

## CHAIRMAN'S REPORT



This year's annual report chronicles a productive and challenging time at the PARC. The research work illustrated throughout its pages, clearly indicate how the best of science is mobilized to nourish a food secure and sustainable future. I am especially proud to report that PARC's work continues to offer solutions and strategies to face critical issues of food security. It works to help ensure food security for the 21<sup>st</sup> century through its network of research centres and institutions spread all over Pakistan. PARC is not only recognized for scientific excellence; it rather develops real products and technologies for

use on the ground. To strengthen national agricultural research, the PARC fosters relationships with colleagues in national programs, provides capacity building for research staff, and helps to improve skills in research administration and management. Several reviews were conducted at PARC during the year which focused on how PARC should position itself within NARS and the international agricultural research system in the future, the areas of research on which PARC should concentrate, and the structure and governance mechanisms needed to advance PARC's mandate. The momentum of the results and progress the PARC achieved in 2014-15 will certainly strengthen our efforts in 2015-16 and prepare us well to meet the future challenges.

The activities of various technical divisions were handled through in-house research establishments of PARC and through countrywide research programs on various commodities, MOUs with national and international organizations, PSDP and RADP funded projects and also through competitive grant of Agricultural Linkages Program, Ministry of Science and Technology and other institutions.

The focus of Plant Sciences Division (PSD) remained on sustainable improvement in productivity and quality of crop commodities. Major activities towards achieving this goal include provision of relevant germplasm to various NARS partners to facilitate development of improved varieties/hybrids, conducting National Uniform Yield Trials



(NUYT) of various commodity crops and holding of Variety Evaluation Committee (VEC) meetings to release high yielding varieties/hybrids resistant to key biotic and abiotic stresses. The Report highlights the linkages of PSD with national and international research organizations/institutes and also the outcome of significant inland studies conducted to enhance resilience in our cropping systems through adoption of climate smart agriculture based on diversification and innovative technologies.

The Natural Resources Division has successfully derived and tested plant and coal derived humic acids. Biozote is now being demonstrated to rice growing farmers for increased paddy yield. Biozote along with vermin compost produced significant yield improvement in peas and tomato. Solar desalinization technology of PARC is being progressively adopted in water scarce saline areas for portable use and kitchen gardening. Furthermore, crop water requirement for various horticultural crops was determined under different ecologies of Pakistan. A model site for integrated watershed management was established in Kambrial, PindiGheb where efficient utilization of harvested rain water has been made through solar water pumping. Expansion of glacial lakes in HKH region and snow cover dynamics in Hunza River Basin has also been analyzed by the CAEWRI, NARC. Rehabilitation of degraded community rangelands on 200 ha is being done through silvo-pastoral interventions in Chakwal. Honeybee colonies were placed in Margalla Hills and harvested honey has been introduced as *Margalla Organic Honey*. A mungbean variety *Sona Mung* was successfully released in Khyber Pakhtunkhwa. Approximately 18000 olive nursery plants were developed and distributed among olive growers of Balochistan. Studies on new varieties of pistachio & cherries and evaluation of high altitude pastures has been initiated in Gilgit Baltistan.

Animal Sciences Division addressed the innovative research aspects of livestock, poultry and fisheries sectors. During the year, the main emphasis of research work was laid on studying the pathogenesis and pathogen characterization; diagnosis and control of trans-boundary viral pathogens; foot and mouth disease *Peste des Petits Ruminants* and surveillance of selected zoonotic diseases i.e. Brucellosis and Crimean Congo Haemorrhagic Fever. The National Reference Lab for Poultry Diseases (NRLPD) endeavored to develop better avian health management systems including disease monitoring and its management by introducing better diagnostic and control strategies along with supporting human resource development at the provincial and regional level

with the technical and financial assistance of national and international institutions. Work is in progress for large scale application of Timed Artificial Insemination (AI) and oestrus synchronization along with improving semen quality and its preservation techniques in buffalo and cows. Angora rabbits and the improved desi layer chicks for rural backyard poultry keeping on commercial basis is a continuous activity. The PARC Feed Technology Unit has expanded its sales in the current year for the livestock farmers. Besides, several new facilities were introduced for the farmers of ICT area like PARC Veterinary Mobile Clinic and bale silage technology development at Livestock Research Station, NARC. Amino Acid Analyzer has been made functional for feed formulation on amino acid content basis. Aquaculture and fisheries sector focused on intensification of fish culture and establishment of American Channel Catfish hatchery for mass seed production to promote its culture in Pakistan. The Animal Product Improvement Program initiated marketing of research based cheese and yogurt. Research on ostrich breeding was also started at the NARC premises for introducing this new meat product among the farming community.

