MNS University of Agriculture, Multan

ANNUAL REPORT
2021-22

Agriculture Complex, Multan-Punjab-Pakistan www.mnsuam.edu.pk +92 61 9201541, 9201560

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VICE CHANCELLOR'S MESSAGE

Dear Readers,

It is a matter of honor and immense pleasure that destiny has given me the opportunity to lead yet another successful year of MNS University of Agriculture, Multan. With a fresh aura of energy, I proudly present the annual report of the university for the year 2021-22. The higher education scenario has witnessed a significant change in approach and a remarkable growth around the world. In Pakistan as well, higher education has readily adapted to the global demands and every institution in the country has geared up to meet the challenges by harnessing latest technologies on educational front. The move towards inter-disciplinary studies, research based and interactive learning with technology integration have opened up several options as well as created multiple challenges.

In the wake of economy-based system of education in Pakistan, the major focus should be on creating an optimized and vibrant platform for quality in knowledge enhancement and bridging the gap between academia and industry with an objective to build up core competence in students integrating knowledge with skills on the foundation of ethics and values.

As strong believers and practitioners of Robert Schuller's dictum "Tough Times Never Last but Tough People Do", we started this year with the 2nd Convocation of the university. It was proud moment to see the energy of our youth as they walked down the aisle holding their degrees, and some of them wearing medals with pride and enthusiasm. As the year passed by, the university has witnessed many visits by foreign researchers and entrepreneurs and has gathered appreciation at every forum. The entrepreneurship development activities and establishment of “Business Incubation Center” in the University extend full support to the young entrepreneurs to nurture their ideas with innovation and creativity and establish an enterprise for knowledge transfer and wealth creation.

As an agriculturist, I have profound concerns for energy crisis and adverse effects of deforestation on the environment. Earlier this year, the “Plant for Pakistan” campaign was launched by MNS University of Agriculture, Multan and numerous plants were planted by the students and faculty members. The activity was also extended beyond the university premises and about 300 saplings were planted on the road that leads to the campus. As a proud proclamation, I would like to mention that MNS University of Agriculture, Multan has been ranked as the most sustainable university in the country.

Interfaith harmony holds special place in my heart and to inculcate tolerance and love towards humanity in the students, my staff and faculty members leave no stone unturned to arrange seminars on peace and to celebrate events like Christmas. I ensure that our students are active in co-curricular activities as much as their involvement in their academic pursuits.

That's why different societies and clubs are fully-functional and they guarantee maximum students' participation.

A Sports Gala was successfully arranged in the university this year and I was over whelmed to see that a number of institutions from around the country had participated in that event.

I strongly believe that MNSUAM is marching ahead in the right direction, providing a holistic education to the future generation and playing a positive role in nation building. We reiterate our endeavor to provide premium quality education accessible to all and an environment for the growth of over-all personality development leading to generating "Global Professionals". Our scholarship program is providing an opportunity to the students to get international exposure which is the call of this rapidly growing era. The Office of Research, Innovation, and Commercialization (ORIC) and the Office of Quality Enhancement (QEC) have significantly contributed to the growth and success of this institute.

I would sum up my message by quoting the national poet of Pakistan, Dr. Muhammad Iqbal, who says "Failure is not fatal until we surrender, trying again is the key to glorious victory"

Welcome to the exciting and rejuvenating journey of this year with MNS University of Agriculture, Multan!

Prof. Dr. Asif Ali (T.I)
Vice Chancellor

EXECUTIVE SUMMARY

Agriculture sector in Pakistan is the major contributor to the GDP and exports, thereby boosting the country's economy. MNS University of Agriculture is the institute which connects the farmers with researchers, students with field men, academicians to industries and community to the greater cause; community engagement and active citizenship. From developing the state of the art campus, to fighting with the perks of pandemic, the challenges never came slow but our resilience as a team and hard work had paid it all. It is the efforts of our institute that made it possible for this University to secure the top rank in the country as the most sustainable university of Pakistan. The annual report summarizes the journey of this year.

The first chapter covers the Academic Activities describing the degree programs offered and some details of faculties and departments beside key achievements which include the successful completion of the interim visits of National Technology Council of Pakistan for B.Sc. Agro-Industrial Engineering Technology, Department of Agribusiness and Applied Economics to start PHD in Agriculture Economics, approval of the curricula M.Sc. (Hons.) AIET and M.Sc. (Hons.) Agri. Engineering programs from the Board of Advanced Studies and Research (BASR), Department of Agribusiness and Applied conceptualized and got an approval for the Entrepreneurship Lab to facilitate undergraduate and postgraduate students etc. Foreign academic linkages have been strengthened this year and University is in connection to renowned foreign universities like University of Greenwich, UK, University of Bonn, Germany and many others.

Research and Developmental activities including research projects, publications, workshops, seminars and conferences are discussed in the second chapter. This year faculty has submitted 58 different research projects to various national and international funding agencies including ACIAR, RASTA-PIDE, DAAD, AVFH, UK (GCRF), Texonomy Polymouth, IsDB, IFSOLAR-IWMI, RASTA CGP-0.4, WHO/TDR-2022, and funding was awarded to 33 projects, student FYPs from Ignite and skill development under Kamyab Jawan worth 7.18 million. The execution of 63 projects, including 11 international and 52 national research projects (worth PKR 895.504 million) is in progress. The University organized seven national and international conferences, ten competitions, and 60 national and international Webinars. The capacity building and mentoring activities include 37 faculty training/workshops and 34 training of students/researchers under the Central Lab System with 109 outreach and recreational activities. It also covers information related to Mango Festival, DICE, Dunya Kisan Mela, farmer advisory and industry consultancy activities, working with communities through social action plans on multiple socio-economic opportunities.

Chapter three focuses on Quality Assurance and reflects tireless efforts towards ensuring quality of education and research at the University. The Quality Enhancement Cell (QEC) of the Varsity is mandated to ensure quality teaching and research through keen assessment for better outcomes. This year, QEC has assisted the faculty to use different platforms (Zoom, LMS, Google meet) and interactive sessions with the students through various platforms. This Chapter also highlights the details about the initiation of new postgraduate degree programs, annual technical review of TTS faculty, plagiarism checking, and capacity building of faculty and students as well as impact of quality assurance at the campus.

Teacher evaluation information had been collected from both undergraduate and postgraduate students. Whether it is capacity building, accreditation of undergraduate programs or preparation of curriculum for Outcome Based Education or Hybrid/Blended Learning, the QEC had always been an active and adept part of University administration.

The fourth chapter encompasses details of faculty development trainings/workshops to nurture their teaching, research, and leadership skills. During 2021-22, more than 70 faculty members were benefited from faculty/staff workshops, 8 pre-service and in-service faculty members were endowed with the facility of faculty development programs (both foreign and local MS/PhD) this year.

Chapter five elaborates quick facts about discipline-wise and gender-wise student enrollment etc. Basic enrollment during 2021-22 was 1787 with 1311 male and 476 female students, respectively. The maximum enrollment of 462 students was observed in B.Sc. (Hons.) Agriculture program. Furthermore, 216 students were enrolled in M.Sc. (Hons.) Agriculture program, and 12 scholars started pursuing doctorate degrees. Till the end of the academic year 2021-22, the total number of faculty reached to 139, out of which 96 possess doctorate degrees.

Chapter six (Universities Building Economies) contains information about liaisons developed by the University with local and foreign institutions/organizations like PEEP, USAID, CCI, DICE-AFS and SMEBFC, PMAS, ICI etc. In this Chapter, the collaborative activities and events like Mango Festivals, Establishment of South Punjab Agricultural Forum, Establishment of Modern Mango Small Tree System, Establishment and Propagation of Miscanthus and Sisal as a Pulp and energy Crops, Hand-on Training on Conversion of Household Waste into Organic Fertilizer, Veterinary Hospital are discussed in detail. Initiatives like mutual Cooperation Agreement Inked between MNSUAM and National Bank of Pakistan, Capacity Building/Training on Protected Soilless Farming, and Demonstration of IPM for Cotton are also discussed. Strengthening of physical infrastructure plays a vital role in the development of any educational institute. On the other hand, strengthening of technological Infrastructure is also essential as it brings new opportunities and advanced means for improving access and quality of higher education. Chapter seven exhibits the information regarding the developmental projects initiated by the University at main campus and Jalalpur Pirwala Experimental Farm and success stories in this regard. University has come a long way from its humble suburban beginning to its current state and its planned expansion to a new state of the art campus and MNS University of Agriculture, Multan Phase-II has also been initiated. Construction of Masjid Fatima-Tu-Zahra and Central Library has also been built the varsity premises. Next chapter provides details of ICT infrastructure and automation services including computer labs, digital library, PERN services, video conferencing facilities, wireless LAN, biometric attendance system, learning management system, New Video Conference rooms are fully equipped and functional at MNSUAM.

Chapter nine is about “University Building Communities” that reveals information about the farming and scientific community service-oriented activities, which the Varsity considers as its obligation. MNSUAM is Ranked as the Most Sustainable University of Pakistan in UI Green Metric World University Rankings. University has an active policy of public service and vigorously engages the community in all its academic and non-academic activities. Some major events/activities during this year include Special Lecture on The Risk Factors for Adverse Outcomes with COVID-19, Seminar to Raise Awareness on the Issue of Violence against Women, Training on water and Soil Analysis, Kashmir Day celebration, Seminar on 'Fikr-e-Iqbal', Awareness Webinar on Addressing Zinc Deficiency through Biofortification of Wheat in Pakistan, Webinar on the Eve of World Youth Day and world Father's Day etc.

MULTAN: THE CITY OF SAINTS

Welcome to the city of saints; rich of culture, colors, history, and an epitome of modernization. Multan has a population around 2,106,000. It is considered to be one of the oldest cities of Pakistan and its history fades away in the mists of myth and mythology. Multan is the birthplace of renowned Sufis like Baba Farid and it is the resting place for many like Sheikh Bahauddin Zikria, Bibi Pak Daman, Shah Shams Tabrez and Shah Rukn-e-Alam. It has a significant contribution to rich Sufi culture in the subcontinent. The aforementioned Sufis preached the teachings of Islam and are considered to be the flag bearers of peace and harmony among the region. The Sufi culture of Multan is a fresh blow of air to the otherwise hot weather of the region. The shrines and mausoleums that are considered to be the identity of the city are adorned with the touch of blue and white Mongolian art, the famous blue pottery which is embedded in the culture of Multan. Famous and historically significant mosques in the city like Jamia Mosque, the first mosque to be built here by Muhammad Bin Qasim when he conquered this city, Sawi Mosque, Mosque Baqarabadi, and Mosque Ali Muhammad Khan stand in gratitude to the Creator. Taking in account the history of this city, one cannot forget to mention the famous gates of Multan known as Lohari Gate, Pak Gate, Haram Gate, Daulat Gate, Bohar Gate and Delhi Gate. Old bazars like Hussain Agahi, narrow streets that blanket these gates add to the richness of cultural heritage of this city. From Qilla Qasim fort to the Ghanta Ghar chowk, or Clock tower, there is a patch that covers the history of this city from old sufi saints to the influx of British Raj in the subcontinent.

Say two words, “Multan” and “Winters” in front of a food-lover, and the next thing you will hear will definitely be Sohan Halwa. Sohan Halwa is to winter what mangoes are to summer, except the former is not limited just to the winters. This famous sweet which has become the defining symbol of Multan is available and carried through all over the country any time of the year. When talking about the treat for the people of Multan in summers, it is the king of the fruits, the Mango. Mango orchards on the eastern side of the city blossom throughout the summer season. Out of 150 varieties of mangoes grown in Pakistan, their major production is carried out in Multan. Anwar Ratol, Langra, Dussehri, and the infamous Chaunsa, all are widely cultivated in Multan. The ripening season of Chaunsa lasts from July till late August.

Multan has the second oldest medical institute built by Sardar Abdul Rab Nishtar, known as Nishter Hospital, which was extended to Nishter Medical College and later upgraded as Nishter Medical University. It has various departments and considered to be Punjab's largest hospital in terms of area. Talking about old institutes in Multan, let's not forget Bahauddin Zakariya University named after the Sufi saint Hazrat Bahauddin Zakariya. Established in 1975, BZU is one of the largest universities in Punjab. MNS University of Agriculture is another emerging institute in Multan, which is environmentally the most sustainable university in the country and ranked 1st among Pakistan. It has covered a long and toilsome journey to move from its humble suburban vicinity to the present state of the art campus. Agriculture-based research and highly qualified staff of this university is a blessing for the farmers and this institute plays a vital role in introducing modern techniques to the traditional practices in the field of agriculture. Another gigantic structure that adds to the beauty of this city is the State Bank of Pakistan's building located in the heart of the city. Neighboring some other significant structures like Multan Arts Council, Multan Chamber of Commerce, and Sports Complex, the building was completed in 1998 and is an epitome of modernity and adroit architect.

Talking about all other metropolitans of Pakistan, Multan is considered to be the most peaceful city, with a well-developed infrastructure. Big investors are now making investments in this city and it is developing rapidly as different housing societies, malls, industries, and restaurant chains are coming to Multan, taking it to the next level of development and modernization. Overall, if you want to connect to the history and enjoy the aspects of the modern world, Multan is definitely one of the best cities to visit in Pakistan.

THE MNS UNIVERSITY OF AGRICULTURE

The MNS University of Agriculture, Multan (MNSUAM) is an HEC recognized higher education institution established in 2012. Within a short span of time, the University has made rapid progress in terms of expanding its academic programs, students' enrolment, physical infrastructure, campus network, and hiring highly qualified and experienced academic and administrative staff. As a matter of fact, MNSUAM is considered as one of the fastest growing academic institutions of Pakistan, which is evident in the reports and comments made by officials from HEC, NAEAC, Agriculture Department, Representatives of the Government, and local and foreign experts, who visit the varsity from time to time.

The main campus of the University is located at Old Shujabad Road, Multan, neighboring several different wings and formations of Punjab Agriculture Department positioned within a radius of 2-3 kilometers. These include Mango Research Institute, Central Cotton Research Institute, Cotton Research Station, Agricultural Mechanization Research Institute, Soil and Water Testing Laboratory, Directorate of Water Management, Agricultural Extension Wing, Pest Warning and Quality Control of Pesticides, Fisheries Department, Federal Seed Certification and Registration Department. All these offices and the University have combined into an “Agriculture Complex” with a common agenda of facilitating the farming community of the region. The University's main campus is spread on an area of 180 acres at a prime location in Multan and consists of purposefully built buildings including Academic Block, Administration Block, Girls and Boys hostels, Library, Faculty and Staff residences etc. For carrying out agricultural research activities, the University has established a separate graduates block, centralized labs system, agricultural farms at the main campus as well as at Jalalpur Pirwala comprising 500 acres.

Over the years, the University has introduced several new degree programs to provide multidisciplinary education to the students with innovative approaches. The University has strengthened its teaching resources by hiring new qualified faculty through regular, TTS and IPFP appointments following a transparent and rigorous process of recruitment. The administrative offices have also been manned with qualified and experienced staff members to provide necessary support to the University for carrying out its functions. The University has instituted a Center for Agricultural Sustainability in South Punjab (CAS-SP) and Department of Outreach and Continuing Education this year to strengthen it research and outreach initiatives. The Office of Research, Innovation and Commercialization (ORIC) is working for capacity building of the faculty for enhancing research activities. The Quality Enhancement Cell (QEC) is mandated to ensure quality teaching and research through continuous assessment for better outcomes. The Directorate of Students Affairs provides all necessary support to students with respect to their admission, selection of subjects, registration, financial support etc., whereas the Career Development Center helps them find suitable jobs after completion of their degrees. It is worth mentioning here that the University manages more than 60 percent of its final semester internships as paid internships which provide an excellent learning environment to the young graduating students. Furthermore, overwhelming employability of MNSUAM graduates in the private sector shows the competitive strength of the university graduates.

The University regularly conducts national and international events including conferences, seminars, workshops, and festivals. Some activities have now become the trademark of this University such as Dice-AFS, Sino-Pak International Cotton Conference, Climate Smart Agriculture Conference, Smart Plant Protection Conference, International Conference on Bee Pollination and Conservation, Spring Festival, Kisan Mela, Fish Mela, Annual Cotton Seminar and Mango Festival. The University has the honor of among the top 5 teams in the national Microsoft Imagine Cup during the last two consecutive years. Acknowledging the efforts for developing a Sustainable Campus, the UI GreenMetric World University Rankings 2021 has ranked MNSUAM at number 1 among the universities across Pakistan. With a vision to highlight a positive image of our country onto the canvas of the world and lure international markets for bilateral trade, investment and business, the University is actively playing its part to explore new horizons for economic betterment of Pakistan.

Muhammad Nawaz Shareef
University of Agriculture
Multan

ACADEMIC ACTIVITIES

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CHAPTER-1

ACADEMIC ACTIVITIES

In order to ensure production of trained human resources and to meet a wide array of needs of scientists, experts and extension workers in the rapidly growing agriculture sector, allied trades and industries, the University offers integrated teaching and research programs in agriculture and allied sciences. The University has come a long way from its humble beginning to its current state as an expanded campus with fully operational teaching Labs, research farms, and a well-equipped Graduate Labs Block. During the short span of its existence, the University has escalated its existing academic programs while offering several new degree programs to provide multidisciplinary education to the students with innovative approaches. We relentlessly strive for excellence in all aspects of education, use of modern techniques and embracing relevant innovations, exceptional campus environment, student and community services. University is progressing well in the blended education system. We have put our students' education and experience at the heart of our decision-making. To meet the modern pedagogical standards, we are progressing well in the blended learning system and citizenship education. The faculty, students, and administration are committed to fulfilling their responsibilities to achieve academic aspirations.

1.1. Faculties & Departments

- Faculty of Agriculture and Environmental Sciences
  - Department of Agronomy
  - Department of Food Science and Technology
  - Department of Home Sciences
  - Department of Horticulture
  - Department of Soil and Environmental Sciences
  - Institute of Plant Breeding and Biotechnology
    - Biotechnology
    - Plant Breeding and Genetics
    - Seed Science and Technology
  - Institute of Plant Protection
    - Entomology
    - Plant Pathology
- Faculty of Agricultural and Bio-Systems Engineering and Technology
  - Department of Agricultural Engineering
- Faculty of Social Sciences and Humanities
  - Department of Agribusiness and Applied Economics
  - Department of Computer Science
  - Others Supporting Departments
    - Department of Agricultural Extension
    - Department of English
    - Department of Islamic Studies
    - Department of Outreach and Continuing Education
    - Department of Statistics

- Center for Agricultural Sustainability in South Punjab

➢ Faculty of Sciences
➢ Faculty of Food and Home Sciences
➢ Faculty of Veterinary and Animal Sciences
- Department of Anatomy
- Department of Animal Feed and Production
- Department of Biochemistry and Biotechnology
- Department of Clinical Sciences
- Department of Fisheries and Aquaculture
- Department of Pathobiology
- Department of Pharmacology and Physiology
- Department of Poultry Sciences

1.2. Degree Programs Offered

1.2.1. Undergraduate

The undergraduate programs offered by the University with duration and requisite qualification are given below:

Name of Degree	Credit hours and duration	Academic qualification	Minimum requirement
B.Sc. (Hons.) Agriculture	141 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical/Pre-Engineering)/ Pre-Agriculture	
B.Sc. (Hons.) Environmental Science	137 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical/Pre-Engineering) or equivalent qualification	
BBA Agribusiness	132 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical/Pre-Engineering)	
B.Sc. (Hons.) Agricultural and Resource Economics	138 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical/Pre-Engineering) or ICS with Economics or I.COM	Minimum 50% of total marks
BS Computer Science/ BS Data Science	133 credit hours for duration of 8 semesters/130 credit hours for duration of 8 semesters	F.Sc . (Pre-Engineering)/ICS/A-level students (with Mathematics)/ F.Sc. (Pre- Medical)/ A-level students (with Biology). 1. Minimum 50% marks in intermediate 2. Reserve two (02) seats for DAE (specialized in electrical, electronics and Telecommunication) students.	

		Note: Students of F.Sc. (Pre-Medical)/ A-level students (with Biology) must have to take deficiency courses of Mathematics of 6 credit hours within one year of their regular studies.
BS Information Technology	135 credit hours for duration of 8 semesters	1. F.Sc. (Pre-Engineering)/ICS/A-level students (with Mathematics)/F.Sc. (Pre- Medical)/A-level students (with Biology). 2. Minimum 50% marks in intermediate. 3. Reserve two (02) seats for DAE (specialized in electrical, electronics and Telecommunication) students. **Note:** Students of F.Sc. (Pre-Medical)/A-level students (with Biology) must have to take deficiency courses of Mathematics of 6 credit hours within one year of their regular studies.
B.Sc. Agro-Industrial Engineering Technology	138 credit hours for duration of 8 semesters	Intermediate Science F.Sc. (Pre - Engineering/Pre- Agriculture/Three years Diploma of Associate Engineering (DAE), A-Level
BS Poultry Science	135 credit hours for duration of 8 semesters	Intermediate science (Pre-medical) Candidates having F.Sc. Pre-Engineering with 50% marks will be eligible subject to study deficiency course in Biology: Essentials of Biology BIO-301, 3(2-1). Candidates having F.Sc. Pre-Agriculture with 50% marks will be eligible subject to study deficiency course in Biology: Essentials of Biology BIO 301, 3(2-1).
B.Sc. (Hons.) Animal Science	138 credit hours for duration of 8 semesters	A candidate must have passed F. Sc. (Pre-Medical) or standard equivalent examination with at least 50% marks from University or Boards with Physics, Chemistry, and Biology. Candidates having F.Sc. Pre-engineering and F.Sc. Pre-Agriculture degree are eligible for admission, subject to qualifying the deficiency course in Biology: Essentials of Biology BIO 301, 3(2-1).
BS Microbiology	135 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical)

BS Zoology	129 credit hours for duration of 8 semesters	F.Sc. (Pre-Medical)/A-level students (with Biology)	Minimum 60% of total marks
B.Sc. (Hons.) Human Nutrition and Dietetics	141 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical), A-Level	
B.Sc. (Hons.) Home Economics	135 credit hours for duration of 8 semesters	Intermediate Science (Pre-Medical), A level, Intermediate (Home Economics)	

1.2.2. Postgraduate

Degree/ Discipline	Program	Duration (Semester)		Admission Criteria	Eligibility
		Minimum	Maximum		
M.Sc. (Hons.) Agronomy, Agriculture Economics, Biotechnology, Entomology, Food Science and Technology, Horticulture, Plant Breeding and Genetics, Plant pathology, Soil Science	Regular	4	6	Screening test (50%), B.Sc. (Hons.) Agri. with major in relevant field of study from any HEC recognized university/DAIs (Deficiency course will be given where necessary) **For Agricultural Economics** 1. A minimum CGPA of 2.5 on a scale of 4.0 in field of B.Sc. (Hons.) Agricultural Economics, **OR** B.Sc. (Hons.) Agriculture and Resource Economics. 2. A minimum CGPA of 2.50 on a scale of 4.0 in field of BBA Agribusiness and BS Agribusiness and Marketing.	(a) CGPA = 2.5/4.00 (b) At least 2nd Division (c) Entry Test
M.Sc. (Hons.) Seed Science and Technology	Regular	4	6	Screening test (50%) with major in Seed Science and Technology, Agronomy, Entomology, Food Science and Technology, Horticulture, Plant Breeding and Genetics, Soil Science, Biotechnology, Plant Pathology from HEC recognized university / DAIs.	(a) CGPA = 2.5/4.00 (b) At least 2nd Division (c) Entry test

				(Deficiency course will be given where necessary)	
M.Sc. (Hons.) Climate Change	Regular	4	6	Screening test (50%) Sixteen years of education in following disciplines: Agricultural Sciences (All majors)/ B.Sc. (Hons.) Soil and Environmental sciences/ Agri. Engineering/ Environmental Engineering/Environmental Sciences/Agri. Economics/ Food science & Technology/Dairy Technology/Dairy Science and Technology/DVM /Animal Husbandry/Poultry Sciences/Fisheries/Agribusiness from HEC recognized university/ DAIs. (Deficiency course may be given to students on the recommendation of the supervisory committee where necessary).	(a) CGPA = 2.5/4.00 (b) At least 2nd Division (45% Marks) (c) Entry test
MS Computer Science	Regular	4	6	1. BS (CS) 4 year degree program (Minimum 130 credit hour), or Computer Science conversion course 2 year degree program referred to as "MCS" or MSc Computer science). 2. Candidates having Computer Engineering/ Bachelor of Science in Software Engineering/ Bachelor of Science in Information Technology/ Bachelor of Engineering (Computer and Information System)/ B.Sc. Computer System Engineering (16 year education) and MIT from a recognized institution are also eligible but have to qualify deficiency course(s) before entering in th e MSCS. Deficiency courses will be decided by departmental committee	(a) CGPA = 2.5/4.00 (b) First division where the GPA system is not implemented. (c) Entry Test

MS Management (Specialization in Agribusiness)	Regular	4	6	**a.** BBA (Agribusiness)/B.Sc. (Hons.) Agri. , Agricultural Economics/Agriculture and Resource Economics, Marketing and Agribusiness Major) (four years degree programs) **b.** MBA (Agri. Business) (two years degree program) **c.** M.Sc. (Economics) (with deficiency courses of one semester as decided by BoS) **d.** B.Sc. (Hons.) Agri. (all other majors)/ B.Sc. (Hons.) A.H./DVM/B.Sc. (Hons.) Food Sciences/ B.Sc. (Hons.) Agri. Engineering/B.Sc. (Hons.) (with deficiency courses of one semester to be decided by the Board of Studies of the Department. **e.** BS Agribusiness and Marketing.	(a) CGPA = 2.5/4.00 (b) At least 2nd Division (c) Entry Test
Ph.D. (Agronomy, Biotechnology, Entomology, Food Science and Technology, Horticulture, Plant Breeding and Genetics, Plant Pathology, Seed Science and Technology, Soil Science)	Regular	6	10	Subject Based Screening Test (70%), M.Sc. (Hons.) /M.Phil. in relevant subject from HEC DIAs, Subject based entry test, Deficiency courses	(a) CGPA not less than 3.00/4.00 (b) At least 1st division

1.3. Directorate of Graduate Studies

1.3.1. Mission

The mission of the Directorate of Graduate Studies is to streamline the admission and research process of postgraduate students and provide all possible guidelines regarding course work, GS - 10, synopsis and thesis preparation and submission. Moreover, to facilitate the students timely collection, approval and processing of their documents.

1.3.2. Vision

To enhance the quality of research, to automate the system of admission of postgraduate students and minimize the document's processing time through the use of available technology.

1.3.3. Functions

- To process the approval of new/revised postgraduate courses through Graduate Study Research Board (GSRB)/Board of Advanced Studies and Research (BASR).
- Processing of applications for admission to M.Sc., M. Phil./MS/M.Sc. (Hons.) and Ph.D. programs.
- Collection of course work and enrolment forms (GS/10) of postgraduate students in each semester.
- Scrutiny of the synopsis and thesis, course work and supervisory committees of M.Sc./MS/M.Sc. (Hons.) and Ph.D. students and arranging their approval by BASR.
- Scrutiny of the thesis of postgraduate students to ensure their proper format as laid down by BASR.
- Preparation of agenda and conduct of meetings of BASR.
- Execution of the policies and decisions of BASR.

1.4. Graduate Resource Center

MNS University of Agriculture Multan initiated a novel initiative in the form of a Graduate Resource Center (GRC) during October 2017 after discussion and approval of the Executive Committee of the University. The GRC is an interdisciplinary platform to break the barriers between the graduate students of different subjects of agricultural and allied sciences for their scientific and professional skills developments. The GRC performs activities under the umbrella of Directorate of Graduate Studies and emphasizes on four major sections:

a) Postgraduate research skills development
b) Scientific/community seminars
c) Leadership and interpersonal skills development
d) Annual graduate research day with a slogan to "make your research visible"

1.4.1. Aims

The program aims to enhance the quality of graduate training to make young researchers effective intellectuals and growing leaders to cope with challenges of the agriculture market in the country and around the world.

1.4.2. Functions

- Graduate Resource Center activities are held every Wednesday at 10:30 a.m. in seminar Hall of the University or via online platforms like Zoom.
- Membership and participation of all PhD scholars at MNSUAM is compulsory, while all interested master or undergraduate students can participate voluntarily.
- All faculty members and scientists from South Punjab Agriculture Forum can contribute and participate voluntarily.

1.4.3. Activities undertaken by Graduate Resource Centre

Activity	Title and Resource Person	Date
Seminar	**Teacher student interaction** Ms. Saima Rasheed, Lecturer, Institute of Plant Breeding & Biotechnology, MNSUAM	07.07.2021
Seminar	**Principles and components of IPM : Sharing the experience of cotton insect pest management at MNSUAM farms** Dr. Muhammad Ishtiaq, Assistant Professor, Institute of P lant Protection, MNSUAM	14.07.2021
Seminar	**SDG 3 : Good health and well-being, An overview and strategies** Dr. Unsar Naeem Ullah, Assistant Professor, Institute of Plant Protection, MNSUAM	28.07.2021
Seminar	**Scope of Bioinformatics; Introduction and bi ological databases** Dr. Sarmad Frogh Arshad, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	02.08.2021
Ph.D. Synopsis Defense	**Ph.D. Synopsis Defense** Sadia Hakeem (Ph.D. Scholar), Student, Institute of Plant Breeding and Biotechnol ogy, MNSUAM	16.08.2021
Seminar	**How to improve the quality of the images for the scientific publications** Mr. Muhammad Khubaib Jamil, Student, Institute of Plant Breeding and Biotechnology, MNSUAM	01.09.2021
Seminar	**Curve fitting using SimgaPlot** Dr. Amar M atloob, Assistant Professor, Department of Agronomy, MNSUAM	08.09.2021
Ph.D. Thesis Defense	**Ph.D. Thesis Defense** Mr. Ali Ammar, Student, Institute of Plant Breeding and Biotechnology, MNSUAM	20.09.2021
Ph.D. Thesis Defense	**Ph.D. Thesis Defense** Mr. Shoaib Liaqat, Student, Institute of Plant Breeding and Biotechnology, MNSUAM	21.09.2021
Seminar	**Case method : Teaching and learning** Dr. Mubashir Mehdi, Associate Professor, Department of Agribusiness and Applied Economics, MNUSAM	22.09.2021
Seminar	**Effective presentation of your work in video format** Dr. Shoaib Ur Rehman, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM / Mr. Muhammad Khubaib Jamil, Student, Institute of Plant Breeding and Biotechnology, MNSUAM	29.09.2021
Seminar	**Dengue Awareness** Dr. Unsar Naeem Ullah, Assistant Professor, Institute of Plant Protection, MNSUAM	06.10.2021
Seminar	**Carbon sequestration potential of various land use system under changing climate** Dr. Hafiz Mohkam Hammad, Associate Professor, Department of Agronomy, MNSUAM	13.10.2021
Seminar	**The smart shift in pesticide use** Dr. Muhammad Fiaz, IPFP fellow, Institute of Plant Protection, MNSUAM	27.10.2021
GRC Day	**Research based video competition**	3.11.2021
Seminar	**Genome sequencing and molecular breeding in crop plants** Prof. Dr. Jing Ruilian, Chinese academy of agricultural sciences, China / Dr. Awais Rasheed, Assistant Professor, Quaid -i-Azam University, Islamabad	10.11.2021
Seminar	**Awareness about mental health issues** Dr. Muhammad Asif Mughal, Ibn -e-Sina hospital, Multan	17.11.2021
Seminar	**The red palm weevil (*Rhynchophorus ferrugineus*)** Dr. Muhammad Khalid, IPFP fellow, Institute of Plant Protection, MNSUAM	24.11.2021

Seminar	**Challenges and prospects of hybrid cotton - A way forward towards cotton revival** Dr. Du Xiongming, Chinese academy of agricultural sciences, China / Dr. Saghir Ahmad, Director Cotton research institute	01.12.2021
Seminar	**Agribusiness value chain system** Dr. Rajendra / Dr. Tim Sun, University of Queensland, Australia	08.12.2021
Seminar	**How to overcom publication anxiety for early career research** Sadia Hakeem (Ph.D. Scholar), Student, Institute of Plant Breeding and Biotechnology, MNSUAM	15.12.2021
Seminar	**Indoor plants; leisure or necessity** Dr. Gulzar Akhtar, Department of Horticulture , MNSUAM	29.12.2021
Ph.D. Thesis Defense	**Ph.D. Thesis Defense** Hafiz Shahzad Ahmad, (Ph.D. Scholar), Student, Department of Soil and Environmental Sciences, MNSUAM	06.01.2022
Seminar	**How to arrange manuscript according to PLOS One Journal** Muhammad Shees Sharif, Student, Institute of Plant Breeding and Biotechnology, MNSUAM	12.01.2022
Ph.D. Thesis Defense	**Ph.D. Thesis Defense** Muhammad Naeem Akhtar, (Ph.D. Scholar), Student, Department of Soil and Environmental Sciences, MNSUAM	18.01.2022
Ph.D. Thesis Defense	**Ph.D. Thesis Defense** Adnan Fareed, (Ph.D. Scholar), Student, Department of Soil and Environmental Sciences, MNSUAM	20.01.2022
Seminar	**Understanding the role of predators for the management of fall armyworm** Dr. Fawad Zafar Ahmad Khan, Institute of Plan t Protection, MNSUAM	31.01.2022
Ph.D. Synopsis Defense	**Shelf stability of dehydrated mango slices** Khizar Hayat, (Ph.D. Scholar), Student, Department of Food Science and Technology, MNSUAM	09.02.2022
Seminar	**Application process of Fulbright scholarship, 2023** Dr. Fawad Zafar Ahmad Khan, Institute of Plant Protection, MNSUAM / Dr. Rabia Munsaf Khan, State University of New York	16.02.2022
Seminar	**Rural development: Current status, challenges and future prospective in pakistan** Department of Agribusiness and Applied Economics, MNSUAM	22.02.2022
Seminar	**Publication success story, tips for publishing in high impact journals and use referencing tool** Adnan Fareed, (Ph.D. Scholar), Student, Department of Soil and Environmental Sciences, MNSUAM	23.02.2022
Seminar	**Plagiarism and academic integrity** Dr. Aziz Ul Rehman, Assistant Professor, Faculty of Veterinary and Animal Science, MNSUAM	30.03.2022
Seminar	**What are the options: An overview of the next generation sequencing Facility at MNSUAM** Dr. Muhammad Faisal Boo ta, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	06.04.2022
Seminar	**Dengue awareness** Dr. Unsar Naeem Ullah, Assistant Professor, Institute of Plant Protection, MNSUAM	13.04.2022
Seminar	**Understanding sustainability in Agricult ure; A community based approach** Mr. Abd Ur Rehman, Lecturer, Department of Agribusiness & Applied Economics, MNSUAM	20.04.2022
Seminar	**Application of Omics in modern plant breeding, recent trends and future prospect** Prof. Dr. Fang Liu, Dr. M. Jawad Umar, Chinese academy of agricultural sciences, China / Dr. Shoaib Ur Rehman, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	27.04.2022
Seminar	**Nutritional guideline/Tips for weight management** Ms. Umrah Zafar, Lecturer, Department of Food Science and Technology, MNSUAM	11.05.2022

Ph.D. Synopsis Defense	**Ph.D. Synopsis Defense (Revised)** Tania Safdar, (Ph.D.) Scholar, Student, Institute of Plant Breeding & Biotechnology, MNSUAM	13.05.2022
Seminar	**Environmental pollution and One Health; the circumstances of Pakistan** Dr. Ahmad Mahmood, IPFP Fellow, Department of Soil and Environmental Sciences, MNSUAM	18.05.2022
Seminar	**Life table; A step towards better crop management tool** Dr. Nadir Naqqash, Assistant Professor, Institute of Plant Prote ction, MNSUAM	25.05.2022
Ph.D. Thesis Defense	**Comparative Transcriptomics Analysis of Contrasting Cotton Interspecific Lines for Fibre Traits** Farzana Ashraf, (Ph.D. Scholar) Student, Institute of Plant Breeding and Biotechnology, MNSUAM	01.06.2022
Seminar	**Challenges and prospects on date palm** Dr. Rashid Alyahyai, Sultan Qaboos University / Dr. Ghulam Sarwar Markhand, Date Palm Research Institute, Khairpur Mirs, Sindh	07.06.2022
Ph.D. Thesis Defense	**Ph.D. Thesis Defense** Shoaib Liaqat and Ali Ammar, (Ph.D. Scholars), Institute of Plant Breeding and Biotechnology, MNSUAM	13.06.2022
Seminar	**Identification of glaciers lakes along China Pakistan economic corridor (CPEC)** Dr. Muhammad Saifullah	22.06.2022
Seminar	**A Global Menace : Understanding the addiction and substance use (World Drug Day :)** Dr. Muhammad Asif Mughal (Psychiatrist) / Ms. Tehmeena Yaseer (Clinical Psychologist)	27.06.2022

1.5. Academic Calendar (2021-22)

1.5.1. Undergraduate Academic Calendar

Sr. No.	Particulars/ Activity	Date
A	**Enrollment Winter Semester 2021-2022**	**October 11, 2021**
1.	Commencement of Classes	11-10-2021
2.	Mid-Term Examination	06-12-2021
3.	Final Term Examination	31-01-2022
	Total Duration	18 Weeks
B	**Enrollment Spring Semester 2022**	**February 14, 2022**
1.	Commencement of Classes	14-02-2022
2.	Mid-Term Examination	11-04-2022
3.	Final Term Examination	06-06-2022
	Total Duration	18 Weeks
C	**Enrollment Summer Session 2022**	**June 20, 2022**
1.	Commencement of Classes	20-06-2022
2.	Mid-Term Examination	18-07-2022
3.	Final Term Examination	22-08-2022
	Total Duration	10 Weeks

1.5.2. Postgraduate Academic Calendar

Sr. No.	Particulars/ Activity	Date
A	**Enrollment Winter Semester 2021-2022**	**September 06, 2021**
1.	Commencement of Classes	27-09-2021

2.	Mid-Term Examination	22-11-2021
3.	Final Term Examination	17-01-2022
	Total Duration	19 Weeks
B	**Enrollment Spring Semester 2022**	**February 07, 2022**
1.	Commencement of Classes	07-02-2022
2.	Mid-Term Examination	04-04-2022
3.	Final Term Examination	30-05-2022
	Total Duration	19 Weeks
C	**Enrollment Summer Session 2022**	**June 20, 2022**
1.	Commencement of Classes	20-06-2022
2.	Mid-Term Examination	18-07-2022
3.	Final Term Examination	15-08-2022
	Total Duration	10 Weeks

1.6. Academic Achievements

- Blended/hybrid through Moodle based Learning Management System and video conferencing tools including Zoom, MS Teams and Google Meet for all courses in accordance with the "Online Preparedness Guidelines" of HEC and University's SoPs.
- Department of Agribusiness and Applied Economics played a major role in conceptualization and approval of the Centre for Agricultural Sustainability in South Punjab (CAS-SP).
- Department of Agribusiness and Applied Economics played a major role in conceptualization and approval of the Entrepreneurship Lab for undergraduate and postgraduate students.
- Department of Agribusiness and Applied Economics organized Poster Competition (Ideas for Sustainable Future in Agribusiness" under the ACIAR funded ASSIB Project on June 10, 2022.
- The Department of Agribusiness and Applied Economics also applied for the NOC of PhD in Agriculture Economics and admission will start from next year.
- Approval of the curricula M.Sc. (Hons.) AIET and M.Sc. (Hons.) Agri. Engineering programs from the Board of Advanced Studies and Research (BASR)
- Completion of the interim visits of National Technology Council of Pakistan for B.Sc. Agro-Industrial Engineering Technology.
- Organized National Curriculum Revision Committee meeting of B.Sc. AIET under the umbrella of National Technology Council
- Following three new undergraduate degree programs have been launched.
    - BS Public Health
    - BS Medical Laboratory Technology (MLT)
    - BS Biochemistry
- Following new postgraduate programs were approved by the Academic Council and NOC was granted by HEC:
    - MS Poultry Science

  - MS Public Health
  - MS Fisheries and Aquaculture
- Para-Veterinary School has been established at Jalalpur Pirwala and offering following programs
  - BS Zoology
  - Livestock Assistant Diploma (2 years)
- Review Meetings of NAEAC for B.Sc. (Hons.) Agriculture, major Agronomy, Entomology, Food Science and Technology, Horticulture, Plant Breeding and Genetics, Seed Science and Technology, and Soil Science degree programs.
- Department of Computer Science has accredited BS Computer Science programs from the National Computing Education Accreditation Council (NCEAC) & BS Information Technology program application has been submitted for the accreditation.
- Revision of scheme of studies for various programs from the Board of Study, Faculty Board, and Academic Council.
- The number of faculty members escalated to 139 (93 Ph.D. and 46 Non Ph.D.) and most of them are HEC approved supervisors.
- The Office of the Controller of Examinations successfully organized 2nd convocation for the sessions of 2014-18, 2015-19 and 2016-20 and distributed medals among the position holder students and degrees to the undergraduate and postgraduate students.

1.7. Foreign Academic Linkages

1.7.1. Faculty of Agriculture and Environmental Sciences

- University of California Davis, USA
- Iowa State University, USA
- Razbio Ltd., UK
- Swansea University, UK
- University of Greenwich, UK
- Hochschule Geisenheim University, Germany
- University of Bonn, Germany
- Huazhong Agricultural University, Wuhan, China
- Industrial Crop Research Institute (ICRI), Yunnan Academy of Agri. Sci., China
- HortResearch, South Africa
- College of Agriculture and Biotechnology, Zhejiang University, China
- School of Environmental Science and Engineering, Shandong University. China
- Tonglu County local/district government, Zhenjiang, China
- Biotechnology Research Institute Chinese Sciences of Agricultural Science Beijing, China
- Okinawa Institute of Science and Technology School Corporation, Japan
- University of Tasmania, Australia
- Australian Centre for International Agricultural Research
- National Agricultural Technology Institute Cordoba, Argentina
- Ghazi University Ankara, Türkiye
- Department of Plant Protection, Higher Educational Complex of Saravan, Islamic Republic of Iran

1.7.2. Faculty of Social Sciences and Humanities

- Department of Agribusiness and Applied Economics is a key partner of the Punjab team in ACIAR project "Improving groundwater management to enhance agriculture and farming livelihoods in Pakistan".

- Academic and research linkages with Charles Sturt University and University of Sydney for preparation and submission of ACIAR funded project "Living with Salinity".
  Charles Sturt University, Australia
- Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia
- Monash University, Australia
- Murdoch University, Australia
- University of Adelaide, Australia
- University of Canberra, Australia
- Osmaniye Korkut Ata University, Türkiye
- Selcuk University, Türkiye
- Istanbul Gelisim University, Türkiye
- Kırşehir Ahi Evran University, Türkiye
- ICBA, UAE
- Distinguished Innovation Collaboration and Entrepreneurship (DICE), USA
- Wuhan University of Technology, China

1.7.3. Faculty of Agricultural, Biosystems Engineering and Technology

- Kyungpook National University, South Korea
- Universiti Putra, Malaysia
- University of Agriculture in Krakow, Poland
- Agricultural Research Center of the Ministry of Agriculture and Land Reclamation, Egypt
- Kyungpook National University, South Korea
- Universitas Sebelas Maret, Indonesia
- Kyushu University, Japan
- SKF Boilers and Dryers Manufacturer International, Mangalore, Karnataka, India

1.7.4. Faculty of Veterinary and Animal Sciences

- Eberswalde University of Sustainable Development, Germany
- Faculty of Pharmacy, University of Copenhagen, Denmark

1.8. Institutional Linkages

1. Agricultural Mechanization Research Institute, Multan
2. Air University, Multan Campus
3. Ali Akbar Group of Industries
4. AMRI, Multan
5. Association of Biorisk Management, Peshawar
6. Ayub Agricultural Research Institute, Faisalabad
7. Bahauddin Zakariya University, Multan
8. Bayer Crop Science
9. Best Technologies, Multan
10. Central Cotton Research Institute, Multan
11. Centre for Global Strategic Studies, Islamabad
12. COMSATS University, Islamabad
13. Cotton Research Institute, Multan

14. CropLife Pakistan, Karachi
15. Dept. of Civil Engg., NUST
16. Doaba Foundation
17. Engro Fertilizers Ltd., Pakistan
18. Evyol Group of companies
19. FAO, Pakistan
20. Fatima Fertilizers Company Ltd., Pakistan
21. Federal Urdu University of Arts, Sciences & Technology, Islamabad
22. Federation of Pakistan Chambers of Commerce & Industry, Karachi
23. Food and Agriculture Organization of the United States
24. GIFT University, Gujranwala
25. Horticulture Research Station, Bahawalpur
26. Islamia University, Bahawalpur
27. Jaffer Agro Services (Pvt.) Ltd.
28. Japan Machinery Ltd.
29. Khawaja Fareed University of Engineering and Information Technology, Rahim Yar Khan
30. Mango Research Institute, Multan
31. Mehran University of Engineering and Technology, Jamshoro
32. MNS University of Engineering and Technology, Multan
33. National University of Science and Technology, Islamabad
34. National Vocational and Technical Training Commission
35. NCBA&E, Multan Campus
36. Nestle, Pakistan
37. NFC Institute of Engineering and Technology, Multan
38. Nishtar Medical University, Multan
39. Noori Agrolines, Multan
40. Pakistan Crop Protection Association, Multan
41. Pakistan Institute of Development Economics, Islamabad
42. Pakistan Meteorology Department, Islamabad
43. Pesticide Quality Control Lab, Multan
44. Potato Research Institute, Sahiwal
45. Punjab Irrigation Research Institute, Lahore
46. Punjab Mango Research and Development Board
47. Punjab Postharvest Research and Development Board
48. Qayyum & Company
49. Roomi Foods (Pvt.) Ltd.
50. SAWIE systems
51. Shahid Javed Burki Institute of Public Policy, Lahore
52. Soil and Water Testing Laboratory, Multan
53. Syngenta Pakistan Limited
54. The Govt. Sadiq College Women University, Bahawalpur
55. US-Pakistan Centre for Advanced Studies in Energy
56. University of Agriculture, Faisalabad
57. University of Education, Multan

58. University of Engineering and Technology (UET), Lahore
59. Women University, Multan
60. Karakoram International University Gilgit-Baltistan
61. Global Climate Change Impact Study Center, Islamabad

1.9. Honors and Awards

- Prof. Dr. Zulfiqar Ali, Institute of Plant Breeding & Biotechnology, MNSUAM received HEC "Best University Teacher Award" in 2021.
- MNSUAM's Business Incubation and Agricultural Entrepreneurship Center (BIAEC approved by the Higher Education Commission under the leadership of Prof. Dr. Mubashir Mehdi.
- Prof. Dr. Irfan Ahmad Baig assumed the charge of the office of the Dean, Faculty of Social Sciences & Humanities, MNSUAM as the first Dean of the MNS University of Agriculture, Multan on March 15, 2022.
- Prof. Dr. Irfan Ahmad Baig was awarded with a letter of appreciation and acknowledgment for organizing the roundtable discussion on "Food security vis-à-vis sustainable Agriculture in Pakistan: Policy Outcomes and Prospects" from Center for Global & Strategic Studies (CGSS), Islamabad.
- Dr. Ayesha Hakim, Assistant Professor, Department of Computer Science achieved the status of Associate Fellow in recognition of her achievements regarding the UK Professional Standards Framework for teaching and learning support in higher education.
- Prof. Dr. Asif Raza, Coordinator, FVAS worked as Guest Scientist at Eberswalde University for Sustainable Development, Germany from March 07 to June 08, 2022.
- Dr. Aziz ul Rahman, Assistant Professor, Department of Pathobiology, FVAS was awarded Gold Medal in Microbiology by Pakistan Academy of Sciences (PAS) Islamabad.

1.10. Good Practices Implemented

- Faculty Student Interaction
- Class monitoring
- Curriculum revision regarding course objectives, contents and learning resources
- Outcome based learning
- Blended/Hybrid teaching
- Use of learning management system
- Discussion and visual aids for Teaching (Videos, Presentations and hands on activities)
- Module based teaching system
- Maintenance of course files
- Lecture shortage
- Strengthening of teaching labs and field infrastructure
- Engagement of undergraduate students in research activities by attaching them with postgraduate students
- Alumni database
- Career counseling sessions for students
- International seminars/conferences/workshops
- Hands-on trainings for faculty and students
- Internship of B.Sc. (Hons.) 8th Semester students at private sector companies and farms

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University of Agriculture
Multan

RESEARCH AND DEVELOPMENT

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University of Agriculture
Multan

RESEARCH AND DEVELOPMENT

CHAPTER-2

RESEARCH AND DEVELOPMENT

The Office of Research, Innovation and Commercialization (ORIC) has been functioning since 2015 to facilitate students and faculty to support and organize research and commercialization activities at the University. The office also helps in prioritizing research and innovations according to educational, industrial, social and economic needs in accordance with University's vision to become a center of innovation, high-impact research and commercialization. It also facilitates intellectual property (IP) protection, implementation of operational and quality standards, and translation of research into commercialization through strong industry-academia linkages and entrepreneurship. The ORIC believes in reciprocal understanding, which is indispensable for coordination between academia and industry to uplift a standardized and well-acclaimed innovation and commercialization ecosystem.

To enhance research quality, relevance and competitiveness and promote innovation and commercialization at HEIs, Higher Education Commission Islamabad has disseminated HEC, ORIC Policy 2021. MNSUAM has adopted the policy and accordingly, ORIC MNSUAM has been recognized by HEC. MNSUAM has the honor to achieve the status of 2nd recognized ORIC at the national level and 1st recognized ORIC in Southern Punjab in accordance with the new HEC ORIC Policy 2021. After recognition, ORIC, MNSUAM became eligible for BIC funding from HEC and has been awarded funding of PKR 23.996 million by HEC for the establishment of the Business Incubation & Agricultural Entrepreneurship Center.

ORIC facilitated the faculty for submission of 58 research projects to various international and national funding agencies, including ACIAR, RASTA-PIDE, DAAD, AVFH, UK (GCRF), Texonomy Polymouth, IsDB, IFSOLAR-IWMI, RASTA CGP-0.4, WHO/TDR-2022, Canada Fund for Local Initiative 2022, International Center for Genetic Engineering and Biotechnology, RSTMH Early Career Grants, Horizon-2020, Climate and Cryosphere, UAF (EFS), HEC (LCF, TTSF, BIC, PERIDOT), PSF(NTIF, CRP, NSLP), HRI-NIH, PARB and industry/private sector. Resultantly, 33 competitive research grants worth PKR 262.835 million have been won by the faculty including national and international funding agencies (PKR 238.097 million), industry/private sector (PKR 17.557 million) and NAVTTC (PKR 7.18 million) under Skill Development Program (Kamyab Jawan Kamyab Pakistan) for the proliferation of scientific culture and innovative research. Moreover, the ORIC has also facilitated the faculty for the successful completion of 19 research projects worth PKR 20.037 million and one skill development project worth PKR 6.250 million. The execution of 63 projects, incuding 11 international and 52 national research projects (worth PKR 895.504 million) is in progress.

Due to the availability of a conducive research and working environment, the faculty was able to publish 281 research articles in well-reputed national and international peer-reviewed journals and 51 book chapters. Faculty was facilitated by ORIC for filing of five patents to IPO Pakistan.

On the other hand, 22 Agreement(s) of Cooperation (AoCs) have been signed with various national and international organizations and ORIC will take the lead for the successful implementation of these AoCs with the partner organizations in collaboration with the Director External Linkages and concerned Focal Person(s). Similarly, ORIC has organized seven national and international conferences, 10 competitions, and 60 national and international seminars/Webinars.

The capacity-building and mentoring activities include 37 faculty trainings/workshops and 34 trainings of students/researchers under the Central Lab System with 109 outreach and recreational activities. The other civic engagement events to make a change in the community include Mango Festivals at Islamabad, Multan and Lahore, DICE, Dunya Kisan Mela, farmer advisory and industry consultancy activities, working with communities through social action plans on multiple socio-economic opportunities, challenges and avenues to develop their resilience.

The University has participated in various global rankings regarding Higher Education Institutions, including Times Higher Education (Impact Rankings, World Universities Rankings, Subject Validation, Young University Rankings), WUR with real impact Rankings, QS World University Rankings and UI GreenMetric World University Ranking. MNSUAM has been ranked at (i) 1st position in Pakistan and 154th worldwide as an environmentally sustainable University in UI GreenMetric World University Rankings 2022 (ii) 2nd in Pakistan (Agri Universities), 5th in Pakistan (All Universities) and 601-800 worldwide being an SDGs engaged University under the subject category " Agriculture & Forestry" by THE Impact Rankings 2022 (iii) 1st in Pakistan (Agri Universities), 3rd in Pakistan (overall) and 101-200 worldwide being a global innovative University by World's Universities with Real Impact Rankings 2022.

