that these mushrooms were found on a variety of substrates and in

different habitats of Thar and a high livestock Desert. Threats to mushroom diversity in Thar Desert are of much concern due to ever increasing anthropogenic activities, frequent droughts

population. Conservation of these wild mushrooms is urgently needed for their sustainable utilization as food and medicine in future.

PMNH Botanist delivers lecture on role of fungi in agricultural output

Dr. Muhammad Ismail Bhatti, Associate Curator (Mycology), PMNH, delivered a lecture to the beneficial as well as harmful participants of Training of effects of plant parasitic Trainers Programme at nematodes on different filed National Sugarcane Research crops. More than 35

Institute, Thatta, Sindh. He spoke on the role of macro and micro fungi in agriculture and



Dr. Muhammad Ismail Bhatti, Associate Curator, PMNH, with the participants of Training of Trainers Programme, at National Sugarcane Research Institute, Thatta, Sindh.

participants are getting training on non-formal education to set up Farmers Field Schools on vegetable

growing in the Thatta area. The participants appreciated the role of PMNH/PSF in the science promotion activities.

Meeting on joint research activities

Dr. Muhammad Ismail, Associate Curator (Mycology), PMNH held a meeting with Dr. Sikanadr Khan Sherwani, Sr. Lecturer, Federal University of Science and Technology Karachi, Karachi. They discussed possibilities of joint research activities between the Museum and the University.

Research study on higher plants in Muzaffarabad & adjoining areas

Dr. Sumaira Sahreen, Associate Curator, Botanical Sciences Division, BSD carried out higher plant research study in Muzaffarabad and adjacent areas on August 25-29, 2015.

The main objective of this research study was to record seasonal higher plant flora of the area. She collected more than 200 specimens along with natural photography and recorded other parameters.

ECO Science Foundation delegation visits PMNH

Pakistan to attend meeting of took a round of different the ECO Science Foundation galleries of PMNH and also (ECOSF) Board of Trustees in held a meeting with Dr. MK August 2015, along with the Leghari, Director General, President of ECOSF, Prof. Dr. PMNH and Dr. Muhammad Manzoor Hussain Soomro Rafique, Deputy Director visited Pakistan Museum of General.

Foreign delegates, who were in Natural History. The delegates

Posting/Transfer

During the month of August, Mr. Maqbool Ahmed Qureshi, Deputy Director (Admin) was transferred from Pakistan Museum of Natural History (PMNH) to Pakistan Science Foundation head office as Deputy Director (Estt) and Mr. Muhammad Igbal Khan from PSF to PMNH as Deputy Director (Admin) with immediate effect by the competent authority.



A group photo of the delegates during visit to PMNH.

PMNH scientist guest speaker at 5th National Conference on Biodiversity

Dr. Syed Aneel Ahmad Gilani, Associate Curator, Botanical Sciences Division, PMNH attended and presented a research paper as guest speaker at the 5th National Conference entitled "Trends towards Biodiversity Conservation in Pakistan" on August 02-04, 2015 at University of Peshawar, Barragali Summer Campus. Dr. Gilani presented his research paper on the floral diversity of Cholistan and its impact on the livelihood of the locals. The Vice Chancellor of Hazara University, Dr. Habib Ahmad, presented a souvenir to the guest speaker at the end of the conference.



Dr. Syed Aneel Ahmad Gilani addresses the 5th National Conference "Trends towards Biodiversity Conservation in Pakistan" at Baragali.

Summer Field Study Programme for University of Haripur Students

PMNH is to promote scientific institutes by guiding the

One of the main objectives of in the research and educational activities about natural history students. In the series of such



activities 13 students from the associated wildlife species of Department of Forestry and Wildlife Management, University of Haripur, Khyber Pakhtunkhwa, under the supervision of their Lecturer Mr. Muhammad Kabir, participated in a Summer Field Study Programme held at PMNH from August 26, 2015 to September 04, 2015. The 10day programme was aimed at educating the students on aims and objectives of PMNH, reference collection, fossils records of animals, display of ecological zones and

Pakistan, threats to the biodiversity of Pakistan, preservation of wildlife species, fresh water fish fauna of Pakistan, avian and mammalian fauna of Pakistan. Herpeto-fauna of Pakistan, reptiles and amphibians of Pakistan, butterflies of Pakistan and reference collection in herbariums of.

