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Newsletter of the Pakistan Atomic Energy Commission

May-June, 2007

32nd International Nathiagali Summer College opens

Human capital our unique advantage

Investment in Technology only way out

Innovation to determine wealth and strength of nations: Prof. Atta-ur-Rehman
PAEC undertaking projects for human resource development
in high-tech areas: Chairman



Dr. Atta-ur-Rehman, Chairman, HEC presiding over the inaugural session of 32nd INSC. Sitting from (L to R) Dr. Ansar Parvez, Member (Sciences), PAEC, Mr. Anwar Ali, Chairman, PAEC, Dr. Atta-ur-Rehman, Dr. Riazuddin, DG, NCP and Dr. Hafeez A. Hoorani, Scientific Secretary, INSC

Enormous human capital in the shape of 100 million youth under 25 years is a unique advantage of Pakistan among the comity of nations. We are certain to convert them into innovative minds through proper education and training.

This was stated by Prof. Atta-ur-Rehman, Chairman, Higher Education Commission while inaugurating the prestigious International Nathiagali Summer College jointly organized by Pakistan Atomic Energy Commission (PAEC) and National Centre for Physics (NCP) on June 25, 2007.

He said, this demographic advantage is a unique strength of Pakistan which is not available to many countries with aging populations where predominant number of young people are not opting for scientific pursuits. This is a window of opportunity

for us if we make proper investment in education and training in an enabling environment.

There has been a big change in the area of higher education compared to the past as S&T has found full commitment of the President and Prime Minister of Pakistan for transforming the country into a knowledge economy. There is a realization at the highest level that innovation and technology is the only way out to acquire strength and prosperity, Prof. Atta stated.

To lure back these highly trained individuals going abroad for their P.h.D. studies, we have the necessary infrastructure to absorb them through excellent pay packages and provision of productive work environment. Many already settled abroad have returned home in response to incentives being offered here. The same is evident from the fact that there has been 360 % increase in our research out put, Dr. Atta said.

We have provided such a solid foundation for flourishing of higher education that it will be sustainable in the years to come. Our system offers free access to knowledge and free access to scientific instrumentation. Not a single scientific project presented to us remained without funding. A 15 year tax holiday is being offered for high-tech industry, which will present lucrative opportunities for innovative individuals, Prof. Atta told.

Linkage programmes with foreign institutions are also being funded. We are launching an e-book programme next month with 40000 scientific books on the internet along with provision of linking with international research networks.

Earlier in his welcome address, Chairman, PAEC, Mr. Anwar Ali informed that President of

Pakistan has launched a major initiative for the development of human resource in the field of S&T and in pursuance of the same, PAEC has also undertaken a number of projects including a Centre of Advanced Polymers, an Institute of Optics and Lasers, a Tokamak (toroidkamera-magnit-katushka) Fusion Laboratory and a Synchrotron Light Machine which will offer training and research opportunities to many scientists and engineers.

Adjacent to our premier R&D facility, PINSTECH, is our human resource development centre, PIEAS, which has been ranked as number one engineering university of the country by HEC. With the tradition of research at PINSTECH and addition of new facilities, PINSTECH-PIEAS complex will become world class centre for the development of science and technology. This complex will be accessible to the scientific community, Anwar Ali told.

Establishment of all these facilities will be a momentous task for which we will have to allocate resources to cultivate science. In this context, we look forward to our cooperation with international organizations like IAEA, CERN, Abdus Salam International Center for Theoretical Physics (ASICTP) and others, Mr. Anwar Ali stated.

We in PAEC are making our contributions towards country's development. In addition to our programme in basic and applied sciences, we are working for the uplift of socio-economic sector. PAEC has already been assigned

by the Government of Pakistan to generate 8800 MW of nuclear electricity by 2030. We certainly hope to meet this target. Our medical centres are providing diagnostic and treatment of cancer while our agricultural and biotechnology centres are engaged in new discoveries in their respective areas of research, Chairman, PAEC apprised.

"I must mention here that our achievements would not have been possible without the competence and commitment of the human resource of PAEC, and I take this opportunity to record my appreciations for them", Mr. Anwar Ali concluded.

In his introductory remarks, Dr. Riazuddin, Director, International Nathiagali Summer College informed that during the last 31 years over 600 eminent scientists including six Nobel Laureates shared their knowledge and experience with over 900 scientists from as many as 72 countries. Nearly 6000 participants drawn from universities, colleges and R&D institutes from Pakistan benefited from these colleges.