2. PROJECTS

2.1. Fresh Awarded Faculty Research Projects

2.1.1. International Projects

Sr. No	Project	Principal Investigator	Total Amount (Million PKR)	Funding Agency
1	Accelerating genetic gain in wheat through hybrid breeding in Bangladesh, Ethiopia and Pakistan	Prof. Dr. Asif Ali	77.116	ACIAR
2	Developing competitive and inclusive value chains of value pulses in Pakistan	Prof. Dr. Mubashir Mehdi	5.000	ACIAR
3	Adapting to salinity in the Southern Indus Basin (ASSIB)	Prof. Dr. Irfan A. Baig	7.4	ACIAR
4	Impact of major public policies on cotton production in Pakistan	Prof. Dr. Irfan A. Baig	7.400	RASTA-PIDE
5	Biodiversity+ Collaborative capacity building for plant biodiversity research preservation in oasis ecosystem of Pakistan	Prof. Dr. Asif Ali	15.079	DAAD
6	Sustainable cotton production using artificial intelligence (SCP-AI)	Dr. Salman Qadri	0.850	TCP-UK
7	Nanostructure-based biosynthetic selenium fertilizer for drought stress amelioration in wheat and functional agriculture	Dr. Fahim Nawaz	2.019	AVHF (Germany)
8	Smart Monitoring and Control of the Dengue Vector	Prof. Dr. Shafqat Saeed / Dr. Unsar Naeem Ullah	3.378	UK-GCRF

2.1.2. National Projects

1	Establishment of Business Incubation Agricultural and Entrepreneurship Center	Prof. Dr. Mubashir Mehdi	14.464	HEC-BIC
2	Evaluation of toxicological and morphological effects of different chemosterilants on fruit fly	Dr. M. Fiaz	1.000	HEC-SRGP

3	Thinking beyond the Herbicide Efficacy Box: Appraising Herbicide Resistance, Leaching, Persistence and Carryover in Cotton-Wheat Cropping System	Dr. Amar Matloob	5.023	HEC-NRPU
4	Design and Development of self -propelled energy efficient multi-grain crop planter	Dr. Umair Sultan	3.8985	HEC-NRPU
5	Role of ornamental plants to mitigate soil heavy metal pollution	Dr. Gulzar Akhtar	3.070	HEC-NRPU
6	Production of certified Mango Nursery for Small Tree System	Dr. Kashif Razzaq	6.495	HEC-NRPU
7	Genetic Transformation of Potato (*Solanum tuberosum*) with Ipomoea batatas orange (IbOr) for Enhanced Photosynthesis and Productivity	Dr. Ummara Waheed	5.297	HEC-NRPU
8	Supply Chain Management and value addition of Jaman fruit (*Syzigium cumini*)	Dr. Sami Ullah	2.971	HEC-NRPU
9	Agronomic investigations under spate irrigated cropping systems of Punjab Pakistan	Dr. Khuram Mubeen	3.220	UAF-EFS
10	Selection and conservation of elite Jamun (*Syzigium cumini* Skeels.) genotypes	Dr. Sami Ullah	1.982	UAF-EFS
11	Design and Development of Indigenized Compost Windrow Turner For The Enrichment of Soil Nutrients	Dr. Sarfraz Hashim	10.130	PARC-ALP
12	Development and Commercialization of Indigenous Technology for Production of Moringa Seed Oil ad Food Ingredient	Dr. M. Shahbaz	5.000	PSF-CRP
13	Potential Risks of Glacier Lake Outburst Floods under Climate Change along China-Pakistan Economic Corridor (CPEC)	Dr. Muhammad Saif Ullah	5.230	PSF-CRP
14	Biofortification of Fodders with Selenium to Improve Milk Yield and Quality in Dairy Cattle	Dr. Fahim Nawaz	4.144	PSF-NSLP
15	Identification of Potential hazards risks of glaciers lakes along China Pakistan Economic Corridor (CPEC)	Dr. Saifullah	0.300	WWF
16	Enhanced Alfalfa seed production through conservation of native insect pollinators, germplasm development and agronomic management	Dr. Mudassir Ali	22.308	PARB
17	Development of soybean in Pakistan to reduce the import bills	Prof. Dr. Hammad Nadeem Tahir	17.948	PARB
18	Import of High Value Germplasm and Technologies of Elite Exotic Fruits, Vegetables and Medicinal Crops for Diversification and Sustainable Production in Punjab	Dr. Kashif Razzaq	4.880	PARB
19	Treatment of brackish water for growing of vegetables and irrigation management of mango orchards	Prof. Dr. Tanveer Ul Haq	7.495	PARB

2.1.3. Industry Funded Research Projects

Sr. No.	Project	Principal Investigator	Total Amount (Million PKR)	Funding Agency
1	Establishment of Modern mango small tree system	Dr. Abid Hussain	7.170	Fossil Energy, Mehmood Kot, Muzaffar Garh
2	Establishment of Mushroom Production Unit at Dar-Ul-Ihsan Farm Burrana Khas, Vehari	Dr. Muhammad Nadeem	0.910	Dar-Ul-Ihsan Farm, Burrana Khas Vehari
3	Establishment and propagation of Miscanthus and Sisal as pulp and energy crops	Dr. M. Baqir Hussain	7.927	Bulleh Shah Packaging Pvt. Ltd. Lahore
4	Potential of different insecticides as soil termiticides for TIIE management of termite	Dr. Naeem Iqbal	1.550	Patron Group

2.1.4. Skill Development Projects

Sr. No.	Project	Focal Person	Total Amount (Million PKR)	Funding Agency
1	Prime Minister Kamyab Jawan Kamyab Pakistan Batch-3 Jalalpur Pirwala Campus	Prof. Dr. Shafqat Saeed	1.630	NAVTTC
2	Prime Minister Kamyab Jawan Kamyab Pakistan Batch-3 Multan Campus	Prof. Dr. Shafqat Saeed	5.550	NAVTTC

2.2. Ongoing Research Projects

2.2.1. International Projects

Sr. No.	Project	Principal Investigator	Total Amount (Million PKR)	Funding Agency
1	Hybrid wheat for food security	Prof. Dr. Asif Ali	13.830	DFID
2	Increasing productivity and profitability of pulse production in cereal based cropping system in Pakistan	Prof. Dr. Zulfiqar Ali / Dr. Umair Waqas	53.516	ACIAR
3	Developing competitive and inclusive value chains of value pulses in Pakistan	Prof. Dr. Mubashir Mehdi	5.000	ACIAR
4	Accelerating genetic gain in wheat through hybrid breeding in Bangladesh, Ethiopia and Pakistan	Prof. Dr. Asif Ali	77.116	ACIAR
5	Adapting to salinity in the Southern Indus Basin (ASSIB)	Prof. Dr. Irfan A. Baig	7.400	ACIAR
6	Smart monitoring and control of the Dengue vector	Prof. Dr. Shafqat Saeed	3.378	UK GCRF

7	Biodiversity+ Collaborative capacity building for plant biodiversity research preservation in oasis ecosystem of Pakistan	Prof. Dr. Asif Ali	15.079	DAAD
8	Genetic adaptability and water-fertilizer intelligent regulation mechanism of climate smart varieties	Prof. Dr. Asif Ali	9.200	PSF-NSFC
9	Carbon Sequestration: an ultimate solution for improving farmers livelihood and resource use efficiency	Dr. M. Imran	1.5	FOSTECT Veitnam
10	Sustainable cotton production using artificial intelligence (SCP-AI)	Dr. Salman Qadri	0.850	TCP-UK
11	Nanostructure based biosynthetic selenium fertilizer for drought stress amelioration in wheat and functional agriculture	Dr. Fahim Nawaz	2.109	AVHF (Germany)

2.2.2. National Projects

Sr. No.	Project	Principal Investigator	Total Amount (Million PKR)	Funding Agency
1	Investigations on crop productivity, commercial potential and market constrains of guar bean industry	Dr. Muqarrab Ali	2.221	HEC-NRPU
2	Exploring the nutritional and functional properties of mango seed oil in bakery products	Dr. Muhammad Shahbaz	2.300	HEC-NRPU
3	Water conservation and improvement in soil fertility through tillage and strip cropping of legumes in spate irrigated area of Pakistan	Dr. Khuram Mubeen	1.829	HEC-NRPU
4	Improving chickpea production on sandy soil by using biochar produced from cotton sticks at different temperatures	Prof. Dr. Tanveer Ul Haq	2.620	HEC-NRPU
5	Subsistence farmer's production diversity and market access: impact on rural woman and children's dietary diversity	Dr. Umer Ijaz Ahmad	0.868	HEC-NRPU
6	Vegetable grafting against soil borne diseases, salinity and drought	Dr. Hafiz Nazar Faried	3.480	HEC-NRPU
7	Development of production and formulation technologies for eco-friendly entomopathogenic fungus for managing fruit fly	Dr. Mirza Abdul Qayyum	4.950	HEC-NRPU
8	Genetic variability and molecular characteristics of RNA viruses infecting cucurbits in Punjab, Pakistan	Dr. Muhammad Ashfaq	5.267	HEC-NRPU
9	Optimizing production practices and fruit quality of pomegranate in Southern Punjab	Prof. Dr. Ishtiaq A. Rajwana	6.664	HEC-NRPU
10	Development of nutritious energy dense emergency relief food products for disastrous areas of Pakistan With special reference to protein energy malnutrition	Dr. Ambreen Naz	2.510	HEC-NRPU
11	Design and development of self-propelled energy efficient multi-grain crop planter	Dr. Umair Sultan	3.899	HEC-NRPU

12	Thinking beyond the herbicide efficacy box: appraising herbicide resistance, leaching, persistence and carryover in cotton-wheat cropping system	Dr. Amar Matloob	5.023	HEC-NRPU
13	Genetic transformation of potato (*Solanum tuberosum*) with *Ipomoea batatas* for enhanced photosynthesis and productivity	Dr. Ummara Waheed	5.297	HEC-NRPU
14	Supply chain management and value addition of jaman fruit (*Syzigium cumini*)	Dr. Sami Ullah	2.971	HEC-NRPU
15	Production of certified mango nursery for small tree system	Dr. Kashif Razzaq	6.495	HEC-NRPU
16	Entitled role of ornamental plants to mitigate soil heavy metal pollution	Dr. Gulzar Akhtar	3.070	HEC-NRPU
17	Molecular characterization and in vitro evaluation of chemicals against *Botryosphaeriaceae* species associated with mango gummosis disease in Districts Multan and Muzaffargarh	Dr. Muhammad Zeeshan	1.000	HEC-SRGP
18	Genetic analysis of naturally colored cotton in relation to drought stress	Dr. Akash Fatima	1.000	HEC-SRGP
19	Early detection and management of Red Palm Weevil, *Rhynchophorus ferrugiineus* (Olivier), a highly damaging pest of Date Palm (*Phoenix dactylifera*) in Pakistan	Dr. Khalid Mahmood	1.000	HEC-SRGP
20	Design and development of indigenous solar desiccant drying system	Dr. Shazia Hanif	1.000	HEC-SRGP
21	Investigation of biotype and associated cytochrome P450 insecticide resistance detoxification encoding genes of cotton whitefly, *Bemisia tabaci*	Dr. Umair Sial	0.900	HEC-SRGP
22	Evaluation of toxicological and morphological effects of different chemosterilants on fruit fly	Dr. Muhammad Fiaz	1.000	HEC-SRGP
23	Prevalence of rotavirus and hepatitis A virus in drinking and sewage water collected from selected regions of Southern Punjab	Dr. Aziz-ul-Rahman	1.000	HEC-SRGP
24	Evaluation of reproductive hormonal profile and hematology of Chinkara deer (*Gazella bennettii*) in Pakistan	Dr. Rana Waseem Akhtar	1.000	HEC-SRGP
25	Effect of replacing crude protein with synthetic amino acids on growth performance, hematological profile, carcass traits and nutrient digestibility in quail, broiler chickens and fancy birds	Dr. Atif Rehman	1.000	HEC-SRGP
26	National crop genomics and speed breeding center for agriculture sustainability	Prof. Dr. Asif Ali	450.000	ADP
27	Establishment of Business Incubation Agricultural and Entrepreneurship Center	Prof. Dr. Mubashir Mehdi	14.464	HEC

28	Breeding soybean for adaptation and high yield in current scenario of climate change in Punjab	Prof. Dr. Hammad Nadeem Tahir	17.770	PARB
29	Improving yield, drought and salinity tolerance in wheat through GA-Sensitive dwarfing gene system	Prof. Dr. Zulfiqar Ali/ Muhammad Ali Sher	37.291	PARB
30	Development of innovative techniques for plan multiplication canopy management and value addition of promising ber (*Ziziphus mauritiana)* Varieties	Dr. Ambreen Naz	9.440	PARB
31	Advancements in saline agriculture related interventions for food security	Prof. Dr. Tanveer Ul Haq	7.495	PARB
32	Enhanced alfalfa seed production through conservation of native insect pollinators	Dr. Mudassir Ali	22.308	PARB
33	Development of soybean in Pakistan to reduce the import bills	Prof. Dr. Hammad Nadeem Tahir	17.948	PARB
34	Import of high value germplasm and technologies of elite exotic fruits, vegetables and medicinal crops for diversification and sustainable production in Punjab	Dr. Kashif Razzaq	4.880	PARB
35	Local development of Micro Plot Seeders for improving efficiency of agricultural experiments	Dr. Alamgir Akhtar Khan / Dr. Umair Sultan	2.302	UAF-EFS
36	Agronomic investigations under spate irrigated cropping systems of Punjab-Pakistan	Dr. Khuram Mubeen	3.220	UAF-EFS
37	Selection and conservation of elite Jamun (*Syzigium cumini* Skeels.) genotypes	Dr. Sami Ullah	1.982	UAF-EFS
38	Biofortification of fodders with selenium to improve milk and quality in dairy cattle	Dr. Fahim Nawaz	4.144	PSF-NSLP
39	Potential risks of glacier lake outburst flood under climate change along China-Pakistan Economic Corridor (CPEC)	Dr. Muhammad Saifullah	5.230	PSF-CRP
40	Development and Commercialization of indigenous technology for production of moringa seed oil ad food ingredient	Dr. M. Shahbaz	5.000	PSF-CRP
41	Impact of major public policies on cotton production in Pakistan	Prof. Dr. Irfan A. Baig	3.500	RASTA CGP
42	A way forward towards women entrepreneurship	Dr. Afshan Shafi	5.030	PARC-ALP
43	Design and development of indigenized compost windrow turner for the enrichment of soil nutrients	Dr. Sarfraz Hashim	10.130	PARC-ALP
44	Identification of potential hazards risks of glaciers lakes along China Pakistan Economics Corridor	Dr. Muhammad Saifullah	0.300	WWF
45	Physiological aspects of feedlot fattening and breeding of Makhi Chinni goat	Prof. Dr. Junaid Ali Khan	2.647	MNSUAM

2.2.3. Industrial Projects

Sr. No.	Project Title	Principal Investigator	Total Amount (Million PKR)	Funding Agency
1	Isolation and evaluation of halotolerant nutrient mobilizing bacteria	Dr. Shakeel Ahmad	0.525	NIHA Corp
2	Production of special purpose pasta wheat through contract farming	Prof. Dr. Zulfiqar Ali	24.96	Volka Foods International
3	Establishment of modern mango small tree system	Dr. Abid Hussain	7.170	Fossil Energy, Mehmood Kot, Muzaffar Garh
4	Establishment and propagation of Miscanthus and Sisal as pulp and energy crops	Dr. Baqir Hussain	7.927	Bulleh Shah Packaging (Pvt.) Limited, Lahore
5	Estabilishment of mushroom production Unit at Dar-Ul-Ihsan Farm Burrana Khas, Vehari	Dr. Nadeem Ahmad	0.910	Dar-Ul-Ihsan Farm, Burrana Khas Vehari
6	Potential of different insecticides as soil termiticides for TIIE management of termite	Dr. Naeem Iqbal	1.550	Patron Group
7	Development and application of functional markers for seed quality based on phytohormones metabolism in cotton	Dr. M. Baqir Hussain	1.200	PAC Industrial Fellowship

2.3. Completed Projects

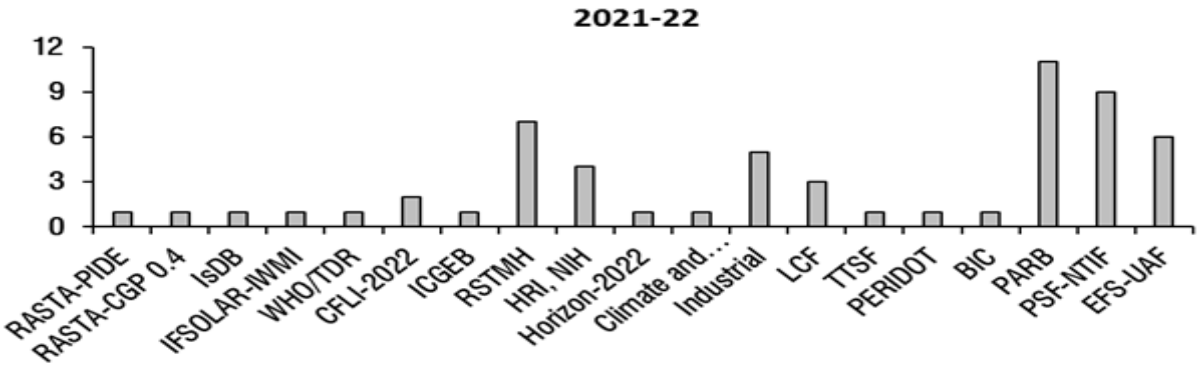
Sr. No.	Project	Principal Investigator	Total Amount (Million PKR)	Funding Agency
1	Development and validation of Gel-Free KASP Markers to identity high yielding wheat breeding material from Pakistan	Dr. Shoaib Ur Rehman	0.490	HEC-SRGP
2	Nutritional Effects of different levels of probiotics (*Lactobacilious acidophilus* and *Saccharomyces sereyisiae* on major carps (*Labeo rohita* and cyprinus carpio) comparative analysis	Dr. Riffat Yasin	1.000	HEC-SRGP
3	Fruit and shoot borers of mango, *Mangifera indica* L.; A potential quarantin e pest and threat to mango industry	Prof. Dr. Shafqat Saeed	3.400	HEC-NRPU
4	Development of entophatic bacteria mycorrhizal fungi consortium in chickpea	Dr. Usman Jamshaid	3.327	HEC-NRPU
5	Management of whitefly by integrated strategies and development of resistant cotton germplasm through genetic engineering	Prof. Dr. Shafqat Saeed	4.803	PARB
6	A comprehensive integrated scientific approach for the development of sustainable management strategies of pink bollworm (*Pectinophora gossypiella*)	Prof. Dr. Shafqat Saeed	3.911	PARB

7	Current Status, genetic variability and molecular characterization of major viruses infecting onion and garlic crops in Punjab, Pakistan	Prof. Dr. Muhammad Ashfaq	1.800	IFS (Sweden)
8	Isolation and evaluation of halotolerant nu trients mobilization bacteria	Dr. Shakeel Ahmad	0.525	Industrial
9	Intelligent face mask and body temperature detection system	Dr. Ayesha Hakim	0.069	Ignite
10	IoT based street light monitoring system	Engr. Adnan Altaf	0.065	Ignite
11	IoT based fish stress monitoring system	Dr. Abdul Razzaq	0.079	Ignite
12	Seed sowing robot	Ms. Javeria Jabeen	0.078	Ignite
13	Automatic hand-sanitizing dispenser with thermometer	Ms. Javeria Jabeen	0.076	Ignite
14	Aquatic trash bin	Ms. Javeria Jabeen	0.075	Ignite
15	Baby Monitoring Smart Cradle	Dr. Aamir Hussain	0.050	Ignite
16	Drain clog detector using tensor flow	Dr. Aamir Hussain	0.074	Ignite
17	Smart helmet	Engr. Adnan Altaf	0.069	Ignite
18	Smart hydroponic	Dr. Aamir Hussain	0.070	Ignite
19	Navigational assistive shoes	Ms. Javeria Jabeen	0.076	Ignite

The following skill development projects have been completed in MNSUAM:

Sr. No.	Project	Focal Person	Total Amount Million (PKR)	Funding Agency
1	Prime Minister Kamyab Jawan Kamyab Pakistan Batch-2	Prof. Dr. Shafqat Saeed	6.250	NAVTTC

2.4. Project submission to various Funding Agencies



2.5. Facilitation for Filing of Patents

The ORIC facilitated the following faculty members in completing documentation for filing of patents during 2021-22.

Sr. No.	Name of Faculty	Department	Innovation	National / International
1	Dr. Umair Sultan	Agri. Engineering	MicroPlot Seeder for Agricultural experiments	National
2	Dr. Umair Sultan	Agri. Engineering	High Efficiency Seed Drill (Combo) for general wheat sowing	National
3	Dr. Arslan Khan	Institute of Plant Protection	Bio-fungicide for the Management of Mango sudden death	National
4	Dr. Ayesha Hakim	Computer Science	SmarTraps for Fruitfly	National
5	Prof. Dr. Shafqat Saeed	Institute of Plant Protection	Chemosterilant Bait	National

2.6. Seminars/Webinars

Sr. No.	Date	Title	Department	National / International
1	07.07.2021	Aquaculture: The best industry of the future	Veterinary & Animal Sciences	International
2	13.07.2021	Prospects and challenges of organic agriculture	Agronomy	International
3	14.07.2021	An interactive session on job hunting in foreign markets for food professionals	FST	International
4	15.07.2021	Current scenario and future perspective of guar bean production	Agronomy	International
5	04.08.2021	Major selection webinar	CDC	National
6	08.08.2021	Halal meat industry in the world: Challenges and prospects for Pakistan	Veterinary & Animal Sciences	National
7	13.08.2021	Genomics proteomics and virulence gene identification of Mycoplasma Bovis	MNSUAM	International
8	16.08.2021	Deer antler biological phenomena and possible use in clinics	MNSUAM	International
9	06.09.2021	Role of influential women in peace promotion	DSA/District Women Peace Forum II, District Govt.	National
10	14.09.2021	Addressing zinc deficiency through bio-fortification of wheat in Pakistan	ORIC	National

11	22.09.2021	Prediction & forecasting of data through machine learning	Agribusiness & Applied Economics	National
12	23.09.2021	Inter-Firm linkages event of "Value chain of fish and fishery products"	MNSUAM/SMEBFC	National
13	29.09.2021	Data visualization using R	Agribusiness & Applied Economics	National
14	06.10.2021	Data envelopment Analysis for Efficiency Assessment	Agribusiness & Applied Economics	National
15	07.10.2021	Crop growth modeling: A tool to assess' resilience in agriculure production system	Agronomy	International
16	07.10.2021	World cotton day	IPP	National
17	08.10.2021	Prospects of saline agriculture in arid environments	Soil & Environmental Sciences	International
18	13.10.2021	Prospects of agricultural development for pakistan in the context of CPEC	Veterinary & Animal sciences	National
19	13.10.2021	Dietary intake assessment for food security measurement	Agribusiness & Applied Economics	National
20	25.10.2021	A systemic and participatory research approach for sustainable agriculture: The MARISCO method	Veterinary & Animal sciences	International
21	28.10.2021	Innovation & food chain management in food and agriculture (*on the Eve of DICE*)	ORIC	International
22	04.11.2021	Pulse crops: Hope for the future	IPBB	International
23	05.11.2021	Affordable and clean energy	Agri. Engineering	International
24	08.11.2021	Quinoa: A future smart food	Agronomy	International
25	09.11.2021	Fall armyworm management	IPP	International
26	10.11.2021	Genome sequencing and molecular breeding in crop plants	IPBB	International
27	25.11.2021	Installation of sustainable tube wells in Punjab	Agri. Engineering	National
28	25.11.2021	Agricultural disaster and animal diseases prevention and control for Pakistan	China/MNSUAM	International
29	25.11.2021	Water-saving agriculture for Pakistan	China/MNSUAM	International
30	26.11.2021	Challenges and prospects of hybrid cotton - A way forward towards cotton revival	IPBB	International
31	26.11.2021	Secrets of success	RSU	National

32	26.11.2022	Library management system and HEC digital resources	Chief Librarian	National
33	01.12.2021	International Aids Day	MNSUAM	National
34	07.12.2021	Fikr-e-Iqbal (by Excellency Sahibzada Sultan Ahmed Ali, Dewan of Junagadh State, Chairman MUSLIM Institute Islamabad)	Agribusiness & Applied Economics	National
35	08.12.2021	Agribusiness value chain system	Agribusiness & Applied Economics	International
36	17.12.2021	Managing water resources for sustainable saline agriculture	Agri. Engineering	International
37	23.12.2021	Violence against women	Harassment Monitoring Cell	National
38	31.12.2021	Spate irrigated agriculture: Potential challenges and way forward	Agronomy	International
39	05.01.2022	Data sciences and data management, data sensing and drone technology in agriculture and bio-sciences	Veterinary & Animal sciences / Finland Delegates	National
40	20.01.2022	Introduction of intense coding program for computer science students	Computer Science	National
41	21.01.2022	Awareness seminar on cyber crime	Computer Science	National
42	24.01.2022	CUHK-Pakistan "Agriculture-Environment interaction and its implications"	IPBB	International
43	27.01.2022	The risk factors for adverse outcomes with COVID-19 infections & its management	Soil & Environmental Sciences	National
44	07.02.2022	Seerat un Nabi (PBUH; ﷺ خاتم النبیین) and Shaan e Quran	Qirrat & Naat Club	National
45	15.02.2022	Career counselling- Induction in PAF	Agribusiness & Applied Economics/PAF	National
46	16.02.2022	Traffic awareness and Road Safety	CSO/Highway Traffic Police	National
47	22.02.2022	Rural development: Current status, challenges and future perspectives in Pakistan	Agribusiness & Applied Economics	International
48	01.03.2022	Water-Climate-Agriculture nexus	University of Agriculture Krakow, Poland/MNSUAM	International
49	03.03.2022	Advances and opportunities in crop genome editing	IPBB	International
50	15.03.2022	Paigham E Pakistan (Role of Youth in Peacebuilding/Youth Peace Mela)	MNSUAM/IIU, Islamabad	National

51	28.03.2022	Value-chain and value-addition of minor fruits with special reference to Ber	FST	National
52	05.04.2022	Seed longevity and storage management	IPBB	National
53	26.04.2022	Road safety	CSO/Highway Traffic Police	National
54	30.05.2022	How to achieve success in examinations	CTL, MNSUAM	National
55	06.06.2022	Plantation and water use under prevailing climatic change scenario on the Eve of World Earth Day	Plant for Life Society and GYM Club	National
56	07.06.2022	Challenges and prospects of date palm	IPBB	International
57	07.06.2022	Awareness Walk, Food Testing Camp and Nutrition Camp	FST	International
58	09.06.2022	Cotton seminar	IPP/Engro Fertilizer Pvt. Ltd.	National
59	20.06.2022	Father's Day	PRP	National
60	23.06.2022	Cotton webinar: Look after the cotton during rain	IPP / CRI Multan	National

2.7. Conferences

Sr. No.	Date	Title	Department	National / International
1	20-21.10.2021	Sustainable Bioeconomy in Livestock and Crop Production (Hybrid mode)	V&AS/University of Kassel/Afyon Kocatepe University, Türkiye	International
2	6-7.12.2021	Needs for Sustainable Water Management in a Climate Crisis for the Indus Basin	Agribusiness & Applied Economics	International
3	06.01.2022	Cotton; Policy Perspective & Planning	BIPP/SA-CAS/Agribusiness & Applied Economics	International
4	23-24.02.2022	Remote Sensing & GIS Integration in Veterinary, Agricultural & Health Sciences (RGVAHS-2022)	V&AS/Eberswalde University for Sustainable Development/ TRANSECT, Germany	International
5	9-10.03.2022	Smart Plant Protection	IPP	International
6	15-16.03.2022	Climate Smart Agriculture: The way towards Ecosystem Restoration	Agronomy/FAO-Pakistan	International
7	21.04.2022	Agriculture Advancement and Sustainable Development: Learning from Robust Chinese Initiatives	Pakistan Research Center / MNSUAM	International

2.8. Other Outreach/Recreational/Capacity-Building Activities

2.8.1. Competitions

Sr. No	Date	Title	Department
1	09.07.2021	Mango Dish Competition during *Mango Festival* at DHA Multan	FST
2	09.09.2021	In-House Competitions for Poetry, Painting and Video Competition (to send nomination for onward submission to HEC for intervarsity competition)	Senior Tutor
3	07.10.2021	Revival of Cotton in Pakistan	IPP
4	11-13.10.2021	Uni Food Cooperatives	ORIC
5	29.10.2021	Graduate Research Day	MNSUAM
6	27.12.2021	Bilingual Debate Competition at the eve of *DICE*	MNSUAM
7	28.12.2021	Plant Centric Meal Competition with special reference to Pulse Value addition aspect of ACIAR Pulses Project no. 041	ORIC/FST
8	26.03.2022	Plant Centric Meal Competition	FST
9	23-31.05.2022	Intra University Seerat Un Nabi Quiz Competition	Qirrat & Naat Club
10	06.06.2022	Poster Competition on the eve of World Earth Day	Plant for Life Society and GYM Club

2.8.2. Activities under Social Action Plans

Sr. No.	Date	Title	Department
1	14.07.2021	Protection against sexual harassment in Higher Education Institutions	ORIC
2	30.07.2021	Internationalization, youth as Pakistan's potential in South Asia	ORIC
3	09.09.2021	Entrepreneurial mindset, higher education, and the role of IELTS	ORIC
4	21.09.2021	Leadership ande development	ORIC
5	06.12.2021	Entrepreneurial mindset to summit of success	ORIC
6	16.12.2021	Stay healthy at any age by Sir Wali-Mutazammil USA, Evelyn Lanka Ricardo Arikawa AmSoc Sao Paulo Brazil	ORIC
7	20.12.2021	Personal development planning and Islam	ORIC
8	17.01.2022	Entrepreneurship with vulnerable youth	ORIC

9	24.01.2022	Child application Zainab and its credentials	ORIC
10	12.02.2022	Clean and green environment	ORIC
11	14.02.2022	Climate and environmental change	ORIC
12	20.02.2022	Drugs and its repercussions	ORIC
13	22.02.2022	Career counseling with students of DSA PGICA 5 Faiz	ORIC
14	12.05.2022	ORIC's representation at Puchik Lounge	ORIC
15	18.05.2022	Role of students how to be voracious bok readers	ORIC
16	21.05.2022	Little steps big impact tree plantation	ORIC
17	25.05.2022	Uses and abuses of social media	ORIC
18	27.05.2022	Entrepreneurial mindset and role of ORIC MNSUAM	ORIC
19	31.05.2022	Kindness is Humanity" at SOS Children's Village Pakistan Multan	ORIC
20	02.06.2022	How to become creative writer, successful entrepreneur and job interview skills	ORIC
21	07.06.2022	How to become creative writer, successful entrepreneur	ORIC
22	22.06.2022	Save water save life	ORIC

2.8.3. Faculty and Staff Trainings/Workshops Organized

Sr. No.	Date	Title	Department
1	17.08.2021	Policy analysis matrix and other policy related tools	IPP
2	16.09.2021	Fish farming	Fisheries/SMEBFC
3	20.09.2021	Freeze drying under PARB Project 1057	FST
4	23.09.2021	Capacity building workshop for scaling-up alfalfa production	IPBB/Agronomy/Maxim International
5	30.09.2021	National stakeholders inception workshop No-3 (Hybrid Mode) under adapting to salinity in the Southern Indus Basin (ASSIB) project	ORIC/Agribusiness & Applied Economics.
6	18-31.10.2021	Forestry / Horticulture techniques	Horticulture
7	25.10.2021	Freeze drying under PARB Project 1057	FST
8	1-4.11.2021	Machines for enhancing efficiency in conducting agronomic and breeding trials	IPBB/ORIC/Agri. Engineering

9	11.11.2021	Exploring skill and strength for professional growth	MNSUAM
10	16.11.2021	Poultry farm management	MNSUAM/SMEBFC (SMEDA)
11	9-15.11.2021	Master trainers training on "Efficient use of tractor" Holland Industrial donated a 50 HP Tier 3 tractors for the establishment of I.C. Engine Lab	Agri. Engineering
12	24.11.2021	Advances in monitoring of water and salinity at farm	Soil & Environmental Sciences/PCRWR
13	30.11.2021	Wheat training workshop at JPP Farm	Agronomy
14	09.12.2021	Financial management of agriculture-based startups	MNSUAM/SMEDA
15	23.12.2021	Outcome based education system	Agri. Engineering
16	29.12.2021	Training workshop/field day under ACIAR Pulse Project-041	Project Team
17	17.02.2022	Climate smart water-fertilizer intelligent system for cotton and wheat	ORIC
18	02.03.2022	Capacity building workshop by BASF	IPBB
19	15-17.03.2022	Technical sessions & training workshop under PSF project titled "Genetic adaptability and water-fertilizer intelligent regulation mechanism of climate smart varieties"	Project Team
20	17-18.03.2022	Geneious & SnapGene	IPBB
21	17.03.2022	Setting-up and use of Turnitin	QEC
22	21.03.2022	NTN and STRN registration & e-filling of returns	BIAEC/SMEDA
23	22.03.2022	National inception training workshop on "Identification of Glaciers Lakes using geographical information system (GIS) and remote sensing (RS)"	Project Team
24	28-29.03.2022	Training workshop and stakeholders round table session on "Management of crop nutrition and high efficiency irrigation systems"	Soil & Environmental Sciences/Engro Fertilizer Limited
25	11-13.05.2022	Bio-risk management	V&AS/ORIC/ABM-Pakistan
26	12.05.2022	Fruits dehydration and its business scope under PARB funded Project 1057	FST
27	13.05.2022	Setting-up and Use of Turnitin	QEC

28	16.05.2022	Commercialization of Research Outcomes	ORIC/SMEBFC
29	17.05.2022	Cotton campaign Training	Dean FAES
30	17.05.2022	Quality assurance in HEIs	QEC
31	19.05.2022	Entrepreneurship / Small Business startup and management	ORIC / SMEDA
32	19.05.2022	Exzellenz verbindet –be part of a worldwide network	Agronomy
33	24.05.2022	Green youth movement (GYM) project	HEC (P&D Division)/MNSUAM
34	24.05.2022	Photosynthesis system (CIRAS-3)	Horticulture
35	31.05.2022	"R" and "Statistix" data analysis tools	IPBB
36	27-28.06.2022	Biodiversity assessment	IPBB, FVAS, Uni. of Kassel
37	29.06-02.07.2022	Scientific working and publishing	IPBB, FVAS, Uni. of Kassel

2.8.4. Students Training under Central Lab System

Sr. No.	Date	Title	Name of Trainer
1	27.07.2021	Atomic absorption spectrophotometer	Dr. Abid Hussain
2	30.07.2021	Hands-on training on spectrophotometer	Dr. Shakeel Ahmed
3	03.08.2021	Atomic absorption spectrophotometer	Dr. Abid Hussain
4	10.08.2021	Atomic absorption spectrophotometer	Dr. Abid Hussain
5	01.09.2021	Isolation of microbes	Dr. Afshan Shafi
6	01.09.2021	Isolation of microbes	Dr. Afshan Shafi
7	03.09.2021	qPCR and gel electrophoresis	Dr. Muhammad Abu Bakar Saddique
8	03.09.2021	Growth chamber/germinators	Ms. Plosha Khanum
9	15.09.2021	pH meter, laminar air flow and tissue culture	Ms. Plosha Khanum
10	16.09.2021	pH meter, laminar air flow and tissue culture	Ms. Plosha Khanum
11	08.10.2021	Ciras-3	Dr. H. Nazar Faried
12	12.10.2021	Ciras-3	Dr. H. Nazar Faried
13	12.10.2021	qPCR and gel electrophoresis	Dr. Muhammad Abu Bakar Saddique
14	21.10.2021	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad

15	28.10.2021	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
16	29.10.2021	qPCR and gel electrophoresis	Dr. Muhammad Abu Bakar Saddique
17	04.11.2021	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
18	11.11.2021	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
19	15.11.2021	qPCR and gel electrophoresis	Dr. Muhammad Abu Bakar Saddique
20	10.12.2021	Isolation and purification of microbes	Dr. Muhammad Arslan Khan
21	14.12.2021	Isolation and purification of microbes	Dr. Muhammad Arslan Khan
22	14.12.2021	Atomic absorption spectrophotometer	Dr. Abid Hussain
23	23.12.2021	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
24	25.01.2022	Seed germinators	Ms. Plosha Khanum
25	18.03.2022	GC-MS	Dr. Abid Hussain
26	22.03.2022	HPLC	Dr. Abid Hussain
27	22.03.2022	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
28	30.03.2022	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
29	13.04.2022	Atomic absorption spectrophotometer	Dr. Abid Hussain
30	20.04.2022	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
31	27.04.2022	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
32	04.05.2022	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
33	20.05.2022	Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
34	24.05.2022	Ciras-3	Dr. H. Nazar Faried

2.8.5. Celebrations / Interactive Sessions

Sr. No.	Date	Title	Department
1	06.08.2021	Farmer Day on "Tree plantation under Plant for Pakistan Program" at JPP Farm	MNSUAM
2	12.08.2021	Pakistan Air Force publicity campaign	CDC

3	14.08.2021	Pakistan independence celebration and cotton IPM day	MNSUAM
4	21.09.2021	Leadership and entrepreneurship development	ORIC/CBS
5	08.10.2021	World's Egg Day	V&AS
6	16.10.2021	World Food Day "Biofortification; A strategic tool to combat malnutrition for better future"	FST/Harvest Plus, Pakistan
7	22.10.2021	Awareness Session on "Early detection of breast cancer"	IPBB
8	24.10.2021	World Polio Day	Sr. Tutor/Rotary Club
9	27.10.2021	Black Day (Kashmir)	DSA/Sr. Tutor
10	31.10.2021	Wheat Farmers Field Day	MNSUAM
11	03-04.11.2021	Blood donation and blood screening (Hepatitis B, C, Blood Sugar)	Blood Screening & Blood Donation Society/RBC Indus Hospital, Bwp
12	10.11.2021	World Science Day	MNSUAM
13	11.11.2021	Peace Cultural Festival	ORIC/District Women Peace Forum II
14	16.11.2021	Interactive session on "Diabetes & associated health problems" (World Diabetes Day-2021)	FST
15	19.11.2021	Kissaan convention for " Wheat productivity enhancement" at University Farm Jalalpur Pirwala	MNSUAM
16	03.12.2021	World Science Day-2021 "Halt soil salinization, boost soil productivity"	FFC/S&ES
17	07.12.2021	World Fisheries Day	V&AS
18	10.12.2021	Health awareness camp "DVAGO Pharmacy and Wellness Experts"	RSU
19	15.12.2021	Winter Sports Gala 2021	Sports Instructor
20	24-30.12.2021	Chrysanthemum exhibition	Horticulture/Estate Management
21	15.02.2022	Consultative meeting on Food Sector- Formulation of national industrial policy	ORIC (MIL)
22	08.03.2022	Spring Plantation Drive-2022 under plant for Pakistan Campaign	PHA/Dr. Muqarrab Ali
23	08.03.2022	International Women's Day	CS
24	25-27.03.2022	Kisan Mela-2022	Dunya Media Group/District Govt/Agri. Deptt/MNSUAM

25	26-27.03.2022	Book Fair	Dr. Ambreen Naz
26	29.03.2022	Consultative session/round table discussion on K use in Pakistan	Soil and Environmental Sciences
27	12.04.2022	Awareness campaign among individual on "Know your nutrition in Ramadan"	FST
28	20.05.2022	Bee Pollination and Conservation	IPP
29	06.06.2022	World Environment Day-2022	Plant for Life Society and GYM Club
30	07.06.2022	World Food Safety Day	FST
31	17.06.2022	Walk on Desertification and Drought Day	IPP

2.9. Research Linkages International

2.9.1. International

Sr. No.	Organization	Country	Signing Date
1	AoC "TSAU Tashkent State Agrarian University, Uzbekistan"	Uzbekistan	08.08.2021
2	MoU among "Institute of Tropical Bioscience and Biotechnology of CATAS, MINSOL Consultants (Pvt) Ltd, PMAS AAUR, MNSUAM, UAF"	China	23.11.2021
3	AoC "Distinguished, Innovation, Collaboration and Entrepreneurship"	USA	22.12.2021
4	AoC "Razbio Limited"	UK	09.03.2022
5	AoC Selcuk University, Konya, Türkiye	Türkiye	16-05-2022
6	AoC Agricultural Research Centre (ARC), Ministry of Agriculture and Land Reclamation Arab Republic of Egypt	Egypt	21.06.2022

2.9.2. National

Sr. No.	Organization	Signing Date
1	MoC "The National Bank of Pakistan"	11.08.2021
2	AoC Bulleh Shah Packages, Lahore	13-08-2022
3	AoC "Institute of Business Management Sciences (IBMS) UAF	20.09.2021
4	AoC Institute of Tropical Bioscience and Biotechnology of CATAS, Pir Mehr Ali Shah Arid Agriculture Rawalpindi, University of Agriculture, Faisalabad	13-09-2021
5	AoC Site Agreement for Bayer Pakistan (Pvt.) Ltd.	01.12.2021
6	AoC "Maxim Agri. (Pvt.) Limited"	07.12.2021
7	AoC Letter of Intent with FAO	30-11-2021
8	AoC "National Productivity Organization"	13.12.2021
9	AoC "Federation of Pakistan Chambers of Commerce & Industry (FPCCI)"	22.12.2021
10	AoC "Association for Biorisk Management, Pakistan"	25.05.2022

11	AoC Sun Green Farms (Pvt.) Pakistan	19-01-2022
12	AoC The Bank of Punjab	13-04-2022
13	AoC House of Rockville (Pvt.) Limited	24-04-2022
14	AoC Assosiation for biorisk management, Pakistan	25-05-2022
15	AoC Evyol Group of Companies (Pvt.) Ltd., Multan	21-06-2022
16	AoC Ayub Agricultural Research Institute Faisalabad, Pakistan	23-06-2022

2.10. Awards Won

During the reported year, following nine (09) faculty members won national / international level awards:

Sr. No.	Title of Award/ Honor	Forum/ Conferring Authority/ Organization	Name, Designation and Department of Award Winner
1	Best University Teacher Award 2020	Higher Education Commission	Dr. Zulfiqar Ali, Professor IPBB / Principal Officer ORIC
2	Outstanding Research & Innovation Award	Rotary International District 3272-Pakistan	Dr. Ayesha Hakim, Assistant Professor , Computer Science
3	Best Research Paper Award - 2021	MNSUAM	Dr. Salman Qadri, Associate Professor, Computer Science
4	Best Research Paper Award - 2021	MNSUAM	Dr. Umair Sultan, Assistant Professor, Agri. Engineering
5	Best Research Paper Award - 2021	MNSUAM	Dr. Alamgir A. Khan, Associate Professor (Retd.), Agri. Engineering
6	Best Research Paper Award - 2021	MNSUAM	Dr. Mohsin Nawaz, Assistant Professor, Agri. Engineering
7	Best Research Paper Award - 2021	MNSUAM	Dr. Alamgir A. Khan, Associate Professor (Retd.), Agri. Engineering
8	Best Research Paper Award - 2021	MNSUAM	Dr. Abid Hussain, Manager, Industrial Linkage, ORIC
9	Prof. Dr. Javed Iqbal Gold Medal (Microbiology)	The Applied Zoological Society of Pakistan	Dr. Aziz Ul Rahman, Assistant Professor, Faculty of Veterinary and Animal Sciences

2.11. ORIC Recognition from HEC

To enhance research quality, relevance and competitiveness and promote innovation and commercialization at HEIs, Higher Education Commission Islamabad has disseminated HEC ORIC Policy 2021. MNSUAM has adopted the policy and accordingly, ORIC MNSUAM has been recognized by HEC. MNSUAM has the honor to achieve the status of 2nd recognized ORIC at the national level in accordance with the new HEC ORIC Policy 2021 and 1st recognized ORIC in Southern Punjab. In compliance with HEC ORIC Policy 2021, the meeting(s) of the ORIC Steering Committee and Ethical Institutional Review Board were held. The ORIC Steering Committee considered various agenda items and recommended the adoption of HEC ORIC policy 2021, ORIC strategic plan (2021-26), and priority research areas and the same were approved by the Syndicate. The HEC guidelines for presenting ORIC annual report (2020-21) to the Board of Advanced Studies & Research were also fulfilled.

HIGHER EDUCATION COMMISSION

H-9, Islamabad, Pakistan
Phone :+92-51-90401905, Fax: +92-51-90401906, Email: nawais@hec.gov.pk

Director (RFI)

No. MNSUAM/ORIC/RFI/R&D/HEC/2021-22-2
October 11, 2021

With reference to application, received from Muhammad Nawaz Shareef University of Agriculture, Multan, the competent authority is pleased to recognize **"Office of Research, Innovation and Commercialization (ORIC)"** at **Muhammad Nawaz Shareef University of Agriculture, Multan**.

2. As per the Higher Education Commission's ORIC policy, Muhammad Nawaz Shareef University of Agriculture, Multan is now eligible for the enhanced overhead cost up to 15% against HEC sponsored competitive research grants. The overhead will be solely dependent upon the performance of the ORIC as per categories mentioned in the table below:

Category	Overhead Percentage
W	15%
X	10%
Y	5%
Non-Complying	-

For the first year of notification (ending 30th June 2022), the ORIC of Muhammad Nawaz Shareef University of Agriculture, Multan is eligible for **5% overhead** corresponding to Y category and afterwards it will be validated, based on annual performance and audit of self-assessment scorecard, in accordance with the above cited categories.

3. The overhead will be utilized by the ORIC for research-support activities and shall be subject to review and audit by the HEC. We look forward to persistent commitment by the ORIC towards its foreseen objectives and compliance with HEC ORIC Policy and SOPs.

(Noshaba Awais)

Prof. Dr. Asif Ali (TI)
Vice Chancellor
Muhammad Nawaz Shareef University of Agriculture,
Multan

Copy To :

- PS to Director General (Finance Division) HEC, Islamabad
- SPS to Director General (R&I Wing) HEC, Islamabad
- Director (Research Grant Management-R&D Division) HEC, Islamabad
- Head of ORIC, Muhammad Nawaz Shareef University of Agriculture, Multan

2.12. Revenue Generated

ORIC has been facilitating faculty for execution of national/international/industrial level projects, commercialization activities, lab trainings and conduct of various events that involve revenue generation. A summary of revenue generated by ORIC from these services during the reported year is as follows:

Particulars	Revenue in Million PKR
Sponsorships for events	50.50
ORIC Overhead from Research Projects	17.94
Consultancies provided	01.98
Lab Sample Analysis	0.049
Total	**70.469**

2.13. Pakistan Agriculture Coalition Fellowship on Cotton Production

MNS University of Agriculture, Multan offers a variety of funding options for national students pursuing postgraduate studies, including scholarships and student assistantships. A PhD fellowship on cotton production is being availed by Ms. Bushra Irum, M.Sc. student from the Department of Soil and Environmental Sciences, funded by the Pakistan Agriculture Coalition.

2.14. Facilitation to HEC Indigenous Awardee(s)

ORIC facilitated seven PhD awardees of HEC Indigenous-5000 Fellowships enrolled in various departments of MNSUAM for the accomplishment of their research work through timely disbursement of funds from the Treasurer Office.

2.15. Facilitation to Faculty for HEC Approved PhD Supervisorship

ORIC facilitated 23 faculty members of various departments to renew/apply for HEC approved PhD Supervisorship during the reported year. Currently, the University has 73 faculty members with the status of Approved PhD Supervisor from HEC.

2.16. Promotion of Research and Consultancy Culture

ORIC is striving hard to promote the culture of research and consultancy through creating a research eco-system. During the reported year, 15 faculty members provided consultancies to various agencies/industries e.g., Syngenta, SMEBFC, FAO, PAF, NBP, Mahmood Group of Industries, etc. Moreover, keeping in view the need of the local community, especially the farmers and industrialists, this University has taken the following revolutionary steps:

1. All faculty members of the University are encouraged to take part in need-based research and consultancy.

2. Students are motivated for research and consultancy in the form of paid work.
3. Liaisons are being established among the researchers and extension workers to work for a common target like the establishment of the South Punjab Agriculture Forum.
4. For the benefit of the local community, this University intends to provide funds from its own resources to the researchers to carry out problem-oriented research.

2.17. Business Incubation and Agricultural Entrepreneurship Center (BIAEC)

Business Incubation and Agricultural Entrepreneurship Center (BIAEC) is aimed to initiate the business culture among the youth, including students and career professionals of South Punjab. The overall focus of this initiative is to mobilize the new generation towards economic development through launching the business and social enterprises. The BIAEC provides excellent counseling to the students. The BIAEC helps the students to convert their innovative ideas into valuable businesses.

2.17.1. Current developments at BIAEC

- MNSUAM BIAEC is the only registered BIC in Multan and also got funding of 24 Million from HEC. MNSUAM BIAEC submitted a proposal for the establishment of BIC in south Punjab and the proposal was selected among 8 universities out of 35 universities in Pakistan.
- Sybrid (Private) Limited launched the Corporate Innovation Center for Agriculture and Allied Technologies (CICAAT) at the Muhammad Nawaz Sharif University of Agriculture, Multan, with the collaboration of BIAEC to promote agri-tech, business innovation and young talent in the region.

2.17.2. Capacity building sessions for incubatees

- Workshop on NTN & STRN registration and E Fillings of return (21-03-2022)
- Workshop on Honey Production & Business Plan (28-2-2022)
- Workshop on Mango Export (12-02-2022)
- Workshop on Digital Marketing and Women Leadership (07-01-2022)
- Workshop on Financial Management (09-12-2021)

2.17.3. University Enterprises

GREEN AGRICULTURE SERVICES

UniFresh

UNI HONEY

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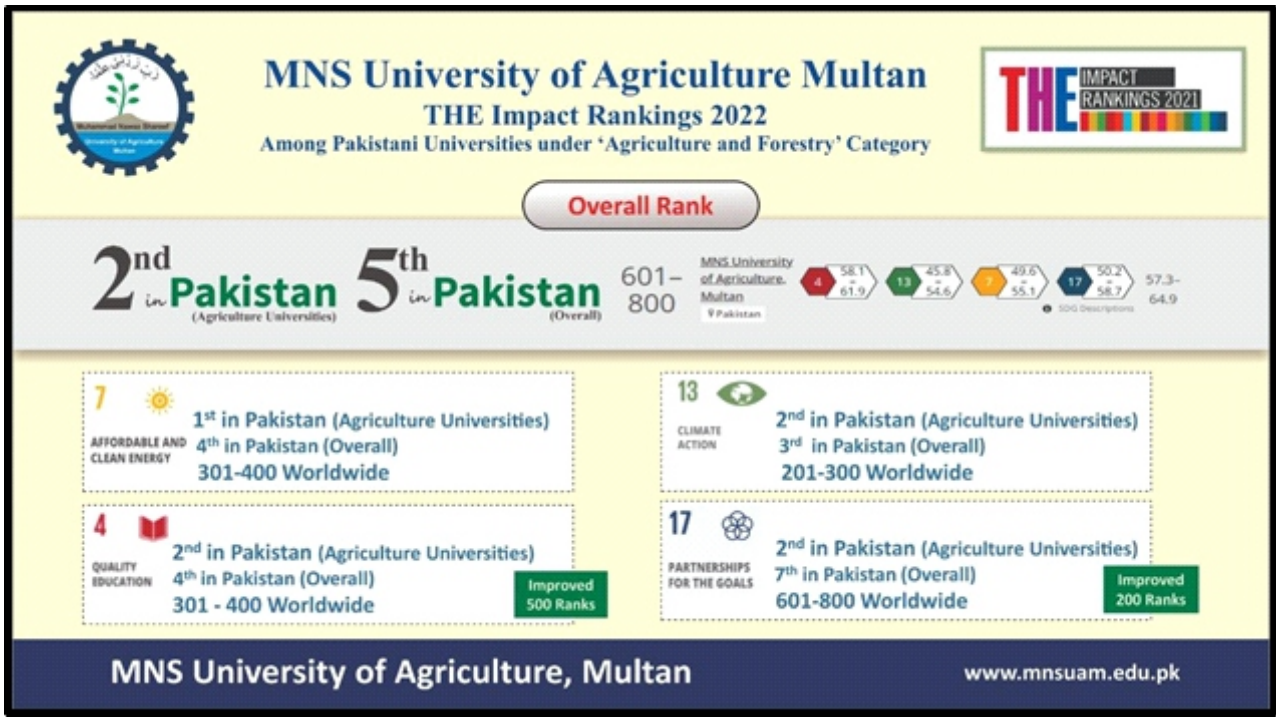
2.18. Rankings

2.18.1. Times Higher Education Impact Rankings 2022

The Times Higher Education Impact Rankings are the only global performance tables that assess universities against the United Nations' Sustainable Development Goals (SDGs). They use carefully calibrated indicators to provide comprehensive and balanced comparisons across four broad areas: research, stewardship, outreach and teaching.

MNSUAM has been ranked 2nd in Pakistan (Agriculture Universities), 5th in Pakistan (All Universities) and 601-800 Worldwide under the subject category "Agriculture and Forestry". The University has improved 500 ranks in SDG-4 and 200 ranks in SDG-17 as compared to last year's ranking of individual SDGs.



2.18.2. Times Higher Education World University Rankings 2022

The Times Higher Education World University Rankings include more than 1,500 universities across 93 countries and regions, making them the largest and most diverse university rankings to date. This ranking analyzed more than 80 million citations across over 13 million research publications and included survey responses from 22,000 scholars globally.

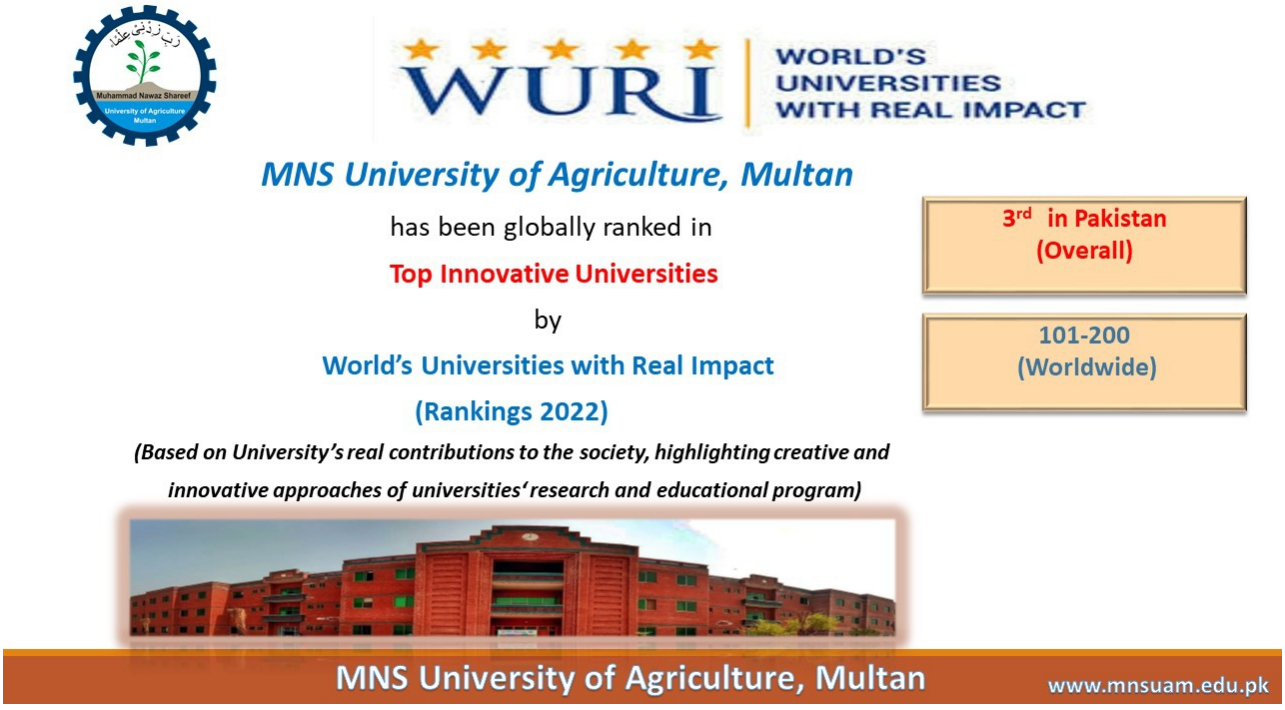
MNSUAM attained the status of "Reporter University" during 2021while the result for 2022 are still awaited.

2.18.3. Subject Validation 2021

Subject Validation is a part of Times higher Education (THE) rankings which focus on showcasing offered subjects. THE collects offered subject information from the university each year in June and update on THE profile of the university. MNSUAM submitted data for the year 2021 and results are displayed on the profile and data for the year 2022 is also submitted.

2.18.4. WURI Ranking

World Universities with Real Impact Ranking is not based on tradition, reputation, or popularity but rather is focused on new concepts such as innovativeness, entrepreneurship, responsibility, and openness. MNSUAM submitted 17 innovative ideas for the year 2022. WURI published results and MNS University of Agriculture Multan Ranked 101-200 in Global Top innovative Universities, 3rd in Pakistan (Overall) and 1st in Pakistan (Agriculture Category).



2.18.5. QS World University Rankings 2022

QS World University Rankings comprise **research** data, **survey** data**, institutional** data and **county-level** data, and carefully balance these to ensure diverse types of institutions can be fairly reflected. MNSUAM submitted data for the year 2022 and results are still awaited.

2.18.6. UIGREENMETRIC WORLD UNIVERSITY RANKINGS

The UI GreenMetric is an annual publication of University rankings on environmental sustainability. It comprises six indicators of the particular University, including; Setting and infrastructure, Energy and Climate Change, Waste, Water, Transportation and Research & Education. MNS-University of Agriculture, Multan achieved 1st position in Pakistan and 154th worldwide as an environmentally sustainable University in UI GreenMetric World University Rankings 2022.

2.19. Publications

2.19.1. Journal Articles

The following research papers/manuscripts were published during 2021 -22.

Sr. No.	Paper	Authors' Name	Year	Journal	Volume	Page Number
1	Neuroprotective effects of oleuropein: recent developments and contemporary research	Butt MS, U Tariq, A Naz, and M Rizwan.	2021	J. Food Biochem.	45	1-26
2	Nutritional functions and antioxidative enzymes in juice extract from two different maturity stages of low temperature stored phalsa (*Grewia subinaequalis Dc*) fruit	Hassan H, M Amin, IA Rajwana, S Ullah, K Razzaq, HNFaried, GAkhtar, UN Ullah, MA Qayyum, MM Aslam, K Ali, Z Asghar, S Nayab, A Naz and HW Sahar.	2021	LWT-Food Sci. Technol.	153	112552
3	Standardization of growing media for grapes nursery production	Saqib M, K Razzaq, S Ullah, A Hussain, IA Rajwana, A Naz, G Akhtar, M Amin, HN Faried, MS Zafar and M Shafique.	2021	J. Plant Environ.	3	46-55
4	Influence of pre-gelatinized starch on rheology of composite flour, in vitro enzyme digestibility and textural properties of millet-based chapatti	Nasir M, S Ahmad, M Usman, U Farooq, A Naz, MA Murtaza, Q Shehzad, A Mehmood and GM Din.	2021	Carbohydr. Polym. Technol.	2	100108
5	Pre and postharvest evaluation of hydroponically grown toma to at different maturity stages	Faried HN, Z Haider, , IA Rajwana, AA Bahar, S Ahmed and , S Ullah.	2021	Pure Appl. Biol.	11	704-708
6	Anti-acne and anti-inflammatory potential of fruit's pulp, peels and juices	Hassan Z, A Irfan, M Iqbal, A Zareen, H Anwar and MF Tabassum.	2021	Ann. Romanian Soc. Cell Biol.	25	1289-1304

7	Automated birdsong clustering and interactive visualization tool	Hakim A and MT Mahmood.	2021	Pak. J. Agric. Sci.	58	1395-1403
8	Antidiarrheal and cardio - depressant effects of himalaiella heteromalla (D.Don) Raab -Straube: in vitro, in vivo, and in s ilico studies	Fatima S, F Usman, S Malik, N Bano, NU Rahman, M Riaz, RA Marc and CC Muresan.	2021	Plants	11	78
9	Effect of pesticides on erythrocytes of indigenous fish *Labeo rohita*	Bano N, A Nadeem, S Maalik, S Mushtaq, N Iqbal, AK Khan, A Shabbir, M Imran, S Niaz, M Yasin, MA Qayyum, B Ahmad, M Skalicky, SA Alharbi and S Alfarrajm.	2021	J. King Saud Univ. Sci.	7	101586
10	Biological activities of methanolic extract of *Aegle marmelos* against HN protein of Newcastle disease virus	Andleeb R, MU Ijaz, A Rafique, A Ashraf, N Bano, N Zafar, F Tasleem, RA Marc, OL Pop and HT Ahmedah.	2021	Agronomy	11	1784
11	Effects on egg production and quality of supplementing drinking water with calcium and magnesium	Yi1 XJ, A Rehman, RW Akhtar, A Abbas, K Hussain, R Yasin, HM Ishaq, RZ Abbas, MA Raza, HS Hu and G Li.	2021	S. Afr. J. Anim. Sci.	51	469-476
12	Gut microbial dysbiosis and its association with esophageal cancer	Ishaq HM, IS Mohammad, KS Muhammad, H Li, RZ Abbas, S Ullah, Y Fan, A Sadiq, MA Raza, R Hussain, HM Arshad, I Khan, MU Waqas, AU Rehman, R Yasin, A Rehman, RW Akhtar and J Xu.	2021	J. Appl. Biomed.,	19	1-13

13	A new discovery of a giraffokeryx skull and associated fossil assemblage of Ruminants from the middle miocene deposits of the Siwaliks	Samiullah K, S Akhtar, R Yasin, RM Fazal, MA Raza, S Mahboob, KA Al-Ghanim, FA Al-Misned and Z. Ahmed.	2021	Hist. Biol.	34	759-783
14	New fossil remains of giraffids from the lower siwaliks of Punjab, Pakistan: evolution, systematics and biogeography	Arif A, K Samiullah, R Yasin, B Rasool, S Naz, X Ni, and S Akhtar.	2021	Pak. J. Zool.	54	265-274
15	Reliable and energy-efficient routing scheme for underwater w ireless sensor networks (UWSNs)	Iqbal S, I Hussain, Z Sharif, K . H Qureshi, and J Jabeen.	2021	Int. J. Cloud Comput.	11	42-58
16	Semantics analysis of agricultural experts' opinions for crop productivity through machine learning	Rehman M, A Razzaq, IA Baig, J Jabeen, MH N Tahir, UI Ahmed, A Altaf and T Abbas.	2021	Appl. Artif. Intell.	35	986-1001
17	Potential soil moisture deficit: a useful approach to save water with enhanced growth and productivity of wheat crop	K Shahbaz, A Rasool, S Irshad, MB Hafeez, M Ali, M Saddique, M Asif, Z Hasnain, S Naseem and M S AA Al-Hashimi.	2021	J. Water Clim. Chang.	12	2515-2525
18	Assessing purpose and importance of transitional change through student development perspective	Khan M, S Kaynat, IU Khan, S Khan, U Waheed and Matiullah.	2021	PalArch's J. Archaeol. Egypt/ Egyptol.	8	8
19	Fruit drop in cotton: some causes	Qureshi H, U Waheed, AB Siddique, Z Ali, R Ahmed, M Sidduqiue, I Shahzadi, A Naz, W Ejaz and N Raza.	2021	J. Agric. Food	2	36-62
20	Phenotypic and genotypic diversity in some bread wheat genotypes exposed to heat stress	Shahbaz U, U Waheed, M Siddique, N Riaz, MW Khan, SU Din, A Raziq, FA Jawad, NM Khan and H Ullah.	2021	Egypt. J. Agric. Res.	99	411-420

21	Weed dynamics, crop growth and yield attributes of irrigated chickpea in response to chemical weed control	Arshad N, A Matloob, M Aziz, MAR Khan, M Amin, A Mobli, K Hussain, AM Khan and Z Ali.	2021	Int. J. Pest Manag.	Online first	2015010
22	Zinc coated urea enhanced the growth and quality of rice cultivated under aerobic and anaerobic culture	Irshad M, MA Wahid, MF Saleem, S Khan, S Irshad, A Matloob, M Sarwar, M Ali, Z Hasnain and MA Cheema.	2021	J. Plant Nutr.	45	1198-1213
23	Effect of plant spacings on growth, physiology, yield and fiber quality attributes of cotton genotypes under nitrogen fertilization	Zaman I, M Ali, K Shahzad, MS Tahir, A Matloob, W Ahmad, S Alamri, MR Khurshid, MM Qureshi and A Wasaya.	2021	Agronomy	11	2589
24	Utilization of the neighborhood design to evaluate suitable cover crops and their density for *Echinochloa colona* management	Matloob A and B.S. Chauhan.	2021	Plos One	16	e0254584
25	Foraging behavior and visit optimization of bumblebees for the pollination of greenhouse tomatoes	Zameer U, M Ali, A Sajjad, S Saeed, A Matloob, MA Bashir, RA Alajami, BM Hargis, M Hashem, S Alamari and S Atta.	2021	J. King Saud Univ. Sci.	34	101744
26	Helminth protection against type 1 diabetes: an insight into immunomodulatory effect of helminth induced infection	Mughal MAS, M K Khan, Z Abbas, RZ Abbas, H R Bajwa, AK Chatha, M Imran, Z D Sindhu, A Abbas, A Zafar and M Nadeem	2021	Mol. Biol. Rep.	3	6581–6588

27	Mycoplasma pathogenicity for humans and animals: an effort of complete genome sequencing and gene family analysis of *Mycoplasma synoviae*	Yi XJ, A Rehman, U Shahid, CX Hong, A Abbas, K Hussain, MA Raza, HM Ishaq, HS Hu and Guo Li.	2021	Pak. J. Agric. Sci.	58	1379-1385
28	In vitro and in vivo anticoccidial effects of butyric acid and its impact on blood and serum chemistry of broiler chickens.	Rani Z, RZ Abbas, A Abbas, Z Saeed, TR, Hussain, K Mehmood, A Rehman and K Hussain.	2021	Kafkas Univ Vet Fak Derg Kafkas Univ Vet Fak	27	583-588
29	Anticoccidial potential of ageratum conyzoides and its effect on blood parameters of experimentally infected broiler chickens	Hussain K, RZ Abbas, A Abbas, K Samiu llah, T Ahmed, F Siddique, M Mohsin, A Rehma, AUl Rahman and MU Waqas.	2021	J. Hell. Vet. Medical Soc.	72	28497
30	Ochratoxin a occurrence, its pathological effects on poultry health and decontamination approaches	Mehtab1 U, MA Tahir1, RZ Abbas, A Abbas, K Hussain, F Siddique, M Mohsin, Z Rani, A Rehman and R Yasin.	2021	J. Hell. Vet. Medical Soc.	4	3257-3262
31	Translation norms in Pakistani literature: a comparative study of the reluctant fundamentalist and bunyad parast.	Khan A and A Saeed.	2021	Pak. Social Sci. Rev.	5	305-323
32	The privilege of purdah and the role of women in Pakistan freedom movement in Shaista ikramullah's from purdah to parliament	Saeed A, S Ayaz and A Khan	2021	Oeconomia Copernicana	12	1-6
33	Effect of drought on trichome density and length in cotton (*Gossypium hirsutum*)	Shahzad, M, Z Khan, W Nazeer, SF Arshad, F Ahmad, B Farid, MR Shahid, and H Riaz.	2021	J. Biores. Manag.	8	15

34	Bioinformatics and expression analysis of histone modification genes in grapevine predict their involvement in seed development and hormonal signaling	Wang L, B Ahmad, C Liang, X Shi, R Sun, S Zhang, and G Du.	2021	BMC Plant Bio.	1	412
35	Kaolin and Jasmonic acid improved cotton productivity under water stress conditions	Nazim M, M Ali, KShahzad, F Ahmad, F Nawaz, M Amin, S Anjum, SA N Alharbi,, S Fahad, and S Danish.,	2021	Saudi J. of Biolo. Sci.	28	6606-6614
36	Rhizobacteria inoculation and caffeic acid alleviated drought stress in lentil plants	Hye MZ, MN Akbar, Y Iftikhar, M Abbas, A Zahid, S F ahad, R Datta, M Ali, AM Elgorban, MJ Ansari and S Danish.	2021	Sustainability	13	9603
37	Exogenously applied kaolin and jasmonic acid improve morpho-physiology, seed cotton and fibre quality under water stress	Nazim M, M Ali, K Shahzad, F Ahmad, F Nawaz, M Amin, S Anjum, O Nasif, SA Alharbi, S Fahad and S Danish.	2021	Saudi J. Biolo. Sci.	28	6606-6614
38	Postharvest γ-aminobutyric acid application mitigates chilling injury of aonla (*Emblica offcinalis Gaertn.*) Fruit during low temperature storage	Ali S, MA Anjum, A Nawaz, S Ejaz, R Anwar, G Khaliq, S Hussain, S Ullah, R Hussain, MS Saleemand MUHasan.	2021	Postharvest Biol. Technol.	185	111803
39	Pre-harvest oxalic acid application improves fruit size at harvest, physico-chemical and sensory attributes of 'Red flesh' apricot during fruit ripening	Ahmed M, S Ullah, K Razzaq, IA Rajwana, G Akhtar, A Naz, M Amin, MS Khali d and S Khalid.	2021	J. Hortic. Sci. Biotechno.	69	48-55