Social Sciences Division (SSD) is bestowed with the responsibility of carrying out research on socio-economic and agriculture policy related aspects of Pakistan's agriculture sector. It operates through its six satellite Social Sciences Research Institutes (SSRIs) located in all provinces, AJK and at NARC, Islamabad. These institutes carry out research on socio-economic aspects relating to farmers in Pakistan apart from extending a helping arm to provincial agricultural research systems. This has not only bridged the information gap on micro-level issues of farming, technology evaluation & adoption but also resulted in the development of new crop, livestock and farm mechanization related technologies in the country. During 2014-15, more than 30 studies have been carried out; of which 15 have been briefed in this Report. The sectors covered are major and minor crops, livestock and horticulture. The research themes directly and indirectly addressed are agricultural production and value chains; technology transfer and impact analysis along with cross cutting themes like climate change and use of alternate energy sources in agriculture.

The newly established Agricultural Engineering Division (AED) of Pakistan Agricultural Research Council (PARC) is actively involved in the design, development, monitoring and implementation of research projects related to the scope of this Division. Agricultural engineering research for sustainable agriculture production is conducted in the areas of land preparation, seeding, planting, crop harvesting, and post harvest



machinery. Major machines designed, developed and implemented are power disk plough, onion seed planter, peas planter, fertilizer band placement drill, mobile flat bed dryer for drying of groundnut, seed storage bin cum dryer (for storage of rice), wood chipper shredder, hot water treatment plant for mangoes, sisal decorticator, solar dryer (for drying of dates) and biomass furnace for greenhouse heating. A project on Post Harvest Management funded by SAARC Development Fund (SDF) was initiated to work on the post harvest drying, processing and packaging technologies for dates and banana in their production catchments at Khairpur and Sukkur Districts. PARC established a new field station namely "AZRI Technology Field Station, Khairpur" to promote value added technologies in these areas under the SDF Funded Project. Agricultural Engineering Division is an active member of the Centre for Sustainable Agricultural Mechanization (CSAM) based at Beijing, China. PARC participated in most of the activities undertaken by CSAM and sponsored by UNESCAP. This includes; (i) Participation in 2<sup>nd</sup> Regional Forum in Indonesia; (ii) Asian and Pacific Network for Testing of Agricultural Machinery (ANTAM) meetings and activities, and (iii) Establishment of Regional Council of Agricultural Machinery Association in Asia and the Pacific.

In the light of the recommendations given by the Independent Third Party Evaluation (ITPE), and directives of the BOG of PARC a Five Years Business Plan of PARC was jointly prepared by PARC and FAO experts. To follow various technical and reforms areas of the business and to assess its implementation, a Result Based Monitoring and Evaluation (RBM&E) Framework was developed in consultation with the International Centre for Integrated Mountain Development (ICIMOD). PARC has adopted the RBM&E framework and I am proud to claim that PARC is the second organization in Pakistan who has developed and adopted such a system of planning, monitoring and accountability, which is performance based at the organization, private institute, program, project and personnel level. This was the first year of its implementation. The difficulties faced by the scientists and research managers in understanding the conceptual premises of the RBM&E framework and filling up various formats were considered by the management and a module for training of the scientists has been designed in consultation with Pakistan Strategy Support Program (PSSP) and Asian Centre for the Organizations Development (ACOD) Islamabad, a private sector organization. A round of the trainings has been planned to be arranged at each Centre of PARC. After learning these hands on skill, the scientists will become familiar with the theory, concepts, and practices of RBM&E. This whole process will enable the



organization to run its business as per its medium term plan and to assess the progress of various components of the organization according to its mandated functions.

Under the Agricultural Linkages Program (ALP), the processing of 7<sup>th</sup> batch of grants started with more than 650 new research proposals floated by the scientists from all over Pakistan of which 122 detailed projects were processed. During the year, 78 projects were on-going in various disciplines of agriculture in the NARS. To-date more than 300 projects have been completed which have significantly contributed towards agricultural growth and development. The ALP has started another portfolio for the benefit of researchers, which provides funds for exchange visits of scientists; payment for publishing of research papers in refereed research journals; and to attend the international conferences. Soon it is going to institute a program of awards for the highly productive scientists in various fields of agricultural research. Prior to this, another imitative in technical proposal writing was taken to build capacity of agriculture scientists and academia in collaboration with Pakistan Strategy Support Program (PSSP) of USAID. Seven training workshops were organized for the scientists from federal and provincial organizations of agricultural R&D. More than 200 scientists were involved from Punjab, Sindh, Khyber Pakhtunkhwa, Balochistan, AJK, Gilgit Baltistan and federal area. Consequently, the quality of research proposals has significantly improved.

