MNS-University of Agriculture, Multan

ANNUAL REPORT 2020-21

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بسم الله الرحمن الرحيم

Muhammad Nawaz Shareef
University of Agriculture
Multan

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Vice Chancellor's Message

Dear Readers,

By the grace of Allah Almighty, this year we have been successful to break the shackles of lockdown and 2021 has been a threshold to COVID-19 perils. I am excited to present our journey from social distancing to mutual understanding and achievements in this annual report of 2020-2021. Through the lens of this report let's magnify the accomplishments of MNSUAM team and their tireless efforts to bring things back to normal. It is due to the cooperation and dedication of MNSUAM lot that we are able to have a COVID-Free campus with all of the faculty and staff members being vaccinated against the current pandemic. The recommencement of academic and research activities are the delineation of higher goals and targets set by the MNSUAM community and is the depiction of its continuous hard work and motivation.The credo of "knowledge-based economy" is all we are and will be striving for.

Innovative research and outreach is our key motive so, a Graduate Resource Center is our one of the eminent initiatives as it is the platform to train young researchers to meet the challenges of the modern day agricultural practices. MNS-University of Agriculture, Multan has been ranked as 3rd best university nationally and 243rd worldwide in 2020, by UI Green Metric which, is an annual publication of university (of Indonesia) ranking on sustainability. I always empathize on every aspect of sustainability.

As soon as the lockdown restrictions were lifted, our research activities were resumed, followed by a strict pattern of keeping SOPs intact. I would proudly endorse the achievements of my faculty in the fields of research by submitting various projects, organizing national and international conferences, seminars, active participation in workshops and trainings, capacity building and capacity sharing etc. Be it business incubation activities or entrepreneurial skill inculcation, MNSUAM faculty has always been zealous and enthusiastic to encourage students and taking out best from them. Ostentatious events like mango festival, wheat farmer day and international conferences arranged by MNSUAM portray our grand vision and skills of our team in event planning, management, execution of ideas and exceptional team work which has always been by focus.

As patriarchy has engulfed the country ever since partition, our focus has always been towards the empowerment and protection of women. Propelling this ambition forward, I along with my staff has always ensured to promote students and faculty members to come forward with confidence and channelize their skills as I believe women prove to be better administrators and leaders. Pink-ribbon campaign and violence against girls/women were the two major fields in which our team is working to promote awareness and make sure that girls feel safe and protected under the umbrella of the university administration. Not only girls, but all the students irrespective of their genders, are urged and encouraged to develop and nurture an environment that is safe, friendly and interactive. In addition, university students have tried to keep in loop the transgender community by listening to their problems and highlighting them through the university platform.

Scholarship programs and need based scholarships help the students to pursue education of international standard without worrying about expenses and I am overwhelmed to proclaim that a huge amount of money has been distributed among students as a gesture to support them through this difficult and challenging time.

Prioritizing health and wellbeing of our students, various activities are conducted and it is the part of the tradition of MNSUAM. From plant-centric meal competitions to sports activities, we always strive to promote health awareness amongst students. Co-curricular activities and different societies and clubs promote personality-building and I always encourage my students and staff to shine and develop as active and inspiring individuals.Directorate of students' affairs always makes sure to arrange different events and activities for encouraging students to overcome stage fright and develop confidence.Furthermore, Career Development Center ensures job placements of students.Taking up social action plans are another platform where students in collaboration with British council, has worked as active citizens of Pakistan by highlighting and trying to curb with any social challenge they feel is important to address.

Office of research and innovation (ORIC) and office of quality enhancement (QEC) are two major offices that are working to develop the technical framework of the university and ensure quality of education. Annual review of the faculty and plagiarism checking always encourage the faculty to stay active and overcome their weaknesses.

Concluding this message, I would once again extend my gratitude to Allah Almighty for making it possible for me to accomplish the goals and I pray that in future I and my team come up with more constructive and exceptional targets and their fulfillment InshaAllah.

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

Executive Summary

MNS-University of Agriculture, Multan has been established with an aim to provide education in various disciplines of agriculture and other branches of knowledge, making provisions for research & development, and to serve the farming community and agro-based industry. The University started its academic activities in 2012. However, the real kick-start of the University as an emerging educational institute was in the year 2016, and since then, it is progressing by leaps and bounds. These annual report documents elucidate another year of University's journey and magnify its continuous growth and improvement in all peripheries.

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 constitution of Online Academic Council and certification of teachers to impart online education/blended courses, Department of Agribusiness and Applied Economics being approved for the initiation of new degree program B.Sc. (Hons.), Agricultural and Resource Economics (4-year degree program, direct admission) by the Board of Studies and Faculty Board, and submission of new undergraduate degree programs to the academic council etc. During the COVID-19 crisis and the unforeseen lockdown, top management of the University has always focused and ensured that the students get proper guidelines to pave their way to the unexpected virtual road. This chapter also unveils well-founded practices that were adopted to embrace new trends in quality of education.!

Research and Developmental activities including research projects, publications, workshops, seminars and conferences are discussed in the second chapter. This year faculty has submitted 130 different research projects to various national and international funding agencies including HEC, PARB, PSF, SUPARCO, Pak-Italy, PHEC, ADP, industry/private sector and funding was awarded to 40 projects, student FYPs from Ignite and skill development under Kamyab Jawan worth 97.633 million. The University organized five national and international conferences, seven competitions, and 40 national and international Webinars. The capacity building and mentoring activities include 11 faculty training/workshops and 37 training of students/researchers under the Central Lab System with 94 outreach and recreational activities. It also covers information related to Mango Festival, DICE, farmers training on small tree system (STS) and Honey bee keeping, 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, due to COVID crises, QEC has assisted the faculty to use different platforms (Zoom, LMS, Google meet) for smooth running of semesters and carrying out academic activities efficiently. 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 in large amount by both undergraduate and postgraduate students.

Whether it is capacity building, accreditation of undergraduate programs or preparation of curriculum for Outcome Based Education, 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 2020-21, more than 20 faculty members were benefited from development programs, and 17 pre-service and in-service professional development programs were organized this year.

Chapter five elaborates quick facts about discipline-wise and gender-wise student enrollmentetc. Basic enrollment during 2020-21 was 1138 with 873 and 265 male and female students, respectively. The maximum enrollment of 482 students was observed in B.Sc. (Hons.) Agriculture program. Furthermore, 205 students were enrolled in M.Sc. (Hons.) Agriculture program, and 12 scholars started pursuing doctorate degrees. Till the end of the academic year 2020-21, the total number of faculty reached to 104, out of which 74 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, Agreement of Cooperation Between MNSUAM and Volka Foods, Consultative Session on Wheat Production Strategy: Season 2020-21, Visit of German Ambassador to Pakistan and Managing Director, METRO to MNSUAM, and appreciation by National Assembly Standing Committee on Food Security and Research are discussed in detail. Initiatives like Pasta Wheat Cultivation in Pakistan, Consultative Workshop on Formulations of Bio-Pesticides and Bio-Fertilizers in Pakistan, First Meeting of the Coordination Committee on Academia-Industry Linkages 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. 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, Microsoft Dynamics 365 implementation and online admission portal.

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. 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 International Conference on Plant Based Foods, Seminar on Islamic Banking, Training on Community Action for Disaster Response imparted by Rescue 1122, Foundation stone of Central Mosque, Kashmir Day celebration, Secretary Agriculture Sindh's visit to the campus, Awareness Webinar on Health Effects of Tobacco, Special Lecture by Renowned Cricketer, Mr. Saeed Anwar, COVID-19 Awareness Campaign for Farming Community etc.

However, key achievements are also discussed in this chapter like MNSUAM being positioned as the 3rd most sustainable University of Pakistan in UI Green-Metric Rankings, British Council Official's appreciation to MNSUAM for Effective Community Services and Provincial Minister for Higher Education's applause for the University.

Besides education, Sports and co-curricular activities are helpful in developing strong personalities and instilling various traits in students. The sports events organized/participated by the University during the year 2020-21 are elaborated in Chapter ten. Whereas, Chapter eleven 'Universities Building Leadership' couldn't go unmentioned without an achievement which has made the MNSUAM family proud; Prof. Dr. Asif Ali received **Tamgha-e-Imtiaz** for his outstanding contribution to the agriculture sector. The chapter also features various activities carried out by different Student Societies and Clubs, established to inculcate a sense of leadership in students, under the umbrella of Directorate of Students' Affairs. The details of activities carried out by Career Development Center and Placement Bureau for providing guidance/counseling to students are also part of this Chapter. Chapter twelve provides financial information about development and non-development budget and expenses made by the University, while Chapter thirteen gives a glimpse of University's top notch governance and meetings of various statuary bodies held during 2020-21.

Chapter fourteen tells about Office of Resource Generation and Development, its initiatives and future plans. Information regarding scholarship programs is also part of this Chapter. During 2020-21, an amount of 46.11 million rupees was distributed by Financial Aid Office of MNSUAM among 804 students of undergraduate and postgraduate programs for financial support.

Chapter fifteen entitled 'External Linkages' specifies the MoUs/agreements signed between MNSUAM and national/international institutions/organizations for promoting R&D activities through external collaboration. During the 2020-21, the University signed 4 MoUs with international institutions, while 25 agreements were successfully executed with private and public-sector partners from Pakistan.

Health education builds students' knowledge, skills and positive attitudes about health. Health education teaches about physical, mental, emotional and social health and the final chapter, chapter sixteen has elaborated University's efforts to educate students and ensure health provisions to staff and the students. Therefore, a joint degree program with Nishtar Medical University has started in the university, i.e. B.Sc. (Hons.) Human Nutrition and Dietetics. Moreover, free ambulance service, chemical safety lab, vaccination for COVID-19and seasonal influenza were also the part of health-relatedactivities this year.

The City of Multan

Muhammad Nawaz Shareef
University of Agriculture
Multan

The City of Multan

On the banks of river Chenab, there lays a city which is holy to many people in Pakistan, famously known as the "city of saints". Formerly known as Kashtpur, Multan is the birthplace of Farriduddin Ganjshakar, the first poet of the Punjabi language. If Multan is a birthplace of Baba Farid, it is the resting place for many Sufis like Sheikh Bahauddin Zikria, Bibi Pak Daman, the miraculous Shah Shams Tabrez and Shah Rukn-e-Alam. It is the sanctity of these shrines that drive people from the suburbs of Multan to take off their shoes as soon as they enter the premises of this city. This city has its roots in Delhi Sultanate and Mughal Empire. Along with tombs, there are famous and historically significant mosques in Multan like; Jamia Mosque, the first mosque to be built in there by Muhamamd Bin Qasim who conquered this city, Sawi Mosque, Mosque Baqarabadi, and Mosque Ali Muhammad Khan. 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.

Talking about mementos of Multan, the first and the foremost thing to be mentioned is blue pottery. The Multani kashi is influenced by Mongolian art and was introduced by local craftsmen of Multan. Ustad alam institute of Blue pottery is the oldest factory equipped with modern machines for stone grinding, ceramic moulding, painting and firing. The place provides on the job training opportunity to learn pottery and Kashigari. The institute is owned by Ustad Muhammad Alam, the acclaimed artisan of Kashigari. He has a career of over 60 years in the craft and has bagged many prizes including Presidential Award and UNESCO award. Shades of dark blue and turquoise and repetition of patterns are hallmark of blue pottery ceramics. Architects have used these patterns and lethal color combinations to adorn the shrines of Bahauddin Zikria, shah rukn-e-alam and buildings like beautiful eid gah mosque and many more. Multani sohan halwa is the second most famous thing used as a souvenir over decades. Founded by Hafiz Ahmad din in 1930, sohan halwa is considered to be the healthiest and the most scrumptious dessert of the subcontinent. Another gift for the palates of people in Pakistan and all over the world is the king of fruits: The Mangoes. Mango orchards on the eastern side of the city blossom throughout the summer season. Out of 150 varieties of mangoes grown in Pakistan, major production of it is carried out in Multan. Anwar ratol, Langra, Dussehri, and the most popular one Chaunsa, all are grown in Multan. The ripening season of Chaunsa lasts from July till late August. The season of Pakistani mangoes usually begins in the month of May and lasts till September.

Multan has second oldest medical institute built by Sardar Abdul Rab Nishtar, known as Nishtar hospital, which was extended to Nishter medical college and known as Nishter medical university today. 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 Zikria Univeristy named after scholar and saint Bahauddin Zakariya. Built in 1975, BZU is one of the largest Universities in Punjab. Another gigantic structure that adds to the beauty of this city is the state bank building located near Multan Art's Council. This building was completed in 1998 and is an epitome of modernity and adroit architect.

Paving its way from culturally rich historical background to portraying the modern era, Multan has covered a vast journey. Modern day Multan is diverse, developed and modernized with factories, industries, educational institutes, malls, hotels and well-developed system of roads. While mentioning industries of Multan, Pak-Arab Fertilizers Company is the largest name to be mentioned. Developed 38 years back, it is the only fertilizer company in Pakistan that produce compound fertilizer. Housing societies like DHA, has helped the city to cover another mile towards development. Within the span of 10 years, there are many educational institutes that are building their campuses in Multan taking the standard of education in the city to the next level. MNS-university of Agriculture is one of them. MNS-UAM started its degree programs in 2013 and within a period of 8 years, today university has a state of the art campus which is equipped with modern instruments to revolutionize the study in the field of agriculture. Highly qualified staff and intricate vicinity of the campus makes it one of the best institutes in Multan.

A city which is older than time and developed to meet the challenges of modern day is worth commending and is an absolute mark on the map of Pakistan.

MNS University of Agriculture, Multan

MNS University of Agriculture, Multan

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. Besides Bachelor's level degree programs in Agriculture, Agribusiness, Computer Science and Information Technology, the University also offers F.Sc. Pre-Agriculture, and M.Sc. and Ph.D in various disciplines of Agricultural Sciences. The University has also started B.Sc. (Hons.) Human Nutrition and Dietetics, B.Sc. (Hons.) Poultry Science, B.Sc. Agro-industrial Engineering Technology, whereas 6 new undergraduate degree programs and 5 MS/M.Sc./PhD programs are being initiated this year.

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 Sino-Pak International Cotton Conference, 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 2020 has ranked MNSUAM at number 3 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.

ACADEMIC ACTIVITIES

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-1

ACADEMIC ACTIVITIES

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ACADEMIC ACTIVITIES

In order to ensure production of trained human resource and to meet a wide array of needs of scientists, experts and extension workers in rapidly growing agriculture sector, allied trades and industries, the University offers integrated teaching and research programs in agriculture and allied sciences. Since its establishment, the University's contribution, in conformity with its concept, scope, and canvas of academic activities has magnified manyfolds.

1.1. Faculties & Departments

- Faculty of Agriculture and Environmental Sciences
  - Department of Agronomy
  - Department of Food Science and Technology
  - 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
    - Post-harvest
    - Weed Science
- Faculty of Agricultural and Biosystems Engineering and Technology
  - Department of Agricultural Engineering
- Faculty of Social Sciences and Humanities
  - Department of Agribusiness and Applied Economics
  - Department of Computer Science
  - Department of Continuing Education
  - Others Supporting Departments
    - ✓ Department of Statistics
    - ✓ Department of English
    - ✓ Department of Pak. Studies
    - ✓ Department of Islamic Studies
- Faculty of Sciences
- Faculty of Food and Home Sciences
- Faculty of Veterinary and Animal Sciences
  - Department of Anatomy
  - Department of Pharmacology and Physiology
  - Department of Biochemistry and Biotechnology
  - Department of Pathobiology
  - Department of Clinical Sciences
  - Department of Poultry Sciences
  - Department of Animal Feed and Production
  - Department of Fisheries and Aquaculture

1.2. Degree Programs Offered

1.2.1. Undergraduate

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

Degree	Credit hours and duration	Academic qualification	Minimum requirement
B.Sc. (Hons.) Agriculture	141 credit hours for duration of 8 semesters	Intermediate Science F.Sc. (Pre-Medical/Pre-Engineering)/Pre-Agriculture	Minimum 50% of total marks
BBA Agribusiness	132 credit hours for duration of 8 semesters	Intermediate	
BS Computer Science	133 credit hours for duration of 8 semesters	1. Intermediate Science 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.	
BS Information Technology	135 credit hours for duration of 8 semesters	1. Intermediate Science 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 securing minimum 50% of total marks.	

B.Sc. (Hons.) 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 BIO-301, 3(2-1) (Essentials of Biology) Candidates having F.Sc. Pre-Agriculture with 50% marks will be eligible subject to study deficiency course in Biology BIO-301, 3(2-1) (Essentials of Biology)	
B.Sc. (Hons.) Fisheries and Aquaculture	136 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 BIO-301, 3(2-1) (Essentials of Biology) Candidates having F.Sc. Pre-Agriculture with 50% marks will be eligible subject to study deficiency course in Biology BIO-301, 3(2-1) (Essentials of Biology)	
BS Microbiology	135 credit hours for duration of 8 semesters	Intermediate Science (Pre-medical)	
B.Sc. (Hons.) Animal Science	138 credit hours for duration of 8 semesters	F.Sc. (Pre-Medical) or standard equivalent examination with at least 50% marks from University or Boards with Physics, Chemistry, Biology. Candidates having F.Sc. Pre-engineering and F.Sc. Pre-Agriculture degree are eligible for admission subject to qualify the deficiency course in Biology: Essentials of Biology BIO-301, 3(2-1)	
B.Sc. (Hons.) Human Nutrition and Dietetics	141 credit hours for duration of 8 semesters	Intermediate science (Pre-medical), A-Level	Minimum 60% of total marks

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, B.Sc. (Hons.) Agriculture and Resource Economics. **OR** 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
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,	(a) CGPA = 2.5/4.00 (b) At least 2nd Division

M.Sc. (Hons.) Climate change	Regular	4	6	Biotechnology, Plant Pathology from HEC recognized university/ DAIs. (Deficiency course will be given where necessary) 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 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	(a) CGPA = 2.5/4.00 (b) First division where GPA system not implement ed. (c) Entry test

				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 the MSCS. Deficiency courses will be decided by departmental committee	
MS Management (Specialization in Agribusiness) **Note:** Program shall be offered Subject to NOC from HEC.	Regular	4	6	**a.** BBA (Agribusiness)/B.Sc. (Hons.) Agri. (Agriculture 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 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

PhD (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 Directorate of Graduate Studies is to streamline 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 Executive Committee of the University. The GRC is an interdisciplinary program 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 as 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 on every Wednesday at 9:40 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 of Graduate Resource Center

Activity	Title and Resource Person	Date
Seminar	**Herbicide Resistance: Mechanisms and Management** Dr. Amar Matloob, Assistant Professor, Department of Agronomy, MNSUAM	01.07.2020
Seminar	**Cotton Defense Umbrella Traits** Ms. Zahida Noreen, Ph.D. Student, Institute of Plant Breeding and Biotechnology, MNSUAM	08.07.2020
Seminar	**Mental Health and its Relationship with COVID-19** Dr. Asif Mughal, Psychiatrist	15.07-2020
Seminar	**Challenges to Seed Production Industry in Changing Climate** Dr. Rashid Mehmood, Assistant Professor, Arid Agriculture University, Rawalpindi	22.07.2020
Seminar	**Potential of Buckwheat (*Fagopyrum esculentum*) as Multipurpose Crop in Argo-climatic Conditions of Multan** Mr. Mahmood Alam Khan, Ph.D. Scholar, Department of Agronomy, MNSUAM	28.07.2020
Seminar	**Effects of Tillage and Organic Amendments on Soil Health and Productivity of Wheat-Cotton Cropping System** Mr. Hafiz Muhammad Waleed, Ph.D. Scholar, Department of Agronomy, MNSUAM	28.07.2020
Seminar	**Seed Enhancement Techniques** Mr. Waseem Zulfiqar, Ph.D. Student, Institute of Plant Breeding and Biotechnology, MNSUAM	05.08.2020
Seminar	**Future Smart Food Crops** Dr. Shahid Iqbal, Assistant Professor, Department of Agronomy, MNSUAM	12.08.2020
Seminar	**Strategy for Identification of Novel Genes And Its Functional Characterization** Dr. Syed Adeel Zafar, CAAS-CHINA, Chinese Academy of Agricultural Sciences	19.08.2020
Seminar	**Lessons to Learn From The Life of Hazrat Imam Hussain (RA) i.e. Patience, Determination, Forgiveness, Courageousness** Mr. Mudassir Ayoub, Ph.D. Scholar, History and Civilization Studies, BZU, Multan	26.08.2020
Ph.D. Synopsis	**Genetic Variability and Spatiotemporal Dynamics of Major RNA Viruses Infecting Onion and Garlic Crops in Punjab, Pakistan** Muhammad Zubair Hamza, Ph.D. Synopsis, Institute of Plant Protection, MNSUAM	02.09.2020
Seminar	**Development and Achieving SMART Key Performance Indicator** Prof. Dr. Asif Ali, VC MNSUAM, Institute of Plant Breeding and Biotechnology, MNSUAM	09.09.2020
Seminar	**Meat Production in Pakistan: Current Status and Future Prospects** Dr. Muawuz Ijaz, Lecturer, University of Veterinary and Animal Sciences, Lahore (Jhang Campus)	16.09.2020

Seminar	**High Performance Chelates** Dr. Muhammad Imran, Technical Development Manager Micronutrients, Ethylene and Sulphur Derivatives, Nouryon, Germany	30.09.2020
Seminar	**SMOG ISSUES in Pakistan** Dr. Sajid Hussain, Chinese Academy of Agricultural Sciences	14.10.2020
Seminar	**Impact of Glaciers and Snow Melting on Agriculture Sustainability** Dr. Sher Muhammad, The International Centre for Integrated Mountain Development, Nepal	22.10.2020
Seminar	**Research Based Video and poster - An interactive Session with Students** Dr. Shoaib Ur Rehman, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	28.10.2020
Seminar	**Strip Intercropping: A New Innovation to Increase Cereal and Legume Production in Pakistan** Dr. Muhammad Ali Raza, Post-Doctoral Research Fellow, Sichuan Agricultural University, China	04.11.2020
	Research Based Poster and Video Competition	11.11.2020
Seminar	**Introducing Indigenous Research Resources Developed by PASTIC** Mr. Syed Habib, Pakistan Scientific and Technological Information Center	17.11.2020
Seminar	**SPS Certification** Sikander Ali, M.Sc., Institute of Plant Protection, MNSUAM	18.11.2020
Seminar	**How to Publish in High Impact Factor Journals? My Success Story** Dr. Mohsin Nawaz, Assistant Professor, Department of Agricultural Engineering, MNSUAM	25.11.2020
Seminar	**Scientific Writing Skills And Publishing Tips** Prof. Rana Munns, Commonwealth Scientific and Industrial Research Organisation/University of Western Australia	02.12.2020
Seminar	**How to be Happy** Prof. Dr. Asif Ali, VC MNSUAM, Institute of Plant Breeding and Biotechnology, MNSUAM	09.12.2020
Seminar	**Effective Utilization of HEC Digital Library Resources** Dr. Akash Fatima, Assistant Professor, Institute of Plant Breeding and Biotechnology, MNSUAM	16.12.2020
Seminar	**Initials of Gene Expression Experiment** Dr. Shoaib Ur Rehman, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	23.12.2020
Seminar	**Management of Pink Bollworm with Mating Disruption Technique "An overview"** Mr. Furqan Ahmad, PhD Student, Institute of Plant Breeding & Biotechnology, MNSUAM	30.12.2020
Seminar	**Ensuring Food Security through Fish Farming: An Alternate Policy Option** Dr. Nasir Nadeem, Associate Professor, Department of Agri-Business and Agri-Economics, MNSUAM	06.01.2021
Seminar	**Synthesis, Characterization and Application of Nanomaterials** Mr. Muhammad Usman, Lecturer, Institute of Plant Breeding and Biotechnology, MNSUAM	13.01.2021
Ph.D. synopsis Defense	**Ph.D. synopsis Defense** Sidra Jameel, Ph.D. Scholar, Institute of Plant Breeding & Biotechnology, MNSUAM	20.01.2021
Seminar	**Boosting Genomics with Deep Learning** Dr. Zulqurnain Khan, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	03.02.2021
Seminar	**High Throughput Genotyping** Ms. Mahnoor Naeem, MSc. Student, Institute of Plant Breeding & Biotechnology, MNSUAM	10.02.2021
Seminar	**Management of Pink Bollworm in Cotton through Refugia** Dr. Shafqat Saeed, Professor, Institute of Plant Protection, MNSUAM	17.02.2021
Seminar	**Opportunities for Higher Studies in China** Dr. Shoaib Ur Rehman, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	10.03.2021
Seminar	**Insecticide Resistance Monitoring: Smart Perspective** Dr. Muhammad Umair Sial, IPFP Fellow / IPP	17.03.2021
Seminar	**Career Opportunities in UNO and International Organizations** Mr. Usman Haider, Political Affair Officer, UNO	18.03.2021
Seminar	**Potential of Robotics and Automation in Agriculture** Dr. Umar Shahbaz Khan, Project director, National research Centre for Robotics and Automation	31.03.2021
Seminar	**Personal Excellence** Mr. Muhammad Wajihuddin / Ms. Misbah Saghir, Business strategist, executive coach, certified trainer, e-commerce and digital marketing industries	07.04.2021
Seminar	**Future of Agriculture - with Data Science Analytics** Dr. Ayesha Hakim/Sana Tariq, Assistant Professor, Department of Computer Science, MNSUAM	14.04.2021
Ph.D. Final Defense	**Ph.D. Final Defense** Ms. Sabah Merrium (Ph.D. Scholar), Institute of Plant Breeding and Biotechnology, MNSUAM	16.04.2021
Ph.D. synopsis Defense	**Ph.D. Synopsis Defense** Mr. Muhammad Adnan, (Ph.D. Scholar), Department of Soil and Environmental Sciences, MNSUAM	21.04.2021

Ph.D. synopsis Defense	**Ph.D. Synopsis Defense (Repeated)** Mr. Muhammad Adnan, (Ph.D. Scholar), Department of Soil and Environmental Sciences, MNSUAM	28.04.2021
Seminar	**Broadening the Genetic Base of Cotton Cultivars** Dr. Iftikhar Ali, Institute of Cotton Research, China	19.05.2021
Seminar	**Plagiarism and HEC Policy** Dr. M. Hammad Nadeem Tahir, Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	26.05.2021
Seminar	**Tips for success: An effective presentation for the dissertation** Dr. M. Arslan Nawaz, Student, Faculty of Organic Agriculture Sciences, Witzenhausen, University of Kassel, Germany	02.06.2021
Seminar	**How to Write Successful Research Proposal** Prof. Sergey Shabala, Professor, University of Tasmania, Australia	09.06.2021
Seminar	**Development of Polystyrene Coated Persulfate Slow-Released Beads for the Oxidation of Targeted PAHs: Effects of Sulfate and Chloride Ions** Dr. Mohsin Nawaz, Assistant Professor, Department of Agricultural Engineering, MNSUAM	16.06.2021
Seminar	**Thesis Writeup does not have to be Painful** Prof. Dr. Asif Ali, VC, MNSUAM	23.06.2021
Seminar	**New Fruit Trees to Plant in Hot and Dry Climates of Pakistan** Dr. M. Abubakar Saddique, Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM	30.06.2021

1.5. Academic Calendar (2020-21)

	A	**Enrollment Winter Semester 2020-21**	**September 01-11, 2020**
	1.	Commencement of Classes	14-09-2020
	2.	Mid-Term Examination	10-11-2020
	3.	Final Term Examination	06-01-2020
	4.	Result Declaration	26-01-2021
Total Duration		20 Weeks	

	B	**Enrollment Spring Semester 2021**	**January 27 - February 03, 2021**
	1.	Commencement of Classes	04-02-2021
	2.	Mid-Term Examination	02-04-2021
	3.	Final Term Examination	31-05-2021
	4.	Result Declaration	19-06-2021
Total Duration		20 Weeks	

1.6. Academic Achievements

- All ongoing postgraduate programs have attained NOC from HEC.
- All ongoing undergraduate programs have been accredited by National Agriculture Education Accreditation Council (NAEAC).
- Constitution of Online Academic Council and certification of teachers to impart online education.
- Initiation of online classes through Learning Management System like Moodle, and video conferencing tools like Zoom and Google Meet for all courses of Spring 2021 in accordance with the "Online Preparedness Guidelines" of HEC and University's SoPs.
- Department of Agronomy is offering a new undergraduate elective course "Spate irrigated Agriculture" from winter semester 2020-21.
- Department of Agribusiness and Applied Economics played a major role in conceptualization and approval of Centre for Agricultural Sustainability in South Punjab (CAS-SP).
- Department of Agribusiness and Applied Economics played a major role in conceptualization and approval of Entrepreneurship Lab for undergraduate and postgraduate students.
- Department of Agribusiness and Applied Economics has got approval for the initiation of new degree program B.Sc. (Hons.) Agricultural and Resource Economics (4-year degree program, direct admission) by the Board of Studies and Faculty Board.
- Another new postgraduate degree program of M.Sc. (Hons.) Postharvest Management Technology was approved by the syndicate of the University under the umbrella of Institute of Plant Protection, and NOC from HEC has been received to start this degree program.
- Approval of the curricula M.Sc. (Hons.) AIET and M.Sc. (Hons.) Agri. Engg. programs from the Board of Advanced Studies and Research (BASR).
- Successfully completion of the interim visits of National Technology Council of Pakistan for B.Sc. Agro-Industrial Engineering Technology.
- Successfully submission of the zero visit application to Pakistan Engineering Council (PEC) to start B.Sc. Agricultural Engineering.
- Approval of scheme of study to start the B.Sc. Environmental Engineering.
- In 2020-21, following new undergraduate degree program has been submitted to Academic Council for approval:
    - ✓ BS Zoology
- Following new postgraduate (MS & Ph.D.) programs have been submitted to Academic Council for approval:
    - ✓ MS and Ph.D Zoology
    - ✓ MS and Ph.D Microbiology
- The NOC to launch following postgraduate degree programs have been submitted to HEC in September 2020.
    - ✓ MS Public Health
    - ✓ MS Poultry Science
    - ✓ MS Fisheries

- Initiation of Farm Management as major subject of B.Sc. (Hons.) Agriculture after approval of scheme of studies from Academic Council and Syndicate.
- Successfully completion of the formal visits of NAEAC for B.Sc. (Hons.) Agriculture, major Agricultural and Resource Economics, Biotechnology, Plant Pathology, and BBA Agribusiness degree programs.
- Review Meetings of NAEAC regarding undergraduate programs of Agronomy, Entomology, Plant Breeding and Genetics, Entomology, and Soil science.
- Department of Computer Science has successfully launched an MS Computer Science program this year.
- Department of Computer Science has successfully accredited BS Computer Science programs from the National Computing Education Accreditation Council (NCEAC) & BS Information Technology program application has been submitted for the accreditation.
- Successfully revision of scheme of studies for various programs from the Board of Study, Faculty Board, and Academic Council.
- The numbers of faculty members have been increased to 114 (84 Ph.D. and 30 Non Ph.D.) and most of which are HEC approved supervisors.

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 Geisenhelm 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, Turkey
- 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 key partner of Punjab team in ACIAR project "Improving groundwater management to enhance agriculture and farming livelihoods in Pakistan".
- Academic and research linkages with CSU and UoC for preparation and submission of ACIAR funded project "Living with Salinity".
- University of Adelaide, Australia

1.7.3. Faculty of Agricultural, Biosystems Engineering and Technology

- Kyungpook National University, South Korea
- University Putra, Malaysia

1.7.4. Faculty of Veterinary and Animal Sciences

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

1.8. Institutional Linkages

1. Ayub Agricultural Research Institute, Faisalabad
2. Mango Research Institute, Multan
3. Central Cotton Research Institute, Multan
4. Cotton Research Institute, Multan
5. Pesticide Quality Control Lab, Multan
6. Soil and Water Testing Laboratory, Multan
7. Agricultural Mechanization Research Institute, Multan
8. Women University, Multan
9. Nishtar Medical University, Multan
10. University of Agriculture, Faisalabad
11. NFC Institute of Engineering and Technology, Multan
12. National University of Science and Technology, Islamabad
13. University of Engineering and Technology (UET), Lahore
14. COMSATS University, Islamabad
15. Bahauddin Zakariya university, Multan
16. Khawaja Fareed University of Engineering and Information Technology, Rahim Yar Khan
17. Islamia University, Bahawalpur
18. University of Education, Multan
19. Air University, Multan Campus
20. NCBA&E, Multan Campus
21. GIFT University, Gujranwala

22. MNS University of Engineering and Technology, Multan
23. U.S.Pakistan Centre for Advanced Studies in Energy
24. Food and Agriculture Organization of the United States
25. Pakistan Meteorology Department, Islamabad
26. Nestle, Pakistan
27. Engro Fertilizers Ltd., Pakistan
28. Fatima Fertilizers Company Ltd., Pakistan
29. Alternative Technologies, 389- B Faisal Town, Lahore
30. Best Technologies, Multan
31. Doaba Foundation
32. Punjab Irrigation Research Institute, Lahore
33. Noori Agrolines Multan
34. Dept. of Civil Engg., NUST
35. Potato Research Institute, Sahiwal
36. AMRI, Multan
37. Qayyum & Company
38. Japan Machine Ltd.
39. Punjab Mango Research and Development Board
40. Punjab Postharvest Research and Development Board
41. Horticulture Research Station, Bahawalpur
42. SAWIE systems
43. Ali Akbar Group of Industries
44. Roomi Foods (Pvt.) Ltd.
45. Bayer Crop Science
46. Jaffer Agro Services (Pvt.) Ltd.
47. Syngenta Pakistan Limited
48. Evyol Group of companies
49. National Vocational and Technical Training Commission

1.9. Honors and Awards

- Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM received "Tamgha-e-Imtiaz" for his outstanding performance and contribution to the development of Agriculture sector as a Plant Breeder and Geneticist. This is the first ever civil award received by a MNSUAM Official.
- Prof. Dr. Ishtiaq Ahmad Rajwana, Pro-Vice Chancellor, MNSUAM was appointed as Chairman, National Agriculture Education Accreditation Council (NAEAC) by Chairman, HEC for a period of four years.
- Mr. Muhammad Arif, Lecturer, Soil and Environmental Sciences, Mr. Furqan Ahmad, Mr. Babar Farid, Lecturers, Institute of Plant Breeding and Biotechnology won PhD scholarship of Chinese Academy of Sciences.