The college was founded in 1976 by Pakistan Atomic Energy Commission and is being held annually with remarkable regularity. This was 32nd appearance of the college. It has provided a forum for personal contacts and exchange of ideas among scientists of various countries.

After this inaugural session, the entire college shifts to its traditional venue at Nathiagali, where, it has a two week stay comprising academic and social activities.

The first week activity (June 25 - June 30, 2007) is "Nuclear Energy & New Energy Technologies" while the Second Activity (July 02 - July 07, 2007) covers " Technology and Applications of Synchrotron Light Source".

Nathiagali Summer College

A Scenic Venue

Offers frank interaction, absorbing discussions coupled with excursions

Nathiagali is a scenic hill resort lodged in the sylvan slopes of the lower Himalayan range. Perched at a height of 2600 meters in the forest studded hills, it is about three hours drive towards north-east of Islamabad, the capital city of Pakistan. A small village known only to those seeking escape from the heat and with penchant for enjoying natural beauty, it became the venue of a yearly activity of international discourse of the highest level in this part of the world. With the snow-clad views

of Nanga Parbat and other Karakorum peaks, and a cool and bracing climate heavy with the scent of firs and pines, and ablaze in a riot of colour presented by roses, cherries and wild flowers, it provides an excellent blend of tranquil atmosphere conducive for learning and enjoying nature's beauty at its best.

The summer in these resorts is pleasant, with temperatures ranging from 15 at night to 30°C during the day. The monsoons

are unpredictable and unexpected storms with downpour accompanied by short staccato bursts of hail may turn the air quite chilly. From October to March, the once lush green world turns into a whole glistening fairyland. Other places of interest nearby include Murree, Patriata, Ayubia, and Bhurban. Surrounded by thickly wooded pine and chestnut trees, Bhurban is gifted with natural scenic beauty, peace and tranquility.

(Taken from INSC Brochure with thanks)

Summer College Objectives

Breaking the intellectual isolation of the scientists in the developing countries.

Keeping pace with the rapid progress in science and contemporary needs by promoting higher science education.

Placing due emphasis on the interaction of modern trends in physics and their applications in current technological development with special reference to the needs of the countries of the Third World.

Proceedings

In order to ensure wider dissemination of knowledge, the proceedings of the colleges have been published upto the 24th College by Plenum press, World Scientific and Nova Scotia publishers. This year proceedings will be published in Journal of Physics Conference Series, Institute of Physics (IoP) UK, Ltd.

OFFICIAL PATRONAGE FOR INSC AT THE TOP MOST LEVEL

The inaugural sessions of the INSC have mostly been presided over by the head of the state or the head of the government. This has been a source of encouragement, both for the organizers and the participants.

Sponsors of INSC

Since its inception in 1976, INSC has been organized every year by Pakistan Atomic Energy Commission which has also provided the funding base for this activity. Over the years, the principal co-sponsor has been Abdus Salam ICTP, Trieste, Italy, US National Science Foundation and Chinese Academy of Sciences. The College has been co-sponsored by several other agencies

Nobel Laureates Who lectured at INSC

Leo Esaki
Pierre-Gilles de Gennes
Robert Hofstadter
Abdus Salam
Samuel C. Ting
Chen Ning Yang

PAEC-2nd Short Training Course for Medical Doctors on Preparedness for Handling, Treatment and Management of Victims of a Nuclear/Radiation Emergency/Accident

Safety is given utmost importance in all work places at PAEC. We are quite vigilant and prepared for dealing with any radiation or nuclear emergency. This was stated by Dr. Ansar Parvez, Member Science, PAEC, while addressing the concluding ceremony of one week PAEC-2nd Short Training Course for Medical Doctors on "Preparedness for Handling, Treatment and Management of Victims of a Nuclear/Radiation Emergencies/Accidents".

The course was organized by Health Physics Division, Directorate of Systems & Services, PINSTECH for medical doctors within the framework of emergency preparedness programme. It was attended by 22 participants from 12 PAEC and 04 non-PAEC hospitals/ institutions of the country.

The lectures on the course were delivered by learned speakers/scientists from PAEC and specialists from various hospitals of the country. These were mainly focused on radiation detection and measurement, effects of radiation exposure, assessing doses to members of the public, handling and management of radioactive waste, types of radiation emergencies and accident victims, survival skills during nuclear



Participants of the course with Dr. Ansar Parvez, Member (Science), PAEC

emergency, hospital response during radiation emergency, management of acute radiation syndromes, existing medical facilities for handling nuclear emergency in Pakistan, laboratory demonstrations/ visits and video films.