The PMNH scientists and experts from three Scientific Divisions of the Museum imparted training to the students on above mentioned areas.

airs documentary on PMNH ews Channel records an d

An informative and educational documentary film was recorded by Mr. Asmatullah Niazi, Sr. Anchor Person, PTV Islamabad Centre which was telecast by PTV News Channel. The DG PMNH, Dr. M.K. Leghari and research and public education.

the Director Earth Sciences Division (ESD), PMNH, Dr. Ghazala Roohi spoke in the documentary on role of the Museum. It was a very informative documentary on PMNH role in natural history



Mr. Asmatullah Niazi, Sr. Anchor Person, PTV Islamabad Centre, recording interviews of the DG PMNH and the Director ESD, PMNH.

Data of visitors to PMNH in August

PMNH is playing an important role in public education on natural history through educational tours of students groups and visits of general public to the Museum display galleries. The total number of visitors to PMNH in August 2015 was 11,680



A group photo of students during their visit to PMNH.

including 2,243 students, 5,540 general public, 19 foreigners and 3,878 children bellow 12 years of age. The PMNH staff conducted the guided tours of student groups and facilitated the general visitors to the Museum through guide facilities. PMNH generated a revenue of Rs 1,35,130 through entry tickets this month.



The PMNH Teacher Guide conducts guided tour of a students

Educational stall set up during monsoon tree plantation campaign

PMNH set up an educational President, representatives of stall on the occasion of Azadi the civil society and NGOs. Monsoon Tree plantation campaign 2015 on August 27, 2015 in Park Enclave by the Capital Development Authority (CDA) Islamabad. The Chairman, CDA, Mr. Maroof Afzal, was the Chief Guest on this occasion. CDA Member Environment Syed CDA Chairman visited the Mustafain Kazmi, the PMNH stall and admired its Islamabad Chamber of role in biodiversity Commerce and Industry conservation.

officers and officials of different government and nongovernment organizations, students and people from different walks of life participated in the campaign and planted saplings at the Park Enclave Housing Project. The



People visit PMNH stall set up on the occasion of the Tree Plantation Campaign by CDA

Pakistan Scientific & Technological Information Centre (PASTIC)

Editor: Mrs. Rahila Khurram

Workshop on Intellectual Property Rights Organized at GCUW, Faisalabad



property rights at Government College Women University, Faisalabad on August 28, 2015.

PASTIC Sub-Centre, Faisalabad in collaboration with Government College Women University (GCWU), Faisalabad and Intellectual Property Organization (IPO)-Pakistan organized a one-day Workshop on Intellectual

Property Rights at the GCWU, Faisalabad on August 28, 2015. The workshop was aimed at giving an orientation to the University faculty members about the basics of Intellectual Property Rights (IPRs) and the essential requirements for its



Prof. Dr. Muhammad Akram Shaikh, Director General, PASTIC/Member Science-PSF giving Introductory Remarks about the workshop.

protection. As many as 70 participants including Deans. Directors and senior faculty members attended the workshop.

Prof. Dr. Muhammad Ashraf (SI). Chairman Pakistan Science Foundation, was the Chief Guest, while Prof. Dr. Naureen Aziz Qureshi, Vice Chancellor, GCWU, Faisalabad, was the Guest of Honour at the Workshop.

Prof. Dr. Nighat Bhatty, Coordinator Science & Technology-GCWUF, delivered the welcome address. Prof. Dr. Muhammad Akram Sheikh, Director General, PASTIC/Member Science-PSF gave the Introductory Remarks.

The Chief Guest of the workshop, Prof. Dr. Muhammad Ashraf, Chairman PSF shared his views about significance and requirement of such kind of activities and appreciated the efforts of PASTIC & GCWU for arranging the activity.

Mr. Zahoor Ahmad, IPO-Pakistan gave a detailed presentation on Importance of Patent Information for

Researchers (Drafting & filing Process of patents). Major (R) Muhammad Saeed, Head of School of Computational Sciences, TUF, focused his presentation on Cyber & Software related to Intellectual Property Issues. At the end of inaugural session shields were distributed among the speakers and organizers.



Participants of the workshop at GCWU Faisalabad.