40	Combined foliar application of calcium, zinc and boron and application time influence leaf nutrient status, vegetative growth, fruit yield, fruit biochemical and anti-oxidative attributes of 'chandler'strawberry	Salman M, S Ullah, K Razzaq, IA. Rajwana, G Akhtar, N Faried and M Amin.	2021	J. Plant Nutr.	45	1837-1848
41	Potassium-induced drought tolerance of potato by improving morpho-physiological and biochemical attributes	Bahar AA, HN Faried, K Razzaq, S Ullah, G Akhtar, M Amin, M Bashir, N Ahmed, F Masoud, S Ahmar, T Javed, MH Siddiqui, F Branca and ES Dessoky.	2021	Agronomy	11	2573
42	Morpho-physiological and biochemical attributes of chili genotypes grown under varying salinity levels	Butt M, A Sattar, T Abbas, R Hussain, MIjaz, A Sher, U Shahzad, S Ullah, M Brestic, M Zivcak, K Gasparovic, BS Aljuaid, AM El - Shehawi and K Zuan.	2021	PLos ONE	16	e0257893
43	Carboxymethyl cellulose coating delays ripening of harvested mango fruits by regulating softening enzymes activities	Ali S, MA Anjum, AS Khan, A Nawaz, S Ejaz, G Khaliq, S Iqbal, S Ullah, RN Rehman, MM Ali and MS Saleem.	2021	Food Chem.	380	131804
44	Development of synthetic food baits for mass trapping of *Bactrocera zonata* S. (*Diptera: Tephritidae*)	Hasnain M, S Saeed, UN Ullah and S Ullah.	2021	J. King Saud Univ. Sci.	34	101667
45	Sentiment analysis of students feedback before and after COVID-19 pandemic	Umair M, A Hakim, A Hussain and S. Naseem.	2021	Int. J. Emerg. Technol. Learn.	12	171-176

46	Stomatal state identification and classification in quinoa microscopic imprints through deep learning	Razzaq A, S Shahid, M Akram, M Ashraf, S Iqbal, A Hussain, MA Zia, S Qadri, N Saher, F Shahzad, AN Shah, A Rehman and SE Jacobsen.	2021	Complexity	2021	1-9
47	Performance evaluation of indigenous floppy sprinkler irrigation system for various crops water management	Hashim S, AA Khan, M Saifullah, KM Khedher, M Ali, H Rehman, A Hussain, M Waqas, A Ashraf, I Ahmad, M Jawad and RM Ikram.	2021	J. King Saud Univ. Sci.	33	101636
48	Machine vision approach for classification of rice varieties using texture features	Qadri S, T Aslam, SA Nawaz, N Saher, A Razzaq, M Rehman, N Ahmad, F Shahzad and SF Qadri.	2021	Int. J. Food Prop.	24	1615-1630
49	The impact of prolonged use and oxidative degradation of atrazine by Fenton and photo-Fenton processes	Fareed A, A Hussain, M Nawaz, M Imran, Z Ali and S Haq.	2021	Environ. Technol. Innov.	24	1018440
50	Combined sulfur and organic compost treatment influences nutrient uptake and photosynthetic activity to improve growth and yield of sunflower	Haq SU, A Hussain, U Riaz, MB Hussain, N Fareed, NA Ikram and F Nawaz.	2021	Pak. J. Agric. Res.	34	656-663
51	Pathology and molecular characterization of eimeria tenella from clinically infected broiler chickens in district Lahore, Pakistan	Sultan R, A Aslam, MY Tipu, H Rehman, S Usman, A Anjum, MS Imran,M Usman and MZ Iqbal.	2021	Pak. J. Zool.	54	47-55
52	Toxico-pathological effects of heavy metals from industrial drainage waste water on vital organs of small ruminants in Lahore	Sharaf S., MR Khan, A Aslam, M Rabbani, A Sharf, M Ijaz, A Anjum and, N Hussain.	2021	Environ. Sci. Pollut. Res.	28	3533-3543

53	Carbofuran exposure causes alterations in clinicopathological features of cattle egret (*Bubulcus ibis coromandus*)	MA. Munir, KM Anjum, A Javid, N Khan, , C Jianming, J Naseer, and A Anjum, S Usman, S Hafeez and M Shahzad.	2021	Indian J. Anim. Res.	56	1416
54	Molecular identification of *Coxiella burnetii*, and incidence and risk factors of coxiellosis in Bovines of Punjab, Pakistan	Iqbal MZ, AZ Durrani, JA Khan, N Ahmad, , M Usman, A Jabbar, S Usman, A Anjum, M Husnain, N Raza and A Haq.	2021	Pak. J. Zool.	54	17582
55	Clinico-pathological and hemato-biochemical assessment of field originated chicken anemia virus in experimentally challenged birds	Nadeem SM, MR Khan, A Aslam, AA Sheikh, A Ahmad AA Latif and A Anjum.	2021	Indian J. Anim. Res.	55	936-940
56	Molecular characterization and pathology of virulent newcastle disease virus isolated from broiler chickens in district Lahore, Pakistan	Ali M, MR Khan, A Aslam, H Rehman, A Anjum, SF Waheed, S Usman, S Masood, A Ullah and A Masood.	2021	Indian J. Anim. Res.	56	1420
57	First report of *Alternaria alternata* causing fruit rot on fig (*Ficus carica*) in Pakistan	Alam MW, A Malik, A Rehman, M Sarwar, S Muhammad, H Alsamadany, Y Alzahrani and Z Ahmed	2021	Plant Dis.	105	2015
58	First report of *Lasiodiplodia pseudotheobromae* causing stem end rot of mango fruit in Pakistan	Alam MW, A Malik, A Rehman, M Sarwar, T Shafeeq, A Hameed, NA Rajput and M Atiq.	2021	Plant Dis.	102	1096

59	First record of *Chaetomium globosum* causing leaf spot of pomegranate in Pakistan	Alam MW, A Malik, A Rehman, M Sarwar, TA Chohan, R Mustaq, M Hussain, D Hussain and T Shafeeq.	2021	Plant Dis.	102	1094
60	Resistance assessment of citrus varieties against gummosis disease caused by *Phytophthora nicotianae* under natural field conditions.	Tariq H, NA Rajput, M Atiq, ST Sahi, A Rehman, A Rashid, MA Khan, A Hameed and WM Saddique.	2021	Pak. J. Agric. Sci.	34	824
61	The influence of vermicomposting on photosynthetic activity and productivity of maize (*Zea mays* L.) crop under semi-arid climate	Younas M, H Zou, T Laraib, W Abbas, MW Akhtar, MN Aslam, L Amrao, S Hayat,TA Hamid, A Hameed, GA Kachelo, MM Elseehy, AM El-Shehawi, ATK Zuan, Y Li and M Arif.	2021	Plos One	8	e256450
62	*Ruellia nudiflora*-mediated biological synthesis of silver nanoparticles and their potential antioxidant, antifungal and antibacterial applications against selected multidrug resistant bacteria	Ullah S, N Shujaat, RA Khan, A Sohail, M Khan, H Bilal, IU Khan, M Ahmad, M Khan, R Ullah, B Ahmad and RU Khan.	2021	PJMLS	4	291-302
63	Comparative efficacy of amphotericin B-loaded chitosan nanoparticles and free amphotericin B drug against *Leishmania tropica*	Sohail A, RU Khan, M Khan, M Khokhar, S Ullah, A Ali, H Bilal, S Khattak, M Khan, and B Ahmad	2021	Bull. Natl. Res. Cent.	45	187
64	Bio-fortification of cereals and pulses using new breeding techniques: challenges and opportunities	Shahzad R, S Ahmad, S Jamil, S Khan, A Nisar, Z Amina, S Kanwal, H MU Aslam, R A Gill and W Zhou.	2021	Front. Nutr.	8	721728

65	First report of Brown leaf spot of rice (*Oryza sativa* L.) caused by *Bipolaris sorokiniana* in Pakistan	Aslam HMU, NA Khan, SI Hussain, Y Ali, M Raheel, R Shahzad, S Jamil, O Yasin, S Ali and L Amrao.	2021	Plant Dis.	106	1750
66	Multivariate analysis of morpho-physiological and grain yield traits in advance lines of bread wheat under different leaf rust disease regimes	Jabran M, U Arshad, HM U Aslam, A Abbas, A Haseeb, A Hussain, S Hussain, W Sabir, A Jabbar and MA Ali.	2021	Pak. J. Agric. Sci.	58	1463-1471
67	Effect of IGRs on pupal and adult suppression of *Tribolium castaneum* (Herbst) and *Trogoderma granarium* (Everts)	Ali Q, M Raheel, W Ashraf, Q Shakeel, M Qasim, S Ali, K Fatima, A Jabbar, K Naveed, HMU Aslam.	2021	Fresenius Environ. Bull.	-	-
68	Sub-lethal effects of *Lecanicillium lecanii* (Zimmermann)-derived partially purified protein and its potential implication in cotton (*Gossypium hirsutum* L.) Defense against *Bemisia tabaci* Gennadius (Aleyrodidae: Hemiptera)	Abdulle YA, T Nazir, S Sayed, SF Mahmoud, MZ Majeed, HMU Aslam, Z Iqbal, MS Nisar, AU Keerio, H Ali and D Qiu.	2021	Agriculture	11	778
69	Integrated analyses of the gut microbiota, intestinal permeability, and serum metabolome phenotype in rats with alcohol withdrawal syndrome	Yang F, J Wei, M Shen, Y Ding,, Y Lu, , HM Ishaq, D Li, , D Yan, Q Wang, and Zhang.	2021	Appl. Environ. Microbiol.	87	e00834-21
70	Comparative minimal inhibitory and mutant prevention concentration of eight antimicrobial agents against *Klebsiella pneumoniae*	Yang F, P Chen, H Wang, X Xing, S Wang, HM Ishaq, and Wei Liao.	2021	Microb. Drug Resist.	2	229-235.

71	Molecular confirmation and genetic characterization of haemonchus contortus isolates at the nuclear ribosomal ITS2 region: first update from Jhang region of Pakistan	Qamar W, MA Zaman, M Faheem, I Ahmed, K Ali, MF Qamar, HM Ishaq, and FA Atif.	2021	Pak. Vet. J.	57	25-31
72	Effects of water and fertilizer coupling on the physiological characteristics and growth of rabbiteye blueberry	Guo X, S Li, D Wang, Z Huang, N Sarwar, K Mubeen, M Shakeel and M Hussain.	2021	Plos One	16	e0254013
73	Zinc solubilizing bacteria mediated enzymatic and physiological regulations confer zinc biofortifcation in chickpea (*Cicer arietinum* L.)	Batool Sadia, HN Asghar, MA Shehzad, S Yasin, M Sohaib, F Nawaz, G Akhtar, K Mubeen, ZAZahir and M Uzair.	2021	J. Plant. Nutr. Soil Sci.	21	2456-2471
74	Integrated phosphorus nutrient sources improve wheat yield and phosphorus use efficiency under sub humid conditions	Mubeen K, A Wasaya, H Rehman, TA Yasir, O Farooq, M Imran, R M Ikram, R Nazeer, F Zahoor, MW Yonas, M Aziz, MH Rahman, M Ahmad, M Alam, M Ali, M Ali, A Khaliq, M Ishtiaq and MM Waqas.	2021	PLos One	16	e0255043
75	The impact of horse purslane (*Trianthema portulacastrum* L.) Infestation on soybean [*Glycine max* (L.) Merrill] productivity in northern irrigated plains of Pakistan	Mubeen K, M Shehzad, N Sarwar, H Rehman, TA Yasir, A Wasaya, M Ahmad, M Hussain, MB Abbas, MW Yonas, S Farooq and TA Alahmadi.	2021	Plos One	16	e0257083
76	Rhizobial inoculation in soil improves growth, yield and economic returns of irrigated chickpea	Fareed HMA, A Matloob, K Mubeen and MB Hussain.	2021	Soil Environ.	40	183-193

77	Foliar applied calcium chloride confers drought tolerance in maize by modulating growth and agronomic attributes	Abbasi SH, M Aziz, K Mubeen and MU Jamshaid.	2021	Soil Environ.	40	146-156
78	Sulfate-based fertilizers regulate nutrient uptake, photosynthetic gas exchange, and enzymatic antioxidants to increase sunflower growth and yield under drought stress	Shafiq BA, F Nawaz, S Majeed, M Aurangzaib, A Al Mamun, M Ahsan, KS Ahmad, MA Shehzad, M Ali, S Hashim and T ul Haq.	2021	J. Plant. Nutr. Soil Sci.	21	2229-2241
79	Zinc-solubilizing bacteria-mediated enzymatic and physiological regulations confer zinc biofortification in chickpea (*Cicer arietinum* L.)	Batool S, HN Asghar, MA Shehzad, S Yasin, M Sohaib, F Nawaz, G Akhtar, K Mubeen, ZA Zahir and M Uzair.	2021	J. Plant. Nutr. Soil Sci.	21	2456-2471
80	Interface engineering of bi-layer semiconductor SrCoSnO3-&-CeO2-& heterojunction electrolyte for boosting the electrochemical performance of low-temperature ceramic fuel cell	Shah MAKY, Z Tayyab, S Rauf, M Yousaf, N Mushtaq, MA Imran, PD Lund, MI Asghar and B Zhu.	2021	Int. J. Hydrog. Energy	46	33969-33977
81	Sustainability and efficiency analysis w.r.t adoption of climate-smart agriculture (CSA) in Pakistan: a group-wise comparison of adopters and conventional farmers	Imran MA, A Ali, RJ Culas, M Ashfaq, IA Baig, S Nasir and AH Hashmi.	2021	Environ. Sci. Pollut. Res.	13	19337-19351
82	Role of non-state organizations in strengthening social capital: case study of Mansehra district of KP province, Pakistan	Nasir S, M Yasin, MU Mehmood, M Luqman, M Yaseen, MZ Majeed, M Aslam and MA Imran.	2021	Int. J. Agric. Ext.	9	335-341.
83	Morphological and palynological assessment of some taxa of genus *Echinochloa* through light and scanning electron microscopy	Shaheen S, J Sharifi-Rad, N Harun, MA Khan, M Ali, S Khalid, S Javad, U Hanif, S Sajjad and F Khan	2021	Microsc. Res. Tech.	12	2883-2889

84	Biochar and urease inhibitor mitigate NH_3 and N_2O emissions and improve wheat yield in a urea fertilized alkaline soil	Dawar K, S Fahad, MMR Jahangir, I Munir., SS Alam., SA Khan, IA Mian, R Datta, S Saud, J Banout, M Adnan, MN Ahmad, A Khan, R Dewil, MH Rahman, MJ Ansari and S Danish.	2021	Sci. Rep.	11	17413
85	Climate change impact uncertainty assessment and adaptations for sustainable maize production using multi-crop and climate models	Yasin M, A Ahmad, T Khaliq, MH Rahman, S Niaz, T Gaiser, I Ghafoor, HS Hassan, M Qasim and G Hoogenboom.	2021	Environ. Sci. Pollut. Res.	29	18967–18988
86	Potential role of plant growth regulators in administering crucial processes against abiotic stresses	Sabagh AEL, M Sonia, H Akbar, MH Rahman et al.	2021	Frontiers in Agronomy	4	648694
87	Seed priming with sulfhydral thiourea enhances the performance of *Camelina sativa* L. under heat stress conditions.	Waraich EA, M Ahmad, W Soufan, MT Manzoor, Z Ahmad, MH Rahman and M Sabagh.	2021	Agronomy	11	1875
88	Assessing the potential of partial root zone drying and mulching for improving the productivity of cotton under arid climate	Iqbal R, MH Rahman, M., MAS Raza et al.	2021	Environ. Sci. Pollut. Res.	28	66223–66241
89	Flood mitigation in the transboundary Chenab river basin: a basin-wise approach from flood forecasting to management	Ali S, MJM Cheema, MM Waqas, M Waseem, MK Leta, MU Qamar, UK Awan, M Bilal and MH Rahman.	2021	Remote Sensing	13	3916
90	Effect of arbuscular mycorrhizal fungi on the physiological functioning of maize under zinc-deficient soils	Saboor A, MA Ali., S Danish, N Ahmed, S Fahad., R Datta, AM Javed, O Nasif, MH Rahman and BR Glick.	2021	Sci. Rep.	11	18468

91	Salinity stress in wheat (*Triticum aestivum* L.) In the changing climate: adaptation and management strategies	Sabagh A, I M Sohidul, S Milan, AR Muhammad, S Kulvir, AH Mohammad, H Akbar, MH Rahman et al.	2021	Front. Agron.	-	-
92	Crop models: important tools in decision support system to manage wheat production under vulnerable environments	Wajid A, K Hussain, MH Rahman, Q Shakil and G Hoogenboom.	2021	Agriculture	11	1166
93	Linking plants functioning to adaptive responses under heat stress conditions: a mechanistic review	Hassan UM, T Rasool, C Iqbal, A Arshad, M Abrar, NM Abrar, MH Rahman, MA Noor, A Sher and S Fahad.	2021	J. Plant Growth Regul.	-	-
94	Identification and characterization of triple action bioagents (TAB) and their potency against *Fusarium* wilt of lentil	Nisa RT, KA Bhat, U Basu, R Rashid, X Wang, SK Jan, HS Viswanath, W Soufan, M Mushtaq, MH Rahman, F Ahmad bhat and EL Sabagh A.	2021	Horticulturae	7	587
95	Biochar and slow-releasing nitrogen fertilizers improved growth, nitrogen use, yield, and fiber quality of cotton under arid climatic conditions	Manzoor S, MH Rahman, G Haider, I Ghafoor, S Ahmad, M Afzal, F Nawaz, R Iqbal, M Yasin, S Danish and A Ghaffar.	2022	Environ. Sci. Pollut. Res.	29	13742-13755
96	Biochar enriched with buffalo slurry improved soil nitrogen and carbon dynamics, nutrient uptake and growth attributes of wheat by reducing leaching losses of nutrients	Javeed HMR, M Ali, I Ahmed, X Wang, I Al-Ashkar, R Qamar, A Ibrahim, MH Rahman, A Ditta and A EL Sabagh.	2021	Land	12	1392
97	Line × tester analysis and estimating combining abilities for the physiological and yield traits in bread wheat	Hakeem S, Z Ali, MAB Saddique MH Rahman and S Maryam.	2021	Agric. Sci. J.	2	19-29

98	Leaf proteome response to drought stress and antioxidant potential in tomato (*Solanum lycopersicum* L.)	Rai GK, A Parveen, G Jamwal, U Basu, RR Kumar, PK Rai, JP Sharma, AI Alalawy, MA Al-Duais, MA Hossain, MH Rahman, A Raza, S Danish and MI Sakran.	2021	Atmosphere	12	1021
99	Physiochemical changes of mung bean [*Vigna radiata* (L.) R. Wilczek] in responses to varying irrigation regimes	Islam MR, MM Kamal, MA Alam, J Hossain, W Soufan, MH Rahman, AE Sabagh and MS Islam.	2021	Horticulturae	7	565
100	Assessing the impact of climate variability on maize using simulation modeling under semi-arid environment of Punjab, Pakistan	Ahmed I, MH Rahman, A Ahmad, S Ahmed and J Judge.	2021	Environ. Sci. Pollut. Res.	25	28413-28430
101	Adaptation strategies to improve the resistance of oilseed crops to heat stress under a changing climate: an overview	Ahmad M, EA Waraich, M Skalicky, S Hussain, U Zulfiqar, MZ Anjum, MH Rahman, M Brestic, D Ratnasekera, LL Tamayo, IA Ashkar and AE Sabagh.	2021	Front. Plant Sci.	11	767150
102	Impact of agricultural drought on sunflower production across Hungary	Harsanyi E, B Bashir, F Alsilibe, K Alsafadi, A Alsalman,, A Szeles, MH Rahman, I Bacskai, C Juhasz, T Ratonyi and S Mohammed.	2021	Atmosphere	12	1339

103	Potential effects of biochar application for improving wheat (*Triticum aestivum* L.) Growth and soil biochemical properties under drought stress conditions	Zaheer MS, HH Ali, W Soufan, R Iqbal, MH Rahman, J Iqbal, M Israr and A El Sabagh.	2021	Land	10	1125
104	Yield stability and genotype environment interaction of water deficit stress tolerant mung bean (*Vigna radiata* L. Wilczak) genotypes of Bangladesh	Islam MR, BC Sarker, MA Alam, T Javed, MJ Alam, MS Zaman, MG Azam, R Shabbir, A Raza, MH Rahman, ES Dessoky and MS Islam.	2021	Agronomy	11	2136
105	The nexus between environmental impact and agricultural sector linkages: a case study of Pakistan	Sajid MJ, MH Rahman.	2021	Atmosphere	12	1200
106	Impact of in-field soil heterogeneity on biomass and yield of winter triticale in an intensively cropped hummocky landscape under temperate climate conditions	Rahman MH, A Raza, H Ahrends, H Hugging and T Gaiser.	2021	Precis. Agric.	23	912–938
107	Leaf prickle hairs and longitudinal grooves help wheat plants capture air moisture as a water-smart strategy for a changing climate	Hakeem S, Z Ali, MAB Saddique, MH Rahman and R Trethowan.	2021	Planta	254	1-11
108	Growth and productivity assessments of peanut under different irrigation water management practices using CSM-CROPGRO-Peanut model in eastern Mediterranean of Turkey	Sezen SM, I Ahmad and MH Rahman.	2021	Environ. Sci. Pollut. Res.	29	26936–26949
109	Hydrological response of the kunhar river basin in Pakistan to climate change and anthropogenic impacts on runoff characteristics.	Saifullah M, M Adnan, M Zaman, A Waga, S Liu, MI Khan, AS Gagnon and S Muhammad.	2021	Water	13	3163

110	Prediction of changes in water balance of Nam Co lake under projected climate change scenarios	Adnan M, S Kang, M Saifullah, S Liu, G Zhang, Q Zhao, MA Faiz and M Zaman.	2021	Hydrol. Sci. J.	66	1712-1727
111	Quantification of glacier mass budgets in the Karakoram region of upper Indus basin during the early twenty-first century	Wu K, S Liu, Z Jiang, Q Liu, Y Zhu, Y Yi, F Xie, AA Tahir, and M Saifullah.	2021	J. Hydrol.	603	127095
112	Flood hazard mapping of rivers in snow-and glacier-fed basins of different hydrological regimes using a hydrodynamic model under RCP scenarios	Hayat H, M Saifullah, M Ashraf, S Liu, S Muhammad, R Khan and AA Tahir.	2021	water	13	2806
113	Assessment of spatial and temporal pattern of hydrological droughts in the upper Indus basin, Pakistan	Saifullah M, S Liu, M Adnan, M Zaman,S Muhammad, M Babur, Y Zhu and K Wu.	2021	Pol. J. Environ. Stud.	30	4633–4645
114	A review on distribution, biology and management strategies about a less studied insect pest (*Trilocha varians*) of Ficus	Ramzan M, U Naeem-Ullah,MU Sial, N Iqbal, and S Saeed.	2021	Pak. J. Agric. Sci.	34	394-671
115	Sentence classification using N-Grams in Urdu language text	Awan MDA ,S Ali, A Samad, N Iqbal, MMS Missen and N Ullah.	2021	Sci. Program.	2021	11
116	Event classification from the Urdu language text on social media	Awan MDA, NI Kajla, A Firdous, M Husnain and MMS Missen	2021	PeerJ Comput. Sci.	7	e775
117	Graph neural networks using local descriptions in attributed graphs: an application to symbol recognition and hand written character recognition	NI Kajla, MMS Missen, MM Luqman and M Coustaty.	2021	IEEE Access	9	99103-99111
118	Luteolin alleviates AflatoxinB1-induced apoptosis and oxidative stress in the liver of mice through activation of Nrf2 signaling pathway	Rajput SA, A Shaukat, K Wu, IR Rajput, DM Baloch, RW Akhtar, MA Raza, A Najda, Papliski Rafa, A Al-Brakati, AF El- kott and MM Abdel-Daim.	2021	Antioxidants	8	1268

119	Weed-competition effects on proso millet (*Panicum miliaceum* L.): implications for the farmers	Younis M, NA Ikram, S Iqbal, S Ahmed, A Ghaffar, Z Hasnain, G Abbas, N Chaudhary, A Mubeen, MA Wahid and RM Ikram.	2021	Int. J. Agric. Ext.	9	-
120	Comparative effects of individual and consortia plant growth promoting bacteria on physiological and enzymatic mechanisms to confer drought tolerance in maize (*Zea mays* L.)	Saleem M, F Nawaz, MB Hussain and RM Ikram.	2021	J. Soil Sci. Plant. Nutr.	21	3461-3476
121	Molecular characterization and identification of economically important Potyviruses in Cucurbitaceae family from Gujranwala division of Punjab, Pakistan	Ashfaq M, M Waqas, N Ahmed, M Raheel, HT Abbas, A Masroore, RM Ikram, H Riaz, M Ishtiaq, Z Khan, A Saeed, M Skalicky, S A Alharbi and S Alfarraj.	2021	J. King Saud Univ. Sci.	8	101642
122	Genome wide association mapping through 90K SNP array against leaf rust pathogen in bread wheat genotypes under field conditions	Ahmed HGM, MN Iqbal, MA Iqbal, Y Zeng, A Ullah, M Iqbal, H Raza, MM Yar, HA Anwaar, N Zahid, A Masroor and RM Ikram.	2021	J. King Saud Univ. Sci.	33	101628
123	Sulphur coated urea improves morphological and yield characteristics of transplanted rice (*Oryza sativa* L.) through enhanced nitrogen uptake	Rehman H, MG Asghar, RM Ikram, S Hashim, S Hussain, M Irfan, K Mubeen, M Ali, M Ahamd, M Ali, I Haider, M Shakir, M Skalicky, SA Alharbi and S Alfarrajh.	2021	J. King Saud Univ. Sci.	34	101664

124	Role of machine vision for identification of kidney stones using multi features analysis	Farjad HM, S Qadri, MH Malik, N Saher, F Shahzad, SA Nawaz and DM Khan.	2021	Lah. Garri. Uni. Res.h J. CSIT	5	0503212
125	OP-convNet: a patch classification-based framework for CT vertebrae segmentation	SYED FURQAN Qadri SF , L Shen, M Ahmad, S Qadri, SS Zareen and S Khan.	2021	IEEE ACCESS	9	158227-158240
126	Ginsenoside Rb1 mitigates *Escherichia coli* lipopolysaccharide-induced endometritis through tlr4-mediated NF-κb pathway	Shaukat A, I Shaukat, SA Rajput, R Shukat, S Hanif, I Shaukat, X Zhang, C Chen, X Sun, T Ye, K Niu, Z Yao, S Shaukat, M Safdar, M Abdelrahman, X Gu and L Yang.	2021	Molecules	26	7089
127	Orexin-A regulates follicular growth, proliferation, cell cycle and apoptosis in mouse primary granulosa cells via the AKT/ERK signaling pathway	Safdar M, A Liang, SA Rajput, N Abbas, M Zubair, A Shaukat, H Jamil, Y Guo, F Ullah and L Yang.	2021	Molecules	18	5635
128	Lycopene protects intestinal epithelium from Deoxynivalenol-induced oxidative damage via regulating Keap1/Nrf2 signaling	Rajput SA, S Liang, X Wang and H Yan.	2021	Antioxidants	10	1493
129	Residual toxicity and sublethal effects of fenvalerate on the development and physiology of *Spodoptera exigua* reared on different hosts	Khan MM, M Hafeez, JA Siddiqui, F Ullah, S Shah, A Iftikhar, S Rehman, SA Rajput, D Ali, MHA Almarzoug and S Sudheer.	2021	J. King Saud Univ. Sci.	33	101593
130	Resveratrol (RV): a pharmacological review and call for further research	Zhang L, C Li, MU Kakar, MS Khan, P Wu, RM Amir, D Dai, M Naveed, Q Li, M Saeed, J Shen, SA Rajput and J Li.	2021	Biomed. Pharmacother.	143	112164

131	Ginsenoside Rb1 protects from staphylococcus aureus-induced oxidative damage and apoptosis through endoplasmic reticulum-stress and death receptor-mediated pathways	Shaukat A, I Shaukat, SA Rajput, R Shukat, S Hanif, K Jiang, T Zhang, M Akhtar, I Shaukat, X Ma, J Liu, S Shaukat, M Akhtar, L Yang and G Deng.	2021	Ecotoxicol. Environ. Saf.	219	112353
132	Improvement in growth and yield attributes of cluster bean through optimization of sowing time and plant spacing under climate change scenario	Hussain I, M Ali, AM Ghoneim, K Shahzad, O Farooq, S Iqbal, F Nawaz, S Ahmad, V Barek, M Brestic, S Obaid, S Fahad, S Danish, S Taban, H Akca and R Datta.	2021	Saudi J. Biol. Sci.	29	781-792
133	Effect of water stress on grain yield and physiological characters of quinoa genotypes	Saddiq MS, X Wang, S Iqbal, MB Hafeez, S Khan, , A Raza, J Iqbal, , MM Maqbool, S Fiaz, MA Qazi and A Bakhsh.	2021	Agronomy	11	1934
134	Adaptability and yield potential of different species of amaranth under semiarid conditions	Samreen N, S.M.A.Basra, I Shahid, M. Ahmad, M. Hafeez, MZ Akram, Z Noreen, K Shahbaz, and MS Saddiq.	2021	Int. J. Agric. Biol.	24	1558-1564
135	Attenuation of cadmium induced oxidative stress in cucumber seedlings by modulating photosynthesis and antioxidant machinery through foliar applied glutamic acid	Munawar S, M A Ghani, B Ali, M Azam, R Anjum, M Sarwar and MM Abbas.	2021	Hortic. Sci.	49	19-28
136	Impact of farm management practices on quality of milk	Saadi TUR, U Farooq, AShafi, M Amin,K Hayat, MZ Khan and M Ahmad.	2021	Agric. Sci. J.	3	32-45

137	Influence of pregelatinized starch on rheology of composite flour, in vitro enzyme digestibility and textural properties of millet-based chapati	Nasir M, S Ahmad, M Usman, U Farooq, A Naz, AM Murtaza, Q Shezad, A Mehmood, GM Din.	2021	Carbohydr. Polym.	2	100108
138	Quality evaluation of fermented chickpea (*Cicer arietinum*)	B Ali, A Shafi, U Farooq, S Iqbal, K Hayat and AU Rehman.	2021	Agric. Sci. J.	3	32-45
139	Exosome/liposomes-like nanoparticles: new carriers for CRISPR genome editing in plants	Alghuthaymi M A, A Ahmed, Z Khan, SH Khan, FK Ahmed, S Fiaz, E Nepovimova, K Kuca and KA Abd-Elsalam.	2021	Int. J. Mol. Sci.	22	7456
140	A quest for livelihood sustainability? Patterns, motives and determinants of non-farm income diversification among agricultural households in Punjab, Pakistan	Amjed M, M Rizwan, A Abbas, M Nazam, A Samie and N Nadeem.	2021	Sustainability	13	9084
141	Marginal quality water arbitrated essential oil contents in metal hoarded flower petals of scented roses	Ahsan M, A Younis, M Nafees, A Tufail, Q Shakeel, M Raheel, F Nawaz, MJ Jaskani, M Amin, M Sajid, G Akhtar, A Bukhsh, UH Siddiqua, MA Raza, T Schwinghamer and H Zulfiqar.	2021	Ecotoxicol. Environ. Saf.	226	112853
142	Screening of wheat (*Triticum aestivum* L.) Genotypes for drought tolerance using polyethylene glycol	Bukhari MA, AN Shah, S Fahad, J Iqbal, F Nawaz, A Manan and MS Baloch.	2021	Arab. J. Geosci.	14	2808

143	Silicon seed priming combined with foliar spray of sulfur regulates photosynthetic and antioxidant systems to confer drought tolerance in maize (*Zea mays* L.)	Farman M, F Nawaz, S Majeed, HMR Javed, M Ahsan, KS Ahmad, M Aurangzaib, MA Bukhari, MA Shehzad and MB Hussain.	2021	Silicon	15	-
144	Transcript abundance of heat shock protein genes confer heat tolerance in cotton (*Gossypium hirsutum* L.)	Ali MM, Z Ali, F Ahmad, F Nawaz, Q Shakil, S Ahmad and A Ali.	2021	Pak. J. Bot.	54	-
145	Plant growth promoting rhizobacteria improve growth and yield related attributes of chili under low nitrogen availability	Raza A, S Ejaz, MS Saleem, V Hejnak, F Ahmad, MAA Ahmed, SS Alotaibi, AM El-Shehawi, MS Alsubeie and ATK Zuan.	2021	Plos One	16	e0261468
146	Combined application of zinc and silicon alleviates terminal drought stress in wheat by triggering morpho-physiological and antioxidants defense mechanisms	Sattar A, X Wang, T Abbas, A Sher, M Ijaz, S Ullah, M Irfan, M Butt, MA Wahid, M Cheema, S Fiaz, A Qayyum, MJ Ansari, SA Alharbi, M Wainwright, F Ahmad, K Xie and ATK Zuan.	2021	PLoS One	16	e0256984
147	Characterization of vascular plant one-zinc finger (VOZ) in soybean (*Glycine max* and *Glycine soja*) and their expression analyses under drought condition	Rehman S, G Qanmber, MHN Tahir, A Irshad, S Fiaz, F Ahmad, Z Ali, M Sajjad, M Shees, M Usman and Z Geng.	2021	PLoS One	16	e0253836
148	Infectious bronchitis disease in poultry its diagnosis, prevention and control strategies	Samad A, A Abbas, U Mehtab, R Ali, H Khera, A Rehman and M Hamza.	2021	Ann. Agric. Crop Sci.	6	1100

149	Exploring the potential of moringa leaf extract as bio stimulant for improving yield and quality of black cumin oil	Mehmood A, K Naveed Q Ayub, SAlamri, MH Siddiqui, C Wu, D Wang, S Saud, J Banout, S Danish, R Datta, HM Hammad, W Nasim, M Mubeen, F Shah and S Fahad.	2021	Sci. Let.	11	24217
150	Using space-time scan statistic for studying the effects of COVID-19 in Punjab, Pakistan: a guideline for policy measures in regional agriculture	Hussain S, M Mubeen, A Ahmad, S Fahad, W Nasim, HM Hammad, SG Mustafa, B Murtaza, M Tahir, S Parveen.	2021	Environ. Sci. Pollut. Res.	21	17433
151	Synthesis of silver nanoparticles using Plantago lanceolata extract and assessing their antibacterial and antioxidant activities	Shah MZ, ZH Guan, A Din, A Ali, AU Rehman, K Jan, S Faisal, S Saud, M Adnan, F Wahid, S Alamri, MH Siddiqui, S Ali, W Nasim, HM Hammad and S Fahad.	2021	Sci. Rep.	11	20754
152	Satellite-based evaluation of temporal change in cultivated land in southern Punjab (Multan region) through dynamics of vegetation and land surface temperature	Hussain S, M Mubeen, A Ahmad, N Masood, HM Hammad, M Amjad, MS Khalid and M Waleed.	2021	Open Geosci.	13	1561-1577
153	Hydrogeochemical and health risk investigation of potentially toxic elements in groundwater along river Sutlej floodplain in Punjab, Pakistan	Ahmad S, M Imran, B Murtaza, M Arshad, R Nawaz, HM Hammad, MA Naeem, A Waheed, NK Niazi and M Shahid.	2021	Environ. Geochem. Health	43	5195–5209

154	Efficacy of chlorella pyredoidosa to ameliorate the hepatotoxic effects of aflatoxin B1 in broiler chickens	Subhani Z, M Shahid, F Hussain and JA Khan.	2021	Pak. Vet. J.	1	13-18
155	Comparative characterization of cinnamon, cinnamaldehyde and kaempferol for phytochemical, antioxidant and pharmacological properties using acetaminophen-induced oxidative stress mouse model	Hussain Z, JA Khan, MI Arshad, F Muhammad and RZ Abbas.	2021	Bol. Latinoam. Caribe. Plantas Medi. M	4	339-350
156	Bio-efficacy of extensively used pyrethroid, neonicotenoid and carbamate insecticides against jassid on sunflower	Ali S, M Zubair, MK Malik, AI Jalali, H Qamar, K Hanif, T Mahmood, MA Qayyum and S Saeed.	2021	Biosci. Res.	18	3334-3338
157	Transportation of chromium (VI) to *Bombyx mori* L. from mulberry plant (*Morus alba* L.) grown at soil irrigated with chromium (VI) containing effluents	Ali M, M Alamgeer, MA Qayyum, K Zia, M Asfaq and MA Saleem.	2021	J. Sci. Agric.	5	36-43
158	Development of polystyrene coated persulfate slow-release beads for the oxidation of targeted PAHs: effects of sulfate and chloride ions	Abbas W, S Abbas, M Nawaz, M Azam, JM Oh and A Shahzad.	2021	J. Hazard. Mater.	416	125879
159	Correlation, regression analysis of seed oil contents in relation to morphological characters in cotton	Awais HM, SF Arshad, W Nazeer, M Usman, ATK Tipu, M Ali, A Saleem, HJ Arshad and A ShahRukh.	2021	J. Bioresour. Manag.	8	20-26
160	Impact of women education on economic growth: an evidence from Pakistan	Zahra K, M Yasin, B Sultana, Z Haider and R Khatoon.	2021	J Econ. Impact	3	113-120

161	Physiological and molecular response of cotton (*Gossypium hirsutum* L.) To heat stress at the seedling stage	Sajid M, MAB. Saddique, MHN Tahir, A Matloob, Z Ali, F Ahmad, Q Shakil, ZU Nisa, and M Kifayat.	2021	SABRAO J. Breed. Genet.	54	44-52
162	Fungal and bacterial endophytes for rice improvement with special reference to drought stress	Khan MUU, MAB Saddique, Z Ali, MB Hussain, T Rehman, A Rebi, ZA Kakar and S Saeed.	2021	Nat. Volatiles Essent. Oils	8	-
163	Genotypic variability of grain phytic acid, mineral bioavailability, and their relation to foliar Zn application	Su Da, MA Muneer, Y Cai, MAB Saddique and F Cheng.	2021	Crop Pasture Sci.	73	461-472
164	Association mapping of agronomic traits in bread wheat using a high density 90k SNP array	Sher MA, AS Khan, Z Ali and SH Khan.	2021	J. Biochem. Biotechnol.	2	236-247
165	Correlation and path coefficient analysis of morphological traits in sunflower (*Helianthus annuus* L.) populations	Tahir MHN, HA Sadaqat and S Bashir.	2021	Int. J. Agri. Bio.	4	341-343
166	Diversity analysis of chickpea germplasm for the yield related traits	Mansoor MA, MHN Tahir, RM Ikram, Z Ali, AM Khan and MAB Saddique.	2021	Agri. Sci. J.	3	10-19
167	Gene action of yield related characters under normal and drought stress conditions in *Brassica napus* L.	Ijaz W, S Kanwal, MHN Tahir and H Razzaq.	2021	Pak. J. Bot.	53	1979-1985
168	Estimation of genetic variability and correlation among different ryegrass genotypes for fodder yield and quality related traits	Hasnain M., MHN Tahir, MA Sher and MA Shehzad.	2021	Agri. Sci. J.	3	26-31
169	Perceptions, vulnerability and adaptation strategies for mitigating climate change effects among small livestock herders in Punjab, Pakistan	Faisal M, A Abbas, Y Cai, A Ali, MA Shahzad, S Akhtar, MH Raza, SM Ajmal, X Chunping, SA Sattar and Z Batool.	2021	Int. J. Environ. Res. Public Health	18	10771

170	Assessing small livestock herders' adaptation to climate variability and its impact on livestock losses and poverty	Faisal M, A Abbas, X Chunping, MH Raza, S Akhtar, MA Ajmal, Z Mushtaq and Y Cai.	2021	Clim. Risk Manag.	34	100358
171	Evaluation of different fungicides against *Colletotrichum graminicola*, the cause of red leaf spot of sorghum	Ali M, S Ali, MA Zeshan, R Binyamin, N Ahmed, MU Ghani and AA Khan.	2021	Pak. J. Agric. Res.	34	599-607
172	Toxicity of different insecticides against the dwarf honey bee,*Apis florea* fabricius (Hymenoptera: Apidae)	Anwar MI, N Sadiq, DM Aljedani, N Iqbal, S Saeed, HA Khan, U Naeem-Ullah, HM Aslam, HA Ghramh and, KA Khan.	2021	J. King Saud Univ. Sci.	34	101712
173	Host range and pathogenicity potential of *Helicoverpa armigera* nucleopolyhedrovirus (HaNPV) to lepidopterous pests of cotton	Abid AD, S Saeed, SM Zaka, S Shahzad, MN Naqqash and N Iqbal.	2021	J. King Saud Univ. Sci.	34	101740
174	Sub-lethal doses of nucleopolyhedrosis virus and synthetic ınsecticides alter the biological parameters of *Helicoverpa armigera* Hübner (Lepidoptera: Noctuidae	Abid AD, SM Zaka, S Saeed, N Iqbal, MN Naqqash and MS Shahzad.	2021	Plos One	16	e0259867
175	Standardization of growth media for grapes nursery production	Saqib M, K Razzaq, S Ullah, A Hussain, IA Rajwana, A Naz, G Akhtar, M Amin, HN Faried, S M Zafar and M Shafique.	2021	J. Plant Environ. Environ.	3	46-45
176	Evaluation of the chilli veinal mottle virus CP gene expressing transgenic *Nicotiana benthamiana* plants for disease resistance against the virus	Riaz T, M Ashfaq and Z Khan.	2021	Braz. J. Biol.	82	e243692

177	Biochemical evaluation for weak-light tolerance of various tomato (*Solanum lycopersicum* L.) cultivars in China	Ali Z.	2021	Pak. J. Bot.	49	913-919
178	Using multiplexed CRISPR/Cas9 for suppression of cotton leaf curl virus	Binyameen B, Z Khan, SH Khan, A Ahmad, N Munawar, MS Mubarik, H Riaz, Z Ali, AA Khan, AT Qusmani, KA Abd-Elsalam and SH Qari.	2021	Int. J. Mol. Sci.	22	12543
179	Low-frequency infra-red electromagnetic wave promotes partial nitrifcation by affecting the community signal system	Wang Z, P Liu, S Ni, T Lee and S Ahmad	2021	Chem. Eng. J.	425	131636
180	Impact of dietary fiber (inulin and resistant starch) on the quality parameters of low fat cheddar cheese from buffalo milk	Murtaza MS, A Sameen, S Rafique, M Shahbaz, N Gulzar, MA Murtaza, U Farooq and I Hafeez.	2021	Pak. J. Zool.	5	1-8
181	Soluble starch synthase enzymes in cereals: an updated review	Irshad A, H Guo, S Rehman, X Wang, C Wang, A Raza, C Zhou, Y Li and L Liu.	2021	Agronomy	11	1983
182	Role of extension services in enhancing efficiency of market oriented dairy farmers: an evidence from Punjab, Pakistan	Ullah S, B Brammer and UI Ahmed.	2021	Sarhad J. Agric.	4	1314-1322
183	Microbial worth in food industry	Khan S, R Sardar, W Zaib and R Yaqoob.	2021	Pak-Euro J. Med. Life Sci.	4	240-249
184	Prevalence of aflatoxins in selected dry fruits, impact of storage conditions on contamination levels and associated health risks on Pakistani consumers	Naeem I, A Ismail, A Rehman, Z Ismail, S Saima, A Naz , A Faraz, CAF ON Benkerroum, MZ Aslam and R Aslam.	2022	Int. J. Environ. Res. Public Health	19	3404

185	Classification and grading of harvested mangoes using convolutional neural network	Iqbal HMR and A Hakim	2022	Int. J. Fruit Sci.	22	95-109
186	Computational representation and analysis of emotion dynamics	Hakim A, S Marsland and HW Guesgen.	2022	Multimed. Tools. Appl.	81	21111–21133
187	Effect of fertilizers and supplementary feeding on water quality and plankton productivity in fish ponds under uniform fish stocking density	Abbas S., K Samiullah, F Jabeen, R Yasin, S Ahmad, SM Mubarik, S Yaqub, MH Rehman, S Ahmad, K Feroz and M Ashraf.	2022	J. Biodivers. Environ. Sci.	6:	434-443
188	Drought stress mitigating morphological, physiological, biochemical, and molecular responses of guava (*Psidium guajava* L.) cultivars	Usman M, SAM Bokhari, B Fatima, B Rashid, F Nadeem, MB Sarwar, MS Nawaz-ul-Rehman, M Shahid and CM Ayub.	2022	Front. Plant Sci.	13	878616
189	Ligustrum lucidum leaf extract-assisted green synthesis of silver nanoparticles and nano-adsorbents having potential in ultrasound-assisted adsorptive removal of methylene blue dye from wastewater and antimicrobial activity	Sultan M, M Siddique, R Khan, AMFallatah, N Fatima, I Shahzadi, U Waheed, MBAA and AM Abbasi.	2022	Materials	15	1637
190	Synthesis, characterization, and application of ag-biochar composite for sono-adsorption of phenol	Khan MN, M Siddique, N Mirza, R Khan, M Bilal, N Riaz, U Waheed, I Shahzadi, A Ali, MH Abdellattif, G E Batiha, A Al-Harrasi and A Khan.	2022	Front. Environ. Sci.	10	823656

191	Effect of short-term zero tillage and legume intercrops on soil quality, agronomic and physiological aspects of cotton under arid climate	Saleem MF, A Ghaffar, MH Rahman, M Imran, R Iqbal, W Soufan, S Danish, R Datta, K Rajendran, and A EL-Sabagh.	2022	Land	11	289
192	Isolation of a Novel endophytic *Bacillus* strain capable of transforming pentachlorophenol and structure determination of pentachlorophenol phosphate using single-Crystal X-ray diffraction	Ito K, R Kataoka, S Katayama, H Kiyota, A Mahmood, T Kikuchi, T Sato, F Sakakibara and K Takagi.	2022	J. Agric. Food Chem.	70	770-776
193	The response of *Triticum aestivum* treated with plant growth regulators to acute day/night temperature rise	Ihsan MZ, A Khaliq, MH Siddiqui, L Ali, R Kumar, HM Ali, A Matloob and S Fahd.	2022	J. Plant Growth Regul.	41	2020–2033
194	Nanoparticles: synthesis and their role as potential drug candidates for the treatment of parasitic diseases	Bajwa HUR, MK Khan, Z Abbas, R Riaz, T Rehman, RZ Abbas, MT Aleem, A Abbas, MM Almutairi, FA Alshammari, Y Alraey and A Alouffi.	2022	Life	18	750
195	Assessment of avermectins-induced toxicity in animals	Salman M, RZ Abbas, K Mehmood, R Hussain, S Shah, M Faheem, T Zaheer, A Abbas, B Morales, I Aneva and J L Martanez.	2022	Pharmaceuticals	15	332
196	Epidemiological investigation and development of loop mediated isothermal amplification for the diagnosis of ovine theileriosis	Zaman MA, A Rafique, U Mehreen, S Mehnaz, FA Atif, A Abbas, K Hussain, MA Raza, S Altaf, F Siddique RM Masudur and M Omar.	2022	Pak. Vet. J.	42	-

197	Phenylpropanoid pathway engineering: an emerging approach towards plant defense	Yadav V, Z Wang, C Wei, A Amo, B Ahmad, X Yang and X Zhang.	2022	Pathogens	4	312
198	Genome-wide identification and expression analysis of dirigent gene family in strawberry (*Fragaria vesca)* and functional characterization of fvdir13	Shi Y, Y Shen, B Ahmad, L Yao, T He, J Fan, Y Liu, Q Chen, and Z Wen.	2022	Sci. Hortic.	297	550-555
199	Ectopic expression of VvFUS3, B3-domain transcription factor in tomato influences seed development via affecting endoreduplication and hormones	Ahmad B, S Zhang, J Yao, S Chai, V Yadav, HR Athar, M U Rahman, L Wang and X Wang.	2022	Hortic. Plant J.	8	260-265
200	Synchronization of boron application methods and rates is environmental friendly approach to improve quality attributes of *Mangifera indica* L. on sustainable basis	Khan MMH, N Ahmed, MA Ali, S Danish, M Skalicky, S Fahad, R Datta, MM Hassan, M Brestic and AE Sabagh.	2022	Saudi J. Biol. Sci.	29	1869-1880
201	Organic amendments as an ecofriendly substitute of carbofuran for the suppression of nematodes associated with *Malus pumila*	Zafar MI, A Khalid, S Kali, F Khan, M Tahir, M Aliand A Siddiqa.	2022	S. Afr. J. Bot.	144	187-193
202	Synergistic effect of gum arabic and carboxymethyl cellulose as biocomposite coating delays senescence in stored tomatoes by regulating antioxidants and cell wall degradation	Shakir MS, S Ejaz, S Hussain, S Ali, H Sardar, M Azam, S Ullah, G Khaliq, MS Saleem, A Nawaz, M Akbar and AI Canan.	2022	Int. J. Biol. Macromol.	201	641-652
203	Protective effect of jasmonic acid and potassium against cadmium stress in peas (*Pisum sativum* L.)	Abbas T, R Fan, S Hussain, A Sattar, S Khalid, M Butt, U Shahzad, HM Atif, M Batool, S Ullah, Y Li, A Al-Hashimi, MS Elshikhg and R Al-Yahya.	2022	Saudi J. Biol. Sci.	29	2626-2633

204	Extraction of psychological effects of COVID-19 pandemic through topic-level sentiment dynamics	Razzaq A, T Abbas, S Hashim, S Qadri, I Mumtaz, N Saher, MRehman F Shahzad, and SA Nawaz.	2022	Complexity	2022	1-10
205	Retrospective study on the association of risk factors of Johne's disease along with physiological biomarker in large ruminants of Punjab, Pakistan	Anwarullah M, AZ Durrani, M Ijaz, AA Anjum, MZ Iqbal, M Husnain, A Anjum, Q Ashraf, G Mustafa and M Usman.	2022	Pak. J. Zool.	54	641-645
206	Genetic diversity of cucumber green mottle mosaic virus (CGMMV) infecting cucurbits	Asad Z, M Ashfaq, N Iqbal, HMU Aslam, H Riaz, A Hameed, F Parvaiz, N Sadiq, KA Khan, and Z Ahmad.	2022	Saudi J. Biol. Sci.	29	3577-3585
207	Biochemical base of resistance in citrus against canker disease	Hameed A, M Atiq, ST Sahi, NA Rajput, Z Ahmed, MW Alam, H Alsamadany, Y Alzahrani, S Sarfraz, J Altaf, SA Awan, R Maqbool, ZH Shah, N Liaqat and MU Khan.	2022	Pak. J. Agric. Sci.	58	1850-1858
208	In-vitro antibacterial potential of antibiotics against *Xanthomonas axonopodis* pv. citri	Hameed A, M Atiq, NA Rajput, H Alsamadany, Y Al-Zahrani, MW Alam, ZH Shah, F Ali, A Afzal and Z Ahmed.	2022	Fresenius Environ. Bull.	31	3886-3892
209	Integrated management of fusarium wilt of chilli caused by *Fusarium oxysporum* f. sp. capsici through different management approaches	Muhammad N, NA Rajput, Muhammad A, ST Sahi, A Rehman, A Hameed, GA Kachelo and S ahmed.	2022	Pak. J. Bot.	54	1-8

210	Role of exogenous application of alpha-tocopherol in reducing low temperature stress in bell pepper	M Atiq, S Adil, NA Rajput, ST Sahi, A Hameed, A Jabbar and M Usman.	2022	Int. J. Phytopathol.	10	231-241
211	Predicting the impact of environmental factors on citrus canker through multiple regression	Hameed A, M Atiq, Z Ahmed, NA Rajput, M Younas, A Rehman, MW Alam, S Sarfaraz, N Liaqat, K Fatima, K Tariq, S Jameel, P Vachova, SH Salmen, and MJ Ansari.	2022	Plos One	4	1371
212	Fungi species causing dieback and wilt diseases in shisham [*Dalbergia sissoo* (Roxb)] and impact of various fungicides on their management	Ghazali HMZU, S Akram, I Fatima, M Hussain, A Hameed, M Arif, MAA Ahmed, AA Al-Ghamdi, MS Elshikh and BOO Alrashidi.	2022	J. King Saud Univ. Sci.	4	101970
213	Polyvinylepyrrolidone and chitosan-doped lanthanum oxide nanostructures used as bactericidal agent and nano-catalyst	Khan AD, M Ikram, A Haider, A Ul Hamid, WN, and J Haider.	2022	Appl. Nanosci.	22	02471
214	Highly efficient industrial dye degradation, bactericidal properties and in silico molecular docking analysis of ag/cellulose-doped Cuo nanostructures	Ikram M, I Hafeez, M Naz, A Haider, S Naz, A Ul-Hamid, J Haider, A Shahzadi, M Imran, W Nabgan, and S Ali.	2022	ACS Omega	20	17043–17054
215	Experimental and computational study of Zr and CNC-doped MnO_2 nanorods for photocatalytic and antibacterial activity	Ikram M, R Asghar, M Imran, A Haider, A Ul-Hamid, J Haider, A Shahzadi, W Nabgan, I Shahzadi, S Goumri-Said, MB Kanoun and AR Butt.	2022	ACS Omega	16	14045-14056

216	Evaluation of bactericidal potential and catalytic dye degradation of multiple morphology based chitosan/polyvinylpyrrolidone-doped bismuth oxide nanostructures	Bari A, M Ikram, A Haider, A Ul-Hamid, J Haider, I Shahzadi, G Nazir, A Shahzadi, M Imran and A Ghaffar.	2022	Nanoscale Adv.	4	2713-2728
217	Cu-loaded C3N4-MgO nanorods for promising antibacterial and dye degradation	Akbar MU, M Ikram, M Imran, A Haider, A Ul-Hamid, S Dilpazir, I Shahzadi, g Nazir, A Shahzadi, W Nabgan, J Haider.	2022	Appli. Nanosci.	12	-
218	Facile synthesis of silver and polyacrylic acid doped magnesium oxide nanostructure for photocatalytic dye degradation and bactericidal behavior.	Jamal F, M Ikram, A Haider, A Ul-Hamid, M Ijaz, W Nabgan, J Haider and Iram Shahzadi,	2022	Appli. Nanosci.	12	-
219	In-vitro catalytic and antibacterial potential of green synthesized Cuo nanoparticles against prevalent multiple drug resistant bovine mastitogen *Staphylococcus aureus*	Hamid AU, H Dafalla, AS Hakeem, A Haider and M Ikram.	2022	Int. J. Mol. Sci.	23	2335
220	Development of 4-aminophenol sensor based on Co-MoS_2 nanomaterials decorated on glassy carbon electrode using electrochemical technique	A Ul-Hamid, H Dafalla, M Ikram, A Raza, A Haider, S Ali, MM Alam, A Saeed, I Ahmad, M Ali, AM Asiri and MM Rahman,	2022	J. Mater. Sci. Eng.: B	282	115778
221	Towards efficient dye degradation and bactericidal behavior of Mo-doped La_2O_3 nanostructures	Ikram M, N Abid, A Haider, Ul- A Hamid, J Haider, A Shahzadi, W Nabgan, S Goumri-Said, AR Butt, and MB Kanoun.	2022	Nanoscale Adv.	-3	2516

222	Graphene oxide-Zno nanorods for efficient dye degradation, antibacterial and in-silico analysis	Shaheen S, A Iqbal, M Ikram, M Imran, S Naz, A Ul-Hamid, A Shahzadi, W Nabgan, J Haider and A Haider.	2022	Appl. Nanosci.	12	165-177
223	Gao, genomic survey and cold-induced expression patterns of bHLH transcription factors in *Liriodendron chinense* (Hemsl) sarg.	Li R, B Ahmad, D Hwarari, D Li, Y Lu, M Gao, J Chen and L Yang.	2022	Forests	13	518
224	Alterations in population distribution of *Liriodendron chinense* (Hemsl.) Sarg and *Liriodendron tulipifera* Linn. caused by climate change	Cao Y, J Feng, D Hwarari, B Ahmad, H Wu, J Chen and L Yang.	2022	Forests	13	488
225	ICE-CBF-COR signaling cascade and its regulation in plants responding to cold stress	Hwarari D, Y Guan, B Ahmad, A Movahedi, T Min, Z Hao, Y Lu, J Chen and L Yang.	2022	Int. J. Mol. Sci.	23	1549
226	Diagnosis, prevention and control strategies of infectious bronchitis virus	Khera HURA, A Samad, A Abbas, U Mehtab, A Rehman, K Hussain, W Zaib, MA Raza, MU Waqas, MA Tahir, MJ Shahid, M Hamza, A Muazzam, N Niaz, B Ahmad and T Ahmad.	2022	Sci. Lett.	10	16-20
227	Perception, attitude, and confidence of physicians about antimicrobial resistance and antimicrobial prescribing among COVID - 19 patients: a cross-sectional study from Punjab, Pakistan	Hayat K, ZU Mustafa, MN Ikram, M Ijaz-Ul-Haq, I Noor, MF Rasool, HM Ishaq, AU Rehman, SS Hasan and Y Fang.	2022	Front. pharmacol.	12	794453-794453

228	Foliar application of chitosan improves plant biomass, physiological and biochemical attributes of rose (Gruss-an-Teplitz)	Arshad MA, G Akhtar, IA Rajwana, S Ullah, MB Hussain, M Amin, N Faried, K Razzaq, MA Shehzad, M Ahsan, Y Sajjad and I Ahmed.	2022	Kuwait J. Sci.	49	11655
229	Chitosan-induced physiological and biochemical regulations confer drought tolerance in pot marigold (*Calendula officinalis* L.)	Akhtar G, HN Faried, K Razzaq, S Ullah, FM Wattoo, MA Shehzad, Y Sajjad, M Ahsan, T Javed, ES Dessoky and NR Abdelsalam.	2022	Agronomy	12	474
230	Drivers influencing consumers' buying intentions towards frozen chicken products: a case of south Punjab	Ansar M, M Aslam, M Yasin, IA Baig, S Nasir, MA Imran and S Ullah.	2022	J. Econ. Impact	25	26-48
231	Morphological and palynological assessment of taxonomically problematic genus paspalum based on light and scanning electron microscopy	Shaheen S, MA Khan, MN Shahid, Z Shamim, B Rasool, K Hussain, S Khalid, N Harun, R Siddique, R Sonia and F Khan.	2022	Microsc. Res. Tech.	2	623-629
232	Comparison of *Bougainvillea spectabilis* and *Bougainvillea glabra* species inhibited in Pakistan based on microscopic studies: light microscope and scanning electron microscope	Shaheen S, MA Khan, MA Naeem, MN Shahid, M Jaffer and H Mukhtar.	2022	Microsc. Res. Tech.	3	1194-1198
233	Vitamin C supplementation ameliorates liver function profile and antiviral treatment response in hepatitis C patients	Nayila I, MS Javed, MA Khan, G Hussain, SAR Naqvi, S Ali, Z Jabeen, S Shahnawaz, R Akram, T Iman, M ZH Dogar and SA Malik.	2022	Pak. J. Pharm. Sci.	35	619-625

234	Extracts of eucalyptus alba promote diabetic wound healing by inhibiting α-glucosidase and stimulating cell proliferation	Mumtaz R, M Zubair, MA Khan, S Muzammil, and MH Siddique.	2022	Evid. Based Complement Alternat. Med.	1	-
235	Leaf rolling dynamics for atmospheric moisture harvesting in wheat plant as an adaptation to arid environments	Merrium S, Z Ali, MHN Tahir, MHRahman and S Hakeem.	2022	Environ. Sci. Pollut. Res.	29	48995–49006
236	Wetting mechanism and morphological adaptation; leaf rolling enhancing atmospheric water acquisition in wheat crop-a review	Ali Z, S Merrium, MH Rahman, S Hakeem, MAB Saddique and MA Sher.	2022	Environ. Sci. Pollut. Res.	29	30967-30985
237	Methyl jasmonate alleviated the adverse effects of cadmium stress in pea (*Pisum sativum* L.): a nexus of photosystem II activity and dynamics of redox balance	Manzoor H, Mehwish, S Bukhat, S Rasul, M Ishaq, A Rehmani, S Noreen, HR Athar , ZU Zafar , M Skalicky, W Soufan, M Brestic, MH Rahman, CC Ogbaga and A EL Sabagh.	2022	Front. Plant Sci.	-	-
238	Leaf rolling and leaf angle improve fog capturing and transport in wheat; adaptation for drought stress in an arid climate	Merrium S, Z Ali, MH Rahman, S Hakeem and MA Khalid	2022	Bot. Stud.	63	13
239	Impact of climate change on dryland agricultural systems: a review of current status, potentials, and further work need	Hayat MAR, M Ahmad, M Hassan, AMS Kheir, F Hassan, MH Rehman, FA Shaheen, MA Raza and S Ahmad.	2022	Int. J. Plant Prod.	-	-
240	Effect of partial rhizosphere drying on plant photosynthetic, antioxidative and water related indicators in cotton	Iqbal R, MAS Raza, MH Rahman, S Hyder, M Israr, MU Aslam, F Mustafa, M Shahzaman, M Ayaz, M Toleikiene, F Hashemi, MT Khan and MM Aslam.	2022	Commun. Soil Sci. Plant Anal.	53	2125-2140