- Mr. Asif Mehmood Arif, Lecturer, Institute of Plant Protection (Plant Pathology) won the HEC indigenous Ph.D. Fellowship to pursue his Ph.D.
- Alexander von-Humboldt Foundation awarded Von-Humboldt Postdoctoral Fellowship to Dr. Fahim Nawaz at University of Hohenehim, Stuttgart, Germany
- Federal Ministry of Education and Research, Germany awarded Postdoctoral Fellowship to Dr. Muhammad Habib ur Rehamn at The Institute of Crop Science and Resource Conservation (INRES), Crop Science Group, University of Bonn, Germany.

1.10. Good Practices Implemented

- 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
- Use of class management software
- Engagement of undergraduate students in research activities by attaching them with postgraduate students
- Constitution of Research and Vigilance Committee
- Started alumni follow up
- Career counseling sessions for students
- International seminars/conferences/workshops
- Hands-on Training of faculty and students
- Compulsory internship of B.Sc. (Hons.) 8th Semester students at private sector companies and farms
- Students hands on training for the development of mini projects
- Provision of help in the form of tutorials and guidelines to whole faculty and students for using online systems

RESEARCH AND DEVELOPMENT

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-2

RESEARCH AND DEVELOPMENT

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RESEARCH AND DEVELOPMENT

The Office of Research, Innovation and Commercialization (ORIC) has been functioning since 2015 for facilitation of 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 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 for the uplift of a standardized and well-acclaimed innovation and commercialization ecosystem.

Despite COVID-19 pandemic, the graph of activities did not go down, during the reported year. Many of the faculty and staff get suffered from this virus but their inspiration towards the tasks was encouraging. ORIC also facilitated the faculty for submission of 130 research projects to various national and international funding agencies, including HEC, PARB, PSF, SUPARCO, Pak-Italy, PHEC, ADP, industry/private sector. Resultantly, 40 competitive research grants worth PKR 97.633 million have been won by the faculty and students from various national and international funding agencies (PKR 62.65 million), industry/private sector (PKR 27.18 million), Students FYPs from Ignite (PKR 1.46 million) and Skill Development under Kamyab Jawan (PKR 6.245 million) for the proliferation of scientific culture and innovative research. Moreover, ORIC has also facilitated the faculty for the successful completion of 23 research projects worth PKR 159.90 million and three skill development projects worth 5.807 million. The execution of 52 national (46) and international (06) research projects (worth PKR 443.41 million) is in progress. Due to the availability of conducive research and working environment, the faculty was able to publish 207 research articles in well reputed national and international peer-reviewed journals and 28 book chapters.

On the other hand, 32 Agreement(s) of Cooperation (AoCs) have been signed with various national and international organizations and ORIC will take the lead for successful implementation of these AoCs with the partner organizations. Similarly, ORIC has organized five national and international conferences, seven competitions, and 40 national and international seminars/Webinars. The capacity building and mentoring activities include 11 faculty training/workshops and 37 training of students/researchers under the Central Lab System with 94 outreach and recreational activities. The other civic engagement events to make a change in the community include Mango Festival, DICE, farmers training on STS and Honey bee keeping, farmer advisoy and industry consultancy activities, working with communities through social action plans on multiple socio-economic opportunities, challenges and avenues to develop their resilience. Besides afford mentioned activities and achievements, the ORIC facilitated faculty and university administration for patents filing, certification of quarantine facilty and participation of university in various rankings (The Times Higher Education Impact Ranking, The Times Higher Education World Universities Ranking, WURI Ranking, QS World Ranking and UI GreenMetric World University Ranking).

2.1. Projects

2.1.1. Fresh Awarded Faculty Research Projects

The following research projects were awarded during the reported year 2020-21.

Sr. No.	Project	Principal Investigator	Total Amount Million (PKR)	Funding Agency
1	Prevalence of rotavirus and hepatitis A virus in drinking and sewage water collected from selected regions of Southern Punjab	Dr. Aziz-ul-Rahman	0.70	HEC-SRGP
2	Smart monitoring and control of the dengue vector	Prof. Dr. Shafqat Saeed	3.19	UK GCRF
3	Biodiversity + Collaborative capacity building for plant biodiversity research preservation in oasis ecosystem of Pakistan	Prof. Dr. Asif Ali/ Prof. Dr. Zulfiqar Ali	15.04	DAAD
4	Genetic analysis of naturally colored cotton in relation to drought stress	Dr. Akash Fatima	1.00	HEC-SRGP
5	Molecular characteristics and in-vitro evaluation of chemicals against *Botryosphaeriaceae* species associated with mango gummosis disease in district Multan and Muzaffargarh	Dr. M. Zeeshan	1.00	HEC-SRGP
6	Evaluation of reproductive hormonal profile and hematology of Chinkara deer (*Gazella bennettii*) in Pakistan	Dr. Rana Waseem Akhtar	1.00	HEC-SRGP
7	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	1.00	HEC-SRGP
8	Nutritional effects of different levels of Probiotics (*Lactobacillus acidophilus* and *Saccharomyces cerevisiae*) on major carps (*Labeo rohita* and *Cyprinus carpio*): comparative analysis	Dr. Riffat Yasin	1.00	HEC-SRGP

9	Investigation of biotype and associated cytochrome P450 insecticide resistance detoxification encoding genes of cotton whitefly, *Bemisia tabaci*	Dr. Umair Sial	1.00	HEC-SRGP
10	Early detection and management of red palm weevil, *Rhynchophorus ferrugineus* (Olivier), a highly damaging pest of date palm *(Phoenix dactylifera)* in Pakistan	Dr. Khalid Mehmood	1.00	HEC-SRGP
11	Design and development of indigenous solar desiccant drying system	Dr. Shazia Hanif	1.00	HEC-SRGP
12	Adapting to Salinity in the Southern Indus Basin (ASSIB)	Prof. Dr. Irfan A. Baig	2.31	ACIAR
13	Smart Trap for detection and monitoring of mango fruit fly species *(aka SmarTraps)*	Dr. Ayesha Hakim	0.35	Uni. Resources
14	Genetic adaptability and water-fertilizer intelligent regulation mechanism of climate smart varieties	Prof. Dr. Asif Ali	18.00	PSF-NSFC IV-83
15	Design and development of indigenized compost windrow turner for the enrichment of soil nutrients	Engr. Dr. Sarfraz Hashim	10.13	ALP PARC
16	Development of fruits value addition business entities: A way forward towards women entrepreneurship	Dr. Afshan Shafi	5.03	ALP PARC

2.1.2. Industry Funded Research Projects

Sr. No.	Project	Principal Investigator	Total Amount Million (PKR)	Funding Agency
1	Production of special purpose pasta wheat through contract farming	Prof. Dr. Zulfiqar Ali	24.96	Volka Food International, Ltd., Multan
2	Production of *Moringa olifera* based nutraceutical products	Prof. Dr. Umar Farooq	1.02	Hafeez Ghee & General Mills, Pvt. Ltd. , Multan
3	Development and application of functional markers for seed quality based on phytohormones metabolism in cotton	Dr. M. Baqir Hussain / Ms. Bushra Irum	1.20	PAC Industry Fellowship

2.1.3. Students Projects Funded by Ignite

Sr. No.	Project	Principal Investigator	Total Amount Million (PKR)
1	Identification of missing person (kidnapped) through image processing	Ms. Ghalia Riaz/Dr. Abdul Razzaq	0.080
2	Student engagement detection in classrooms through facial expressions and sentiment analysis	M. Umair/Dr. Ayesha Hakim	0.080
3	Improving Pakistan's healthcare system through process mining	Ms. Ayesha Bibi/Dr. Ayesha Hakim	0.070
4	Automated rice classification and grading using deep learning	Syed Wajahat Mashkoor/Dr. Ayesha Hakim	0.070
5	Automated air and sound pollution monitoring system	Ms. Tabish Imam/Dr. Ayesha Hakim	0.070
6	Smart poultry system	Ms. Laraib Noor/Dr. Amir Hussain	0.080
7	Automatic mango variety classification and grading using deep learning	Mr. Hafiz M. Rizwan Iqbal/ Dr. Ayesha Hakim	0.071
8	Smart wheelchair for elderly and disabled people	Mr. Hafiz Usama Ishtiaq/Dr. Amir Hussain	0.080
9	IoT based vehicle speed control system	Mr. Hussain Sajid/Ms. Ms. Javeria Jabeen	0.070
10	Intelligent face mask and body temperature detection system	Dr. Ayesha Hakim	0.070
11	IoT based streetlight monitoring system	Engr. Adnan Altaf	0.065
12	IoT based fish stress monitoring system	Dr. Abdul Razzaq	0.080
13	Seed sowing robot	Ms. Javeria Jabeen	0.079
14	Automatic hand sanitizing dispenser with thermometer	Ms. Javeria Jabeen	0.077
15	Aquatic trash bin	Ms. Javeria Jabeen	0.075
16	Baby monitoring smart cradle	Dr. Aamir Hussain	0.051
17	Drain clog detector using tensor flow	Dr. Aamir Hussain	0.074
18	Smart helmet	Engr. Adnan Altaf	0.070
19	Smart hydroponic	Dr. Aamir Hussain	0.070
20	Navigational assistive shoes	Ms. Javeria Jabeen	0.076

2.1.4. Ongoing Research Projects

2.1.4.1. International

Sr. No.	Project	Principal Investigator	Total Amount PKR	Funding Agency
1	Increasing productivity and profitability of pulse production in cereal based cropping system in Pakistan	Prof. Dr. Zulfiqar Ali	40.00	ACIAR
2	Current status, genetic variability and molecular characterization of major viruses infecting onion and garlic crops in Punjab, Pakistan	Prof. Dr. M. Ashfaq	1.80	IFS (Swedan)
3	Carbon Sequestration: an ultimate solution for improving farmers livelihood and resource use efficiency	Dr. M. Imran	1.50	FOSTECT Vietnam
4	Smart monitoring and control of the dengue vector	Prof. Dr. Shafqat Saeed	3.19	UK GCRF
5	Biodiversity+ Collaborative capacity building for plant biodiversity research preservation in oasis ecosystem of Pakistan	Prof. Dr. Asif Ali/ Prof. Dr. Zulfiqar Ali	15.04	DAAD
6	Adapting to salinity in the Southern Indus Basin (ASSIB)	Prof. Dr. Irfan A. Baig	2.31	ACIAR

2.1.4.2. National

Sr. No.	Project	Principal Investigator	Total Amount PKR	Funding Agency
1	Development of endophytic bacteria-mycorrhizal fungi consortium to mitigate the drought stress in chickpea	Dr. M. Usman Jamshaid	3.30	HEC-NRPU
2	Management of whitefly by integrated strategies and development of resistant cotton germplasm through genetic engineering	Prof. Dr. Shafqat Saeed	4.80	PARB
3	A comprehensive integrated scientific approach for the development of sustainable management strategies of Pink Bollworm (*Pectinophora gossypiella*)	Prof. Dr. Shafqat Saeed	3.91	PARB
4	Fruit and shoot borers of mango, *Mangifera indica* L.; A potential quarantine pest and threat to mango industry	Prof. Dr. Shafqat Saeed	3.40	HEC-NRPU

5	Development of nutritious energy dense emergency relief food products for disastrous areas of Pakistan with special reference to protein energy malnutrition (PEM)	Dr. Ambreen Naz	2.51	HEC-NRPU
6	Improving yield, drought and salinity tolerance in wheat through GA-sensitive dwarfing gene system	Prof. Dr. Zulfiqar Ali	33.98	PARB
7	Collection and characterization of Phalsa *(Grewia Subinaequalis* D.C.) landraces having high sugar and carotene contents	Dr. Kashif Razzaq	2.98	ALP PARC
8	Breeding Soyabeen for adoptation and high yield in current scenario of climate change in Punjab	Prof. Dr. M. Hammad Nadeem Tahir	34.46	PARB
9	Investigations on crop productivity, commercial potential and market constraints of guwar bean industry	Dr. Muqarrab Ali	2.22	HEC-NRPU
10	Water conservation and improvement in soil fertility through tillage and strip cropping of legumes in spate irrigated area of Pakistan	Dr. Khuram Mubeen	1.90	HEC-NRPU
11	Improving chickpea production on sandy soils by using biochar produced from cotton sticks at different temperatures	Dr. Tanveer Ul Haq	2.62	HEC-NRPU
12	Vegetable grafting against soil borne diseases, salinity and drought	Dr. H. Nazar Faried	3.48	HEC-NRPU
13	Development of production and formulation technologies for eco-friendly entomopathogenic fungus for managing fruit fly	Dr. Mirza Abdul Qayyum	4.95	HEC-NRPU
14	Development of innovative techniques for plan multiplication canopy management and value addition of promising ber (*Ziziphus marutiana*) varieties	Dr. Ambreen Naz	9.40	PARB
15	Isolation and evaluation of halotolerant nutrient mobilizing bacteria	Dr. Shakeel Ahmad	0.53	NIHA
16	Exploring the nutritional and functional properties of mango seed oil in bakery products	Dr. M. Shahbaz	2.30	HEC-NRPU

17	Genetic variability and molecular characterization of RNA viruses infecting cucurbits in Punjab, Pakistan	Prof. Dr. M. Ashfaq	8.87	HEC-NRPU
18	Enhancing productivity in 10 low producing tehsils through deployment of agri scientists at farm level	Prof. Dr. Asif Ali	200	ADP
19	Optimizing production practices and fruit quality of pomegranate in Southern Punjab	Prof. Dr. Ishtiaq A. Rajwana	6.66	HEC-NRPU
20	Local development of Micro Plot Seeders for improving efficiency of agricultural experiments	Dr.Alamgir Akhtar Khan/Dr. Umair Sultan	2.30	EFS-UAF
21	Development and validation of gel-free KASP markers to identify high yielding wheat breeding material from Pakistan	Dr. Shoaib ur Rehman	0.49	HEC-SRGP
22	Genetic analysis of naturally colored cotton in relation to drought stress	Dr. Akash Fatima	1.00	HEC-SRGP
23	Molecular characteristics and in-vitro evaluation of chemicals against *Botryosphaeriaceae* species associated with mango gummosis disease in district Multan and Muzaffargarh	Dr. M. Zeeshan	1.00	HEC-SRGP
24	Prevalence of rotavirus and Hepatitis A virus in drinking and sewage water collected from selected regions of Southern Punjab	Dr. Aziz-ul-Rahman	1.00	HEC-SRGP
25	Evaluation of reproductive hormonal profile and hematology of Chinkara deer (Gazella bennettii) in Pakistan	Dr. Rana Waseem Akhtar	1.00	HEC-SRGP
26	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	1.00	HEC-SRGP
27	Nutritional effects of different levels of Probiotics (*Lactobacillus acidophilus* and *Saccharomyces cerevisiae*) on major carps (*Labeo rohita* and *Cyprinus carpio*): comparative analysis	Dr. Riffat Yasin	1.00	HEC-SRGP
28	Investigation of biotype and associated cytochrome P450 insecticide resistance detoxification encoding genes of cotton whitefly, *Bemisia tabaci*	Dr. Umair Sial	1.00	HEC-SRGP

29	Early detection and management of red palm weevil, *Rhynchophorus ferrugineus* (Olivier), a highly damaging pest of date palm *(Phoenix dactylifera)* in Pakistan	Dr. Khalid Mehmood	1.00	HEC-SRGP
30	Development of fruits value addition business entities: A way forward towards women entrepreneurship	Dr. Afshan Shafi	5.03	ALP PARC
31	Design and development of indigenous solar desiccant drying system	Dr. Shazia Hanif	1.00	HEC-SRGP
32	Smart Trap for detection and monitoring of mango fruit fly species *(aka SmarTraps)*	Dr. Ayesha Hakim	0.35	MNS-UAM
33	Genetic adaptability and water-fertilizer intelligent regulation mechanism of climate smart varieties	Prof. Dr. Asif Ali	18.00	PSF-NSFC IV-83
34	Design and development of indigenized compost windrow turner for the enrichment of soil nutrients	Engr. Dr. Sarfraz Hashim	10.13	ALP PARC
35	intelligent face mask and body temperature detection system	Dr. Ayesha Hakim	0.07	Ignite
36	IoT based streetlight monitoring system	Engr. Adnan Altaf	0.07	Ignite
37	IoT based fish stress monitoring system	Dr. Abdul Razzaq	0.08	Ignite
38	Seed sowing robot	Ms. Javeria Jabeen	0.08	Ignite
39	Automatic hand sanitizing dispenser with thermometer	Ms. Javeria Jabeen	0.08	Ignite
40	Aquatic trash bin	Ms. Javeria Jabeen	0.08	Ignite
41	Baby monitoring smart cradle	Dr. Aamir Hussain	0.05	Ignite
42	Drain clog detector using tensor flow	Dr. Aamir Hussain	0.07	Ignite
43	Smart helmet	Engr. Adnan Altaf	0.07	Ignite
44	Smart hydroponic	Dr. Aamir Hussain	0.07	Ignite
45	Navigational assistive shoes	Ms. Javeria Jabeen	0.08	Ignite
46	Development and application of functional markers for seed quality based on phytohormones metabolism in cotton	Dr. M. Baqir Hussain/Ms. Bushra Irum	1.20	PAC Industry Fellowship

2.1.5. Projects Completed

Sr. No.	Project	Principal Investigator	Amount (Million PKR)	Funding Agency
1	Molecular characterization of gut microbial between ischemic heart disease patients and healthy volunteers in Pakistan	Dr. Hafiz M. Ishaq	3.00	HEC-SRGP

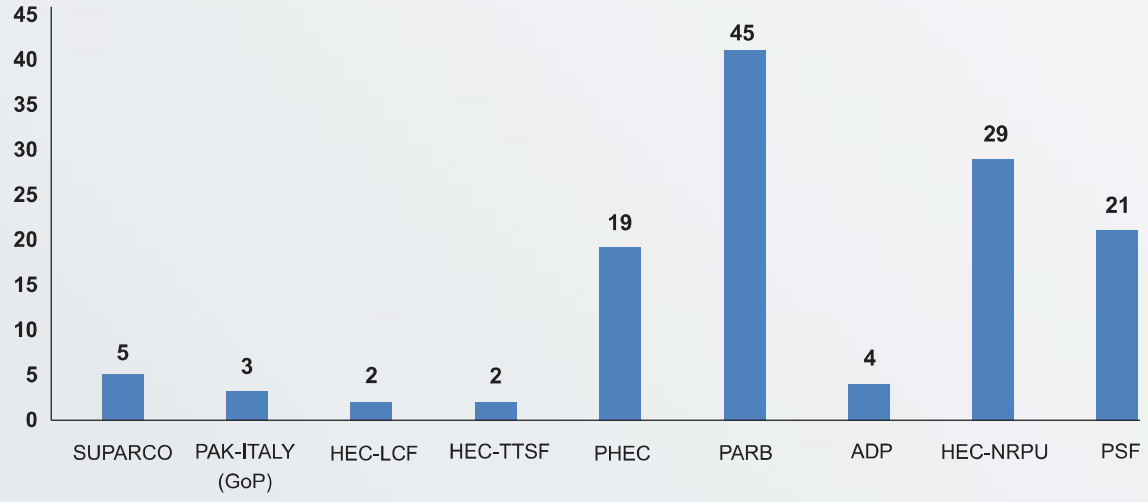
2	Introduction and promotion of one pass conservation tillage machinery for cotton wheat cropping system	Dr. Alamgir Akhtar Khan	12.29	HEC-TDF
3	Identification of phosphorus efficient cotton genotypes under heat stress conditions	Prof. Dr. Zulfiqar Ali	0.50	HEC-SRGP
4	Screening of genotypes with improved phosphorus uptake using symbiotic fungus in cotton	Dr. M. Salman/Prof. Dr. Zulfiqar Ali	0.48	HEC-SRGP
5	Development and Indigenization of Floppy Sprinkler system for future irrigation	Dr. Sarfraz Hashim	6.66	HEC-TDF
6	Environment friendly management of Potato Virus Y (PVY)	Dr. Nadeem Ahmed	0.48	HEC-SRGP
7	Community awareness about recycling of house garbage into value added products by intergartion with local manufacturer	Dr. Shakeel Ahmad	0.58	HEC-SIOP
8	Identification of Alternate Hosts of Cotton leaf curl disease in Multan Region	Dr. Hassan Riaz	0.42	HEC-SRGP
9	Production of special purpose pasta wheat through contract farming	Prof. Dr. Zulfiqar Ali	24.96	Volka Foods International, Ltd., Multan
10	Production of Moringa olifera based nutraceutical products	Prof. Dr. Umar Farooq	1.02	Hafeez Ghee & General Mills Pvt. Ltd., Multan
11	Commissioned research for the development of cotton seed	Prof. Dr. Zulfiqar Ali	90.94	GOP
12	Hybrid wheat for food security	Prof. Dr. Asif Ali	13.83	DFID
13	Improving groundwater management to enhance agriculture and farming livelihoods in Pakistan	Prof. Dr. Irfan A. Baig	4.00	ACIAR
14	Smart waste bin	Ms. Aiman Fatima/Dr. Ayesha Hakim	0.08	Ignite
15	Identification of missing person (kidnapped) through image processing	Ms. Ghalia Riaz/Dr. Abdul Razzaq	0.08	Ignite
16	Student engagement detection in classrooms through facial expressions and sentiment analysis	Mr. M. Umair/Dr. Ayesha Hakim	0.07	Ignite
17	Improving Pakistan's healthcare system through process mining	Ms. Ayesha Bibi/Dr. Ayesha Hakim	0.07	Ignite
18	Automated rice classification and grading using deep learning	Syed Wajahat Mashkoor/Dr. Ayesha Hakim	0.07	Ignite

19	Automated air and sound pollution monitoring system	Mr. Tabish Imam/Dr. Ayesha Hakim	0.08	Ignite
20	Smart poultry system	Ms. Laraib Noor/Dr. Amir Hussain	0.07	Ignite
21	Automatic mango variety classification and grading using deep learning	Mr. Hafiz M. Rizwan Iqbal/ Dr. Ayesha Hakim	0.08	Ignite
22	Smart wheelchair for elderly and disabled people	Mr. Hafiz Usama Ishtiaq/ Dr. Amir Hussain	0.07	Ignite
23	IoT based vehicle speed control system	Mr. Hussain Sajid/ Ms. Javeria Jabeen	0.07	Ignite

The following skill development projects have been completed in MNSUAM:

Sr. No.	Project	Principal Investigator/ Focal Person	Amount (Million PKR)	Funding Agency
1	Prime Minister Kamyab Jawan Kamyab Pakistan Batch-1	Prof. Dr. Shafqat Saeed	3.750	NAVTTC
2	Skills for Job 2020	Prof. Dr. Shafqat Saeed	2.013	PSDF
3	Computer Application in Office	Prof. Dr. Shafqat Saeed	0.044	NAVTTC

2.1.6. Submitted Projects to Various Funding Agencies



2.2. Publications

2.2.1. Journal Articles

The following research/review articles were published during 2020-21.

Sr. No.	Article	Authors' Name	Year	Journal	Vol.	Pages
1	Factors affecting female labor force participation in Punjab, Pakistan	Riaz S and N Nadeem	2020	Pak. J. Soc. Sci.	39	1059-1066
2	Antimicrobial potential of banana peel: a natural preservative to improve food safety	Shoukat N, U Farooq, K Akram, A Shafi, Z Hayat, K Hayat, S Naseem and MZ Khan	2020	Asian J. Agric. Biol.	4	19-34
3	New Artiodactyla fossils from middle Miocene deposits of Chakwal, Punjab, Pakistan	Samiullah K, R Yasin, N Bano, B Rasool, MS Mubarik, RM Fazal, S Mahboob, O Draz, KAA Ghanim, T Raza, Z Javed, FA Misned, M Nazish and, H Sarfraz	2020	Geol. J.	1	1109-1129
4	Comparative study of innovative blends prepared by fortification of date powder to alleviate child malnutrition	Raza N, MU Arshad, FM Anjum, F Saeed, U Farooq., A Naz., MS Murtaza., T Tufail, H Bader Ul Ain and M Imran	2020	Food Sci. Nutr.	8	5875-5887
5	Deep-BSC: Predicting raw DNA binding pattern in *Arabidopsis Thaliana*	Bukhari SAS, A- Razzaq, J Jabeen, S Khan and Z Khan	2020	Curr. Bioinform.	16	457 - 465
6	Synergistic effect of *Meloidogyne incognita incognita* and *Rhizoctonia bataticola bataticola* causing root rot diseases of cotton	Khan MA, SA Khan, H Riaz, N Ahmad, R Binyamin, W Ashraf, M Ishtiaq, M Ali, MA Zeshan, Q Shakeel, RM Ikram, U Waheed, A Mahmood and MY Wong	2020	Int. J. Agric. Biol.	24	1401-1408

7	In-vitro and In-vivo management of *Meloidogyne incognita* (Kofoid and White) Chitwood and *Rhizoctonia bataticola* (Taub.) B utler in cotton using organic's	Khan M A, H Riaz, M Raheel, Q Shakeel, U Waheed, N Ahmed, M Bashair, W Ashraf, HT Abbas, M Siddique, M Khan, A Naz, M Shaheen, AM Arif, H Ali, M Nasir, M J Ansari, HA Ghramh and KA Khan	2020	Saudi J. Biol. Sci.	28	01-11
8	Weed dynamics and yield of wheat under stale seeded technology with an additional tillage	Younis MW, K Mubeen, M Aziz, W Ahmed, A Ghaffar, M Alam, M Ahmad, A Khaliq, MA Qayyum and MB Abbas	2020	J. Pure Appl. Agric.	5	52-65
9	Impact of ascorbic acid on cluster bean productivity under normal and skip irrigation conditions	Hayat HMA, M Ali, K Shahzad, SF Arshad, A Ghaffar, O Farooq, S Iqbal, LH Akhtar, A Hussain, I khan and MM Iqbal	2020	J. Crit. Rev.	7	2416-2425
10	Evaluation of different production systems in combination with foliar sulphur application for sunflower (*Helianthus annuus* L.) under arid climatic conditions of Pakistan	Ahmad S, A Ghaffar, MH Rahman, T Haq, MA Khan and A Mahmood	2020	Sarhad J. Agric.	36	1266-1278
11	Competitiveness of horse purslane with growth and yield of cotton	Niaz MB, A Ghaffar, K Mubeen, MA Khan, W Ahmed	2020	Pak J. Weed Sci. Res.	26	313-330
12	Experimental investigation of evaporative cooling systems for agricultural storage and livestock air-conditioning in Pakistan	Raza HMU, M Sultan, Majid Bahrami, AA Khan	2020	J. Eng. Sci. Technol.	13	3

13	Glyphosate-induced hormesis: impact on seedling growth and reproductive potential of common sowthistle (*Sonchus oleraceus*)	Mobli A, A Matloob and BS Chauhan	2020	Weed Sci.	68	605-611
14	Zinc-induced effects on productivity, zinc use efficiency, and grain biofortification of bread wheat under different tillage permutations	Zulfiqar U, S Hussain, M Ishfaq, A Matloob, N Ali, M Ahmad, MN Alyemeni and P Ahmad	2020	Agronomy	10	1566
15	Sowing techniques and cultivars influence phenology, productivity and profitability of forage oat	Gondal MR, A Riaz, SA Rizvi, A Matloob, W Naseem, A Hussain and MS Hanif	2020	Int. J. Agric. Biol.	24	1527-1532
16	Bioeconomic evaluation of allelopathic crop leachates integrated with reduced doses of herbicide for horse purslane management in maize under field conditions	Mushtaq MN, MI Hashmi, T Tariq, A Matloob and ZA Cheema	2020	Planta Daninha	38	
17	Effect of drying-rewetting durations in combination with synthetic fertilizers and crop residues on soil fertility and maize production	Farooq N, G Sarwar, T Abbas, L Bessely, MA Nadeem, MM Javaid, A Matloob, M Naseem and NA Ikram	2020	Pak. J. Bot.	52	2051-2058
18	Repellent and acaricidal activity of essential oils and their components against *Rhipicephalus* ticks in cattle	Salman M, RZ Zahid, M Israr, A Abbas, KM Mehmood, MK Khan, ZD Sindhu, R Hussain, MK Saleemi and S Shah	2020	Vet. Parasitol.	283	109178

19	*In vitro* anticoccidial activity of *Vitis vinifera* extract on oocysts of different *Eimeria* species of broiler chicken	Abbas RZ, A Abbas, Z Iqbal, MA Raza, K Hussain, T Ahmed and MU Shafi	2020	J. Hell. Vet. Medical Soc.	71	2272-2276
20	Proline, total antioxidant capacity, and *OsP5CS* gene activity in radical and plumule of rice are efficient drought tolerance indicator traits	Saddique MAB, Z Ali, MA Sher, B Farid, RM Ikram and MS Ahmad	2020	Int. J. Agron.	2020	
21	Foliar applied brassica water extract improves the seedling development of wheat and chickpea	Farooq O, M Ali, N Sarwar, A Rehman, MM Iqbal, T Naz, M Asghar, F Ehsan, M Nasir, QM Hussain and S Afzal	2020	Asian J. Agric. Bio.	4	
22	Effects of temperature on baseline susceptibility and stability of insecticide resistance against *Plutella xylostella* (Lepidoptera: Plutellidae) in th e absence of selection pressure	Jaleel W, S Saeed, MN Naqqash, MU Sial, M Ali, SM Zaka, ZM Sarwar, M Ishtiaq, MA Qayyum, QU Aine, A Anwar, M Sarmad, R Azad, M Latif, F Ahmed, W Islam, KA Khan, and HA Ghramh	2020	S. J. Biol. Sci.	27	1-5
23	Impact of seed dressing and soil application of potassium humate on cotton plants productivity and fiber quality	Ullah A, M Ali, K Shahzad, F Ahmad, S Iqbal, MH Rahman, S. Ahmad, M.M. Iqbal, S Danish, S Fahad, J Alkahtani, MS Elshikh and R Datta	2020	Sustainab ility	10	1103
24	Mitigation of osmotic stress in cotton for the improvement in growth and yield through inoculation of rhizobacteria and phosphate solubilizing bacteria coated diammonium phosphate	Majid M, M Ali, K Shahzad, F Ahmad, RM Ikram, M Ishtiaq, IA Alaraidh, A Al-hashimi, HM Ali, T Zarei R Datta, S Fahad, A El Sabagh, GS Hussain, MZM Salem, MH Rahman and S Danish	2020	Sustainab ility	12	

25	Android enabled approach for smart garden monitoring with IoT	Ali M, N Kanwal, A Hussain, F Samiullah, A Iftikhar and M Qamar	2020	Int. J. Adv. Appl. Sci.	7	117-124
26	Development of energy aware routing scheme for wireless sensor networks	Khan NS, A Hussain, M Ali, A Razzaq and A Ijaz	2020	Int. J. Emerg. Technol.	11	381-388
27	An IoT based approach for efficient home automation with Thingspeak	Ali M, Z Nazim, W Azeem, H Hamad, A Hussain, K Javeed and M Tariq	2020	Int. J. Adv. Comput. Sci. Appl.	11	118-124
28	Machine vision based identification of eye cataract stages using texture features	Shehzad M, S Qadri, T Aslam, SF Qadri, A Razzaq, SS Muhammad, SA Nawaz and N Ahmad	2020	Life Sci. J.	17	44-50
29	Emotion based facial expression detection using machine learning	Aslam T, S Qadri, M Shehzad, SF Qadri, A Razzaq and SS Muhammad	2020	Life Sci. J.	17	35-43
30	Development of an adaptive energy aware routing scheme for wireless sensor networks	Khan NS, A Hussain, M Ali, A Razzaq and A Ijaz	2020	Int. J. Emerg. Techno.	11	381-388
31	Internal Marketing and Customer Brand Equity: A Case Study of Banking Sector in Pakistan	Mehdi M, S Saleem, B Ahmad and N Nadeem	2020	Pak. J. Soc. Sci.	40	641-652
32	Identification and prioritization of cloud based global soft ware development best practices	Akbar MA, S Mahmood, H Alsalman, A Razzaq, A Gumaei and MT Riaz	2020	IEEE Access	8	191242-191262
33	Effect of microwave treatment on the nutritional profile of the citrus mandarin cultivars peels	Hayat K, X Zhang, S Hussain, A Hussain and MU Tahir	2020	J. Food Process. Preserv.	1	7