Prof. Dr. Muhammad Ashraf, Chairman-PSF. distributed shields among the participants & speakers of the workshop.

PASTIC National Science Reference Library launches OPAC of MoST

Reference Library has taken selected for developing OPAC, the initiative of developing a namely, Union OPAC (Online Public Foundation and its two Access Catalogue) of all the subsidiaries, PASTIC & organizations under the Ministry of Science & Technology. In the first stage

PASTIC National Science three organizations were Pakistan Science PMNH (Pakistan Museum of Natural History). The catalogue of books of all these

uploaded on PASTIC website. For searching, please visit http://pastic.gov.pk/advancebo oksearch.aspx.

In this connection suggestions and complaints are welcome for further improvement. The same

three organizations has been application android version is also available for smart phones. This application can be downloaded from PASTIC web site http://pastic.gov.pk. And if any problem in downloading, please contact at this email mti@pastic.gov.pk.

PASTIC Information Services at Doorsteps of Universities / Institutions

PASTIC regularly organizes its large Number of students, information services stalls at universities and R&D institutions to bring its services at the doorsteps of researchers. The PASTIC Sub Center, Lahore organized a Services Stall at Department of Botany, University of the Punjab. Lahore, on August 27, 2015. A Stall at Department of

researchers, faculty members and the Chairman, Department of Botany, University of Punjab, Lahore visited the PASTIC stall and inquired about the PASTIC Services. The PASTIC Sub-Centre,

Karachi organized a Services



PASTIC Participates in SDC Trainings

PASTIC, being the National An officer of PASTIC, Ms. Focal Point for SAARC Documentation Center (SDC) facilitates institutions and organizations for participation in training courses regularly organized by SDC. Accordingly, two persons from Mehran University of Engineering & Technology, namely, Mr. Azam Ali Halepoto, Librarian and Mr. Munir Ahmed Shaikh, Member Library Committee were sent for training on "Creation of Digital Repositories" organized by SDC in New Dehli, India from 9-13 August, 2015.

Saima Siddique Tariq has also proceeded for training on "Research Evaluation in Social Sciences for Scholars of SAARC Countries" from 31st August to 11th September 2015 at Bhubaneswar, India. The training is being organized by SDC in collaboration with the Birla Institute of Management Technology (BIMTECH). These training programmes provide a platform for the peoples of South Asia to work together in a spirit of friendship, trust and understanding.



Ms. Ghazala Yasmin, Deputy Director, PASTIC Peshawar, delivering the presentation about PASTIC S&T Servi Chemistry, University of Peshawar, organized a Services Karachi on August 28, 2015. A large number of students, researchers, faculty members Benazir Bhutto Women visited the PASTIC Stall. The PASTIC Sub-Centre,

Stall at Department of Bioinformatics, Shaheed University, Larama Campus, Peshawar, on August 28, 2015.



Students visited the PASTIC Services Stall at Department of Chemistry, University of Karachi.

Awareness Seminar at Ouetta

PASTIC Sub Centre Quetta, arranged one day PASTIC Awareness Seminar at Department of Zoology, University of Balochistan, Quetta, on August 25, 2015. Mr. Faisal Hilal, Acting Assistant Director (STI) delivered a detailed presentation on PASTIC Services. More than 30 students participated in this seminar.

Meetings/Workshops/Trainings Attended Prof. Dr. Muhammad Akram Shaikh, Director General, PASTIC/Member Science-PSF, participated in Best Project Award Ceremony and Open House (79 EC) at College of Aeronautical Engineering organized by PAF Academy, Risal pur on August 21st, 2015.

Pakistan Science Foundation

Constitution Avenue, Islamabad Phone: 9201887, Fax: 9202468 www.psf.gov.pk E-mail: psfsecy@psf.gov.pk

Pakistan Museum of Natural History Garden Avenue. Shakarparian, Islamabad Phone: 9252086, 9252087 www.pmnh.gov.pk

PASTIC National Centre

Q. A. University Campus, Islamabad Phone: 9248103-04, Fax: 9248113 www.pastic.gov.pk E-mail: director@pastic.gov.pk Layout: Abdul Rasool, PMNH

Printed at: PASTIC Press Reprographic Unit, PASTIC National Centre, Islamabad ISO 9001:2000 Certified