241	Using the taguchi experimental design for assessing within-field variability of surface run-off and soil erosion risk	Raza A, H Ahrends, MH Rahman, H Huging and T Gaiser.	2022	Sci. Total Environ.	828	154567
242	Effect of slow release nitrogenous fertilizers and biochar on growth, physiology, yield, and nitrogen use efficiency of sunflower under arid climate	Waqar M, MH Rahman, MU Hasnain, S Iqbal, A Ghafar, R Iqbal, MI Hussain and A EL- Sabagh.	2022	Environ. Sci. Pollut. Res.	-	-
243	Climatic trends of variable temperate environment: a complete time series analysis during 1980-2020	Lone BA , S Qayoom, A Nazir, SA Ahanger, U Basu, T A Bhat, ZA Dar, M Mushtaq, A El-Sabagh, WSoufan, MH Rahman and RF El-Agamy.	2022	Atmosphere	13	749
244	The use of soil conditioners to ensure a sustainable wheat yield under water deficit conditions by enhancing the physiological and antioxidant potentials	Ejaz MK, M Aurangzaib, R Iqbal, M Shahzaman, MH Rahman, M El-Sharnouby, R Dat, FM Alzuaibr, MI Sakran and A EL Sabagh.	2022	Land	11	368
245	Comparative evaluation of groundwater, wastewater and canal water for irrigation on toxic metal accumulation in soil and vegetable: pollution load and health risk assessment	YuH, F Chen, J Ma, ZI Khan, MI Hussain, I Javaid, K Ahmad, S Nazar, S Akhtar, A Ejaz, M Sohail, M Nadeem, Y Hamid and MH Rahman.	2022	Agric. Water Manage.	264	107515
246	The evolution of the glacier surges in the tuanjie peak, the qilian mountains	Gao Y, S Liu, M Qi, X Yao, Y Zhu, F Xie, K Wu, and M Saifullah.	2022	Remote Sensing	4	852

247	Reducing nutrient uptake in okra weeds by suppressing their population through alligator weed compost mulch for better pod yield and quality	Tanveer A, M Sarwar, MS Asghar, MF Saleem, H Maqsood, B Ali, MK Munir, M Arshad, RM Ikram, NA Ikram and M Rizwan.	2022	Arab. J. Geosci.	15	1006
248	Effect of seed priming with salicylic acid on yield of castor bean genotypes (*Ricinus communis* L.) under drought stress	Raza H, K Mubeen, MA Shehzad, SF Arshad, A Ghaffar, HM Hammad, RM Ikram, M Aziz, M Ahmad, A Khaliq and M Usman.	2022	Pure Appl. Biol.	12	93-102
249	A lightweight convolutional neural network model for liver segmentation in medical diagnosis	Ahmad M, SF Qadri , S Qadri, IA Saeed, S S Zareen, Z Iqbal, A Alabrah, HM Alaghbari and SMM Rahman.	2022	Comput. Intell. Neurosci.	2022	-
250	Efficient liver segmentation from computed tomography images using deep learning	Ahmad M, SF Qadri, MU Ashraf, K Subhi, S Khan, SS Zareen and S Qadri.	2022	Comput. Intell. Neurosci.	-	-
251	SVseg: stacked sparse autoencoder-based patch classification modeling for vertebrae segmentation	Qadri SF, L Shen, M Ahmad, S Qadri, SS Zareen and MA Akbar.	2022	Mathematics	10	796
252	Computer vision approach for liver tumor classification using CT dataset	Hussain M, N Saher and S Qadri.	2022	Appl. Artif. Intell.	36	-
253	Brain tumor classification based on hybrid optimized multi-features analysis using magnetic resonance imaging dataset	Nawaz SA, DM Khan and S Qadri.	2022	Appl. Artif. Intell.	36	-
254	Physiochemical comparison of black and green grapes varieties and sensory evaluation of jam in Punjab	Umer R, A Naz, K Razzaq, N Raza, U Farooq, M Sharif, N Naz, S Ahmad and U Waheed.	2022	Int. J. Agric. Ext.	10	-

255	Knockdown of GmD53a confers strigolactones mediated rhizobia interaction and promotes nodulation in soybean	Rehman N, FU Khan, M Imran, SA Rajput, Y Li, I Ullah, RW Akhtar, AAK AL-Huqail, A El- Askary, AS Khalifa and MT Azhar.	2022	PeerJ	10	-
256	Transcriptomics reveals the effect of thymol on the growth and toxin production of *Fusarium graminearum*	Wang LQ, KT Wu, P Yang, F Hou, SA Rajput, DS Qi, and S Wang.	2022	Toxins	14	142
257	Characterization of biopolymeric encapsulation system for improved survival of *Lactobacillus brevis*	Azam M, M Saeed, T Ahmad, I Yamin, WA Khan, MW Iqbal, S Mahmood, M Rizwan and T Riaz.	2022	J. Food Meas. Charact.	16	2292–2299
258	Occurrence of microplastics and heavy metals in aquatic and agroecosystem: a case study	Ahmad T, MAQ Iqbal, A Batool, A Noor, M Jafr, H Hussain and M Irfan	2022	Bull. Environ. Contam. Toxicol.	-	-
259	Insecticidal effects of parthenium hysterophorus and moringa oleifera leaf extracts on digestibility indices and survival of *Spodoptera litura* (Lepidoptera: Noctuidae)	Ullah MI, S Majeed, M Arshad, S Ali, N Mehmood, N Altaf, A Abdullah, M Luqman, U Farooq and M Afzal.	2022	Asian J. Agric. Biol	1	1-10
260	Assessing the synergistic activity of clarithromycin and therapeutic oils encapsulated in sodium alginate based floating microbeads	Khan IU, M Shoukat, M Asif, SH Khalid, S Asghar, MU Munir, M Irfan, A Rasul, SH Qari, AT Qumsani, MM Hassan, M A Alahdal, M Usman and Z Khan.	2022	Microorganisms	10	1171

261	Effect of nitrogen on yield and oil quality of sunflower (*Helianthus annuus* L.) Hybrids under sub humid conditions of Pakistan	Nasim W, A Ahmad, A Bano, M Usman, R Olatinwo, M Usman, T Khaliq, A Wajid HM Hammad, M Mubeen and M Hussain.	2022	Am. J. Plant Sci.	3	243-251
262	Evaluating the impact of nitrogen application on growth and productivity of maize under control conditions	Hammad, HM, MS Chawla, R Jawad, A Alhuqail, HF Bakhat, W Farhad, F Khan, M Mubeen, AN Shah, K Liu, and MT Harrison.	2022	Front. Plant Sci.	13	-
263	Exploring the potential effect of *Achnatherum splendens* L.-derived biochar treated with phosphoric acid on bioavailability of cadmium and wheat growth in contaminated soil	Irfan M, K Dawar, S Fahad, M Imran, S Alamri, MH Siddiqui, S Saud, JZK Khattak, S Ali, H Shah, T Nawaz, HM Hammad, J Banout and W Nasim.	2022	Environ. Sci. Pollut. Res.	29	37676-37684
264	Nano agrochemical zinc oxide influences microbial activity, carbon, and nitrogen cycling of applied manures in the soil-plant system	Shah GM, H Ali, I Ahmad, M Kamran, HM Hammad, GA Shah, HF Bakhat, A Waqar,J Guo R Dong and MI Rashid.	2022	Environ. Pollut.	293	118559
265	Comparative effects of biochar and NPK on wheat crops under different management systems	Ullah I, D Muhammad, M Mussarat, S Khan, M Adnan, S Fahad, M Ismail, IA Mian, A Ali, MH Saleem, MGF Saeed, M Ibrahim, MAS Raza and HM Hammad et al.	2022	Crop Pasture Sci.	243	-

266	Zinc in soil-plant-human system: a data-analysis review	Natasha N, M Shahid, I Bibi, J Iqbal, S Khalid B Murtaza, HF Bakhat, ABU Farooq, M Amjad, HM Hammad, NK Niazi and M Arshad.	2022	Sci. Total Environ.	808	1520-1524
267	Socio-economic, farm, and information variables influencing farmer's decision to adopt a sustainable way of cotton production	Mehmood HZ, A Abbas, S Hassan and R Ullah.	2022	Int. J. Agric. Ext.	10	-
268	Forecasts about livestock production in Punjab-Pakistan: implications for food security and climate change	Mehmood HZ, H Afzal, A Abbas, S Hassan and A Ali.	2022	J. Anim. Plant Sci.	32	-
269	Compatibility and synergistic interactions of fungi, Metarhizium anisopliae, and insecticide combinations against the cotton aphid, *Aphis gossypii* Glover (Hemiptera: Aphididae)	Nawaz A, F Razzaq, A Razzaq, MD Gogi, GMF Grandon, M Tayib, MA Ayub, M Sufyan, M R Shahid, MA Qayyum, M Naveed, A Ijaz and MJ Arif.	2022	Sci. Rep.	12	4843
270	Evaluation of eggplant genotypes and coat protein cistron based characterization of cucumber mosaic cucumovirus eggplant isolates of subgroup IB from pothwar region of Pakistan	Ashfaq M, S Bashir, R Binyamin, MA Mehmood and Z Asad.	2022	Pak. J. Agric. Sci.	58	1833-1841
271	Immunological characterization of chitosan adjuvanted outer membrane proteins of Salmonella enterica serovar typhi as multi- epitope typhoid vaccine candidate	Ayub A, M Usman, Aa Ihsan, Q Ain ,AB Awan, M Wajid, A Ali, A Haque, M Iqbal and Y Sarwar.	2022	Mol. Biol. Rep.	50	7531

272	Agri-nanotechnology and tree nanobionics: augmentation in crop yield, biosafety, and biomass accumulation	Zhao X, AHEl-Sappah M Abbas, K Yan, J Li, S Zafar, Z Hasnain, N Aslam, N Iqbal, SS Hussain, M Usman, M Abbas, M Tahir, S Abbas, SK Abbas and H Qiulan.	2022	Front. Bioeng. Biotechnol.	10	387
273	Practice, attitude and knowledge of contact lense users among Lahore population	Shah Rukh A, SF Arshad, M Usman, MU Munir, R Anjum, S Munir and S Tariq.	2022	Int. j. pharm. Integr. Health sci	3	55-64
274	Interplant transfer of nitrogen between C3 and C4 plants through common mycorrhizal networks under different nitrogen availability	Muneer MA, X Chen, MZ Munir, Z Nisa, MAB Saddique, S Mehmood, D Su, C Zheng and B Ji.	2022	J. Plant Ecol.	58	-
275	GhCDNC and GhCYP706B1 genes mediate gossypol biosynthesis in upland cotton	Maryam H, Z Ali, MAB Saddique and F Nawaz.	2022	Mol. Biol. Rep.	49	4919-4928
276	Environmental and health impacts of crop residue burning: scope of sustainable crop residue management practices	Raza MH, M Abid, M Faisal, T Yan, S Akhtar and KMM Adnan.	2022	Int. J. Environ. Res. Public Health	19	4753
277	Combined foliar application of calcium, zinc, boron and time influence leaf nutrient status, vegetative growth, fruit yield, fruit biochemical and anti-oxidative attributes of chandler strawberry	Salman M, S Ullah, K Razzaq, IA Rajwana, G Akhtar, HN Faried, A Hussain M Amin and S Khalid.	2022	J. Plant Nutr.	45	1837-1848
278	Current status and molecular characterization of zucchini yellow mosaic virus (ZYMV) infecting ridge gourd (*Lufa acutangula* L) in different regions of Punjab, Pakistan	Asad Z, MAshfaq, MIUHaq, G Irshad and MA Khan.	2022	Pak. J. Bot.,	54	467-474

279	Insight into UV-induced simultaneous photocatalytic degradation of Ti3C2Tx MXene and reduction of U(VI)	Chen L, M Wakeel, TU Haq, C Chen and X Ren.	2022	J. Hazard. Mater.	430	128377
280	Evaluation of the response of indigenous cotton cultivars to low potassium stress in hydroponics system	Akhtar MN, TU Haq and F Ahmad.	2022	Pak. J. Bot.	54	20
281	Antagonistic screening and confronting potential of Trichoderma viride against Pakistani and American soil-borne pathogens (*Pythium aphenidermatum*, *Fusarium oxysporum* and *Phytophthora capsici*) in controlled conditions	Iqbal, S, M Ashfaq, AH Malik, M Inam-ul-Haq and KS Khan.	2022	Pak. J. Phytopathol.	34	81-91

2.20.1. Books/Book Chapters Published

Sr. No.	Book/Chapter Title	Editor's Name	Author's Name	Year	Publisher
1	Carotenoids: structure and function in human body	Haq MZ, S Dewanjee and M Riaz.	Bano N and I Imran.	2021	Springer Nature Switzerland
2	Computer assisted diagnosis, diabetes and cardiovascular disease	El-Baz E and JS Suri.	Bano N and MZ Haq.	2021	Elsevier
3	Alternative medicine intervention for COVID-19	Haq MZ, MN Bin-Jumah, SI Alothman and HA Henidi.	Bano N, F Batool and MNB Jumah.	2021	Springer Nature
4	CRISPR crops: the future of food security	Khan Z, T Saboor, M Ashfaq, A Saddique and P Khanum.	Khan Z, T Saboor, M Ashfaq, A Saddique and P Khanum.	2021	Springer Nature Singapore
5	Current trends in wheat research	Ansari MR.	Qayyum MA, S Saeed, U Naeem-Ullah, A Matloob, M Wajid, AB Siddique, R Shahid, HU Ur Rehman Zia, H Bilal and M Ramzan.	2021	IntechOpen publishers

6	Veterinary pathobiology and public health	Abbas RZ and A Khan.	Tahir AM, M Mohsin, M Jamil, MZ Afzal, L Aguilar-Marcelino, RZ Abbas, Yanruofeng, A Abbas, Z Saeed, HM Waqar and G Yin.	2021	Unique Scientific Publishers
7	SOL gel and other fabrication methods of advanced carbon materials	Ikram M and A Maqsood.	Ikram M, A Raza, K Shahzad, A Haider, J Haider, AK Durrani, AH Rizvi, A Maqsood and M Ikram.	2021	Intech Open Limited, UK
8	Veterinary pathobiology and public health	Abbas RZ and A Khan.	Rahma AU, MAB Shabbir and M Asif Raza.	2021	Unique Scientific Publishers
9	Advances in seed production and management	Tiwari AK.	Bakhtavar MA and I Afzal.	2021	Springer, Singapore
10	Handbook of bioremediation	Hasanuzzaman M and MNV Prasad.	Iftikhar S, V Turan, HM Tauqeer, B Rasool, M Zubair, MU Rahman, MA Khan, S Akhtar, SA Khan, Z Basharat, I Zulfiqar, J Iqbal, M Iqbal and PMA Ramzani.	2021	Academic Press
11	Engineering tolerance in crop plants against abiotic stress	Fahad S, O Sanmez, S Saud, D Wang, C Wu, M Adnan, M Arif and Amanullah.	Slam MS, S Fahad, A Hossain, MK Chowdhury, M Aamir MH Rahman et al.	2021	CRC Press (Taylor & Francis Group
12	Engineering tolerance in crop plants against abiotic stress	Fahad S, O Sanmez, S Saud, D Wang, C Wu, M Adnan, M Arif and Amanullah.	Naz M, MA Iqbal, MS Islam, A Hossain, S Danish, R Datta, S Fahad, D Ratnasekera, MA Hossain and MH Rahman.	2021	CRC Press (Taylor & Francis Group)
13	Mutation breeding, genetic diversity and crop adaptation to climate change	Sivasankar S, N Ellis, L Jankuloski and I Ingelbrecht.	Hussain M, L Jankuloski, MHU Rahman, M Malek, MK Islam, MR Raheemi, J Dana, KM Lwin, F Ahmad, M Rizwan, G Mohyuddintalha, M Asif and S Ali.	2021	CABI

14	Building climate resilience in agriculture	Jatoi WN, M Mubeen, A Ahmad, MA Cheema, Z Lin and MZ Hashmi.	Akram R, T Jabeen, MA Bukari, SA Wajid, M Mubeen, MHU Rahman, F Rasul, S Hussain and M Aurangzaib.	2021	Springer
15	Engineering tolerance in crop plants against abiotic stress	Fahad S, O Sanmez, S Saud, D Wang, C Wu, M Adnan, M Arif and Amanullah.	Waqas MM, MH Rahman, S Ali and H Rasheed.	2021	CRC Press (Taylor & Francis Group)
16	Engineering tolerance in crop plants against abiotic stress	Fahad S, O Sanmez, S Saud, D Wang, C Wu, M Adnan, M Arif and Amanullah.	Sabagh EA, MS Islam, MA. Iqbal, A Hossain and MH Rahman.	2021	CRC Press (Taylor & Francis Group)
17	Weather forecasting	Saifullah M.	Thanh C, TT Tien, DNQ Hoa, EPP Agbo, LAG Alana, TE Babalola, PG Oguntunde, AE Ajayi, FO Akinluyi, M Saifullah, M Waqas, S Hashim, M Khan, M Adnan, R Muhammad Adnan, S Liu, Y Latif, M Iqbal and S Muhammad.	2021	Intech open
18	Glaciers and the polar environment	Kanao M, D Godone and N Dematteis.	Saifullah M, S Liu, M Adnan, M Ashraf, M Zaman, S Hashim and S Muhammad.	2021	intechopen
19	Locust outbreak: management and world's economy	Riaz U.	Qayyum MA, S Saeed, N Iqbal, A Khan, U NaeemUllah, H Riaz, M Ishtiaq, M Fiaz, U Sial, A Siddique and MA Mehdi.	2021	Apple Academic Publishers
20	Sequencing technologies in microbial food safety and quality	Thangadurai D.	Shafi A, U Farooq, K Akram, Z Hayat, K Hayat and MZ Khan.	2021	CRC Press
21	Sequencing technologies in microbial food safety and quality	Thangadurai D.	U Farooq, A Shafi, M Shahbaz, MZ Khan, K Hayat, M Baqir.	2021	CRC press
22	CRISPR crops the future of food security	Khan AA, H S Habibullah and Z Khan.	Khan AA, S Habibullah and Z Khan.	2021	Springer Singapore

23	Ethnobiology of mountain communities in Asia	Abbasi AM and RW Bussmann.	Sadia S, KS Ahmad, A Mehmood, F Nawaz, A Haroon, M Hameed, F Ahmad, W Rani and AM Abbasi.	2021	Springer Nature, Switzerland
24	Ethnobiology of mountain communities in Asia	Abbasi AM and RW Bussmann.	Mustafa A, KS Ahmad, A Mehmood, F Nawaz, A Haroon, A Hamid and I Liyaqat.	2021	Springer Nature, Switzerland
25	Plant breeding-current and future views	Abdurakhmonov IY.	Hayat K, A Bardak, MU Rahman, HM Imran, F Ahmad, D Parlak, M Azam, M Usmaan, M Adnan, S Anjum and RSA Khan.	2021	Intechopen
26	Locust outbreak: management and the world economy	Riaz U and KR Hakeem.	Qayyum MA, M Yasin, W Wakil, D Hunter and M Wajid.	2021	Apple Academic Press
27	Wild germplasm for genetic improvement in crop plants	Wani SH and MT Azhar.	Saddique MAB, MS Ahmad, MA Sheer, AA Khan and Z Ali.	2021	Academic Press (Elsevier)
28	Wild germplasm for genetic improvement in crop plants	Wani SH and MT Azhar.	Shoaib LM, MAB. Saddique MA Sher and Z Ali.	2021	Academic Press (Elsevier)
29	Crispr crops: the future of food security	Ahmad A, Z Khan and SH Khan.	Khan Z, T Saboor, M Ashfaq, MAB Saddique and P Khanum.	2021	Springer Nature
30	Laboratory safety manual MNSUAM	Khan Z, S Ahmad and G Haider.	Khan MA.	2021	MNSUAM
31	Veterinary pathobiology and public health	Abbas RZ and A Khan.	Rahman AU, MAB Shabbir and MA Raza.	2021	Unique Scientific Publishers
32	Handbook of plant and crop physiology	Pessarakli M.	Mubaraka R, M Bucher and MB Hussain.	2021	NEWGEN Publishing UK
33	Wild germplasm for genetic improvement in crop plants	MT Azhar and Wani SH.	Tahir MHN and H Razzaq.	2021	Academic Press (Elsevier)
34	Handbook of plant and crop physiology	Pessarakli M.	Haq TU, M Imran, and HS Ahmad.	2021	NEWGEN Publishing UK
35	Input use efficiency for food and environmental security	Bhatt R, R Swaroop and MA Hossain.	Ayman EL- Sabagh, MS Islam, A Hossain, M Aamir, I Muhammad HU Rahman, et al.	2022	Springer, Singapore
36	Cotton breeding and biotechnology	Khan Z, Z Ali and AA Khan.	Saddique MAB, Z Ali, MA Sher, B Farid, F Ahmad, and S. Arshad.	2022	CRC Press

37	Modern techniques of rice crop production	Sarwar N, A Rehman, S Ahmad and M Hasanuzzaman.	Farooq O, N Sarwar, HM Aatif, M Ali, AA Khan, MM Iqbal, MZ Manshaa, and S Ahmad.	2022	Springer
38	Plant stress mitigators: types, techniques and functions	Ghorbanpour M, MA Shahid,	Ali S, MA Anjum, S Ullah, S Ejaz, A Nawaz, S Hussain and G Khaliq.	2022	Elsevier Science
39	Functional genomics in cotton	F Ahmad, A Fatima, P Khanum, S Rehman, MAB Saddique, MA Khan and Z Khan.	Ahmad F, A Fatima, P Khanum, SU Rehman, MAB Saddique, MA Khan and Z Khan.	2022	CRC Press
40	Cotton breeding and biotechnology	Khan Z, Z Ali and AA Khan.	Iqbal N, F Akbar, U Waheed and S Ahmad.	2022	Ta;ylor and Francis
41	Cotton breeding and biotechnology.	Khan Z, Z Ali and AA Khan.	Waheed U, S Shabir, F Mazhar, M Rehman, HA Qureshi and N Iqbal.	2022	Taylor and Francis
42	Plant stress mitigators.	Choudhary DK, A Vaishnav and SS Arya.	Mahmood A, H Bardak, D Bozdoan, T Yamaguchi, A Hamed, R Kataoka, and OC Turgay.	2022	Springer Top of Form
43	Animal health perspectives	Khan A and RZ Abbas.	Abbas A, Z Rani, RZ Abbas, K Hussain , F Siddiqui, A Rehman, B Ahmad, MA Raza, JA Khan, R Yasin, SA Rajput, W Zaib, TU Rehman, MM Ayaz and HURA Khera.	2022	Unique Scientific Friends
44	Cotton breeding and biotechnology challenges and opportunities	Khan Z, Z Ali and AA Khan.	Shah FS, MA Bhatti, AA Khan, IA Baig, MHN Tahir, F Ahmad and MA Bakhtavar.	2022	CRC Press
45	Bioactive compounds from multifarious natural foods for human health	Suleria HAR, MR Goyal and HB Ain.	Shakir S, S Ahmad, A Naz and N Raza.	2022	Apple Academic Press
46	Mass spectrometry in food analysis	Nollet LML and RWinkler.	Islam S, D Thangadurai, R Hospet, Z Khoje, L Prakash, M David, N Bedi, N Bhagat, U Farooq, K Hayat, J Sangeetha, A Hussain and ZZ Chowdhury.	2022	CRC Press, Florida, USA

47	The CRISPR/cas tool kit for genome editing	Ahmad A, SH Khan and Z Khan.	Khan Z, Z Ali, AA Khan, T Sattar, A Zeshan and T Saboor	2022	Springer Singapore
48	Sustainable management and utilization of sewage sludge	Rajput VD, AN Yadav, H Singh, JS Kumar and ST Minkina.	Ahsan M, A Younis, F Ramzan, U Tariq, M Nafees, F Nawaz, G Akhtar, A Akram and A Ramzan.	2022	Springer Nature
49	Cotton breeding and biotechnology	Khan Z.	Ahmad F, A Fatima, P Khanum, SU Rehman, MAB Saddique, MA Khan and Z Khan.	2022	Taylor & Francis
50	Modern techniques of rice crop production	Sarwar N, A Rehman, S Ahmad and M Hasanuzzaman.	Hussain MB, SH Shah, A Matloob, R Mubaraka, N Ahmed, I Ahmad, TU Haq and MU Jamshaid.	2022	Springer, Switzerland.
51	Cotton breeding and biotechnology challenges and opportunities	Khan Z, Z Ali and AA Khan.	Mehdi M, MH Raza and MT Azeem.	2022	Taylor & Francis

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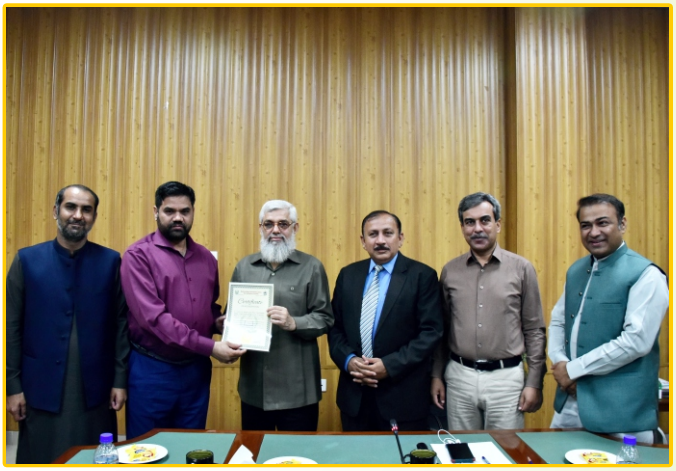


QUALITY ASSURANCE

CHAPTER-3

QUALITY ASSURANCE

3.1. Quality Enhancement Cell

MNS University Agriculture, Multan established a Quality Enhancement Cell (QEC) in March 2016 for quality assurance in teaching and other academic activities to meet international standards of higher education. The main focus of QEC is the implementation of quality assurance policies of HEC and monitoring the degree programs being offered by the University, to promote outcome based learning. This helps in developing a mindset among the faculty and students for the promotion of academic excellence. During 2021-22, the QEC assisted the faculty members to offer courses online using Moodle LMS and interactive sessions with the students through various platforms (MS Teams, Zoom, and Google Meet). Furthermore, the QEC also arranged training workshops for the Program Teams for preparing SARs and other quality assurance tasks, and awareness seminars for chairpersons to maintain quality assurance standards in their respective departments. The QEC also assists the academic departments in accreditation of undergraduate programs by the respective councils, and getting NOCs from HEC for postgraduate programs.

3.2. Functions of QEC

The QEC at MNS University of Agriculture performs the following functions:

1) Capacity building of faculty, through seminars and training sessions, for the preparation of Self-Assessment Reports (SARs) of the academic programs by various departments.
2) Preparation of SARs by Program Teams and evaluation by Assessment Teams.
3) Conduct the meetings of Departmental Technical Review Committees for annual review of TTS faculty.
4) Accreditation of undergraduate programs from respective Accreditation Councils.
5) Training of faculty and implementation of policies for offering courses online.
6) University Readiness for online teaching (Faculty Readiness, and Course Readiness).
7) Hybrid/Blended Learning.
8) Preparation of curriculum for Outcome Based Education.

During 2021-22, the detail of various activities undertaken by the QEC is as follows:

3.3. Course and Teacher Evaluation

With the objective of improving the course contents and teaching for a conducive classroom environment, feedback of students is collected in the form of HEC Course and Teacher Evaluation Proformas at the end of every semester. Feedback from the students for Course and Teacher Evaluation was obtained through an online system. Following is the detail of number of Courses for which this information was collected:

Sr. No.	Semester	Number of Courses	
		Undergraduate	Postgraduate
1	Winter 2021-22	335	99
2	Spring 2022	281	81

3.4. Visit by National Agriculture Education Accreditation Council (NAEAC)

The QEC helps and guides the Institutes/Departments in preparing documents and making other necessary arrangements for the visit of Accreditation Inspection Committee (AICs) of Accreditation Councils. The QEC acts as a bridge between the teaching departments and Accreditation Councils. During the year 2021-22, following visits of (AICs) of different councils were arranged for various programs in the University.

Sr. No.	Disciplines	Nature of Visit	Accreditation Council
	B.Sc. (Hons.) Agriculture		
1	Agronomy	On-Site Accreditation	National Agriculture Education Accreditation Council (NAEAC)
2	Entomology		
3	Plant Breeding and Genetics		
4	Seed Science and Technology		
5	Food Science and Technology		
6	Soil Science		
7	Horticulture		

3.5. NOCs to Initiate Postgraduate Degree Programs

University is expanding and offering new MS, M.Sc. (Hons.) and Ph.D. degree programs after getting NOCs from the HEC for launching new postgraduate degree programs. During the report period NOCs were obtained from HEC for the following postgraduate degree programs:

- MS Poultry Sciences
- MS Fisheries and Aquaculture
- MS Public Health

During this year, six cases were submitted to the HEC for NOCs for initiating the following degree programs:

- M.Sc. (Hons.) Agricultural Engineering
- M.Sc. (Hons.) Agro-Industrial Engineering Technology
- M.Sc. (Hons.) Weed Science
- M.Sc. (Hons.) Human Nutrition and Dietetics (HND)
- Ph.D. Human Nutrition and Dietetics (HND)
- Ph.D. Agricultural Economics

3.6. Departmental Technical Review of TTS Faculty

To create a spirit of competition and target based assessment, the MNSUAM promotes hiring young faculty as Assistant Professor on TTS. The meetings of DTRC, for assessing annual performance of the TTS faculty, were held during the year under report as per following detail:

Sr. No.	Institutes/Departments	Faculty Members	No. of Cases
1	Agronomy	3	3
2	Food Science and Technology	2	3
3	Soil and Environmental Sciences	3	6
4	Biotechnology (IPBB)	1	1
5	Entomology (IPP)	4	6
6	Plant Pathology (IPP)	2	3
7	Horticulture	4	11
8	Agricultural Engineering	3	3
9	Veterinary and Animal Sciences	3	3
10	Computer Science	3	5
11	Agribusiness and Applied Economics	2	3
12	Agricultural Extension	1	1
	Total	**31**	**48**

3.7. Assessment of Self-Assessment Reports (SARs)

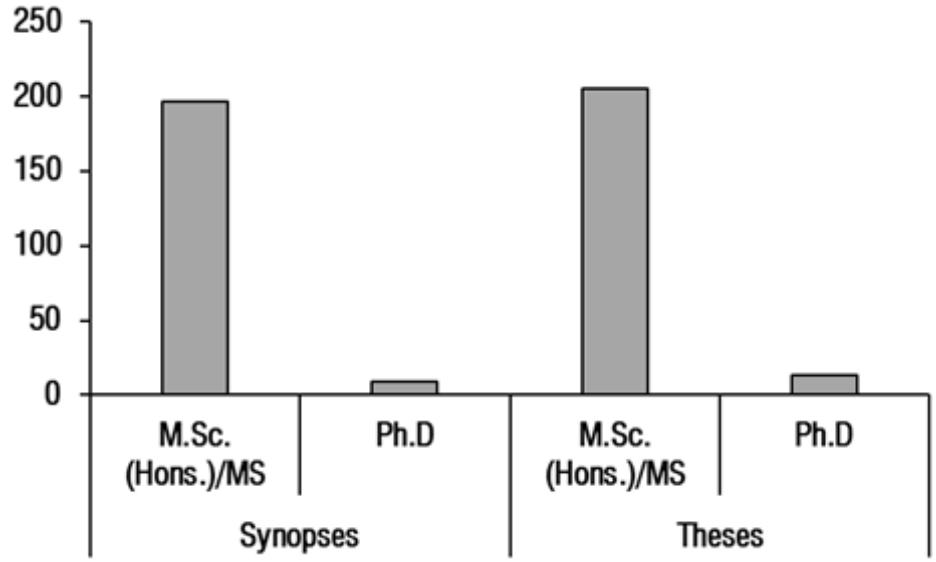
Program Teams (PTs) of Institutes/Departments prepare SARs and submit to QEC, Assessment Teams (ATs) conduct the assessment and submit reports to QEC. The Departments/Institutes prepare and submit implementation plans to QEC based on the findings of ATs. Assessments of SARs, preparation of implementation plans and executive summary of the following programs were completed during this year:

Sr. No.	Programs	SARs Prepared by PTs	SARs Assessed by ATs	Implementation Plan	Executive Summary
Faculty of Agriculture and Environmental Sciences (FAES)					
1	Biotechnology B.Sc. (Hons.) M.Sc. (Hons.), PhD	✓	✓	✓	✓
2	Plant Pathology B.Sc. (Hons.) MSc (Hons.), Ph.D	✓	✓	✓	✓
3	Climate Change M.Sc. (Hons.)	✓	✓	✓	✓
4	Human Nutrition and Dietetics (HND) B.Sc. (Hons.)	✓	✓	✓	✓
Faculty of Social Sciences and Humanities (FSSH)					
5	Computer Science (BS, MS)	✓	✓	✓	✓
6	Information Technology (BS)	✓	✓	✓	✓
7	Agricultural and Resource Economics B.Sc. (Hons.) Agriculture	✓	✓	✓	✓
8	Agriculture Economics M.Sc. (Hons.)	✓	✓	✓	✓
9	BBA Agribusiness	✓	✓	✓	✓
10	Management Agribusiness Specialization (MS)	✓	✓	✓	✓
Faculty of Veterinary and Animal Sciences (FVAS)					
11	Poultry Sciences BS (Hons.)	✓	✓	✓	✓

12	Animal Sciences BS (Hons.)	✓	✓	✓	✓
13	Microbiology (BS)	✓	✓	✓	✓
Faculty of Agricultural Biosytem Engineering and Technology					
14	Agro Industrial Engineering Technology (B.Sc.)	✓	✓	✓	✓

3.8. Plagiarism/Similarity Index Checking for Postgraduate Synopses/Theses

For maintaining and assuring the quality, similarity index/plagiarism checking of postgraduate research synopses and theses is mandatory at MNS-UAM and only those documents are accepted which have similarity index within permissible limits as defined by HEC. The QEC provides services for checking similarity index of synopses/theses and papers/articles submitted for travel grants to different funding agencies.



3.9. Institutional Performance Evaluation (IPE) Visit of QAA HEC

In order to improve the quality of HEIs, faculty development, excellence in learning research, and improving access, Higher Education Commission (HEC) has started the Institutional Performance Evaluation (IPE). The IPE team, constituted by Quality Assurance Agency (QAA) of HEC, visited the MNS University of Agriculture, Multan from November 22-24, 2021 for assessing the overall performance of the University regarding academic, administrative and other related matters. The QEC prepared and submitted the University Portfolio Report (UPR) according to the HEC IPE manual that consisted of the following eleven standards.

- Mission and Goals
- Planning and Evaluation
- Organization and Governance
- Integrity
- Faculty
- Students
- Institutional Resources
- Academic Programs and Curricula
- Public Disclosure and Transparency
- Assessment and Quality Assurance
- Student Support Services

The IPE team reviewed all the standards thoroughly and prepared the IPE report. The team also interacted with the students, faculty members, and administrative staff, visited the campus, classrooms, research laboratories, research fields, greenhouses, hostels and other infrastructure of MNSUAM to get first hand feedback.

3.10. Trainings/Workshops Organized

The QEC conducted following capacity building training/seminars for the faculty to assure quality in the academic programs at the university.

1. Online Training of Program Teams (PTs) for “Preparation of Self-Assessment Reports (SARs) and other quality assurance related tasks
2. Webinar on “HEC Best University Teacher Award”
3. Seminar on “Quality Assurance and Accreditation Awareness Seminar”
4. Training on “Setting-up and use of Turnitin”
5. Workshop on “Quality Assurance in HEIs”

3.11. Impact of Quality Assurance

Quality Enhancement Cell is responsible to prepare the assessment reports at the end of the semester and to achieve this target, QEC collects evaluation forms filled by relevant students/employer/faculty/alumni, to prepare all reports including course evaluation, teachers evaluation, faculty survey, survey of graduate students and employer survey. The results of the assessment report have increased the quality of education, students' satisfaction and performance of the faculty members. Overall impact of Quality Assurance is as under:

1. The steps taken in terms of Quality Assurance by the QEC has created awareness among the students and teachers related to competitiveness at national and international level.
2. The steps taken towards standardization have created seriousness at teaching and teachers are using innovative and ICT based approaches for making learning more effective.
3. Offering courses on hybrid/blended learning mode ensured better learning and also helped offering courses online during the COVID-19 to continue academic activities and students' learning without any inconvenience.
4. The process of assessing strengths, weaknesses and potential of the different programs introduced is taking route at the institutional level.
5. Efforts regarding the observance of minimum criteria for admissions and research have resulted in positive outcomes at departmental level.
6. An analytical and comparative tendency to learn from the top institutions (HEIs) in the country and outside the country has started and will yield positive results.
7. Efforts to find high place in the University rankings within and outside the country have been undertaken.
8. Putting the different processes in proper order has been prioritized at University level.
9. Monitoring and Evaluation has become an integral component of each ongoing project.

3.12. Impact towards the Higher Education

- Institutionalization of quality assurance
- Information systems for HEC (Ranking, Faculty Evaluation etc.) Internationalization (Linkages, Ph.D. scholarships, Post-docs, Student Exchange, Conferences, Professional advanced Trainings, Plagiarism checking etc.)
- Awareness and capacity building of faculty members through various professional development programs

3.13. Impact towards Institutional Administration

- Institutionalization of quality assurance mechanisms
- Development of teaching and learning framework
- Promotion of outcome based teaching (classroom management, teaching methodology, peer reviews etc.)
- Management of academic staff (area of interest, expertise, workload and other responsibilities/duties assigned from time to time)
- Administrative and financial management of research projects.
- Participation/membership of external stakeholders in the Board of Studies, Academic Council, Selection Board, Syndicate etc.

3.14. Teaching Practices

- Preparation of Course Files
- Defining expected learning outcomes, scheme of study, division and completion of credit hours
- Information on student progress
- Assessment of learning both formative and summative throughout the entire semester.
- Teaching strategies, methodologies, micro-teaching etc.
- Hybrid/Blended Course using Moodle
- Training of teachers for Teaching Online Courses
- Block Model Courses

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FACULTY DEVELOPMENT

FACULTY DEVELOPMENT

CHAPTER-4

FACULTY DEVELOPMENT

The University has a policy for capacity building of its all employees with special emphasis on faculty development. The University regularly organizes a number of seminars and workshops in collaboration with QEC/ORIC for the professional development of young faculty. Moreover, the faculty members also participate in a number of trainings funded and organized by other organizations/agencies. These training programs focus on teaching and research methodologies and awareness on prevailing HEC/University rules and regulations.

4.1. Objectives

- Promote human resource development as an integral part of the MNS-UAM strategic plan.
- Foster an environment of organizational and individual lifelong learning.
- Design, develop and implement programs and trainings/workshops that provide new knowledge, new skills, innovative thinking, and motivation, thereby contributing to significant improvements in the University's services and processes.
- Promulgate workplace harmony, effectiveness, and job satisfaction by providing programs that encourage appreciation of and sensitivity toward all persons.

4.2. Faculty development programs (MS/ PhD local + Foreign)

Sr. No.	Faculty Member	Designation	Department	Program	Name of University	Country
1	Mr. Muhammad Arif	Lecturer	Soil & Environmental Sciences	Ph.D.	Uni. of Science & Technology	China
2	Mr. Asif Mahmood Arif	Lecturer	IPP	Ph.D.	UAF	Pakistan
3	Ms. Saima Rasheed	Lecturer	IPBB	Ph.D.	UAF	Pakistan
4	Mr. Azher Khan	Lecturer	English	Ph.D.	IIUI	Pakistan
5	Mr. Muhammad Arslan	Lecturer	Climate Change	Ph.D.	Uni. of Bonn	Germany
6	Mr. Muhammad Rizwan	Lecturer	Agronomy	Ph.D.	Uni. of Bonn	Germany
7	Mr. Qamer Mahmood	Lecturer	FV&AS	Ph.D.	Ghent University	Belgium
8	Ms. Aisha Arshad	Lecturer	FV&AS	Ph.D.	Uni. of Veterinary Medicine	Vienna

4.3. Returned Scholars

Sr. No.	Name of Faculty	Program	Name of University
1	Dr. Fahim Nawaz	Post-Doc	University of Hohenheim, Germany
2	Dr. Habib ur Rehman	Post-Doc	University of Bonn, Germany

4.4. Faculty and Staff Trainings/Workshop Organized

Sr. No.	Training	Duration		Organization	Trainee
		From	To		
1	Technology Transfer and Entrepreneurship Development	26.07.2021	05.08.2021	AARDO-Sponsored International Online Training Programs in Collaboration with MARDI, Malaysia & IIT, Delhi, India	Engr. Aysha Khalid
2	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Prof. Dr. Irfan Ahmad Baig
3	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Prof. Dr. Shafqat Saeed
4	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Prof. Dr. Zulfiqar Ali
5	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Prof. Dr. M. Hammad Nadeem Tahir, Director QEC
6	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Prof. Dr. Umar Farooq
7	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Muhammad Asif Raza
8	a Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Nasir Nadeem
9	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Salman Qadri
10	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Hafiz Mohkum Hammad

11	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Mubashir Mehdi
12	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Sarfraz Hashim
13	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Ayesha Hakim
14	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Shazia Hanif
15	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Dr. Afshan Shafi
16	Webinar on "Teaching 21st Century; Challenges and Opportunities" through Zoom video link	06.07.2021	06.07.2021	PHEC, Lahore	Ms. Madiha Gohar
17	Training Course on New Technology of Agro-Processing and Food Engineering for Developing Countries-Chinese Government Training Program	06.07.2021	26.07.2021	Chinese Embassy	Dr. Umair Sultan
18	Training Course on New Technology of Agro-Processing an Food Engineering for Developing Countries-Chinese Government Training Program	06.07.2021	26.07.2021	Chinese Embassy	Engr. Farrukh Ehsan
19	Training Course on New Technology of Agro-Processing an Food Engineering for Developing Countries-Chinese Government Training Program	06.07.2021	26.07.2021	Chinese Embassy	Engr. Muhammad Kashif

20	Training Course on Beekeeping and Honey Processing	13.07.2021	11.08.2021	Chinese Embassy	Dr. Mudssar Ali
21	Training Course on Beekeeping and Honey Processing	13.07.2021	11.08.2021	Chinese Embassy	Dr. Muhammad Abid
22	2 Days Workshop on GPS and GNSS Hands on Training Workshop for Surveying and Mapping	03.08.2021	04.08.2021	PMAS-AAU, Rawalpindi	Dr. Muhammad Mohsin Khan
23	2 Days Workshop on GPS and GNSS Hands on Training Workshop for Surveying and Mapping	03.08.2021	04.08.2021	PMAS-AAU, Rawalpindi	Dr. Hafiz Muhammad Usman Aslam
24	"Competitive Bidding! An Effective Tool To Ensure Value For Money In Public Procurement"	2nd week of August	2nd week of August	The Islamia University of Bahawalpur	Mr. Muhammad Rafiq Farooqi
25	"Competitive Bidding! An Effective Tool To Ensure Value For Money In Public Procurement"	2nd week of August	2nd week of August	The Islamia University of Bahawalpur	Mr. Muhammad Asif Nawaz
26	"Competitive Bidding! An Effective Tool To Ensure Value For Money In Public Procurement"	2nd week of August	2nd week of August	The Islamia University of Bahawalpur	Mr. Inam Ullah Khan
27	Promoting Gender Equality at Workplace	30.08.2021	01.09.2021	Pakistan Manpower Institute	Ms. Somiya Ambreen, Deputy Registrar (HR), Registrar Office
28	Training Course on Agricultural Pest and Diseases Control Technology for Pakistan	06.09.2021	17.09.2021	Chinese Embassy	Dr. Naeem Iqbal, Assistant Professor
29	Training Course on Agricultural Pest and Diseases Control Technology for Pakistan	06.09.2021	17.09.2021	Chinese Embassy	Dr. Hafiz Muhammad Usman Aslam, Lecturer
30	AARDO-FERO Online Training Programme on "Sustainable Practices for Smart Agriculture and Livelihood in African-Asian Countries", The Far East Regional Officer (FERO), RO Korea, 25-29 October, 2021	25.10.2021	29.10.2021	AARDO, India	Dr. Muhammad Saifullah

31	AARDO-FERO Online Training Programme on "Sustainable Practices for Smart Agriculture and Livelihood in African-Asian Countries", The Far East Regional Officer (FERO), RO Korea, 25-29 October, 2021	25.10.2021	29.10.2021	AARDO, India	Dr. Mohsin Nawaz
32	AARDO-FERO Online Training Programme on "Sustainable Practices for Smart Agriculture and Livelihood in African-Asian Countries", The Far East Regional Officer (FERO), RO Korea, 25-29 October, 2021	25.10.2021	29.10.2021	AARDO, India	Dr. Muhammad Mohsin Khan
33	Training Course on Operation & Maintenance of Agricultural Machinery for Pakistan	15.10.2021	04.11.2021	Chinese Embassy	Dr. Hafiz Mokhum Hammad
34	Training Course on Operation & Maintenance of Agricultural Machinery for Pakistan	15.10.2021	04.11.2021	Chinese Embassy	Dr. Amar Matloob
35	Training Course on Operation & Maintenance of Agricultural Machinery for Pakistan	15.10.2021	04.11.2021	Chinese Embassy	Dr. Umair Sultan
36	Training Course on Operation & Maintenance of Agricultural Machinery for Pakistan	15.10.2021	04.11.2021	Chinese Embassy	Dr. Shazia Hanif
37	Training Course on Operation & Maintenance of Agricultural Machinery for Pakistan	15.10.2021	04.11.2021	Chinese Embassy	Engr. Muhammad Kashif
38	Seminar on Building and Developing of Employment Service System	09.11.2021	22.11.2021	Shandong Foreign Trade College, China	Mr. Muhammad Zakir Khan
39	Seminar on Building and Developing of Employment Service System	09.11.2021	22.11.2021	Shandong Foreign Trade College, China	Mr. Muhammad Nadeem Ayub
40	Seminar on Building and Developing of Employment Service System	09.11.2021	22.11.2021	Shandong Foreign Trade College, China	Mr. Amjad Ali Khan

41	Cross Border Agricultural E-Commerce for the Belt and Road Countries	18.11.2021	01.12.2021	Chinese Embassy	Dr. Mubashir Mehdi,
42	Women's Leadership Program	29.11.2021	04.12.2021	NAHE, HEC, Islamabad	Ms. Somiya Ambreen
43	Women's Leadership Program	29.11.2021	04.12.2021	NAHE, HEC, Islamabad	Dr. Ayesha Hakim
44	Women's Leadership Program	29.11.2021	04.12.2021	NAHE, HEC, Islamabad	Dr. Ambreen Naz
45	Women's Leadership Program	29.11.2021	04.12.2021	NAHE, HEC, Islamabad	Dr. Nighat
46	Women's Leadership Program	29.11.2021	04.12.2021	NAHE, HEC, Islamabad	Dr. Shazia Hanif
47	Water-Saving Agriculture for Pakistan	25.11.2021	07.12.2021	Chinese Embassy	Dr. Zulfiqar Ali
48	Water-Saving Agriculture for Pakistan	25.11.2021	07.12.2021	Chinese Embassy	Ms. Sadia Hakeem, Research Associate
49	Water-Saving Agriculture for Pakistan	25.11.2021	07.12.2021	Chinese Embassy	Ms. Hira Maryam, Student
50	seminar on Ensuring Transparency in Public Sector Projects Management	30.11.2021	30.11.2021	NAB Multan	Rana Muhammad Tufail, Subject Expert (Project Director)
51	seminar on Ensuring Transparency in Public Sector Projects Management	30.11.2021	30.11.2021	NAB Multan	Engr. Khalid Mohy ud Din, Subject Expert (Executive Engineer)
52	seminar on Ensuring Transparency in Public Sector Projects Management	30.11.2021	30.11.2021	NAB Multan	Mr. Muhammad Rafiq Farooqi, Director (Procurement & Inventory Control)
53	seminar on Ensuring Transparency in Public Sector Projects Management	30.11.2021	30.11.2021	NAB Multan	Rana Inamullah Khan, Assistant Treasurer

54	seminar on Ensuring Transparency in Public Sector Projects Management	30.11.2021	30.11.2021	NAB Multan	Mr. Muhammad Azeem Afzaal, Assistant Treasurer
55	03 Days Capacity Building Workshop (Online) for Effective Reporting and Implementation of Cartagena Protocol on Biosafety Feb 28 – March 02, 2022.	28.02.2022	02.03.2022	Ministry of Climate Change, Islamabad	Dr. Zulqurnain Khan, Assistant Professor
56	Remote Sensing and Field – Based Glacier and Snow Monitoring in Pakistan"	14.03.2022	17.03.2022	PARC, Islamabad	Dr. Abdul Razzaq, Assistant Professor
57	2-Days Hands-On-Training on "Taxidermy Techniques & Natural History Museum Development"	22.02.2022	23.02.2022	The University of Agriculture, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan.	Dr. Mubahsir Mehdi, Associate Professor
58	Session on Formulation of Project Log Framework	23.02.2022	23.02.2022	Government of the Punjab, Agriculture Department, Lahore	Mr. Azeem Afzaal, Assistant Treasurer
59	One Day Workshop on Establishing and Promoting International Linkages in Pakistani HEIs	May, 2022	May, 2022	Higher Education Commission, Islamabad	Dr. Hafiz Mohkum Hammad, Associate Professor / Director External Linkages
60	Women's Leadership Program; 28th March to 1st April, 2022	28.03.2022	01.04.2022	Higher Education Commission, Islamabad	Dr. Ummara Waheed, Assistant Professor
61	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Prof. Dr. Muhammad Hammad Nadeem Tahir, Director QEC
62	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Ms. Somiya Ambreen, Additional Registrar

63	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Dr. Ayesha Hakim, Assistant Professor, Computer Science
64	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Dr. Ali Haider, Assistant Professor, Clinical Sciences
65	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Dr. Muhammad Nadir Naqqash, Assistant Professor, IPP
66	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Dr. Muhammad Abu Bakar Saddique, Assistant Professor, IPBB
67	Capacity Building of Academic Leadership in Teaching, Research & Services	15.06.2022	31.08.2022	Kohat University of Science and Technology (KUST) and HEC	Dr. M. Mohsin Khan, Lecturer, Agricultural Engineering
68	International Symposium on Network Analysis in Agricultural Systems to Address Grand Challenges to Food Security	15.06.2022	17.06.2022	University of Agriculture Faisalabad	Dr. Muhammad Ali Sher, Lecturer, IPBB
69	International Symposium on Network Analysis in Agricultural Systems to Address Grand Challenges to Food Security	15.06.2022	17.06.2022	University of Agriculture Faisalabad	Dr. Akhtar Hameed, Assistant Professor, IPP
70	International Symposium on Network Analysis in Agricultural Systems to Address Grand Challenges to Food Security	15.06.2022	17.06.2022	University of Agriculture Faisalabad	Dr. M. Nadir Naqqash, Assistant Professor

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ACCESS

CHAPTER-5

ACCESS

5.1. Basic Enrollment during 2021 -22

Sr. No.	Program Offered	Male	Female	Total
1	Livestock Assistant Diploma (LAD)	227	0	227
2	B.Sc. (Hons.) Agriculture	362	100	462
3	B.Sc. (Hons.) Environmental Sciences	6	14	20
4	B.Sc. (Hons.) HND	3	33	36
5	B.Sc. (Hons.) Home Economics	0	15	15
6	B.Sc. (Hons.) Agri. & Resource Economics	19	4	23
7	BBA Agribusiness	72	13	85
8	BS Computer Science	157	38	195
9	BS Information Technology	160	30	190
10	BS Data Science	39	11	50
11	B.Sc. AIET	19	0	19
12	B.Sc. (Hons.) Poultry Sciences	18	1	19
13	B.Sc. Animal Sciences	10	0	10
14	BS Microbiology	19	65	84
15	BS Zoology	52	72	124
16	M.Sc. (Hons.)	139	77	216
17	Ph.D.	9	3	12
	Grand Total	**1311**	**476**	**1787**

5.2. Data of M.Sc. (Hons.) and Ph.D. Student Enrollment

5.2.1. M.Sc. (Hons.)/ MS Enrollment during 2021 -22

Sr. No.	Program Offered	Eligible Candidates	Admitted (Male)	Admitted (Female)	Total Admissions
1	Agronomy	18	13	00	13
2	Agri. Economics	09	08	00	08
3	Management (Agri. Business)	12	09	00	09
4	Biotechnology	20	4	13	17
5	Computer Science	65	20	15	35
6	Climate Change	09	02	05	07
7	Entomology	24	17	07	24

8	Food Science & Technology	83	13	22	35
9	Horticulture	27	17	05	22
10	Plant Pathology	20	13	06	19
11	Plant Breeding and Genetics	15	10	00	10
12	Seed Science and Technology	01	01	00	01
13	Soil Science	10	10	00	10
14	Fisheries and Aquaculture	12	05	07	12
15	Public Health	19	04	06	10
16	Poultry Science	13	07	01	08
	Grand Total	**357**	**158**	**87**	**240**

5.2.2. Ph.D. Enrollment during 2021 -22

Sr. No.	Program Offered	Eligible Candidates	Admitted (Male)	Admitted (Female)	Total Admissions
1	Agronomy	04	02	01	03
2	Biotechnology	01	00	01	01
3	Entomology	01	00	00	00
4	Food Science & Technology	06	03	03	06
5	Horticulture	09	05	01	06
6	Plant Pathology	02	02	00	02
7	Plant Breeding and Genetics	03	01	01	02
8	Soil Science	1	0	1	01
	Grand Total	**27**	**13**	**08**	**21**

5.3. Number of Students Passed Out during 2021 -22 (Undergraduate)

Sr. No.	Degree Program	Total Enrolled	Male	Female	Pass Out
1	F.Sc. Pre-Agriculture	49	41	01	42
2	BS Computer Science	53	47	06	53
3	BS Information Technology	69	56	11	67
4	BBAA	62	50	06	56
5	Agri. Economics	24	20	02	22
6	Agronomy	33	31	02	33
7	Biotechnology	16	16	02	18
8	Entomology	40	33	04	37
9	Food Science & Technology	40	22	17	39
10	Horticulture	35	27	05	32
11	Plant Breeding and Genetics	25	22	02	24
12	Plant Pathology	33	27	06	33
13	Seed Science	17	14	01	15
14	Soil Science	25	24	00	24

5.4. Number of Students Passed Out during 2021 -22 (Postgraduate)

Sr. No.	Degree Program	Male	Female	Pass Out
1	M.Sc. (Hons.) Agronomy	12	0	12
2	M.Sc. (Hons.) Agri. Economics	08	01	09
3	M.Sc. (Hons.) Biotechnology	02	11	13
4	MS Computer Science	23	18	41
5	M.Sc. (Hons.) Entomology	18	05	23
6	M.Sc. (Hons.) Food Science & Technology	13	15	28
7	M.Sc. (Hons.) Horticulture	14	04	18
8	M.Sc. (Hons.) Plant Breeding & Genetics	12	08	20
9	M.Sc. (Hons.) Plant Pathology	15	02	17
10	M.Sc. (Hons.) Seed Science & Technology	02	0	02
11	M.Sc. (Hons.) Soil Science	11	04	15
12	M.Sc. (Hons.) Climate Change	02	0	02
13	Ph.D. Plant Breeding & Genetics	00	01	01

5.5. Full-time Faculty Members

Sr. No.	Designation	Male	Female	Total
1	Professor	11	-	11
2	Associate Professor	08	-	08
3	Assistant Professor	53	07	60
4	Lecturer	43	17	60
5	**Grand Total**	**115**	**24**	**139**
6	**Ph.D. Faculty**	**86**	**10**	**96**

Muhammad Nawaz Shareef
University of Agriculture
Multan

UNIVERSITIES BUILDING ECONOMIES

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CHAPTER-6

UNIVERSITIES BUILDING ECONOMIES

6.1. University-Industry Linkages

MNSUAM is taking a qualitative leap forward by developing strong linkages with agro-based industries through general support, collaborative need based research and new business incubators. The purpose of the collaboration with various local and foreign organizations and industries is to ensure the training of our faculty members and young scholars in interdisciplinary research methods. MNSUAM is actively looking forward to foreign collaborations and funding for its faculty development program and research projects. MNSUAM has been a regular liaison with various industries and the corporate sector since its establishment in 2012.

6.2. Farmer Advisory Services

MNSUAM in pursuit of its moral obligation and national commitment to serve the farming community has launched farmer advisory services that consist of daily crop and weather advisory and other relevant information. Farmer advisory services are ensuring demand driven and need based agro-technology transfer to farmers with different farming backgrounds. Developing a sound linkage between academia-industry and the farming community to have a demand-driven agenda for research, University's top priority. By accelerating the diffusive process of innovative agro-technology, the gap between potential and actual yield can be abridged and our farmer advisory service is one such step towards this great milestone.

6.3. South Punjab Agricultural Forum

This forum comprises stakeholders from public and private sectors including Pakistan Central Cotton Committee, Central Cotton Research Institute, Cotton Research Station, Agricultural Mechanization Research Institute, Mango Research Institute, Soil and Water Testing Laboratory, Directorate of Water Management, Agricultural Extension Wing, Pest Warning and Quality Control of Pesticides, Federal Seed Certification and Registration Department, Floriculture, Pakistan Crop Protection Association, etc. The agenda is to establish a platform for research and coordination mechanism development among MNSUAM, public sector sister research organizations, and the private sector to strengthen the overall agriculture sector. The South Punjab Agriculture Forum has now been established where all the agriculture-related departments are working in collaboration to boost the agro-based economy of the country.

6.4. Establishment of Modern Mango Small Tree System

Ultra-high-density plantation (UHDP) is also known as Mango Small Tree System (STS), a new age technology that is increasingly being used for mango plantations across the globe. STS in synergy with other sustainable agricultural techniques can yield up to 200% more crop yield than the traditional method of cultivation. It ensures optimal utilization of all resources while increasing the production unit area. This technique also ensures a uniform shape and colour of the fruit while maintaining its flavour and freshness. The increase in production leads to a higher export as well. This means more profit margins for the farmers which goes a long way in addressing the need for farmers' welfare by improving their economic status. Fossil Energy (Pvt.) Ltd awarded a research project to MNSUAM and the goal of this project is to establish a modern mango small tree system as a model.

The objective of this project is to provide farmers with a new type of technology that can help them increase their income.

(i) Preparation of soil for mango plantation
(ii) Layout and plantation of mango nursery plants under STS
(iii) Installation of High-efficiency irrigation system (HEIS)
(iv) Training and pruning of mango plants for better plant structure
(v) Management practices for healthy plant growth and development
(vi) Production of high-quality fruits for value addition

6.5. Establishment and Propagation of Miscanthus and Sisal as a Pulp and Energy Crops

Pulp is a lignocellulosic fibrous material prepared by chemically or mechanically separating cellulose fibres from wood, fibre crops, wastepaper, or rags. Mixed with water and other chemical or plant-based additives, pulp is the major raw material used in paper making and the industrial production of other paper products. The Paper Industry of Pakistan is not among the prime industries of the country and is in the developing stage. Consumption of Paper in Pakistan is in far excess of the domestic capacity. So, the local demand for some types of papers is met through imports. Over a period of time, domestic industry has attained capacities and capabilities to produce all major Paper & Paperboard products leaving small room for imports. However, domestic demand for some specialized papers, including coated art paper / card and newsprint, among others, is met through imports. More than 70% of mills are located in Punjab province, 20% are in Sindh province and 10% are in Khyber Pakhtunkhwa province. Raw materials used for paper production include wood, agricultural wastes (straws, bagasse, grasses), and other materials (waste paper, cotton lint and waste, pulp and waste paper). However, the requirements of the pulp industry are beyond the availability of raw materials. Therefore, it is a dire need to establish specialized pulp crops to feed the pulp and paper industry of Pakistan. *Miscanthus giganteous* and sisal have been identified as potential crops for providing the raw material for the pulp industry. Miscanthus and sisal crops are also identified as potential biofuel feedstock with the substantial value of energy produced per ton of dry matter. These species are known to be hardy crops that can withstand harsh conditions and grow on marginal lands. The cellulose contents in both crops have been reported to give significant value to pulp production making them favourite feedstock for the pulp and paper industry.