34	Reduced graphene oxide–TiO_2/sodium alginate 3 dimensional structure aerogel for enhanced photocatalytic degradation of ibuprofen and sulfamethoxazole	Nawaz M, AA Khan, A Hussain, J Jang, HY Jung, DS Lee	2020	Chemos phere	261	127702
35	Foot and mouth disease in a wide range of wild hosts: a potential constraint in disease control efforts worldwide particula rly in disease-endemic settings	Rahman A, K Dhama, Q Ali, MA Raza, UN Chaudhary and MZ Shabbir	2020	Acta Trop.	210	105567
36	Harvest maturity influences fruit q uality of Carambola (*Averrhoa carambola* L.)	Nayab S, K Razzaq, S Ullah, IA Rajwana, M Amin and A Naz	2020	J. Hortic. Sci. Technol.	3	109-112
37	Orchard locality and postharvest oxalic acid application influence fruit quality and shelf life of Jamun (*Syzygium cumini* L.) fruit	Aslam MM, S Ullah, K Razzaq, IA Rajwana, G Akhtar, HN Faried, M Amin, UN Ullah and U Khalil	2020	J. Pure Appl. Agric.	5	31-34
38	Preserving wheat grain quality and preventing aflatoxin accumulation during storage without pesticides us ing dry chain technology	Bakhtavar MA and I Afzal	2020	Environ. Sci. Pollut. Res.	27	42064 - 42071
39	Climate smart Dry Chain Technology for safe storage of quinoa seeds	Bakhtavar MA	2020	Sci. Rep.	10	12554
40	Surging dynamics of glaciers in the Hunza valley under an equilibrium mass state since 1990	Wu K, S Liu, Z Jiang, Y Zhu, F Xie, Y Gao and M Saifullah	2020	Remote Sens.	18	2922

41	Upward Expansion of Supra-Glacial Debris Cover in the Hunza Valley, Karakoram, During 1990~2019	Xie F, S Liu, K Wu, Y Zhu, Y Gao, M Qi, S Duan, M Saifullah and AA Tahir	2020	Front. Earth Sci.	8	1-18
42	Thin debris layers do not enhance melting of the Karakoram glaciers	Sher M, L Tian, S Ali, Y Latif, MA Wazir, MA Goheer, M Saifullah, I Hussain and L Shiyin	2020	Sci. Total Environ.	746	141119
43	Event-based time distribution patterns, return levels, and their trends of extreme precipitation across Indus Basin	Zaman M, I Ahmad, M Usman, M Saifullah, MN Anjum, MI Khan and MU Qamar	2020	Water	12	3373
44	The protective effect of walnut oil on lipopolysaccharide-induced acute intestinal injury in mice	Miao F, C Shan, SAH Shah, RW Akhtar, S Geng, X Wang and D Ning	2020	Food Sci. Nutr.	9	711-718
45	Effects of walnut oil (*Juglans sigillata*) on intestinal anti-oxidant, anti inflammatory, immunity and gut microbiota modulation in mice	Miao F, C Shan, SAH Shah, RW Akhtar, S Geng, J Sheng and X Wang	2020	J. Food Biochem.	45	13567
46	Comparison of genomics and growth characteristics of two canine distemper virus strai ns isolated from minks in China	Tao R, J Chen, T Zhao, C Gong, H Pan, RW Akhtar, X Li, SAH Shah, Q Li and J Zhao	2020	Front. Vet. Sci.	7	570277
47	Effect of *In-Ovo* Administration of L Arginine on the gross anatomy of tibia bone, alkaline phospahtase and growth performance in Japanese Quail (*Coturnix japonica*)	Luqman Z, S Masood, S Hameed, H Zaneb, RW Akhtar, SAH Shah, N Hussain, S Aslam and N Iqbal	2020	J. Anim. Health Prod.	9	22-26

48	Industrial sawdust waste: an alternative to soilless substrate for garlic (*Allium sativum* L.)	Yasin M, K Jabran, I Afzal, S Iqbal, MA Nawaz, A Mahmood, M Asif, MA Nadeem, Z Rahman, M Adnan, M Siddiqui, MQ Shahid and C Andreasen	2020	J. Appl. Res. Med. Aromat. Plants	18	100252
49	Identification of edible fish species of Pakistan through DNA barcoding	Ghouri MZ, M Ismail, MA Javed, SH Khan, N Munawar, AB Umar, M Nisa, SO Af tab, S Amin, Z Khan and A Ahmad	2020	Front. Mar. Sci.		
50	Controlling geminiviruses before transmission: Prospects	Mubarik MS, SH Khan, A Ahmad, A Raza, Z Khan, M Sajjad, RHA Sammour, AEZ Mustafa, AAA Ghamdi, AH Alajm i, FKI Alshamasi and MS Elshikh	2020	Plants	11	1556
51	Analysis of SARS-CoV-2 RNA-dependent RNA polymerase as a potential therapeutic drug target using a computational approach	Aftab SO, MZ Ghouri, MU Masood, Z Haider, Z Khan, A Ahmad and N Munawar	2020	J. Transl. Med.	18	275
52	Ethno-veterinary uses of Poaceae in Punjab, Pakistan	Majeed M, KH Bhatti, MS Amjad, AM Abbasi, RW Bussmann, F Nawaz, A Rashid, A Mehmood, M Mahmood, WM Khan and KS Ahmad	2020	PLoS ONE	15	e0241 705
53	Comparative study of different preservative solutions for extending flower quality and market acceptability of *Rosa hybrida Cv.* Freedom	Ahsan M, A Ramzan, M Nafees, A Younis, M Amin, G Akhtar, K Saleem and A Sabeeh	2020	Sci. Horti.	266	109311

54	Thiamethoxam at sublethal concentrations induces histopathological, serum biochemical alterations and DNA damage in fish (*Labeo rohita*)	Hussain R, A Ghaffar, G Abbas, G Jabeen, I Khan, RZ Abbas, S Noreen, Z Iqbal, IR Chaudhary , HM Ishaq, MT Ghori and A Khan	2020	Toxin Rev.	7	
55	Effect of different levels of energy and lysine on the production performance of laying hens	Sharif M, A Ali, U Anwar, FA Chisti, S Jameel, MQ Bilal, M Hussain, F Ahmad, M Yousaf, A Naveed, ASMG Kibria, HM Ishaq and MA Rahman	2020	Pak. J. Agric. Sci.	57	1653-1659
56	First record of tomato leaf miner, *Tuta absoluta* (meyrick 1917) (*Lepidoptera: gelechiidae)* from Southern part of Punjab	Ishtiaq M, M Sadique, N Faried, U Naeem-Ullah and MA Hamza	2020	J. Animal Plant Sci.	30	1604-1611
57	Biological and morphological parameters of *Trilocha varians* (*Lepidoptera: Bombycidae*) in Pakistan	Ramza M, U Naeem-Ullah, M Ali and H Riaz	2020	Punjab Univ. J. Zool.	35	255-259
58	Application of spermidine to manage water stress for improved fine rice yield and quality	Sarwar N, MH Javaid, A Neelam, A Rehaman, O Farooq, A Wasaya, K Mubeen, A Ghani and MZ Mushtaq	2020	Pure Appl. Biol.	9	1813-1819
59	Adaptability of Proso millet (*Panicum milliaceum*) in Multan Pakistan	Akber MA, RM Ikram, S Iqbal, K Mubeen, M Imran, MH Rahman and W Ahmad	2020	Agric. Sci. J.	1	9-15
60	Influence of various mineral phosphorus sources on growth and yield of maize (*Zea mays* L.) in rainfed conditions of Rawalakot, Azad Jammu and Kashmir	Shehzad M, A Hira, M Khalid, J Muhammad, MT Majid, M Mehdi, S Naeem, A Ayesha, AQ Muhamma, MRJ Hafiz, M Khuram, A Aqeela and K Sadaf	2020	Int. J. Agric. Technol.	16	1505-1514

61	Influence of semi-arid environment on radiation use efficiency and other growth attributes of lentil crop	Rahman MH, I Ahmad, D Wang, S Fahad, M Afzal, A Ghaffar, Q Saddique, MA Khan, S Saud, S Hassan, M Fahad, M Din, S Ahmad, Z Yue, RA Shah, O Sanmez and W Nasim	2020	Environ. Sci. Pollut. Res.	28	13697 - 13711
62	Population dynamics of mango fruit flies in tehsil Jatoi, Punjab, Pakistan	Javaid M, UN Ullah, M Ramzan, M Shahid, N Iqbal, MA Qayyum and SH Bhutto.	2020	Pak. J. Biotechnol.	17	129-132
63	Role of nanotechnology in crop protection and production: A review	Javaid M, UN Ullah, W.S. Khan, S. Saeed, MA Qayyum and MA Khan	2020	J. Innov. Sci.	6	221-227
64	Evaluation of Nuclear Polyhedrosis Virus (NPV) and Emamectin Benzoate against *Spodoptera litura* (F.)(Lepidoptera: Noctuidae)	Yasin M, MS Qazi, W Wakil and MA Qayyum	2020	Egypt. J. Biol. Pest Control	1	
65	Assessment of ameliorative effect of Aab-e-Shifa polyherbal formulation in experimentally-induced wound in rabbits	Khan IA, AH Lodhi, SH Munawar, A Manzoor, Z Manzoor, MA Raza and O Iqbal	2020	Trop. J. Pharm. Res.	11	2357-2362
66	A comparative phylogenomic anal ysis of SARS-CoV-2 strains reported from non-human mammalian species and environmental samples	Rahman A, MAB Shabbir, MW Aziz, S Yaqub, A Mehmood, MA Raza and MZ Shabbir	2020	Mol. Biol. Rep.	47	9207-9217
67	Partial root-zone drying (PRD), its effects and agricultural significance: a review	Iqbal R, MAS Raza, M Toleikiene, M Ayaz, F Hashemi, MH Rahman, MS Zaheer, S Ahmad, U Riaz, M Ali, MU Aslam and I Haider	2020	Doc. Bull. Natl. Res. Cent.	159	

68	Red light optimized physiological traits and enhanced the growth of ramie (*Boehmeria nivea* L.)	Rehman M, S Fahad, MH Saleem, M Hafeez, MH Rahman, F Liu and G Deng	2020	Photosy nthetica	58
69	Phenotypic plasticity of spineless safflower (*Carthamus tinctorius* L.) cultivars in response to exogenous application of salicylic acid u nder rainfed climate conditions	Arshad A, H Qamar, R Siti-Sundari, Z Yue, M Zubair, MA Raza, MH Rehman and L Zhang	2020	Pak. J. Agric. Res.	33
70	Potential effects of biochar application on mitigating the drought stress implications on wheat (*Triticum aestivum* L.) under various growth stages	Haider I, MAS Raza, R Iqbal, MU Aslam, MH Rahman, S Raja, MT Khan, MM Aslam, M Waqas and S Ahmad	2020	J. Saudi Chem. Soc.	24
71	Assessment of the consequences of heat changes on cotton cultivars growth, phenology and yield at different sowing regimes	Mehboob KMR, R Iqbal, M Israr, J Shamshad, U Riaz, MH Rahman, F Ali, A Nawaz, M Sarfraz, A Waheed, MT Khan and M Aslam	2020	Plants	9
72	Analyzing the performance and application of CERES-Wheat and APSI M in the Guanzhong Plain, China	Saddique Q, Z Yufeng, A Ajaz, J Ji, J Xu, M Azmat, MH Rahman, J He and H Cai	2020	ASABE	63
73	Optimizing management options through empirical modeling to improve pearl millet production for semi-arid and arid regions of Punjab, Pakistan	Ullah A, I Ahmad, MH Rahman, M Waseem, MM Waqas, MA Bhatti, A Ahmad	2020	Sustaina bility	18
74	Bringing farmers' perceptions into science and policy: Understanding salinity tolerance of rice in southwestern Bangladesh under climate change	Islam MA, F Ludwig, LL Bruyn, MH Rahman, V Shelia and G Hoogenboom	2020	Land Use Pol.	101

75	Effects of elevated air temperature and CO_2 on maize production and water use efficiency under future climate change scenarios in Shaanxi Province, China	Saddique Q, MI Khan, MH Rahman, X Jiatun, M Waseem, T Gaiser, MM Waqas, I Ahmad, L Chong and H Cai	2020	Atmosph ere	11	
76	Genetic variability among maize genotypes for grain yield and its components under autumn crop season of Multan	Zaman N, MHN T ahir, SF Arshad and MA Shehazad	2020	Agric. Sci. J.	2	30-40
77	Strigolactone (GR24) induced salinity tolerance in sunflower (*Helianthus annuus* L.) by ameliorating morpho-physiological and biochemical attributes under in vitro conditions	Zulfiqar H, M Shahbaz, M Ahsan, M Nafees, MHN Tahir, M Akram, A Maqsood, S Ahmad, M Kamran, S Alamri, MH Siddiqui, S Saud and S Fahad	2020	J. Plant Growth Regul.	4	4
78	Principal component analysis and assessment of *Brassica napus* L. accessions for salt tolerance indices	Kanwal S, MHN Tahir and H Razzaq	2020	Pak. J. Bot.	52	
79	Morphological characterization and determination of genetic diversity in sorghum accessions by SSR markers	Sabir MW, Z Ali, MHN Tahir, MA Shehzad and TH Malik	2020	Agric. Sci. J.	2	66-78
80	Evaluation of laterite as a filter media to remove arsenic from groundwater	Maqsood HR, S Rukh, M Imran, A Mehmood, W Ahmad, A Matloob, HS Ahmad, A Khan and SA Butt	2020	J. Serb. Chem. Soc.	86	195-207

81	Safety assessment of foods at capital hospital of Pakistan through the hazard analysis an d critical control point system	Zeb A, R Ayesha, SA Gilani, M Shahbaz, A Imran, A Ghorab, KF El Massry, R Suleman, TA Gondal, M Asif, S Ahmed, MI Afzal, MT Sultan, AN Ahmad and M Imran	2020	J. Food Prot.	83	
82	Potential use of quinoa for yoghurt preparation	Zahid R, MS Murtaza, U Farooq, M Shahbaz, G Akhtar and S Iqbal	2020	Agric. Sci. J.	2	
83	Impact of hydrocolloids on physicochemical and sensory att ributes of goat milk yoghurt	Rehman A, M Shahbaz, U Farooq and M Amin	2020	Agric. Sci. J.	2	
84	Nano-encapsulation of bioactive compounds: A diminutive review	Bahadur A, MS Murtaza, M Shahbaz, S Ramzan and MM Ali	2020	J. Agric. Food	1	13-22
85	CRISPR/Cas9-based antibody production in plants	Zahoor B, U Waheed, S Saeed, F Gulzar, H Tasleem, M Usman and Z Khan	2020	Pak. J. Biochem. Biotechn ol.	1	59-75
86	Weed science as a new discipline and its status in some South Asian universities and colleges: examples from Bangladesh, Bhutan, Nepal and Pakistan	Shrestha A, MP Anwar, AKMM Islam, T Gurung, S Dhakal, A Tanveer, MM Javaid, M Nadeem and NA Ikram	2020	CAB Reviews	16	
87	Potential of Neonicotinoids, Botanicals and Plant Defense Activators against Whitefly Infestation and Tomato Leaf Curl Virus Disease (TLCVD)	Zeshan MA, MA Khan, S Ali, M Arshad, GM Sahi, M Sagheer, N Ahmed, R Binyamin, MU Ghani	2020	Int. J. Agric. Biol.	24	1157-1166

88	Foraging behavior and bait station preference in scavenging termite, *Odontotermes obesus* (Blattodea: Termitidae)	Iqbal N, AM Alvi, M Hussain, S Saeed, UN Ullah, A A Khan and AD Abid	2020	Bull. Entomol. Res.		
89	Tracing transmission of *Salmonella enterica* subsp. *enterica* in tomato fruits	Raja S, AA Khan, HMN Cheema	2020	Int. J. Agric. Biol.	17	1255-1259
90	Postharvest quarantine vapour heat treatment attenuates disease incidence, maintains eating quality and improves bioactive compounds of 'Gola' and 'Surahi' guava fruits	Malik AU, MU Hasan, WU Hassan, AS Khan, MS Shah, IA Rajwana, M Latif and R Anwar	2020	J. Food Meas. Charact.	1	
91	Current status and gen etic variability of cucumber mosaic cucumovirus (CMV) isolates infecting major cucurbits and solanaceous vegetable s in Pothwar region of Pakistan	Ahsan M, M Ashfaq, T Mukhtar and NA Abbasi	2020	Pak. J. Agri. Sci.	57	1353-1361
92	Heat shock protein and aquaporin expression enhance water conserving behavior of citrus under water deficits and high temperature conditions	Ali Z	2020	Env. Exp. Bot.	181	
93	Examination of main fruit and vegetables market in Multan District of Pakistan	Hamza M, M Aslam, B Sharif, S Ullah, A Iqbal and MA Imran	2020	J. Manag. Leadership	3	69-81
94	Achieving fast start-up of anammox process by promoting the growth of anammox bacteria with FeS addition	Zou C, B Guo, X Zhuang, L Ren, SQ Ni, S Ahmad, Z Qiao, Z Cui and J Hong	2020	NPJ Clean Water	3	

95	Incredible role of osmotic adjustment in grain yield sustainability under water scarcity conditions in Wheat (*Triticum aestivum* L.)	Mehmood T, M Abdullah, S Ahmar, Y Muhammad, MS Iqbal, Y Muhammad, SU Rehman, S Ahmed, RM Rana, A Ghafoor, MKN Shah, X Du and FM Poblete	2020	Plants	9	1208
96	A wheat stress-induced WRKY transcription factor TaWRKY32 confers drought stress tolerance in *Oryza sativa*	Darwish E, SU Rehman, X Mao and J Ruilian	2020	Asian J. Agric. Biol.	2021	
97	Multiomic analys is elucidates the reasons underlying the differential metabolite accumulation in mature leaves and fruit juice sacs of citrus	Guo LX, SB Hussain, AR Fernie, YZ Liu, M Yan, H Chen and SM Alam	2020	J. Agric. Food Chem.	68	11863 - 11874
98	Identification and t ranscript analysis of CsAPD2 reveal its strong relationship with citric aci d accumulation in citrus fruits	Bai YX, SB Hussain, X Wei, CY Shi, DH Liu and YZ Liu	2020	Sci. Horti.	272	10960 7
99	Evaluation and screening of promising drought tolerant Chickpea (*Cicer arietinum* L.) genotypes based on physiological and biochemical attributes under drought conditions	Jan M, T Haq, H Sattar, M Bu tt, A Khaliq, M Arif and A Rauf	2020	Pak. J. Agric. Res.	6	
100	The influence of integrated organic and inorganic fertilizers on forage yield and nutritive value of maize and soil properties	Ibrahim M, M Jameel, T Ul Haq, M Nadeem, MIA Rehmani, AN Abbas, S Ahmad, MA Sh abir, MM Iqbal and LM Lauriault	2020	East African Scholars J. Agri. Life Sci.	3	383-388

101	Drivers of farm households' perceived risk sources and factors affecting uptake of mitigation strategies in Punjab Pakistan: Implications for sustainable agriculture	Amjed MI, A Abbas, SAA Naqvi, M Rizwan, A Samie and UI Ahmed	2020	Sustaina bility	12	
102	Economic analys is of f ish farming in Punjab, Pakistan	Aslam MU, N Nadeem, IA Baig, UI Ahmed	2020	Rev. Dev. Econ.	6	625-637
103	Checklist of the tick (*Acari: Argasidae, Ixodidae*) species of Pakistan	Ramzan M, N Ullah, U Bokhari, SHM Saba, S Khan, and S Saeed	2020	Vet. Ital.	56	221-236
104	Management of *Tribolium castaneum* (Herbst) and *Rhyzopertha dominica* (Fabricius) by using microwave oven	Nauman M, UN Ullah, M Hanif, H Ghaffar, M Shahid and SHM Bokhar	2020	J. Innov. Sci.	6	132-136
105	Dusky cotton bug *Oxycarenus hyalinipennis* Costa (*Lygaeidae: Hemiptera*) loss assessment in cotton	Hafeez F, M Akram, M Farooq, M Saghir, M Arshad, A Iftikhar, A Naeem and UN Ullah	2020	Intl. J. Trop. Insect Sci.		
106	Genetic diversity of mungbean genotypes with different resistance again st mungbean yellow mosaic virus determined by microsatellite markers	Binyamin R, MA Khan, FS Awan, S Ali, MA Zeshan, A Ma sroor, N Ahmed and MU Ghani	2021	J. Anim. Plant Sci.	31	
107	Fatty acid profile and bio-efficacy of wheat germ oil in hyperlipidemic rabbits	Rehman H, U Farooq U, K Akram K, Z Hayat Z, A Shafi A, F Sarfraz and A Sindhu	2021	Pak. J. Agric. Bio.	3	16-21
108	Low-cost smart crop monitoring and irrigation system based on IoT and mobile application	Farooq MU, A. Hakim, IA Baig, P Khanna, J Jabeen and UI Ahmed	2021	Preprints	1	

109	Serodiagnosis of *Toxoplasma gondii,* associated risk factors in domesticated cats: preventing zoonosis in humans and implications for livestock extension	Abbas M, A Nasir, M Kashif, K Hussain, N Bano, MA Raza, W Zaib, RZ Abbas, M Nadeem, R W Akhtar, T Zaheer, MU Waqas, Z Rani, A Sikandar, A Abbas, A Rehman, and HR Khera	2021	Int. J. Agric. Ext.	9	13-18
110	Heat shock proteins: classification, functions and expressions in heat shock proteins: classification, functions and expressions in plants during environmental stresses	S Khan, R Jabeen, F Deeba, U Waheed, P Khanum and N Iqbal	2021	J. Bioresour. Manag.	8	2309-3854
111	Effect of curing regimes on compressive strength and corresponding performance evaluation of palm oil fuel ash and high performance concrete	Riaz, N., M Sultan, M., R Ahmad, R., MA Imran, M. A., YR Taseer, Y. R., M Arslan, MA Shahzad, AS Hanif and Z Hussain	2021	Fresenius Environ. Bull.	30	63-71
112	Community-based business on small hydropower (SHP) in rural Japan: A case study on a community owned SHP model of Ohito agricultural cooperative	Alam Z, Y Watanabe, S Hanif, T Sato and T Fujimoto	2021	Energies	14	33-49
113	Morphological and genetic characterization of *Fusarium oxysporum* and its management using weed extracts in cotton	Khan MA , SA Khan, U Waheed, M Raheel, Z Khan, AW Alrefaei and HH Alkhamis	2021	J. King Saud Univ. Sci.	33	101-299
114	Comparative expression studies of fiber related genes in cotton spp.	Nadeem M, N Iqbal, U Waheed, Z Zia, M Ali and Z Khan	2021	J. Bioresour. Manag.	8	

115	Heat Shock Proteins: Classification, functions and expressions in plants during environmental stresses	Khan S, R Jabeen, F Deeba, U Waheed, P Khanum and N Iqbal	2021	J. Bioresour. Manag.	8	2309-3854
116	Induced Polyploidy: A Tool for Forage Species Improvement	Rauf S, R Ortiz, DP Malinowski, WR Clarindo, W Kainat, M Shehzad, U Waheed and SW Hassan	2021	Agriculture	2101 1	210
117	Assessing the potential of polymer coated urea and sulphur fertilization on growth, physiology, yield, oil contents and nitrogen use efficiency of sunflower crop under arid environment	Perveen S, S Ahmad, M Skalicky, I Hussain, MH Rahman, A Ghaffar, MS Bashir, M Batool, M Hassan, M Brestic and S Fahad	2021	Agronomy	11	269
118	CRIPSR case system: Biological role in bacterial virulence, genome editing and in antimicrobial resistance	Rizwan M, M Arshad, M Kashif, AZ Durrani, A Abbas, T Ahmad, M Nadeem and K Khan	2021	Punjab Univ. J. Zool.	36	111-118
119	Clinico-hematological, patho-anatomical and molecular based investigation of blackleg disease in Cholistani cattle	Hussain R, SE Haque, I Khan, G Jabeen, AB Siddique, A Ghaffar, RZ Abbas, Qudratullah, HM Ishaq, MT Javed, N Tariq, MT Ghori, A Qayyum, A Abbas, MM Jalees and G Wareth	2021	Pak. J. Agric. Sci.	58	
120	Immunogenicity and protective efficacy of probiotics with EtIMP1C against Eimeria tenella challenge	Mohsin M, L Li, X Huang, MT Aleem, YJ Habib, AI Shehata, MZ Afzal, RZ Abbas, A Abbas and G Yin	2021	Pak. Vet. J.	41	274-278

121	Probiotics as therapeutic, antioxidant and immunomodulatory agents against poultry coccidiosis	Mohsin M, RZ Abbas, G Yin, Z Sindhu, A Abbas, Z Huang, MT Aleem, Z Saeed, MZ Afzal, A Ejaz and M Shoaib	2021	World Poultry Sci. J.	77	
122	An insight into COVID -19 a 21st century disaster and its relation to immunocompetence and food antioxidants	Siddique F, RZ Abbas, MK Mansoor, ES Alghamdi, M Saeed, MM Ayaz, A Iqbal, M Rahman, M Manzoor, A Abbas, A Javaid and I Hussain	2021	Frontiers Vet. Sci.	7	
123	Therapeutic potential of medicinal plants against Leishmaniasis: a public health concern	Hussain K, RZ Abbas, A Abbas, MA Raza, MS Mahmood, M Imran, MK Khan and M Rafay	2021	B Latinoam. Caribe Pl.	20	123-131
124	Slow-release nitrogen fertilizers enhance growth, yield, NUE in wheat crop and reduce nitrogen l osses under an arid environment	Ghafoor I, MH Rahman, M Ali, M Afzal, W Ahmed, T Gaiser and A Ghaffar	2021	Environ. Sci. Pollut. Res.	28	
125	Current understandings on magnesium defic iency and future outlooks for sustainable agriculture	Chaudhry AH, S Nay ab, SB Hussain, M Ali and Z Pan	2021	Int. J. Mol. Sci.	22	1819
126	Dataset of Pakistan sign language and automatic recognition of hand configuration of Urdu alphabet through machine learning	Imran A, A Razzaq, IA Baig, A Hussain, S Shahid, T Rehman	2021	Data Brief	36	107021
127	Time series analysis and forecasting of air pollution particulate matter (PM2.5): an SARI MA and factor analysis approach	Bhatti UA, Y Yan, M Zhou, S Ali, A Hussain, H ingsong, Z Yu and L Yuan	2021	IEEE Access	9	41019 - 41031

128	Security framework for IoT based real-time health application	Hussain A, T Ali, M Irfan, S Shafiq, U Draz, Z Safdar, S Yasin, A Glowacz, A S malcerz, A Kula and FS AlKhtani	2021	Electronics	10	
129	Advanced color edge detection using Clifford Algebra in satellite images	Bhatti UA, ZM Quan, HQ Song, S Ali, A Hussain, Y Yuhuan, Z Yu, L Yuan and SA Nawaz	2021	IEEE Photonics	13	
130	IoT based smart streetlights emp owered by piezoelectric sensors	Ahmad S, MA Rajwana , K Iqbal, A Hussain and A Ijaz	2021	Int. J. Sci. Res.	10	341-345
131	A sustainable framework for preventing IoT systems from zero-day DDoS attacks by machine learning	Ali M, A Siddique, A H, F Hassan, A Ijaz and A Mehmood	2021	Int. J. Emerg. Techno.	12	116-121
132	Classification of canola seed varieties based on multi-feature analysis using computer vision approach	Qadri S, SF Qadri, A Razzaq, MU Rehman, N Ahmad, SA Nawaz, N Saher, N Akhtar and DM khan	2021	Int. J. Food Prop.	24	493-504
133	A spatial model of K-Nearest Neighbors for classification of cotton (Gossypium) varieties based on image segmentation	Aslam T, S Qadri, N Saher, SA Nawaz, M Shehzad, SF Qadri, A Razzaq, F Shahzad and DM Khan	2021	Lgurjcsit	5	24-39
134	An auto matic determining food security status: Machine learning based analysis of household survey data	Razzaq A, UI Ahmed, S Hashim, A Hussain, S Qadri, S Ullah and Asghar	2021	Int. J. Food Prop.	1	726-736
135	Improving sentiment analysis efficacy through feature synchronization	Ali Z, A R azzaq, S Ali, S Qadri and A Zia	2021	Multimed. Tools. Appl.	1	

136	Synthesis and application of modified orchard waste biochar for efficient scavenging of copper from aqueous solutions	Hussain A, U Yousaf, UR Ch, J A hmad, M Na waz, HN Faried, T Haq	2021	Arab. J. Sci. Eng.	46	1-13
137	Anticoccidial potential of *Ageratum conyzoides* and its effect on blood parameters of experimentally infected Broiler chickens	Hussain K, RZ Abbas, A Abbas, MA Raza, K Samiullah, MK Khan, T Ahmad, F Siddique, M Mohsin, A Rehman, A Rahman, RW Akhtar, MU Waqas and R Yasin	2021	J. Hell. Vet. Med. Soc.	2	17
138	Gut microbial dysbiosis and its association with esophageal cancer	Ishaq HM, IS Mohammad, KS Muhammad, H Li, RZ Abbas, ZD Sindhu, S Ullah, Y Fan, A Sadiq, MA Raza, R Hussain, HM Arshad, I Khan, MU Waqas, A Rahman, R Yasin, A Rehman, RW Akhtar and J Xu	2021	J. Appl. Biomed.	19	1
139	Prevalence and phylogenetic analysis of Crimean-Congo hemorrhagic fever virus in ticks collected from Punjab province of Pakistan	Shahid MF, T Yaqub, M Ali, A Rahman and DA Bente	2021	Acta Trop.	218	105892
140	Do natural leaf extracts involve regulation at physiological and biochemical levels to extend vase life of gladiolus cut flowers?	Akhtar G, IA Rajwana, Y Sajjad, MA Shehzad, M Amin, K Razzaq, S Ullah, HN Faried, A Farooq and Samiullah	2021	Sci. Hortic.	282	109311

141	Physiological insights into sulfate and selenium interaction to improve drought tolerance in mungbean	Aqib M, F Nawaz, S Majeed, A Ghaffar, KS Ahmad, MA Shehzad, MN Tahir, M Aurangzaib, HMR Javeed, M Habib-ur-Rahman and MM Usmani	2021	Physiol. Mol. Biol. Plants	27	1073-1087
142	Pretreatment with selenium and zinc modulates physiological indices and antioxidant machinery to improve drought tolerance in maize (*Zea mays* L.)	Nawaz F, B Zulfiqar, KS Ahmad, S Majeed, MA Shehzad, HMR Javeed, MN Tahir and M Ahsan	2021	S. Afr. J. Bot.	138	209-216
143	Zoonotic potential of Newcastle disease virus: Old and novel perspectives related to public health	Rahman A, H M Ishaq, MA Raza and MZ Shabbir	2021	Review Med. Vir.		
144	Spatio-temporal variations in terrestrial water storage and its controlling factors in the Eastern Qinghai-Tibet Plateau	Zhu Y, S Liu, Y Yi, M Qi, W Li, M Saifullah, S Zhang and K Wu	2021	Hydrol. Res.	52	323–338
145	Spatiotemporal heterogeneity of snow cover in the central and western Karakoram Mountains based on a refined MODIS product during 2002-2018	Yi Y, S Liu, Y Z hu, K Wu, F Xie and M Saifullah	2021	Atmos. Res.	250	10540 2
146	Genus *Spodoptera* (Hadeninae: Noctuidae: Lepidoptera): A new species from Southern Punjab, Pakistan	Sarwar ZM, Al Malik, M Suhail, S Saeed, MU Sial, W Jaleel, MN Naqqash and Q Saeed	2021	Pakistan J. Zool.	1	1-4
147	Olfactory response of two different Bactrocera fruit flies (Diptera: Tephritidae) on banana, guava, and mango fruits	Jaleel W, R Saeed, MZ Shabbir, R Azad, S Ali, MU Sial, DM Aljedani, HA Ghramh, KA Khan, D Wang and Y He	2021	J. King Saud Univ. Sci.	33	10145 5