The course consisted of 10 technical sessions (comprising of 22 lectures),

3 technical visits to various laboratories of PINSTECH and a few videos demonstrating different radiation emergency scenarios. Dr. Ansar Parvez Member Sciences, PAEC, distributed certificates among the participants. ■

IAEA Prosper Mission Assesses KANUPP Operating Experience

A six member IAEA led PROSPER mission visited KANUPP from 18-28 February 2007. The purpose of the mission was to review the operational experience feedback (OEF) practice of KANUPP and to assess the comprehensiveness of self assessment programme of KANUPP. The mission recommended management policy guidance and need of a strong reporting culture. The self assessment report of KANUPP on OEF was regarded as commendable by the PROSPER mission. ■



Group photo of participants of "PROSPER MISSION" at KANUPP

AMAT Follow-up Mission at KANUPP

An Ageing Management Assessment Team (AMAT) Follow-up Mission comprising of five IAEA experts visited KANUPP from 12-16 February, 2007 to review KANUPP actions to the recommendations/suggestions provided by the main AMAT mission in 1999. The other objective of the mission was to provide information on ageing management practices in Hungary, Japan, Korea, Canada and Romania. Presentations were delivered by IAEA team members and KANUPP counterparts in their respective areas. Valuable information/knowledge was acquired in perspective of system structure and components (SSCs) ageing management and



AMAT Mission: A view of discussion between KANUPP officials and IAEA Experts

systematic ageing management program (AMP) implementation. Through out the Follow-up Mission the IAEA team recognized considerable progress in plant ageing management activities and appreciated the strong

leadership by the plant management in promoting ageing management at KANUPP. IAEA experts included: Mr. Liviu N. Delcea, Mr. Dongsik kang, Mr. Takeyuki Inagaki, Mr. John Chooneon Jin, and Mr. Tamas Janos Katona. ■

PAEC Arranges Training Course on Vibration Technology

Vibration analysis is a well established technique for condition monitoring of critical machines and equipment in nuclear power plants and industry. According to SAME estimates, about 82 % of all malfunctions in the mechanical equipment can be detected with the help of fibro-monitoring and fibro-diagnostic methods. Taking cognizance of its significance in improving plant performance, the Directorate of Nuclear Power Engineering organized a three-day Level-I certificate training course on Application of Vibration Technology for Fault Diagnosis in Rotating Machines, in Islamabad from 23-25 April 2007. The course was intended for the engineers and managers involved in plant operation, maintenance and equipment design.

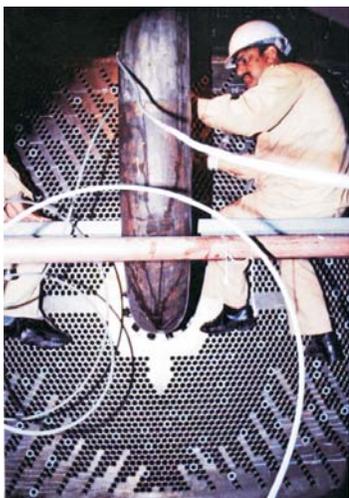
There was an overwhelming response from PAEC projects and other organizations of repute from all over the country.

The course was attended by 61 participants from PAEC, Pakistan Nuclear Regulatory Authority (PNRA), NESCOM, Pakistan Navy, MTC, PMO, WAPDA, Karachi Electric Supply Corporation (KESC), Pakistan Steel and Attock Refinery.

The course was inaugurated by Mr. Zia ul Hasan Siddiqui, Member (Power), PAEC. In their keynote addresses the Member (Power) and D.G. Nuclear Power Engineering highlighted the well-established economic and technological benefits of vibration

technology in industry. They emphasized that nuclear power plants are capital intensive projects, and nuclear electricity costs are competitive if the plants are run with high availability factors over extended period of time. Plant condition-monitoring plays a very important role in achieving this goal. Experience accumulated over a number of operating years of nuclear power plants around the world has shown that the surveillance and fault detection in plant equipment contributes very positively in achieving higher plant factors over its lifetime. Vibration analysis also plays a valuable role in plant ageing management. At the end of the course the participants were distributed VA-level-I certificates. ■

PAEC's Non-Destructive Testing Centre Participates in In-Service Inspection of Chashma Nuclear Power Plant-I