Keeping in view the above scenario, and the great interest shown by the packaging industry, the production and propagation technology of miscanthus and sisal crops will be established in Pakistan. The following objectives will be addressed in the project;

1. To test adaptation of miscanthus and sisal on waste / marginal lands (saline/dry conditions)
2. To optimize the sowing time of miscanthus and sisal for maximum biomass yield
3. To test the quality of miscanthus and sisal as pulp and bioenergy feedstock 4. To devise the tissue culture techniques for propagation of miscanthus and sisal

The duration of the project is 3 years, from August 2021 to August 2024. This project is funded by Bulleh Shah Packages, a leading paper manufacturer in Punjab, Pakistan. A total of 7.93 million PKR is going to be spent on this project.

6.6. Establishment of Mushroom Production Unit at Dar-Ul-Ihsan Farm Burran Khas, Vehari

The Establishment of Mushroom Production Unit at Dar-Ul-Ihsan Farms Burrana Khas, Vehari is also an industrial project. The project aims to establish a high-tech mushroom production unit at Vehari. It is a quick returning crop with 50 to 100% profit under the optimized conditions for mushroom growth. It is one of the most suitable fungal organisms for producing protein rich food from various agro-wastes or forest wastes without composting. The following activities will be undertaken in the project;

1. Alteration of infrastructure
2. Installation of mushroom holding structure
3. Installation of mushroom production system (Humidifier, Exhaust, fans, Lights and Meters)
4. Installation of mushroom production system
5. Training of manpower for better mushroom production
6. Management practices for healthy mushroom growth and development

6.7. Potential of Different Insecticides as Soil Termiticides for the Management of Termites

The project has been funded by PATRON CHEMICALS, Multan, Pakistan. The research work will focus on the development and optimization of insecticide dosage for the termite control in soil and also on the development machinery required for soil management. The main objective of this project is to develop new pesticides that can be used to control termite infestation in soils. The proposed research work will help to increase production in the agriculture sector by reducing costs of labour and machinery.

6.8. Industrial Projects/ Grants/ Funding/ Support etc.

Sr. No.	Title	Funding Agency	Award Amount (Million PKR)	Current Status
1	Establishment of Modern Mango Small Tree System	Fossil Energy	7.17	Ongoing
2	Establishment and propagation of Miscanthus and Sisal as a pulp and energy crops	Bulleh Shah Packages Pvt Ltd. Lahore	7.93	Ongoing
3	Establishment of High-Tech Mushroom Production Unit at Vehari	Dar-ul-Ihsan Farm, Burana Khas, Vehari	0.91	Ongoing
4	Potential of different insecticides as soil termiticides for the management of termites	Patron Chemicals	1.55	Ongoing
		Total cost	**17.55**	

6.9. Consultancy Contracts Executed through ORIC with Industry, Commerce or Government

6.9.1. Training Session Syngenta Vegetable Seed Team

A two-day training was conducted for Syngenta Pakistan's Seed team at MNSUAM on April 01-02, 2022.

The objectives of the training were:

- Vegetable nursery raising (sweet pepper, tomato, cabbage and cauliflower)
- Nursery media selection for hilly areas (cool climate)
- Nursery raising structure information keeping in view Swat area climate
- Basics of Hydroponic Technology and facility visit in MNSUA.

6.9.2. Capacity Building/Training on Protected Soilless Farming

Changing climatic scenarios and expensive seeds demand for vigorous seedlings production under a protected environment. Therefore, Syngenta Pakistan organized a capability training of its seed team during the Annual Syngenta Vegetable Seed conference "Bringing plant potential to life" on October 15-18, 2021. Dr. Nazar Faried (Assistant Professor, Horticulture, MNS-UAM) was invited for the capacity building of the field seed team vis-à-vis Soilless protected farming which growing media and seed germination, plant growing environment, protected farming (tunnel farming, greenhouse Cultivation), hydroponics/ soilless farming, plant nutrition and indigenous hydroponic unit, MNS-UAM: A case study. Overall, it was a wonderful experience of academia-industry interaction with possibility of different future endeavors.

6.9.3. Technical Report of Land Evaluation for Agricultural Potential (Dera Ismail Khan and Muzaffargarh Sites)

A consultancy was provided at the request of the Pakistan Air Force regarding land suitability classification from Jan. 31, 2022 to Feb. 1, 2022.

Different soil (location/access, electrical conductivity, soil texture, weed infestation, water holding capacity and drainage, etc.) and water (Quantity of salts in mg/L, sodicity hazards (SAR and RSC) parameters were observed during field visit for land evaluation. Furthermore, the numbers of crops which can be grown in a particular soil also determine the scope or value of the land.

6.9.4. Hand-on Training on Conversion of Household Waste into Organic Fertilizer

This training was provided to employees of Mehmood Group of Industries, Industrial Estate Multan. Around 25 participants have attended this training. This training workshop was arranged for participants to enhance their knowledge about the management of organic waste through composting. A pre-training survey was carried out to assess the previous knowledge of the participants about composting. After the survey, a PowerPoint presentation on composting was delivered to impart basic knowledge of the area. It was told in the presentation that composting is the natural process of recycling organic matter, such as leaves and food scraps, into a valuable fertilizer called "black gold," or "compost," which is a rich source of nutrients and beneficial microbes that improve soil health and plant growth. Organic waste causes environmental pollution and attracts different pests and diseases, but proper processing and disposal of brown and green organic waste through composting can be beneficial. Composting provides a natural way to recycle organic waste by providing a suitable environment for decomposing microbes, which speeds up the process of decomposition. Composting can be done in aerobic and anaerobic ways. But, aerobic composting by using a bin is easier and more beneficial. Different factors including air, water, temperature and particle size affect the normal process of composting. There are different methods of composting but, practically composting can be done by hole and heap methods.

After the presentation, a practical demonstration of the composting procedure was also done. At end of the training session, the improvement in the knowledge of farmers was assessed by asking different questions about composting, suitable materials, and methods of composting, and it can be predicted that after this session they will be able to apply this knowledge to prepare compost at their farms.

6.10. Annual Mango Festival – Centaurus Islamabad

Mango Festival was at The Centaurus Mall Islamabad as a continuation of its 4th-year collaborative event on 2-3 July 2021. The event was organized in collaboration with Mango Research Institute, Multan and the Islamabad Chamber of Commerce and Industry (ICCI). The event was inaugurated by the Provincial Minister for Agriculture, Syed Hussain Jahania Gardezi; Adviser to Prime Minister on Commerce, Mr. Abdul Razak Dawood; Sardar Yasir Ilyas Khan, President ICCI and the Vice Chancellor, MNS University of Agriculture Multan, Prof. Dr. Asif Ali (T.I.).

This festival brought the natural fragrance and aroma of mango varieties to the capital city from different regions of the country. About 40 exhibitors across Pakistan set their stalls in the Mango Festival to exhibit around 160 varieties of mangoes including 4-5 low-sugar varieties. The mango festival was attended by people from all walks of life including government ministers, industrialists and ambassadors of Germany, Belgium, Belarus, UAE, Iran, Morocco, Lebanon, Saudi Arabia, Jordan, Palestine and Nepal and diplomatic staff from many other embassies also.

The fair encouraged mango growers and exporters and provided a platform for showcasing export-quality mangoes. The basic aim of organizing this exhibition at the most visited Mall of Islamabad was not only to showcase the diversity of Pakistani Mangoes but also to link growers to high end markets and enhance mango exports as per the vision of the Prime Minister of Pakistan. The promotion of mango in the federal capital has attracted attention of different countries from central Asia and helped boost the export potential of this agricultural commodity. The visitors and participating mango growers appreciated the efforts of Sardar Yasir Ilyas Khan and Prof. Dr. Asif Ali in organizing the mango festival.

The closing ceremony was held on July 3, 2021. The chief guest was Hon'ble Syed Fakhar Imam, Federal Minister for National Food Security and Research. During his address Syed Fakhar Imam said, “We have recently seen a remarkable difference in mango export as compared to other fruits' export and such festivals certainly helped bring this positive trend in export promotion. The efforts of MNS University, MRI and Centaurus in organizing such a festival were appreciated.

6.11. Showcasing Diversity, Potential and Value in Mango Sector

Fifth Annual Multan Mango Festival was organized from July 8-10, 2021, at DHA Arena Multan. The worthy Chancellor of the University Ch. Mohammad Sarwar, Governor Punjab, along with Provincial Minister for Agriculture, Syed Hussain Jahania Gardezi, Provincial Minister for Energy, Dr. Akhtar Malik inaugurated the festival on July 08, 2021. The Governor appreciated the efforts of the University in branding the mango festival and making it a regular activity since 2016.

He was delighted to see such an immense and wonderful diversity of mangoes at this festival. He also appreciated the efforts of MRI, DHA and mango growers for their contributions to the efforts of the university.

An overwhelming public response was received owing to highly attractive, entertaining, and business-oriented activities. A seminar and discussion session of the stakeholders was also held to discuss technical issues being faced by the mango industry during picking, transportation, packaging, and marketing.

At the occasion, many dignitaries like Squash Champion, Mr. Jansher Khan, Lt. Gen. Muhammad Waseem Ashraf, HI(M) Chairman DHA Multan, parliamentarians, Malik Ahmed Hussain Dehar, Haji Atta Ur Rehman, Malik Saleem Labir, Qasim Khan Langah, Mian Tariq Abdullah, Ms. Shahida Ahmed Malika, Additional IG South Punjab Capt. Retd. Zafar Iqbal Awan, Secretary Agriculture South Punjab, Saqib Ali Ateel, Retd. IG Railway Police Syed Ibne Hussain, Vice Chancellor BZU, Prof. Dr. Mansoor Akbar Kundi, Vice Chancellor Women University Multan Prof. Dr. Uzma Qureshi, Vice Chancellor Khawaja Fareed University, Prof. Dr. Suleman Tahir, Vice Chancellor, Nishtar Medical University Prof. Dr. Ahmed Ijaz Masood, Vice Chancellor CUVAS, Prof. Dr. Sajjad Ahmad Khan, Chief Executive, PARB, Dr. Abid Mehmood, Director MRI, Mr. Abdul Ghaffar Grewal, and progressive growers like Mr. Mumtaz Khan Manais, Ms. Rabia Sultan, Major. Tariq Khan, Zahid Hussain Gardezi, Noor ul Haq Jhander, Khawaja Shoaib, Chairman Kissan Ittehad Khalid Khokhar and many others were present. More than 70 stalls were arranged by the mango growers, mango processing industry and exporters for the visitors and general public.

Various festive activities including games, kids' mango eating competition, face painting, kids fancy dress walk, mango drawing, puppet show, magic show, mascots, camel dance, and traditional drum beating were part of the festival. The students of MNSUAM organized various performances including cultural shows, dramas, singing, and folk dances etc. A competition on 'Mango Dish Making' was organized by the Department of Food Science and Technology wherein students from different educational institutes, housewives and restaurants' staff participated and prepared various mango dishes with unique recipes. A cultural singing concert was organized in the Mango Enclave of DHA which was a good activity for the promotion of agricultural tourism. The visitors were also offered ample mangoes at the Mango Eatery. A multilingual mushaira was part of the second day's activities, which was well received by the audience. The event was open for local communities and families to visit the exhibition and get information on different mango varieties and participate/attend the festive activities.

The closing ceremony of the mango festival was held on July 10, 2021 wherein Federal Minister for National Food Security and Research, Syed Fakhar Imam concluded the Mango Festival. Syed Fakhar Imam also chaired a seminar on value and supply chain for mango where all sectors of mango business participated. The Minister informed that the government has started working on new plans for the improvement of agricultural production and profitably with higher exports which will contribute to poverty alleviation.

Overall, this event provided a valuable opportunity for awareness, branding and networking in the mango production, supply and value chain. The stakeholders of the mango industry were brought together across the country under a single roof and discussions were made to overcome prevailing challenges, identify crucial gaps, and explore options to improve the value and net income of the mango supply chain. More than 200 indigenous and exotic mango cultivars being grown in the Punjab region were displayed on stalls. More than 70 stakeholders including growers, exporters, processors, nursery owners, fertilizer companies/dealers, pesticide companies, banks and several other organizations/firms etc. displayed their products on stalls.

More than 30,000 people visited and participated in the mango festival. Such an overwhelming response and involvement in the Mango Festival from mango stakeholders, government officials, and the local community is very encouraging which demands continuity of the festival in future.

6.12. Webinar to Promote Organic Farming

The Department of Agronomy organized an International Webinar on "Prospects and challenges of organic agriculture" on July 13, 2021. The objective of this webinar was to create awareness about the latest trends in organic farming as an eco-friendly approach, while seeking innovative solutions to its key challenges. Dr. Abdul Ghaffar (Chairman, Department of Agronomy) welcomed the participants and speakers of this webinar. Dr. Mudassir Aziz (Lecturer, Department of Agronomy) was the moderator and focal person of this webinar. The resource persons of this international webinar were from Japan, Germany, Iran and the United Kingdom. Prof. Dr. Sher Muhammad (Department of Agricultural Sciences, AIOU, Islamabad), Prof. Dr. Mairam Athmann (HoD, Organic Farming and Cropping System, University of Kessel, Germany), Dr. Nicola Cannon (Royal Agricultural University in Cirencester, UK), Dr. Mohammadreza Rezapanah [(Associate Professor of IRIPP/AREEO, Tehran, Iran and Head and Board Member of CEOA (Centre of Excellence for Organic Agriculture)] and Dr. Shaikh Tanveer Hossain (Senior Program Officer, Agriculture Unit Asian Productivity Organisation, Tokyo, Japan discussed current scenario, historical perspective, development and certification systems, organic plant protection, recent trends and innovations in organic agriculture. Afterwards, a question-answer session was also held. Prof. Dr. Shafqat Saeed (Dean, Faculty of Agriculture and Environmental Sciences, MNSUAM) offered vote of thanks.

6.13. Combating Cotton Diseases

Institute of Plant Protection, MNSUAM organized a series of meetings of a committee constituted by Secretary Agriculture (South Punjab) to identify the causes of blackening of leaves in cotton crop. The Vice Chancellor headed the committee. He tasked the teams to carry out field surveys and will present their field and lab analysis reports. Scientists from CCRI, Multan; AARI, Faisalabad; UAF, NIAB carried out independent studies and submitted the final reports. The microorganisms involved in blackening of cotton leaves are Cladosporium and Alternaria. Both are non-parasitic microorganisms and grow superficially on secretions of sucking pests.

Whitefly is the major source of honeydew secretions in cotton. It was recommended to control of sucking pests especially whitefly in cotton field and pray selected fungicides alone or in combination with 1% bleach when observe the blackening of leaves

6.14. Veterinary Hospital Inaugurated at MNSUAM

In pursuit of its obligations to serve the farming community of the region, Faculty of Veterinary & Animal Sciences, MNSUAM has established a veterinary hospital for training of students and to facilitate farmers of South Punjab for treating their animals. The hospital will offer free of charge services for disease diagnosis and treatment of cows, buffaloes, horses, cats, dogs, rabbits, and birds etc. The Vice Chancellor, Prof. Dr. Asif Ali (TI) inaugurated the hospital on July 27, 2021, wherein faculty members, students and farmers participated. Addressing the ceremony, Prof. Dr. Asif Ali said that we aspire to deliver the very best of veterinary health and care services and this hospital is expected to meet the increasing demand for modern animal care and treatment requirements for pets and domestic animals. As a public sector University committed to serve the community of this region, we are taking all possible steps for the development of the agriculture sector and the people associated with it. There is a lot for the students of this University to learn through this hospital. He announced plans to launch diplomas and short courses on animal production and healthcare. He congratulated Dr. Asif Raza, Associate Professor, Department of Veterinary and Animal Science and his team for taking up such a relevant initiative.

6.15. Webinar on Guar bean

Department of Agronomy, MNSUAM organized an international webinar on "Current Scenario and Future Perspective of Guar bean Production" on July 15, 2021. In his inaugural address, MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (TI) emphasized on the inclusion of leguminous crops into the cropping system for the long-term benefits and sustainable soil management. He said that crops like guar bean can benefit both farmers and industry. Dr. Muqarrab Ali, Assistant professor/principal Investigator of guar bean project (HEC NRPU 10547) gave a comprehensive overview of project activities and achievement so far. Dr. Lal Hussain Akhtar (Principal Scientist, Guar Research Station/Director, regional Agriculture Research Institute, Bahawalpur discussed production technology and innovations in guar bean. Dr. Hadi Pirasteh-Anosheh, Assistant Professor, National Salinity Research Center, Agricultural Research, Education and Extension Organization, Iran postulated the opportunities for growing guar bean as a crop for saline environments. Industrialists and farmers also expressed their viewpoints regarding value added products of guar bean and current farming practices. Prof. Dr. Shafqat Saeed, Dean, Faculty of Agriculture and Environmental Sciences, MNSUAM concluded the webinar, while, Dr. Abdul Ghaffar, Chairman, Department of Agronomy, MNSUAM offered vote of thanks.

6.16. Webinar on Halal Meat

The Faculty of Veterinary and Animal Sciences organized a webinar on "Halal Meat Industry in the World: Challenges and Prospects for Pakistan" on August 08, 2021.

Syed Fakhar Imam (Federal Minister for National Food Security and Research) was the Chief Guest. while, Mr. Mumtaz Khan Manais (T.I) (Ex Minister Livestock/Ex-Chairman, Punjab Agriculture and Meat Company) delivered a detailed presentation on fattening and Halal Meat trade.

The event promoted awareness about the potential of the global Halal meat market, industrial perspectives, critical challenges and prospects regarding Halal meat export with special reference to Pakistan. Syed Fakhar Imam said that livestock is also a key sector of agriculture beside crop production and needs due attention. He advocated for improvement in quality of products, setting up accredited laboratories to meet standardization and conformity of Halal meat products to increase its exports manifold. . Mr. Mumtaz Khan Manais acknowledged that with Pakistan's geographic position and high-quality livestock, the halal meat industry is one of the many export options that Pakistan is looking to fully exploit for its export mission. In his presentation, he elaborated the factors that hinder export competitiveness and international standards to be followed regarding quality halal meat. He also talked about the potential of the livestock sector, quality meat production, its processing, value addition, marketing and supply chain for local and export markets. The discussants, Prof. Dr. Iqrar A. Khan (S.I), Vice Chancellor, University of Agriculture, Faisalabad and Prof. Dr. Sajjad Khan, Vice Chancellor, Cholistan University of Veterinary and Animal Sciences endorsed that country's share in the world Halal market is negligible despite having a great opportunity to grab the global market. They also emphasized the need for genetic improvement programs of local breeds. They also emphasized on the need of balanced nutrition and better livestock management to maximize productivity and economic returns. Prof. Dr. Asif Ali said that despite various challenges, livestock sector is already actively contributing to the national economy. He said that livestock is among the biggest economic activity in rural areas and a major source of women empowerment. Afterwards, the Chief Guest inaugurated the plantation of Miyawaki forest by planting a tree sapling.

6.17. Mutual Cooperation Agreement Inked between MNSUAM and National Bank of Pakistan

The signing of a Mutual Cooperation Agreement (MCA) between MNSUAM and National Bank of Pakistan was held virtually on August 11, 2021. On behalf of MNSUAM, Prof. Dr. Asif Ali (T.I), Vice Chancellor and on behalf of the NBP, Mr. Rehmat Ali Hassani, Group Chief signed the agreement. On the occasion, Prof. Dr. Asif Ali said that the purpose of this agreement is to provide services in order to guide the farmers and students. It also aims at training and promotion of hydroponic, tunnel farming, vegetable nursery, ultra high density mango orchards, agricultural machinery, modern poultry and dairy farming, bee keeping, biofloc fish farming and mushroom production.

The agreement will also provide opportunities to the agricultural university students to learn and work in the field. He added that the MCA aims at increasing the overall capacity of farmers and students so that the people affiliated with the field of agriculture can benefit in a real sense. The NBP Group Chief said that by focusing on the private sector, we can improve and bring a positive change to society. He said that loans would be given to farmers and cultivators of 12 acres and less and the MNSUAM will facilitate the process for their welfare. He applauded MNUSAM for working tirelessly for the betterment of agriculture in the region and the day is not far off when this region will be the most productive region in the country.

6.18. Demonstration of IPM for Cotton

Cotton IPM Day was celebrated by Institute of Plant Protection, MNSUAM at Research Farm Jalalpur on August 14, 2021. On-field demonstration in the IPM plot was specially arranged for Pakistan and Mr. Saqib Ali Ateel (Secretary Agriculture, South Punjab) graced the day with their presence. Prof. Dr. Asif Ali (T.I; Vice Chancellor) welcomed the guests and said that our primary goal is to provide a platform to the farming community to solve their problems by establishing effective linkages between farmers and research institutes. The MNSUAM in collaboration with the Department of Agriculture is keen to disseminate the knowledge about production and management of cotton crop. Prof. Dr. Shafqat Saeed briefed the visitors about University's initiatives on Smart Plant Protection and success stories regarding cotton production by merely using botanicals in the field without any synthetic pesticides. He added that by using IPM technology, farmers can save money, lower their production costs, and maximize profit margins while sustaining environmental quality. The guests were shown an IPM block wherein a healthy cotton crop stand free of insect pests and diseases was bearing plenty of fruits. Minister and Secretary Agriculture emphasized the need to adopt the IPM technology developed by the University for farmers. The Minister for Agriculture appreciated the efforts of the university for the revival and uplift of cotton crop in Punjab. Prof. Dr. Asif Ali inspired the faculty of IPP to gear up the direction of research as per real issues of Pakistan.

6.19. Geographical Indications as Intellectual Property Rights for the Economic Growth

Intellectual Property Organization (IPO) experts advised attaching Geographical Indication (GI) to products to win special status and penetrate lucrative international markets to attract premium price in much needed foreign exchange. They expressed these views at a seminar held on August 26, 2021 organized by MNSUAM in cooperation with IPO Islamabad. Prof. Dr. Shafqat Saeed (Dean, Faculty of Agriculture and Environmental Sciences) presided over the seminar. Mr. Muhammad Ismail (Director, IPO) attended the seminar as special guest, while IPO Pakistan consultant Ms. Nadia Zubair Shah was there as resource person. Ms. Nadia Shah gave a detailed insight of getting GI for products. Prof. Dr. Shafqat Saeed reiterated University's commitment to promote Multani culture and heritage at international level as per vision of the Vice chancellor Prof. Dr. Asif Ali. Mango producers and academics including Syed Zahid Hussain Gardezi, Major (Retired) Tariq, Asif Hayat Tipu, Abdur Rahman, Prof. Dr. Hammad Nadeem, Dr. Umar Farooq, Dr. Mubashir Mehdi, Dr. Muhammad Asif Raza and other faculty members were also present.

6.20. Stakeholder Workshop under ACIAR Funded Project

Under the Umbrella of ACIAR funded project "Adapting to salinity in the Southern Indus Basin", a workshop on farmer Integrated Learning Model was organized by MNSUAM and Society of Facilitator and Trainers (SOFT) from July 26-27, 2021. This project has been launched in Punjab, Sindh and Balochistan provinces and carried out in collaboration with various universities and research institutions of these provinces. The project aims to develop and investigate adaptation options and strategies with people managing and living in salinity affected agricultural landscapes in the southern Indus Basin. The aim of this workshop was active engagement of the relevant government departments, policy makers, farmers and other institutions for locally and collaboratively determined adaptation planning and action to cope with salinity. The event was attended by 40 farmers from salt affected areas who shared their problems and learning experiences with the experts as part of participatory approach.

6.21. Hands on Training on Fish Farming

Department of Fisheries and Aquaculture, MNSUAM organized hands-on training for farmers on fish farming on September 16, 2021. Imparting training to farmers was aimed at promotion of fish farming in the country and was attended by a good number of farmers besides faculty members. The trainer, Dr. Naheed Bano, Assistant Prof. discussed technical aspects of fish farming and efficient management techniques. She informed that fish could be preserved for one year with proper management adding that farmers could get better production of fish even from brackish water. Dishes made by fish are appreciated across the world as they curb the dietary needs of kids and women. In his inaugural address, MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I), said that fish is a rich source of protein which is an essential part for human body growth adding that our population is facing its deficiency. Fish farming is gaining popularity in urban as well as rural, Dr. Asif added that biofloc fish farming has been much successful in the cities and now its trend is growing with each passing day.

6.22. Capacity Building Workshop for Scaling up Alfalfa Production

Institute of Plant Breeding and Biotechnology, and Department of Agronomy, MNS University of Agriculture Multan in collaboration with Maxim International PVT limited successfully organized "Capacity Building Workshop for Scaling up Alfalfa Production" on September 23, 2021. Objective of organizing this timely and much needed workshop was to guide farmers and alfalfa exporters about modern production technology and processing techniques because alfalfa sowing time is approaching. Alfalfa expert panel included Dr. Qamar Shakeel, Dr. Muhammad Asif Shahzad, Engineer Mazhar Hussain, and Mr. Waqas Shah. Experts guided the farmers via effective presentations and responding to farmer's queries. Experts explained critical aspects of crop management for quality fodder and hay production. Due to escalating livestock population, its usage in the form of fresh foliage and hay is increasing locally and internationally. Hay exports are increasing especially to Qatar, Dubai, Kuwait, they pointed out. MNSUAM provided a platform to all stakeholders for better fodder, hay production and its export. Forty alfalfa growers, five hay exporters joined physically including faculty members Prof. Dr. Muhammad Hammad Nadeem Tahir, Dr. Abdul Ghaffar, Dr. Shahid Iqbal Mr. Mahmood Alam Khan, Dr. Rao Muhammad Ikram; while, 70 participants were linked with online zoom network.

6.23. Inter Firm Linkages workshop on Value Chain of Fish and Fish Products

A one day Inter Firm Linkages Program was conducted on September 23, 2021 in collaboration with MNSUAM and SMEDA. The purpose of this program was to develop links between academia, farmers and Industries. Dr. Mubashir Mehdi, Director Business Incubation and Entrepreneur Center, MNSUAM welcomed all participants and highlighted the importance of fish farming. Mr. Fawad Ahmad Khan, Manager BDS, SMEBFC Multan talked about the importance of inter-firm linkages and the future of fisheries. Mr. Kamran Maqsood MD Fish Feed Industry highlighted the significance of feed and use of advanced equipment for fish farming. Mr. Muhammad Umer Sindhu, MD Tawakkal Fish Hatchery, Muzafargarh talked about the use of new species and innovations in hatchery. Mr. Muhammad Ali, Assistant Director, State Bank of Pakistan explained different schemes and loan options for farmers. Manager Food Safety Ramada, Dr. M. Abbas Ranjha elaborated the process of food selection and criteria of quality checking at Ramada. Dr. Muhammad Ali from Punjab Food Authority talked about the selection and quality evaluation methods of Punjab food Authority. Mr. Nisar Ali Khan, Deputy Director, Pakistan National Accreditation Council, briefed about the accreditation process and how to register a company. Dr. Naheed Bano, Assistant Professor, Faculty of Veterinary and Animal Sciences, MNSUAM postulated that the fish farming requirements in the scenario of climate change and the importance of new techniques in fisheries and aquaculture. At the end, Dr. Mubashir Mehdi gave concluding remarks and emphasized on the collaborative research work.

6.24. Stakeholder Inception Workshop under ACIAR Funded Project

An inception workshop of Australian Centre for International Agriculture Research (ACIAR) funded project "Adapting to salinity in the Southern Indus Basin", was held on September 30, 2021 at MNSUAM. This project has been launched in Punjab and Sindh provinces and carried out in collaboration with various universities and research institutions across the globe. This 2.5-year project is a launching pad for a 10-year program to explore how Pakistan can withstand the menace of salinity that has entrenched in its landscape. The project aims to develop and study adaptation options and strategies with people managing and living in salinity affected agricultural lands in the southern Indus Basin. The aim of this workshop was to present the salient features of the project for active engagement of the relevant government departments, policy makers, farmers and other institutions to explore collaboratively determined adaptation packages to cope with salinity. Mr. Saqib Ali Ateel, Secretary Agriculture, South Punjab attended this event as a chief guest. He applauded the efforts of the varsity and ACIAR to address the germane issue of salinity in Pakistan. He added that findings of this project will bring prosperity by increasing the livelihood of farmers on a sustainable basis. Dr Munawar Raza Kazmi, ACIAR's Country Manager, presented the significant work of ACIAR and how this work focuses on the rural communities. He expressed the hope that the project would prove to be a landmark in improving the livelihoods of salt-affected farming community of Pakistan. Prof. Dr. Asif Ali (T.I), Vice Chancellor MNSUAM thanked all the participants and urged the use of phytoremediation strategies and cultivation of halophytic plants to get most out of salt-affected soils. He shared the success stories of Jalalpur Pirwala farm where cultivation of exotic Australian grass was fruitful and also palatable to farm animals.

Our experience shows that shrimp farming can be another economically viable option on such soils, he further added. The event was attended by experts from ACIAR, IUCN, CSRIO, ICBA, University of Cumbria, Monash University, MUET, MNSUAM, US-Pakistan Centre for Advanced Studies in Water, PARB, officials from Agriculture Department who shared their research and learning experiences as part of participatory approach.

6.25. Internees Training Under ADP Funded Project

Agri-Internship Training was conducted at MNS Agricultural University by the Internee Management Unit established under ADP funded Internship Project to increase the productivity and profitability of the farmers. An online weekly training was conducted by UAF, UAAR and MNS University of Agriculture, Multan on October 6, 2021. The internship program is sponsored by the Department of Agriculture, Government of Punjab, for young agriculture graduates who were placed in 10 low producing tehsils of the province including Haroon Abad, Burewala, KotAddu, Kahror Lal Esan, Pakpattan, Narowal, Shahkot, Quaid Abad, Chakwal, and Fateh Jang. These internees were given hands-on training for modern agriculture practices so that they can use their knowledge and skills to help solve the problems of the growers. Under this project, more than 2000 farmers have been registered (in the first year) and are being provided with quality advisory services at farm level; including crop diversification, innovations and efficient resource utilization. The event focused on timely sowing of wheat crop, use of good quality seed of improved varieties, modern methods of crop establishment, judicious use of fertilizers and pesticides, correct spraying techniques so that farmers can increase their profit margins while reducing the cost of production and other risks.

6.26. Poster Competition held to Mark World Cotton Day

World Cotton Day was observed at the MNSUAM on October 07, 2021. In this regard, a poster competition among postgraduate students was held aiming at raising awareness to the farmers and scientific community regarding problems related to cotton crop and their possible research solutions. The students presented their research work in the form of informative posters. Prof. Dr. Asif Ali (Vice Chancellor, MNSUAM), Mr. Saqib Ali Ateel (Secretary Agriculture, South Punjab) were the notables of the event. They visited the posters and appreciated the students for valuable work on hot issues pertaining to cotton crop. Around 50 posters were presented and each student was given a five minute time slot to present his/her poster in front of the audience followed by a brief question-answer session.

6.27. International Webinar on "Prospects of Agricultural Development for Pakistan in the context of CPEC"

Department of Veterinary and Animal Sciences of MSNUAM organized an international webinar on the prospects of agriculture development for Pakistan in the context of CPEC on October 13, 2021. Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM chaired this webinar and Dr. Michael Spies (Professor, Eberswalde University for Sustainable Development) joined as a guest speaker. Dr. Asif Ali talked about the positive effects of CPEC on agriculture and the economy of Pakistan. He added that after the completion of CPEC, Pakistan will be able to export cherries, nuts, trout fish and other food items to China.

Dr. Michael Spies talked about the role of CPEC in improving the life of a common man in Pakistan by improvement in agricultural production and farming practices. He added that cherry production is increasing in the northern areas of Pakistan and China is importing the same from America and European countries. He also talked about processing techniques, value addition and phytosanitary measures needed for export competency. Dr. Asif Raza, Chairman, Department of Veterinary and Animal Sciences offered vote of thanks. The webinar was attended by a large number of faculty members and students.

6.28. International Conference on Sustainable Bioeconomy

Faculty of Veterinary and Animal Sciences, MNS University of Agriculture, Multan organized an International Conference on "Sustainable Bioeconomy in Livestock and Crop Production" (Hybrid mode) on October 20 & 21, 2021 in collaboration with Eberswalde University for Sustainable Development, University of Kassel/ University of Gottingen, Germany, and Afyon Kocatepe University, Turkey. Eminent scientists from China, Germany, Turkey, India and Pakistan participated online and discussed important topics of the conference to support sustainable bioeconomy in the context of climate change to help identify and implement sustainable opportunities by fostering scientific exchange. The purpose of organizing this conference was to promote a sustainable bioeconomy through livestock and crop production so that farmers could benefit from the process. The conference brought together the foreign and national experts as well as policy makers, researchers and stakeholders to discuss opportunities related to sustainable bioeconomy development. Prof. Dr. Asif Ali said that Varsity is making all possible efforts to expand the livestock sector and moving towards a bioeconomy is one of the key policy strategies for sustainable development. Dr. Michael Spies, Dr. Marion Reichenbach, Dr. Ismail Bayram, Dr. S.P. Sangeetha and other speakers concluded that each of us must contribute to sustainable, resource-efficient solutions, and better understanding of how food reaches our table, and what agricultural systems can be the most sustainable, especially in regions, where agriculture plays a major role in the economy. Participants also discussed the integrated livestock and crop production systems, generation of animal waste, good practices on how waste generation can be reduced, and how various types of waste can be utilized by changing technological processes and at the same time saving energy resources.

6.29. Farmer Convention to Boost Wheat Productivity

MNSUAM organized a farmer convention on October 31, 2021 in collaboration with the Agriculture Department, Govt. of Punjab and Fatima Fertilizer Company to promote Wheat Sowing in Season 2021-2022. Federal Minister for Food Security and Research, Syed Fakhar Imam, and Punjab Agriculture Minister, Hussain Jahanian Gardezi graced the occasion with their honourable participation. Vice Chancellor MNSUAM, Prof. Dr. Asif Ali (T.I), Director General, Agriculture Extension, Punjab, Dr. Anjum Ali Buttar, Director General, Agriculture Research, Punjab, Dr. Zafar Iqbal Qureshi, Additional Secretary Task Force, Mr. Barak Ullah, Director Agriculture Extension, Multan, Mr. Shahzad Sabir, President Pakistan Kissan Itehad, Mr. Khalid Khokhar, representatives from Crop Protection Association of Pakistan, and farmers from Multan and Khanewal attended this convention. The session started with the name of Allah and Prof. Dr. Asif Ali, (VC, MNSUAM) welcomed the distinguished guests thereafter.

He highlighted the importance of wheat in the national economy and for food security of the country with around 220 million populations. He further informed the honourable guests that MNSUAM is striving hard to facilitate the farming community of this region regarding innovations and technology transfer of mechanization, wheat hybrids, climate resilient crop varieties and production technology. The Vice Chancellor also briefed about the University's pivotal role in development of the agriculture sector in this dynamic region. He proposed that collective effort of all departments is the way forward to achieve significant gains in productivity and management of field crops and today's event is an outcome of effective academia-industry linkages. The Head of Technical Services Fatima Fertilizer Company, Mr. Naseerullah Khan, appreciated the government's initiatives for taking measures to enhance wheat yield in the country. He also expressed his gratitude to the administration of Agriculture University for their cooperation in organizing a successful event. Minister for Punjab Agriculture, Syed Hussain Jehanian Gardezi, informed the growers that a wide array of seeds and other necessary agricultural goods are being provided to growers at subsidized rates under the national plan of increasing wheat production in the current year. He emphasized cultivation of approved varieties and optimum use of fertilizers for nutritional management to maximize yield per acre. The Federal Minister for Food Security and Research, Syed Fakhar Imam also informed the growers about the initiatives being taken under the Prime Minister's Agriculture Emergency Program and urged them to adopt modern agricultural technology in the backdrop of evolving climate changes. He called for innovation in agriculture and increase in production per acre, adding that farmers could not only increase wheat production per acre in this way but also assist the government to overcome the current wheat crisis in the country by taking full advantage of the modern methods of cultivation.

6.30. Agri. Student Engagement in Wheat Campaign

The Final Year Students of the MNS University of Agriculture, Multan participated in the Wheat Campaign to guide the farming community about modern trends and experts' recommendations of the Punjab Government to increase the per acre yield of the wheat crop. The students of the University's Faculty of Agriculture were sent on a 10-day visit to the villages for this purpose. The students travelled with the Punjab Agriculture Extension Department officials and staff during the provincial government's wheat campaign in order to inform farmers about new research and technology for increasing the per acre production of wheat. A training workshop was organized on November 8, 2021 in which they were informed about modern wheat production technology. Addressing the students, Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that the campaign to grow more wheat should be carried out with hard work and courage as it is a service to the country and the nation. The students were motivated to undertake the Wheat Campaign and embrace the challenge of food Add: thesecurity to contribute towards the national cause positively.

6.31. Webinar on Pulses

An international webinar on pulses was organized by the Institute of Plant Breeding and Biotechnology, MNSUAM on November 4, 2021. The main purpose of conducting the webinar entitled "Pulse Crops: Hope for Future" was to create awareness about agronomic and nutritional benefits of pulses especially chickpea. The International Webinar was presided over by the MNSUAM, VC, Prof. Dr. Asif Ali (T.I). The guest speaker of this International Webinar was Dr. Douglas R Cook from the University of California Davis. Addressing the webinar, Prof. Dr. Asif Ali said that in order to improve the production of pulses, we need more focused research work on pulses as these are important sources of protein. Along with wheat, cotton and sugarcane, if we also cultivate pulses, then we will have the advantage of reducing water scarcity in the country," he added. Addressing the International Webinar, Dr. Douglas R Cook stressed that crop production under water scarcity can be met by cultivating pulses. In view of increasing water scarcity, we have to include pulses in our rotation. He advocated the need for breeding of high-yielding, climate resilient chickpea within the context of user-preferred traits such as seed quality and nutrient density, reduced synthetic inputs, and biotic stress resistance. He presented his valuable research work regarding symbiotic nitrogen fixation, metagenomics of plant-associated microbes, drought tolerance, and domestication of chickpea. Addressing the webinar, Dr. Muhammad Farooq Hussain Munis from Department of Plant Sciences, Quaid-e-Azam University, Islamabad-Pakistan said that modern technology has to be introduced for the prevention of diseases so that pulses can be grown on sustainable basis. Prof. Dr. Zulfiqar Ali concluded the webinar, while, Prof. Dr. Hammad Nadeem Tahir offered vote of thanks. Dr. Sehrish Ijaz was the moderator of this event.

6.32. Webinar on Affordable and Clean Energy

An international webinar on Clean and Affordable Energy was organized by the Department of Agricultural Engineering on November 5, 2021. The International Webinar was presided over by Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM. The International Guest Speaker was Dr. Indri Yaningsish, Assistant Professor, University of Sebelas Maret, Indonesia, and Engr. Faisal Hassan, Executive Engineer, Bangladesh Power and Development Board, Bangladesh. Addressing the International Webinar, Prof. Dr. Asif Ali said that alternative and affordable energy sources are the only solutions to the problem of energy crises and environmental degradation. The community needs to shift towards alternative sources of energy, including solar, wind and biogas. Researchers and universities will play their full role in promoting clean and alternative energy sources in Pakistan. Dr. Indri said that research in energy is very important and viable alternative sources of energy are the need of the hour. He added that dynamic and thermodynamics mixes are essential in solar material adsorption as they can improve the system by controlling the temperature and humidity in the air. While talking about different solar systems, Engr. Faisal Hassan introduced the modern honey solar system (Honeycomb Solar Air Heating System) and E-bag (Energy saving Bag) which is a way of saving energy in the cooking process. Dr. Sarfraz Hashim, Chairman, Department of Agricultural Engineering, emphasized on the promotion of clean energy and said that technology will be further improved in the future. Hosting an international webinar, Dr. Shazia said that with the help of E-bags, basic daily meals could be cooked and their use will be further enhanced in the future.

6.33. Webinar on Quinoa as a Future Smart Food Crop

Department of Agronomy MNS University of Agriculture Multan organized an international webinar entitled "Quinoa: A Future Smart Food" on November 8, 2021. Future Smart Food (FSF) is a term coined by FAO for those crops having four characters i.e., (1) Climate Resilience (2) Balanced nutritional profile (3) Locally available (4) Economically viable. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that more than 5000 plant species are edible, however, most of the world population is consuming only three crops i.e., wheat, rice, maize leading to malnutrition. This situation is further aggravated due to climate change adversities and failure of major crops. Hence, dire need is felt to diversify the food basket utilizing underutilized species like quinoa for nutritional security. Quinoa is a top priority FSF crop and FAO is promoting this crop all over the world. MNSUAM also believes in diversity and is available for any facilitation and collaboration for scaling up this crop. Dr. Abdul Ghaffar said quinoa was introduced in the South Punjab region in 2017 and due to research and outreach activities, this crop is appearing in farmers' fields and also available in supermarkets. Dr. Shahid Iqbal said that still a lot of work is needed to identify more site-specific varieties, value chain development and massive awareness for scaling up its production and consumption. MNSUAM is in close contact with Chinese Universities, ICBA and FAO to extend collaboration for quinoa promotion. One of MNSUAM joint projects has been approved with Shanxi Agriculture University China funded by the Chinese Government for dry land farming of quinoa. Dr. Didier Bazile (CIRAD Biodiversity Advisor Senior Researcher at UMR SENS FRANCE), who is leading global collaborative network on quinoa) and promoting quinoa all over the world, said that quinoa has spread to different parts of the world and has become an important crop internationally. This crop needs to be further improved so that its usefulness can be exploited to full extent. He explained how quinoa expanded all over the world. Second international speaker was Dr. David Wu. He is a specialist in mechanized quinoa cultivation, processing and marketing. He is also known as quinoa king of China. He explained how he promoted quinoa in China. Total 350 participants attended the webinar.

6.34. Farmer Convention to Maximize Wheat Productivity

A Farmer Convention was organized at Jalalpur Pirwala Farm of MNSUAM on November 19, 2021. The purpose of holding this event was to educate the farmers about modern wheat production technology and to encourage them to grow more wheat. The Farmer's Convention was presided over by the Secretary Agriculture, South Punjab, Mr. Saqib Ali Ateel and Acting Vice Chancellor, Prof. Dr. Shafqat Saeed. Prof. Dr. Shafqat Saeed said that there is an urgent need to increase the production of wheat by three maunds per acre to meet the national demand. To achieve this goal, the Agricultural University Multan and Punjab Government are running the wheat campaign in full swing. MNSUAM in collaboration with different government and private organizations is organizing events for promotion of agriculture sector in the south Punjab. The experts observed that timely sowing, mechanization, good land preparation, use of quality seeds and other inputs, integrated nutrient management and weed control are important to enhance per acre production of wheat. Mr. Saqib Ali Ateel while addressing the event said that we have to work together to make crop production successful by adopting modern techniques and embracing the innovations. Wheat production needs to be increased to cope with climate change. The government is subsidizing fertilizers and seeds to promote wheat cultivation.

Farmers should take advantage of this and cultivate more wheat. He lauded the administration of MNSUAM and the students for actively participating in the wheat campaign.

6.35. Capacity Building Workshops for Efficient Use of Tractor

MNS University has arranged a two-day workshop/training for faculty and students titled: (i). "Tractor Mechanics and Principles of Efficient Tractor Operation" (ii) "Environmental impact of diesel exhaust, its remedies, and EPA standards". Engr. Mansoor Rizvi, Country Manager of New Holland was the guest speaker/trainer. In the first quarter of the morning session, Pakistan Society of Agricultural Engineers (PSAE) conducted a brief meeting with the stakeholders including faculty members, progressive farmers and the Industrial representatives. Prof. Dr Asif Ali, Vice Chancellor inaugurated the session and appreciated the activities of PSAE for the promotion and enhancement of agricultural engineering profession. President, PSAE interacted with senior students and received their feedback. Engr. Rizvi described the role of society in dissemination of information and knowledge pertaining various area related to the Agricultural Engineering profession. The president (PSAE) said that Agricultural Engineering is multi-disciplinary profession and it is addressing various challenges in mechanized farming systems. Engr. Abdul Aleem, Director Agricultural Mechanization Research Institute (AMRI) and Vice President of the PSAE stressed upon the participants to join PSAE platform by becoming its member to strengthen the society in the pursuit of their goals which are mainly advocating the role of Agricultural engineering and providing concrete technical and commercial support to the institutions engaged in the manufacturing of farm machinery. Engr. Dr. Alamgir A. Khan, the Subject Expert, Agricultural Engineering, MNS University of Agriculture and an exponent of PSAE said that agro-based industry and farm machines are lagging in automation, on the other hand farmers are facing serious challenges due to upcoming shortage of labor particularly the skilled labor. He said that academic institutions should focus on capacity building of their existing faculty with special emphasis on automation. Trained faculty can further educate the future technologists/engineers. In his opinion, the PSAE can play a vital role in connecting the national and international stakeholders. Dr. Alamgir made strong recommendations for the establishment of two centers: i) "Agro-Industrial Center of excellence at MNSUAM" to support local agro-based industry for specialized tasks and ii). "Establishment of region-wise agro-Industrial Parks (AIP)" with the aim to serve as one window platform to the farming community. AIP would also help produce high standard farm machines in the country and resultantly increase national export. Engr. Dr. Sarfraz Hashim, Chairman, Agricultural Engineering, MNSUAM said that the training program is very useful for faculty members and students to get awareness about field issues and the optimum operations of the tractor. The carbon emission test (CET) is crucial for diesel operating vehicles. Launching an emission testing system with special prominence on the testing of the CET is very important to control the environment pollution.

Mansoor Rizvi imparted training on different parts of tractors and their better use. He also guided the students about the problems faced while using tractors in the field. He further said that only by getting complete information of the tractor, one can get maximum benefit by using minimum fuel. On this occasion, Engr. Alamgir Akhtar appreciated the tireless efforts of Engr. Mansoor Rizvi and vowed to conduct such trainings in future also.

6.36. Training on Crop Husbandry in Spate Irrigated Areas

MNS University of Agriculture, Multan aims at capacity building of the farmers beyond the provincial boundaries. In this context, Dr. Khuram Mubeen, Assistant Professor, Agronomy Department, MNSUAM was invited by Strengthening Participatory Organization (SPO) and Flood Based Livelihoods Network Pakistan to train the farmers and the project staff for practices of better crop production in spate irrigated areas of Bhag, Balochistan. Dr. Khuram Mubeen successfully trained the farmers and project staff w.e.f. November 11-19, 2021 and imparted the agronomic knowledge and suggested ways to get economical and better crop production. Field visits and farmer meetings were also arranged in Tehsil Bhag, Balochistan. Farmers were also advised about the outcomes of the research studies undertaken at MNSUAM for efficient water conservation techniques including the pre-monsoon deep tillage on feasible fields of hill torrent ecologies for improving the water infiltration and reducing the surface run-off for better crop production. Farmers were also advised about the wise selection of crops and improved crop cultivars to avoid the disease infestation lowering the crop productivity and to make the efficient use of water available. Demonstrations for legume seed inoculation and seed treatment with fungicide were also carried out along with their importance.

6.37. Farmer's Training Workshop on Wheat Productivity Enhancement

Department of Agronomy, MNSUAM organized a one day Farmer's Training Workshop on "Wheat Productivity Enhancement" on November 30, 2021 to showcase the significance of climate smart stewardship for wheat production and assess the associated challenges and their pragmatic solutions. This workshop provided an opportunity to review the existing initiatives, knowledge exchange, climate smart wheat production practices, capacity building, new research avenues, and learning from the experiences of professionals and progressive wheat growers. The event covered informative presentations/lectures by subject experts followed by interactive discussion, Q&A session, and field demonstrations focusing on production scenarios, improved wheat germplasm, wheat pathology, physiology and quality. In concluding comments, Professor Dr. Zulfiqar Ali (Principal Officer, ORIC) appreciated the Agronomy Department for arranging such an important and timely event management related to staple crop wheat. He thanked farmers in particular for sparing time from their busy schedule to attend this workshop. About 100 participants were trained for innovative trends and practices with special reference to sustainable wheat production.

6.38. Workshop for Young Entrepreneurs

SMEDA in collaboration with the Business Incubation Center of MNSUAM organized a one-day workshop for young business entrepreneurship on December 17, 2021. The workshop provided training to young students on business issues and efficient financial management. SMEDA Manager, Mr. Saad Khan graced the occasion. Lead Trainer Mr. Mirza Nadeem Baig briefed the audience on how to organize the financial management of business operations and financial documentation methods. Prof. Dr. Asif Ali (T.I), Vice Chancellor said that young students who want to start their own business will have to develop their skills according to the business requirements. He further said that Business BIC should organize such workshops regularly covering various aspects of agri. business. Finally, Dr. Mubashir Mehdi, Director, BIC, thanked the guests and said that we will continue to organize such trainings in the near future.

6.39. ORIC MNSUAM Organized the First Steering Committee Meeting

The first meeting of the ORIC Steering Committee was held on December 23, 2021 under the chairmanship of Prof. Dr. Asif Ali (T.I), Vice Chancellor. The chair welcomed all the participants and acknowledged the initiative taken by ORIC. He said that MNSUAM is the second university in the country which has successfully registered its ORIC with the Higher Education Commission, Islamabad in accordance with revised HEC ORIC Policy. Recently, MNSUAM has scored first position at country level in the UI GreenMetric World University Rankings 2021 on the basis of excellent performance and sustainable development. This is a matter of honor not only for the University but for the entire South Punjab. Prof. Dr. Zulfiqar Ali, Principal Officer, ORIC said that ORIC is playing a key role in facilitating work with industry, universities and funding agencies, and providing opportunities for research funding for scientists. He remarked that overcoming the 'trust deficit' between academia and industry can assure a large range of benefits for both sides. He further said that MNSUAM has so far published 844 research publications and has earned competitive research projects worth of Rs. 1289 million since its inception. Moreover, MNSUAM has conducted 27 International Conferences, produced 319 postgraduate students, launched 18 climate smart technologies, and initiated 46 divergent degree programs during the aforementioned period. He apprised the committee regarding ORIC's functions, vision, mission, objectives and responsibilities. Expressing her views, Ms. Rabia Sultan Gurmani, the Co-Chairperson of the ORIC Steering Committee said that our PhD students are in dire need of practical knowledge so that they can make a real contribution for the nation. She lauded the performance of the ORIC and MNSUAM. Expressing his views, Mr. Asif Majeed (CEO, Evyol Group) said that the industry is actively working with the university to solve the problems faced by the agriculture sector. The committee constituted its sub-committee of well conversant representatives of various sectors including Seed, Pesticide, Fertilizer, Farmers and Food Industry organizations for review of ORIC's KPIs on quarterly basis.. These representatives will be helpful in monitoring the activities of the ORIC and will serve as advisors. The committee also discussed ORIC Strategic Plan (2021-26), ORIC Annual Report 2020-21 and recommended the items for approval from the Syndicate. Prof. Dr. Zulfiqar Ali urged that ORIC will strive hard to improve the research work, publication, agriculture, social entrepreneurship and will hunt international projects. Dr. Rasheed Ahmad (Executive Director CropLife Pakistan) Prof. Dr. Shafqat Saeed, Prof. Dr. Irfan Ahmad Baig, Prof. Dr. Umar Farooq also participated in the meeting.

6.40. MNSUAM Organized DICE AFS & DICE Mega Innovation & Entrepreneurship Event 2021

The two-day Distinguished, Innovation, Collaboration and Entrepreneurship (DICE) Agriculture and Food Sciences & DICE Mega Innovation & Entrepreneurship Event 2021 was successfully organized by the MNSUAM with joint collaboration of DICE America. Hundreds of students from 50 universities of Pakistan participated and over 150 business models were presented in the event. The idea behind the event was to motivate academia, industry, government, entrepreneurs and expatriates to join a common platform to showcase innovations and technologies, share knowledge and collaborate with each other for the rapid development of innovative products, necessary for the economic development of the country.

The main objectives of the competitions were to foster a culture of innovation and entrepreneurship in the country and make it part of Nation's DNA, and to create a positive and favorable image of Pakistan's agriculture and food based industry in the eyes of the international community. Plant Centric Meal Competition, NIB Shark Session, Cultural Festivity and Gala Dinner were the allied activities associated with this mega event.

Federal Minister for National Food Security and Research, Syed Fakhar Imam inaugurated the event. During his inaugural address, he congratulated the MNSUAM and DICE administration for organizing this program. There is an urgent need to guide the people in modern agriculture and agribusiness so that we can play a significant role in the development of the country. To this end, I think that MNSUAM is proving to be very helpful by providing a platform to universities across the country. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that the objective of organizing this event was to promote entrepreneurship among the students. The competition is being held among the 160 plus business models from 52 universities across the country which showed the diversity of ideas in the minds of young students, he added. We have succeeded in making this mega event happen again and through this platform we have brought the universities and the industry together so that they can use each other's ideas and play their best part in solving the economic problems of the country. Mr. Khursheed Qureshi, CEO DICE thanked MNSUAM and said that there is an urgent need to bring innovation in modern times. Mr. Sarfraz Hussain, Divisional Head, Bank of Punjab said that Bank of Punjab is providing loans to young students in Pakistan on easy terms under Kamyab Jawan Program so that they can take their business ideas to a logical conclusion. At the end, Syed Fakhar Imam along with the other distinguished guests visited the stalls of various universities and private institutions and appreciated their efforts immensely. Among others, Dr. Shafiq Pitaffi, Chairman Suncrop Group and Mr. Asif Majeed, Chairman Evyol Group also expressed their views at this occasion.

The closing ceremony of the DICE competitions was held on December 28, 2021. Mr. Saqib Ali Ateel, Secretary Agriculture, South Punjab was the chief guest. While giving his remarks, Mr. Saqib Ali Ateel said that today MNSUAM has organized a beautiful and successful event in which students from more than 50 universities across the country presented their business ideas. Our youth are guarantee for a better future for this country, if they continue to bring in innovative business and entrepreneurship ideas such as those he has seen at this great event organized by the MNSUAM. He further said that the business models presented at the event are proof of the fact that our students are very talented and our future is in safe hands. At the end, prizes were distributed among the first, second and third prize winning students in different categories. Overall, 25 prizes worth of Rs. 1 million were awarded to the student entrepreneurs.

6.41. Training Workshop on Validating Ideas-A Systematic Approach

A two-day training workshop on Validating Ideas-A Systematic Approach to improve the quality of education through capacity building was organized by ORIC, MNSUAM from December 27-28, 2021. The resource person for the training workshop was Dr. Khurram Jahangir Sharif from Qatar University. Trainees from Nishtar Medical University, Women's University, Bahauddin Zakaria University, MNSUET, Multan participated in the training.

Dr. Khurram Jahangir Sharif briefed that any organization has to work under the policy of "Nine Building Blocks". As long as we remain unfamiliar with the ever-changing international education standards, we will not be able to make progress. He shared various examples in this regard. Speaking on the occasion, MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that MNSUAM has emerged as the best institution in South Punjab as it has recently been ranked as the number one in the GreenMetric Rankings. He further said that holding such workshops would further boost the morale of the faculty and staff and create awareness among them to learn modern skills. At the end of the workshop, Secretary Agriculture South Punjab, Mr. Saqib Ali Ateel congratulated the participants and distributed certificates among them.

6.42. Inauguration of Corporate Innovation Center for Agriculture and Allied Technologies

Syed Hussain Jahanian Gardezi, Provincial Minister for Agriculture, Punjab, inaugurated the Corporate Innovation Center for Agriculture and Allied Technologies (CICAAT). Director Business Incubation Centre, Dr. Mubashir Mehdi and collaborating officers from Sybrid Mr. Ather Imran Nawaz, Chief Executive Officer, Dr. Azeem Khan and Aly Iqbal gave a detailed run through of the Centre. and Prof. Dr. Asif Ali (T.I) Vice-Chancellor MNSUAM, in a ceremony held on January 26, 2022. Concave Agri, a Lakson Group associated venture that is focused on agri-tech signed an MOU with MNSUAM on this auspicious occasion to accelerate the agricultural start-ups in the South Punjab. Syed Hussain Jahanian Gardezi, Provincial Minister for Agriculture, Punjab, appreciated the launch of CICAAT and industrial partnership of Sybrid and MNSUAM to bisnuess startups in agriculture. The CICAAT, which is a joint venture of MNSUAM and Sybrid (Pvt.) Ltd. will provide opportunities to build a strategic relationship to accelerate the development of innovative solutions and services and promote young talent in the South Punjab to equip themselves accordingly. This is a very good initiative which will promote Agri. Entrepreneurship in South Punjab and beyond in the coming future. The CICAAT will serve as a platform to stimulate the growth of technology based new businesses in the region and facilitate joint projects with a core focus on research, economic growth, jobs creation, digital transformation, and increasing exports of Pakistan. CEO Sybrid, Mr. Ather Imran Nawaz stated, “Partnership with MNSUAM to set up Corporate Innovation Center for Agriculture and Allied Technologies (CICAAT) is part of our strategic plan to build strong relationships with academic institutions, to eventually foster the culture of innovative research and commercialization.

6.43. Consultative Session on Cotton Policy Perspective and Planning

A consultative session on Cotton Policy Perspective and Planning was organized by Department of Agri. Business and Applied Economics, MNSUAM in collaboration with Shahid Javed Burki Institute of Public Policy on January 6, 2022. The session was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). Prof. Dr. Asif Ali highlighted the importance of seed potential and balance of ecological elements in cotton production, adding that research on fundamental factors should be made part of the policy. He stressed on the need for policy shifts to make agriculture more competitive, profitable, and sustainable. Only with the recommendations of experts, effort to achieve our targets would be possible. We expect that the forum will come up with a comprehensive set of recommendations to improve production of quality cotton.

Dr. Shafiq from Better Cotton Initiative briefed the participants on eco-friendly initiatives to transform cotton production worldwide by developing Better Cotton as a sustainable mainstream commodity. He said that promotion of Better Cotton Initiative is necessary to meet the challenges ahead and it will benefit Pakistani farmers and the textile sector. Dr. Mahmood from Burki Institute appreciated the forum of all experts and said that with the joint efforts of all stakeholders, the growth of cotton can be ensured. Appreciating the merits of this forum, Prof. Dr. Shafqat Saeed stated that MNSUAM as a repository of agricultural knowledge, research and intellectual capital is striving to enhance cotton productivity and improve living standards of the farming community. At the end of the session, Prof. Dr. Irfan Ahmed Baig thanked all the participants and apprised them of the steps to be taken for ensuring mutual consultation and coordination for future. Syed Hassan Raza, Mr. Shahid Akhtar, Mr. Sohail Haral, Mr. Muhammad Shafiq, Mr. Shahid Najam, Mr. Muhammad Ashfaq, Dr. Saghir Ahmed, Dr. Umar Ijaz, Dr. Samiullah, Mr. Shoaib Nasir and many other stakeholders, faculty and farmers participated in this event.

6.44. Webinar on IT Skills and Programming

An international webinar on IT Skills and Programming was organized by the Department of Computer Science, MNSUAM on January 17, 2022. Dr. Zafar Shahid (Technical Lead, Facebook Video Team, Menlo Park, California) was guest of honour in the webinar. Prof. Dr. Asif Ali said that IT skills are very important in all institutions. Institutions, especially universities, need to provide effective training to students to enhance their IT skills and digital literacy. He further said that development is not possible without IT skills in this era. International Guest Speaker Dr. Zafar Shahid highlighted the role of IT students in improving the economy of Pakistan and innovative ways to improve the educational skills of IT students in programming and appreciated the performance of MNSUAM students. Chairman, Department of Computer Science Dr. Salman Qadri, Dr. Abdul Razzaq, Dr. Nadeem Iqbal, Dr. Ammar Hussain, Dr. Umar along with a large number of faculty and students participated in the webinar.

6.45. Linking Research for Development with Smallholder's Livelihood

The Showcasing Event of Australian Center for International Agricultural Research (ACIAR) Projects under the theme "Linking Research for Development with Smallholder's Livelihood" was organized at MNS University of Agriculture, Multan in collaboration with the ACIAR on February 4, 2022. Minister for Agriculture (Punjab), Syed Hussain Jahania Gardezi; Secretary Agriculture South Punjab, Mr. Saqib Ali Ateel and Chairman Punjab Agriculture Research Board, Dr. Abid Mahmood graced the event. Syed Hussain Jahania Gardezi said that MNSUAM is playing a significant role in solving the problems of farmers and development of agriculture. He further said that the projects presented in this successful program should be scaled up for dissemination to the masses for broader impact. He especially appreciated the Vice Chancellor for engaging farmers of South Punjab in the agricultural value chain development. He emphasized that researchers and academia should join hands. Secretary Agriculture, South Punjab, Mr. Saqib Ali Ateel said that government policies and subsidies are being extended to the farmers in the best possible way to increase their productivity. He appreciated the efforts of the MNSUAM and said that he has assured his full support for the development of agriculture and provision of relief to the farmers.

Dr. Abid Mehmood emphasized that we should come up with plans to combine industry and academia in innovation and commercialization of research in order to solve the problems of farmers in a better way. Dr. Munawar Kazmi (Country Manager, ACIAR) briefed the visitor that ACIAR support to Pakistan focuses on a collaborative approach for the long term security of food, water and energy by providing research and development and building technical capacity. He briefed about the significant work of ACIAR and how this work focuses on the rural communities. He expressed the hope that the ongoing projects will improve the livelihoods of the farming community of Pakistan. Prof. Dr. Asif Ali (T.I) thanked all the participants and said that we will continue to play our role in working with ACIAR to solve the problems faced by the farmers. He added that MNSUAM is making provisions for R&D activities through developing academia-industry linkages, promoting entrepreneurship, developing collaborative activities with national and international organizations to elevate the socio-economic status of the farmers. Finally, all the participants visited the stalls displaying ACIAR funded project's achievements and success stories.