148	First report of *Aspergillus niger* causing black rot of grapes in Pakistan	Ghuffar S, MZ Ahmed, G Irshad, MA Zeshan, A Qadir, HA Anwaar, MZ Mansha, HM Asadullah, A Abdullah and U Farooq	2021	Plant Dis.	105	1570
149	Occurrence of leaf spot caused by *Alternaria alternata* on Eggplant (*Solanum melongena*) in Pakistan	Shafique MS, L Amrao, S Saeed, MZ Ahmed, S Ghuffar, HA Anwaar, UAA Sheikh, MA Khan, A Qadir and A Abdullah	2021	Plant Dis.	105	2522
150	Complete genome and molecular characterization of genotype VII velogenic Newcastle disease virus isolated in China	Meng L, S Zhang, X Guo, RW Akhtar, SAH Shah, K Zhao and W Yuan	2021	Acta Virol.	65	149-159
151	Proteomic analysis identifies potential markers for chicken primary follicle development	Wadood AA, W Jingyuan, L Pu, Q Shahzad, M Waqas, X Liu, L Xie, L Yu, D Chen, RW Akhtar and Y Lu	2021	Animals	11	1108
152	An identity based authentication protocol for smart grid environment using physical uncloneable function	Badar HM, S Qadri, S Shamshad, MF Ayub, K Mahmood and N Kumar	2021	IEEE Trans. Smart Grid		
153	Potential applications of hydrophobically modified inulin as an active ingredient in functional foods and drugs - A review	Usman M, C Zhang, PJ Patil, A Mehmood, X Li, M Bilal,, J Haider and S Ahmad	2021	Carboh. Polym.	252	117-176
154	Dough rheology and the impact of zinc sulfate on the quality of cookies	Usman M, PJ Patil, MF Manzoor, M Bilal, S Ahmad, MA Murtaza, H Shah, N Nawaz, S Amjad and M Abrar	2021	J. Food Sci. Technol.	8	
155	Engineering broad-spectrum resistance to cotton leaf curl disease by CRISPR-Cas9 based multiplex editing in plants	Mubarik MS, X Wang, SH Khan, A Ahmad, Z Khan, M W Amjad, MK Razzaq, Z Ali and MT Azhar	2021	GM Crops Food		

156	Nitric oxide regulates water status and associated enzymatic pathways to inhibit nutrients imbalance in maize (*Zea mays* L.) under drought stress	Majeed S, F Nawaz, M Naeem, MY Ashraf, S Ejaz, KS Ahmad, S Tauseef, G Farid, I Khalid and K Mehmood	2021	Plant Physiol. Biochem .	155	147-160
157	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. Bioresour. Manag.	8	154-167
158	Effect of foliar application of zinc oxide on growth and photosynthetic traits of cherry tomato under calcareous soil conditions	Sardar H, S Naz, S Ejaz, O Farooq, A Rehman, M Sameen and G Akhtar	2021	Acta Sci. Pol. Hortoru.	20	91-99
159	Zinc-solubilizing bacteria - mediated enzymatic and physiological regulati ons confer zinc biofortification in chickpea (*Cicer arietinum* L.)	Batool S, HN Asghar, MA Shehzad, S Yasin, M Sohaib, F Nawaz, G Akhtar, K Mubeen and ZA Zahir	2021	J. Soil Sci. Plant Nutr.		
160	Epidemiology and patho - physiological studies in *Trypanosoma evansi* infected camels and buffaloes in Pakistan	R Hussain, K Mehmood, RZ Abbas, I Khan, AB Siddique, S Masood, MS Qadir, HM Ishaq, R Akram, MT Ghori, A Khan and M Tayyib	2021	Pak. J. Agric. Sci.	58	711-718
161	Potential use of molecular and structural characterization of the gut bacterial community for postmortem interval estimation in sprague dawley rats	Li H, S Zhang, R Liu, L Yuan, D Wu, E Yang, H Yang, S Ullah, H M Ishaq, H Liu, Z Wang and J Xu	2021	Sci. Rep.	11	225

162	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. Bioresour. Manag.	8	154-157
163	IoT based smart fish farming aquaculture monitoring system	Karim S, I Hussain, A Hussain , K Hassan and S Iqbal	2021	Int. J. Emerg. Technol.	2	45
164	Development and exploitation of KASP assays for genes underpinning drought tolerance among wheat cultivars from Pakistan	Rehman S, MA Sher, MAB Saddique, Z Ali, MA Khan, X Mao, A Irshad, M Saj jad, RM Ikram, M Naeem and R Jing	2021	Front. Genet.	10	
165	Foliar application of magnesium at critical stages improved the productivity of rice crop grown under different cultivation systems	Ali H, N Sarwar, S Muhammad, O Farooq, A Rehman, A Wasaya, TA Yasir, K Mubeen, MN Akhtar	2021	Sustainability	13	4962
166	Exogenous sodium nitroprusside mitigates salt stress in lentil (*Lens culinaris* Medik.) by affecting the growth, yield, and biochemical properties	Yasir TA, A Khan, M Skalicky, A Wasaya, MIA Rehmani, N Sarwar, K Mubeen, M Aziz, MM Hassan, FAS Hassan, MA Iqbal, M Brestic, M Sohidul Islam, S Danish and AE Sabagh	2021	Molecules	3	2576
167	Evaluation of fourteen bread wheat (*Triticum aestivum* L.) genotypes by observing gas exchange parameters, relative water and chlorophyll content, and yield a ttributes under drought stress	Wasaya A, S Manzoor, TA Yasir, N Sarwar, K Mubeen, IA Ismail, A Raza, A Rehman, A Hossain, A EL Sabagh	2021	Sustainability	10	4799

168	Interference of horse purslane (*Trianthema portulacastrum* L.) and other weeds affect yield of autumn planted maize (*Zea mays* L.)	Mubeen K, MW Yonas, A Khalofah, RM Ikram, N Sarwar, M Shehzad, A Wasaya, H Rehman, TA Yasir, M Aziz, M Alam, HMR Javeed, M Ali, M Ali, M Ahmad, A Khaliq, MA Qayyum, W Ahmad and KA Khan	2021	Saudi J. Biol. Sci.	28	2291-2300
169	Effect of application of biochar, poultry and farmyard manures in combination with synthetic fertilizers on soil fertility and cotton productivity under arid environment	Ahmad S, A Ghaffar, MH Rahman, I Hussain, R Iqbal, G Haider, MA Khan, RM Ikram, H Hussnain and MS Bashir	2021	Commun. Soil. Sci. Plant Anal.	5	
170	China-Pakistan Trade: from RTA to CPEC.	Tahira Y, A Masood, S Ullah and M Aslam.	2021	PJAES	31	
171	Does mosquito diversity have some correlation with habitat characteristics and environmental parameters?	Qayyum MA, M Zeshan, UN Ullah, AA Khan and I Ahmad Rajwana	2021	J. Entomol. Res.	45	
172	New promising high yielding cotton Bt-Variety RH-647 adapted for specific agro-climatic zone	Shaheen M, Y Ali, T Muhammad, MA Qayyum, S Atta, S Bashir, MA Bashir, S Hashim, M Hashem and S Alamri	2021	Saudi J. Biol. Sci.	1	
173	Diversity and correlation of entomopathogenic and associated fungi with soil factors	Qayyum MA, S Saeed, H Riaz, N Ahmed, M Ishtiaq, W Wakil, M Yasin, CM Asrar and H Bilal	2021	Saudi J. Biol. Sci.	1	
174	Sowing date influences cotton leaf curl disease (CLCuD) incidence and productivity of non-BT cotton cultivars	Mubeen K, MN Afzal, M Tariq, M Ahmad, D Muhammad, M Shehzad, M Aziz and MW Yonas	2021	Pure Appl. Biol.	11	26-34

175	Early growth of Cotton is affected by increasing concentration of fresh leaves extract of *Calotropis procera*	Mubeen K, A Tanveer, RM Ikram , M Shehzad, M Aziz and HM Amir	2021	J. Agric. Food	2	10-16
176	Plant communities exhibit low resource partitioning for pollinator guilds under sub-tropical conditions of Pakistan	Sajjad A, J Liu, Y Wang, MA Farooqi, Z Zhao, A Ahmad, W Akram, M Ali and A Ali	2021	PloS One	16	e0247 124
177	Line X tester a nalysis 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
178	Myriad of physio-genetic factors determining the fate of plant under zinc nutrient management	Mapodzeke J M, MF Adil, S Sehar, MF Karim, MAB Saddique, Y Ouyang and IH Shamsi	2021	Environ. Exp. Bot.	189	
179	Does the adaptation of climate-smart agricultural practices increase farmers' resilience to climate change?	Ihsan Ja mil, Wen Jun, Bushra Mughal, Muhammad Haseeb Raza, Muhammad Ali Imran and Ali Waheed	2021	Environ. Sci. Pollut. Res.	28	27238 - 27249
180	Efficiency of different types of biochars to mitigate Cd stress and growth of sunflower (*Helianthus*; L.) in waste water irrigated agricultural soil	Bashir S, MA Qayyum, A Husain, A Bakhsh, N Ahmed, MB Hussain, MS Elshikh, MS Alwahibi and BMA Almunqedhi	2021	Saudi J. Biol. Sci.	28	2453-2459
181	Modeling approaches to assess soil erosion by water at the field scale with special emphasis on heterogeneity of soils and crops	Raza A, H Ahrends, MH Rahman and T Gaiser	2021	Land	11	

182	Impact of climate warming on cotton growth and yields in China and Pakistan: A regional perspective	Arshad A, MA Raza, Y Zhang, L Zhang, X Wang, M Ahmed and MH Rahman	2021	Agriculture	11	
183	Partial root zone drying irrigation improves water use efficiency but compromise the yield and quality of cotton crop	Iqbal R, MAS Raza, MA Rashid, M Toleikiene, M Ayaz, F Mustafa, MZ Ahmed, S Hyder, MH Rahman, S Ahmad, MU Aslam and I Haider	2021	Commun. Soil Sci. Plant Anal.	2	
184	Effectiveness of herbicide to control rice weeds in diverse saline environments	Hakim MA, AS Juraimi, SMR Karim, MSI Khan, MS Islam, MK Choudhury, W Soufan, H Alharby, A Bamagoos, MA Iqbal, F Hnilicka, J Kubes, MH Rahman, S Saud, M Hassan and AE Sabagh	2021	Sustainability	13	
185	Selenium alleviates the adverse effect of drought in oilseed crops camelina (*Camelina sativa* L.) and canola (*Brassica napus* L.)	Ahmad Z, S Anjum, M Skalicky, EA Waraich, RMS Tariq, MA Ayub, A Hossain, MM Hassan, M Brestic, MS Islam, MH Rahman, A Wasaya, MA Iqbal and AE Sabagh	2021	Molecules	26	
186	Performance of Spring and Summer-Sown Maize under Different Irrigation Strategies in Pakistan	Khan AG, M Imran, A H Khan, A Fares, J Aimunek, T Haq, A Abdullah A, MN Alyemeni and S Ali	2021	Sustainability	13	2757
187	Improving water use efficiency through reduced irrigation for sustainable cotton production	Ahmad HS, M Imran, F Ahmad, S Rukh, RM Ikram, HM Rafique, Z Iqbal, AA Alsahli, MN Alyemeni, S Ali, T Haq	2021	Sustainability	13	

188	Preventive role of propolis against hyperglycemia and hyperlipidemia in Sprague dawley rats (*Rattus norvegicus*) animal modelling system	Shahbaz M, R Arshad, T Zahoor, A Liaqat, TB Qaisrani, S Rafiq, MS Javed, N Raza, S Murtaza, U Farooq, M Imran, SA Gilani and I Ahmed	2021	Cell. Mol. Biol.	67	32-39
189	Biological management of powdery mildew of pea (*Pisum Sativum* L.)	Ahmed N, Z Abbas, H Riaz, HN Faried, MA Mehmood, Z Asad, Z Hamza, MA Zeshan, S Ali, S Latif, HR Ali	2021	Agric. Sci. J.	3	79-95
190	Population dynamics of Whitefly and Thrips under different row spacing and plant density conditions in a cotton field of Punjab, Pakistan	Alvi AM, N Iqbal, J Iqbal, K Ali, M Shahid, W Jaleel, HAA Khan and T Khan	2021	Pak. J. Zool.	53	685-690
191	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
192	Urdbean leaf crinkle virus: current scenario and future prospects	Ashfaq M, MA Khan and SB Kayani	2021	Pakistan J. Phytopathol.	33	205-216
193	Nutrient availability to maize crop (*Zea mays* L.) in biochar amended alkaline subtropical soil	Choudhary TK, KS Khan, Q Hussain and M Ashfaq	2021	J. Soil Sci. Plant Nutr.	21	1293-1306
194	Genetic variation among some isolates of tomato yellow leaf curl virus and its control using some biological fungi and nanoparticles	Al-Abedy NA, KA Al-Shujairi, I Al -Salami, M Ashfaq and BA AL-Musawi	2021	Int. J. Agricult. Stat. Sci.	17	229-236

195	Categorization of available cucumber genotypes against zucchini yellow mosaic virus and root -knot nematode (*Meloidogyne incognita*)	Ahmed HM, M Ashfaq, T Mukhtar and MA Khan	2021	J. Soil Sci. Plant Nutr.	25	955-961
196	Comprehensive RNA-seq analysis revealed molecular pathways and genes associated with drought tolerance in Wild Soybean (*Glycine soja* Sieb. & Zucc.)	Aleem M, MM Raza, MS Haider, RM Atif, Z Ali, JA Bhat and T Zhao	2021	Physiol. Plant.	172	707-732
197	Characterization of Vascular plant One-Zinc finger (VOZ) in soybean (*Glycine max* and *Glycine soja*) and their expression analyses under drought condition	Rehman SU, G Qanmber, MHN T ahir, A Irshad, S Fiaz, F Ahmad et al.	2021	Plos One	16	
198	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 Rehman, R Trethowan	2021	Planta	254	
199	Comparative study of powerful predictive modeling techniques for modeling monthly reference evapotranspiration in various climatic regions	Raza A, M Shoaib, MAI Baig, S Ahmad, MM Khan, MK Ullah, S Hashim	2021	Fresenius Environ. Bull.	30	7490-7513
200	Chromium accumulation in soil, water and forage samples in automobile emission area	Tasneem A, A Kafeel, IK Zafar; M Zunaira, K Ahlam, NA Rahmah, SA Moodi, H Mohamed, F Shahid, M Mudassar, S Hashim, FW Yong	2021	Saudi J. Biol. Sci.	14	

201	Role of nitrogen and magnesium for growth, yield and nutritional quality of radish	Yousaf M, S Bashir, H Raza, AN Shah, J Iqbal, M Arif, MA Bukhari, S Muhammad, S Hashim, J Alkahtani, MS Alwahibi, C Hu	2021	Saudi J. Biol. Sci.	28	3021-3030
202	Genetic gain for grain micronutrients and their association with phenology in historical wheat cultivars of Pakistan released between 1911 and 2016 in Pakistan	Shaukat M, M Sun, M Ali, T Mahmood, S Naseer, S Maqbool, S Rehman, Z Mahmood, Y Hao, X Xia, A Rasheed , Z He	2021	Agrono my	11	1247
203	Identification of single nucleotide polymorphism in TaSBEIII and development of KASP marker associated with grain weight in wheat	Irshad A, H Guo, S Rehman, X Wang, J Gu, H Xiong, Y Xie, L Zhao, S Zhao, C wang and L Liu	2021	Front. Genet.	12	2
204	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, AA Mamun, M Ahsan, KS Ahmad, MA Shehzad, M Ali, S Hashim, T Haq	2021	J. Soil Sci. Plant Nutr.	21	516
205	In-situ synthesis of ultrafine Co nanoparticles confined in interconnected nitrogen-doped carbon networks for enhanced reduction of 4-nitrophenol	Zhu K, H Xu, M Wakeel, T Haq, X Ren and C Chen	2021	Appl. Surf. Sci.	563	150320
206	Qualitative assessment and global mapping of supercritical CO_2 power cycle technology	Sultan U, Y Zhang, M Farooq, M Imran, AA Khan, W Zhuge, TA Khan, MH Yousaf and Q Ali	2021	Sustain. Energy Technol. Assess.	43	100978

207	Chemical profiling, HPLC Characterization and in-vitro antioxidant potential of Pakistani propolis collected from peripheral region of Faisalabad	Shahbaz M, T Zahoor, R Arshad, S Rafiq, TB Qaisrani, A Liaqat, MS Javed, Z Akbar, N Raza, S Murtaza, U Farooq, M Imran, AE Ghorab, U Bacha, I Ahmad, Z Mehmood, R Muzaffar, TA Gondal, SAM Shah, AS Shah , M Akhtar, MI Afzal and M Umer	2021	Cell. Mol. Biol.	67	32-39

2.2.2. Books/Book Chapters Published

Sr. No.	Book	Chapter	Editor's Name	Author's Name	Year	Publisher
1	Sequencing Technologies in Microbial Food Safety and Quality	Molecular Epidemiology of Food borne diseases	Thangadurai D	Shafi A, U Farooq, K Akram, Z Hayat, K Hayat and MZ Khan	2020	CRC, Florida, USA
2	Sequencing Technologies in Microbial Food Safety and Quality	Food Quality and Food Safety: An Introduction	Thangadurai D	Farooq U, A Shafi and K Hayat.	2020	CRC Press, Florida, USA
3	Reference Series in Phytochemistry: Bioactive Molecules in Food	Persimmon (*Diospyros kaki*) Fruit: Bioactive Natural Therapeutic Strategy for the Management of Nutritional Disorders	kaki D	Farooq U, A Shafi, K Akram and Z Hayat.	2020	Springer

4	Plant Ecophysiology and adaptation under climate change: Mechanisms and perspectives	Loss of Agro-Biodiversity and Productivity Due to Climate Change in Continent Asia: A Review	Hassanuzzaman M	Fatima A, M Farid, K Safdar, A Fayyaz, S Maheen Ali, S Adnan, M Nawaz, H Muniir, N Raza and M Zubair	2020	Springer Singapore
5	Cotton Production and Uses Agronomy, Crop Protection, and Postharvest Technologies	Modern Concepts and Techniques for Better Cotton Production	Ahmad S and M Hasanuzzaman	Rahman MH, I Ahmad, A Ghaffar, G Haider, A Ahmad, B Ahmad, M Tariq, W Nasim, G Rasul, S Fahad, S Ahmad and G Hoogenboom	2020	Springer, Singapore
6	Cotton Production and Uses Agronomy, Crop Protection, and Postharvest Technologies	Climate Resilient Cotton Production System	Ahmad S and M Hasanuzzaman	Ghaffar A, MH Rahman, HR Ali, G Haider, S Ahmed, S Fahad and S Ahmad	2020	Springer, Singapore

7	Cotton production and uses Agronomy, crop protection and post-harvest technologies	Sowing Methods for Cotton Production	Ahmad S and M Hasanuzzaman	Farooq O, K Mubeen, AA Khan and S Ahmad	2020	Springer, Singapore
8	Agronomic Crops, Vol. 3: Stress Response and Tolerance	Role of Mineral Nutrition in Improving Drought and Salinity Tolerance in Field Crops	Hasanuzzaman M	Nawaz F, MA Shehzad, S Majeed, KS Ahmad, M Aqib., MM Usmani and RN Shabbir	2020	Springer Nature Singapore
9	Systems Modeling	Disease Modeling as a Tool to Assess the Impacts of Climate Variability on Plant Diseases and Health	Ahmed M	Zeeshan M, M Obaid, AM Aqeel, A Hasan, R Muhammad, A Raza, S Ahmed, G Qadir, M Ahmad, FA Shaheen, F Hassan and ZH Shah	2020	Springer Singapore
10	Environment, Climate, Plant and Vegetation Growth	Insect Pests of Cotton Crop and Management Under Climate Change Scenarios	Fahad S, M Hasanuzzaman, M Alam, H Ullah, M Saeed, IA Khan and M Adnan	Ullah UN, M Ramzan and S Haroon, M Bokhari, A Saleem, MA Qayyum, N Iqbal, MH Rahman, S Fahad and S Saeed	2020	Springer

11	Microbial Bioremediation & Biodegradation	Energy-Efficient Anaerobic Ammonia Removal: From Laboratory to Full-Scale Application	Shah MP	Ni SQ, HA Ahmad, Y Zhao, Q Li, Y Dong, S Ahmad, Z Cui and Z Qiao	2020	Springer Nature Singapore
12	CRISPR Crops: The Future of Food Security	Disease Resistance in Crops Through CRISPR/Cas	Ahmad A, S Habibullah and Z Khan	Khan Z, T Saboor, M Ashfaq, A Saddique and P Khanum	2021	Springer Nature
13	CRISPR Crops: The Future of Food Security	CRISPR/Cas -Mediated Abiotic Stress Tolerance in Crops	Ahmad A, S Habibullah and Z Khan	Aftab A, S Khan, Habibullah and Z Khan	2021	Springer Nature
14	Computer Assisted Diagnosis, Diabetes and Cardiovascular Disease	Carotenoids in Diabetes, Retinopathy, and Cardiovascular Risk	Baz EE and JS Suri	Bano N and MZ Haq	2021	Elsevier
15	Alternative Medicine Intervention for COVID-19	Introduction to COVID-19	Haq MZ, MNB Jumah, SI Alothman and HA Henidi	Bano N, F Batool and MNB Jumah	2021	Springer Nature
16	Carotenoids: Structure and Function in Human Body	Carotenoids in Liver and Lung Diseases	Haq MZ, S Dewanjee and M Riaz	Bano N and I Imran	2021	Springer Nature Switzerland

17	Veterinary Pathobiology and Public Health	Newcastle Disease in Mammalian Species: the Propensity of Cross-Species Transmission Towards Public	Abbas RZ and A Khan	Rahman A, MAB Shabbir, MA Raza	2021	Unique Scientific
18	Glaciers and the Polar Environment	Risks of Glaciers Lakes Outburst Flood along China Pakistan Economic Corridor	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	Effect of Entomopath ogenic Fungi on The Migratory Locust	Riaz U	Qayyum MA, S Saeed, N Iqbal, MA Khan, UN Ullah, H Riaz, , M Ishtiaq, M Fiaz, MU Sial, A Siddique and A Mehdi	2021	Apple Academic Publishers
20	Ethnobiology of Mountain Communities in Asia	Ethnobotany of Mountain Region of Himalaya, District Poonch, Azad Kashmir	Abbasi AM and RW Bussmann	Mustafa A, KS Ahmad, A Mehmood, F Nawaz, A Haroon, A Hamid and I Liyaqat.	2021	Springer Nature, Switzerland

21	Ethnobiology of Mountain Communitie in Asia	Plant Resources and Their Uses in Salt Range, Pakistan	Abbasi AM and RW Bussmann	Sadia, S., KS Ahmad, A Mehmood, F Nawaz, A Haroon, M Hamid, F Ahmad, W Rani and AM Abbasi.	2021	Springer Nature, Switzerland
22	Plant Breeding-Current and Future Views	Association Mapping for Improving Fiber Quality in Upland Cottons	Abdurakhmonov IY	Hayat K, A Bardak, MRahman, HM Imran, F Ahmad, D Parlak, M Azam, M Usmaan, M Adnan, S Anjum and RSA Khan	2021	Intechopen
23	Effect of Entomopathogenic Fungi on The Migratory Locust	Advanced Technologies for Monitoring and Management of Locust	Riaz U	Qayyum MA, M Yasin, W Wakil, D Hunter and M Wajid	2021	Apple Academic Press
24	Wild Germplasm for Genetic Improvement in Crop Plants	Utilization of Wild Ancestors for Biotic and Abiotic Stress Tolerance in Barley	Wani SH and MT Azhar	Shoaib LM, MAB Saddique, MA Sher and Z. Ali	2021	Elsevier

25	Wild Germplasm for Genetic Improvement in Crop Plants	Emerging Avenues for the Exploitation of Wild Relatives of Rice in Plant Breeding	Wani SH and MT Azhar	Saddique MAB, MS Ahmad, MA Sheer, AA Khan and Z Ali	2021	Elsevier
26	Wild Germplasm For Genetic Improvement in Crop Plants	Untapped Soybeans: A Genetic Reservior for its Improvement	Wani SH and MT Azhar.	Tahir MHN and H Razzaq	2021	Elsevier
27	Laboratory Safety Manual MNSUAM	General Laboratory Safety Practices	Ali Z, S Ahmad and G Haider	Khan MA	2021	MNSUAM
28	Handbook of Plant and Crop Physiology	Physiologic al Basis of Abiotic Stress Tolerance in Plants	Pessarakli M	Haq T, M Imran, and HS Ahmad	2021	Taylor and Francis Group LLC

2.3. License Negotiated/Signed

Sr. No.	PI Name	Project	Company Name	Product Name	License Date
1	Engr. Dr. Sarfraz Hashim	Development and indigenization of floppy sprinkler system for future irrigation	M/S Noori Agro Lines	Indigenous Floppy Sprinkler Irrigation System	Feb 01, 2021
2	Engr. Dr. Alamgir Akhtar Khan	Introduction and promotion of one pass conservation tillage machinery for cotton wheat cropping system	M/S AgriTec Pvt. Ltd.	Cotton Stalk Puller Shredder Machine	Jan 12, 2021

2.4. Facilitation for Filing of Patents

ORIC facilitated following faculty members in completing documentation for filing of patent during 2020-21.

Sr. No.	Faculty Member	Innovation	National / International
1	Dr Sarfraz Hashim	Indigenous Floppy Sprinkler	National
2	Dr. Umair Sultan	High Efficiency Seed Drill	National
3	Dr. Ayesha Hakim	SmarTraps	National

2.5. Seminars/Webinars

Sr. No.	Date	Title	Organizer/ Department
1	16.07.2020	Impact of Micro-Financing on Rural Livelihood : Sharing of Global Experiences	Prof. Dr. Irfan A. Baig
2	23-24.09.2020	Seed Stewardship in Post-COVID scenario	Institute of Plant Breeding and Biotechnology
3	18.10.2020	Future Prospects of Fisheries and Aquaculture in Pakistan	Veterinary & Animal sciences
4	20.10.2020	Islamic Banking Awareness Session	Bank of Punjab
5	20.10.2020	Wheat Production for Season 2020-21	ORIC
6	22.10.2020	How to Earn Through Digital Marketing	Computer Science
7	30.10.2020	Seerat-ul-Nabi & Mehfil e Naat	Mr. Abdul Rasheed
8	04.12.2020	Biofloc and Intensive Fish Farming	Veterinary and Animal Sciences
9	04.12.2020	How to use HEC Digital Library Resources	Chief Librarian
10	09.12.2020	Promoting Entrepreneurship in Students for Opportunities in Agriculture	Prof. Arshad Jamil (USA), AVS, MNSUAM
11	11.12.2020	Climate Change Impact on Agricultural Water Resources	Agri. Engineering
12	18.12.2020	How to write a Synopsis / Research Project	Chief Librarian
13	30.12.2020	Recent Advances in Citrus Fruit Quality Improvement and Future Prospects	Horticulture

14	05.01.2021	Financial Support for Cottage Industries/Cluster Development	PSIC/Agri. Engineering
15	08.01.2021	Garrison Library; A Modern Way of Learning	Chief Librarian
16	14.01.2021	Business Grants/Loan for Students to Promote Academic Innovations	Agri. Engineering / PSIC / MNSUET
17	20.01.2021	Beekeeping for Nutrition & Entrepreneurship for Rural	Institute of Plant Protection
18	29.01.2021	Effective Utilization of HEC Digital Resources	Chief Librarian
19	30.01.2021	Awareness on Smoking and Use of Other Tobacco Products	SAP/ORIC
20	19.02.2021	Hybrid Wheat & Sustainable Agriculture	Dr. Zulfiqar Ali/Bayer Crop Sci
21	24.02.2021	Webinar on "Crop Protection & Seed Stewardship"	Prof. Dr. Zulfiqar Ali
22	24.02.2021	Special Lecture of Mr. Saeed Anwar, Ex-Cricketer/Islamic Scholar on "Tolerance, humanity and interreligious brotherhood"	Team of social & religious tolerance course & Qirat & Naat Club
23	25.02.2021	National Cultural Identity of Pakistan & Inauguration of Girls in Scouting	Rover Scout Unit
24	08.03.2021	Mango Production and Protection	ORIC/BASF
25	10.03.2021	Women Researchers and their Contribution towards Entrepreneurial Development	ORIC/WUM/FJWU Rawalpindi
26	22.03.2021	World Water Day	Agri. Engineering
27	22.03.2021	Reckoning Impact of Changing Climate upon Agricultural Water	Agri. Engineering
28	24.03.2021	Women Empowerment through Entrepreneurship	MNSUAM
29	31.03.2021	Potential of using Robots in Agriculture	Agri. Engineering/NCR A
30	02.04.2021	Health Program on “Tuberculosis Impacts and its Management”	HND NMU/Food Science and Technology

31	06.04.2021	Performance & Impact of Latest Agri-Technologies & ICM Gadgetry in Precision Farming & Effective R&D Programs	ORIC/FDP
32	08.04.2021	CRISPR-based Genome Editing and Its Applications	ORIC/ Institute of Plant Breeding and Biotechnology
33	08.04.2021	Monitoring and Control of the Dengue Vector	Institute of Plant Protection
34	25.05.2021	Whitefly Management in Cotton	MNSUAM/BASF
35	07.06.2021	World Environment Day-2021	Soil and Environmental Sciences
36	08.06.2021	Nutrition & Weed Management Management in Cotton	MNSUAM/BASF
37	08.06.2021	World Food Safety Day -2021: Safe Food Now for a Healthy Tomorrow	Food Science and Technology
38	15.06.2021	Apna Maqaam Paida kr	MNSUAM
39	25.06.2021	Greenhouse Horticulture: Current Status & Future Prospects	Horticulture
40	07.07.2021	Aquaculture: The Best Industry of the Future	Veterinary & Animal sciences

2.6. Conferences

Sr. No	Date	Title	Organizer / Department
1	08.09.2020	Virtual Conference "Safe Use Ambassador (SUA)"	MNSUAM/Bayer Crop Sciences
2	15-16.10.2020	International Virtual Conference "Plant Based Food; Potential for Food Security and Pandemic Management"	Food Science and Technology
3	27-28.01.2021	International Conference on "Smart Plant Protection"	Institute of Plant Protection
4	25.02.2021	Youth Conference for Countering Extreme Behaviours	Senior Tutor
5	20.05.2021	International Conference on "Bee Pollination under Climate Change Scenario"	Institute of Plant Protection

2.7. Other Outreach/Recreational/Capacity Building Activities

2.7.1. Competitions

Sr. No.	Date	Title	Organizer
1	20.07.2020	Participation of 10 student groups in Agri Surge Innovation Challenge, 2020 (https://ignite.org.pk/agrisurge/)	CS/IT
2	10.08.2020	Participation of 32 Final Year student groups in National Grassroots ICT Research Initiative (NGIRI)	CS/IT
3	17.08.2020	Poster Competition on World Cotton Day	MNS-UAM
4	31.08.2020	Participation of 8 students in SUPARCO Space Station Research Experiment, 2020	CS/IT
5	11.11.2020	Graduate Research Day • Best Research Poster Competition (Non-Virtual) • Best video, related to participants research work/idea (Virtual)	Graduate Resource Centre
6	08.06.2021	Poster Competition on World Food Safety day	Food Science and Technology
7	19.06.2021	Business Idea Competition	MNSUAM/ Accountability Lab

2.7.2. Activities Under Social Action Plans

Sr. No.	Title	Date
1	Awareness of Covid-19 Seminar among TG and Public	02-07-2020
2	Session on HIV AIDs World Day	01-12-2020
3	Online Poster and Debate Competition	08-12-2020
4	Anti-corruption Day	09-12-2020
5	Session on Quaid's day "Youth as Catalyst for Leadership"	25-12-2020
6	Youth Conference on Entrepreneurial Mindset	30-12-2020
7	Professional Mindset and how to outclass in Information Technology	06-01-2021
8	Child Sexual Abuse	11-02-2021
9	Career Counseling with Youth	11-02-2021

10	International Seminar on "Entrepreneurial Initiatives and Bigger Purpose in Creation"	24-02-2021
11	"How to build leadership qualities among youth"	25-02-2021
12	Trans First Education, "How Freelancing can change the life of Transgender Community"	07-04-2021
13	Social Entrepreneurship Mindset and Pandemic	27-05-2021
14	Environmental Entrepreneurship and Today's Youth	28-05-2021
15	Competiveness Entrepreneurship and Economic how to Multilingual in Professional Life	30-05-2021
16	Gender Equality Entrepreneurship	`30-06-2021