Eddy current testing of condenser tubes in progress



Ultrasonic inspection of welds of a piping system



Thickness measurement by ultrasonics

PAEC's National Institute for Biotechnology and Genetic Engineering (NIBGE) Organizes Course on "Molecular Detection of RNA Viruses"

Infectious diseases in animals & humans remain a key constraint to the development & progress of developing countries. Several RNA viruses being pathogenic for human or animal population are of great concern with respect to health, economic & environmental status of the country. The success of any disease control and eradication program relies on the efficacy of diagnosis, surveillance and monitoring methods. The molecular detection techniques have been successfully exploited to improve both the speed and accuracy of disease diagnosis. In this connection a National training course on "Molecular detection of RNA viruses" was held at National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad from 24-26th of April, 2007. This training course held under an Agriculture Linkage Program (ALP) project that was awarded to Environmental Biotechnology Division (EBD), NIBGE. 25 participants from different institutes, universities and organizations of the country were selected.

This particular course was designed to provide the participants with awareness and background of; molecular biology of viruses, molecular approaches for the detection of pathogens, PCR and its applications,



NIBGE faculty with the chief guest, Professor Dr. Muhammad Nawaz, Vice Chancellor, University of Veterinary and Animal Sciences (UVAS), Lahore

bioinformatics, SNPs and nanobiotechnology. Participants were also provided with practical lab training i.e., field sample preparation, RNA isolation, cDNA synthesis, PCR amplification and PCR product analysis. A manual covering theoretical background and protocols was also provided to the participants.

The chief guest, Professor Dr.

Muhammad Nawaz, Vice Chancellor, University of Veterinary and Animal Sciences (UVAS), Lahore in his concluding address appreciated the work on molecular disease diagnosis which is being carried out by Environmental Biotechnology Division, NIBGE. He further informed that PCR based diagnostic facility for FMD has been established at UVAS and he also acknowledged NIBGE's contribution for this.

Assignments of IAEA Experts in Pakistan

(i) Mr. Liaquat Hussain (USA) and Ms. Wanna Wimolwattanapun (Thailand), carried out assignment as an IAEA Experts at PINSTECH, Islamabad to Assist in National Workshop on Use of Advanced Software for Data Interpretation, Fingerprinting and Source Apportionment including Back Trajectory Techniques from 09-10 April, 2007 and Executive Management Seminar on Improved Information on Environmental Pollution and Management from 11-13 April, 2007 under RCA Project Improved Information about Urban Air Quality Management.

(ii) Dr. Jong-Po Lee (Republic of Korea), IAEA Expert carried out Mission at National Centre for Non-Destructive Testing (NCNDT), PAEC, Islamabad from 26 March to 06 April, 2007 as an IAEA Expert for Task Preliminary Training in the Analysis of UT Data for Nuclear Power Plants under IAEA Technical Co-operation Project Development of Capabilities in Automatic Ultrasonic Testing and Material Corrosion Testing for Structural Integrity Assessment.

(iii) Mr. Zhang Jing, Section Head (TCPA), Programme Management Officer, Division for Asia and the Pacific, Department of Technical Co-operation, (IAEA), visited Pakistan for a Meeting with TC Project Counterparts at KANUPP, Atomic Energy Minerals Centres/Institute of Nuclear Medicine & Oncology (INMOL), Lahore, NCNDT, PAEC HQ, PINSTECH, PIEAS, PNRA, from 26-30 March, 2007.

(iv) Mr. Sukho Lee (Republic of Korea), IAEA Staff Member and Mr. Choong Heui Jeong (Republic of Korea), IAEA Expert carried out Expert Mission at KANUPP from 26-30 March, 2007 for Task: To Review the Report and Implementation Plan on Post Accident Monitoring System of Karachi NPP under Project Improving Safety Features of KANUPP. The following IAEA staff members/experts also joined the team:

Mr. Takeyuki Inakagi (Japan), IAEA Staff Member

Mr. Liviu N. Delcea, IAEA Staff (Romania) IAEA Staff Member

Mr. John Chooneon Jin (Canada) IAEA Expert

Dr. Tamas Janos Kantona (Hungary) IAEA Expert

Mr. Dongsik Kang (Republic of Korea) IAEA Expert

Appointments of PAEC

Experts Abroad

(i) Mr. Zamir Ahmed, Deputy Chief Engineer, CHASNUPP (C-I), Kundian has been appointed Résident Liaison Engineer of PAEC at (WANO-Tokyo Centre) for a period of two years from 29 January, 2007 to 28 January, 2009.