6.46. Capacity Building Workshop for Mango Exporters

A capacity building workshop for farmers exporting Unifresh Mango brand was organized at MNS Agricultural University on February 9, 2022. The objective was to familiarize the mango growers about export challenges and possible solutions. Another objective was development of mango clusters and consortium for promoting mango export. Prof. Dr. Asif Ali while addressing on the occasion, said that Agricultural University is actively working on building and enhancing the capabilities of mango growers in order to transform them into good entrepreneurs so that they can run their own business successfully. He further said that MNSUAM has successfully created its own brand under the name of Unifresh which will be helpful in connecting mango growers to the high end markets. Dr. Syed Mubashir Mehdi, Director, Business Incubation Centre, MNSUAM informed the farmers on how they can become part of the Unifresh Value Chain system and its benefits and implications. He guided them about the whole framework of the Unifresh Export Consortium. Prof. Dr. Amman Ullah Malik (UAF) trained the growers on postharvest mango management. Dr. Mubashir Mehdi and Mr. Rana Asif Hayat discussed the issues and challenges faced during the export process and access to the big markets and proposed pragmatic solutions. The participants learned a lot from this workshop and got guidance regarding mango export. More than 50 exemplary farmers from Sindh and Punjab participated in this workshop.

6.47. IT Industry and Academia Meetup

Department of Computer Science and Directorate of IT organized an IT Industry and Academia Meetup in collaboration with Pakistan Software Export Board (PSEB), TechNation Pakistan, and Digital Pakistan on February 10, 2022. The seminar was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). Mr. Osman Nasir (Managing Director, PSEB) introduced PSEB and the latest initiatives that PSEB is taking to bridge the gap between industry and academia. He stated that the IT sector is the only sector in Pakistan that is trade-surplus by 88% in terms of software export. Merging the IT industry with academia has a potential to exceed IT export by 10 billion dollars by 2025. He mentioned that PSEB is working on developing an IT export strategy with clear objectives to achieve the target.

Mr. Raza Ahmad Sukhera (Joint Director Policy and Sector Growth, PSEB) said that there is a need to bridge the gap between industry and education through industry-led training and boot camps organized by PSEB. Miss Hira Secretary General (All Pakistan Software House Association) encouraged the students to adopt the attitude of preparing and learning the skills required for the industry. Prof. Dr. Asif Ali said that he is completely convinced by the need to merge Information Technology with Agriculture to solve the National issue of food security. He mentioned that the merger of agro-based industry with IT can transform the future of agriculture in coming years. Prof. Dr. Irfan Ahmad Baig (Dean, Faculty of Social Science and Humanities) mentioned the lack of paid internships for IT graduates and requested PSEB and P@SHA to bring more opportunities in the region. Shields and souvenirs were distributed among distinguished guests and the meet up ended with fruitful discussion with faculty and students at the lunch. Faculty of Computer Science is motivated to arrange frequent meet ups with industry to bring training and job opportunities for students and graduates.

6.48. Consultative Session on Cotton Production Strategy 2022

A Consultative Session on Cotton Production Strategy 2022 was held at MNS University of Agriculture, Multan on February 14, 2022. The meeting was attended by experts from various institutions, the main purpose of which was to reiterate and prioritize the technological and socio-economic stewardship for the whole process of cotton production to achieve the crop yield target for the upcoming season. The meeting was chaired by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). He expressed the hope that during the session, participants will focus on the coming cotton season in particular so that the hope that has been revived regarding the future of cotton among the growers would not die down. Dr. Saghir Ahmad presented the cotton scenario 2021 and the way forward. Observing the current production and pricing, he opined, the area under cultivation would increase to approximately 4 million acres in Punjab. He further speculated that it would expand to Baluchistan, Cholistan and other dry zones of Pakistan due to changing climatic conditions. While discussing the reasons, he further added that timely sowing, price intervention, low rainfall, low night temperature, less pest attack and implementation of IPM favored the higher yields in 2021. The chair emphasized the importance of efficient weather advisory and inquired about the pre-season weather forecast system that can add in decision making to grow cotton in different regions. Dr. Anjum Ali (Director General, Agri. Ext.) emphasized on the use of bio-pesticides following the established system involving Adaptive Research and registration process after conducting rigorous bio-safety trials. Dr. Khalid Abdullah, Cotton Commissioner assured that MnFSR is moving the case of the cotton intervention prices as per last year's formula (based on the Import Parity Price) on the recommendation of the committee. House appreciated the efforts and emphasized that a suitable intervention price is essential to promote cotton. Issues pertaining to the cost of cotton production were also discussed. Dr. Anjum Ali briefed the house on several interventions of the Govt. to reduce the cost of production and promote the use of good quality seed among the farmers. He also agreed to discuss the issue of irrigation cost in the relevant committee set for the purpose. He also invited Chairman PCPA to come up with a strategy to include certain pesticides in the Kissan Card so that farmers would be able to use pesticides at concessional rates. House also stressed on the availability of best quality seed (having more than 70% germination) for more than 4.0 million acres.

It was discussed that farmers should be sensitized to use the seeds of approved cotton varieties with tag and traceability mechanism instead of purchasing unapproved varieties at higher prices. House also discussed the opportunity of reviving cotton in traditional areas of Sahiwal, Mailsi and Chicha Watni. Participants also highlighted the importance of cotton as an oil seed crop. The crop has also a huge contribution in bringing the income differential down in the rural areas with its pro-poor income generating impacts. Yield production was targeted to be increased by 10% as compared to the previous year (2.2 t ha^{-1}). Overall, target for Punjab was set at 6.5 million bales with seed provision of 32000 metric tons. According to Cotton Commissioner, Dr. Khalid Abdullah, pricing should be based on lint quality and fiber length, and farmers should know and focus on producing good quality (lint quality and fiber length) rather than production. Mr. Shahid Sattar and Dr. Javed Hassan (representatives from APTMA) said that APTMA is happier and willing to pay more premiums on good quality cotton. Prof. Dr. Asif Ali, while emphasizing on formulating a holistic approach for profitable cotton production, said that the seed crop should be completely separated from the fiber crop so that we can get good quality seed and the importance of IPM should not be overlooked. The house emphasized that the government should timely announce a subsidy policy so that cotton cultivation could be further enhanced. Agricultural Scientist Dr. Shafqat Saeed; Agricultural Economists, Dr. Irfan Ahmed Baig, Dr. Mubashir Mehdi; Chairman Cotton R&D Board Mr. Bilal Israel Khan; Chairman PCPA, Dr. Shafiq Pitafi; Deputy Secretary Agriculture South Punjab Dr. Haider Karar; Dr. Muhammad Iqbal Bandisha, Syed Tanveer Hussain, Mr. Asif Majeed, Dr. Ata-ur-Rehman, Dr. Muhammad Ashfaq, Dr. Naeem Iqbal, Dr. Muhammad Fayyaz, Dr. Abdul Ghaffar were also present.

6.49. Climate Smart Water-Fertilizer Intelligent System for Cotton & Wheat

One-day international training workshop on "Climate Smart Water-Fertilizer Intelligent System for Cotton & Wheat" was organized under PSF-NSFC funded project entitled "Genetic Adaptability and Water-Fertilizer Intelligent Regulation Mechanism of Climate Smart Varieties" on February 17, 2022. The objective of this workshop was to bring together scientists, research scholars, and the private sector to enhance the knowledge about the improvement of cotton and wheat yield using smart water-fertilizer system. The resource persons of this workshop were from MNSUAM, Pakistan, China and Indonesia. The workshop was held in two sessions, a webinar and hands on training session. The workshop was started with the welcome from Prof. Dr. Asif Ali T.I), Vice Chancellor, MNSUAM. He talked about the importance of climate change and the need of scientific research in this area to address the related challenges. He further talked about the SINO-PAK joint research project. He appreciated the efforts of the organizers of this workshop and all team members. In the webinar, various talks on diverse topics such as climate smart cotton and wheat, Challenges and opportunities of cotton crop in Pakistan, and Introduction to different modules in SWAP model were delivered by experts such as Prof. Zhang Rui, Biotechnology Research Institute, Chinese Academy of Agricultural Sciences, China; Dr. Muhammad Taufik, Department of Geophysics and Meteorology, IPB University, Bogor, Indonesia and Dr. Saghir Ahmad, Director, CRI, Multan, Pakistan, respectively. More than 50 participants attended the session. In the hands-on training session, resource persons, Dr. Habib ur Rahman and Dr. M. Saif Ullah conducted various sessions on APSIM and SWAP models for crop studies. Participants learnt development of different modules using data of cotton and wheat genotypes for irrigation and water regulation mechanisms in the model.

In the concluding session of the training, Mr. Mohsin Gardezi, VCO Fidak Farms, appreciated the efforts of the organizers for capacity building in new research areas. Prof. Dr. Asif Ali distributed the certificates among the participants.

6.50. Webinar on Rural Development

An international webinar titled "Rural Development: Current Status, Challenges, and Future Perspectives in Pakistan" was organized by the Department of Agribusiness and Applied Economics, MNS-Agriculture University Multan February 22, 2022. The webinar was organized to address the challenges and opportunities for improving the quality of life and economic well-being of people living in rural areas. The session was presided over by respected Prof. Dr. Asif Ali (T.I), Vice-Chancellor, MNSUAM, who regarded rural growth and development as the key component for the economic growth of the country. He added that rural transformation and inclusive growth are need of the hour to address the issues of rural poverty, youth unemployment, and gender equality. The session was moderated by Prof. Dr. Nasir Nadeem, Charmain, and coordinated by Mr. Abd-Ur-Rehman, Lecturer, Department of Agribusiness and Applied Economics. The guest speakers, Dr. Usman Mustafa, Mr. Israr M. Khan, and Prof. Dr. Zhou Deyi highlighted the current challenges and opportunities in the rural development sector. More than 100 students and faculty members participated in the Webinar. This webinar was part of the capacity-building program of the students and faculty members.

6.51. Training Session on Honey Beekeeping

Keeping in mind the ecological significance of honey bees, MNSUAM is leading the work on honey bee farming in the region. Dr. Muhammad Abid, Assistant Professor, Department of Agricultural Engineering/ Coordinator MNSUAM Entrepreneurship Program is actively involved in research and outreach activities in this regard. A training on Honey Beekeeping, it's production and business plan was conducted on February 28, 2022 in collaboration with SME Business Facilitation Centre, Multan and BIC, ORIC, MNSIUAM. The basic purpose of this training was to develop entrepreneurial skills among the students for successful honey bee farming. The participants were given hands-on training in terms of colony management, queen breeding, honey extraction techniques, reduction in post-harvest losses, nutrition, pests and diseases and pollination of entomophilous crops, improving skills of honey bee keeping and harvesting practices. In the future, more sessions will be organized to commercialize modern beekeeping practices.

6.52. Value Chain Approach of Research for Development

A meeting was held on the value chain of various crops on February 28, 2022. It was chaired by Punjab Agriculture Research Board (PARB) Chairman, Dr. Abid Mahmood. The growing problems in the national and international market and the lack of proper marketing of Pakistani fruits and vegetables as a major problem were discussed. The participants agreed that agricultural research needs to be carried out in accordance with the market issues and challenges. Comprehensive research is needed for the value chain of every agricultural commodity to improve the quality and efficiency of agricultural production.

Addressing the meeting, Dr. Abid Mahmood, Chairman PARB, said that agricultural value chain studies are needed to fulfill the demands of consumers besides catering the access to the emerging markets and matching demand and supply. The exclusive studies of value chain are needed and agricultural universities should play their role for agricultural value chain research. In today's meeting, a comprehensive strategy will be formulated so that we can successfully market our agricultural crops and commodities. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that this forum is aimed at solving the problems of global and national market in an efficient manner. He added that the University owns this initiative of PARB. MNSUAM is already providing a platform for value chain development and value added products for various fruits and vegetables in order to connect the growers with the high end markets. The value chain study can improve the quality of processing by reducing post-harvest losses, he added. Dr. Mubashir Mehdi, Director, Business Incubation Center, briefed about the value chain activities undertaken at the MNSUAM and gave a detailed presentation. The meeting was attended by Director ORIC, UAF, Prof. Dr. Zaheer Ahmad Zaheer; Dr. Amanullah Malik; Dr. Hamad Badar; Muhammad Ajmal; Ali Mohsin Shaheed Gardezi; Director ORIC, Pir Mehr Ali Shah University Rawalpindi; Major Tariq Khan and PO, ORIC, MNSUAM, Prof. Dr. Zulfiqar Ali.

6.53. South Punjab Agricultural Sectoral Plan 2050

A consultative session on Mid-Century Agricultural Sectoral Plan 2050 of South Punjab was organized by the Center for Agriculture Sustainability in South Punjab & Department of Agribusiness and Applied Economics, MNSUAM on March 1, 2022. The agenda of the meeting included the progress overview of the South Punjab Sectoral Plan 2050 to obtain feedback from the stakeholders for quality improvement of the report. The session aimed at exploring the challenges and opportunities for sustainable growth of agriculture in South Punjab. The meeting was chaired by Mr. Saqib Ali Ateel, Secretary Agriculture, South Punjab, and co-chaired by Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM. The worthy Vice-Chancellor welcomed the participants and explained the current situation and changing dynamics of agriculture in South Punjab. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that our survival lies in the judicious use of natural resources and sustainable development of agriculture in the region. Mr. Saqib Ali Ateel said that the growing population and deteriorating natural resources such as arable land and water are key challenges of the future. He urged all the stakeholders to chalk out a comprehensive, cost-effective and eco-efficient plan to tackle these issues in a holistic manner. A comprehensive presentation on the present and future landscape of agriculture in South Punjab was presented by Prof. Dr. Muhammad Ashfaq and Prof. Dr. Irfan Ahmad Baig. The participants suggested that poverty can be reduced through interventions for improvement of the agriculture sector. Major challenges in the agriculture of Pakistan are the productivity gap and abrupt weather changes. We should primarily work on these basic issues and set policies keeping in view the aforementioned challenges. The work should also consider the dynamic capacity building of farmers relating to climate adoption. Our focus should be on human resource development, particularly gender mainstreaming in the agriculture sector. Decent work conditions should also be part of the farm work environment. Along with progressive and small commercial farmers, Dr. Avais Tahir, Director PERI, Ali Mohsin Shaheed Gardezi, CEO, Fidak Farms Pvt. Ltd., Prof. Dr. Shafqat Saeed, Dean FAES, Prof. Dr. Zulfiqar Ali, PO ORIC, Dr. M. Abbas, Air University, Prof. Dr. Mubashir Mehdi, Prof. Dr. Asif Yaseen from BZU, Prof. Dr. Nasir Nadeem, Dr. Sami Ullah, Dr. Ali Imran, Dr. Umer Ijaz, Mr. Shoaib Nasir, Mr. Abd-Ur-Rehman, and many others participated in the session.

6.54. Webinar on Water-Climate-Agriculture Nexus

An awareness seminar on the relationship between water resources and climate change was organized at MNSUAM on March 1, 2022. Dr. Muhammad Saifullah, Assistant Professor, Department of Agri. Engineering, MNSUAM introduced the guest speakers to the participants. He briefed about the importance of the Water-Climate-Agriculture Nexus. Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM gave the opening remarks and highlighted the importance of Water-Climate-Agriculture Nexus. Prof. Leszkek Książek (Dean, Faculty of Environmental Engineering and Geodesy, University of Agriculture, Krakow, Poland) briefed about his University and research facilities available related to climate smart agriculture. He briefed the audience about natural soil management practices, flood protection and river restoration in Poland. Prof Agnieszka Ziernicka-Wojtaszek (Head Department Ecology, Climatology and Air Protection) shared her findings on ecological bases for engineering. He discussed the impact of climate change on agricultural production. He elaborated different mathematical models forecasting air pollution and its effect on agricultural landscapes. Dr. Andrzej Walega (Department of Sanitary Engineering and Water Management) talked about flood characteristics of different basins of Poland and assessment of peak flow and direct runoff in forested catchments. Dr. Muhammad Saifullah and Dr. Mohsin Nawaz also shared their thoughts on water related challenges in transboundary rivers of Pakistan and their implication for agriculture, climate change trends in Pakistan and their impact on agricultural productivity and sustainability, synthesis and recycling of sustainable aerogel and its utilization for wastewater treatment. Dr. Hafiz Mohkum Hammad (Director External Linkages, MNSUAM) briefed about the agreement for collaboration between MNSUAM and UAK, Poland.

6.55. International Conference on Smart Plant Protection-2022

Institute of Plant Protection, MNSUAM organized two-days online conference on March 9-10, 2022. The International Conference on Smart Plant Protection provided insight into innovations and advances in Plant Protection, aiming to protect the plant resources from the invasion and infestation of insect pests, plant pathogens and weeds. The conference provided a collection of innovative ideas and recent research undergone by students, academia and industrialists, world over. Such events provide opportunities for discussions and dialogues between stakeholders like students, scientists, researchers and practitioners including policy makers, business, civil society and farmers. Plants, the only producers on the globe, are challenged by insect pests, diseases, competition of weeds and abiotic stresses. The success of crop protection relies on devising good agricultural practices for mitigating these issues. Smart Plant Protection is one of the forums created to gather the intellectuals and advocates of Plant Protection, sharing their findings that would lay the foundation for research to benefit the farming community. Conference was held under four broad themes viz. Insect pest management, plant disease diagnostics and management, weeds management, and biotechnology for plant protection. Mr. Saqib Ali Ateel, Secretary, Agriculture, South Punjab; Mr. Imtiaz Hussuain Warraich, Additional Secretary (General); Dr. Haider Karar, Deputy Secretary (Technical); Prof. Dr. Subba Reddy Palli, Department of Entomology, Agricultural Science Center North, University of Kentucky; Dr. Fatma A. Mostafa, Integrated Pest Management, Plant Pathology Research Institute, Agriculture Research Center, Egypt; Dr. Syed Farooq Shah, CEO Razbio Limited UK, Razbio Innovations, SMC Pvt. Ltd.

Pakistan, Dr. Abid Ali, Assistant Professor, Department of Entomology, UAF, Pakistan; Dr. Tom Bourguignon, Assistant Professor, Okinawa Institute of Science and Technology, Japan; Dr. Sukirno, Assistant Professor, Tropical Biology Department, Faculty of Biology, Universitas Gadjah Mada, Indonesia; and Mr. Ghulam Farid, CEO RiseAG spoke in the conference

In all, 206 abstracts were accepted for publication in Abstract book (Entomology-130, Plant Pathology-64, Weed Science-15, Biotechnology-12). Around 350 participants registered themselves for participation in the Conference. In total, 60 oral talks were delivered from Pakistan, Turkey, Malaysia, China, USA, Japan, India, UK, Indonesia and Saudi Arabia, Egypt, and Australia.

The conference learned that under changing climate, artificial intelligence-based systems are necessary for identification, monitoring and management of pests (insects, pathogens, weeds). Conservation of natural enemies and enhanced use for pollinators will be key for smart plant protection. Development of pest prediction models for real time monitoring and optimizing biopesticides formulation are other germane areas needing attention. Mutual consensus was also made upon transgenic-based resistance against pests and the need to revisit production technology to synchronize with the effects of climate change. The recommendations of the conference would be presented in local language as Science for Farmers in coming days.

6.56. Third International Conference on Climate Smart Agriculture

The Department of Agronomy, MNSUAM organized an international conference on "Climate Smart Agriculture: The Way towards Ecosystem Restoration" on March 15-16, 2022. The conference was organized in collaboration with the Food and Agriculture Organization of the United Nations (Green Climate Fund). Distinguished climate change experts from Germany, Italy, USA, UK, Turkey, China, South Korea, Egypt, Lithuania and all over Pakistan participated in this event. Dr. Fatih Bozdemir (FAO Representative) and Syed Ibne Hussain (Former IG, Railway Police / Member PPSC), were guests of honour in the inauguration ceremony. About 350 participants (scientists, academia, researchers, students, policy makers, agriculture experts, progressive farmers and other stakeholders) across the world had an opportunity to meet and share knowledge and develop community partnerships about climate smart agriculture for a sustainable and secure future.

Prof. Dr. Asif Ali (T.I) gave a comprehensive overview of the conference and thanked all the organizers and sponsors of this conference. He said that research work on climate change is our top priority area and MNSUAM is well aware of the current situation. He added that the conference had brought together renowned experts on climate change across the globe. Dr. Fatih Bozdemir said that agriculture in Pakistan is facing multiple issues; water scarcity and climate change being the two biggest challenges. He presented efforts undertaken by FAO to upscale climate smart agriculture in Punjab. Ms. Emelda Berejena said that the climate change conference would help the scientists and farmers to develop a strategy to cope up with the environmental changes. She gave an overview of case studies and progress of FAO for climate smart agriculture in Pakistan.

Prof. Dr. Ashfaq Ahmad (ADPC-Islamabad, Pakistan) hoped that the conference would also pave the way for making a better agriculture policy as he presented a methodological framework for assessing the agriculture sector risks and hazards. Risks due to unprecedented climatic changes and weather extremes may increase many folds due to lack of awareness to cope with situations or early warning systems to avoid major losses, he laminated. Prof. Dr. Zulfiqar Ali gave an overview of climate smart technologies developed at MNSUAM. Research collaboration, sharing of ideas, knowledge transfer and brain-storming sessions would be beneficial in this regard, he proposed. Dr. Abdul Ghaffar offered a vote of thanks.

In addition to inaugural and plenary sessions, six technical sessions under the thematic areas of (i) Climate smart agricultural (CSA) innovations and technologies & Socio-economic perspectives and policy innovations for CSA (ii) Genetic adaptability and water-fertilizer intelligent tools/technologies for climate smart crops varieties under changing climate scenarios (PSF-NSFC Project) (iii) Modeling for climate change & Global warming impacts and mitigation (iv) Ecosystem restoration and provision of ecosystem services and biodiversity and (v) Climate smart soil and fertilizer management & food diversification for future food security were also held wherein about 76 scientists presented their work, out of which 21 talks were delivered by international keynote speakers. The event provided a platform to discuss practical innovative solutions for adoption of the climate smart agriculture system in Pakistan. It helped discover smart strategies including ICT, support farmers through technology, soil fertility management, water saving techniques, mechanization, precision farming and cropping system diversification to improve productivity of agricultural systems.

The concluding ceremony of the conference was graced by Syed Hussain Jahania Gardezi (Minister for Agriculture, Punjab) as chief guest. Other notables included Ms. Florence Rolle (FAOR, Pakistan) and Mr. Saqib Ali Ateel (Secretary Agriculture, South Punjab). Syed Hussain Jahania Gardezi applauded the efforts of MNSUAM to boost agricultural development in this dynamic region. Mr. Saqib Ali Ateel acknowledged the efforts and dedication of MNSUAM for providing a discussion platform with national and international climate change experts at the right time. Ms. Florence Rolle said that she is convinced that this gathering is a big opportunity for all stakeholders to share their experiences for fixing the emerging challenges of global climate change and its effects on sustainability of agriculture systems.

Prof. Dr. Irfan Ahmad Baig (Dean, FSS&H) and Mr. Jam Khalid (FAO Representative) presented the recommendations of this conference. It was decided that findings of the conference will also be shared to the farming community in local languages under the umbrella of a seminar entitled "Science for Farmers" as farmers are the main stakeholder. It is believed that this conference provided opportunities for better future planning and adaptation of climate smart agricultural systems.

6.57. Awareness Seminar on E-Commerce and Online Earning Skills

An awareness seminar on E-Commerce and Online Earning Skills was organized by the Rover Scout Unit in collaboration with Extreme Commerce, Business Incubation, and Agriculture Entrepreneurship Center, and the Directorate of IT, MNSUAM on March 17, 2022. The main objective of this seminar was to explore the opportunities for students to use their skills and work as a freelancer. Dr. Gulfam Khan Khalid, Executive Director, Extreme Commerce, and Mr. Maher Mushtaq Hussain, Head Extreme Commerce, Multan Incubator, Mr. Asif, Head Extreme Commerce Rahim Yar Khan Incubator along with their team motivated the students to work online and answered their questions of the students. The Vice Chancellor, Prof. Dr. Asif Ali (T.I) appreciated the efforts of the Rover Scout Unit to develop e-commerce in modern times. In this digital age e-commerce and freelancing can play a vital role in the development of the country. We continue to provide such opportunities to our students so that they can take advantage of it and move forward and this seminar is an important step in this direction, he further added.

6.58. Training Workshop and Consultative Discussion on Management of Crop Nutrition and High Efficiency Irrigation Systems

Department of Soil & Environmental Sciences, MNSUAM in collaboration with Engro Fertilizer Limited, Pakistan organized a training workshop on "Management of crop nutrition and high efficiency irrigation systems" on March 28, 2022. The resource person was Prof. Dr. Munir Jamil Al Rusan, Department of Natural Resources and Environment, Jordan University of Science and Technology, Jordan who is also a consultant to Arab Potash Company, Jordan. He is one of the key crop nutrition experts. The workshop was attended by a large number of farmers, academia, researchers, industry, extension agents and postgraduate as well as undergraduate students. After the formal inauguration, Professor Dr. Tanveer ul Haq, Chairman, Department of Soil and Environmental Sciences welcomed all the participants and invited Mr. Asif Ali (Research and Development Lead, Engro). Mr. Asif Ali introduced the guest speaker as well as elaborated the objectives of this workshop. He further mentioned that Pakistani farmers have been practicing flood irrigation as well as indiscriminate use of fertilizers which leads to significant losses of precious resources. He further mentioned the role of Engro in enhancing the water and fertilizer use efficiency.

Prof. Dr. Munir Jamil Al Rusan gave a comprehensive presentation entitled "Essential Plant Nutrients; Determination of fertilizer requirement". Professor Munir particularly focused on the losses of nutrients as well as water under the traditional and conventional agricultural practices. He also explained the use of fertigation techniques minimizing the losses. Prof. Dr. Asif Ali (T.I.), Vice Chancellor, MNSUAM addressed the participants and elaborated the need for such workshops. He formally thanked the guest speaker and particularly appreciated the efforts put in by the Department of Soil and Environmental Sciences and Engro in arranging this Workshop. He also introduced different initiatives of MNSUAM in addressing fertilizer and water.

After the conclusion of the first session, progress was made on hands-on training of different irrigation systems.

A visit of field, drip irrigation installment at MNSUAM as well as the hydroponics farm of the University was arranged. The participants learnt directly from the resource person as well as other experts of the field who had thorough discussions and gave answers to many of their queries as well as suggested different aspects of fertigation to be considered in Pakistan. After the field trip, the participants gathered again in the seminar room and a conclusion session was held in which the participants were awarded with certificates of participation as well as the resource persons were awarded souvenirs of appreciation.

6.59. Seed Longevity and Storage Management Webinar

Webinar on Seed Longevity and Storage Management was organized by Institute of Plant Breeding and Biotechnology, MNSUAM on April 5, 2022. Dr. Kent J. Bradford, Distinguished Professor Emeritus, Seed Biotechnology Center, University of California Davis talked about the importance of seed storage for provision of high-quality certified seed to the farmers. He explained modern seed storage techniques along with "Dry Chain Technology" for commercial seed storage. Prof. Hugh W. Pritchard, Head Seed and Stress Biology, RBG Kew, Wakehurst, UK shared his experiences on longevity of seeds in genbank storage. He briefed about the different techniques for germplasm conservation including cryopreservation and highlighted the importance of genebank storage for conservation of biodiversity. Prof. Dr. Asif Ali, Vice Chancellor MNS University of Agriculture Multan expressed his views that seed storage is the key for food security, and it is the need of hour to adopt modern seed storage techniques both for commercial and genbank storage. Finally, Prof. Dr. Hammad Nadeem Tahir, Director, Institute of Plant Breeding and Biotechnology thanked all the speakers and participants of the webinar and expressed the hope that this event would lead to the introduction of modern storage methods within Pakistan and further improve the country's agriculture.

6.60. Cotton Productivity Enhancement Campaign

An online meeting on the cotton campaign was hosted by MNS University of Agriculture, Multan in collaboration with the Agriculture Department, Government of Punjab on May 11, 2022. Agenda of the meeting was to take on board all the stakeholders involved in cotton production and to launch a campaign in cotton growing areas to assist farmers in solving their cotton-related issues, to assist the agriculture extension department in outreach activities and most importantly to provide hands-on experience to the Agri. Graduates by working with farmers and experts from different agriculture departments. Following recommendations/decisions were made after discussion with all stakeholders. MNSUAM will be the focal point for coordination with universities and hub for this campaign. Each participating University and Agriculture Department will nominate their focal person within one day and each University will provide the number of students they can engage throughout the cotton season and this list of students needs to be arranged tehsil-wise. Moreover, Universities will prepare the schedule to arrange Farmer Field Days, Seminars, Road Shows, deployment of students for module-based training regarding cotton pest management and agronomic practices. Agri. Extension Department will provide their requirement for the number of students for each tehsil and will devise an action plan for student's training. Students engaged in the cotton campaign should be awarded with 'Summer Internship Certificates'. Geo-tagging system will be used for student monitoring.

MNSUAM will assist other Departments/Universities to deploy this system. Agriculture Extension and Pest Warning Departments will support internees within their available resources for mobility. It was also agreed upon that support from the private sector will also be solicited such as seed, pesticides, and fertilizers, etc.

6.61. Farmers Training Workshop on Cotton Production

Department of Agronomy, MNSUAM in collaboration with Fatima Fertilizers organized a one day workshop on Cotton Productivity Enhancement on May 11, 2021. The event covered informative presentations/lectures by subject experts followed by interactive discussion, Q&A session, and field demonstrations focusing on production scenarios, latest strategies for new and improved cotton germplasm, vigorous crop stand, cotton pathology, physiology and quality in an era of dwindling natural resource base and uncertainty of climatic optima. About 150 participants were trained about innovative trends and practices with special reference to sustainable cotton production. Specialists in cotton agronomy, pathology, physiology, entomology and quality shared their experiences with the participants, who also received hands-on training about these aspects. Dr. Abdul Ghaffar, Chairman, Department of Agronomy and Director, University Farms welcomed the participants, invited speakers, national scientists, researchers, industrial partners, farmers, stakeholders, students and campus community. He said the MNSUAM is always striving to resolve agricultural issues of the farming community on priority basis. Mr. Imran Hameed, Fatima Fertilizer Representative said that balanced use of fertilizers in cotton is the basic ingredient for higher yield. Other topics covered were IPM, effective use of agricultural pesticides, judicious water and nutrient use strategies and irrigation scheduling, pest scouting, gap filling, thinning, managing crop husbandry as per weather forecasts etc. Dr. Mohkam Hammad, Associate Professor and Director, External Linkages thanked all the stakeholders for providing a platform for the welfare of the farmers while continuing their cooperation with the MNSUAM. At the end, certificates were awarded to the successful students for completng a short course on weeds and their management.

6.62. Agri. Graduates Received Training on Cotton

Training of students on cotton production technology, pest and disease control was conducted at MNSUAM on May 17, 2022. Addressing the students on the occasion, Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that in order to promote experiential learning, we have organized a Summer Internship Program for our graduates in collaboration with the Agriculture Extension Department. Students will be in the field during summer vacations for the guidance of farmers and will have an opportunity to learn from experiences of farmers and extension workers. He motivated the students to perform well and bring credit to their Alma Mater. Prof. Dr. Shafqat Saeed, Dean, FAES briefed the students about the program objectives and activities. Dr. Muhammad Ishtiaq, Assistant Professor, Entomology, gave information about pest and beneficial insect identification, pest scouting and economic threshold levels, harming and controlling cotton insects. He added that integrated pest management is a combination of common sense and scientific principles. It's a way of thinking about pest management that values biodiversity and avoids adverse effects on humans and the environment.

Dr. Muqarrab Ali, Assistant Professor, Agronomy talked about modern production technology of cotton, while Dr. Muhammad Arslan Khan gave an overview of cotton diseases, precautionary measures and control tactics. At the end of the program, Mr. Allah Ditta Abid, Director, Plant Protection spoke and shared his field experiences and responded to student's queries.

6.63. Effect of Climate Change on Mango Production

A meeting was held at MNSUAM on May 18, 2022 to appraise the effects of climate change and ongoing heat wave on the productivity of mango crop. The meeting was chaired by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). Academicians, research scientists and progressive growers attended this meeting. It was agreed upon that climate change is negatively impacting mango orchards and immediate action is required to safeguard this economically important fruit crop. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) urged the development of a database for prediction and decision support of mango growers. On this occasion, Mr. Abdul Ghaffar Grewal, Director, Mango Research Institute, Multan laminated that severe temperature variation from March 11 to March 17 from 37 °C to 42 °C, contrary to 34 °C routine temperature in previous years, affected the mango fruit to a greater extent. Similarly, the temperature in April also remained high compared to the ones in previous years, and it also aggravated problems for the growers. He delivered a detailed presentation on the effects of climate change and mitigation strategies. Progressive Mango Grower, Malik Zafar Hussain Mahay regarded climate change as a serious threat to mangoes. Syed Abid Imam also attended this meeting as a special guest and acknowledged the work of Agriculture University for the mango growers. Mr. Shehzad Sabir Director, Agriculture Extension, Multan informed that due to on-going heat wave, besides fruits, growth of plants and development of new branches are also being affected. It was decided to carry out a well-designed survey to assess the damage caused by the heat waves on different varieties of Mango and developed a strategy to improve mango production in the changing climatic conditions.

6.64. International Conference on Bee Pollination and Conservation

The Institute of Plant Protection, MNSUAM organized 2nd one-day International Conference on "Bee Pollination and Conservation" on May 20, 2022. Every year this day is celebrated as World Bee Day. The event provided insights into current status, innovations and advances in bee pollination under the changing climate with special focus on native social and solitary bees. Main themes of the event were biodiversity and conservation of bees, crop pollination, and beekeeping. The conference stimulated and facilitated discussions and dialogues about new research ideas that can help to explore the pollinator diversity and their conservation strategies. A total of 72 abstracts were received, and participants from five countries, including Pakistan, India, USA, China, and Nepal, participated in the conference. Moreover, a photo salon competition was also organized, and 69 entries were received from students and researchers. In the inaugural session, the chief guest was Mr. Saqib Ali Ateel, Secretary for Agriculture, South Punjab. Dr. Shimat V. Joseph from the University of Georgia, USA, and Dr. Neil Cobb from iDigBees were the keynote speakers. The Vice Chancellor, Prof. Dr. Asif Ali (T.I.), gave the inaugural speech about biodiversity and its importance concerning the pollinator fauna. He emphasized the need to highlight the importance of bees in our daily lives.

He stated that marking the day was aimed at sensitizing the growers and other stakeholders about the significance of a balanced ecosystem where bees can service with all their diversity. Prof. Dr. Shafqat Saeed briefed about the importance of social and solitary bees. He also highlighted the history of World Bee Day. About one-third of the food that we eat daily relies on bee pollination. Honeybees and solitary bees play an important role in the pollination of crops such as canola, soybeans, cucurbits, sunflower, cucumber, citrus, melon and many other important food, commercial and cash crops, he further added. Mr. Saqib Ali Ateel highlighted the role of the South Punjab Agriculture Secretariat in reducing the use of pesticides in cotton, which directly impacted the beneficial fauna. He appreciated the role of MNS University of Agriculture Multan and its leadership in emphasizing the role of pollinators. The conference continued for three sessions. At the end of the conference, Prof. Dr. Shafqat Saeed presented the conference recommendations. The Vice-Chancellor reiterated to focus on the action on the conference recommendations. He appreciated the role of the whole team in conducting the scientific gathering. Photo Salon winners were announced, and the top three position holders were given cash prizes.

6.65. Seminar on Promotion of Palm Cultivation and Production In Pakistan

An International Seminar on Promotion of Palm Cultivation and Production in Pakistan was organized at MNSUAM under the auspices of the Department of Institute of Plant Breeding and Biotechnology on June 8, 2022. Presiding over the International Seminar, Vice Chancellor Prof. Dr. Asif Ali (T.I) welcomed the guests and spoke briefly on the importance of dates. Talking from Oman, Rashid Al-Yahyai informed about the current situation in Oman regarding the production and cultivation of dates. Date palm is the primary crop in the Sultanate of Oman and represents 75% of all fruit trees in the country. Irrigation using scarce water resources is practised in all date producing regions of Oman. Soil and water salinity, pests and diseases, increased production costs as well as limited market outlets led to a decline in date production in recent years. He presented ways to improve date palm production in Oman. Factors that adversely affect date palm production were discussed and solutions were proposed to increase total production of dates in Oman. He added that agroecology is very important for the promotion of modern agriculture and can increase production. Scientists of both the countries can work together to increase the production and quality of palm cultivation through their research collaboration. Prof. Dr. Sarwar Mirzad discussed the date palm production context on a global scale. He said that although Pakistan ranks eighth in terms of palm exports but due to lack of value addition and good packaging, the money earned is not appreciable. Prof. Dr. Hamad Nadeem Tahir, Dr. Zulqarnain khan, Dr. Muhammad Shoaib, Ms. Palwasha Khanum, other faculty and a large number of students were present on the occasion.

6.66. Seminar on Cotton Productivity Enhancement

A cotton seminar was organized by two sisterly organizations, Institute of Plant Protection and Engro Fertilizers, Pakistan on June 09, 2022. Secretary Agriculture South Punjab, Multan Mr. Saqib Ali Ateel was Guest of Honour. Due to changing climatic conditions, poor agronomic practices, unavailability of irrigation water, fertilizers and plant protection chemicals and low market value, cotton cultivation has decreased from 5 million acres to 2.9 million acres in the area. This decrease resulted in less production of cotton throughout the country and threatened the economy of Pakistan.

Keeping in view the worsened situation, various stake holders like academia, provincial government, industry, research organizations and farmers gathered on a platform provided by MNS University of Agriculture and Engro Fertilizers Pakistan. The seminar was opened by the welcome note of MNSUAM Vice Chancellor Prof. Dr. Asif Ali (T.I.). He welcomed the honourable guests and explained the efforts of MNSUAM for the betterment of cotton. He told the audience that this year, the Government of Punjab has launched a cotton campaign in collaboration with the universities. In this campaign, students of B.Sc. (Hons.) Agriculture will join hands to the Agriculture Department for assistance, motivation and training of farmers about cotton cultivation. This activity will also boost the professional morale and knowledge of students about the field. The Vice Chancellor highlighted efforts of Prof. Dr. Shafqat Saeed, Coordinator, Faculty of Agriculture and Environmental Sciences, and his team for providing expertise and services regarding integrated pest management in the area, through effective linkage of academia, research institutes and farmers, since the last couple of years.

Dr. Saghir Ahmad, Chief Scientist, Cotton Research Institute (CRI) Multan, discussed the different varieties of cotton, their response to stress and their production technologies. He said that better cotton yield can be achieved by timely land preparation, de-linting of seed, sowing on a well prepared land, maintaining optimum plant population, selection of good varieties, proper application of fertilizers and irrigation, integrated pest management and clean picking. He was also hopeful for the future of cotton crop in the area because of collaborative efforts of various stakeholders. Mr. Shahzad Shabir Director Agriculture (Ext.), Multan, discussed previous negative growth and positive growth of last year's cotton crop. He highlighted different crops which replaced cotton in the previous years. He also discussed the achievement of cotton production in 2021 because of dedicated efforts made by various departments including MNSUAM and Agriculture Extension. These efforts included pink bollworm management, delay in first spray, IPM demo plots, use of botanicals, early morning pest scouting, hot spot treatment, rigorous feedback from farmers through extension workers, guidance of farmers through social media and fortnightly meetings with authorities. He discussed competing crops for cotton such as rice, maize and sugarcane. Other factors for cotton production declination were climate change, pest outbreak and resurgence and marketing issues.
Muhammad Asif Ali, Head Agronomy, Engro Fertilizers Pakistan highlighted the role of proper use of fertilizers for cotton crop, He advised the farmers to not flood DAP just like urea due to difference in mixing and run off ability of both fertilizers. He persuaded farmers to make efforts to increase the organic matter of soil for crop betterment along with better water retention. Mulching will be helpful for the soil to retain its essential nutrients, he added. Mr. Naveed Alam Qureshi, Manager Agronomy Engro Fertilizers Limited, advised the farmers to use plant protection chemicals judiciously and also to choose environmentally safe chemicals. Unwise use of plant protection chemicals may reduce natural enemies and lint quality. Mr. Hassan Raza, Seed Production Official came with suggestions to do team work. He requested Secretary Agriculture to assure the quality of plant protection chemicals. Director General Agri. Research, Mr. Muhammad Nawaz Khan Maikan elaborated the importance of crop, and paradigm shift of its cultivation area due to climate change. He advised farmers to visit their field regularly. Chief Guest, Secretary Agriculture, Mr. Saqib Ali Ateel assured the farmers for quality assessment of plant protection chemicals and availability of fertilizers. Moreover, he advised them to choose a good variety and adopt modern production technologies. He urged the universities and research institutes to disseminate latest findings among the farming community.

Muhammad Nawaz Shareef
University of Agriculture
Multan

STRENGTHENING OF PHYSICAL INFRASTRUCTURE

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CHAPTER-7
STRENGTHENING OF PHYSICAL INFRASTRUCTURE

Physical infrastructure is considered a crucial element in the development of any educational institution in the world. There are many factors which affect quality of education and research but a conducive environment is the most important factor for consideration. A lot of efforts have been made to develop the infrastructure in a way to achieve the objective for provision of congenial environment to the students, faculty and administration of this university.

The detail of the projects undertaken to improve and strengthen infrastructure of MNS University of Agriculture, Multan are as under:

7.1. National Crop Genomics and Speed Breeding Center for Agriculture Sustainability

ADP Project of Rs. 450.00 million for establishment of National Crop Genomics and speed breeding Center for agriculture Sustainability at MNS-University of Agriculture Multan was approved during FY 2021-22 with the execution period of 36 months.

An amount of Rs. 123.295 million was released during FY 2021-22 and out of which Rs. 80.934 million has been consumed for Civil Work and remaining amount of Rs.42.361 million has been consumed for procurement lab equipment, Furniture and Chemical. The civil work of the foundation has been completed while column work is in progress. The remaining civil work, big data analysis and procurement of chemicals, lab equipment, and furniture & fixtures will be completed as per PC-I provision.

The development project will help the agriculture sector in achieving its aims of provision of quality crops and improve income of the farmers through competitive economic farming. The proposed components of the project will also focus on exploring alternative policies to support scenarios for achieving long-run objectives in line with the government vision, while providing immediate relief without impacting environment and resource sustainability.

The main objective of NCG&SBC is to explore the genomic information and historic genetic background of major crops; wheat and cotton, with possible fast track solutions to the issues including insect/pest complex, climate change and produce quality to ensure food security in the country in particular and in the region in general. The specific objectives are:

1. Acquisition, maintenance, and characterization of germplasm for genetic purity - a base for genotyping.
2. Genome sequencing of indigenous germplasm to explore genomic information.
3. Upgrading and accelerating conventional breeding through integration of genomics.
4. Capacity building of Human Resource in new Genome/Genetic Techniques.

7.2. Construction of Masjid Fatima-Tu-Zahra at MNS University of Agriculture Multan

The competent authority decided to construct Central Mosque of 3000 persons capacity having covered area of 23000 square feet consisting of one Prayer Hall, One Veranda, Two side rooms, Ablution area and Library with the estimated cost of Rs. 93.00 million is in progress at MNS University of Agriculture Multan.

The University made a call for donations for construction of the mosque and received good response. The drawing/design of the mosque is prepared by M/S Mirza Nasir Associates in a Turkish Style.

After approval of drawing/design a committee was constituted and decided that work will be executed through donation and own sources. The scheme started and donation was collected only 10.99 million and work has been executed in foundation. As per recommendation of the mosque construction committee a tender of Rs.19.00 million was awarded to the contractor through own sources and Masjid Hall completed up to roof Level.

The structure work of mosque Fatima-Tu-Zahra has been completed and roof work is in progress. All the progress has been made during FY 2021-22.

In addition to the projects being executed during 2021-22, The University has completed some important development projects consisting of basic infrastructure of the University. The project wise brief introduction of scope is as under.

7.3. Establishment of MNS University of Agriculture, Multan Phase-II

One ADP Project of Rs. 1510.243 Million was approved with the execution period of 48 months up to June 30, 2019. Due to less funding in FY 2018-19, the time/cost overrun. Consequently, the scheme was revised at a cost of Rs. 1746.258 million and the project execution period was also extended for one year (Up to June 30, 2020). An amount of Rs. 1743.989 million has been consumed till June 30, 2020. Project activities have been 100% completed including 22 and other allied activities within the stipulated period.

An amount of Rs. 1333.438 million was allocated for the construction of physical infrastructure i.e. Academic Block, Administration Block, Boy's Hostel, Girl's Hostel, Faculty Hostel, Residences, Boundary Wall and Allied External Services.

The MNS University of Agriculture, Multan awarded the contract of all civil work modules and the construction work on all University buildings has been completed. An amount of Rs. 1333.438 million was released up to FY 2019-20 for the civil works and out of which Rs. 1333.429 million has been consumed. University Boundary Wall of 12,145 Rft (running feet), Building of Administration Block, Academic Block, Boys Hostel, Girls Hostel, Faculty Hostel, Residences, Motor Vehicle Shed, Overhead Reservoir, Water Supply, Sewerage, Roads and other External Services have been completed.

Under the project, an amount of Rs. 189.295 million was released for the procurement of Lab and ICT Equipment up to FY 2019-20 from which Rs. 189.202 million has been consumed and 760 equipment have been procured and established twenty four labs.

An amount of Rs. 39.745 million was released for the procurement of furniture & fixtures up to FY 2019-20. The necessary furniture & fixtures have been procured and installed in the classrooms, hostels, and guest house.

An amount of Rs. 49.304 million has been provided under Farm Development and other components. The university leveled the 500 Acres of barren land at Jalalpur Pirwala and constructed a 4816 meter long water course for irrigation purposes. The University converts this barren land into the research/ experimental stations and it is very useful for research students and faculty members to perform research activities.

7.4. Provision of Fresh Irrigation Water and Other Basic Infrastructure Facilities at Jalalpur Pirwala (JPPW) Farm of MNSUAM

Another ADP Project of Rs. 170.00 million for fresh irrigation water and other basic infrastructure facilities at JPPW Farm of MNSUAM was approved with an execution period of 24 months (2019-20 to 2020-21).

The major objective of the project is to provide fresh water for irrigation to bring 250 acres of land under cultivation, which cannot be brought under cultivation as the canal water is too short to meet the requirement and groundwater is highly brackish. The project aims at providing required infrastructure at the farm for research and experimentation.

Other components of the project include provision of sheds for farm machinery and implements, farm animals, farm produce and stores for the inputs. Establishment of training halls for capacity building of the farmers is also one of the project objectives. The project objectives are elaborated as below: -

i. Installation of two turbine tube wells near the bed of River Chenab for sweet/fresh water supply for irrigation along with underground conveyance system to meet canal irrigation water shortage during Kharif season and to meet demand of Rabi season.
ii. Construction of sheds for keeping of agricultural machinery and farm animals for prolonged life of implements and safety of farm animals.
iii. Construction of stores for inputs and sheds for farm produce for bulk purchase of inputs and safety of the farm produce.
iv. Construction of training halls for capacity building of the farmers and other stakeholders.

An amount of Rs. 170.00 million was released for FY 2020-21 and the same has been consumed to carry out the Civil Work including laying of 8991 KM pipeline for irrigation water, animal shed, input store, implement shed, training hall and boundary wall. Furniture and fixtures have also been procured for the training hall.

7.5. Central Library at MNS University of Agriculture, Multan

The University Library and Collection Services provide fundamental support for students, researchers and staff, complementing academic activities. Libraries are collections of books, journals, periodical publications, including magazines, scholarly journals, books published as part of a series and other sources of recorded information.

Library is an essential part of the University which is the main source of learning for students as well as faculty members. Library provides a learning environment for students to achieve their goals and keep in touch with books to build the nation. The primary function, of course, is research. Students and professors alike use libraries to research their topics for papers, thesis, books, papers, journals, etc. Number of books available has increased over the years as under:

Sr. No.	Financial Year	Total Number of Books
1	2016-2017	2976
2	2017-2018	4436
3	2018-2019	5009
4	2019-2020	5350
5	2020-2021	5384
6	2021-2022	5471

Other achievements pertaining library during 2021-22 are as under;

- Improvements in library infrastructure development of an in-house e-repository for the university researchers.
- Facilitate to the university community by providing them remote access to electronic resources through e-repository.
- Subscription of HEC databases to facilitate borrowers in their respective field of research.
- Provide Hands-on training sessions on “How to Access and Use of E-repository “to the university students/ researcher/faculty.
- Provide various Hands on training sessions on “How to Use E-brary/How to use HEC Digital Library / How to Use and access in house E-repository to the university students/ researcher and faculty.
- Held 3 days Annual Book Fair of the university at the event of Kissan Mela.

7.6. University Farms

MNS University of Agriculture, Multan has two research farms at Chak 84-M, Jalalpur Pirwala and Mouza Rangeel Pur, Multan, the first one comprises of 500 acres and the later has 170 acres of land (64 Acres under cultivation for different crops while rest under building and lawns). These farms provide the students an opportunity to get practical training in various disciplines of agriculture. These farms also serve as demonstration centers for the students, provide basic infrastructure for conducting the research and also serve as Model Farms for the farming community. A summary of development works done at the Farms, is being given below:

7.6.1. Agricultural Farm, Jalalpur Pirwala

- After the bulldozer work on 500 acres land of University Farm Jalalpur Pirwala, and after laser leveling the major challenge was to cultivate this saline sodic soil with brackish underground water. However, the challenge has been accepted and about 470 acres of land are now cultivable. The rest will be cultivable after laser land leveling which is also in progress.

- Orchard of different fruit plants like citrus, phalsa, jaman, pomegranate, berry, mango, guava and date palm is also proposed on 100 acres. Furthermore, organic farming on 25 acres of newly developed land is also under consideration.
- The canal system at Jalalpur Pirwala is non-perennial and canal water is available only for six months from mid-April to mid-October every year. To improve the efficiency of canal water, the mohga was shifted toward the head and a 1730 feet paved water channel was constructed. Furthermore, to meet water requirements in winter and as per need in summer, two electric mounted water turbines have also been installed to fetch the sweet/fit irrigation water from 6 km away and crops are being irrigated with this sweet water.
- After the addition of 100 more acres in Rabi season 2021-22, now about 450 acres of land are under cultivation, where various crops and tree plants are being planted. During Rabi season, major crops were wheat, barley, raya and lucerne, whereas, during Kharif season, major crops grown are cotton, millet, guar and sorghum and jantar. Further, sesbania has also been sown for green manuring, to add the organic matter into the soil.
- About 40,000 plants of various tree species like gum Arabic, lebbeck, Indian lilac, Indian beech tree, moringa, pomegranate, guava, jujube, fig etc. have been planted on roadside, alongside the water channels and in specific belts with higher level of salinity, which now are growing up and have started giving a greener look to the premises.
- About 4,000 fruit tree plantations including Citrus, Jajuba, Jaman, Pomegranate and Falsa were successfully done.
- Furthermore, successful adaptability trials for olive have also been done and 10 Acres of plantation under drip irrigation system is under progress.
- Fish farming is ongoing.
- A project for construction of livestock shed, input and output stores and seed stores, farmers training halls and machinery shed has also been completed.

7.6.2. Agricultural Farm, Rangeel Pur, Multan

- In Mouza Rangeel Pur, Multan 180 acres of land were allotted to the University, out of which 60 acres are under University Farm while the rest is for campus and other constructions. The land was encroached by the illegal occupants. All the land has been possessed and is under cultivation.
- In C-block, 39 acres of land is under cultivation. The major crops during growing season 2021-22, were wheat, cotton, Maize, chickpea, soybean, berseem and sorghum etc.
- High-Tech structures like hydroponic system, floppy sprinkler irrigation system, greenhouse/s, containment/quarantine facility and tunnels have been constructed in C-block area.
- One fishpond and other water cleaning ponds in C-block have also been constructed.
- Small tree mango system, citrus block and Kitchen gardening units have also been established.
- A botanical garden of 2 acres is also proposed in C-block, wherein different plants will be planted in the coming seasons.
- A wheat farmer's field day was also organized for demonstration of the hybrid wheat and other advanced wheat lines developed by the University.

- In collaboration with private industries like Bayer Pakistan (Pvt.) Ltd, ICI (Pvt.) Ltd., Fatima Group (Pvt.) Ltd and Engro Fertilizers Pvt. Ltd. research trials on cotton are ongoing. Furthermore, in future both firms will develop infrastructure for students' learning centre.
- During the year 2021-22, an income of 29.67 million from both Farms was achieved against a target of 27.00 million and the amount was deposited in the University account.

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Multan

STRENGTHENING OF TECHNOLOGICAL INFRASTRUCTURE

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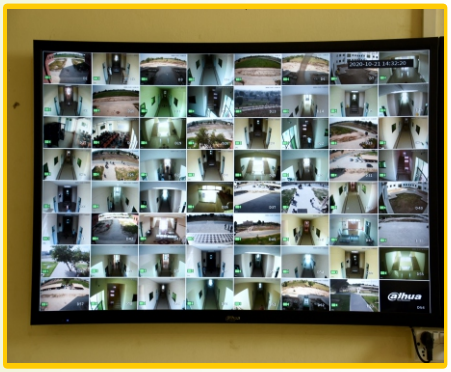
STRENGTHENING OF TECHNOLOGICAL INFRASTRUCTURE



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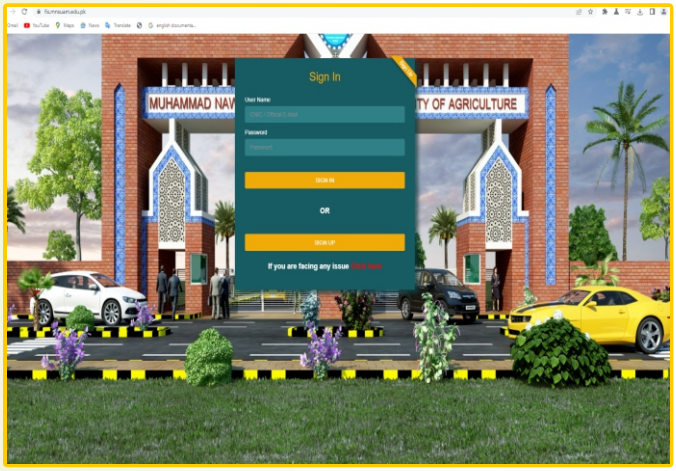
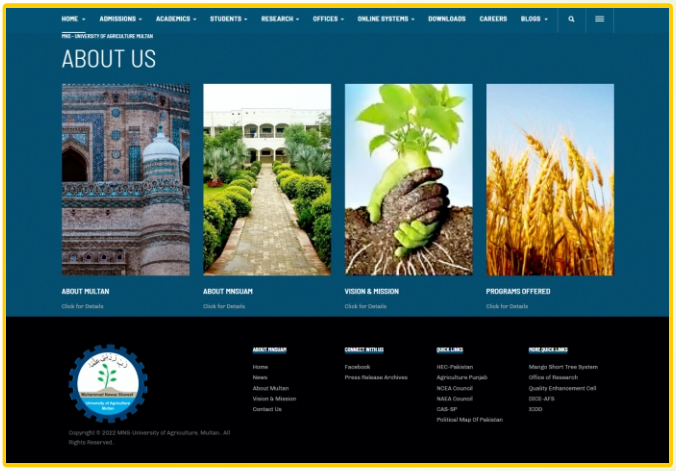
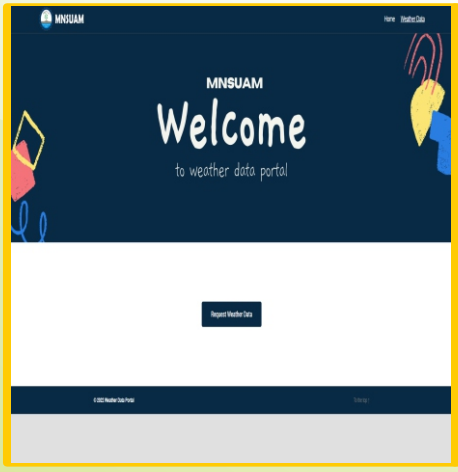
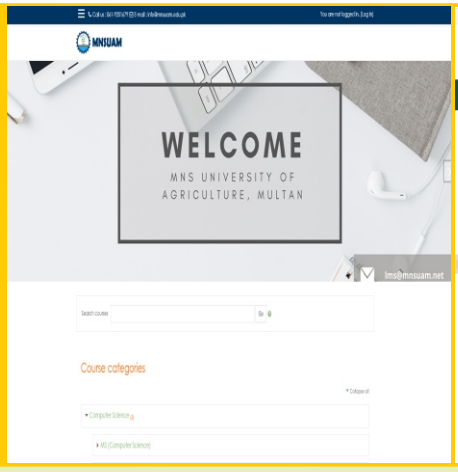








CHAPTER-8
STRENGTHENING OF TECHNOLOGICAL INFRASTRUCTURE

The Directorate of Information Technology (DIT) is focused on delivering a wide range of high-quality IT Services throughout the campus to all academicians, staff and students. Providing a smart & robust environment is a main aim of the DIT, where everyone has easy access to all IT services round the clock. DIT also ensures a secure, reliable, and efficient IT environment where optimized results would be attained. The Directorate of IT played a pivotal role in realizing the vision and mission of the MNS University of Agriculture, Multan by strengthening the ICT Infrastructure and facilities. Following were two major streams of development.

- ICT Hardware Infrastructure
- ICT Software Services

8.1. ICT Hardware Infrastructure

8.1.1. Core Cisco Catalyst 2960 XR Switches

IP Core was upgraded to Catalyst 2960-X switches to provide high routing, switching and security features.

8.1.2. Cisco 3504 WLC Setup

For Campus Wi-Fi services for staff and students, Cisco Wireless LAN Controller 3504 was deployed. This centralized WLC provides secure, high performance Wi-Fi internet experience.

8.1.3. Cisco SG350 Series Switching Setup

The Directorate of IT deployed Cisco SG350 Series Switches are next- generation managed switches that offer excellent performance, rich features, and ease of use. With support for Layer 2 and 3 features, advanced security, routing, and energy-saving technology, they deliver a solid foundation for business applications today and in the future.

8.1.4. Network Security Update Fortigate-200E

The FortiGate 200E series next generation firewall was deployed in the University. Firewalls include high protection against cyber threats with high-powered security processors for optimized network performance, security efficacy and deep visibility. Fortinet's Security-Driven Networking approach provides tight network integration to the new generation of security.

8.1.5. IP Unified Communication Panasonic KX-NSX2000

As one of the world's biggest manufacturers of consumer electronic goods, Panasonic may be better known for its televisions than its telephones. However, the Japanese multinational giant is nothing if not diverse in its product range, and business communication hardware is just one of the many strings to its considerable bow.

8.1.6. Dahua IP Security System Setup

University has upgraded its IP Security system consisting of more than 200 IP PoE cameras covering all campus places, ensuring the safety of the staff and students. A well-equipped control room has been established for monitoring.

8.1.7. Computer Labs

Four new computer labs have been established in the new Faculty building. The Latest software is installed which facilitates the students to work in a comfortable and safe environment. One of these labs has been provided with high-performance computing facilities for senior students conducting research.

8.1.8. Fiber Optic Backbone Links

All buildings of the University have been linked by fiber optic cable. This service provides high speed network services to the staff and students.

8.1.9. New Video Conference Rooms Setup

There are four video conference room facilities for staff and students. One more video conference room is developed for meetings with Foreign Visitors and Governments. These rooms are equipped with Multimedia, LED TV, Sound System & internet facilities.

8.1.10. Multimedia Equipped Classrooms

University has arranged multimedia in every classroom to provide excellent facilitation to students. Multimedia Projectors are providing a facility for diverse teaching and learning more diverse and interactive in classrooms. These Projector's key features are picture execution, determination, long light life, item versatility, brilliance, PC associations and calm activity. Moreover, 50 projectors were installed to give more ease to the students in learning.

8.1.11. Video Conferencing Room Solutions

University has arranged a high-definition Video Conference System for official online meetings, national and international webinars, and conferences. The video conference system provides participants with smooth and natural audio-visual effects and a comfortable and immersive experience for teleconferencing.

8.1.12. Digital Outdoor Display (SMDs)

There are digital display devices installed at different locations of the university that display information in a digital format on large screens. There will be a prompt display of information/announcements regarding current events/activities.

8.2. ICT Software Services

8.2.1. Webinar/Meetings

The Directorate of IT has been supporting the faculty and students in conducting online meetings/webinars using Cisco WebEx Enterprise, Zoom Meeting and Microsoft Teams. Especially during the COVID-19, this really helped the University in conducting online classes and meetings. Hundreds of meetings/conferences/webinars (national and international) have been conducted successfully during the year.

8.2.2. Microsoft Dynamics365 Implementation

Directorate of IT started the implementation of the world- renowned ERP solution using Microsoft Dynamics 365. This ERP would highly enhance the financial operations, procurement, inventory & procurement of the University.