2.7.3. Faculty and Staff Trainings/Workshops Organized

Sr. No.	Date	Title	Organizer
1	08.07.2020	Wellness and Recovery Action Plan phase 2nd	ORIC
2	15.12.2020	Hands-on Training entitled, “How to Access & Use E-Repository”	Chief Librarian
3	14.01.2021	Climate Smart Wheat Production for Food Security	Agronomy
4	02.02.2021	Workshop on "Various Designs of Mosquito Traps made with used PET bottles"	Dr. Unsar Naeem Ullah
5	18.02.2021	Workshop on "Mushroom Cultivati on Business in Southern Punjab"	IPP
6	18.03.2021	Lab Biosafety Training	ORIC/CropLife Pakistan
7	29.03.2021	2nd session of "Lab Biosafety Training"	ORIC/CropLife Pakistan
8	08.04.2021	Online (Zoom) training "Dairy Farm Management"	ORIC/SMEBFC
9	17.06.2021	Training workshop on "Discover yourself and your boss	MNSUAM
10	25.06.2021	Workshop under DAAD funded Biodiversity+ project titled "Collaborative capacity building for plant biodiversity research preservation in oasis ecosystem of Pakistan Biodiversity+"	ORIC/IPBB/Uni. Of Kassel
11	22-23.06.2021 24-25.06.2021	Two Days capacity building workshop on "Conflict Management and Social Entrepreneurship"	MNSUAM/ Accountability Lab

2.7.4. Students Trainings Under Central Lab System

Sr. No.	Date	Title	Name of Trainer
1	13-10-2020	Hands on training on DNA Extraction	Dr. Mehmood Ahmad
2	16-10-2020	Hands on training on qPCR and Gel Electrophoresis	Dr. M. Abu Bakar
3	19-10-2020	Hands on training on Isolation of Microbes	Dr. Afshan Shafi
4	20-10-2020	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
5	20-10-2020	ELISA, Gel Electrophoresis	Dr. Mehmood Ahmad
6	22-10-2020	Hands on training on isolation and purification of microbes	Dr. M. Arslan Khan
7	23-10-2020	Hands on training on qPCR and Gel Electrophoresis	Dr. M. Abu Bakar
8	26-10-2020	Hands on training on Isolation of Microbes	Dr. Afshan Shafi
9	27-10-2020	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
10	27-10-2020	RNA Extraction	Dr. Mehmood Ahmad
11	02-11-2020	Hands on training on pH meter, Laminar air flow and tissue culture	Ms. Plosha Khanum
12	03-11-2020	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
13	09-11-2020	Hands on training on Isolation of Microbes	Dr. Afshan Shafi
14	10-11-2020	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
15	10-11-2020	Hands on Training of DNA Extraction, ELISA, Electrophoresis, RNA Extraction	Dr. Mehmood Ahmad
16	17-11-2020	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
17	24-11-2020	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
18	24-11-2020	Hands on Training of DNA Extraction, ELISA, Electrophoresis, RNA Extraction	Dr. Mehmood Ahmad
19	08-12-2020	Hands on training on Ciras-3	Dr. Nazar Faried
20	15-12-2020	Hands on training on Ciras-3	Dr. Nazar Faried
21	15-12-2020	Hands on Training of DNA Extraction, ELISA, Electrophoresis, RNA Extraction	Dr. Mehmood Ahmad
22	15-01-2021	Hands on training on isolation and purification of microbes	Dr. Muhammad Arslan Khan
23	26-01-2021	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
24	28-01-2021	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
25	28-01-2021	Hands on Training on weather station and climate chamber	Dr. Shahid Iqbal

26	29-01-2021	Hands on training on Atomic Absorption Spectrophtometer	Dr. Abid Hussain
27	03-02-2021	Hands-on Training on Spectrophotometer	Dr. Shakeel Ahmed
28	04-02-2021	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
29	04-02-2021	Hands on training on Atomic Absorption Spectrophtometer	Dr. Abid Hussain
30	08-02-2021	Hands on training on qPCR and Gel Electrophoresis	Dr. M. Abu Bakar
31	11-02-2021	Hands on Training on Soxhlet and Kjeldhal apparatus	Dr. Shabbir Ahmad
32	12-02-2021	Hands on training on Atomic Absorption Spectrophtometer	Dr. Abid Hussain
33	19-02-2021	Hands on training on Atomic Absorption Spectrophtometer	Dr. Abid Hussain
34	03-06-2021	Hands on training on PCR machine, gel electrophoresis, gel documentation system and DNA extraction	Dr. M. Abu Bakar
35	04-06-2021	Hands on Training on isolation and evaluation of pathogenic and beneficial microbes	Dr. M. Arslan Khan
36	17-06-2021	Hands on training on pH meter, Laminar air flow and tissue culture	Ms. Plosha Khanum
37	18-06-2021	Hands on Training on isolation and evaluation of pathogenic and beneficial microbes	Dr. M. Arslan Khan

2.8. Research Linkages

2.8.1. International

Sr. No.	Organization	Country	Signing Date
1	University of Bonn	Germany	11.07.2020
2	RAZBIO Ltd UK and Swansea University	UK	24.08.2020
3	University of Copenhagen	Denmark	08.10.2020
4	EBERWALDE University for Sustainable Development	Germany	12.10.2020
5	Niha Corp, A California Corp-USA	USA	05.12.2020
6	Jiangsu University	China	17.06.2021

2.8.2. National

Sr. No.	Organization	Signing Date
1	Tawakkal Fish Hatchery and Farms, Muzaffargarh	09.07.2020
2	BASF Pakistan Pvt. Ltd.	14.07.2020
3	Fatima Jinnah Women University, Rawalpindi	29.07.2020
4	Volka Food International Ltd., Multan	20.08.2020

5	Huawei Technologies (Pakistan) Pvt. Ltd.	26.08.2020
6	Super Punjab Feeds	16.09.2020
7	Fatima AG Solutions Limited, Lahore	25.09.2020
8	Metro Cash & Carry Pakistan	28.10.2020
9	Society of Facilitators and Trainers Islamabad	05.11.2020
10	All Pakistan Fruit & Vegetable Exporters, Importers and Merchant Association	12.11.2020
11	Farm Dynamics Pakistan (Pvt) Ltd. Lahore	17.11.2020
12	ICI Pakistan Ltd. Karachi	20.11.2020
13	Shaoor Foundation for Education & Awareness (SFEA), Islamabad	24.11.2020
14	Bayer Pakistan (Pvt) Ltd	22.12.2020
15	The Accountability Lab, Islamabad	18.01.2021
16	Croplife Pakistan Association	01.02.2021
17	Human Appeal (HA). Pakistan	25.02.2021
18	SANIFA Agri Services Limited, Lahore	16.03.2021
19	Karakorum International University Gilgit, Gilgit-Baltistan	22.03.2021
20	Fatima AG Solutions Limited, Lahore	08.04.2021
21	Sybrid Private Limited Pakistan	27.05.2021
22	Jaffer Agro Services (Pvt.) Ltd.	02.06.2021
23	Engro Fertilizers Limited	08-06-2021
24	Syngenta Pakistan Limited, Karachi Pakistan	10-06-2021
25	Sawie Systems, Lahore	21.06.2021
26	NAVTTC	28.06.2021

2.9. Adoption of HEC ORIC Policy 2021

The Syndicate, in its 29th meeting held on 29.04.2021, has adopted HEC ORIC Policy 2021. Under this policy, ORIC Steering Committee (SC) and Ethical Institutional Review Board (EIRB) were formulated. EIRB is mandated to review research proposals to ensure that all research proposals, especially on human subjects, adhere to guidelines. Five meetings of EIRB were arranged before submission to various national and international funding agencies during the reported period. SC performs as the governing body of ORIC for providing strategic leadership and governance oversight.

2.10. Certification of Quarantine Facility

Post Entry Quarantine Facility established by MNSUAM comprising Glasshouse, Quarantine Lab and Containment area has been certified by Department of Plant Protection, Govt. of Pakistan. The certified quarantine facility will be helpful for the researchers to import the plants or plant material from abroad for strengthening the indigenous research and find out the solution of various crops by introducing and adapting plant materials.

2.11. Facilitation to HEC Indigenous Awardee(s)

ORIC has facilitated 13 Ph.D 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.

2.12. Promotion of Research and Consultancy Culture

ORIC is striving hard to promote the culture of research and consultancy through creating a research eco-system. 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 common target like establishment of 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.

2.13. Business Incubation and Agricultural Entrepreneurship Centre (BIAEC)

Business Incubation and Agricultural Entrepreneurship Centre (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 business and social enterprises. The BIAEC provides excellent counselling to the students. The BIAEC helps the students to convert their innovative ideas into valuable business activities through following incubations. One of the Incubatee Green Agriculture Services, conducted Seven trainings in Sindh and Punjab. Four trainings on Mango Small Tree system in Tando Ghulam Ali, Sindh, Rahim Yar Khan, Two trainings at Multan. Furthermore, two trainings on Mango Nursery in Tandojam Agriculture University Sindh, and another training at MNSUAM were conducted. An online training was conducted on Mango Production system. Green Agriculture Services also participated in Mango Festival at Centaurus Mall, Islamabad and provided platform to 50 growers for branding of mangoes and selling in high end markets.

Sr. No.	Company	Focal Person	Business Type	Advisory Person/ Academic Lead Partner	Date of Agreement
1	Green Revolution	Shahzad Saleem	Agro Services	Dr. Shakeel Ahmad	05.01.2021
2	Smart Traps to Take Smart Decisions	Ms. Sana Tariq	Agro Services + IT Solutions	Dr. Ayesha Hakim	18.02.2021
3	MINSOL Consultants Pvt. Ltd.	Nehal Ahmad Khan	Consultancy/ Marketing/ Farming/ Biotech etc.	Prof. Dr. Zulfiqar Ali	30.04.2021

2.13.1. Students Registered for Idealist By Startup Pakistan

About 1000 students applied for idea1. Students registered for Idealist by startup Pakistan Ideagist startup Pakistan cohort 2 and after registration they got training from international scholars about entrepreneurship and startups.

2.13.2. Students Selected from Pak 100 Idea Competition

One student from BBAA selected from PAK 100 competition among 200 candidates and he was selected for interview among 27 teams in Pakistan.

2.13.3. Students Registered for Kamyab Nojavan Program for E-Rozgar and Enablers for Freelancing and E-Marketing

About 50 students got training of kamyab Nojavan program and many of them are now working online and earning money from fiver and some of students are also in the process of registration of enablers.

2.13.4. Students' Idea Selected for Taj-Sibau Innovative Business Competition

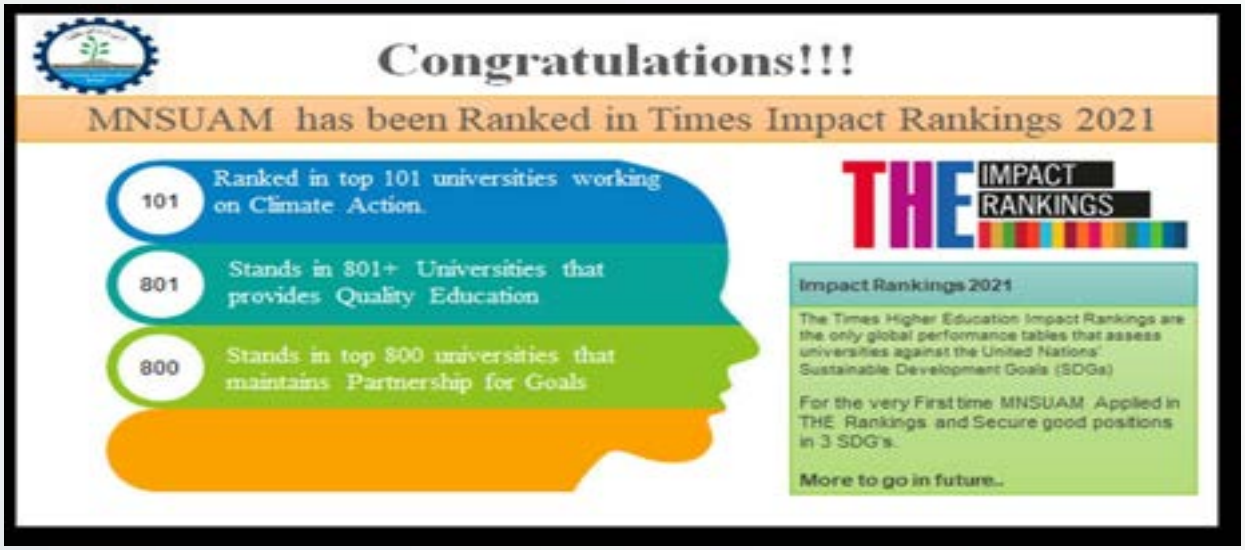
About five teams registered their business idea in TAJ-SIBAU innovative business competition and three teams got selected and they were called for the product display in competition.

2.14. University Rankings

2.14.1. Impact Rankings 2021

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 comparison across four broad areas: research, stewardship, outreach and teaching.

For the very first time, MNSUAM applied for Times Higher Education Impact Rankings 2021 and secure good position in three SDGs. Ranked in top 101 universities working on climate action. MNSUAM stands 801+ Universities that provide Quality education. Also Stands in top 800 universities that maintain Partnership for Goals.



2.14.2. World University Rankings

The Times Higher Education World University Rankings 2021 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. Trusted worldwide by students, teachers, governments and industry experts, this year's league table provides great insight into the shifting balance of power in global higher education.

2.14.3. WURI Ranking

WURI Ranking is not based on tradition, reputation, or popularity, but rather is focused on new concepts such as innovativeness, entrepreneurship, responsibility, and openness. If you wish to learn more, please visit the full list of Global Top 100 WURI 2020 at the following website: https://www.wuri.world/wuri-ranking-2020/.

For 2021, the WURI Ranking adds a new category to its assessment: crisis management. The year 2020 had to deal with the trauma and disruption caused by the COVID-19 pandemic. In this respect, role of heads of various organization has been primarily occupied with the great challenges brought on by this pandemic, such as the conversion to online education, restricted research activities, and social distancing measures. Furthermore, there were also institutional difficulties brought on by the reduced number of students and increased costs. However, it is during a testing time like this when the sharing of successful experiences in crisis management helps us prepare more effectively for the future.

2.14.4. QS Rankings

QS World University Rankings reveals the top 1,000 universities from around the world, covering 80 different locations. There are 47 new entrants in this year's top 1,000 while over 5,500 universities were evaluated and considered for inclusion. While the Massachusetts Institute for Technology (MIT) continues its record-breaking streak at number one - the ninth year in a row it's achieved this feat - the big story this year is the impressive gains made by Asian universities. 26 institutions from the continent now feature in the global top 100, more than ever before.

2.14.5. UI GREENMETRIC World University Rankings

The UI GreenMetric is an annual publication of University rankings on sustainability. It comprises on six indicators of the particular University including Setting and infrastructure, Energy and Climate Change, Waste Water, Transportation and Research & amp; Education. It is an initiative from the University of Indonesia that ranks Universities around the world based on their commitment and actions towards sustainability. The MNS University of Agriculture Multan, initially submitted the data during 2018 towards this ranking and got 5th Position on National level and 367th position worldwide. In 2019, MNS University of Agriculture, Multan improved its point and is now ranked as 4th national and 311th worldwide. In, 2020, the University upgraded its rank once again and placed 3rd best University nationwide and 243rd worldwide. The UI GreenMetric World University Rankings and MNS University of Agriculture Multan, aim to increase awareness towards sustainability. The primarily objective of the UI GreenMetric and its collaborative University is to control the carbon foot prints and protect the natural atmosphere for the future. The Vice Chancellor has greatly emphasized on every aspect of sustainability. He always appreciates the efforts of academic staff and administration to increase awareness regarding this issue and protect our environment from drastic effects of pollution.

2.15. 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 assistantship. ORIC announced subject fellowship with the donation amount of Dr. Neil Forrestor from Australia. In response, Ms. Bushra Irum, MSc student from Department of Soil and Environmental Sciences was awarded PAC fellowship which will continue for 36 months.

2.16. Visit of Australian High Commissioner

An Australian delegation led by the Australian High Commissioner, His Excellency Mr. Jeoffrey Shaw called on Prof. Dr. Asif Ali, Vice Chancellor MNSUAM on Feb. 22, 2021. Other members of the delegation were Ms. Lauren Waugh (Second Political Secretary, Australian High Commission) and Dr. Munawar Raza Kazmi (Country Manager, ACIAR). The purpose of this visit was to get insight about ongoing academic and research activities at MNSUAM and explore new avenues for future research collaboration with Australian counterparts. Talking on the occasion, Prof. Dr. Asif Ali informed the delegation that South Punjab has become the heart of agricultural activities in Pakistan, and the University is facilitating the farming community of this region through research, innovations and technology transfer. He also briefed the delegation about the University's pivotal role in the development of agriculture sector in this dynamic region, and delivered a presentation, particularly highlighting the success of Hybrid Wheat, Living with Salinity and Pluses projects undertaken by MNSUAM with collaboration and support from Australia. The Australian High Commissioner, His Excellency Mr. Jeoffrey Shaw lauded the initiatives and appreciated the facilities available at MNSUAM. He added that Australia is supporting research and innovation through partnership of local institutes with the ACIAR. Keeping in view the existing potential of the country, Australia would explore further opportunities for enhancing bilateral trade with Pakistan. Dr. Kazmi stated that the ACIAR pulses project is the first of its own kind, which aims to enhance the production and profitability of pulses in cereal based cropping systems in Pakistan. This project will re-introduce legumes in cropping systems as a priority for agriculture development; this would have nutritional, economic and environmental benefits. He appreciated the University's efforts in linking pulse growers with high end markets and being a partner in research and development programs on salinity. This project will be launched in Punjab, Sindh and Baluchistan provinces and carried out in collaboration with various universities and research institutions of the provinces. The Australian delegation was briefed about Research Labs, Research Farms, Fish Ponds, Bifloc Unit, Hydroponic Unit, Green House, Weather Station, Vegetable Nursery Unit and newly constructed buildings of the University's main campus. All members appreciated the R&D activities at the University under the leadership of Prof. Dr. Asif Ali. Prof. Dr. Zulfiqar Ali, Director ORIC, MNSUAM briefed the delegation regarding hybrid and water saving wheat yield trials, and the Excellency acknowledged his efforts towards sustaining food security.

2.17. Miscellaneous Activities

- During the reported period, GC-MS Lab, FT-IR Lab, Cotton Lab, Genome Editing Lab and Chemical Safety Room were established.
- In Central Lab System, procurement of research equipment especially *GC-MS* and *FT-IR Spectrophotometer* was made.
- 3rd meeting of Institutional Biosafety Committee was convened to review the biosafety aspects of various projects before submission to funding agencies.

QUALITY ASSURANCE

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-3
QUALITY ASSURANCE

3.1. Quality Enhancement Cell

MNS University Agriculture Multan, established 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 the year 2020-21, 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) in the scenario of COVID-19 Pandemic to continue academic activities and provision of Quality Education to the students. Furthermore, QEC ensured the implementation of MNSUAM and HEC policies regarding online education.

3.2. Functions of QEC

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

1) Capacity building of faculty, through seminars and trainings, 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 and Course Readiness etc.)
7) Hybrid/Blended Learning
8) Preparation of curriculum for Outcome Based Education (OBE)

During the year 2020-21, the details of various activities of QEC are as follows:

3.3. Course and Teacher Evaluation Proforma

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 Proforma at the end of every semester. Feedback from the students for Course and Teacher Evaluation was obtained through 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 2020-21	331	90
2	Spring 2021	322	67

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 various Accreditation Councils. The QEC acts as a bridge between the teaching departments and Accreditation Councils. During the year 2020-21, following visit of (AICs) of different councils were arranged for various programs in the University.

Sr. No.	Disciplines	Nature of Visit	Accreditation Council
1	B.Sc. (Hons.) Agriculture Major Biotechnology	Formal Visit	NAEAC
2	B.Sc. (Hons.) Agriculture Major Plant Pathology		
3	B.Sc. (Hons.) Agriculture Major Agricultural and Resource Economics		
4	BBA Agribusiness		
5	B.Sc. Agro Industrial Engineering Technology	Interim Visit	NTC

3.5. NOCs to initiate Postgraduate degree Programs

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

- M.Sc. (Hons.) Postharvest Management Technology
- MS Management Agribusiness Specialization

During the report period two cases were submitted to the HEC for NOCs for initiating following degree programs:

- MS Public Health
- MS Poultry Science

3.6. Departmental Technical Review Committee (DTRC) of Faculty Hired through Tenure Track System (TTS)

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

Institutes/Departments	TTS Faculty Members
Agronomy	03
Veterinary and Animal Sciences	03
Total	**06**

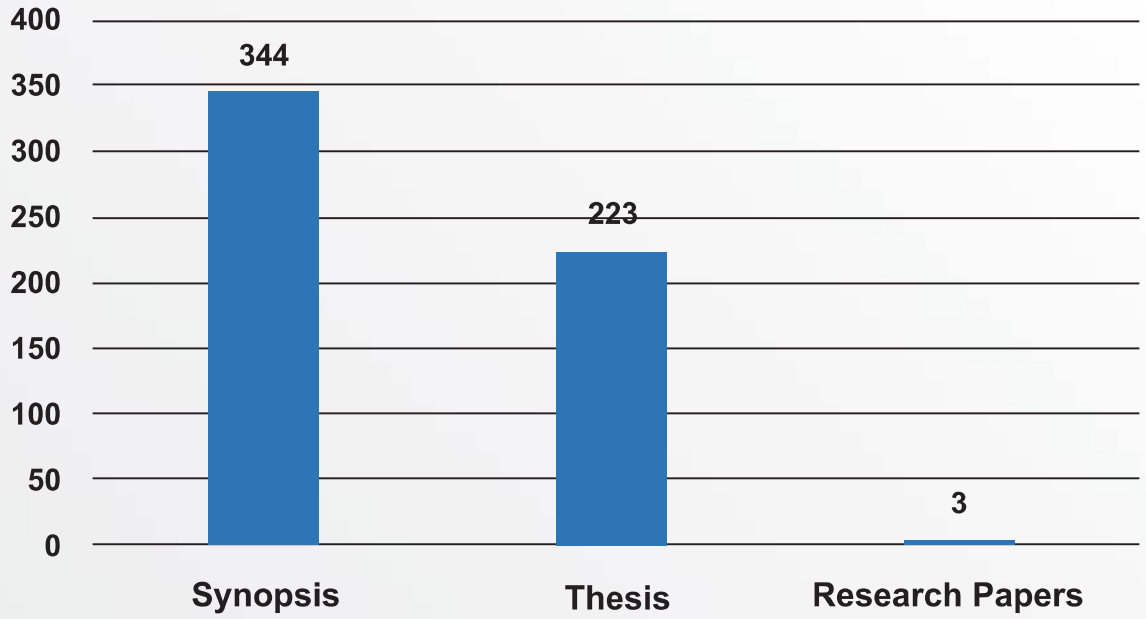
3.7. Assessment of Self-Assessment Reports (SARs)

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

Sr. No.	Programs	SARs Prepared by PTs	SARs Assessed by ATs	Implementation Plan
1	Plant Breeding and Genetics	✓	✓	✓
2	Seed Science and Technology	✓	✓	✓
3	Biotechnology	✓	✓	✓
4	Entomology	✓	✓	✓
5	Plant Pathology	✓	✓	✓
6	Agronomy	✓	✓	✓
7	Food Science and Technology	✓	✓	✓
8	Horticulture	✓	✓	✓
9	Soil Science	✓	✓	✓
10	Climate Change	✓	✓	✓
11	Computer Science	✓	✓	✓
12	Information Technology	✓	✓	✓
13	Agricultural and Resource Economics	✓	✓	✓
14	BBA Agribusiness	✓	✓	✓
15	Poultry Sciences	✓	✓	✓
16	Fisheries and Aquaculture	✓	✓	✓
17	Agro Industrial Engineering and Technology	✓	✓	✓

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

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



3.9. Trainings/Workshops Organized

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

1. Developing Scheme of Studies for Outcome Based Education
2. Plagiarism and HEC Policy
3. Scientific Research Methodology
4. Workshop on Preparation of Self-Assessment Reports (SARs)
5. Capacity building of students in online system including LMS, FIS, Admission System, Video Conference Tools
6. Hands-on Training entitled “How to Access and Use E-Repository”
7. Training workshop on “Discover Yourself and Your Boss”
8. Workshop on “Data Visualization and Analysis with Stata”
9. Scientific Writing Skills
10. Synopses Writing

3.10. 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, the Quality Enhancement Cell got filled the evaluation forms 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 improved the 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 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 finding 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.

3.11. 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

3.12. 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 Board of Studies, Academic Council, Selection Board, Syndicate etc.
- Formulating Standard Operating Procedures (SOPs) for policy implementation, e.g. Faculty Evaluation, Turnitin, Purchase and Procurement etc.

3.13. Teaching Practices

- Preparation of Course Files.
- Detailed course plans containing expected learning outcomes, weekly lecture break-up, assignments, quizzes, and exams schedule, suggested readings, and other course activities.
- Information on student progress.
- Assessment of learning both formative and summative through the entire semester and program
- Teaching strategies, methodologies, micro teaching etc.
- Hybrid/Blended Course using Moodle based Learning Management System.
- Training of teachers for Teaching Online Courses.

FACULTY DEVELOPMENT

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-4

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 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 work place 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.	Name of Faculty	Program	University
1	Dr. Fahim Nawaz	Post-Doc	University of Hohenheim, Germany
2	Dr. Habib ur Rehman	Post-Doc	University of Bonn, Germany
3	Mr. Muhammad Arif	Ph.D.	University of Science and Technology, China
4	Mr. Asif Mahmood Arif	Ph.D.	University of Agriculture, Faisalabad
5	Mr. Muhammad Arslan	Ph.D.	University of Bonn, Germany
6	Mr. Azher Khan	Ph.D.	International Islamic University, Islamabad

4.3. Faculty and Staff Trainings/Workshop Organized

Sr. No.	Training	Duration		Organization	Trainee
		From	To		
1	New Amendments in PPRA Rules, 2004	18.08.2020	18.08.2020	Institute of Tender Management, PC, Lahore	• Mr. M. Asif Nawaz • Mr. Inam Ullah Khan

2	Framework Agreement and Unsolicited Proposals Process under New Amendments	19.08.2020	19.08.2020	Institute of Tender Management, PC, Lahore	• Mr. M. Asif Nawaz • Mr. Inam Ullah Khan
3	E-Procurement Process under New Amendments	20.08.2020	20.08.2020	Institute of Tender Management, PC, Lahore	• Mr. M. Rafiq Farooqi • Mr. Azeem Afzaal • Mr. Adnan Nabi
4	Evaluation Process, Negotiations and Discounts under New Amendments	21.08.2020	21.08.2020	Institute of Tender Management, PC, Lahore	• Mr. M. Rafiq Farooqi • Mr. Azeem Afzaal • Mr. Adnan Nabi
5	Three days Workshop On Improving Value for Money	28.09.2020	30.09.2020	Department of the Auditor-General of Pakistan, Performance Audit Wing, Lahore	• Mr. M. Rafiq Farooqi • Mr. Ghulam Haider Saeedi • Mr. Muhammad Asif Nawaz
6	Training Course on Water Resource Management – Issues and Way Forward	21.09.2020	25.09.2020	AHK National Centre for Rural Development, Islamabad	• Dr. Sarfraz Hashim • Dr. Muhammad Saifullah
7	Online Workshop-Cum-Training Programme on Fisheries and Aquaculture	12.10.2020	23.10.2020	AARDO, Delhi, India	• Dr. Naheed Bano

8	Training on Assistant Leader Trainers for Scouts Leaders	10.10.2020	17.10.2020	Provincial Scouts Headquarters, Baluchistan Boy Scouts Association, Quetta	• Dr. Umar Ijaz Ahmed
9	Online International Training Programme	02.11.2020	11.11.2020	Bangladesh	• Mr. Muhammad Arqam Iqbal • Mr. Muhammad Ali Imran
10	Training on Train the Trainer (TTT), for Huawei ICT Academy	02.11.2020	06.11.2020	HEC, RC Lahore	• Dr. Amir Hussain • Mr. Israr Hussain
11	Online Training Programmes at National Institute for Micro, Small and Medium Enterprises (NIMSME)	15.05.2021	21.05.2021	AARDO, Hyderabad, India	• Dr. Sami Ullah

12	Capacity Building Program on Online Teaching Course Level-I	20.03.2021	10.04.2021	NAHE, HEC, Islamabad	• Prof. Dr. M. Hamm ad Nadeem Tahir • Dr. Salman Qadri • Dr. Tanveer Ahmad • Dr. Ayesha Hakim • Dr. Asghar Abbas • Dr. Riffat Yasin • Dr. Rana Waseem Akhtar • Dr. Atif Rehman • Dr. Aziz ul Rahman • Dr. Hafiz M. Usman Aslam • Dr. Muhammad Umair Sial • Dr. Muhammad Fiaz • Dr. Khalid Mehmood • Dr. Akash Fatima • Dr. Shazia Hanif • Ms. Madiha Gohar • Dr. Sehrish Ijaz • Mr. Hafeez-ur-Rehman Ali Khera • Mr. Waqar Zaib • Mr. Nasir Niaz
13	Three days Comprehensive Workshop on Train the Procurement Trainer	18.03.2021	20.03.2021	Institute of Tender Management	• Mr. M. Asif Nawaz • Mr. M. Azeem Afzaal • Dr. Maher Iftikhar Ahmad

14	Multicounty observational study mission on Advanced Food Safety Management	28.06.2021	30.06.2021	Asian Productivity Organization (APO)	• Dr. Afshan Shafi
15	Workshop on Better Speaker	09.06.2021	09.06.2021	PCD NUST, Islamabad	• Dr. Ayesha Hakim • Dr. Abid Hussain • Ms. Somiya Ambreen
16	Clean Energy Solutions and Waste Management for Sustainable Development	14.06.2021	18.06.2021	AARDO-Sponsored International Online Training Programs in Collaboration with MARDI, Malaysia & IIT, Delhi, India	• Dr. Sarfraz Hashim • Dr. Mohsin Nawaz • Dr. Umair Sultan • Dr. Shazia Hanif • Engr. Muhammad Kashif
17	Agri-Tech Solutions and Approaches to Sustainable Rural Development	21.06.2021	25.06.2021	AARDO-Sponsored International Online Training Programs in Collaboration with MARDI, Malaysia & IIT, Delhi, India	• Dr. Sarfraz Hashim • Dr. Muhammad Saifullah • Dr. Mohsin Nawaz • Engr. Muhammad Kashif

ACCESS

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ACCESS

5.1. Basic Enrollment during 2020-21

Program Offered	Male	Female	Total
F.Sc. (Pre Agriculture)	0	0	0
B.Sc. (Hons.) Agriculture	405	77	482
B.Sc. Human Nutrition and Dietetics	05	29	34
B.Sc. (Hons.) Poultry Sciences	32	04	36
B.Sc. (Hons.) Fisheries & Aquaculture	17	02	19
B.Sc. (Hons.) Animal Sciences	27	04	31
BS Microbiology	18	20	38
B.Sc. (Hons.) AIET	36	01	37
BS CS	79	20	99
BS IT	78	16	94
BBA Agribusiness	41	10	51
M.Sc. (Hons.)/MS	128	77	205
Ph.D	07	05	12
Grand Total	**873**	**265**	**1138**

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

5.2.1.M.Sc. (Hons.)/ MS Enrollment during 2020-21

Sr. No.	Program Offered	Eligible Candidates	Admitted (Male)	Admitted (Female)	Total Admissions
1	Agronomy	23	11	01	12
2	Agri. Economics	05	03	0	03
3	Management (Agri. Business)	25	11	02	13
4	Biotechnology	56	01	25	26
5	Computer Science	83	16	10	26
6	Climate Change	14	01	05	06
7	Entomology	31	17	03	20
8	Food Science & Technology	59	23	16	39
9	Horticulture	37	13	07	20
10	Plant Pathology	28	11	05	16
11	Plant Breeding and Genetics	28	10	02	12
12	Postharvest Management Technology	0	0	0	0

13	Seed Science and Technology	0	0	0	0
14	Soil Science	21	11	01	12
	Grand Total	**410**	**128**	**77**	**205**

5.2.2. Ph.D Enrollment during 2020-21

Sr. No.	Program Offered	Eligible Candidates	Admitted (Male)	Admitted (Female)	Total Admissions
1	Agronomy	02	01	0	01
2	Biotechnology	0	0	0	0
3	Entomology	01	0	0	0
4	Food Science & Technology	03	02	01	03
5	Horticulture	01	01	0	01
6	Plant Pathology	0	0	0	0
7	Plant Breeding and Genetics	03	01	02	03
8	Seed Science and Technology	01	01	0	01
9	Soil Science	05	01	02	03
	Grand Total	**16**	**07**	**05**	**12**

5.3. Number of Students Passed Out during 2020-21 (Undergraduate)

Sr. No.	Degree Program	Total Enrolled	Male	Female	Pass Out
1	F.Sc. Pre Agriculture	44	20	0	20
2	BS Compute Science	58	47	7	54
3	BS Information Technology	59	37	11	48
4	BBAA	39	29	6	35
5	Agri. Economics	12	12	0	10
6	Agronomy	33	31	2	33
7	Biotechnology	13	11	2	9
8	Entomology	32	32	0	32
9	Food Science & Technology	34	24	10	34
10	Horticulture	33	25	8	33
11	Plant Breeding and Genetics	20	18	2	19
12	Plant Pathology	33	26	5	31
13	Seed Science	12	12	0	3
14	Soil Science	23	19	4	21

5.4. Number of Students Passed Out during 2020-21 (Postgraduate)

Sr. No.	Degree Program	Male	Female	Pass Out
1	M.Sc. Agronomy	29	02	31
2	M.Sc. Agri. Economics	01	0	01
3	M.Sc. Biotechnology	01	09	10
4	MS Computer Science	16	04	20
5	M.Sc. Entomology	30	05	35
6	M.Sc. Food Science & Technology	17	05	22
7	M.Sc. Horticulture	16	04	20
8	M.Sc. Plant Breeding & Genetics	14	04	18
9	M.Sc. Plant Pathology	04	0	04
10	M.Sc. Seed Science & Technology	06	0	06
11	M.Sc. Soil Science	06	04	10

5. 5. Full-time Faculty Members

Sr. No.	Designation	Male	Female	Total
1	Professor	09	-	09
2	Associate Professor	07	-	07
3	Assistant Professor	40	04	44
4	Lecturer	35	09	44
5	**Grand Total**	**91**	**13**	**104**
6	**PhD Faculty**	**67**	**07**	**74**

UNIVERSITIES BUILDING ECONOMIES

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CHAPTER-6

UNIVERSITIES BUILDING ECONOMIES

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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 for foreign collaborations and funding for its faculty development program and research projects. MNSUAM has a regular liaison with various industries and corporates sector since its establishment in 2012.