(ii) Dr. Naeem Ahmed Laghari, Bahawalpur Institute of Nuclear Medicine & Oncology (BINO), Bahawalpur is currently on appointment as Staff Physician, Oncology Department, King Abdulaziz Medical City, Riyadh, Kingdom of Saudi Arabia for a period of one year beginning 03 February, 2007.

Director, Bahawalpur Institute of Nuclear Medicine & Oncology (BINO), Bahawalpur is currently on appointment as Staff Physician, Oncology Department, King Abdulaziz Medical City, Riyadh, Kingdom of Saudi Arabia for a period of one year beginning 03 February, 2007.

(iii) Mr. Muhammad Rashidullah, Deputy Chief Engineer, Karachi Nuclear Power Complex (KNPC), Karachi is currently undertaking a assignment as KANUPP Representative with Candu Owners Group (COG) Office, Toronto, Canada for a period of six months from 09 February, 2007 to 08 August, 2007.

Hosting of Events in Pakistan

(i) PAEC in co-operation with IAEA hosted a Scientific Meeting on Regional Consultation on Genetically Modified Cotton for Risk Assessment and Opportunities for Small-Scale Cotton Growers at National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad from 04-09 March, 2007 in which 42 foreigners from different countries attended this Meeting.

(ii) PAEC in co-operation with IAEA hosted an International Symposium on Microbial Technologies for Sustainable Agriculture: Exploring the hidden potentials of Microbes' at NIBGE from 12-16 March, 2007 which was attended by 12 foreigners.

Visit of Foreigners to Pakistan

(i) A four Member Technical Support Team of WANO-Tokyo Centre, Japan visited KNPC (K-I) Karachi from 14-19 January, 2007 for Mission on Condition Assessment of Life Management of Turbine Generator

(ii) Mr. Prathapar, (Australian) visited NIAB, Faisalabad on 15 January, 2007 to deliver a Seminar on his IAEA Consultancy Project for Water Management.

(iii) A four Member Team from M/s. Walischmiller GMBH, Gewerbegebiet Eschdorf, Dresden, Germany visited Isotope Production Division (IPD), PINSTECH, Islamabad in connection with the Installation/Commissioning of Mo-99 Production Plant

(iv) Messrs. Arie Pieter Runiard and Peter Leonard Oldenkamp (Netherlands), Experts in Potato visited NIBGE, Faisalabad on 06 February, 2007 to assess possibility of collaboration with NIBGE.

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(v) Twenty six students from Oman visited NIAB/NIBGE, Faisalabad from 16-18 January, 2007.

(vi) Mr. Kogel Roland (German) Expert from M/s SENTCH Instruments, Gmbh, Germany visited NILOP, PINSTECH, Islamabad from 02-09 March, 2007 for Installation of Ellipsometer and FTIR.

(vii) Mrs. Elizabeth Anne Trevan (Australia) visited MINAR, Multan and NORI, Islamabad from 8-18 March, 2007 and delivered a Lecture on "Planning for the Future, Strengthening PAEC's Mammography Facilities".

(viii) Mr. Ivica Basic, Lead ENTEKO Expert/Technical Advisor and Mr. Srdan Spalj, ENTEKO Expert Lead from ENTEKO Ltd., Croatia visited CHASNUPP-I, Karachi from 12-23 March, 2007 for Execution of Tasks in the Scope of Contract between CHASNUPP-I and ENTEKO Ltd Croatia for the Development of Symptom Based Emergency Operating Procedures for CHASNUPP-I, Kundian from 12-30 March, 2007.

(ix) Prof. Dr. Kazuo Watanabe, University of Tsukuba, Japan visited NIBGE, Faisalabad from 19-20 March, 2007.

(x) An eight Member delegation led by Mr. Jun-Yeon Byun, Director General, Overseas Nuclear Project Department (KEPCO), Republic of Korea visited CHASNUPP (C-I & C-2) during 09-12 April, 2007 and also gave a Seminar on Korean Nuclear Power Industry at Hotel Holiday Inn, Islamabad from 10-11 April, 2007.