8.2.3. PERN Update

University upgraded the PERN services contract from P1 to P2 package that enhanced the internet bandwidth from 45 Mbps to 150 Mbps, and faculty & student licenses including MS Office 365 and MS Windows OS.

8.2.4. Website Update

The Directorate of IT is managing the official website as well as launching project-related websites for faculty and students. University's official website was updated from WordPress to Joomla, a free and open-source content management system. Web links of various online systems have been uploaded to university websites.

8.2.5. Kaspersky-Virus

Directorate of IT purchased Kaspersky Endpoint Security Cloud Plus anti-virus software for protecting against a wide variety of threats, including other types of malicious software, such as keyloggers, browser hijackers, Trojan horses, worms, rootkits, spyware, adware, botnets, and ransomware.

8.2.6. LMS System Update

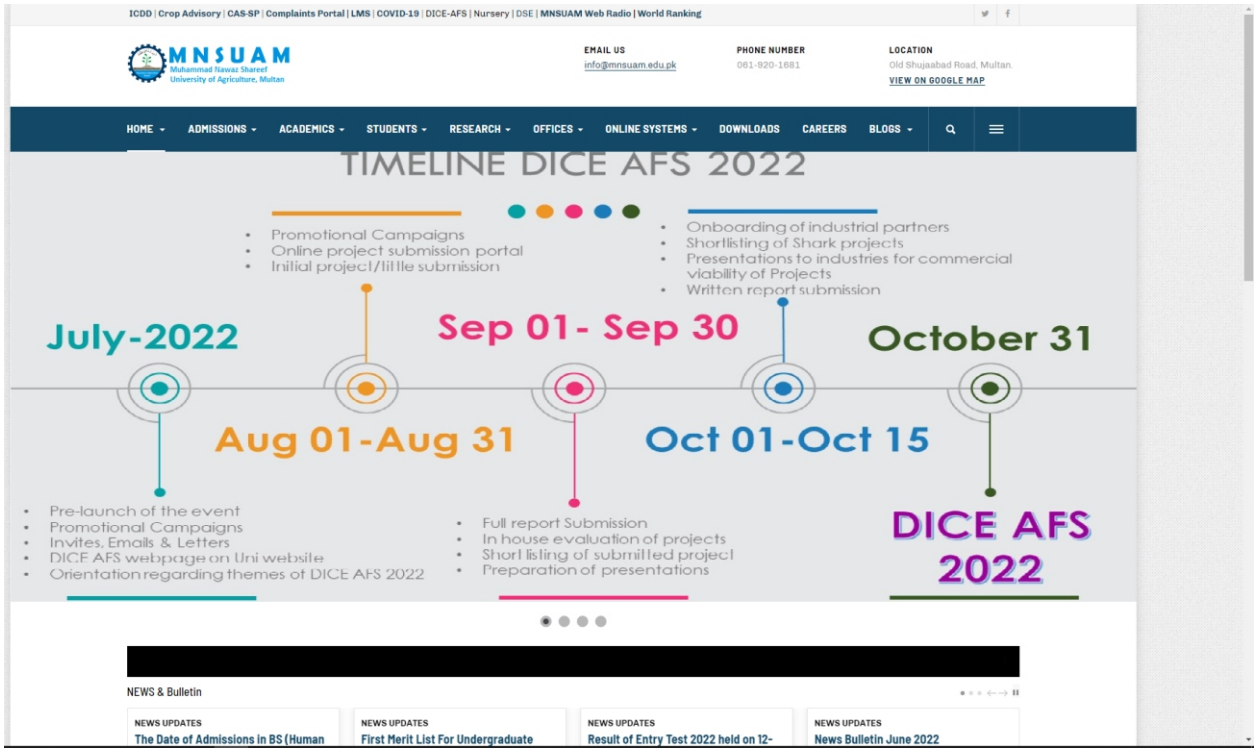
During the COVID-19 pandemic, the Directorate of IT with support of the Department of CS deployed Moodle LMS System & Google Classroom hosted on local servers and conducted online classes and online entry tests for the second time. This facility highly added value to the automation of the University and provided uninterrupted education facilities to students and faculty.

8.2.7. Google G-Suite Services

All staff and students have the facility of Google Corporate G Suite services. These services consist of Email, Word, Excel, PowerPoint & unlimited Google drive. All students were provided G-Suite accounts this year, which highly enhanced the productivity of students and collaboration. These services are being managed by the Directorate of IT.

8.2.8. Online Systems

- Admission System (http://admission.mnsuam.edu.pk)
- Faculty Information System (https://fis.mnsuam.net/)
- Development of web-based system for Agricultural Sciences Journal (ASJ) https://asj.mnsuam.net/
- Developed a web site for International Conference on Climate Smart Agriculture (http://mnsuamcsa.com/)
- Development of online Student and Course feedback System (https://qec.mnsuam.net/)
- Development of weather portal (https://weather-data.mnsuam.edu.pk/)
- Developed a complaint system (https://complaints.mnsuam.edu.pk/).



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UNIVERSITIES BUILDING COMMUNITIES

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CHAPTER-9
UNIVERSITIES BUILDING COMMUNITIES

9.1. MNSUAM Ranked as the Most Sustainable University of Pakistan in UI GreenMetric Rankings

MNSUAM has secured first position as the Most Sustainable University among Pakistani varsities in UI GreenMetric ranking. As many as 956 varsities of 80 countries of the world competed for the ranking 2021, wherein MNSUA bagged 154th position globally by getting 7550 points. The University has improved its position from 3rd/243rd in 2020 to 1st/154th in 2021. Purpose of the ranking is to count on the policies, initiatives, and contributions for Environmental Sustainability in the Universities all over the world. The rankings are useful for University leadership to put in place eco-friendly policies and manage behavioral change among the campus community. The ranking evaluates institutions in terms of six broad categories namely: i) Setting and Infrastructure, ii) Energy and Climate Change, iii) Waste Management, iv) Water Conservation, v) Transportation, and vi) Education. MNSUAM has obtained high scores in total open space area, total area on campus covered in plants, total electricity usage, smart building implementation, carbon footprint divided by total campus population, reducing the use of paper and plastic on campus, waste treatment, water conservation and recycling, and pedestrian path on campus; whereas, the University got relatively good scores in number of renewable energy sources in campus, greenhouse gas emission reduction program, number of vehicles divided by total campus population, zero emission vehicles policy on campus, university run sustainability website, water efficient appliances usage, consumption of treated water, community building activities. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) stated that our University has attained a distinct position in the ranking owing to our commitment and collective approach towards sustainability. We have accomplished this feat by adopting environment-friendly standards and focusing on the educational process with the techniques, applications, strategies, and practices associated with the objectives of the Prime Minister's Clean & Green Pakistan drive and the United Nations Sustainable Development Goals. Considering the fact that MNSUAM is much younger than the participating institutions, the University has made steady progress because of the dedicated team work, willingness to accept challenges, and result-oriented delivery of work. Nevertheless, we need to improve ourselves and set targets for the next year to improve our international ranking. He also appreciated the efforts of Dr. Muqarrab Ali, Assistant Professor, Agronomy and Mr. Muhammad Zeeshan from ORIC for compiling the UI GreenMetric report.

9.2. Chemical Safety Lab under Industry-Academia Linkage

MNS University of Agriculture, Multan had signed a Memorandum of Cooperation (MoC) with CropLife Pakistan. As part of academia-industry linkage program, a chemical safety lab has been established by CropLife at MNSUA. Prof. Dr. Asif Ali (TI), Vice Chancellor, MNSUAM flanked by Mr. Rashid Ahmad, Executive Director, CropLife inaugurated this lab on July 30, 2021. Addressing the occasion, Prof. Dr. Asif Ali said, “We are keen to strengthen our connection with public and private sectors and to explore new opportunities for academic excellence. We very much appreciate that our industrial partners show strong commitment in both R&D and talent building”. University is making quick progress and achieving all its objectives based on its vision to strive for academic excellence and build a knowledge-based economy. The linkages between faculty, industry and farming community are being promoted through effective external linkages and outreach programs, he further added.

9.3. Mango Museum

The University is endeavoring to establish a mango museum in Multan. The idea was fully supported by the management of DHA and promised to provide all possible support to establish a mango museum in DHA Multan. In a meeting of the Stakeholders, it was decided that a core group consisting of MNS scientist, mango growers, industry stakeholders, MRI and DHA will be formed to work out the feasibility of developing a mango museum in DHA Multan. It was decided that a professional who has experience of building museums should be engaged and some model of already heritage museums, specially army museums established in Lahore should be visited.

9.4. Webinar on Wellness through Greenery

Plants for Life Society of MNSUAM in collaboration with Directorate of Estate Management organized a webinar on "Wellness through Greenery" under the campaign "Plant for Pakistan" on August 3, 2021. The webinar was attended by academia, researchers, representatives of civil society, Forest, Wildlife and Fisheries Department, Parks and Horticulture Authority, Multan. At this occasion, Prof. Dr. Asif Ali (T.I) said that planting trees is vital to sustain life and keep the environment clean and healthy. Trees are essential to support life and enhance happiness. He further said that MNSUAM has always actively participated in tree plantation campaigns. “We, as an Institution have planted thousands of trees in many schools of Multan under ″One Child, One Tree” and "Clean and Green Pakistan" projects. Moreover, we have planted trees on the Old Shujabad Road, and this activity has brought a pleasant change in the environment of the whole area”. He urged all teachers, staff and students of the University to plant trees as a fulfillment of their national duty. Mr. Ather Mehmood Shah Khagga (Chief Conservator of Forests, Southern Zone Multan) said that trees are essential for life and there is no better alternative for improvement of our lives and our surroundings other than plantation of trees. He further expressed that his department is targeting to plant 15 million trees by the end of this Monsoon season. Mr. Muhammad Naeem (Director, Parks and Horticultural Authority, Multan) Mr. Najmi Ashraf, a Social Activist also expressed similar views on the occasion. Dr. Muqarrab Ali gave a comprehensive overview and success stories of tree plantation campaigns launched by MNSUAM in recent years.

9.5. Youm-I-Esthesal Kashmir Observed at MNSUAM

Youm-i-Esthesal Kashmir was observed at MNSUAM on August 5, 2021 against revocation of Article 370 and 35-A and continuous victimization of Kashmiris by the Indian government. The event was attended by a large number of students and faculty members. Speaking on the occasion, Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM said we have very close religious and cultural relationship with Kashmiris and condemn all kinds of brutal acts with them. He further said that the Kashmir dispute must be handled according to the UNO charter.. Prof. Dr. Irfan Ahmad Baig (Dean, FSS&H) also expressed that the issue of Kashmir is the bone of contention between Pakistan and India, which requires understanding of the human cause for its pragmatic solution. The revoking of article 370 and 35-A is another condemnable Indian act to subjugate the rights of Kashmiri people. The participants strongly condemned Indian atrocities on innocent Kashmiris struggling for their right to freedom. Dr Asif Raza, Mr. Imran Mahmood, Mr. Muhammad Rafeeq Farooqi, Dr. Mirza Abdul Qayyum, Dr. Usman Jamshaid and Mr. Riaz Ahmad Haraj were also present on the occasion.

9.6. Tree Plantation Campaign Launched at Jalalpur Pirwala Experimental Farm

Directorate of University Farms, MNSUAM organized a Tree Plantation Campaign at Jalalpur Pirwala Experimental Farm on August 6, 2021. Tree plantation was inaugurated by Mr. Mudassir Mumtaz (Assistant Commissioner, Jalalpur Pirwala), while Prof. Dr. Shafqat Saeed (Dean, FAES), Dr. Adul Ghaffar (Director, Uni. Farms), Dr. Asif Raza (Director, Estate Management) and Dr. Muqarrab Ali (Focal Person, Plants for Life Society) accompanied him. Directorate of University Farms and Plants for Life Society Team leaders highlighted the significance of trees for life and society. They urged that planting trees is not only the Sunnah of the Holy Prophet (PBUH) but also the way forward to overcome adverse effects of climate change. Mr. Mudassir Mumtaz said that tree plantation is vital for a clean and green environment. He appreciated the efforts of the University farm management in this regard. Prof. Dr. Shafqat Saeed said that tree plantation is essential keeping in view the global climate change scenario. Trees contribute to the environment by providing oxygen, improving air quality, climate amelioration, conserving water, preserving soil, and supporting the wildlife. Dr. Abdul Ghaffar said that we are planting more than 20,000 multipurpose trees here this Monsoon season. Afterwards, each faculty member accompanied by a number of students continued this plantation drive by planting several hundreds of saplings.

9.7. Webinar on the Eve of World Youth Day

The Department of Public Relations and Senior Tutor Office of MNSUAM organized a webinar on the eve of World Youth Day on August 12, 2021. Prof. Dr. Asif Ali (T.I), Vice Chancellor was the chief guest of this event while, Mr. Azam Malik, Motivational Speaker and Poet was the keynote speaker. Prof. Dr. Asif Ali said that we should educate our youth in a manner that they can serve the nation professionally. We always try to engage our students in such seminars and activities, which on one hand educate them about society's obligations towards them and inculcate the sense of being responsible citizens on the other hand. Mr. Azam Malik postulated that the youngsters can play a vital role in the development of the country and they should do what they prefer to do and have the decision power to choose the right career and goals. He further said that we should adapt the model of Iqbal's Shaheen, if we really want to succeed in life. Dr. Mirza Abdul Qayyum and Mr. Naeem Toor also spoke on the occasion and said that if China and USA can bring economic revolution, then Pakistan has also great potential since most of its population comprises young people full of innovative ideas and energy. They urged the youth to become successful entrepreneurs instead of becoming job seekers. Dr. Usman Jamshaid and Mr. Riaz Ahmad Hiraj along with students of various societies participated in the webinar.

9.8. Independence Day Celebrations and Plantation Drive

Pakistan's 74th Independence Day Celebrations Ceremony was held on 14th August, 2021 at the main campus of the University as well as Jalalpur Pirwala Experimental Farm. The Vice Chancellor, Prof. Dr. Asif Ali, hosted the national flag followed by the national anthem. Large number of students, faculty and officials were present at the moment. Later on, flag hoisting ceremony and tree plantation campaign were held at Jalalpur Pirwala Experimental Farm. The event was graced by Mr. Hussain Jahania Gardezi (Minister for Agriculture, Punjab), Mr. Saqib Ali Ateel (Secretary Agriculture, South Punjab) and Mr. Barak Ullah (Additional Secretary Agricultural Task Force) and many other notables from South Punjab Agriculture Forum.

A large number of faculty members and students from MNSUAM participated in this campaign and planted numerous trees under the auspices of Plants for Life Society and Directorate of Farms. Mr. Hussain Jahania Gardezi also inaugurated the new building of the Training Centre at Experimental Farm, Jalalpur Pirwala. He said that following the agenda of faith, discipline, and unity suggested by great Quaid-e-Azam, we can develop our nation to embrace any challenge. He added that self-belief and proper planning is the key to achieve any task. It is the responsibility of the youth of this country to come forward and lead its way to prosperity and success. Afterwards, the Dramatic Club of MNSUAM performed various national songs, skits and dramas on themes related to Independence of Pakistan. The memorable performances of the students were lauded by participants in the ceremony. The participants applauded the pace of developmental work and congratulated University Administration for organizing this event in the newly established building and prayed for further success. The Vice Chancellor appreciated the faculty and administrative staff for organizing such a wonderful event and cherished all activities. The faculty members and administrative staff also brought their families and children in the ceremony, as well as a large number of students attended the event.

9.9. Defence Day Celebrations

The Defence Day of Pakistan (6th September) was celebrated with traditional fervor and solemnity at the University. The day is a special memorial to the military forces of the country that were at the very center of the battlefield in the war against India in 1965. A seminar entitled "Role of Women in the Peace Development" was organized by the Directorate of Student Affairs in collaboration with the District Women Peace Forum. Ms. Sabeen Gul, Member Provincial Assembly was the chief guest of the event. She said that the role of women is always vital for a country's prosperity. They not only participated effectively in the Pakistan Movement but also in the defense of the country. Prof. Dr. Asif Ali, while addressing the audience, said that we celebrate this day not as a memorial of war but as a commemoration of the resilience of our armed forces and the people who sacrificed their lives for their motherland. We need to be as strong and united as we were during those days, in order to face the threatening challenges Pakistan is currently facing. Unprecedented sacrifices were rendered to achieve this homeland and the nation is still ready to sacrifice everything for its development and existence. We salute to those mothers who gave birth to the brave soldiers for this homeland. Prof. Ali further said that the youth of Pakistan are our future therefore they should work hard with devotion and discipline to make the country developed and secure in the era of 5th generation war and non-traditional security threats. Students of Music Club and Dramatic Society paid special tribute to the martyrs of 1965 war who defended geographical borders of the motherland boldly and courageously defeated the enemy squarely on the ground, in air and on the sea. The students, through their performances, sent a message that we need to keep reminding the new generations about how the armed forces of Pakistan, solidly backed by the entire nation, had defeated the Indian invaders.

9.10. Webinar on Addressing Zinc Deficiency through Biofortification of Wheat in Pakistan

MNS University of Agriculture Multan is leading from the front to meet the challenges of food security and malnutrition in the region. Office of the Research and Innovation, MNSUAM and HarvestPlus, Pakistan organized an awareness webinar on zinc biofortification in wheat on September 14, 2021.

The event was chaired by Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM who said that food as well nutritional security are big challenges of developing countries like Pakistan. Biofortification is the need of the time and should be considered on priority basis as part of crop improvement programs, he further added. Dr. M. Yaqoob, Country Manager HarvestPlus, explained the role of HarvestPlus in promoting zinc biofortified wheat in the country. He pointed out that the first zinc wheat variety, Zincol-2015, provided to the farmers at the onset of the wheat season 2015-16, and mass produced through our partnership with public and private seed multipliers and farmers. Initially, we are focusing on multiplying and providing zinc wheat seed through a selected number of partners to target home production and consumption. We are also setting up demonstration plots in all provinces, and providing seed at subsidized rates to small and medium scale farmers. Public awareness campaigns, including trainings, meetings, field days, and the media, are helping to educate farmers on the benefits of zinc wheat. Prof. Dr. Hammad Nadeem Tahir, Prof. Dr. Zulfiqar Ali, Prof. Dr. Irfan Ahmad Baig from MNSUAM and Mr. Munawar Hussain, Dr. M. Imtiaz, Dr. Makhdoom Hussain from HarvestPlus, Ch. Faiz Rasool from GAIN, Pakistan, Dr. Javed Iqbal, from AARI, Faisalabad and Mr. Shahzad Sabir, Director Agriculture Extension, Multan also participated in the event. It was agreed upon that the effective linkages and cooperation between academia, research and industry will lead to the development of biofortified food crops in future.

9.11. Promotion of Peace and Pluralism in Society

To mark the International Peace Day on September 21, MNS University of Agriculture Multan organized series of events. On September 21, 2021 an interactive seminar was organized in collaboration with NAB Multan division. As the continuity of the activities regarding peace and leadership at campus, the Community Theatre and Mutual Learning event was organized on September 27, 2021. Human Health, Research and Welfare Associations as a partner to MNSUAM invited youth representatives from Union Council, Bosan Road so that youth representatives from local rural communities can avail an opportunity to learn from the skills of Dramatic Club members of MNSUAM. While addressing the audience, Dr. Mirza Abdul Qayyum (Focal Person, Peace Portfolio) reiterated the vision of the University. He further informed the community about how MNSUAM laid the foundation of peace and leadership at campus through positive engagements. He declared that the key to success for achieving the status of a model institution is through youth engagement in a vibrant and fruitful manner. Dr. Usman Jamshaid (Senior Tutor) stated that along with scientific advancement, learning the skills and real soul of arts is mandatory to lead a peaceful life. Mr. Mahfooz (Project Officer) Human Health, Research and Welfare Associations appreciated the efforts of the University for keeping its identity and recognition on the way to peace and leadership. Representatives from Union Council, Boson Road presented their theatrical skills on stage and later, the students from Dramatic club showed their talent. The last component of the program was the discussion on thought sharing on mutual learning. This session was exclusively organized for youth from the rural area of Bosan Road to provide them a chance to learn from the students of the University.

9.12. World Egg Day Celebrated at MNSUAM

World Egg Day was observed on October 8, 2021 by the Faculty of Veterinary and Animal Sciences, MNS Agriculture University Multan.

World Egg Day is celebrated to make people aware of the nutrients present in eggs and inform them about the benefits of its consumption. Prof. Dr. Asif Ali (T.I) said that eggs must be considered the essential part of our dietary intake. He said that eggs are a high value food and it also decreases the risk of many diseases. Egg consumption can help against malnutrition which is a global problem. He appreciated the organizers for such a wonderful event and congratulated Dr. Asif Raza and his team. Commendable stalls were set up by the students adorned by egg shell models, egg dishes and other value added products. The event was made colorful by vivacious and enthusiastic participation of students.

9.13. World Polio Day

The Office of the Senior Tutor, MNSUAM, Rotaract Club, BZU and Rotary Club, Multan Cantt jointly organized a ceremony to mark 'World Polio Day' on October 24, 2021. Mr. Salman Mubarak, CEO Fazl-ur-Rehman Hospital was the Chief Guest. The aim of celebrating this day was to raise awareness among youth regarding the anti-polio campaign so that they may educate people to keep away from this dangerous disease. Mr. Salman briefed that polio is a critical disease for present and future generations and it needs to be uprooted. He urged the youth to play an active role in eliminating this crippling disease and asked them to take part in all activities to create awareness and vaccination. He disclosed that his hospital is organizing awareness seminars at different places to contribute to the creation of a healthy society. Members from Rotary Club while addressing the seminar advocated that timely vaccination can save our generations from this deadly disease. Dr. Usman Jamshaid, Senior Tutor elaborated that Pakistan is one of those countries where polio has been controlled to a great extent in Pakistan and by the grace of Almighty Allah, the disease will be eradicated soon. We need to work together with utmost dedication to prevent our coming generations from disability. To mark the event, a polio walk was also organized in which a large number of students and faculty participated.

9.14. Seminar on the Eve of World Teacher's Day

A seminar on "World Teacher's Day" was held at Multan MNS Agricultural University on October 5 2021, under the auspices of the Department of Public Relations and the Directorate of Student Officer. The seminar was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I), while, the guest speaker was Khawaja Mazhar Siddiqui (Life Coach and Motivational Speaker). Prof. Dr. Asif Ali appreciated the students' gesture of honoring their teachers. He expressed that such initiatives of students' engagement will definitely send a positive message to the outside community in line with the vision of the University. He said that during the pandemic, our teachers have kept the classes going, conducted exams, completed academic sessions, carried out complex standard operating procedures (SOPs) to keep everyone safe when universities reopened and, most of all, helped their students to cope with the pressures of the 'new normal'. It is because of these efforts that teachers around the world are being celebrated and recognized on World Teachers' Day with the theme “Teachers at the heart of education recovery”. He congratulated Prof. Zulfiqar and reinforced his commitment for capacity building of the faculty and students in a way that they can achieve excellence in their career. Khawaja Mazhar Siddiqui acknowledged that no development is possible without teachers and I wish that every teacher should be a star teacher. Teachers are also the guides who play an important role in transforming a student into a responsible citizen.

They serve selflessly and help us reach our destiny. The contribution of teachers towards nation building can never be undermined. Addressing the seminar, Prof. Dr. Zulfiqar Ali (Winner of HEC Best Teacher Award) said that teachers teach their students just like their own children. Parents give birth to a child whereas teachers shape their life and character and make their future bright. Teachers let us know the importance of education in our life through their continuous efforts. It is the job of the teachers to bring out the hidden talents in the students. The professional skills of teachers will be improved through their capacity-building so that students could be given quality education. At the end of the seminar, Prof. Dr. Irfan Ahmed Baig, Principal Officer, Public Relations, also addressed the gathering and thanked all the guests and students for attending today's event and said that students should respect their teachers as the status of a teacher is like that of a spiritual parent so the teachers should also treat their students with compassion.

9.15. MNSUAM Celebrated World Food Day

World Food Day is an international day celebrated every year worldwide on October 16 to commemorate the founding of the United Nations Food and Agriculture Organization in 1945. World Food Day 2021 was organized by the Department of Food Science and Technology on the theme, *"Our Actions are our future – Better production, better nutrition, a better environment and a better life"*. Prof. Dr. Asif Ali, Vice Chancellor, presided over the ceremony and Mr. Zulfiqar Ali (CEO, Volka Foods) graced the seminar as Chief Guest. The purpose of observing the day was to increase awareness of the need to alleviate hunger from the world. While addressing the participants, Prof. Dr. Asif Ali elucidated the different components of the theme for the celebration, noting that the contribution to change lies with people. He encouraged the participants to be actively involved in shaping the food systems since the way food is produced, cooked and preserved are integral parts of how the agricultural food systems work. He laminated that we have fallen prey to different diseases because of unhealthy and imbalanced diet. We should consume a variety of food instead of a monotonous diet. Natural food is always a source of a physically strong body and many diseases had emerged due to unnatural and imbalanced diets. He further mentioned that we have left our traditional diets like gram, corn-flour bread, millet etc. which were full of energy and healthy nutrients. He urged that we must revive our traditional foods and avoid processed food to remain healthy and active. Mr. Munawar (HarvestPlus) educated the participants on the importance of balanced nutrition and advised them to reduce the uptake of processed foods. He announced an alarming situation regarding an increase in diabetic patients in recent years. He also informed the audience about the importance of different ingredients of food, their nutritive value and effects on the human body. Major Tariq Khan emphasized that people must avoid junk food; particularly children should be encouraged to eat more vegetables and fruits instead of artificially processed edibles. Mr. Zulfiqar Ali informed the participants about the importance of a healthy and balanced diet. He further said that we are professionally and morally bound to avoid wastage of food and it is our duty to preserve additional and left-over food technically and to supply it to poor and deserving people. He added that to stop wastage of fruits and vegetables, the food processing industry should play its due part by developing value-added products. A large number of students and faculty members were also present at the event.

9.16. Awareness Seminar on Breast Cancer

To mark Pink Day, an awareness seminar on breast cancer was organized jointly by MNSUAM and Nishtar Medical University on October 22, 2021 with reference to 'Pink Day'. The seminar was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I), while, the chief guest was Prof. Dr. Ahmed Ijaz Masood (Nishtar Medical University). Dr. Ijaz spoke and educated the audience on the topic. He discussed different aspects of breast cancer including an elaborate dialogue on its causes, symptoms, treatment options, self-examination and preventive measures. He dismantled all myths and overcame taboos concerning breast cancer and gave the audience the entire spectrum of the topic on the basis of factual accuracy. He urged that females should not only get their regular medical checkups but also should be aware of how to diagnose a disease. He further said that women above 40 years of age should have a mammography test once a year to avoid problems. Prof. Dr. Asif Ali encouraged the participants to pass on this important and valuable information to combat breast cancer. He said that Pakistan has the highest incidence of breast cancer in Asia.

9.17. MNSUAM Observed Black Day to Express Solidarity with Kashmiris

Faculty and students of the MNSUAM observed Kashmir Black Day on October 27, 2021 expressing solidarity with oppressed people of Kashmir who are struggling for their freedom for many decades. A Kashmir cause seminar was organized by the Senior Tutor Office and Directorate of Student Affairs to show solidarity with the people of Kashmir wherein speakers highlighted the Kashmiri Freedom Movement and condemned brutal occupation of Indian forces. The Vice Chancellor, Prof. Dr. Asif Ali addressed the participants and said that the issue of Kashmir is bone of contention between the two countries and we need to try more seriously towards its pragmatic solution. The people of Kashmir want freedom, which is their basic right. On this occasion, Mr. Rasheed Ahmed, Lecturer, MNSUAM gave a thought provoking lecture on Kashmir from a historical perspective and enlightened the participants on the situation in the aftermath of revocation of article 370 and 35A of Indian constitution. He said the Pakistani nation would stand by Kashmiri brethren until the realization of their rights to self-determination. Kashmiris cannot be deprived of their right through brutalities of the Indian army. He said we salute the struggle of independence of Kashmiri brothers and sisters and the Pakistani nation would continue their moral and diplomatic support.

9.18. Iqbal Day Celebration

Iqbal Day was celebrated at MNSUAM with national fervor to pay homage to Dr. Allama Muhammad Iqbal on November 9, 2021. A seminar and literary meeting on this occasion was organized at MNS Agricultural University under the auspices of the Literary Club, and the Public Relations and Publication Department. Prof. Dr. Syed Zafar Abbas was the guest speaker of the event. Prof. Dr. Asif Ali while addressing said that students should be made aware of Iqbal's thoughts and moral character. Our survival and prosperity lays in Iqbal's ideology, which is derived from Quran and the life of our Holy Prophet, Hazrat Muhammad (PBUH). He highlighted the vision of Allama Muhammad Iqbal who laid the foundation stone of the Pakistan Movement and how he provided Muslims of the Sub-Continent guidance towards the development of a separate state.

The guest Speaker highlighted the universal message of Allama Iqbal and his philosophy of self-consciousness, empathy, social sensitivity and concern for all human beings. He urged that Iqbal's ideology of freedom was the foundation of the ideology of Pakistan and it is the need of hour to change and amend ourselves as per Iqbal's message. He was a candle for those who were born in the time of decline of Muslims but instead of lamenting, he taught them self-knowledge, unity and thought process. He advised the students that they should seek direction from Allama Iqbal's poetry and follow it to achieve goals for which the country was created. A large number of faculty and students attended this event.

9.19. Event to Mark the World Science Day

World Science Day for Peace and Development was celebrated at MNSUAM on November 10, 2021 to raise awareness of the benefits of science worldwide. To mark the event, a seminar to highlight the significant role of science in society and the need to engage the wider public in debates on emerging scientific issues was held. With climate change becoming a serious threat to the lives of billions of people and the planet, this year's celebration highlighted the importance of “Building Climate-Resilient Communities”. The event was presided over by the MNSUAM, VC, Prof. Dr. Asif Ali (T.I). Prof. Dr. Zulfiqar Ali discussed in detail the global climate change and the disasters affecting Pakistan in particular. He also presented recommendations for innovation in agriculture and environment conservation. Dr. Habib-ur-Rehman, an agronomist on climate change, formulated recommendations for making agriculture more resilient against climatic disasters. He provided awareness to the students about climate change and how to deal with it. Dr. Ayesha Hakim presented recommendations for better awareness and coping with seasonal disasters through the adoption of modern technology. Debate and poetry competitions related to the event theme were also held wherein students from different clubs and societies participated. Prof. Dr. Asif Ali (T.) in his concluding remarks said that scientific development in agriculture, medical, information technology and other fields would make the country prosperous. He urged that youth need to be aware of the effects of the greenhouse effect. He laminated over the concerns of food security, which could emerge as a serious non-traditional security threat in the future. The youth should not only think of passing exams but also focus on learning and conducting research in science. He further emphasized on the need for joint efforts to create a society free from climate disasters. Everyone has a duty to make the environment better and safer, he added.

9.20. Awareness Seminar on HIV AIDS

On December 4, 2021, an awareness seminar on International AIDS Day was organized by the hostel management at MNS Agricultural University. The seminar was presided over by Prof. Dr. Asif Ali, Vice Chancellor (T.I) while the guest speaker was Dr. Nusrat Buzdar (Child Specialist, Nishtar Medical University). A large number of students participated in the awareness seminar. Addressing the seminar, Prof. Dr. Asif Ali said that it is our moral and social responsibility to create awareness about the prevention and control of the spread of this disease. People with the disease need to be encouraged to acknowledge rather than be intimidated so that they can live the rest of their lives proudly as active citizens. Speaking on the occasion, the guest speaker highlighted the responsibilities of the students for identifying and preventing the spread of this disease in the society.

HIV and AIDS is a disease that has always been kept as a secret and its existence in society is being misunderstood as a curse. HIV infected persons should not be treated harshly, instead they should be taken care of so that they may not feel odd during their treatment. He also informed the students about preventive measures to avoid HIV such as infusion of only tested blood from reliable sources, use of a new syringe each time and a new blade with the barber.

9.21. World Soil Day Celebrated

World Soil Day is held annually on December 5 as a means to focus attention on the importance of healthy soil and to advocate the sustainable management of soil resources. Department of Soil and Environmental Sciences, MNSUAM, celebrated World Soil Day wherein a large number of students along with representatives from the industry, farming community, and other stakeholders participated in the event. A poster and model competition among the students was held, where the students particularly highlighted the soil salinization as well as the approaches to reclaim the saline soils. While addressing the event, MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I.) said that soil and humanity have a direct relationship. However, with the indiscriminate use of fertilizers and other agrochemicals, we have deteriorated soil health. He further mentioned that developed countries have moved towards 'one health' concept, and holistic approaches have been adopted for addressing such issues. Prof. Dr. Tanveer ul Haq, Chairman, Department of Soil and Environmental Sciences, highlighted the different steps and strategies used by the Department for reclamation of saline soils as well as mitigating the increasing salinization of soils.

9.22. Seminar on 'Fikr-e-Iqbal'

A seminar on the topic of Fiqr-e-Iqbal was organized by MNSUAM on December 7, 2021. The special guest / guest speaker for the seminar was Sahibzada Sultan Ahmed (Dewan of Junagadh State & Chairman MUSLIM Institute). Prof. Dr. Asif Ali while addressing the seminar elaborated the importance of Fiqr-e-Iqbal and said that Iqbal's thought is a guide for the youth today. It contains comprehensive guidance on tourism, economy and society. He added that there is hope for the youth in Iqbal's thoughts. Our survival and prosperity lays in Iqbal's ideology, which is derived from Quran and the life of our Holy Prophet, Hazrat Muhammad (PBUH). His poems give a purpose to the youth, and create a practical impetus. Sahibzada Sultan Ahmad condemned the incident which took place in Sialkot- the city of Iqbal and said that any such action has nothing to do with our religion and its followers. No such inhumane act is allowed in the state that Iqbal envisioned. This country cannot be handed over to a mob of terrorists or extremists. He highlighted the universal message of Allama Iqbal and his philosophy of self-consciousness, empathy, social sensitivity and concern for all human beings. He urged that Iqbal's ideology of freedom was the foundation of the ideology of Pakistan and it is the need of hour to change and amend ourselves as per Iqbal's message. Allama Iqbal was a candle for those who were born in the time of decline of Muslims but instead of lamenting, he taught them self-awareness, unity and thought process. Iqbal's thought enlightened humanity and awakened man's self-esteem, and made him broad-minded with high moral values. He quoted Iqbal's books and poems by saying that Islam has a concept of equality, and uproots the concept of high and low. At the end, the students asked questions from the guest speaker. The event was attended by a large number of teachers, staff and students.

9.23. Personality Building in the Light of Islamic Teachings

A seminar on "Personality Building in the Light of Islamic Teachings" was organized by the Department of Agribusiness and Applied Economics at MNSUAM on December 8, 2021. Hafiz Farooq Ahmad Saeedi was the special guest of this seminar. He urged the students to follow the teachings of Prophet Muhammad (Peace Be upon Him) for true success. He said our Prophet (PBUH) focused on equality in society, rights of the poor, environmental protection and cleanliness. Our beloved Prophet (PBUH) used to treat people as equals irrespective of the fact that He stood at the epitome of prestige to be the last Prophet humanity could get. Societies are built on high values like tolerance, patience, forbearance, trust, honesty and forgiveness. Chairman of the Department Prof. Dr. Nasir Nadeem said that the Prophet (PBUH) is a glowing example for the whole world especially for the youth due to His high moral character and immaculate way of life.

9.24. World Fisheries Day

World Fisheries Day was celebrated by the Faculty of Veterinary and Animal Sciences on December 7, 2021. The purpose of celebrating this day was to create awareness about the importance of healthy ocean ecosystems and to ensure the sustainable stocks of fisheries in the world. Prof. Dr. Asif Ali (T.I), Vice Chancellor attended this event as chief guest. He talked to students and fish farmers on the importance of fisheries and aquaculture. He emphasized that the fish is the future protein and is the rich source of most refined easily digestible protein having all essential amino acids. In addition to making posters, models and speech competitions on Fisheries Day, the students presented skits on the importance of fish and the problems being faced by the industry. Food stalls presented different dishes made from fish. Fish farmers, hatchery managers, officials from Punjab Fisheries Department, faculty members and students attended this event. To mark the day, an awareness walk was also arranged to highlight the importance of fisheries for the nutrition and economy of Pakistan.

9.25. APS Martyr's Day Observed at MNSUAM

To pay tribute to the martyrs of Army Public School (APS), the students and faculty of MNSUAM observed 16th December as APS Martyr's Day with a pledge to root out terrorism from every corner of the country. Prayers, lighting up of lamps, candles, display of pictures of martyrs and 2-minute silence was observed to honor those who lost their lives in the cowardice attack. While talking to the participants, Prof. Dr. Asif Ali (T.I), Vice Chancellor said that six years ago on this day, the enemy attacked on the future of our country. We honor and recognize great sacrifices of our martyrs and those who were wounded and are determined not to allow such brutality to happen again. The best tribute to APS martyrs on this day is to continue untiring efforts against terrorism and promote education and peace in the country. We must also ensure safety of our surroundings and immediately inform the concerned authorities if we see any suspicious activity around us.

9.26. Hands-on Training in Water and Soil Analysis

The Punjab government is trying to provide farmers with the facility of quick analysis of water and soil at their doorstep. In this regard, the Department of Soil and Environmental Sciences of MNSUAM in collaboration with Engro Fertilizers, set up an Engro Mobile Laboratory for Soil and Water Analysis on December 18, 2021, where students were given hands-on training in water and soil analysis.

This mobile laboratory is providing free of cost analysis of important factors that determine soil health such as soil type, pH, salinity, micro and macro nutrient availability and organic matter. Experts in the field of Soil Science explained how the problems of the farmers can be solved by using this facility. This Mobile Laboratory will help the farmers to apply timely and balanced fertilizers in their fields based upon soil testing which will significantly increase crop productivity.

9.27. Seminar to Raise Awareness on the Issue of Violence against Women

A seminar on women's rights was organized at MNS Agricultural University on December 24, 2021. The main purpose of the seminar was to stop violence against women. The guest speakers of the seminar were Senior Psychologist Miss Munaza Mansoor and Assistant District Public Prosecution Miss Naila Danish. The seminar was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) who said that Islam provides women equal rights and protection. He further said that MNSUAM as an organization is making tangible efforts for the protection of women. Miss Manza highlighted that violence against women is one of the most widespread and devastating human rights violations in our society today. It largely remains unreported due to the impunity, silence, stigma, and shame surrounding it. She urged women to be positive in such matters and to speak out boldly against them and to show courage and be whistleblowers for others. Miss Naila Danish said that women should contact the Anti-Violence Center for such issues so that issues like violence can be resolved at the government level quickly. Dr. Ayesha Hakim and Dr. Nighat Raza came up with potential solutions including women empowerment by entrepreneurship and Islamic education.

9.28. First Chrysanthemum Exhibition

First Chrysanthemum Exhibition was organized by the Department of Horticulture, MNS University of Agriculture Multan from December 24-29, 2021. Chief Guest, Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM and Prof. Dr. Mansoor Akbar Kundi, Vice Chancellor, BZU inaugurated this flower exhibition. Thirteen different varieties of chrysanthemum were displayed in the exhibition. Cantonment Garden Multan, farmers and students of different universities like Islamia University Bahawalpur, Women University, Multan and Bahauddin Zakariya University, Multan participated in the exhibition. Different Rangoli competitions were also conducted during this event. Divergent groups of visitors attended this event and enjoyed it a lot. The Chief Guests appreciated and encouraged the university to conduct such events in future.

9.29. Greetings and Sharing Happiness on the Eve of New Year and Christmas

A cake cutting ceremony was held to mark the dawn of New Year and Christmas on January, 2022. The faculty, students, and administrative staff of MNSUAM along with the Vice Chancellor, Prof. Dr. Asif Ali (T.I) celebrated Christmas, and New Year 2022. The staff and students from Christian community in University were special guests of the event. The faculty members and administrative staff extended best wishes to each other for the New Year and enjoyed the special cake. The ceremony began with the teachings of Jesus Christ. Miss Ayman presented the moral teachings of the Bible. The Vice Chancellor said that MNSUAM always strives for promoting good citizenry, tolerance, and interfaith harmony.

All religions offer moral teachings for the betterment of humanity. Cultural diversity is the beauty of societies. Allah has created diversity, which promotes a good society through harmony. On this occasion, Dr. Rashid Ahmed said that Islam guarantees the protection of life, property, honor and faith of every citizen. All human beings are equal in terms of human rights, and there is no difference in terms of political and economic rights. Dr. Usman Jamshaid thanked all the participants.

9.30. Awareness Session on Cyber Crime

Department of Computer Science, MNSUAM organized an awareness seminar on cybercrime on January 21, 2022. The resource person was Mr. Muhammad Ali Hashmi, Assistant Director Investigation (FIA), Multan. He informed the audience that cybercrime is not only about the Internet and computers. It's more about behavior! ~~The~~ Internet has just made it easy to commit old crimes in a new way. The information and broadcast landscape has changed so we need new laws and policies to tackle this new threat. He said that an Act was enacted in 2016 to curb cyber and electronic crimes in Pakistan under which any victim of cybercrime has the right to legal action. He said that 90 percent of cybercrimes start with misuse of social media. Creating fake accounts on social media is illegal, creating an objectionable image of someone, sharing inaccurate information about someone, sharing someone's personal data or insulting someone's honor on social media and the internet are heinous crimes, he added. Mr. Muhammad Ali Hashmi guided the students about cybercrime and its types. He informed students and faculty members about the useful ways to protect themselves against cybercrimes and guided them where to contact in case of such an encounter. "If you are careful and cautious in answering an unknown call, SMS or email, you can avoid becoming a potential victim of cybercrimes," he said. He emphasized the efforts of FIA in the fight against cybercrime and shared success stories where the victim gets justice in a short duration of time with the help of FIA investigation team. Prof. Dr. Asif Ali (T.I) graciously participated in the event and interacted with students and faculty. He added that the present age is the age of digital and information technology, their use in every sphere of life is increasing day by day. Therefore, there is a need to prevent misuse of these facilities and use it for the welfare of humanity by behaving as good digital citizens.

9.31. Interactive Session on "Building Social Capital"

Department of Computer Science, MNSUAM organized an interactive Session on “Building Social Capital is Our Responsibility and Not a Choice" on January 25, 2022. Resource Person of this session was Mr. Salman Mubarak (Elected District Governor for Rotary international and CEO, Mian Fazal Rehman Hospital, an active health activist and member of Cadre of Technical Advisors of the Rotary Foundation). He is also a member of Paul Harris society and was awarded “Regional Service Award for a Polio Free World” by Rotary Foundation. He is solver ambassador, Elen Meadows Foundation, USA actively involved in provision prosthetic Hands free. Mr. Salman Mubarak shared his thoughts on the importance of building Social Capital earlier in life and the impact of Intolerance in society. He appreciated that MNSUAM, as the Varsity has always stood at the forefront to address the challenges of our society and is a trend setter in youth development and women empowerment. He encouraged the enthusiasm and curiosity of the students and emphasized on conducting such interactive sessions in future and educating the youth in specific, to empower society. Vice Chancellor, Prof. Dr Asif Ali (T.I) participated in the event enthusiastically and interacted with students and faculty on this very important topic.

9.32. Extending Outreach across Provinces: Growers from Sindh Visited MNSUAM

A delegation of farmers from Sindh Province visited MNSUAM on January 18, 2022. The delegation included Mr. Raheel Shah, Mr. Majid Ali, Mr. Junaid Haider Shah, Mr. Niaz Muhammad and Ms. Bilawal Gul. The main purpose of their visit was to discuss modern methods of farming and crop problems in Sindh. During the visit, Prof. Dr. Shafqat Saeed gave a detailed presentation on the development of the University from inception to date. He informed the guests that Varsity is providing community services through effective outreach programs, particularly focusing on capacity building of the farmers. Through Mango Small Tree System, growers from Sindh are linked with the Varsity. He stated that within a short span of time this University has earned excellent repute at national and international level. He also informed the participants about on-going developmental activities in the university and those which are successfully completed. The delegation appreciated the University's initiatives and acknowledged the efforts made for the noble cause of serving the farming community. They showed great interest in fruit fly traps and fruit fly baits. The delegation also expressed desire for holding hands-on training on sudden death of mango for Sindh farmers.

9.33. Career Counseling Seminar for Graduates

A seminar on Career Counseling was organized by the Department of Public Relations, MNSUAM on January 21, 2022. Guest Speaker was Commander Shamim Akhtar from the Pakistan Navy. Speaking on the occasion, Vice Chancellor, Prof. Dr. Asif Ali (T.I) said that education and career play a vital role in a person's life and a good teacher is one who strives to make students capable of surpassing his/her own level of excellence. Here at MNSUAM, the training and research work of the students is done in such a way that they can start their own businesses and be successful entrepreneurs rather than job seekers. Addressing the students, Guest Speaker Commander Shamim Akhtar said that three things are always crucial for success, one is hard work, the other is sacrifice, and the third one is patience. Education and career selection are very important in life. The guidance about these two fields is very important for the students because the young people with raw minds do not know what their abilities are and what strategies are needed to hone them. If students opt their interests as their fortes, they can be transformed into successful individuals. Students need to be guided from the beginning to choose the field according to their preferences and hobbies. Teachers and parents should give children the right to follow their own interests so that they can pursue their career with full zeal and zest.

9.34. Special Lecture on "The Risk Factors for Adverse Outcomes with COVID-19 Infections and Its Management"

Department of Soil and Environmental Sciences, MNSUAM in collaboration with the University Public Health Team successfully organized a special lecture on "The Risk Factors for Adverse Outcomes with COVID-19 Infections and Its Management" on January 27, 2022. The objective of organizing this timely and much-needed special lecture was the capacity building of the audience/participants for effective and timely management of risks associated with COVID-19 epidemic.

Resource person was Dr. Farhan Abdul Rauf, Consultant World Health Organization and a well-known Physician with a specialization in Public Health and Preventive Medicine, Rehabilitation, Disability, Chronic Illness, Patient Education, and Safety. During his lecture, Dr. Farhan informed about how COVID-19 epidemic differs from other allied diseases and what kind of problems an affected person can face. According to Dr. Farhan, the COVID-19 mortality rate was higher in those patients who had a previous history of medical illness or faced malnutrition problems. In this regard, he shared his experiences from Afghanistan, Belarus, Moldova, Pakistan, Poland, Romania, Somaliland, Tajikistan, Ukraine, Uzbekistan and Yemen. Dr. Farhan motivated the audience to focus on a balanced diet with a change in lifestyle to avoid the prevailing threat of COVID-19 epidemic. Prof. Dr. Tanveer-Ul-Haq, Chairman Department of Soil and Environmental Sciences shared the experiences about COVID-19 epidemics, whereas Prof. Dr. Muhammad Asif Raza, Chairman, Department of Veterinary and Animal Sciences talked about the strategies adopted by the MNSUAM during COVID-19. Prof. Dr. Junaid Ali Khan, Dr. Unsar Naeem Ullah, Dr. Muhammad Usman Jamshaid, Dr. Ahmad Mahmood, Dr. Muhammad Imran, Dr. Wazir Ahmed, Dr. Shakeel Ahmad, Dr. Muhammad Baqir Hussain, Dr. Umair Waqas, Dr. Mirza Abdul Qayyum, Dr. Atif Rehman, students, and other staff actively participated in this capacity building activity.

9.35. Kashmir Solidarity Day

To express solidarity with the people of Kashmir, a special ceremony was organized by the Senior Tutor Office. The event was part of three day activities at the University. During the three-day activities, the Dramatic Club, Media Club, Debating Club, Calligraphy Club, Qirrat and Naat Club of the University highlighted the Kashmir issue through their performances. The Vice Chancellor, Prof. Dr. Asif Ali addressed the participants and said that the issue of Kashmir is the bone of contention between Pakistan and India, which requires understanding of the human cause for its pragmatic solution. The people of Kashmir want freedom, which is their basic right. He further said that India's economic progress is far ahead of Pakistan and if we want to get Kashmir free then we should strive hard to become strong enough, so that the world could give importance to our stance. He added that the scenario has changed and this information age calls for coping with growing modernization, enhancing our communication skills and moving in the right direction. On this occasion, other speakers gave thought provoking lectures on Kashmir from a historical perspective. They argued that Kashmiris have their own culture and heritage and it is their fundamental right to express themselves through self-governance. At the end of the event, a solidarity walk for Kashmiri brethren was also organized, wherein students and faculty members participated.

9.36. Training for Tractor Operators

A hands-on training for tractor operators was organized by the Department of Agricultural Engineering at MNS Agricultural University Multan. The trainer of this workshop was Mr. Mushtaq Ahmed, Former Deputy Manager Al Ghazi Tractor. He explained the daily, weekly and monthly maintenance of the tractor and imparted training on different parts of tractors and their better use. He also guided the participants about troubleshooting while using tractors in the field. He further said that only by getting complete information of the tractor, one can get maximum benefit by using minimum fuel.

Dr. Sarfraz Hashim, Chairman, Department of Agricultural Engineering, while informing about the importance of tractors and its maintenance, said that proper maintenance of tractors can save diesel and parts every year. On this occasion, Mr. Mumtaz Khan Manais (Progressive Grower and Ex-member, MNSUAM Syndicate) appreciated the tireless efforts of Mr. Mushtaq Ahmed and vowed to conduct such training in future also.

9.37. Plant for Pakistan Drive

Plant for Pakistan Day was celebrated at MNS Agricultural University under the auspices of Plant for Life Society on February 22, 2022. A large number of male and female students participated in this activity. An awareness walk was conducted on campus at the beginning of the program, after which the students briefed the participants on their project. They urged that planting trees is not only the Sunnah of the Holy Prophet (PBUH) but also the way forward to overcome adverse effects of climate change. Participants took an active part in the tree planting campaign on campus and planted numerous trees to mark the Plant for Pakistan Day. At this occasion, Prof. Dr. Asif Ali (T.I) said that planting trees is vital to sustain life and keep the environment clean and healthy. Trees are essential to support life and enhance happiness. He further said that MNSUAM has always actively participated in tree plantation campaigns. “We, as an Institution, have planted thousands of trees in many schools of Multan under "One Child, One Tree” and "Clean and Green Pakistan" projects. Moreover, we have planted trees on the Old Shujabad Road, and this activity has brought a pleasant change in the environment of the whole area”. He urged all teachers, staff and students of the University to plant trees as a fulfillment of their national duty.

9.38. International Women's Day 2022: Break the Bias

The International Women's Day was observed on March 8, 2022 at MNSUAM to celebrate and acknowledge the role and achievements of women. The motive behind observing the day was to honor the women associated with MNSUAM and provide information to the people about women's rights and highlight their importance in the society. At this occasion, the female students of the University pasted sticky notes to pay tribute to popular women of Pakistan. The students also participated in an awareness walk and seminar held in this connection. The participants at the events highlighted the role of women in the social and economic life of the country. Speaking to the participants of the seminar, Prof. Dr. Asif Ali, Vice Chancellor, said that Quaid-e-Azam, Mr. Muhammad Ali Jinnah always presented himself as a modern Muslim leader and had a clear point of view that women could not be confined to their households. He added that today we need to make a promise that we'll honor our women and give them the respect they deserve. He acknowledged that women have special working capabilities and they have played a vital role in the success story of this institution. He further emphasized on women's role in the development of the country while working side-by-side with men in every field and without any fear. Women empowerment is a prerequisite to achieve sustainable development and prosperity in Pakistan, he added further.

9.39. Plantation Drive at Jalalpur Pirwala

Plantation Drive was inaugurated at Jalalpur Pirwala Research Farm under the auspices of Plant for Life Society, MNSUAM and Tehsil and District Administration, Multan.

More than 5,000 saplings were planted in one go on March 22, 2022. Students of MNSUAM, Punjab College, Qadeer Public School, Professor School and College, Higher Secondary School, Scholars College, Jalalpur Pirwala Public School participated in the plantation drive. On this occasion, Prof. Dr. Asif Ali (T.I) emphasized on the usefulness of trees in the context of current climate change. The Chief Guest, Deputy Commissioner Multan Mr. Amir Karim Khan urged the students to take care of the trees and make the Tehsil Jalalpur Pirwala green by planting more and more trees.

9.40. World Water Day

A one-day training workshop to mark the World Water Day was organized at MNSUAM on March 22, 2022. The event was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). Addressing the workshop, Prof. Dr. Asif Ali said that modern research and technology must be adopted to meet the anticipated challenges of water scarcity. Stressing on the importance of water, he said that there is a direct link between productivity, economy and water. Improving it over time is essential for the development of the country. He further informed the participants that MNSUAM has made remarkable progress by successfully reclaiming and cultivating 500 acres of barren land having brackish underground water. Dr. Adnan, Associate Professor, Comsat University said that 60% of fresh water in Pakistan is obtained due to melting of glaciers which is used for irrigation in the country. Dr. Muhammad Ashraf, Assistant Professor, Khawaja Fareed University of Engineering and Technology, briefed the participants on the basic uses of Geographic Information System and Remote Sensing by pointing out the glacier waterways and their reservoirs via satellite. At the end of the workshop, Chairman, Department of Agricultural Engineering, Dr. Sarfraz Hashim thanked all the participants and the World Wildlife Fund and said that the water needs of the growing population could be met with better water management. An awareness walk on the importance of water was also conducted after the training in which a large number of students participated with various posters and banners.

9.41. Pakistan Day Observed with National Fervor

To mark the Pakistan Day, a colorful program was organized by Directorate of Students Affairs at MNSUAM, wherein students presented tableaux, sang national songs and took part in debate competitions. The participants recited the Holy Quran and prayed for the prosperity of our motherland. The students warmed the hearts of the audience with their melodious songs. Highlighting the need for coexistence, tolerance and humanity, MNSUAM Vice Chancellor, Prof. Dr. Asif Ali referred to the speech of the Quaid-i-Azam after independence in which he had stressed equal rights to every national of the country. He said: “We have not only to follow the teachings of our Quaid but practically we have to demonstrate it with our actions and deeds.” He said it was the need of the hour that every Pakistani should work with the same zeal and zest with which the independence of Pakistan was achieved. Director Business Incubation Center Prof. Dr. Mubashir Mehdi said that now after the creation of Pakistan, it is our duty and responsibility to take our country forward without leaving our faith, culture, and identity. We need to remove all differences for peace and harmony, it is high time to get rid of all those ills which divide the nation and affect the national spirit. A large number of faculty members and students attended the event with great enthusiasm and show of loyalty for Pakistan. On the occasion, the Plant for Life Society of MNSUAM and the management of Dream Garden, Multan jointly planted more than 200 saplings.

9.42. Kissan Dost Mela

MNS University of Agriculture, Multan organized the Dunya Kissan Dost Mela in association with the Dunya News Group from March 25-27, 2022. The event was inaugurated by Governor, Punjab, Chaudhry Muhammad Sarwar. Three-days event aimed at bringing the farmers, agriculture scientists, academia, and industry on a single platform to understand the challenges and issues faced by agriculture in Pakistan. The key objectives of the event were to showcase latest innovations and farming techniques in the agriculture sector; to highlight the need of integrating technology into farming practices for greater yields, to enhance the quality of products and services to meet local and international standards, to contribute efficiently to the national development for a better economy and to discuss and highlight the genuine issues of farmers. The event was organized to attract expert resource persons in the field of agricultural investment, banking, agricultural engineering services, plant protection regulatory services, veterinary service, livestock, fish farming, animal breeding, commercial farming and agricultural extension services. The particular feature of this event was farmer oriented seminars (cotton seminar, wheat and pulses seminar, seminar on managing dairy cattle under high input system) which included informative lectures by the renowned subject experts and thought provoking discussion and question answer sessions. An exhibition of colorful flowers was also part of this event. Fakhr e Pakistan Dangle, Cultural and Folk Music Show, South Punjab Debate Competition, South Punjab Qirat and Naat Competition, Smart Food Festival, Cholistan Cultural Show, Agriculture and Industrial Exhibition, Book Fair, Camel and Goat Show, and Marathon Race were other key activities held during this mega event.

Chaudhry Muhammad Sarwar informed the farmers about the support price policy of cotton. He stressed that this initiative would increase the production of cotton and at the same time in the area under cultivation. He also congratulated the MNSUAM and Dunya Group on the successful organization of this mega event. While addressing the audience, Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM highlighted various initiatives being undertaken to address cotton crises in the province. We are not here for the sheer promotion of academics, but to ensure the translation of theoretical knowledge into practical applications, and most importantly for community service through effective outreach programs, he added. Mr. Iftikhar-ul-Hassan thanked all the stakeholders who fully cooperated in making this farmers' fair a success. At the end, the speakers of seminars were presented with souvenirs of appreciation.

9.43. First April Celebrated as "April Cool"

An April Cool Day event was organized at MNSUAM on the occasion of 1st April with the joint efforts of Literary Club and Plant for Life Society in which about 200 plants were planted by the students and teachers of the University. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) especially participated and appreciated the tree planting campaign. He said that MNSUAM recognizes the strong connection between a healthy planet and healthy people. With the thought of fostering a green environment where people can thrive and breathe easy, we have launched the 'April Cool' campaign. He urged all teachers, staff and students of the University to plant trees as a fulfillment of their national duty. To mark the event, an awareness walk was also organized. On this occasion, Convener Literary Club, Dr. Unsar Naeemullah highlighted the importance of plants with a poem by legendary poetess Parveen Shakir.

He said that cutting of trees is not only destroying our environment but is a major cause for climate change and global warming. If we want to survive, then we must stop cutting trees in the name of urbanization. The students created a mystic spell of literature by presenting ghazals and poems on trees, optimism, and affection for plants. Chairman, Department of Horticulture, Dr. Tanveer Ahmed said that our mission is to make the MNSUAM green, whether it is Jalalpur Pirwala or the main campus. It is the duty of everyone, including the students, to plant trees and protect them. Dr. Muqrrab Ali, Convener, Plant for Life Society, apprised the audience of the commitment to plant trees and Green Pakistan. At the event, all the participants pledged to work together to make Pakistan clean and green.

9.44. Celebration of World Earth Day

World Earth Day is celebrated on April 22 every year. On this occasion, events are held around the world to raise awareness of environmental protection. The day was first observed in 1970 and is now celebrated annually in more than 192 countries under the auspices of the Earth Day Network. In this regard, Earth Day was celebrated at MNSUAM under the auspices of the Department of Soil and Environmental Sciences. A walk was also organized on the occasion, which was attended by Vice Chancellor Prof. Dr. Asif Ali (T.I), Chairman of the Department of Soil and Environmental Sciences, Prof. Dr. Tanveer-ul-Haq, other teachers and a large number of students. Speaking on the occasion, Prof. Dr. Asif Ali said that all such days are of great importance, and as our lives are directly and indirectly connected with the earth, we must do our best to protect the earth. He laminated that environmental pollution and irresponsible use of land resources have created numerous problems around the world. The purpose of celebrating world earth day is to spread awareness about the damage caused to the earth by environmental pollution and to create awareness among the people for the environment. He said that environmental pollution and Climate change are major challenges. He appreciated the efforts of the Department of Soil and Environmental Sciences and reiterated the need for a discussion forum of all stakeholders for land conservation. Prof. Dr. Tanveer-ul-Haq in his address said that earth is our common home and the purpose of celebrating this day is to raise awareness globally that a better ecosystem is essential for life and stability on earth. He said that factors affecting the natural environment must be overcome for a better quality of life. He added that the Department of Soil and Environmental Sciences has included the need and importance of all such days in the updated curriculum. At the end, the audience and guests reiterated the environmental protection efforts of MNSUAM and intended to continue such initiatives in future also.

9.45. Seminar on Road Safety

A seminar for awareness on 'Road Safety' was organized by Transport Officer Maj. (R) Safdar Hussain in collaboration with Students Affairs and National Highway Police. The special guest of the seminar was DIG Motorway, Chaudhary Muhammad Saleem, while Ch. Nadeem Ashraf Waraich, Superintendent Police/Sector Command N5 Central II, Multan was the key speaker of the event. The seminar aimed at enlightening the students on the importance of safe driving by following traffic rules and basic principles of road safety. Addressing the participants, Chaudhary Muhammad Saleem said that reducing the alarming rate of human casualties on the roads is the responsibility of all road users.

From today, we have to make a commitment to obey the traffic laws in the context of taking care of the lives of all human beings, including our lives, especially while driving. Avoiding speeding and fastening seat belts can save human lives. Mr. Nadeem Ashraf Waraich said that we must always follow the instructions given on road-signs while driving a vehicle. Motorbike is a two-person vehicle; it should not be ridden by three people. Females should also wear helmets while riding a bike. Don't over speed and if someone troubles you while traveling, dial NHA helpline 130 immediately. Turn your headlights dim during night time. The NHA Police regularly imposes fines on those who don't follow traffic rules in order to teach them a lesson. He said that human life is very precious; therefore, we must take acute care while driving on the road. He informed the audience that there was a Fatwa issued in Saudi Arabia that not following the road signs is against Islamic teachings. Motorway officials gave a detailed presentation on road safety measures and emphasized on not using cell phones while driving. They informed that most of the accidents now-a-days have occurred due to use of cell phones while driving. Prof. Dr. Asif Ali, Vice Chancellor added that students' safety is our first priority and this seminar is specially organized for their education on road safety. He mentioned that taking small precautions while traveling can avoid fatal accidents. He added that accidents are increasing day by day due to violation of traffic rules and improper speed. Furthermore, we should realize our collective responsibilities and follow the driving rules ourselves and take care of others as well. A large number of faculty and students attended this event. At the end, safety helmets were distributed among students.