6.2. Session on Academia-Industry Linkages

USAID Punjab Enabling Environment Project (PEEP) team facilitated 2nd meeting on Technology-Driven Industry-Academia Linkages at Ramada Hotel, Multan on November 17, 2020. The meeting was the prime engagement activity under the Academia-Industry Linkages initiative with more than forty participants, including Vice Chancellors and Director ORICs of leading academic institutions, Presidents of Chamber of Commerce & Industry (CCI) and other industry players. Among the VC's present were Prof. Dr. Asif Ali, MNS University of Agriculture, Multan (MNSUAM), Prof. Dr. M. Suleman Tahir, Khawaja Farid University of Engineering and Information Technology (KFUEIT), Rahim Yar Khan, Prof. Dr. Muhammad Sajjad Khan, Cholistan University of Veterinary & Animal Sciences (CUVAS) and Prof. Dr. Athar Mahboob (TI), Islamia University Bahawalpur. Other institutions participated and represented by Director ORICs and senior faculty were Ghazi University (GU), DG Khan, Virtual University (VU), Lahore, and Bahauddin Zakaria University (BZU), Multan. Members from Bahawalpur CCI led by President Tanveer Mehmood and RY Khan CCI President Khawaja Bashir Ahmed and Vehari CCI by Former President Muhammad Ghazenfar Ali participated. Besides, chambers representatives, individual businessmen also attended the meeting along with the representative of SME Business Facilitation Centre (SMEBFC), Multan. The meeting was conducted under strict adherence to COVID 19 SOPs.

PEEP Investment Promotion Specialist Mr. Imran Ch. briefed the participants about the objectives of the meetings and need of the industry academia linkages for a sustainable growth of the agriculture and allied sectors in South Punjab. Issues pertaining to R&D requirements of the industry/private sector were discussed in depth. It was highlighted that despite these institutions located in South Punjab, the knowledge about their R&D capability and availability of facilities was not widely known to the private businesses. Most of the institutions lack formal interface with the industry which was highlighted by the private sector. It was highlighted that, without active outreach activities by ORICs, this gap could not be bridged.

Replying to the points raised by the private sector, Prof. Dr. Asif Ali, Vice Chancellor MNSUAM admitted that primary role of the universities was to contribute in research and development as practiced globally, unfortunately, however the local institutions have become degree awarding machines.

He quoted example of the Lyallpur (UAF) model where Agricultural education, research and extension worked together and as a result private sector growth was achieved across the agriculture value chain. The food and fibre processing industry collaborated with the farmers and researchers to solve their issues. He exclaimed to change the current practices and beef up efforts to best support the private sector/industry. He advised to redirect approach and reach out to private sector for sustainable R&D development for the region. Related to marketing of the processed agri produce, Dr. Asif informed that branded and well packed quality produce could fetch better prices both locally as well as in export markets. He applauded USAID PEEP's efforts for supporting the Academia – Industry linkages initiative.

Other representatives from academia also accepted inactive role and lack of outreach activities with the private sector to guide them through their R&D requirements. A need to improve Academia-Industry interaction was stressed upon to guide institutions for demand-driven R&D projects compared to the current practices.

A coordination committee was proposed to be set up to develop Academia-Academia linkages and Academia-Industry Linkages for systematic promotion and development of R&D functions at each institution.

6.3. Signing of Agreement of Cooperation between Farm Dynamics Pakistan and MNS University of Agriculture, Multan

The Academia – Industry Linkages initiative yielded result as Agreement of Cooperation (AoC) was signed between Farm Dynamics Pakistan (FDP) and MNS University of Agriculture, Multan on November 17, 2020 at the sidelines of Academia-Industry Linkages session. The AoC entails a list of collaborative activities to promote R&D between the FDP and MNSUAM, including exposure of Hi-tech & modern technologies for faculty & students, collaborative R&D activities in diverse areas of interest especially on Local seed production, certified fruit nursery, IOTs based solution for Agriculture, paid Internship program for the students, collaboration on performance, evaluation and cost benefit analysis of new technologies, equipment and machines, collaborative farmers advisory and extension programs, collaboration for establishing agri. business incubation centres of modern and technology based agri. businesses, organizing invited lectures and combined outreach activities in the form of symposia, seminar, workshops, international meetings and conferences.

6.4. Farmer Advisory Services

MNSUAM in pursuit of its moral obligation and national commitment to serve farming community has launched farmer advisory services that comprise of daily crop and weather advisory and other relevant information. Famer 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 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.

6.5. South Punjab Agricultural Forum

This forum comprises of stake holders from public and private sector 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 private sector to strengthen 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.

6.6. MNSUAM Joins Hand with Tawakkal Fish Hatchery to Promote Aquaculture

MNS University of Agriculture, Multan has signed an Agreement of Cooperation with Tawakkal Fish Hatchery and Farms, Muzaffargarh, which is a rapidly growing company in field of aquaculture and is producing healthy and hygienically safe fish. In this regard, a ceremony was held in the Committee Room of Admin Block of the University. Ms. Hira Javed, Project Director and Mr. Javed Iqbal, CEO from Tawakkal Fish Hatchery and Farms, whereas Dr. Naheed Bano, Assistant Professor and Prof. Dr. Asif Ali, Vice Chancellor, MNS University of Agriculture, Multan on behalf of MNSUAM affixed their signatures on the agreement. The main purpose of this agreement is to extend collaboration in the field of aquaculture and fisheries to proliferate the use of other advanced techniques to promote aquaculture in the region. Moreover, Tawakkal Fish Hatchery and Farms will facilitate MNSUAM students of BS and MS Fisheries and Aquaculture for practical demonstrations related to their field of study at their farms through class visits, facilitate them for thesis research, and provide them opportunity of paid/unpaid internships.

6.7. IDEAGIST Startup Pakistan Cohort 2

Office of Research Innovation and Commercialization ORIC under the leadership of Prof. Dr. Zulfiqar Ali and their team of Business Incubation Centre provides unique opportunities for students to start their own business. The ORIC is actively working on Business Incubation Centre (BIC) to promote entrepreneurship among students. MNSUAM wants to ignite the students to stand up with their own feet and let us start their business. IdeaGist is supporting PM's Startup Pakistan program by offering its Practical Entrepreneur Training program for free to all Startup Pakistan participants. Under and postgraduate students or those who have completed their studies at Universities, Colleges, Technical Institutions and Madaris are eligible. Developed for first-time entrepreneurs to give them a good view of the path ahead, Practical Entrepreneur covers an entrepreneur's journey through four stages of maturity. This program builds a basic foundation of entrepreneurial knowledge that is practical, and it can be done at your own pace.

About 250 students of MNSUAM applied for startup Pakistan 2nd Cohort. They got training from well-known entrepreneurs of the world and after their training, 90 students qualified the test and a student, Mr. Waseem Arif from BBAA 2nd Semester got second highest marks in startup Pakistan Cohort 2.

MNSUAM feels proud of its student. Selected candidates have participated in the graduation ceremony on July 11, 2020 which was chaired by the MNSUAM Vice-Chancellor, Prof. Dr. Asif Ali. He appreciated the students of cohort 2 and motivated other students for their next phase.

6.8. MNSUAM Organized Third Annual Mango Festival at the Centaurus Mall, Islamabad

A two-day Mango Festival was organized by MNS University of Agriculture, Multan at the Centaurus Mall Islamabad in continuation of its 3rd year collaborative event on 12-13 August, 2020. The event was inaugurated by the Honorable Provincial Minister for Agriculture Mr. Nauman Ahmad Langrial. The Minister was accompanied by the Chairman, Centaurus Mall and Punjab Board of Investment, Sardar Tanveer Ilyas Khan, the Vice Chancellor, MNSUAM, Prof. Dr. Asif Ali, Minister for Communication and Works Punjab, Sardar Muhammad Asif Nakai, Federal Parliamentary Secretary, Mr. Farrukh Habib, Director Agricultural Information Punjab, Mr. Muhammad Rafiq Akhtar, diplomats from different countries, social and political workers and dignitaries from the capital city. The festival has been consecutively held since last three years with collaborative efforts of Sardar. Tanveer Ilyas Khan and Prof. Dr. Asif Ali. 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 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. A model orchard of High Density Mango cultivation has been established in the University. Moreover, the experts in mango from faculty are conducting workshops to train the farmers for adoption of this new technology to harvest maximum profitability. The Vice Chancellor further stated that as much as 20% mangoes are wasted annually while packing them into wooden crates. Considering this, the University has branded Uni-Fresh Mangoes and initiated packing them in Cardboard boxes. In this regard, the University has also registered 50 farmers for providing them training of packing mangoes into Cardboard boxes to minimize the risk of wastage of mangoes during packing. The Vice Chancellor further told the media that the University has organized a series of webinars to discuss the challenges to mango export and formulated recommendation for sustainable mango production and boosting its export.

6.9. Agreement of Cooperation Between MNSUAM and Volka Foods

MNS University of Agriculture, Multan has signed a Memorandum of Cooperation with Volka Food International. In this regard, a ceremony was held, wherein Prof. Dr. Asif Ali, Vice Chancellor MNS-University of Agriculture, Multan and Ch. Zulfiqar Ali, Chairman Volka Food affixed their signatures on the agreement. Under this agreement, Volka Food and MNSUAM will work on research and development pertaining durum wheat. The two partners joined hands for promotion of durum wheat cultivation, varietal improvement and product testing. Ch. Zulfiqar Ali briefed that currently, durum wheat flour is imported by value-chain actors to market pasta products. Together with MNSUAM, we will be able to engage academia, researchers, industry players, and farming communities to tap into a tremendous potential of durum wheat farming for economic benefits

6.10. Consultative Session on Wheat Production Strategy: Season 2020-21

A consultative session on wheat production for the cropping season 2020-21 was held at MNS University of Agriculture Multan on 27-09-2020. The session was chaired by Syed Husain Jahania Gardezi, Provincial Minister for Agriculture, whereas, Syed Fakhar Imam, Federal Minister (MNFSR) was the Chief Guest. Large number of stakeholders including academia, industry, farmers and researchers participated in the meeting. The experts from academia, industry and private sector were also present for a diverse and comprehensive session outcome.

The session started in the name of Allah, Prof. Dr. Asif Ali (VC, MNSUAM) welcomed the distinguished guests. He highlighted the importance of wheat in national economy and for food security of the country with around 220 million population. He, with permission from the chair, opened the house for deliberations on the challenges and way forward for the coming wheat season so that sustainable supply of the wheat on affordable prices can be ensured without undermining the interest of farmers who are the key to maintain wheat production for such a huge population.

Mr. Saqib Ali Ateel, Secretary Agriculture, South Punjab, in his presentation explained the area and production trends of wheat and oilseed crops produced in the South Punjab. He shared the wheat crop calendar developed with the coordinated efforts of subject experts and partner institutions. He showed sanguinity towards its adoption right from the month of October so that higher wheat productivity can be ensured. He highlighted the need for promoting rust resistant wheat varieties coupled with a comprehensive crop management strategy. The role of print, electronic and social media was also highlighted a source of information towards farming community.

Syed Fakhar Imam (Federal Minister, Ministry of National Food Security and Research) inquired about the procurement of good quality seeds of approved and rust resistant varieties. He was also interested to know about the strategies to increase area under wheat crop. Mr. Saqib Ali Ateel ensured that the Agriculture Department will make coordinated efforts to meets the target provided by the federal government for wheat productivity enhancement. The participants appreciated the efforts made by Mr. Ali Ateel in compiling the wheat calendar and sharing timelines for effective wheat cultivation in the south region specifically.

Prof. Dr. Zulfiqar Ali (Director, ORIC-MNSUAM) presented the scope of wheat production enhancement through hybrid wheat. He highlighted the scope of wheat self-sufficiency through Hybrid Wheat Program initiated at MNSUAM. He shared the progress made in including the results of hybrid wheat trials and multiplication plans. Dr. Zulfiqar Ali shared the statistics of yield at different experimental sites with maximum yield up to 113 maunds per acre. Dr. Zulfiqar Ali in his description about project also shared that hybrid wheat will stem a new era for wheat seed sector. The Pre-basic blue seed and Basic white sterile seed and certified hybrid seed will ensure the purity of seed to the farmers and will result in better performance in field. It was further pointed out that seed placement of wheat hybrids in the field may be done with an already tested wheat planter designed and developed at AMRI Multan.

Syed Hussain Jahania Gardezi also lauded the efforts for the acquisition of hybrid seed production technology and advised that effective seed development plan be conceived for larger benefit of the farming community. He appreciated the purity trait of the hybrid seed and regarded this as need of the time to feed the increasing population of the nation. He then opened the house for discussion on overall low productivity and high yield differentials across the farmers within same agro-ecological region. He requested the participants to share their opinion to improve resource use efficiency including the management efficiency for improving productivity and reducing yield differentials in wheat crop.

In response to the query, Dr. Abid Mahmood (Director General, Agriculture Research) added that main limiting factors of agriculture production depend on seed genetics, inputs (quality and availability) and environmental fluctuations. He emphasized that availability of inputs on affordable prices must be ensured as being done in neighboring countries to increase per acre yield.

Dr. Anjum Ali Buttar (Director General, Agriculture Extension) highlighted different problems faced by the farming community including varieties, input availability and procurement. He proposed that collective effort of all departments is the way forward to achieve significant gains in productivity and management of field crops. He further emphasized to purchase best germplasm from the world resources to improve the genetic potential of wheat in the country.

Dr. Asif Majeed (C.E.O., Kenzo AG) emphasized the problem of lodging in wheat crop at the stage of maturity. Dr. Iqbal Bandaisha (Director ORIC, IUB) responded to the question by explaining major factors contributing in crop lodging. He described that apart from genetic characters, agronomical practices can reduce the lodging up to 10 percent, whereas breakthrough can only be achieved through genetic improvements. Dr. Javaid Ahmad (Director, Wheat Research Institute) explained the house regarding the Punjab 11 variety developed at AARI and its performance. He also added that the institute is striving to produce rust resistant wheat varieties and requested that susceptible varieties be delisted from the approved list well before the start of sowing of crop so that losses can be minimized. Syed Hussain Jahania Gardezi, Provincial Agriculture Minister also inquired about the zoning details based on soil classification so that a proper subsidy policy may be proposed for effective use of fertilizer and other inputs. Dr. Anjum Ali added in the discussion by putting up information regarding dissemination of effective knowledge to farmers. Proper plant population and effective methods of production were discussed among stakeholders. Mr. Syed Fakhar Imam encouraged the participants to come up with a working paper entailing the dire need of development of wheat germplasm bank. This bank may serve as a source of information for further development and will keep track of the strains and varieties procured from external sources. He also encouraged the participants from the private sector to intensively bring up their breeding programs for a more competitive and valuable market output. He appreciated Mr. Saqib Ali Ateel on his efforts and praised the contribution of MNSUAM for arranging this consultative session.

He acknowledged the efforts of all associated departments and ensured that his support will be readily available for the uplift and betterment of agriculture and specifically wheat crop in Punjab as it serves as the food basket for the whole country. Syed Hussain Jahania Gardezi thanked Mr. Fakhar Imam for his valuable remarks and appreciated his efforts in the field of agriculture. He also praised the efforts of all departments to address the national cause of wheat production. He concluded the session with following remarks:

a) All stakeholders must put their collective efforts to meet the wheat production targets of the country.
b) Agri. graduates/students from agriculture universities should be deployed in the field to communicate effective wheat sowing technologies alongside agriculture extension department to overcome the manpower constraints.
c) He appreciated the development of wheat hybrids by MNSUAM and added that hybrid wheat will open new horizons of wheat production in Pakistan even making it capable of addressing the food needs of neighboring countries and earning foreign exchange for national economy.
d) Initiation of a germplasm bank is need of the time and we must secure the indigenous and local germplasm (honoring the work of national breeders/institutes) from which development can be sought at any stage of seed development.
e) He directed Director Genera, Agriculture Extension and Adaptive Research to rationalize the demand of phosphatic fertilizer considering the soil and crop requirements. He assured that the matter will be taken up at higher forums to seek assistance in pricing of inputs for the wheat crop.
f) He advised the forum that November 30th should be the cut-off date for wheat sowing and effective management of inputs such as weedicides and fungicides at proper time must be ensured by the Agriculture Extension Department. This activity will help to improve farmer's profitability and will enhance wheat production in the country.
g) Finally, he assertively added that use of adulterated input at any stage will not be tolerated at all and culprits will be dispensed without any tolerance.

He also thanked the MNSUAM VC, Prof. Dr. Asif Ali for his seamless efforts for South Punjab and appreciated the whole team for a very useful consultative session. Prof. Dr. Asif Ali thanked the participants and submitted reverences to Mr. Syed Fakhar Imam and Mr. Syed Hussain Jahania Gardezi for their time and precious guidelines regarding upcoming wheat season. Dr. Asif Ali also thanked Mr. Saqib Ali Ateel for his support and positive vitalities. He appreciated all the presenters, discussants, and participants for their valuable contributions in the session.

6.11. Memorandum of Understanding between MNSUAM and Super Punjab Feeds

MNS University of Agriculture, Multan has signed a Memorandum of Understanding with Super Punjab Feeds (Pvt.) Ltd. In this regard, a ceremony was held in the Committee Room of Admin Block of the University. Prof. Dr. Asif Ali, Vice Chancellor and Dr. Naheed Bano, Focal Person from MNSUAM and Mr. Kamran Maqsood, Chief Executive Officer and Dr. Muhammad Ahmad Kamran, Project Director from Super Punjab Feeds affixed their signatures on the agreement. Under this agreement, Super Punjab Feeds and MNSUAM will work on research and development pertaining to fisheries and aquaculture.

The two partners joined hands for promotion of fisheries, feed improvement and product testing. MNSUAM through its research wing will optimize the feed composition and that improved feed will be prepared on mass scale by Super Punjab Feeds in the best interest of fish farmers. Under this agreement, joint research and development projects will be sought with an exchange program for students and researchers. Both parties agreed to exchange information, teaching materials, technological and scientific publications etc. Moreover, Super Punjab Feeds will offer paid/unpaid internships to the students of MNSUAM.

6.12. Tilapia Biofloc Aquaculture Research Unit

MNSUAM is keen to promote fisheries and aquaculture in the region. Requirement of vast land to grow targeted species, high-quality feeding and filtrations systems increase the production cost, while reducing profit margins. Water availability is scarce in some regions and land is expensive. Keeping in view the significance of environmental protection and sustainable food production, an alternative would be to revert to traditional fish farming practices, without overstocking and use of harmful chemicals. This would be an ideal option for small scale fish farmers supplying for their own community as well as creating an independent food source. In this regard, Biofloc technology is emerging in the whole world. The University's mission is to successfully run Biofloc fish farms in the region and disseminate the experiences and success stories with the farming community. It is a low cost way in which toxic materials for the fish such as ammonia, nitrate, and nitrite can be converted into feed by the action of heterotrophic bacteria. The principle of this technique is to recycle nutrients. Biofloc helps in cleaning the culture water of the fish while giving an additional source of feed. A tank with 12 ft diameter and capacity of 10000 litres can stock 500-600 fish. This technology is feed and water saving with high density of fish and is cheaper as compared to conventional fish farming. This will also pave the way towards kitchen fish farming (rooftop fish farming). An aerator is used to meet the oxygen demand of fish which consumes electricity equal to 70W bulb. All types of carps and shrimps can easily be cultured in this system. Fertilizers such as DAP and Urea that are used in conventional fish farming are not used in this method.

6.13. German Ambassador to Pakistan and Managing Director, METRO Visited MNSUAM

Honourable German Ambassador to Pakistan His Excellency Bernhard Schlagheck visited MNSUAM on October 28, 2020. Ambassador Schlagheck was glad to visit Multan and was highly impressed with the culture of this ancient city and unique welcome and hospitality that he received at MNSUAM. His Excellency expressed “I am particularly impressed by mystical stories about shrines and saints. As one of the oldest cities of the subcontinent, Multan has a rich heritage. The breath-taking architecture contributes to the magical feeling of the city”. The Excellency said that Germany is keen to strengthen mutual trade ties with Pakistan and urged for more business-to-business contacts between the businesspersons from the two countries. He said that Germany seeks to expand the scope of bilateral trade relations and two business delegations are scheduled to visit Pakistan to explore collaboration with their Pakistani counterparts.

He assured full cooperation in ensuring easy access for Pakistani exporters to German as well as international markets including the European Union. The honourable Ambassador distributed certificates among the successful participants of training program on "Global Good Agricultural Practices in Mango Orchards". Later on, he visited mango small tree systems, mango pruning machinery, heat treatment plant, hydroponic unit and vegetable nursery at MNSUAM and appreciated the efforts of the varsity, particularly with regards to improve crops seeds and Mango Production and value addition systems. He met the faculty and researchers at MNSUAM who carried out parts of their studies or PhD in Germany. At this occasion, a memorandum of cooperation between MNSUAM and METRO was also signed. Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM and Mr. Marek Minkiewicz, Managing Director, METRO Pakistan affixed their signatures on the agreement. The two partners joined hands for the promotion of entrepreneurship and agri. businesses. Under this agreement, MNSUAM will provide seeds of high yield improved varieties of vegetables to farming community who will sale their veggies to METRO. The MNSUAM will also facilitate METRO in the supply chain of good quality meat. Prof. Dr. Asif Ali said, "We are already working with universities in Germany on various projects Value Chain Improvement, Carbon Sequestration, Climate Smart Agri, Capacity building for plant biodiversity research & preservation in oasis ecosystems of Pakistan (Biodiversity+)". He reiterated that we are keen to strengthen our connections with public and private sectors and to explore new opportunities for academic excellence. He informed that the Varsity is striving hard to provide community services through effective outreach programs across Southern Punjab, particularly focusing on facilitating the farming community of this region regarding innovations and technology transfer. Mr. Marek Minkiewicz said that Metro Pakistan not only aims at strengthening the documented economy as an exchequer collector but also offers local businesses a reliable supply source of up to 90% locally produced products and implement a modern agriculture supply chain. The new store at Multan offers METRO's promise of 'everything under one roof, competitive pricing and uncompromising quality.' Mr. Saqib Ali Ateel, Secretary Agriculture, South Punjab said that inauguration of METRO in Multan is a vote of confidence on the economic revival of Pakistan. The Government knowing the significance of South Punjab as a hub of agricultural activities is trying its best to uplift the agriculture sector in this dynamic region. Multan is world famous for its mangoes and high density mango plantation is being standardized keeping in view local agro-ecological conditions, which will revolutionize the existing practices.

6.14. MNSUAM Gets Appreciation by National Assembly Standing Committee on Food Security and Research

It is really a matter of immense pleasure and huge pride that the National Assembly Standing Committee has appreciated MNSUAM for the meritorious services it is rendering to the South Punjab and beyond since its very inception. The National Assembly Standing Committee on Food Security and Research has commended the performance of MNSUAM in its meeting held on Sept. 29, 2020. Prof. Dr. Zulfiqar Ali, Director ORIC represented the University in the meeting. The comments of the committee have been conveyed in the appreciation letter from the Ministry of Food Security and Research. The Vice Chancellor has conveyed his appreciation to the campus community and Prof. Dr. Zulfiqar Ali, in particular, for working hard to create a good name of the university at national and international levels.

6.15. MNSUAM and PMAS Join Hands for Research Collaboration

The Secretary Public Health and Population Welfare Department, South Punjab, Mr. Muhammad Ajmal Bhatti along with the Vice Chancellor, Pir Maher Ali Shah Arid Agriculture Rawalpindi, Prof. Dr. Qamaruz Zaman visited MNSUAM on October 29, 2020. Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM briefed the delegation about MNS-UAM's contribution to the cause of helping farmers of this area. He said that the University is progressing leaps and bounds in terms of establishment of modern labs, increase in student enrollment, winning national and international projects, and successfully collaborating with the farmers and the agricultural industry. Prof. Dr. Asif Ali informed that collaborative research and teaching programs are being developed with the local and regional institutions. He briefed the guests about the on-going academic and developmental activities, and innovations adopted at the varsity. “Community service is our top priority agenda and besides imparting technical knowledge, we are striving to produce graduates who are good humans as well. Due consideration is given to social and religious tolerance,” he added. Mr. Ajmal Bhatti showed special interest and recorded his appreciation for starting a research baked MS program in Public Health under One Health program of UN. He discussed about the ongoing scenario of COVID-19, its severity, precautionary measures and the Government's steps for its prevention. He said that the COVID-19 pandemic has blanketed the whole world adding that the disease has reached to 127 countries so far. He advised to wash hands frequently with anti-bacterial soap for at least 20 seconds, drink more water, stop touching your face with your hands, cover your mouth with cloth while sneezing and coughing, eat healthy food to increase your immunity, and refrain from going to crowded places to avoid the disease. He applauded that the availability of thermal guns, masks, hand washing facilities and sanitizers is being ensured at MNSUAM. 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 are also admirable. Prof. Dr. Qamaruz Zaman and his team from PMAS UAAR had a special session with the Faculty of Agric. and Biosystem Engineering to explain the launch of collaborative research project on digital agriculture. He ensured the collaboration between the two Ag universities to enhance agricultural productivity South Punjab through precision agriculture. He said, “We are ready to work with MNSUAM in areas of agricultural engineering and will introduce modern spraying techniques.”

6.16. MNSUAM is Collaborating with All Pakistan Fruit & Vegetable Exporters, Importers and Merchant Association

A meeting of the Vice Chancellor, MNSUAM Prof. Dr. Asif Ali with Mr. Waheed Ahmad, Patron-in-Chief of All Pakistan Fruit & Vegetable Exporters, Importers and Merchant Association (PFVA) and his team was held on November 16, 2020. The Vice Chancellor, Prof. Dr. Asif Ali briefed the participants about academic, R&D and community outreach activities of the University aimed at improving the livelihood of farmers and overall agriculture sector. Mr. Waheed Ahmad presented the road map titled "Horticulture Vision 2030" as a proposed strategy to accelerate the scope of horticulture for economic growth of Pakistan, developed by Federation of Pakistan Chamber of Commerce and Industry (FPCCI) and PFVA after conducting provincial consultations with various public and private sector stakeholders all over Pakistan.

The presentation encompassed statistical outlook of horticulture industry of Pakistan, challenges for the development of horticulture industry for economic growth of the country, short, medium and long-term measures for export growth, and sectorial interventions. It was highlighted that there is a huge scope for horticulture export in the global market, but unfortunately, Pakistan though an agricultural economy has very less share in the world export. The significant challenges faced by the horticulture industry includes global warming, climate change, water stress, farmer financing and adoption, technology, R&D, value addition and market provision. The participants also discussed strategies for effective implementation of the "Horticulture Vision 2030" in the industry and reviewed various ways of developing linkages between the University and PFVA including "practical training" for the academic part of the curriculum related to horticulture sector, students' internship with the leading exporters of fruits and vegetables with reasonable stipend, revision of existing curriculum of the University to made it realistic by incorporating views of the leading exporters, and discuss mango and tomato supply chain etc. It was emphasized during the discussion that the horticulture industry could only be improved through extensive research and development and implementation of latest modern trends. The implementation of the objectives of "Horticulture Vision 2030" will create huge employment opportunities in the country and uplift the economy of Pakistan. At this occasion a Memorandum of Cooperation was also signed between MNSUAM and PFVA for mutual collaboration and partnership in the areas of mutual interests. Mutual cooperation of the PFVA with the MNSUAM would assist to develop new varieties of fruits and vegetables besides enhancing yield per acre of major crops and production of fruits. The PFVA would provide adequate resources for R&D for the Agricultural Universities and highlight the projects and promote inventions and newly developed technologies by the University for the rapid development of agriculture sector in the country and simultaneously award scholarships to the students of the University for conducting research work on modern principles of the agriculture sector. The PFVA team appreciated the University for making significant development and improvement in a short span of time.

6.17. Memorandum of Cooperation between MNSUAM and ICI, Pakistan Pvt. Ltd.

MNS University of Agriculture, Multan has signed a Memorandum of Cooperation with ICI, Pakistan Pvt. Ltd on November 20, 2020. In this regard, a ceremony was held in the Committee Room of Admin Block of the University. Prof. Dr. Asif Ali (Vice Chancellor) and Prof. Dr. Zulfiqar Ali (Director, ORIC) as Focal Person from MNSUAM and Mr. Abdul Wahab (Business Manager, Agri. Division) and Mr. Sajid Mahmood (Technical Manager, Agri. Division) Focal Person from ICI, Pakistan Pvt. Ltd. affixed their signatures on the agreement. Under this agreement, ICI, Pakistan and MNSUAM will work on research and development pertaining to hybrid wheat grain and seed production. ICI, Pakistan and MNS-UAM will conduct joint trials for evaluation of the wheat hybrids/products. Both parties agreed to organize invited lectures and combined outreach activities in the form of symposia, seminar, workshops, meetings, and conferences. The two partners will also foster talent development for the sustainable future of the industry through internship programs. Under this agreement, joint research and development projects will be sought with an exchange program for students and researchers. Both parties agreed to exchange information, teaching materials, technological and scientific publications etc. Moreover, ICI, Pakistan will offer paid/unpaid internships to the students of MNSUAM.

6.18. Meeting with CEO, National Productivity Organization

Mr. Alamgir Ch., the CEO National Productivity Organization, Ministry of Industries & Production, Govt. of Pakistan along with his team members visited the university on November 16, 2020. The Vice Chancellor welcomed the team and shared the university's on-going research and development projects. Mr. Alamgir presented the scope and objectives of NPO and elaborated various funding opportunities for research projects under APO support programs. Both MNSUAM and NPO decided to collaborate with each other in promotion of R&D, agriculture business, entrepreneurship initiatives, and exchange of information related to funding for various research projects. NPO will invariably disseminate notifications/calls for proposals/funding opportunities to MNSUAM for information of faculty members. It was also decided that business incubation proposals and ideas will be shared with NPO for funding and sponsorship.

6.19. MNSUAM Efforts and Achievements are Commendable: Mr. Asad Rehman Gillani, Provincial Secretary Agriculture

The Provincial Secretary Agriculture, Mr. Asad Rehman Gillani, visited MNSUAM on December 21, 2020. Prof. Dr. Asif Ali briefed about the University's role in development of Agriculture sector in this region. He apprised the guest about vision and mission of MNSUAM and on-going academic and developmental activities. He informed that the varsity is striving hard to provide community services through effective outreach programs across Southern Punjab, particularly focusing on capacity building of the farmers. Construction work of new buildings comprising academic and administration blocks, hostels, guest house, library, staff colony and boundary walls has been completed and academic activities at the University's new campus equipped with all modern facilities are at full swing. The VC maintained that he and his team have established the varsity from "nowhere" adding that the objective was to build an institution "with a difference" where overall focus should be on Agriculture. "We are working on future farming, for which we have introduced a special undergraduate program “Farm Management” and also Faculty of Veterinary and Animal Sciences is offering up to six programs including Animal Sciences, Fisheries and Aquaculture, Poultry etc. The Honourable Secretary visited different development projects of the varsity including hydroponics, greenhouse, vegetable nursery, Sprinkler Floppy irrigation system. He also visited hybrid wheat fields, mango small tree systems, mango pruning machinery, heat treatment plant, hydroponic unit and vegetable nursery at MNSUAM and appreciated the efforts of the varsity, particularly with regards to improved crops seeds and mango production and value addition systems. Mr. Gilani said that we should all play our role for betterment of the agriculture sector. The honourable Secretary hailed the efforts of the varsity for farmers and rural community. Afterwards, he planted a tree sapling at the Admin Block.