Public Sector Development Program is another biggest source of funding for the R&D activities of PARC all over the country. Fifteen large and small R&D projects were ongoing during the year with total cost of Rs. 8.339 billion (for FY 2014-15 Rs.930 million allocated). These covered a mix of activity areas like institutional development for genomic research in plants and livestock, livestock and horticulture research institution building in Balochistan, cooperation for use of Chinese technologies for development of new varieties, hybrids development, kitchen gardening, pesticides residues monitoring system, promotion of olive cultivation, fish stock and feed development, capacity development of Khyber Pakhtunkhwa extension services, etc. Four new projects have also been approved awaiting funds to start in the next year. The Research for Agricultural Development Program (RADP) was launched in April 2007 with total cost of Rs. 2963 million for a period of 60 months. Due to overall financial environment in the country, the allocation of financial resources and release remained far below than those reflected in the PC-I.



Agricultural Innovation Program(AIP) for Pakistan is the product of a consultative process led by the PARC in its capacity as the leading national facilitating and convening authority for science and innovation in agricultural development for Pakistan. This is a USAID initiative funded through and managed by CIMMYT in partnership with PARC and other stakeholders. The goal of AIP is to increase crop productivity and production value of livestock, horticultural and cereal crops, thus increasing income of Pakistani farmers. AIP has direct effects on a large number of farmers through targeted commissioned projects. This is a multi-institute program designed to attract highly skilled staff of national and international repute including the involvement of other international centers as primary partners like ILRI, IRRI, AVRDC and UC Davis to support agriculture research community in Pakistan in achieving the goal of the Program. The Program is much more than a research undertaking. Through this Program, the governments of Pakistan and US have invested heavily in capacity strengthening to assist Pakistan in revitalizing its national research system and integrating the private and public sectors around pro poor science, technology and innovation. The Project is a long term Pakistan owned, Pakistan-led undertaking.

I am pleased to report that the commissioned projects of AIP are progressing at a steady pace in the right direction to achieve growth and prosperity in Pakistan's agriculture sector. In less than two years time, AIP in partnership with the National Agricultural Research System in Pakistan has made significant progress on out-scaling technologies and practices to generate greater impact. I am very confident that AIP with the support of national and international partners will continue to grow and further help us improve the agricultural productivity and economy of Pakistan.

The Coordination & Monitoring Division of PARC remained involved in identifying the areas of cooperation between the National Agricultural Research System (NARS) of Pakistan and various friendly countries, also UN/CGIAR/US based agricultural research agencies in consultation with Ministry of Foreign Affairs, Economic Affairs Division, Ministry of Climate Change and Ministry for National Food Security and Research. It has played crucial role in obtaining the membership of: (i) International Federation of Organic Agriculture Movements (IFOAM), (ii) Centre for Sustainable Agricultural Mechanization (CSAM), and (iii) Centre for Alleviation of Poverty through Sustainable Agriculture (CAPSA). During the year, 11 international/national MoUs/Agreements were signed with Public sector organizations, NGOs and private firms. Meetings were convened with Inter Provincial Agricultural Research Coordination Committee

(IPARCC) and International Development Partners' Forum.

PARC was allocated Current Expenditure Budget of Rs 2415.000 million for the year 2014-15. An amount of Rs. 930.165 million was allocated as Development Expenditure Budget for the ongoing PSDP Projects of the year 2014-15 which was subsequently revised to Rs. 756.87 million thus surrendering Rs. 173.295 million. The principal amount of Rs. 1300.0 million of the Agricultural Linkages Program (ALP) Endowment Fund was kept intact and the funds generated through income from this investment were used to finance the research projects under ALP. A total of 14 Projects at the cost of Rs 186.795 million were approved under MOUs with different national and international organizations.

The successful initiatives of PARC owe a great deal to the strategic visioning and guidance of the Federal Minister for Food Security and Research and the enlightened leadership at the Ministry for National Food Security and Research (MNSFR). I would like to express my profound appreciation to the scientists, staff, our NARS partners and collaborators for their dedicated efforts and considerable achievements documented in this Annual Report. We acknowledge with great appreciation, the financial contribution of donors in making such achievements possible. The significant contributions of the Governing Board towards greater stability and direction are highly acknowledged. We would like to assure our stakeholders that PARC will continue to deliver by translating investment into research to respond positively to the challenges of food security and contribute towards poverty alleviation. The ultimate aim is to achieve prosperity in Pakistan through excellence in agricultural research.



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