9.46. Special Sermon on Social Impacts of Ramadan

A special sermon on "The Month of Ramadan and its Social Impacts" was held April 22, 2022. The objective was to highlight the significance of this Holy month and its impact on human lives and the society as a whole. It was part of the consistent efforts projecting the teachings of 'Quran and Sunnah' through educational pursuits and by holding seminars. As a keynote speaker, Mr. Rasheed Ahmad (Lecturer, Islamic Studies) said that Islam has made comprehensive and integrated systems to train human beings so that they can play a pivotal role in the society. Ramadan is a chance to purify our souls and the spirit of fasting must be reflective in an individual's acts and deeds. He asserted that keeping a check on physical needs and desires leads to spirituality and sympathy for the deserving and needy sections of the society. He urged the need to highlight the equality and brotherhood among Muslim Ummah to pass on the true spirit of Islam and Ramadan. A large number of faculty members, administrative staff and students were present.

9.47. Public Health Nutritional / Medical Camp

A Public Health Nutritional / Medical camp was organized by the Faculty of Veterinary and Animal Sciences in collaboration with the Department of Food Science and Technology, ORIC and ACIAR Pulses Project-041 on May, 19, 2022. The purpose of the camp was to collect the data for the completion of research proposals by BS. Microbiology (4th semester), to advocate the healthy lifestyle, to identify the early signs of lifestyle diseases and the prevention recommendations to avoid the grave prognosis of life threatening ailments. The camp was a huge success since more than 300 students and 50 faculty members have been medically assessed and provided with relevant recommendations.

The high influx of participants in the camp is an indicator that the provided services were highly appreciated. Prof. Dr. Junaid Ali Khan, PO ORIC, Prof. Dr. Umer Farooq (Chairman, Department of Food Science and Technology) and Dr. Muhammad Umair Waqas (Convener, Public health/Nutrition Medical Camp) inaugurated the camp and provided first-hand information on the available services at the camp to the visitors. Dr. Muhammad Umair Waqas explained the objectives of the camp and highlighted the importance of this activity. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I.) was the chief guest of the event and he advised to set up the health advisory facility at university on a permanent basis. This medical camp provided services such as anthropometric measurements, uric acid, cholesterol, HB and blood glucose test, pulse rate, blood pressure, oxygen saturation and body temperature measurements, eye checkup, nutritional recommendations, prevention strategies and behavioral change therapies.

9.48. Green Youth Movement Club

A training workshop under the auspices of Green Youth Movement Club (GYMC) was organized by Higher Education Commission and British Council at MNSUAM on May 24, 2022. It is a HEC-led directive as a step to fulfill the vision of clean and green Pakistan entrusted to the Ministry of Climate Change. Faculty from 14 universities of South Punjab participated in the workshop. The special guest of the event Prof. Dr. Asif Ali (T.I) said that the university has started many eco-friendly programs to increase awareness of environmental sustainability among youth since 2016 and dozens of environmental trainings have been imparted to the students. He further said that the university is carrying out various projects for the betterment of the local community in its vicinity. Mr. Talha Chishti, Program Director, British Council informed the participants about the aims and objectives of this workshop. He also briefed them on the hands-on aspects of the program. The main goal of GYMC is to engage the youth in schools, colleges, and universities to promote eco-friendly culture across the country.. Mr. Imran Mehmood, Registrar, MNSUAM, thanked the Higher Education Commission and British Council representatives and faculty members from all the universities.

9.49. World Environment Day

World Environment Day is celebrated on 5 June every year. This day was first celebrated in 1972, and this year marks its 50th anniversary. In addition, every year a host country as well as a theme is chosen to celebrate this day, as Pakistan hosted the 2021 World Environment Day with the theme “Ecosystem Restoration”. The theme of the World Environment Day 2022 was "Only One Earth" which indicates that we have no place to live other than this planet. To mark the World Environment Day, the Department of Soil and Environmental Sciences organized a seminar, and a poster/model competition in which a large number of students, faculty members, civil society, and other stakeholders participated. Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM said that it is an established fact that the quality of our environment has a tremendous impact on our survival, health, food security, economy and prosperity and we are taking bold steps to protect our environment for our future generations. For the seminar, three keynote speakers Dr. Muhammad Dawood (Associate Professor, BZU), Dr. Muhammad Tahir (Assistant Professor, COMSATS Vehari), and Mr. Misbah ul Haq Lodhi (Deputy Director, Environment Protection Department, Multan) were invited who delivered comprehensive presentations on the theme.

The lectures were followed by discussions, in which students as well as the audience participated actively. The Chairman of the Department of Soil and Environmental Sciences, Dr. Tanveer ul Haq on this occasion briefed that in order to mitigate the environmental pollution; the scientists at the MNSUAM are working tirelessly, and are developing as well as using different methods in this realm. For example, management of smog-causing crop residues, speeding up composting of such materials through the use of microbes, purification of wastewater by using biofilters, purification of contaminated water using constructed wetlands; and use of biofertilizers in minimizing the agrochemicals have been developed and employed in minimizing the environmental impact. He further elaborated that due to these efforts towards sustainability, the University is recognized in UI Green Metric globally as well as locally.

9.50. Role of Plantation in the Context of Climate Change

Seminars and poster competitions on the role of plantation in the context of climate change were organized by the Plant for Life Society and Green Youth Movement Club at the Agricultural University, in which students from various national and international universities participated. The special guest of the seminar was MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I,) while the distinguished guests were Prof. Dr. Abrar Ahmed and Dr. Salman Mubarak. Prof. Dr. Asif Ali said that MNSUAM is the number one environmentally sustainable University in Pakistan which is an honor. The University's job is not only to make societies aware of climate change, but also to contribute to the country's development by adopting modern research. The Plant for Life Society is actively organizing various events and providing guidance on environmental issues. Prof. Dr. Abrar Ahmed said that we should plant more trees that can cure cancer. Dr. Salman Mubarak said that we should not waste plastic and posters. Instead, shopping bags can be made out of these. By adopting modern research and introducing innovations in the context of climate change, we can transform Pakistan into a developed country. Dr. Muqarrab Ali (Incharge, Plant for Life Society) briefed the participants about the impact of climate change on the environment and agriculture. Students participated in poster competitions and presented various stage performances and poetry to highlight climate change issues. Coordinator Faculty of Agriculture Prof. Dr. Shafqat Saeed, Dr. Abdul Ghaffar, Dr. Tanveer Ahmed, Dr. Hafiz Mohkam, Dr. Nazar Farid and other faculty members and a large number of students attended the event.

9.51. World Food Safety Day

World Food Safety Day is an annual celebration to draw attention and inspire action to help prevent, detect, and manage food-borne risks. Every year this day is celebrated to spread awareness about food safety among the general public as well as stakeholders who play a major role in the regulation of rules. To mark this day, a seminar was organized at MNS Agricultural University by the Department of Food Science & Technology and Punjab Food Authority on June 7, 2022. A medical camp was also organized on the occasion. The seminar was presided over by MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). Prof. Dr. Umar Farooq, Chairman, Department of Food Science & Technology welcomed all the guests, participants, and students in the session and shared a brief history and background of the World Food Safety Day. He also highlighted three aspects of food safety i.e., Prevention of food-borne illness, Diagnose/detection, and Management.

Mr. Umair Hanif (DDO, Punjab Food Authority, Multan) briefed about the role and functions of Punjab Food Authority, Multan. He also discussed the vision (Improve Food Safety and Nutrition) and mission (to ensure the provision of safe and healthy food to the entire population of Punjab) of PFA. Mr. Saif Ur Rehman (Director, Family Foods Multan) gave credit to the PFA for guiding him to make the first-ever FSSC-22000 certified industry in Punjab – Family Foods. He suggested the use of disposable glasses for local sugarcane juice because non-disposable glasses cause the spread of contagious diseases such as hepatitis, AIDS, etc. Muhammad Saif (Director Operations, PFA, Multan) encouraged the students to take part in the regulatory measures imposed by the PFA. He stated that according to the latest World Health Organization (WHO) data, one in 10 people worldwide falls ill every year due to eating contaminated food, which kills 400,000 people annually. He said that students are frontline people who will work as responsible persons in the food industry in the future and regarded them as the eyes and ears of society. He also advised the students to keep food security as their first priority. He informed the audience that we can connect to the PFA through social media to ensure safe food from farm to fork. Prof. Dr. Asif Ali thanked all the guests and appreciated the team FST for creating a combination of FST and HND with other related disciplines. Prof. Dr. Asif Ali shared his own experience when he was the focal person of a tripartite commission (Pakistan, Afghanistan, and the USA) that worked for food safety from farm to fork to ensure food safety standards. He also appreciated the concept of wellness created in the environment of the university. Food-borne illness can be avoided, especially in hostels if such a concept is kept regulated through social enterprise. Furthermore, we need to keep a check on our food habits and lifestyle, he added. In the end, he suggested maintaining a safe-food environment in our canteens and hostels, working as a team with PFA, and performing annual audits. Dr. Muhammad Shahbaz, Associate Professor, Department of Food Science & Technology thanked the Punjab Food Authority and all the stakeholders

9.52. World Pest Day

A seminar on Pest Day was organized by Institute of Plant Protection, MNSUAM on June 6, 2022. The seminar was presided over by the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I). The day is dedicated to spread awareness about pest management and its benefits to preserve quality of life for people and plants around us. Speaking on the occasion, Vice Chancellor Prof. Dr. Asif Ali said that harmful insects, herbs and all living things that share resources with human beings are pests. These are a major challenge to our food security and human lives. For example, mosquitoes cause many diseases. About 2.1 million bales of our cotton are lost every year. Similarly, wheat, rice and maize are also severely damaged. The university is working day and night to find eco-friendly solutions to all these problems. Dr. Unsar Naeem Ullah, Associate Professor said since not all pests are harmful, pest scouting should be done before spraying so that beneficial insects remain safe. The same principle applies to the eradication of weeds. In the seminar, Dr. Ishtiaq Ahmed, Dr. Naeem Iqbal, Dr. Nadir Naqash, Dr. Asif Farooq, Dr. Qamar Saeed and Dr. Moazzama Batool from Bahauddin Zakaria University Multan, other faculty and students participated.

9.53. World Day to Combat Drought and Desertification

MNS University of Agriculture Multan organized a one day seminar on June 17, 2022 to observe the World Day to Combat Drought and Desertification. The seminar was organized in person and on zoom at 10:00 am.

The Vice-Chancellor Prof. Dr. Asif Ali (T.I.) in his inaugural address highlighted that current and future droughts will be prolonged and disastrous. He briefed about the drought phenomena and its impact on food security. Dr. Nasrin Salehnia from Department of Earth and Environmental Sciences, Seoul National University, Seoul, South Korea gave a talk on tools for drought scenarios and the impact of drought on wheat crop. She briefed about different tools used in drought studies. Mr. Jahanzaib Dharala gave a thought-provoking briefing on the current challenges of water situation in Pakistan and possible remedial measures. He opined that the urban wastewater treatment and recharging of groundwater can be helpful for waste water management and overcoming the water shortage challenges. Dr. Shahzada Adnan, Pakistan Meteorological Department Islamabad, Pakistan, highlighted the role of the department towards warning the general public about the upcoming environmental and water related threats. He briefed that the advisories are issued in case of a forthcoming drought or water shortage warning. Dr. Umair Waqas highlighted the role of one health concept about the drought. Dr. Ashfaq gave a talk on climate change and water productivity issues in Pakistan. In the end, Prof. Dr. Shafqat Saeed thanked all the speakers and participants. He highlighted that reforestation is much needed in the current situation of droughts and to mitigate the upcoming challenges of water shortage. After the seminar was concluded, Prof. Dr. Nasir Nadeem gave a talk on the importance of water during his Jumma Sermon. After the Jumma prayer, a walk was organized to highlight the importance of the day to combat drought and desertification.

9.54. Webinar on World Father's Day

To mark World Father's Day, an online event was organized by the Directorate of Public Relations and Publication MNSUAM on June 20, 2022. The objective of the day was to recognize the contribution and services of fathers for their children. Mr. Waris Sial, a motivational speaker and master trainer delivered a talk to offer tribute to all fathers on "Father's Day". He said that a loving father is like a tree with a deep shadow. The relationship of father is pure from every personal interest, artificial attitude and worldly benefits. Addressing the occasion, Prof. Dr. Asif Ali (T.I) said that this day is honoring fathers and celebrating fatherhood, paternal bonds, and the influence of fathers in society. Our religion also teaches us to respect our parents; their blessing shapes every dimension of our lives. He said that parents' training and prayers are the reason that we survive and succeed against hardships of life. He urged the students to respect their parents and prayed for those who have left this world.

Muhammad Nawaz Shareef
University of Agriculture
Multan

SPORTS

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CHAPTER-10

SPORTS

Sports are much needed in the context of development of the leadership skills in the students. Sports activities are meant to provide quality fitness and a conclusive environment that inspires participants to engage in competitive events on various levels, institutional and national. Main goal of sports activities is to provide plenty of opportunities to students to keep them healthy with desirable character and remarkable personality traits. The Office of Sports has been providing sports facilities to the male and female students. The Office has developed a system to encourage the students to participate in different sports activities. Collaboration with experts of different games in order to provide the best training facilities to the students is the part of its professional devoir. The sports activities are geared to provide wide participation in intramural activities (within the students), extramural activities (among various faculties of the university) and inter-tertiary or varsity sports activities in national sports events. Teams for Cricket, Football, Volleyball, Table Tennis, Badminton, Hiking and athletics are actively participating in the supporting events in the country.

The sports committee consists of following members:

- Prof. Dr. Irfan Ahmad Baig — Convener
- Mr. Muhammad Arqam Iqbal — Incharge
- Mr. Qaisar Javed — Coach

University has developed excellent infrastructure for indoor as well outdoor sports. University provides facilities in hostels for indoor sports like badminton, table tennis and fitness gym etc. For outdoor sports,, well managed play grounds and basketball court are available.

Sr. No.	Sports Activities	Venue	Male	Female	Date
1.	All Pakistan Tug of War Championship 2021-22	MNSUAM	180	-	February 28 to March 2, 2022
2.	Fakhr E Pakistan Dangal in collaboration with Dunya News	MNSUAM	40	-	March 26, 2022
3.	Kabaddi Championship in collaboration with Dunya News	MNSUAM	120	-	March 27, 2022
4.	HEC Football Intervarsity (Male) Championship 2021-22	IUB Bahawalpur	15	-	March 4-7, 2022
5.	Female Marathon Race	MNSUAM	-	25	March 28, 2022
6.	Female Badminton Championship	MNSUAM	-	38	March 27,

7.	Male Marathon Race	MNSUAM	50	-	March 27, 2022
8.	HEC Table Tennis Intervarsity (Male) Championship 2021-22	MNSUAM	22	-	February 17-19, 2022
9.	Women Divisional League by PCB	Multan Cricket Stadium	-	30	February 18, 2022
10.	HEC Intervarsity Cricket (Male) Championship Zone-E 2021-22	IUB Bahawalpur	15	-	February 19-22, 2022
11.	HEC Intervarsity Badminton (Male) Championship Zone-E 2021-22	KFUEIT, Rahim Yar Khan	6	-	January 27-29, 2022
12.	National Interclub AFL Championship 2021-22 at ISB	Islamabad	12	-	January 9-14, 2022
13.	HEC Kamyab Jawan Sports Gala 2021-22	Islamabad	28	10	December 5-9, 2021
14.	Winter Sports Gala 2021	MNSUAM	150	70	December 13-23, 2021
15.	MNSUAM Double Wicket Championship	MNSUAM	180	-	November 18, 2021

Muhammad Nawaz Shareef
University of Agriculture
Multan

UNIVERSITIES BUILDING LEADERSHIP

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CHAPTER-11
UNIVERSITIES BUILDING LEADERSHIP

11.1. Faculty Leadership (Awards and representation in govt. policy making committees, memberships on various councils etc.)

- Prof. Dr. Zulfiqar Ali, was awarded HEC Best University Teacher Award for 2021. In this competition, 34 universities participated and after a rigorous evaluation process, three faculty members from all over Pakistan, one each in Social Sciences, Physical Sciences and Life Sciences were awarded Best Teacher Award 2021. Prof. Dr. Zulfiqar Ali was recognized as the Best Teacher in Life Sciences.
- The MNSUAM is the member of various governing bodies of Higher Education Commission i.e. the Vice Chancellors' Committee Meeting, MS leading to Ph.D Program, Curriculum Revision Committees, and Quality Assurance etc.
- University is also contributing to the District Government Task Force for Anti-Adulteration, and Anti-Dengue Campaign.
- University is actively involved in policy making regarding mango fruit fly, mango post-harvest management, supply and value chain of mango and major vegetables, Punjab Cotton Control Act 1966, pink bollworm management, cotton mission, monitoring and evaluation of field activities of Agriculture Extension Department etc.
- Prof. Dr. Ishtiaq Ahmad Rajwana (Department of Horticulture) is currently serving as the Chairman of National Agricultural Education Accreditation Council of HEC.
- Prof. Dr. Shafqat Saeed (Institute of Plant Protection) is a member of Cotton Technical Advisory Committee, Punjab.
- Prof. Dr. Shafqat Saeed (Institute of Plant Protection) and Dr. Muhammad Ishtiaq (Assistant Professor, Institute of Plant Protection) are the members of Cotton Protection Advisory Board, Punjab.
- Prof. Dr. Zulfiqar Ali (Institute of Plant Breeding and Biotechnology) is member of Executive Committee of Agriculture Research Board (PARB).
- Dr. Hammad Nadeem Tahir (Institute of Plant Breeding and Biotechnology) is a member of Oilseed Research and Development Board, Punjab.
- Prof. Dr. M. Hammad Nadeem Tahir (Institute of Plant Breeding and Biotechnology), is a member of Institutional Performance Evaluation (IPE) Committee constituted by HEC for Salim-Habib University Karachi.
- Prof. Dr. M. Hammad Nadeem (Institute of Plant Breeding and Biotechnology), is HEC nominee for Plagiarism Standing Committee of Sir Syed University of Engineering and Technology (SSUET), Karachi.
- Dr. Muhammad Saifullah (Assistant Professor, Agri. Engineering) is a member of Board of Study of the department of agriculture engineering, KFUEIT. He is also an external reviewer of QEC Department of Agriculture Engineering, KFUEIT.
- Dr. Sarfraz Hashim (Assistant Professor, Agri. Engineering) is a member of board of study of the department of agricultural engineering, BZU Multan. He is also a member of the Committee to conduct entry test of graduate studies of agricultural engineering, BZU, Multan.

- Dr. Umair Sultan (Assistant Professor, Agri. Engineering) is a member of National Curriculum Revision Committee (NCRC)-HEC of Energy Systems Engineering degree program.
- Dr. Sarfraz Hashim (Assistant Professor, Agri. Engineering) is a member of National Curriculum Revision Committee (NCRC)-HEC of Agro-industrial Engineering Technology degree program
- MNSUAM's Business Incubation and Agricultural Entrepreneurship Center (BIAEC) was approved by the Higher Education Commission under the leadership of Prof. Dr. Mubashir Mehdi.
- Prof. Dr. Irfan Ahmad Baig (Dean, Faculty of Social Sciences and Humanities) was awarded with letter of appreciation and acknowledgment for organizing the roundtable discussion on "Food security vis-à-vis sustainable Agriculture in Pakistan: Policy Outcomes and Prospects" from Center for Global & Strategic Studies (CGSS), Islamabad.
- Dr. Irfan Ahmad Baig nominated as Focal Person for MoC signed between MNSUAM and Federation of Pakistan Chambers of Commerce & Industry (FPCCI).
- Dr. Aziz-Ul-Rahman, Assistant Professor (Faculty of Veterinary and Animal Sciences, MNS-UAM) won Gold Medal in the field of Microbiology from Applied Zoological Society of Pakistan.
- Prof. Dr. Muhammad Ashfaq (Institute of Plant Protection) is a member of Survey Committee for Cotton Crop at Agriculture Department, South Punjab.
- Prof. Dr. Muhammad Ashfaq (Institute of Plant Protection) is a member of Board of Studies of Department of Plant Pathology, The Islamia University of Bahawalpur.

11.2. Directorate of Student Affairs

The Directorate of Students Affairs has the mandate to facilitate and maintain the services including admissions, welfare, sports, health care, guidance, scholarships, financial aid and hostel accommodation. The Directorate of Student Affairs has its mission to offer a variety of services, programs and activities to support and encourage the intellectual, personal, social and cultural development of students. The Directorate has provided all necessary arrangements starting from the first admission inquiry to the last day at the Campus. The Directorate is also involved to check political or unlawful activities of the students. The Directorate also conveys the student's problems to higher administration to facilitate the students. The Directorate not only concentrates on curricular and co-curricular, but also profoundly concerned with the career building and financial assistance of the students.

The Directorate provides students different opportunities to take part in sports/games. It also provides them different platforms for the development of their literary and artistic potential. The purpose of all such activities is to provide students with a conducive environment during their academic years in the University. This office functions as a friend and guide for students and is proving a bridge between administration and students to address their genuine problems.

Following Societies/clubs have been established to provide platform to the students for showcasing their skills and talent

1. Qirat and Naat Club
2. Islamic Learning and Awareness Forum

3. Literary Club
4. Debating Club
5. Music Club (Mossigala Beats)
6. Dramatic Club (MADS)
7. Media Club (Naqash Media)
8. Young Students Peace Society (YSPS)
9. Young Entrepreneurs Club
10. Plant for Life Society
11. Cleanliness Volunteer Force
12. Agri-Tourism Club
13. Character Building Society
14. Women Empowerment Society
15. Blood Donation & Screening Society
16. ICT Club
17. Interfaith Harmony Club
18. Public Health Society
19. Society of Engineers and Technologist

Different activities conducted by MNSUAM Students Clubs and Societies are presented below:

11.2.1. Celebrations of National/International Days

- Youm-e-Istehsal ("Day of Exploitation") Observance (04-08-2021)
- Flag hoisting Ceremony and Pakistan Independence Day Celebrations (14-08-2021)
- Theater Performance by MADS at National Defense Day (06-09-2021)
- Seminar at World Teacher Day (04-10-2021)
- World Polio Day by CBS and Rotract Club (24-10-2021)
- Model Competition on World Soil Day (05-12-2021)
- Awareness Session on Anti-corruption Day (09-12-2021)
- Kashmir Solidarity Day observance (05-02-2022)
- Debate Competition on Pakistan Resolution Day (23-03-2022)

11.2.2. Inter-Faith Harmony and Peace Promoting Activities

- World Peace Day Celebration by YSPS (29-09-2021)
- New Year and Christmas Celebrations with Christian Community of Campus by YSPS (01-01-2022)
- Seerat un Nabi Seminar by Sheikh Qari Saad Naumani by Qirrat and Naat Club (07-02-2022)
- Students of different religions and sects visits Sultan Bahu Shrine arranged collectively by different Clubs/societies (27-02-2022)
- Istaqbal e Ramadan Seminar by Naqsh Media Club & QNC (1-04-2022)

- Seminar on "How Not to make a Conflict" Organized by Society of Engineers and Technologists (02-06-2022)
- Student Aman Mushairah by MNSUAM LITERARY CLUB (30-11-2021)
- Peace Theater on the theme of (Sensitizing youth on peaceful coexistence , diversity and inclusion) organized by Dramatic Club (15-09-2021)
- Musical Session "Peace Through Music" organized by Mossigala (18-03-2022)

11.2.3. Capacity Building and Wellbeing

- Interactive Session on Leadership and Entrepreneurship in collaboration with NAB by CBS (21-09-2021)
- Awareness Seminar on Breast Cancer "Pink Day" by Rotract Club (21-10-2021)
- One Day training on Power Point Presentation (23-10-2021)
- Tajheez-o-Takfeen training session by Qirat and Naat Club (23-03-2022)
- Public Health/ Nutritional Medical Awareness Camp by Public Health Society(17-05-2022)
- Personality Development According to Islam by Qirrat & Naat Club (03-11-2021)
- Fikr e Iqbal session jointly organized by Literary Club and Qirat & Naat Club (07-12-2021)
- Interactive session of Media and Dramatic Club with RJ Khalid Malik (13-10-2021)

11.2.4. Social Drives and Volunteer Work

- Let's Make the April Cool Plantation Drive (01-04-2022)
- Plantation in the scenario of Climate Change (24-12-2021)
- Road Safety Seminar in collaboration with Motorway Police (03-03-2022)
- Establishment of Miyawaki Urban Forest at Campus by PLS (07-08-2021)
- Plantation Drive in collaboration with pharmaceutical company at Miyawaki garden by PLS (23-09- 2021)
- Plantation drive at jasmine courts by PLS (29-09-2021)
- Plantation drive at mulberry courts by PLS (14-10-2021)
- Nursery establishment of 50 tree saplings by each student during Spring season by PLS (17-10-2021)
- Establishment of kitchen garden at jasmine court by PLS (01-11 2021)
- Plantation Drive at DHA Multan by PLS (16-02-2022)
- Plantation Drive with PHA Multan at Old Shujabad Road by PLS (28-02-2022)
- Inauguration of spring plantation drive under plant for Pakistan campaign with Minister Agriculture Syed Hussain Jahanian Gardazi at MNS-UAM gate by PLS on (8-03-2022)
- 5000 plants Block plantation at JPW farm in collaboration with District Government by PLS (22-03-2022)
- Community Plantation Drive at Faisal Cottages Housing Society Multan on Pakistan (23-03- 2022)
- Plantation by Qirat & Naat Club in collaboration with Jamia Dar-ul-Aloom Rahimia (31-08-2021)
- Green Pakistan Plantation Drive by Rotaract club of AUM

11.2.5. Art, Literature and Culture

- Rozan Mushaira by Literary Club (17-05-2022)
- Mazahiya Mushaira by Literary Club (4-7-2022)
- Bait Bazi Competition by Literary Club (8-6-2021)
- Multilingual Mushaira at Mango Festival 2021 at DHA (9-07-2021)
- Urdu Poetry Competition at Defense Day (08-09-2021)
- Adabi Baithak on Quiad Day by Literary Club (11-09-2021)
- Adabi Baithak on Mirza Galib (30-09-2021)
- Adabi Baithak on Parveen Shakir (28-10-2021)
- Adabi Baithak by Literary Club on the Celebration of December (23-12-2021)
- Adabi Baithak on Jaun Elia by Literary Club (1-03-2022)
- Adabi Baithak on Meer Taqi Meer by Literary Club (19-07-2022)
- Cultural night at Dunya News Kissan Mela organized by MADS (27-03-2022)
- Cultural night at Mango Festival at DHA Multan organized by MADS (8-07-2021)
- Cultural night at DICE organized by MADS (29-12-2021)

11.2.6. Entrepreneurial and Professional Skill

- Interactive Session on Leadership and Entrepreneurship by CBS in collaboration with NAB (21-09-2021)
- Training Batch 1 On Cybersecurity by Cybersec Society MNSUAM (29-3-2022)
- Training Batch 2 on Cybersecurity by Cybersec Society MNSUAM (27-6-2022)
- Hands on Training Workshop on Kitchen Gardening at Jasmine Courts/Girls Hostel by PLS (25-11- 2021)
- Hands on Training Workshop on Compost Preparation by PLS (23-02-2022)
- Seminar on Foreign Scholarships by Character Building Society (03-06-2022)

11.2.7. Awards, Participations and Services

- Secured 2nd position by Mosigala Beats in all Pakistan Sufi Singing Competition in Lyallpur Art and Literary Festival organized by UAF (29-03-2022)
- Secured 2nd position by Mosigala Beats in all Pakistan Folk Singing Competition in Lyallpur Art and Literary Festival organized by UAF (29-03-2022)
- Secured 2nd position by Naqsh Media Club in the competition of Thematic photography at Lyallpur Art and Literary Festival organized by UAF (29-03-2022)
- Secured 3rd position by Naqsh Media Club in the competition of Architecture Photography at Lyallpur Art and Literary Festival organized by UAF (29-03-2022)
- Received best backstage management award by Dramatic Club in theater Competition at Lyallpur Art and Literary Festival organized by UAF (29-03-2022)
- Won 2nd position in all Southern Punjab Drama Competition organized by NAB Multan
- Won 2nd position in all Southern Punjab Drama Competition organized by Multan Art Council

- Offered Photography and Media Coverage Services by Naqsh Media Club at Mango Festival (8-10 July 2021)
- Offered Photography and Media Coverage Services by Naqsh Media Club at DICE event (29-12-2021)
- Offered Photography and Media Coverage Services by Naqsh Media Club at Dunya News Kisan Mela (27-03-2022)
- Offered Photography and Media Coverage Services by Naqsh Media Club at Convocation (26-01-2022
- Participation in National CyberSecurity Hackathon 2021 by Cybersec Society MNSUAM (15-11-2021)
  10th Position in National Cybersecurity Hackathon 2021 by Cybersec Society MNSUAM(25-11-2021)
- Participation of Cybersec Society MNSUAM in Nahamchon International CTF (28-04-2022)
- Registration of Cybersec Society MNSUAM in National Cyber Security Cluster as First Cyber security Society of Multan (12-06-2022)
- Participation of Cybersec Society MNSUAM in Hack the box International CTF (14-05-2022)
- Participation of of Cybersec Society MNSUAM in Pakistan Cybersecurity Challenge (19-07-2022)
- Participation of Cybersec Society MNSUAM in Ignite National Technology Fund meeting (20-07-2022)

11.3. Rover Scouts Unit, MNSUAM

- Four rovers participated in the Scout Leader Course 2021 held at Provincial Scouts Training Centre Ghora Gali Murree.
- Eleven rovers and girl scouts participated in the 9th National Rover Moot held at Pakistan Scouts Cadet College Batrasi Mansehra.
- Rover Scouts Unit organized One Night Camping for females in Fort Munro and 40 girls participated in this camping.
- Rover Scouts Unit organized One Night Camping for boys at Soon Valley in October 2021.
- Rover Scouts Unit organized a Scout/ Shaheen Leader Course in November 2021 at MNS University of Agriculture Multan, first time in the history of Pakistan Scouting, a University organized such a training course.
- Three rovers Mr. Sajid Razzaq, Mr. Hamza Bilal and Mr. Ammar Shakeel passed the President Rover Scout Exam which was held at Punjab Boys Scout Association Headquarter Lahore in December 2021
- Mr. Ihtasham Ali Chaudhary and Mr. Sajid Razzaq participated in the President Gold Medal Competition in December 2021 which was held at Punjab Boy Scouts Association Headquarter Lahore.
- Rover Scouts Unit participated in Provincial Snowfall Hike in January 2022 held at Murree Galliyat.
- Rover Scouts Unit participated in Provincial Desert Hike in February 2022 held at Cholistan Desert.

- Rover Scouts Unit organized One Night Camping for females at Soon Valley and 50 girls participated.
- Eight girl scouts and leaders successfully completed the Shaheen Leader Course in May 2022 held at Provincial Boy Scouts Training Center Ghora Gali Murree.

11.4. Career Development Center/Placement Bureau

The Career Development Center/Placement Bureau was established with the aim to provide guidance / counseling to the students of MNS University of Agriculture, Multan for career improvement and placement after the completion of their professional degrees.

There are two members of CDC/PB i.e., Dr. M. Ishtiaq, Assistant Professor, Entomology (Focal Person) and Mr. Usman Jamshaid, Lecturer, Soil and Environmental Sciences (Member). Two students are working on a per hour paid basis which helps students to learn office management, data collection, to organize seminars, webinars and recruitment drives. Details of each activity performed during the year 2020-21 is given herewith.

11.4.1. Students Counseling and Information Sources

Students are being provided services through personal contacts and our online resources. They could call, email at cdc@mnsuam.edu.pk or visit our online resources to get help for different kinds of issues. They could also visit facebook page: "Career Development Center, MNS University of Agriculture, Multan". The link to the Facebook page is given here as https://www.facebook.com/MNSUAM.CDC. More than 2000 people are connected through social media which includes students, faculty members and employers. It has a great effect in disseminating information among the students which included scholarship information ads, Job posts, motivational posts, information regarding seminars, trainings and important events to be held in MNSUAM. We received a good and quick response from this page. Students are provided guidance for the following:

1. Major selection /career goals
2. Searching of jobs
3. Interviewing
4. Writing of resumes
5. Online applying to various posts at NTS, PPSC, FPSC etc.
6. Scholarships advice: Searching Foreign scholarships and applying
7. Required Contact information of any company or institute for applying
8. Information regarding Govt. Departments according to their subject

11.4.2. Alumni Data Collection and Maintaining of Alumni Association

Alumni play an important role in future academia-industry linkages. They could help to achieve our goals. They could help us in a better way than others. Keeping in view the importance of Alumni, Group of alumni students have been maintained by CDC/PB using social media WhatsApp, Gmail, Facebook. We have received bio-data forms from all graduates of all degree programs passed out during each year.

Database of the alumni students has been established with contact numbers and postal addresses. WhatsApp groups of each session have been maintained for dissemination of information to the alumni graduates. Alumni students were invited to annual dinners arranged by each department to strengthen relationships as well.

11.4.3. Placement of Graduates of MNSUAM

Graduates of MNS University of Agriculture Multan are being placed in different organizations through following activities.

11.4.3.1. Internships placement for final year students

Students of professional degree programs require real life experiences through market exposure and this is only possible through internships in professional organizations. In order to equip the students with professional experiences, internships play a vital role. This year we were able to find internships for final year students of B.Sc. (Hons) Agriculture at private sector professional organizations through an internship committee. Dr. M. Ishtiaq, Focal Person of CDC/PB was incharge of the committee. One faculty member was nominated by the Chairman of each department as focal person of the respective department for internship placements. The main objective of the committee was to find internships in well reputed private organizations, institutes, private progressive farms and the second option was to find paid internships. Different organizations were contacted for internship offers. Almost 70% of the students were offered paid internships by Agro Based Industries, Progressive Farms, Banks, and various organizations.

11.4.3.2. Summer Internship

Undergraduate students are also encouraged to work during summer vacations. Career Development Center/ Placement Bureau issued letters to the students willing to serve in any organization of their own choice. We facilitated different organizations to conduct interviews of students for selection of suitable candidates for summer internships project based offers.

11.4.4. On Campus Orientation Seminars / Sessions and_Recruitment Drives by industrial representatives of different organizations for job opportunities

Career Development Center/Placement Bureau helps University graduates to find better job opportunities at different Companies / Organizations and Institutes etc. Our initial survey indicated that the majority of our graduates wanted to continue their studies. But for those, who want to start their career, following efforts have been made for the placement of our graduates during this year 2021-22. Different jobs and scholarship advertisements are being posted using Alumni Network and notice board.

We helped the graduates to find jobs at different Companies / Organizations and arranged their interviews through personal contacts, social media, mobile calls, SMS and Emails. Fifteen awareness seminars and recruitment drives were conducted by different industries facilitated by CDC/PB MSNUAM during this year. A number of students have joined and started their career in these organizations.

A number of organizations, progressive farmers across Pakistan contacted us for assistance in the recruitment process and our placement office assisted in collection of CV's of graduates and encouraged graduates to apply for recruitment not only our graduates but also graduates from other Universities were getting benefit from our office.

Sr. No.	Organization	Events	Date
1	All Departments of Agriculture from FAES & Agri. Economics	Major selection seminar	04.02.2021
2	Pakistan Air Force	Awareness session for Publicity Campaign	12.08.21
3	PepsiCo Pvt. Ltd.	Recruitment test and interviews for Paid internships	13.09.2021
4	Khushhali Bank Pvt. Ltd.	Orientation session and recruitment drive	07.10.2021
5	Sapphire Group Pvt. Ltd.	Orientation session and recruitment drive	14.10.2021
6	JK Sugar Mills Pvt. Ltd.	Company Orientation & AGT Program Session Written Test followed by interviews	11.11.2021
7	Maxim Agri. Pvt. Ltd.	Interviews	17.12.2021
8	PepsiCo Pvt. Ltd.	Online interviews/Session	21.12.2021
9	Pakistan Air Force	Awareness session for Publicity Campaign	15.02.2022
10	HBL Pvt. Ltd.	Interviews of Agri. Graduates	22.02.2022
11	FMC Pvt. Ltd.	Written Test followed by interviews of graduates of MNSUAM	08.03.2022
12	EDGE Group Pvt. Ltd.	Recruitment drive i.e., written test followed by interviews	05.04.2022
13	SPARKO SOL Pvt. Ltd.	Awareness and Q&A session regarding freelancing	31.05.2022
14	Craftooo (The E-commerce Industry)	Awareness session regarding E-commerce at Amazon	01-06-2022
15	Evyol Group Pvt. Ltd.	Recruitment Drive	21.06.22

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FINANCE

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FINANCE

12.1. Financial Year at a Glance

		Million PKR	
Particulars	**Approved Budget 2021-22**	**Revised Budget 2021-22**	**Actual 2021-22**
Receipts			
Opening Balance	20.606	29.088	29.088
Govt. Receipts	223.336	238.289	225.509
University's Own Sources (Self-Generated Income)	333.219	345.892	346.142
Donation	20.000	15.000	15.000
Total Receipts	**602.161**	**628.269**	**615.739**
Expenditures			
Salary Expenditures	309.666	327.250	326.482
Non Salary Expenditures	351.109	285.595	281.104
Total Expenditures	**660.775**	**612.845**	**607.586**
Surplus/Deficit	**58.614**	**15.425**	**8.153**
Development Budget	163.162	169.483	169.483
Recurring Budget	660.775	612.845	607.586
Self-Generated Income	333.219	345.892	346.142
		In PKR	
Trend of Per Student Spending (Salary Expenses Basis)	65,703	79,314	79,128
Trend of Per Student Spending (Non-Salary Expenses Basis)	74,498	69,218	68,130

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UNIVERSITY GOVERNANCE

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UNIVERSITY GOVERNANCE

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UNIVERSITY GOVERNANCE

The MNS University of Agriculture, Multan was announced by the Chief Minister, Punjab on 28-01-2012. The University was established under the Act 2013 of the Punjab Assembly with the objective to impart professional education in agriculture sciences and allied disciplines by catering the need of population, nationally & regionally. The Act XXII 2013 authorized the University to establish the following authorities to supervise the matters of the University for its smooth functioning.

13.1. Syndicate

The Syndicate is the executive body of the University and takes effective measures to raise the standard of teaching, research, technological development, publications and other academic pursuits. As of June 30, 2022, a total of 33 meetings of Syndicate have been held, out of which, four held in 2021-22 are given below:

Sr. No.	Meeting	Date
1	30th	13.07.2021
2	31st	10.10.2021
3	32nd	11.12.2021
4	33rd	26.02.2022

13.2. Selection Board

The Selection Board considers the applications and recommends to the Syndicate, the names of suitable candidates for appointment to teaching and other posts and recommend suitable salary for the selected candidate; and cases of promotion or selection of officers of the University and recommend the names of suitable candidates for such promotion or selection to the Syndicate. The details of meeting of selection board held during current year are given below:

Sr. No.	Meeting	Date
1	13th	04.09.2021 18.09.2021 to 19.09.2021
2	14th	10.12.2021
3	15th	15&16.01.2022
4	16th	25.02.2022
5	17th	21.05.2022
6	18th	10.06.2022

13.3. Finance and Planning Committee (F&PC)

The Finance & Planning Committee prepares the annual statement of accounts and proposes annual budget estimates and makes recommendations to the syndicate, reviews periodically the financial position of the university, advises the syndicate on all matters related to finance, investment and accounts of the university. Following meetings of F&PC were held during the current year:

Sr. No.	Meeting	Date
1	11th	06.12.2021
2	12th	18.06.2022

13.4. Board of Faculties

Board of Faculty coordinates the teaching and research work in the subjects assigned to the faculty and scrutinizes the recommendations of a Board of Studies comprising the faculty with regard to the appointment of paper-setters and examiners for graduate and postgraduate examinations and to forward the panels of suitable paper-setters and examiners for each examination to the Vice Chancellor.

Sr. No.	Faculties	Meeting	Date
1	Faculty of Agriculture & Environmental Sciences	10th	18.03.2022
2	Faculty of Social Sciences & Humanities	7th	28.04.2022
3	Faculty of Veterinary & Animal Sciences	3rd	31.12.2021
		4th	22.06.2022

13.5. Board of Advanced Studies and Research (BASR)

The Board of Advanced Studies and Research advises on all matters connected to the promotion of advanced studies and research publications at the University. Following meetings of the Board were held during 2021-22:

Sr. No.	Meeting	Date
1	12th	01.07.2021
2	13rd	17.08.2021
3	14th	04.01.2022
4	15th	21.03.2022
5	16th	13.06.2022

13.6. Academic Council

The Academic Council is the highest academic body of the University and lays down proper standards of instruction, research, publication and examination, regulates and promotes the academic activities of the University.

Sr. No.	Meeting	Date
1	7th	09.08.2021
2	8th	31.03.2022

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OFFICE OF THE RESOURCE GENERATION/DEVELOPMENT

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OFFICE OF THE RESOURCE GENERATION/DEVELOPMENT

Sustainability of higher education institutions is possible only by employing various modern methods and using non-conventional techniques for resource generation and commercialization by involving the local community, staff, political leadership and foreign funding agencies.

The MNS University of Agriculture, Multan is working in coordination with the UC Davis and JICA on different doable proposals regarding modern lab development, date palm production/quality and mango production/quality.

The University's Financial Aid Office, P&D Office and ORIC are vigorously pursuing the funding agencies with the plan proposals in order to develop a state of the art agriculture institution in Southern Punjab.

14.1. Scholarships and Financial Assistance Program

MNS University of Agriculture, Multan always tries to make quality education accessible to all students in Pakistan, including those from lower and middle income households. The University provides generous financial assistance to qualifying students in all degree programmes. There are several options of financial aid for students and need to explore the many scholarship options available for talented, needy and deserving scholars that help make paying for university affordable as possible.

In recent years, access to higher professional education in Pakistan, particularly in Southern Punjab has become very expensive. Keeping in view of the increasing expenses day by day, it is becoming very difficult for the resource poor section of the society to educate their children. Under the circumstances, Student Financial Aid Office (SFAO) is committed to the success of our students by providing financial aid and advising services that support student recruitment, retention, and timely degree completion, and ensures that a world-class education remains within reach for all eligible students who need financial assistance to achieve their educational goals. Scholarships are awarded to needy and meritorious students. Award is based on merit, financial need, or a combination of both. Scholarships can come from different sources and they may vary in the awarding criteria.

Currently SFAO is offering following Scholarships to the deserving and merited students of MNS-University of Agriculture, Multan

1. University Merit Scholarship
2. HEC Need Based Scholarship
3. Need Based Scholarship from own resources (MNSUAM)
4. USH Scholarship Program
5. Punjab Education Endowment Fund
6. Pakistan Bait-Ul- Mal Stipend
7. Student Loan Schemes
8. Sungreen Scholarship Program
9. Neelum Seeds Need Base Scholarships
10. Ms. Asia Sultan Need Based Scholarships
11. Asia Feed Mills Scholarship Program

12. Colony Textile Mills Scholarship program
13. FFS Scholarship Scheme
14. Gurmani Foundation Scholarship
15. Muhammad Rasheed Memorial Scholarship
16. Mehmood Need Based Scholarship Program

14.2. Miscellaneous Facilities

1. Tuition Fee Concession (50%) to 10% of the students of the class by Dean Faculty.
2. Facility to deposit dues in installments for financially constrained students.
3. A number of students are working on various research projects sponsored by HEC/ Government Departments/ organizations (national and international) to perform work in exchange for money for their education
4. Hiring of students on hourly basis (Work-related learning experience for students who wish to develop hands-on work experience in a certain occupational field).

14.3. Under and Postgraduate Scholarship Awarded During 2021-2022

Scholarship	No. of Awardees	Amount (Million PKR)
Merit Scholarship	251	1.79
PEEF	18	0.64
Pakistan Bait Ul Mal	09	0.17
HEC Need Based	83	6.51
Rasheed Memorial Scholarship	05	0.240
Sungreen Scholarship Program	01	0.060
Ehsaas Scholarship	400	29.72
Total	**766**	**39.13**

14.4. Planning & Development Office

The P&D Office of MNS University of Agriculture, Multan is playing its role in the resource generation for the University development. Annual Development Programs worth Rs. 2120 Million have been successfully completed during their approved Gestation Periods under the auspices of Agriculture Department, Govt. of Punjab. The Project activities have been completed with 99.9% utilization including physical infrastructure, procurement of lab equipment, furniture & fixture, transport, generator, farm development, construction work and allied activities. Specifically, 9 Km underground pipeline from the bed of River Chenab for the cultivation of 500 Acres of land with fresh irrigation water at Jalalpur Pirwala Research Farm of the University. The training Hall, Input & Produce Stores, Animal & Implement Shed and other allied facilities have also been completed under ADP Scheme. Another flagship ADP project (Pilot Project) worth Rs. 200 million, with a gestation period of 36 months has been completed with the objective of training of 376 internees, on boarding the contact farmers and monitoring through GEO tagging application. Feasibility study for Establishment of Sub Campus of MNS University of Agriculture Multan at Khanewal has also been completed for submission of Project for approval.

The detail of following on-going projects and being submitted for approval at different Provincial and Federal agencies;

i. ADP Project of Rs. 450.00 million for National Crop Genomics and Speed Centre for Agriculture sustainability approved with the execution period of 36 months (2020-21 to 2023-24). The first year of the project has been successfully completed with 100% utilization and as per the PC-I provision.

ii. ADP Scheme titled “Strengthening of MNS-University of Agriculture, Multan” of Rs. 650 million was submitted to the Agriculture Department for approval with a gestation period of 36 months (2022-23 to 2024-25). The Agriculture Department allocated the funds for the said project. The project proposal includes a female hostel for 350 student's capacity, a Sports complex for indoor games, 2 computer labs and 3 student buses.

iii. Development Project of Rs. 1356.378 million has also been approved with an implementation period of 36 months by the Higher Education Commission (HEC) Islamabad. The project proposal includes the undergraduate lecture block, female & male hostels (350 students each), multipurpose hall of 700 capacity, guest house, extension of Central Library, lab equipment for the newly established Faculty of Veterinary & Animal Science and Faculty of Agri. & Bio-systems Engineering and Technology, furniture & fixtures, IT equipment and allied external services.

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EXTERNAL LINKAGES

EXTERNAL LINKAGES

EXTERNAL LINKAGES

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EXTERNAL LINKAGES

The changing role of the universities mandated greater connectivity and strong linkages with the local, national and international communities. Therefore, under the initiative of HEC Pakistan, the Directorate of External Linkages was established at the MNS University of Agriculture, Multan in 2016.

The MNS University of Agriculture, Multan seeks to harness expertise from a wide variety of sources from within/outside the country in order to boost its academic and research activities. This in turn helps create a deeper impact on the world of agriculture, science and technology. For this purpose, the University collaborates with leading international universities, professional/ research organizations, commercial ventures, talented professionals and scholars to pursue its academic and research goals. Our faculty, researchers and students are constantly adding value to MNSUAM by remaining actively engaged with professional groups and individuals in the research, review of academic papers, organization of conferences and seminars. The MNSUAM has developed linkages with 48 international organizations, 45 national organizations and 50 industries with overall 143 linkages so far.

Directorate of External Linkages has the responsibility to attract international students, facilitate placement of University students and faculty in high ranking universities, facilitate interaction between faculty and industry and exert a pull for financing of training, research and development activities of the university by national and international donors, alumni, civil society and agro-based industries. The University is receiving delegates from international and national organizations for building and expanding partnerships for capacity building, research and development and outreach activities to bring good to the lives of the farming community of the country.

15.1. Vision

To establish purposeful linkages with national and international academia, organizations, stakeholders, and industries for making a thriving win-win relationship.

15.2. Mission

To create links and consortia with relevant organizations that could help to strengthen scientific collaboration and enhance the capacity building with an aim to strengthen professional learning and extend community services to meet ever-changing local, regional, and global demands through social transformation.

15.3. Achievements

During 2021-22, External Linkages has signed 8 MoUs/AoCs with International organizations and 12 MoUs/AoCs are signed with national private and public sector partners.

15.4. MoU/AoCs with International Organizations

Sr. No.	Subject of ongoing MoU/AoC	Parties Name	Focal Person	Date of Commencement	Duration	Activity and Remarks
1	Research and Development	Tashkent State Agrarian University, Uzbekistan	Dr. Zulqurnain Khan	20.08.2021	Three Years	• Establish combined degree program / exchange program for students and researchers, outreach activities, Seminar, workshops, international meetings/ conferences. Offer scholarship, Establish High Tech Lab in Multan
2	Research and Development	Institute of Tropical Bioscience and Biotechnology of CATAS, Pir Mehr Ali Shah Arid Agriculture Rawalpindi, University of Agriculture, Faisalabad	MNSUAM	23.09.2021	Five Years	• Establishment of commercial tissue culture facilities in Pakistan, development of varieties adapted to indigenous needs and climatic conditions, Joint academic and research activities, exchange of experts, students, researchers and faculty members. The joint research project submitted for the future task of establishment of commercial tissue culture facilities in Pakistan
3	Research and Development	Letter of Intent with FAO	MNSUAM	30.11.2021	-	• Joint resource facility "Centre of Excellence for Climate Smart Agriculture" at the end of project the said resource facility will hand over to MNSUAM. The proposed research proposal for the center is submitted to FAO by MNSUAM
4	Research and Development	Tang Chinese Education & Technology Ltd. Beijing China	Prof. Dr. Irfan Ahmad Baig	14.12.2021	Four Years	• Joint Education programs of Diploma level and degree level of different technical subjects/trades/programs based on Pakistan actual

						HR market and local industry demand will be prepared and agreed by Chinese Vocational Colleges/Chinese universities & Tang Chinese Education & Technology Ltd & MNSUAM, jointly and the programs have to be recognized locally and international.
5	Research and Development	Distinguished Innovation Collaboration and Entrepreneurship (DICE)	Prof. Dr. Irfan Ahmad Baig	22.12.2021	Four Years	• Conducting joint research Projects, organized training programs for farmers, students and researchers, webinar, international meetings and conferences, exchange of information, teaching materials, and technology. • Both parties arranged a mega event for ideas sharing at MNSUAM during 2021.
6	Research and Development	Razbio (Pvt.) Limited, UK	Prof. Dr. Shafqat Saeed	09.03.2022	Four Years	• Joint research activities especially in the field of bio nutrients, collaboration in seminar, workshop and conference. • During this year conducted joint research trials and exchanged bio stimulants
7	Research and Development	Agricultural Research Centre (ARC), Ministry of Agriculture and Land Reclamation, Arab Republic of Egypt	Dr. Sarfaraz Hashim	21.06.2022	Four Years	• Conducting joint research and development projects and cooperation in individual projects. Both parties are working in the field of food technology to proliferate the use of other advanced features to promote agriculture with modern technology methods.

8	Research and Development	Selcuk University, Konya, Türkiye	Prof. Dr. Irfan Ahmad Baig	26.5.2022		• Exchange of faculty members for lectures and short term visits. • One visit of both parties is arranged during this year for exchange of knowledge and research ideas.

15.5. MoU/AoCs with National Organizations

Sr. No.	Subject of ongoing MoU/AoC	Parties Name	Focal Person	Date of Commencement	Duration	Activity and Remarks
1	Research and Development	The National Bank of Pakistan	Dr. Muhammad Ishtiaq	11.08.2021	Three Years	• To establish a working relationship b/w the parties for agriculture focused entrepreneur's development for the trained farmers and students in hydroponics, tunnel farming, high efficient water management, ultra-high density mango orchard establishment. • Managed a stall on mango festival, Started a training program for Beekeeping, • Offered paid internship to the MNSUAM student.
2	Research and Development	Bulleh Shah Packages, Lahore	Dr. Muhammad Baqir Hussain	13.08.2021	Four Years	• To test adaptation of Miscanthus and sisal on waste/marginal lands, to optimized sowing time of Miscanthus and sisal for maximum biomass yield, devise tissue culture techniques for propagation of Miscanthus and sisal • The Bulleh Shah Packages, Lahore granted one research

							project with worth Pak Rs. 7.92 million which is on going
3	Research and Development	Bayer Pakistan (Pvt.) Ltd.	Dr. Abid Hussain	01.10.2021	It can be terminated by giving a thirty days written notice	•	Developmental crop Hybrids/varieties, Crop Protection Productions, capacity building sessions and internship opportunities. Joint research work between both parties is running
4	Research and Development	Maxim Agri. (Pvt.) Limited	Dr. Asif Shahzad	07.12.2021	Four Years	•	Product testing and development, Capacity building and training of 8th semesters of B.Sc. (Hons.) Agriculture. Joint research projects in field of common interest, seminars, exhibitions and summits • During this year offered paid internship and one scholarship to the MS student
5	Research and Development	National Productivity Organization, Pakistan	Prof. Dr. Mubashir Mehdi	13.12.2021	Four Years	•	Organize training program under sustainable National Productivity, Conduct customized training need based assessment national productivity. • The NPO organized training of Faculty and students, and arranged a seminar at MNSUAM.
6	Research and Development	Federation of Pakistan Chambers of Commerce & Industry (FPCCI)	Prof. Dr. Irfan Ahmad Baig	22.12.2021	Five Years	•	Create MNSUAM Corporate Advisory Board (CAB), develop mechanisms to define eligibility criteria of MNSUAM master trainers, research projects etc.

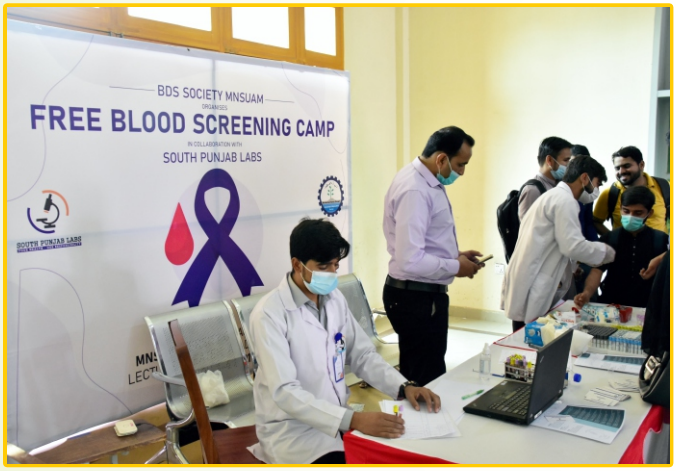
8	Capacity Building and Agriculture Sector Development	House of Rockville (Pvt.) Limited	Prof. Dr. Mubashir Mehdi	24.04.2022	Four Years	• The Parties will collaborate to promote organic agriculture and innovative technologies such as hydroponic farming, Science and Technology Studies (STS), etc. The ongoing development in the community center of MNSUAM will be completed through collaboration between the Parties. Collaboration to develop a sustainable agriculture center that will also include the development of medicinal plants seed bank.
9	Agriculture Sector Development	The Bank of Punjab	Prof. Dr. Mubashir Mehdi	13.04.2022	Four Years	• Provision of finance facilities to fresh graduates / farmers associated with MNSUAM in accordance with BOP's own. Agricultural product range as well as under Federal and Provincial Govt. schemes announced from time to time. • During this year a seminar is arranged, Participated in DIC event at MNSUAM, Offered paid internship MNSUAM graduates by.
10	Career Development and Placement	Evyol Group of Companies (Pvt.) Ltd., Multan	Dr. Muhammad Ishtiaq	21.06.2022	Four Years	• Capacity building and training of 8th semester students of B.Sc. (Hons.) Agri. through offering paid internships. • To collaborate in organizing seminars, exhibitions, symposiums and summits. • Started active research and outreach activity jointly.

11	Research and Development	Association for Biorisk Management, Pakistan	Dr. Baseer Ahmad	25.05.2022	Four Years	• Association for Biorisk Management will provide necessary measures and technical support regularly for the control of zoonotic pathogens through the introduction and strengthening of biosafety and biosecurity practices in the existing laboratories at MNSUAM. • Support of the Institutional Biosafety Committee of the university for developing systems and capacity for regular review of biosafety. • A seminar for awareness of Biorisk Management is arranged for the month of August, 2022
12	Research and Development	Ayub Agricultural Research Institute Faisalabad, Pakistan	Prof. Dr. Muhammad Hammad Nadeem Tahir	23.6.2022	Four Years	• Conducting joint research and development projects and cooperation in individual projects. • Organize combined training programs for Farmers, Students and Researchers, etc. Offer of services of review for thesis/dissertation for doctorate degree program. Both parties will work together for the Genome center at MNSUAM.

Muhammad Nawaz Shareef
University of Agriculture
Multan

MEDICAL AND HEALTH FACILITIES

MEDICAL AND HEALTH FACILITIES



MEDICAL AND HEALTH FACILITIES

CHAPTER-16
MEDICAL AND HEALTH FACILITIES

16.1. Available Medical Facilities

- Free ambulance service
- Routine check-ups for the students and faculty
- First aid to the students and employees of the University

16.2. Awareness Medical Camps

- Setting up free Public Health/ Nutritional Medical camps at the University to promote and advocate healthy lifestyle choices, behavioral modification, prevention, early screening, surveillance, diet consciousness, and health awareness
- Identifying the vulnerable population who are at risk of developing lifestyle diseases through data collection at medical camps
- Provision of free medical services at the camps such as tests for hemoglobin, cholesterol, blood glucose and uric acid, visual activity check through Snellen chart, blood pressure, pulse rate and body temperature measurement, body mass Index calculation, and free nutritional recommendations

16.3. Wellness Clinic Initiative

- A Wellness Clinic facility has been established at the university to provide basic health facilities such as diet plans, medical tests, first aid, etc.
- The facility also provides services to address the prevalent issue of mental health, counseling and addressing stress triggers.

16.4. Public Health Society

- A Public Health Society has been established at the University to advocate health promotion among the students and faculty members .
- The Society also aims at capacity–building of university students to perform, understand and analyze different medical tests.
- The Society joins hands with other institutions to seek recent data on different prevalent ailments, stigmas, nutritional myths, lifestyle choices, health care facilities and hierarchy from a policy perspective.

16.5. BS and MS Public Health Programs

- BS Public health program is an initiative taken by the University to equip the potential students with recent interventions in preventing disease, health policy, disease surveillance, anthropology, epidemiology, health promotion and related areas of public health.
- MS Public health program has been launched in collaboration with Nishtar Medical University, Multan. The program focuses on One Health approach and contemporary public health issues along with social aspects of health. Moreover, collaboration with Health Science Academy (HSA) has been established for mutual supervision of MS students.

16.6. Mosquito and Mosquito Borne Diseases

1. Surveillance of mosquitoes especially Dengue vectors carried out from the whole of the University, every week throughout the year, and reports were sent to Registrar, Dean FA&ES MNSUAM, and Secretary Agriculture, Lahore.
2. Identification of samples of mosquito larvae received from the Health Department, Vehari, was done at regular intervals for the whole of the year.
3. Awareness seminars on Dengue and mosquito borne diseases had been conducted from the forum of GRC.
4. Dr. Unsar Naeem-Ullah, Associate Professor, Entomology, has served as Master Trainer in refresher trainings regarding Dengue Prevention & Control to senior level management of Health Department, on invitation of office of DG Health, Lahore.

16.7. COVID-19

1. Free COVID-19 testing facility was provided to all students, faculty and staff of the University with the cooperation of the Health Department.
2. The University has adopted all safety measures and SoPs as issued by the Punjab Government.
3. Availability of thermal guns, masks, hand washing facilities and sanitizers is being ensured.
4. Road pole streamers, sign boards and banners depicting the COVID-19 preventive measures in written as well as symbolic form are placed to reinforce the awareness among the campus community.
5. On-Campus campaigns were launched for COVID-19 vaccination in which 100% of staff and faculty were ensured to get 2 doses of COVID-19 vaccine, and many were facilitated for booster dose, too.
6. All students were directed to get vaccinated from their homes, and left overs were facilitated in On-Campus campaigns to make the campus 100% COVID-19 free.

16.8. Miscellaneous Activities

1. An introductory talk was delivered by Dr. Unsar Naeem-Ullah, Assistant Professor Entomology on "SDG 3; Good Health and Well-Being, An Overview and Strategies" under the forum of GRC on 28.07.2021.
2. An informative session on "Awareness of Breast Cancer and its Early Detection" by Dr. Ahmed Ijaz Masood (Oncologist) from Nishtar Hospital Multan was conducted on 22.10.2021 in MNSUAM.
3. An awareness seminar about the road hazards, traffic rules and the proper use of the vehicles was conducted in collaboration with Highway Traffic Police Multan on 26.04.2022 in the campus.
4. Webinars on different prevalent health issues were arranged to advocate awareness.
5. International speakers were invited to share their experiences for the learning process.

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