6.20. Consultative Workshop on Formulations of Bio-Pesticides and Bio-Fertilizers in Pakistan organized by MNSUAM

An online Consultative Workshop on Formulations of Bio-pesticides and Bio-fertilizers in Pakistan was organized by the Institute of Plant Protection (IPP), MNSUAM on December 10, 2020. The main focus of this workshop was to initiate constructive discussion on formulations of bio-pesticides/fertilizers for the targeted audience of the industry, academia and the farmers. The Vice Chancellor, Prof. Dr. Asif Ali highlighted the adverse effects of chemical pesticides and synthetic fertilizers on the biodiversity and the environment. He motivated the industry to work on the development of commercial formulations of bio-pesticides and bio-fertilizers with collaboration of MNSUAM and other research organizations. Prof. Dr. Shafqat Saeed, Dean Faculty of Agriculture and Environmental Sciences said that the chemical pesticides have failed to control important pests (e.g. cotton whitefly) in Punjab, Pakistan and farmers are hopeless. Developed countries are now working on the bio-products instead of chemical ones. For examples, there are about 1000 bio-pesticides registered in India followed by 200 in UK, 93 in China and 40 in USA. He also said that MNSUAM has explored some bio-products that are equally effective as chemicals but there is a need to develop academia-industry linkages for their commercial formulations. Mr. Habib-ur-Rehman from Sayban International said that his company is working on bio-pesticides and bio-fertilizers and is also willing to work more on such products with MNSUAM. Mr. Fida Hussain Gadi (CEO, BioTrack Enterprises) and Muhammad Ashraf Ansari (Syngenta Pakistan) also discussed the potential of bio-pesticides and emphasized the role of academia-industry for their commercial formulations. Dr. Farrukh Hassan (CEO, The First Biotechnology Company) said that bio-fertilizers have much potential but there is a need to build trust among farmers with complete research. Overall, a fruitful discussion on the subject matter was done and future collaborations and action plans were proposed.

6.21. First Meeting of the Coordination Committee on Academia-Industry Linkages organized at MNSUAM

The first meeting of the Coordination Committee for developing technology-driven R&D through Academia - Industry linkage for South Punjab was held on December 10, 2020 in the committee room of Admin Block, MNSUAM under strict adherence to COVID-19 SOPs. The Vice Chancellor, MNSUAM welcomed all the participants and acknowledged the initiative taken by USAID-PEEP to develop a common platform to establish linkages among the institutions for working out a common strategy of improving their R&D capacity through shared learning and offer a common facilitation centre to the industry for its needs. He further commented that industry is the major stakeholders for R&D activities in the universities and winning their trust should be a primary objective. Mr. Imran Ch. Investment Specialist, USAID-PEEP briefed the participants about objectives of the meetings and the industry academia linkages for a sustainable growth of agriculture and allied sectors in South Punjab. He added that despite existence of ORICs in several varsities, R&D facilitation catering to the needs of the Agriculture sector/industry has remained limited. On the other hand, the academic institutions needed to know each other's strengths and avoid duplication of efforts on R&D activities.

Therefore, it was envisioned that establishing a common facilitation centre was inevitable to provide R&D support to the industry while creating additional revenue streams. Prof. Dr. Zulfiqar Ali, Director ORIC, MNSUAM remarked that overcoming 'trust deficit' between academia and industry can assure a large range of benefits for both sides. A relatively bigger challenge, however, is the accreditation/certification of our products when they are exported to international markets. Moreover, there is a dire need to establish a reliable database to better analyze the situation and make informed decisions. Other participants also discussed the importance of strong academia-industry linkages for developing and commercialization of innovative business ideas to improve economy growth. It was highlighted that universities are conducting good research in various fields but due to lack of coordination, the universities are unable to commercialize their patents, and the industry is not getting benefits from their R&D efforts. It was also pointed out that more than 95% of Pakistan's industry is based on small enterprises that lack resources as compared to bigger industrial groups. Hence, there is a huge scope of activities if small businesses are targeted as potential clients. The participants also discussed and made decisions pertaining to TORs of the committee and future line of actions.

The meeting was attended by Prof. Dr. Zulfiqar Ali, Director ORIC, Dr. Wasim Babar, Director ORIC, Cholistan UVAS, Bahawalpur, Dr. Arshad Hashmi, Director ORIC, Virtual University of Pakistan, Dr. Muhammad Ali Tarar, Director ORIC, Ghazi University, D.G.Khan, Dr. Muhammad Amin, Associate Professor, Islamia University, Bahawalpur, Dr. Haseeb ur Rehman, Assistant Professor, BZU, Multan, Mr. Imran Chaudhry, Investment Specialist, USAID-PEEP, Mr. Ghulam Ishaq, Hort. Specialist, USAID-PEEP, Mr. Abdullah Zahid, Project Manager, NCRA NUST, Rawalpindi, Mr. Asif Hayat Tipu, CEO, G.A. Services, Multan, Maher Iftikhar Ahmad, Manager U-I Linkages, and Mr. Azher Khan, Manager RD, MNSUAM.

After the meeting, the participants visited various research labs/fields of the university including Small Mango Tree System, Hydroponic Unit, Kitchen Gardening, Biofloc unit, Floppy Sprinkle Irrigation System, and Central Lab system at Graduates block. The visitors appreciated the progress made by the varsity and its efforts for developing linkages with the industry for R&D support.

6.22. MNSUAM is Promoting Pasta Wheat Cultivation in Pakistan

MNSUAM is working to promote Durum Wheat with an aim to help farmers enhance their income, easy availability to local industry and help save foreign exchange. Durum wheat is also called as "Pasta Wheat", which is slightly different from routine wheat crop as its grains are hard and Pasta could easily be prepared from it. Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM said that "Our industry is importing durum wheat from different countries for manufacturing of "Pasta", a kind of food, very much popular in urban areas of the country." He added that industrialists had installed plants for manufacturing of Pasta locally but they were lacking special kind of wheat for it. So, MNSUAM did agreements with some farmers for cultivation of durum wheat and has cultivated it at different locations in Punjab. The farmers will be paid Rs. 500 additional amount against per 40 kg wheat as compared to the payment on routine wheat crop. Dr. Asif Ali stated that the University would provide durum wheat to the industry that would not only offer handsome returns to the farmers but would also help saving foreign exchange. Currently, the industry is making huge payments on import of the durum wheat; however, if it is cultivated locally, then it would be more beneficial for both, the farmers as well as the industry.

6.23. Climate Smart Wheat Production

Department of Agronomy, MNSUAM organized a one day workshop on Climate Smart Wheat Production for Food Security on January 14, 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 breeding strategies for new and improved wheat germplasm, wheat 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 wheat production in a changing climate. Specialists in wheat breeding, agronomy, pathology, physiology, entomology and quality shared their experiences with the participants, who also received hands-on training about these aspects. Afterwards, farmers and stakeholders were demonstrated various research and demonstration trials at campus.

6.24. Internees Conference under ADP Funded Project

MNSUAM in collaboration University of Agriculture, Faisalabad and PMAS University of Arid Agriculture, Rawalpindi has launched one-year internship program sponsored by the Dept. of Agriculture, Government of Punjab, for young agriculture graduates who were appointed in 10 low producing tehsils of the province including Haroonabad, Burewala, KotAddu, Kahror Lal Esan, Pakpattan, Narowal, Shahkot, Quaidabad, 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 first year) and are being provided with quality advisory services at farm level; including crop diversification, innovations and efficient resource utilization.

A two-day Internees Conference was organized under the aforementioned project by Project Management Unit (PMU) on January 21-22, 2021. The first day of conference was graced by Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM; Mr. Sohail Maqbool (Country Head, Vegetable Seeds, Syngenta Pakistan); internees from Burewala, Kot Addu and their field supervisors. MNSUAM Vice Chancellor, Prof. Dr. Asif Ali emphasized the importance of agriculture and its significance in extraordinary times and appreciated the Dept of Agriculture for taking the internship initiative to train and equip fresh agricultural graduates so that they can perform at farm level. He pointed out that this project is unique in the sense that it is directly linking agri graduates and university faculty with the farmers in 10 low producing tehsils of Punjab to enhance Agri productivity. Agri graduates following the latest agricultural technology in conjunction with ICTs can be successful entrepreneurs and role model for others to embrace such innovations. Mr. Sohail Maqbool appreciated the efforts undertaken so far in the project and regarded this milestone towards the betterment of the farming community in Pakistan. He said the positive impacts of this project are already evident and we expect further improvements in crop productivity, profit margins and livelihood standards in near future.

While talking about important factors of the internship program, Prof. Dr. Irfan Ahmad Baig, Dean FoSS&H, said that 110 graduates were appointed in Tehsils of Punjab with low crop productivity so that they could play their roles for improvement of agriculture in these areas, and this intervention is quite successful so far. MNSUAM in pursuit of its moral obligation to serve the farming community of Pakistan and uplift their socio-economic standards will continue such efforts. He further told that the performance of the internees is being observed through a modern monitoring system.

On second day, Rao Shahid (General Secretary, PCPA) was the key guest in addition to internees and their supervisors from Karor Lal Esan and Haroonabad. While addressing to the participants, Prof. Dr. Shafqat Saeed (Dean, FA&ES) said that there is a lot to do for proliferation of agriculture; new policies should be formulated and modern production practices be introduced. The University is working on various research projects for better crop production and prosperity of the farming community. Our graduates are our hope that can transform agriculture sector. Mr. Shahid said that varsity is ensuring experiential learning of the graduates with appropriate skill development and internships for future farming, entrepreneurship and increased employability. The conference was organized by Mr. Shoaib Nasir (Incharge, PMU).

6.25. 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. He is training students to start honey bee business since 2019. Initially, the team faced the following problems in a conventional honey bee hive: (i) There is only a single space for bees to store honey and broods, and during harvest, broods come out with honey, which deteriorates the honey quality and reduces the bee population, (ii) The yield of a single-chamber hive is low, and (iii) There is improper ventilation in a single chamber hive, and due to this, honey bees could not survive in the hot climate of Southern Punjab. Keeping in view all these problems, the MNSUAM Entrepreneurship team and Engr. Arshad Jamil, Mentor Agriculture Volunteers, designed and developed a ventilated multi-chambers bee hive. After the hardships of two years, now the team has successfully developed a ventilated three-storey hive. The benefits of a three-storey hive over a conventional single hive are: (i) Queen does egging on the first chamber so that broods lie in the same chamber, (ii) There is enough space for bees to store honey in the second and third chambers. As a result, it provides ten (10) times more honey than the conventional hive, and (iii) The improved ventilation system decreases the death rate of honey bees and ease in the surveillance of honey bees in the hot climate.

The federal government also recognizes the importance of honey in uplifting the economy. The Prime minister of Pakistan has already started a Billion Tree Honey Initiative to benefit from tree plantation. In this regard, the government has started a loan scheme, and the young entrepreneurs can benefit from this scheme to start the honey business.

MNSUAM leadership has decided to expand the high yielding honey business to the farmer community as well. In this context, the MNSUAM team will train 100 interested farmers from Punjab and Sindh provinces. MNSUAM will provide a ventilated three chambers hive with bees to participants. In the first phase, the training is only for interested and registered participants. In pursuit of this goal, the MNSUAM organized a training session on 30th January, 2021 in which 50 participants participated physically while 100 farmers participated online. The participants had 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.

6.26. MoC between MNSUAM and CropLife Pakistan

MNS-University of Agriculture, Multanhas signed a Memorandum of Cooperation (MoC) with CropLife Pakistan on February 2, 2021. In this regard, a ceremony was held in the Committee Room of Admin Block of the University, wherein Prof. Dr. Asif Ali, Vice Chancellor MNSUAM and Mr. Rashid Ahmad, Executive Director affixed their signatures on the agreement. Under this MoC, CropLife Pakistan and MNSUAM will collaborate in research, development, outreach, and training to promote stewardship, mechanization in agriculture to ensure productivity, quality of harvest and time saving in crop life cycles. The two partners joined hands to explore any other activity viewed to be mutually beneficial related to better crop and resource management, precision agriculture, IoT based interventions, agronomics, pest management, resistance management, IPM, pest survey/ population dynamics, pest identification and initiating policy dialogue for sustainable agriculture. A field and market research based working plan will be prepared to support regulators and farmers to enhance wheat productivity.

6.27. Workshop to Impart Skills about Mushroom Cultivation

The Institute of Plant Protection organized a one-day hands-on workshop on "Mushroom cultivation business in southern Punjab" on February 18, 2021 at the Academic block of MNS-University of Agriculture, Multan. Miss Novera Fahad (President, Multan Chamber of Commerce and Industry, Women Wing) was the chief guest of this event and Honorable Mr. Yasir Humayun (Minister of Higher Education, Punjab) and VC Women University Multan, Prof. Uzma Qureshi also graced the occasion. Mr. Muhammad Kashif (OG-1 Officer, ZTBL), Mr. Anees Murtaza (CEO, Mushroom Tech.), Dr. Nadeem Ahmed and Dr. Muhammad Zeeshan Ahmed (Assistant Professors, MNSUAM) were the Resource Persons for the workshop. The workshop aimed to train the participants including farmers, industrialists, entrepreneurs, and students about profitable mushroom cultivation. While talking to the participants, the Vice Chancellor said that mushroom cultivation is the basic need of the hour, which would benefit not only the end users but bring improvement in the research as well.

Honorable Mr. Yasir Humayun (Minister Higher Education, Punjab) said that mushroom are a good source of protein and the training being imported would be useful to provide income generation opportunities with a small investment. The CEO Mushroom Tech., Mr. Anees Murtaza informed the participants about different procedures of installing low-cost and high-tech mushroom systems. Mr. Muhammad Kashif and Dr. Nadeem Ahmed described the production technology of Button, Oyster and Milky mushroom to the participants; while, Dr. Muhammad Zeshan Ahmed provided the hands-on training. This event was sponsored by Mushroom Tech. and ZTBL, Pakistan. At the end of the workshop, certificates were distributed among the participants.

6.28. Farmer Field Day on Hybrid Wheat

Institute of Plant Breeding and Biotechnology (IPB^2), MNSUAM in collaboration with SunCrop Group organized a Farmer Field Day to provide opportunity to the participants to visit the demonstration plots of promising wheat genotypes having novel traits of water saving (self-irrigation), low gluten, rich in protein contents and high yield. The farmers also witnessed the effectiveness of SunCrop herbicides "FINDUS EXTRA" demonstrated in the university. In his inaugural address, the Vice Chancellor, Prof. Dr. Asif Ali, acknowledged the support of SunCrop and emphasized the importance of academia industry collaboration for feeding a burgeoning world population, which is one of the greatest challenges of our time. The scientists of MNSUAM have introduced climate resilient hybrids of wheat having yield potential up to 10 t ha^{-1} which would be available for general cultivation in next two to three years. Innovative genetics along with proper crop management can increase notational average yield of crop under climate change scenario *i.e.*, rust attack due to changing rainfall patterns, erratic drought spells in rainfed areas and increasing salinization of soils due to continuous use of brackish underground water. He added that farmers should judiciously use herbicides and fertilizers since their excess use is degrading our soils and air quality. The Vice Chancellor also said that the University in collaboration with AMRI has designed a wheat sowing drill and has conducted experiments to reduce seed rate up to half and got success. He also thanked the Punjab Government for assuring farmers a good support price. He ended his welcome talk with phrases that we are always available for the welfare of farmers and also the people of this great country.

Prof. Dr. Zulfiqar Ali, Professor, IPB^2 highlighted the importance of hybrid wheat for regional and global food security. Furthermore, he elaborated the pioneer work of MNSUAM related to hybrid seed production of wheat in Pakistan and success stories in this regard. He said that hybrid wheat seed production is under progress i.e. sorting out males, isolation distance requirements from wheat and other pollen-producing crops, seeding rate optimizations, flowering synchronization, crop management, disease response in CDRI nursery. He said that 600 hybrids are under evaluation which would offer 35 to 40 percent more output. Hybrid wheat seeds are being tested at farmers' fields at various locations in Pakistan. He said that National Assembly Standing Committee on National Food Security and Research, recognized and highly appreciated the work of MNSUAM for development of new seed technologies. The hybrids have 20-30% yield advantage as compared to the open pollinated varieties. Furthermore, these hybrids also manifested rust resistance which is a major challenge for sustainability of wheat production in the country.

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Tassawar Shah from SunCrop Group highlighted the results of their herbicide for effective weed control in wheat crop and other various R&D and marketing activities by the SunCrop group. Dr. Shafique Pitafi (CEO, SunCrop Group) appreciated the efforts of MNSUAM to boost wheat productivity in the country. He assured his support to the University for R&D activities and service to the farming community.

Mr. Hussain Jahania Gardezi, Provincial Minister for Agriculture, Punjab laminated that stagnant wheat production demands cultivation of high-yielding hybrid seed at commercial scale to meet the food requirements of the burgeoning population. Hybrid cultivars with improved yield and other favourable agronomic traits may be promoted for cultivation on large area to boost the national yield. To become self-sufficient in wheat, the country is blessed with hardworking scientists and farmers, fertile land, irrigation water and suitable climate. However, short supply of certified seed has been an issue. Adoption of modern technology is essential for increasing agricultural productivity. The viable way to enhance wheat production is through introduction of high quality seeds apart from ensuring other inputs. There have been some encouraging activities in development of hybrid wheat seed. He appreciated the efforts of team MNSUAM for taking lead in this regard.

6.29. Pre-Launching Ceremony of DICE

Pre-launching ceremony of DICE (Distinguished, Innovations, Collaborations and Entrepreneurship) Mega Innovation and Entrepreneurship, and Agriculture & Food Science Innovation Event was organized by Office of Research, Innovation and Commercialization, and Faculty of Social Sciences and Humanities, MSNUAM in collaboration with DICE Foundation and SunCrop Group on March 13, 2021. The Honourable Minister for Agriculture, Mr. Hussain Jahania Gardezi inaugurated the pre-launch of DICE. Dr. Shafique Pitafi (CEO, SunCrop Group) and Prof. Dr. Asif Ali (Vice Chancellor, MNSUAM) accompanied the Honourable Minister. DICE is a non-profit organization registered in Michigan, USA. Annual DICE Mega Innovation Event is one of the major initiatives of the DICE Program and since 2007 the program is being conducted at various universities across Pakistan. The objective of this event is to foster culture of innovations and entrepreneurship, establish strong relation between industry and academia and possible outcomes include innovations expo and innovations for commercialization.

The MANSUM houses the DICE (Agriculture and Food Science) Office. During the last DICE event at MNSUAM, students from all over the country presented their innovations in areas of agriculture and food science, agribusiness and economics, ICT and computer sciences, engineering, and technology. The participants were briefed about the criteria, registration procedure, project requirements, evaluation grounds and scoring criteria and important dates. Talking on the occasion, Mr. Hussain Jahanaia Gardezi said that the event would bring together all academic institutes of Pakistan, industry, financial institutions and technology vendors displaying their research innovations, products, and technologies. He applauded this initiative and regarded this event a much needed and timely effort. Prof. Dr. Asif Ali said that MNSUAM is playing a key role in developing an entrepreneurial ecosystem. The event will showcase the business and entrepreneurial ideas of students from various institutions of Pakistan. The event will cover product and services based business plans as well a plant-based food products and related businesses. Another objective will be to inculcate the culture of entrepreneurship and value addition among students' and disseminate innovative business ideas. Here at MNSUAM, we are trying to produce graduates with hands on entrepreneurial skills so that they can create new jobs instead of being job seeker themselves, he further said.

6.30. Seminar for Mango Growers

Keeping in view the global sustainable development goals and national strategic development pillars of Pakistan, an awareness seminar was organized for the mango growers to develop technical capacity for high productivity of mango orchards. The training was jointly organized by MNSUAM, BASF Pakistan (Pvt.) Limited, Mango Research Institute (MRI) and Pakistan Mango Growers Association on March 8, 2021. As many as 120 participants who joined the event online were mango growers from Punjab and Sindh; however, processors, traders, researchers, scientists and service providers were also present. Malik Haider (National Sales Manager, BASF), Mr. Atif Kamal (General Manager, BASF), Rana Abbas (Agric. Extension, Multan), Malik Tariq and Mr. Abid Majeed (Mango Research Institute) briefed and trained the participants about various concepts of mango tree growth and development, nutritional requirements and management, tree spacing and canopy management, mango disorders, diseases, pests and innovative control strategies. Representatives from BASF and FMC gave detailed presentations about the safe use of pesticides in mango orchards. At the end, a souvenir distribution ceremony was also held.

6.31. Internees Training under ADP Funded Project

MNSUAM in collaboration with the University of Agriculture, Faisalabad and PMAS University of Arid Agriculture, Rawalpindi has launched one-year internship program sponsored by the Dept. of Agriculture, Government of Punjab, for young agriculture graduates who were appointed in 10 low producing tehsils of the province including Haroonabad, Burewala, KotAddu, Kahror Lal Esan, Pakpattan, Narowal, Shahkot, Quaidabad, 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 first year) and are being provided with quality advisory services at farm level; including crop diversification, innovations and efficient resource utilization.

A twelve-day long internees training was organized under the aforementioned project by Project Management Unit (PMU) from February 23 to March 7, 2021. Internees were imparted six hours of training every day comprised of minimum of two hours of hands-on activities/practical/group activities. Training modules + manuals were developed for a general guideline. Local agro-climatic conditions and working environments were discussed and incorporated in these modules and each module made an assessment of existing and post-training level knowledge of internees.

The inaugural session of this training was graced by Prof. Dr. Asif Ali (Vice Chancellor, MNSUAM), Mr. Barak Ullah (Additional Secretary, Agricultural Task Force) and Prof. Dr. Irfan Ahmad Baig (Dean, Faculty of Social Sciences and Humanities, MNSUAM). Prof. Dr. Asif Ali emphasized the importance of agriculture and its significance in extraordinary times and appreciated the Department of Agriculture for taking the internship initiative to train and equip fresh agricultural graduates so that they can perform at the farm level. He pointed out that this project is unique in the sense that it is directly linking agri. graduates and University faculty with the farmers in 10 low producing tehsils of Punjab to enhance productivity. Agri. graduates following the latest agricultural technology in conjunction with ICTs can be successful entrepreneurs and role model for others to embrace such innovations. He also presented the facts and figures about entrepreneurial success of previous internees. Mr. Barak Ullah appreciated the efforts undertaken so far in the project and regarded this milestone towards the betterment of the farming community in Pakistan. He said that the positive impacts of this project are already evident and we expect further improvements in crop productivity, profit margins and livelihood standards in near future. While talking about important factors of the internship program, Prof. Dr. Irfan Ahmad Baig said that 110 graduates were appointed in Tehsils of Punjab with low crop productivity so that they could play their roles for improvement of agriculture in these areas, and this intervention is quite successful so far. MNSUAM in pursuit of its moral obligation to serve the farming community of Pakistan and uplift their socio-economic standards will continue such efforts. He further told that the performance of the internees is being observed through a modern monitoring system. Agricultural universities are ensuring experiential learning of their graduates with appropriate skill development and internships for future farming, entrepreneurship and increased employability. The event was organized by Prof. Dr. Muhammad Ashfaq (Project Coordinator) and Mr. Shoaib Nasir (Incharge, Project Management Unit).

6.32. Webinar on Women Empowerment through Entrepreneurship

Role of women cannot be denied in the entrepreneurial development of any country. Under the umbrella of Graduate research Centre; a webinar on “Women Empowerment through Entrepreneurship” was organized on March 23, 2021. The event focused on women empowerment and their entrepreneurial spirit and intended to signify the involvement of female leaders and researchers in their entrepreneurial quest

The event objectives were to understand the importance of female entrepreneurship for the development of Pakistan and kind of support needed to promote female entrepreneurship and commercialization of their products/services. Another objective was to unravel the factors that limit female entrepreneurs to excel in this field. Prof. Dr. Asif Ali, VC, MNSUAM emphasized on women's role in the development of the country, while working side-by-side men in every field and without any fear. He acknowledged that women have special working capabilities and they play a vital role in progress of any institution. Women empowerment is prerequisite to achieve sustainable development and prosperity in Pakistan, he added further. Ms. Rabia Sultan, female entrepreneur and progressive grower shared her life-long experiences and success stories. She talked about how she acquired skills and approaches needed to become a successful female entrepreneur. Ms. Naila Qazi, Founder REACH under IdeaGist platform talked about potential and challenges of Pakistani female entrepreneurs. An open discussion session was held afterwards.

6.33. Webinar on Seed Stewardship in Post-COVID Scenario

This webinar was organized by MNS University of Agriculture Multan on September 23-24, 2020. Seed Scientists from California, Minnesota and North CarolinaStates of USA, officials of Federal Seed Certification and Registration Department Pakistan, Punjab Seed Corporation, leadership of multinational and local seed companies, officials from public research institutes and faculty of different universities participated in this online seminar. Mr. Syed Fakhar Imam, Federal Minister of National Food Security & Research was the chief guest. Secretory National Food Security & Research, Prof. Dr. Iqrar A. Khan former Vice Chancellor, University of Agriculture Faisalabad, and Director General Agriculture Research also attended this webinar. Scientists from USA, Mr. Timothy Blank from California Crop Improvement Association, Dr. Kent J. Bradford from University of California Davis, Dr. Fawad Shah, President & CEO, Minnesota Crop Improvement Association and Dr. Aslam Bhatti, BASF Corporation shared their experiences regarding seed related activities in USA during Covid-19 pandemic. Seed system regulations in Pakistan was comprehensively debated during this webinar. Week areas of the seed system were identified, their potential solutions were discussed and recommendations have been given. Officials of FSC&RD elaborated the recent developments in seed regulations in Pakistan. Executives of multinational seed companies shred their experiences about seed stewardship in private sector with reference to Covid-19 scenario. Representatives of local seed companies shared their views regrading local seed production and discussed various options for enhancing local production of certified seed. In the Technical sessions, seed regulations in USA and Pakistan were compared and discussed. Potential opportunities have been highlighted and way forward was determined. Moreover, various aspects of seed quality starting from pre-sowing, production, harvesting, processing and storage were discussed comprehensively. Several strategies for improvement and maintenance of seed quality were proposed.

6.34. Crop Protection and Seed Stewardship Webinar

Webinar on Crop Protection Stewardship was organized by Institute of Plant Breeding and Biotechnology, MNS University of Agriculture Multan on February 22, 2021. Prof. Dr. Asif Ali, Vice Chancellor MNS University of Agriculture Multan Highlighted the importance of crop protection and seed stewardship in his opening remarks. Miss Rachel Pang (Product Stewardship & Sustainability Manager CP APAC region) talked about the Stewardship in Crop Protection. She gave strategies to promote stewardship in crop protection sector. Mr. Bill Batch (Seeds and Traits Stewardship Manager Australia and APAC region) gave an overview of Stewardship in seed sector. He talked about the key components of stewardship in seed sector. Mr. Atif Kamal (General Manager BASF Pakistan) presented the BASF Pakistan work and highlighted the key features of BASF that have been used to promote stewardship in the country both in crop protection and seed sector. In his concluding remarks Prof. Dr. Shafqat Saeed Dean FA&ES, MNS University of Agriculture Multan, added that University is committed to promote stewardship in the country. He talked about the university's initiative for stewardship in seed and agrochemicals.

6.35. Biodiversity+ Workshop

The ORIC in collaboration with IPBB and University of Kassel, Germany organized a one-day workshop entitled "Collaborative capacity building for plant biodiversity research and preservation in oasis ecosystems of Pakistan-Biodiversity+" on June 25, 2021. The objective was to train the students so that they can preserve and utilize the biodiversity of plants present in oasis ecosystems of Pakistan. In his opening remarks the MNSUAM Vice Chancellor, Prof. Dr. Asif Ali (T.I) acknowledged DAAD for funding the project for R&D and capacity building on preserving the biodiversity in Cholistan and GB. He said that the oasis ecosystem of Pakistan is a rich source of many important plants to help mitigate climate change and sustain livelihoods of rural people. Prof. Dr. Andreas Burkert from the University of Kassel elaborated that the Oasis ecosystems of South Punjab and GB, Pakistan is not only rich in plant biodiversity but also it is a rich source of history and culture. He briefed that how plant biodiversity available in Pakistan can be used to ensure food security for the nation. Dr. Sadar Ud Din, Director Bio-resources Conservation Institute, NARC, Islamabad, discussed the biodiversity and plant genetic resources conservation system of Pakistan. He told that the NARC Islamabad is working hard to conserve the plant biodiversity and has a large collection of various plants. Dr. Abdul Ghafoor, Project Director, Productivity enhancement of Sugarcane, talked about the sustainable utilization of plant genetic resources for food security. He told that the germplasm banks are the rich source of several climate smart genotypes. These genotypes stored in the gene banks can help to ensure food security in changing climate. Dr. M. Kashif Ilyas, Senior Scientific Officer, Bio-resources Conservation Institute, NARC, explained that different ecosystems of Pakistan are the niche of many important plants. They are under the pressure of erosion and there is a need to conserve it. The conservation of these plants can make us food secure in near future. The event ended with thought provoking discussion and interactive question-answer session.

STRENGTHENING OF PHYSICAL INFRASTRUCTURE

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Physical infrastructure plays a vital role to develop any educational institution of 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. 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 got revised at a cost of Rs. 1746.258 million and the project execution period 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 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 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 & Fixture up to FY 2019-20. The necessary furniture & fixture have been procured and established the classrooms, hostels, and guest house.

An amount of Rs. 49.304 million has been provided under Farm Development and others component. The university leveled the 500 Acres of barren land at Jalalpur Pirwala and constructed 4816 meter long Water Course for irrigation purpose. 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.

7.2. Construction of Central Library at MNS University of Agriculture, Multan

The Honorable Minister (Caretaker) for Agriculture, Sardar Tanveer Ilyas Khan donated Rs. 20.00 Million from his own pocket during his kind visit to MNSUAM and 10.00 Million were also contributed by the University from its own sources for the Construction of Central Library (Ground Floor) having a covered area of 10,450 Sft. The construction work of library has been completed and an amount of Rs. 29.986 million is disbursed for the Central Library Building up to date.

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 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

Other achievements pertaining library during 2020-2021 are as under;

- Facilitation provided by the e-library section to the University Community by providing them remote access to electronic resources during COVID-19.
- Subscription of HEC databases to facilitate the borrowers in their respective field of research.
- Development of an in-house e-repository for the university researchers.
- Providing Hands on training sessions on "How to Access and use of E-repository" to the University students/researchers/faculty members.
- Providing Hands on training sessions on "How to access and use the HEC digital library".

7.3. 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 the 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 some infrastructure which is missing at present, but is essentially required at the farm for research and experimentation for the graduate as well as postgraduate students and faculty members.

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 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 up to FY 2020-21 and out of which Rs. 169.997 million 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 Fixture has also been procured for training hall.

7.4. 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. 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:

7.4.1. Agricultural Farm, Jalalpur Pirwala

- After the bulldozer work on 500 acres land of University Farm Jalalpur Pirwala, and after laser levelling the major challenge was to cultivate this saline sodic soil with brackish underground water. However, challenge has been accepted and about 430 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 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 has been 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.

- About 375 acres of land are now 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 35,000 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.
- Fish and shrimp farming is ongoing.
- A project for construction of livestock shed, input and output stores and seed stores, farmers training halls and machinery shed is near to completion.

7.4.2. Agricultural Farm, Rangeel Pur, Multan

- In Mouza Rangeel Pur, Multan 180 acres of land were allotted to the University, out of which 70 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, 45 acres land is under cultivation. The major crops during growing season 2020-21, 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 has 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. 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 2020-21, an income of 19.16 million from both Farms was achieved and amount was deposited in University account.

STRENGTHENING OF TECHNOLOGICAL INFRASTRUCTURE

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Multan

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STRENGTHENING OF TECHNOLOGICAL INFRASTRUCTURE

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Directorate of Information Technology (DIT) is focused on delivering a wide range of high-quality IT Services throughout the campus to all Academicians, Staff & Students. Providing a smart & robust environment 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. 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

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. Firewall 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 integration of the network 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 the places of campus ensuring safety of the staff and students. A well-equipped control room has been established for monitoring.

8.1.7. Computer Labs

Three new computer labs have been established in new Faculty building. Latest software are installed which facilitate 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. These rooms are equipped by, 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 facility of diverse teaching and learning more diverse and interactive in classrooms. These Projector key features are picture execution, determination, long light life, item versatility, brilliance, PC associations and calm activity. Moreover, 50 projectors 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 meeting, national and international webinars, and conferences. The video conference system provides participants with smooth and natural audio visual effects whenever and wherever, and provide comfortable and immersive experience for teleconferencing

8.2. ICT Software Services

8.2.1. Webinar/Meetings

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.

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

Directorate of IT is managing the official website as well as launched project related websites for faculty and students. University official website was updated from WordPress to Joomla, a free and open-source content management system.