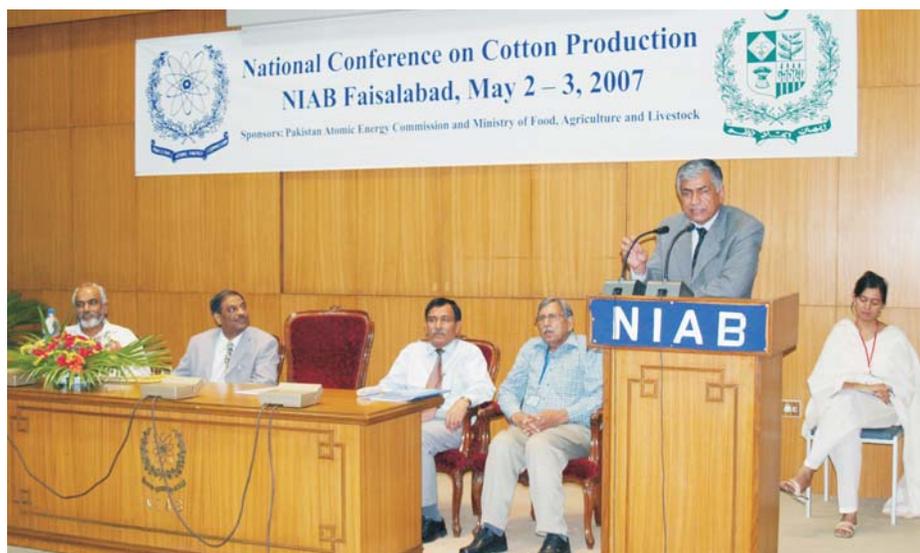
Foreign Trainee under IAEA Award

Mr. Moath Kassim (Yemen National) has started two year M.Sc. degree programme (Medical Physics) at PIEAS, Islamabad from 08 January, 2007.

PAEC's Nuclear Institute for Agriculture and Biology (NIAB) organizes National Conference on Cotton Production

Cotton is an important cash crop of Pakistan grown on more than 7.5 million acres. However the production potential of this crop is under-exploited. To review the present status and future strategies for cotton production, a National Conference on Cotton Production was organized by Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad on 2-3 May 2007. Addressing the inaugural session, the Chief Guest Dr. Qadir Bux Baluch, Agriculture Development Commissioner expressed his confidence that a bumper cotton crop would be achieved in the coming year as a result of the efforts of scientists and government policies. He commended the contribution of 23 crop varieties of NIAB towards national economy and highlighted the role of cotton variety NIAB-78 in uplift of cotton production in the country. Dr. Baluch assured full support from Ministry of Agriculture and Live Stock for R&D activities of the research institutions.

In his welcome address, Dr. M. Ahsanul Haq, Director NIAB presented a brief review of research activities at the institute with particular reference to cotton improvement programme. He mentioned that sustainability of cotton production is vital for our economy but the crop is prone to a number of constraints such as insect pests,



Dr. Qadir Bux Baluch, Agriculture Development Commissioner addressing the seminar

diseases like Cotton Leaf Curl Virus, shortage of irrigation water, high prices of inputs, and lack of awareness and adoption of advanced production technologies. Dr. Ahsan emphasized the need for genetically improved varieties and integrated management practices to materialize the production targets of over 20 million bales set by Government of Pakistan under 'Cotton Vision 2015'.

Over 100 participants representing diverse stakeholder groups like R&D

institutes, universities, policy makers, provincial agriculture departments, seed and pesticide companies, and farmer community attended the conference. A range of topics from genetic engineering, mutation breeding, disease and pest management to irrigation technologies for cotton were covered in the six technical sessions. In view of the importance of cotton in national economy, NIAB plans to make such forum a regular annual activity prior to start of the crop season. ■

Seminar on profitable use of salt affected lands

Saline agriculture is an important biological approach to utilize salt affected lands profitably. In this regard a one day seminar entitled "Profitable use of salt affected lands" was organized by Saline Agriculture Farmers Participatory Development Project, with the coordination of PAEC's Nuclear Institute of Agriculture (NIA), Tandojam and 4B Fertilizers Green Pakistan, Ltd. which was attended by more than 140 participants belonging to farming communities of the area, agriculture related NGOs of

Badin District and agriculture researchers. Director NIA Tandojam chaired the seminar. The project staff delivered lectures in local language about the salt affected lands and their utilization through the application of different biological means. The participants were briefed about the four years activities of Saline Agriculture project at Badin site. The local farming communities highly appreciated the activities of the project in their area. The representatives of the farmers associations said that the

implementation of the project interventions in their area has educated them to solve their agriculture related problems collectively and also made them capable to utilize their salt affected waste lands profitably. The adaptation of modern agriculture techniques and new improved NIA varieties have enhanced the per acre yield of rice, wheat and sugarcane from 40 to 50%. The plantation of salt tolerant tree species provides an opportunity to get a handsome return from these marginal lands. ■