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, Directorate of IT with support of 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 facility of Google Corporate G Suite services. These services consist of Email, Word, Excel, PowerPoint & unlimited Google drive. Especially, all students were provided G Suite accounts this year, that highly enhanced the productivity of students and collaboration. These services are being managed by 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/)

UNIVERSITIES BUILDING COMMUNITIES

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Multan

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9.1. MNSUAM - the 3rd Most Sustainable University of Pakistan in UI GreenMetric Rankings

MNSUAM has secured third position as the Most Sustainable University among Pakistani varsities in UI Green Metric ranking. As many as 912 varsities of 89 countries of the world competed for the ranking 2020 wherein MNSUA bagged 243rd position by getting 6425 points. The university has improved its position from 5th/361st in 2018 and 4th/311th in 2019. 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 (SI), ii. Energy and Climate Change (EC), iii. Waste Management (WS), iv. Water Conservation (WR), v. Transportation (TR), and vi. Education (ED). 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, which are some indicators that need improvement. The Vice Chancellor 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 Prime Minister's Clean & Green Pakistan drive and the United Nation's Sustainable Development Goals. Considering the fact that MNSUAM is much younger among 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 target for the next year to obtain first position in Pakistan in the said 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. Prof. Dr. Zulfiqar Ali, Director ORIC mentioned that China is an economic power but its people feel proud to use bicycles in their daily routine life. He underlined the need of overcoming carbon footprint and for this purpose, varsity should promote riding bicycles in and around the campus to refrain our future generations from polluted environment and materializing Clean and Green Pakistan dream.

9.2. MNSUAM Commemorated 'Kashmir Siege Day' Iin Solidarity with Kashmiris

First anniversary of annexation of Kashmir as Yaum-i-Istehsal (Day of Exploitation/Kashmir Siege Day) was observed and a webinar was arranged on 5th August, 2020. The day was celebrated with an ardent interest and enthusiasm to epitomize the support of Pakistani nation to the unrelenting struggle of Kashmiri people for their condign pretension to self-determination under the UN resolutions.

Dr. Ashfaq Ahmad, Principal Officer, Students Affairs, urged the international community, the United Nations, and human rights organizations to take notice of the grave human rights violations in Indian Occupied Kashmir. While addressing the audience, Mr. Rasheed Ahmad (Lecturer Islamic Studies) said that entire Pakistani nation stands by their Kashmiri brethren in their just struggle for right to self-determination. Irrespective of religious ties, atrocities anywhere on planet are condemnable and we as a Muslim feel more pain for our oppressed Kashmiris who were forced to live under Indian oppression. Mr. Imran Mahmood, Registrar said that Kashmir is an unsettled dispute since partition and Indian leaders had promised in the United Nations that Kashmiris would be given a chance of referendum under UN supervision so that they could decide their fate according to their own wishes. That promise has not yet been fulfilled as Indian leadership fears that Kashmiris will prefer to go with Pakistan. Dr. Usman Jamshaid, Senior Tutor laminated that India is trying to suppress the freedom movement of Kashmiris through oppressive use of force and state terrorism. Recently, the revoking of article 370 and 35A 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 and demanded of the United Nations to live up with its promise and resolve the dispute as per aspirations of the people of Kashmir.

9.3. Pakistani and Foreign Experts Discussed Food Security in the Backdrop of COVID-19

COVID-19 Management Committee (MNSUAM) organized an International Webinar on COVID-19 & Food Security in cooperation with Purdue University, USA, and Charles Sturt University of Australia for discussion on food security amid COVID-19 scenario. Dr. Paul D. Ebner from Animal Sciences Department of Purdue University and Prof. Dr. Gavin Ramsay from Graham Centre, Charles Sturt University gave a detailed insight to the participants on food security in COVID-19 situation. Vice Chancellor MNSUA Prof. Dr. Asif Ali said on the occasion that novel coronavirus hurt the global economy and affected transportation of food. He underlined the need for a global strategy to ensure that the food supply chains remain intact all over the world. He, however, added that virus scenario in Pakistan was not as much serious as was the case in some other countries. He said, government took some initiatives to lessen impact of epidemic on agriculture sector and encouraged farmers to continue to grow food crops. Dr. Paul Ebner presented "Agriculture research during a pandemic: A US perspective". He gave valuable information on COVID-19 related agriculture research and underlined the need for improving agriculture syllabus and pedagogic processes. Giving statistics on COVID-19, he laid stressed on implementation of standard operating procedures (SOPs) in laboratories. He also accentuated on restrictions on traditional activities in universities. Dr. Gavin Ramsay spoke comprehensively on what steps should be taken in health and education sectors during virus epidemic. He said that contagious diseases largely affect import/export of pulses particularly gram pulse form Australia. While highlighting importance of livestock in agriculture sector development, Ramsay said that COVID-19 should be considered as an opportunity to search for new horizons and be a part of the economic change. Afterwards a thought provoking question-answer session was held wherein due deliberations were made on the webinar topic. Prof. Dr. Asif Ali concluded the webinar with highlighting the importance of farm mechanization to reduce human intervention and prevent chances of virus spread.

He also emphasized the need for taking forward the research on microbiology. He stressed on wearing mask, washing hands and social distancing to check virus spread. Prof. Dr. Muhammad Ashfaq, Dr. Mirza Abid Mahmood, foreign experts and experts from south Punjab agriculture forum besides teachers and students attended the webinar.

9.4. Independence Day Celebrations & Plantation Drive

Pakistan's 73rd Independence Day Celebrations ceremony along with Kashmir Solidarity Day was held on 14th August, 2020 at the main campus of the University. The Vice Chancellor, Prof. Dr. Asif Ali, inaugurated the event with hoisting the flag of Pakistan following the national anthem. The students and officials were especially invited to attend the ceremony. The participants recited Holy Quran and prayed for prosperity of our motherland and liberation of Kashmir. Later on, tree plantation campaign was held near the Sardar Tanveer Ilyas Khan Library of the Varsity. A large number of faculty members and students from MNSUAM participated in this campaign and planted numerous trees. Prof. Dr. Asif Ali said that tree plantation and green belts are our priority in Multan and we will strive hard to turn Multan green. He added that trees are the building blocks of life on earth. We are well aware of the significance of trees, and are fulfilling our moral obligation by planting as many trees as we can. He urged all teachers, staff and students of the University to plant trees as a fulfillment of their national duty.

The event formally commenced with recitation from Holy Quran followed by Naat. Afterwards, the Dramatic Club of MNSUAM performed various national songs, skits and dramas on themes related to Independence of Pakistan and atrocities committed to Kashmir and its people. The memorable performances of the students were lauded by participants in the ceremony. Prof. Dr. Asif Ali, Vice Chancellor, in his address, stressed upon spreading pluralistic values in the society based on mutual respect and contributing positively towards the country's progress. Following the credo of faith, discipline and unity coined by our leader Quaid-e-Azam, we can achieve unimaginable goals and can face any challenge with determination and certitude. All we need to do is to listen to the call of the day, remain consistent and composed. While taking these motives into account, huge amount of responsibility lies on the shoulder of the youth of our country. 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.

9.5. UNESCO Regional Consultation Meeting on Water, Energy and Food Sustainability for post COVID-19

Center for Agricultural Sustainability in South Punjab (CAS-SP), MNS University of Agriculture, Multan, UNESCO Jakarta and Islamabad Offices have jointly organized the Regional Consultation Meeting on Water, Energy, and Food Sustainability (WEFS) for Post COVID-19 webinar, on August 13, 2020. This webinar featured the prominent speakers from various institutions of Pakistan, South Korea, Australia, Portugal and Malaysia.

It aimed to develop the collective understanding of the interdependent relations of water, energy, and food in context of COVID-19 and their socio-economic impact to build back better South-South Cooperation in sustainable perspectives.The webinar commenced with the opening remarks by Prof. Dr. Asif Ali, the Vice-Chancellor of MNSUAM, Ms. Patricia McPhillips, Director of UNESCO Islamabad, and Prof. Dr. Shahbaz Khan, Director of UNESCO Jakarta. In his remarks, Prof. Dr. Asif Ali emphasized a meaningful target-oriented, inclusive approach and collaboration with both national and international agencies to respond to the current challenges by managing the nexus of water, energy, and food. Followed by Ms. Patricia McPhillips, who underlined that water, energy, and food management require more attention and priority as they are strongly linked. Prof. Dr. Shahbaz Khan briefly explained in his presentation that how UNESCO Science respond to COVID-19, and has recommended and fostered Open Science to address interconnected challenges posed by water, energy, and food nexus, which relies on an inclusive, transparent, and consultative process involving all countries and various stakeholders.

First session of the meeting was moderated by Prof. Dr. Irfan Ahmad Baig. During the session, keynote speakers shared best practices and exchanged views of responding to the Water, Energy and Food Sustainability (WEFS) challenges. Dr. Abid Suleri, Prime Minister's Economic Advisory Council, Pakistan, comprehensively explained both challenges and opportunities within the nexus of WEFS. While the COVID-19 Pandemic lays recession, health, and food crisis, it also presents us with several opportunities, among others, building health resilience, climate-friendly practices, linkage of food security with global supply chain, and the inclusive digital economy. Other keynote speakers also delivered their presentations and recommendations related to managing WEFS. Prof. Dr. Soontak Lee, Governor of the World Water Council, emphasized that Integrated Water Resources Management (IWRM) should be promoted for coordinated development and management of water resources for better economic growth and social welfare without compromising the environmental aspect. In strengthening of coordinated response, Dr. Norlida, UNESCO Head of Coordination, Human Tropics Center-Malaysia, underlined the importance of water education, which improves the well-being of all people and reduce inequality. Prof. Jeff Camkin, University of Western Australia, added another aspect in addressing the WEFS challenges through improving integrated water policy. The water policy should entail a broader policy thinking, a stronger science-policy-stakeholder interface, and a robust engagement with the local and available knowledge. In line with the point of solid stakeholder engagement, Prof. Dr. Susana Neto, University of Lisbon, Portugal, stressed its essential role that leaves no one behind in addressing current challenges.

Second session was based on the brief discussion led by several panelists who presented their recommendations according to their expertise. Prof. Dr. Jeff Camkin, pointed out the practical way to convince the government to deliver clean water and sanitation by identifying the vulnerable group, adopting equity principles, and a powerful national policy. Managing the WEFS nexus also requires science and technology. Dr. Abu Bakr Muhammad, Lahore University of Management Science, emphasized the importance of integrated thinking and engagement approach in harnessing technology. Ms. Rabia Sultan, Director Gurmani Foundation shared that progressive farmers should be able to tap the benefit of technology and the available resources to boost agriculture productivity.

To ensure the science and technology more inclusive, Mr. Raza Shah, UNESCO Islamabad, pointed out that UNESCO's role in promoting and raising awareness of scientific terms and translate them in local language. He added that Open Science is a truly game changer to address multiple challenges. In building community's resilience toward various hazards, Ms. Ghazala Naeem, from the Resilience Group, shared her view in integrating the Sendai Framework for Disaster Risk Reduction and Sustainable Development Goals.

The summary recommendations were presented by Dr. Tariq Rana, Murray-Darling Basin Authority, Australia. He briefly shared the summary of recommendations, which underlined the importance of education, capacity building, sharing knowledge and information, and stakeholder engagement in response to the current and future challenges posed by COVID-19. The webinar was attended by 4,227 people through live streaming in Facebook pages of UNESCO Jakarta, UNESCO Pakistan and MNSUAM Official.

9.6. Walk to Raise Anti-Dengue Awareness

On September 12, 2020, MNSUAM organized a walk to create awareness about anti-dengue measures and efforts by the several departments of government to control dengue. A large number of students, faculty members and people from different walks of life participated in the event to mark the anti-dengue day. Prof. Dr. Asif Ali, Vice Chancellor unveiled some hard facts about dengue mosquito and fever; he highlighted the steps and precautionary measures to control dengue effectively. He informed that the dengue mosquito is affecting 390 million people in 150 countries across the globe. He emphasized that the government departments and citizens should join hands to control dengue and implement anti-dengue measures along with adopting necessary precautions in this regard. Dr. Atta ur Rehman, Regional Director, Epidemics Prevention and Control Program said that the objective of observing anti-dengue day is to make people aware of measures to control dengue along with involving them to play active role in this respect by maintaining environment in and around their houses neat and clean. He stressed upon the need to promote awareness about the dengue fever in all segments of society especially among the students, enabling them to curb the menace of the dengue fever in the society. He also briefed about general symptoms of dengue fever and precautionary measures to combat dengue menace in Pakistan.

9.7. COVID-19 Free Campus

MNSUAM has resumed academic business from September 15, 2020 as per SoPs of HEC/Govt. of the Punjab. The University has adopted all safety measures and SoPs as issued by the Punjab Govt. in the backdrop of COVID-19. Availability of thermal guns, masks, hand washing facilities and sanitizers is being ensured. 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. Students and staff members have been randomly tested for COVID-19 and none of these were tested positive. The disinfection of buildings is being carried out at least once during the class timings. The physical classes of newly admitted students are at full swing.

9.8. Poster Competition held at MNSUAM to Mark World Cotton Day

World Cotton Day was observed at the MNSUAM on October 07, 2020. 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) and Syed Hassan Raza (Chief Executive Neelum Seeds) were the notables of the event. They visited the posters and appreciated the students for valuable work on hot issues pertaining to cotton crop. The expert panel for poster evaluation consisted of Prof. Dr. Zulfiqar Ali, Dr. Tanvir ul Haq, Dr. Amar Matloob, Dr. Zulqarnain and Dr. Muhammad Waqas Malik. Around 45 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. First position holder was awarded a cash prize of PKR 10,000, while second and third positions were given prizes worth PKR 5000 and 3000 respectively.

9.9. Universities are Hub of Innovation: Prof. Dr. Asif Ali

“Universities are hub of research aiming at producing researchers who could serve the public at large besides contributing to education.” MNSUAM Vice Chancellor, Prof. Dr. Asif Ali stated this during a news conference on October 8, 2020. He informed that social development is result of integrated efforts and media should monitor the ongoing schemes of the university to contribute its bit for betterment. The VC maintained that he and his team have established the varsity from "nowhere" adding that the objective was to build an institution "with a difference" where overall focus should be on agriculture. "We are working on future farming, for which we have introduced a special undergraduate program “Farm Management” and also Faculty of Veterinary and Animal Sciences is offering up to six programs including Animal Sciences, Fisheries and Aquaculture, Poultry etc. Replying to a question, Dr. Asif said that food and nutritional security is a global issue and keeping that in view the university had launched Human Nutrition and Dietetics programme two years ago and complimented the efforts of VC NMU, Saheed Prof. Dr. Mustafa Kamal Pasha whom he misses a lot as a great friend. "Dr. Pasha wanted to have two nutritionists in every ward of Nishtar Hospital so that patients could improve their health by following balanced diet plan." To another question, he informed that public health is a broad based subject which is directly related to many areas. Dr. Asif Ali noted that the varsity is producing graduates of whom only 14 percent are job seekers while 84 percent are either running their own businesses related to farming and working with the agribusiness sector. He said that they have introduced a farming programme for those landlord kids who are interested in future farming and they would be admitted preferably in the said programme.

9.10. International Conference on Plant Based Foods

The Department of Food Science and Technology of MNSUAM organized an international virtual conference on "Plant Based Foods: Potential for Food Security and Pandemic Management" on October 15-16, 2020, with the aim to bring together academia, research, and industry to exchange and share their experiences and research findings with special emphasis on plant based foods. The conference covered diverse themes like food and nutritional security, nutraceutical and functional foods, role of plant based food in human nutrition and diet, functional and health potentials of plant based food, impact of agricultural practices on quality and safety of plant based food, advances in processing and preservation of plant based food, post-harvest handling and losses of plant based food, food safety issues of plant based food. Prof. Dr. Yasmin Rashid (Minister for Health, Punjab) inaugurated the conference with her thought provoking opening speech. Prof. Dr. Asif Ali (Vice Chancellor, MNSUAM), Prof. Dr. Faqir Muhamamd Anjum (Vice Chancellor, University of Gambia), Prof. Dr. Ahmed Ijaz Masood (Vice Chancellor, Nishtar Medical University) and Prof. Dr. Uzma Qureshi (Vice Chancellor, The Women University) also contributed with their valuable remarks in the inauguration session. Dr. Yasmin Rashid said that healthy food plays a key role in immunity building in humans. Our health largely depends on what we eat. She congratulated the organizers of the conference for holding such an important event. She said that hygienic and clean food was the first requirement for good health and we all have to work together to promote healthy and hygienic food. "We have launched Punjab's largest health nutrition programme in the province," she added. Prof. Dr. Ahmed Ijaz Masood informed that both varsities are working jointly for nutrition management to sensitize masses about healthy diet. Prof. Dr. Asif Ali stated that the purpose of organizing such events is to create awareness regarding benefits of plant-based food for a healthy life style. He urged the youth to consume plant based foods instead of junk food items. Prof. Dr. Saeed Akhtar (Director IFSN, BZU), Dr. Fyaz Ashraf (Director Innovation, National Foods), Prof. Dr. Masood Sadiq Butt (President Pakistan Society of Food Scientists and Technologists), Prof. Dr. Tahir Zahoor (Director General NIFSAT, UAF), Dr. KK Ranaweera (Sri Lanka) and Prof. Dr. Uzma Qureshi (Women's University) were the key note speakers.

Around 100 abstracts were received and evaluated for oral and poster presentations. Amongst them, 50 oral presentations were delivered from foreign as well as national speakers. The foreign speakers were from Sri Lanka, Gambia, United Kingdom, Malaysia, Indonesia and Oman. Participants from all over Pakistan participated in the event. Ms. Romana Tanvir Shiekh (Director, Maqbool textile Mills) was the chief guest of the closing ceremony. She appreciated the efforts of MNSUAM to develop a platform for the researchers to come out and share their ideas. Owing to unavailability of organic food, public is suffering from different ailments, she added further. The MNSUAM Vice Chancellor, Prof. Dr. Asif Ali emphasized on the significance of plant based food for a healthy life style. He said that Allah has blessed Pakistan with a diverse environment supporting production diversity and we must capitalize on that along with promoting dietary diversity to arrest malnutrition. He applauded the efforts of the organizers. The Deans, Prof. Dr. Shafqat Saeed and Prof. Dr. Irfan Baig offered the vote of thanks in opening and concluding sessions

9.11. Seminar on Islamic Banking

The Office of the Treasurer and Senior Tutor of MNSUAM organized a seminar on Islamic Banking on October 23, 2020. Prof. Dr. Asif Ali was the chief guest of the event, while, Mr. Rafay Ashraf Usmani (Shariah Board member at Bank of Punjab) was the keynote speaker. He has delivered several lectures at different forums and has written more than three thousand Fatawas on different Islamic topics including Islamic Finance and family law. Prof. Dr. Asif Ali urged the need to follow the teachings of Islam as it will always lead to the right path. He informed that with the blessings of Allah and hard work of the university team, the farm income has a multifold increase and Alhamd u Lilah we have separated Usher on Ag income to support the deserving students. Mr. Rafay explained the basics of Islamic Banking and highlighted the importance of Shariah compliance in businesses and investments. He lectured on structure and mechanism of Islamic Banking. He briefed the participants about the working principles of Islamic Banking and Finance, its underlying theory, logical foundations all the way down to specific products and solutions to the financing and investment needs. He said that the State Bank of Pakistan has established an Islamic Banking Department to evolve a stable and distinct Islamic banking system based on Shariah principles to meet the needs of consumers for Islamic banking products and services. He discussed core ideas and applications of Islamic Finance with respect to interest free loans, insurance, profits, taxation, buying and selling etc. Representative of Bank of Punjab Taqwa Islamic Program also participated in the seminar and answered the questions and queries of the participants in a comprehensive manner.

9.12. Kashmir Solidarity Walk

To express solidarity with the people of Kashmir, a solidarity walk for Kashmiri brethren was organized by Directorate of Students Affairs, wherein a number of students and faculty members participated. The Vice Chancellor, Prof. Dr. Asif Ali addressed to 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 fundamental right. He further said that 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. The participants strongly condemned Indian atrocities on innocent Kashmiris struggling for their right to freedom and demanded of the United Nations to live up with its promise and resolve the dispute as per aspirations of the people of Kashmir. They also prayed for the peace and independence of Kashmir.

9.13. Rescue 1122 Imparted Training on Community Action for Disaster Response

The Rover Scouts Unit of MNSUAM in collaboration with Rotaract Club, MNSUAM and Rescue 1122, Multan conducted a two-days training on “Community Action for Disaster Response” for students of the University from October 26 to 27, 2020. Prof. Dr. Muhammad Ashfaq, Principal Officer, Student Affairs at the inauguration ceremony of the training said that we can save ourselves from big disasters while adopting small precautions. He further said that after getting this training, students will become capable of giving emergency treatment to a person and save his/her life.

There is nothing better than saving a life and serving humanity, he further added. During the two-day event, the Safety Officer of Rescue 1122 Community Safety Wing, provided training to the students of the Varsity, which included emergency treatment in case of accidents, providing first aid to affected persons for wounds and fractures, treating unconsciousness etc. In addition, awareness was also given regarding taking appropriate action in cases of chemical drop on body, snake bite and fire eruption. The Officer of Community Safety Wing said that they were not here to make the students as doctors, but to train them enough to deal with emergency situations, so that they can perform as a better citizen in the society. At this occasion, Dr. Umar Ijaz Ahmed, President Rover Scouts Unit, MNSUAM said that the main purpose of such trainings is to prepare students to help people around them in case of accidents and emergencies.

9.14. British Council Official Applauded MNSUAM for Effective Community Services

Mr. Michael Houlgate (Area Manager, British Council) visited MNSUAM on November 24, 2020 and met the Vice Chancellor, Prof. Dr. Asif Ali. The purpose of his visit was to have an overview of Active Citizens Program and Social Actions Plans undertaken by University students so far. Active Citizenship is a global program run by the British Council and its partners in over 40 countries to promote community cohesion and development through capacity building of young leaders for civic engagement and volunteering. British Council is providing the technical and mentoring support to MNSUAM for developing and implementing the program. Prof. Dr. Asif Ali (VC, MNSUAM) said that Pakistan has active youth, and no nation can achieve the goals of development without involvement of its youth in different projects of social and economic progress. He said that MNSUAM is performing an active role in community development through different outreach and community development projects. We are trying to produce graduates that can make a difference and contribute to the betterment of the society. He also highlighted the importance of promoting an enabling environment at University campuses to think independently and creatively for a prosperous society. Mr. Michael Houlgate said that keeping in view various dimensions of the society, students should study about role and contribution of different segments. Ever since the evolution of civilization, the current time is the most significant one as education system has the responsibility to be in sync with 21st century challenges and aspirations to foster the right types of values and skills that will lead to sustainable and inclusive growth, and multi-cultural societies to live in harmony. Afterwards, he visited the campus and witnessed various research and development activities. He applauded the University administration for marvelous job. He interacted with students regarding their Social Action Plans and advised students to continue their good work. The AM, British Council distributed certificates among students who rendered volunteer services during COVID-19 epidemic. At the end, a plantation ceremony was also held and the honorable guest planted tree sapling at the Admin Block of the Varsity.

9.15. Greetings and sharing happiness

A cake cutting ceremony was held to mark the dawn of New Year and Christmas. The faculty, students, and administrative staff of MNSUAM along with the Vice Chancellor, Prof. Dr. Asif Ali, celebrated Christmas, and the new year 2021.

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 Vice Chancellor said that MNSUAM always strive for promoting good citizenry, tolerance, and interfaith harmony. The 2020 was the first year of my second tenure as Vice Chancellor of this University, whilst things were almost static due to the COVID-19, still we were able to mark achievements attributed to the commitment of the campus community. Our substantial efforts have set the new ways of learning and sustain the performance in academic, research and outreach. Teaching and research facilities have been upgraded/strengthened through the development of infrastructure, procurement of scientific equipment and improvement of learning resources etc. Physical infrastructure has also been improved and the construction work is also completed. He assured that in 2021, we will relentlessly strive for the excellence in all aspects of education, use of modern techniques and embracing relevant innovations, exceptional campus environment, student and community services. The Vice Chancellor emphasized that the MNSUAM is following a human centric design and will continue to follow the path of service to humanity on equal citizenry philosophy. The Christian community expressed gratitude and said that Christmas gave the message of peace and love to all humanity.

9.16. Kashmir Day

To express solidarity with the people of Kashmir, a special ceremony was organized by the Senior Tutor Office in front of the Academic Block of the University. During the ceremony, the Dramatic Club, Media Club, Debating Club, Calligraphy Club, Qirat and Naat Club of the University highlighted the Kashmir issue through their performances. The Vice Chancellor, Prof. Dr. Asif Ali addressed to 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 than 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. On this occasion, other speakers gave thought provoking lectures on Kashmir from a historical perspective and also enlightened the participants on the situation in the aftermath of revocation of article 370 and 35A of Indian constitution. 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.

9.17. Central Mosque Foundation Stone Laid

The foundation stone of 'Fatima tuz Zahra Mosque' at MNSUAM was laid by the Chairman, Punjab Board of Investment and Trade, and Special Assistant to the Chief Minister Punjab, Sardar Tanvir Ilyas Khan on February 12, 2021. Sardar Tanvir Ilyas Khan and others prayed to Allah for timely completion of the beautifully designed mosque on a Turkish model.

He specially appreciated the young architect of the mosque, who has recently completed his PhD in Architecture from Turkey. He said that he would contribute towards the construction of the mosque and considered that this charity is a blessing and will be a source of reward for us even after we leave this world. "I am very attached with this Varsity and it is a great pleasure to be here again and especially for this cause," he added. Prof. Dr. Asif Ali admired the unconditional support of Sardar Tanvir Ilyas Khan as he earlier supported MNSUAM for the construction of the state-of-the-art library and now he is contributing for the construction of mosque. The mosque will be built over a two-years period on an area of 23000 ft^2 having capacity for 3000 persons. The Vice Chancellor said that it is a noble cause and every person should be willing to contribute for its early completion.

9.18. Secretary Agriculture, Sindh Visited MNSUAM

Mr. Abdul Rahim Soomro, Secretary Agriculture/Supplies and Prices, Sindh flanked by Dr. Noor Muhammad Baloch (Director General, Agric. Research), Mr. Hidayatulah Chhajro (Director General, Agriculture Extension) and Dr. Aftab Ahmad Solangi (Project Director, Sindh Agriculture Growth Project) visited MNSUAM and held a meeting with Prof. Dr. Irfan Ahmad Baig (Dean, FSS&H) and Prof. Dr. Zulfiqar Ali (Director, ORIC) and the administrative staff of the University on February 16, 2021. Mr. Saqib Ali Ateel (Secretary Agriculture, South Punjab) welcomed the guests. They were briefed about the strategic importance of the University keeping in view the socio-economic background of the region. The Secretary informed the guests that South Punjab is a predominantly agrarian economy and the team MNSUAM is taking up innovative research and engaging the farming community for enhancement in Agriculture produce. He informed that the varsity is providing community services through effective outreach programs across South Punjab, 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 about completed and on-going developmental activities at the University. He informed that the construction work of new buildings comprising academic and administration blocks, hostels, guest house, library, staff colony and boundary walls has been completed and academic activities at the University's new campus equipped with all modern facilities are at full swing. The Secretary Agri., Sindh appreciated the University's initiatives and affirmed his support for the noble cause of serving the farming community.

9.19. Provincial Minister for Higher Education appreciated MNSUAM

Provincial Minister for Higher Education, Raja Yasir Humayun Sarfraz visited MNSUAM on February 18, 2021. Prof. Dr. Asif Ali, VC, MNSUAM briefed the Minister about the University's role in development of Agriculture sector. He apprised the guest about vision and mission of MNSUAM and on-going academic and developmental activities. He informed that the varsity is providing community services through effective outreach programs across Southern Punjab, particularly focusing on capacity building of the farmers. The VC maintained that he and his team have established the varsity from "nowhere" adding that the objective was to build an institution "with a difference" where faculty members can look beyond classrooms and focus on the sectoral development and serve the stakeholders.

"We are working on future farming, for which we have introduced a special undergraduate program "Farm Management" and Faculty of Veterinary and Animal Sciences is offering up to six programs including Animal Sciences, Fisheries and Aquaculture, Poultry etc. The Provincial Minister said that we are an agro-based country and the earning ecology developed at MNSUAM is worth recognition and appreciation. He further added that the masses of South Punjab are benefiting from this varsity. He appreciated the development projects being carried out in the varsity. Earlier, the Minister visited different projects and inaugurated a training on cultivation of mushroom. Mr. Wasim Khan Badozai (MPA), Prof. Dr. Uzma Quraishi (VC, Women University), Prof. Dr. Irfan Ahmad Baig (Dean, FSS&H) and others accompanied the honourable Minister.

9.20. Awareness Webinar on Health Effects of Tobacco

Office of Research, Innovation and Commercialization (ORIC) of MNSUAM in collaboration with Rafique Research and Educational Society organized a webinar entitled "Anti-Smoking and Tobacco Products" on February 11, 2021. Mr. Muhammad Javed Khan (Director, Tobacco Control Islamabad) was the Resource Person. He is currently serving as Director (Planning) at the Ministry of Law and Justice, Government of Pakistan and has developed National Tobacco Control Policy Framework. He has also introduced pictorial health warnings on cigarettes packs, banning tobacco advertisement, promotion and sponsorship raising awareness among the policy makers and general public on hazards of tobacco use and banning the import of tobacco and related products. He said that the use of tobacco in any form is a big threat to human health. He emphasized the need for launching a campaign against tobacco use among people, especially youth, to save them from the injurious effects of tobacco. He stressed the need for developing innovative and attractive campaigns for the young smokers to quit smoking. Prof. Dr. Zulfiqar Ali (Director, ORIC) added that smoking and chewing tobacco is a major cause of lungs and mouth cancer, asthma, respiratory diseases and cardiac problems, etc. He gave an advisory note to the Varsity students and emphasized them to be the ambassador of Anti-Smoking force and convince smokers to quit smoking for the sake of their own health and the community at large. Mr. Naeem Toor (Incharge, Character Building Society) urged the relevant authorities to implement the Prohibition of Smoking and Protection of Non-smokers Health Ordinance 2002 in true letter and spirit. He said that smoking is not only injurious to physical health but also brings psycho-pathological changes as well as alters the entire brain chemistry, making a person vulnerable to psychological and psychiatric illnesses. Mr. Naeem offered vote of thanks and applauded the efforts of students for their social action plans.

9.21. Countering Extreme Behaviors for Kashmir Cause

Youth Conference for Countering Extreme Behaviors was held at the University on February 25, 2021. Mr. Shehryar Khan Afridi, Chairman Kashmir Committee was the Chief Guest of the event. He emphasized that the Indian expansionist design is a major impediment to the peace and development in South Asia and the regional countries need to unite against such motives of Modi regime. The message of Kashmiris is effectively reaching all over the world through various media resources. Students can shake up the international community through social media.

The bitter reality of India's aggressive occupation of Kashmir and human rights violations calls into question the legitimacy of the United Nations. Mr. Shehryar Afridi said that the youth should be aware of the enemy's propaganda and must not distract from their roots. He said that self-belief and national pride is must for our youth, and they should work diligently to create a tolerant and moderate society. Pakistan is the jewel of the Asian crown and is a center of regional and global connectivity and trade. He said that in this information age, the enemy is using electronic gadgets to proliferate negative propaganda through fake news about Pakistan. Our armed forces are tackling all these propagandas effectively and are our pride. Pakistani youth should act as agents of change and work to unify and unite the nation and instill national pride among the people at large, he concluded. Prof. Dr. Asif Ali said that the international community and the UN should take note of the barbarism and oppression in the occupied Kashmir. Here at MNSUAM, we will continue to raise the voice of innocent Kashmiri sisters and brothers. He said that war is fought not only on the battlefield but also through pen and social media. On Kashmir issue, the vision of the younger generation needs to be further clarified. The sun of Kashmir's independence is about to rise. To highlight the atrocities committed in the Occupied Kashmir and Indian barbarism, the students on behalf of MNSUAM Arts & Dramatic Society performed their Best Skits "Kashmir Jal Raha Hai" & a Meme "No Nihaal ki Faryaad (A Tribute to APS Peshawar Martyers 2014)". The VC thanked the guests and said that the students, faculty and staff of MNSUAM are his pride because of their conduct and spirit of nationalism.

9.22. NUMS and MNSUAM will Work Together

The Vice Chancellor of National University of Medical Sciences (NUMS), Lt. Gen. Syed Muhammad Imran Majeed HI (M), [Retd.] visited MNSUAM and met with the VC, Prof. Dr. Asif Ali. The visitor was briefed about the University's achievement in academia and research, resource mobilization, outreach and community service. Prof. Dr. Asif Ali said that we have chalked out Vision 2030 and are marching to achieve the targets we have set forth. We are focusing on quality education and our priority is to produce agri. graduates with entrepreneurial skills and mind set. Liaison with industry and farmers is our strength and there are many success stories to our credit. Research projects worth 700 million PKR are in progress at the Varsity. We believe in pluralism and interdisciplinary collaboration and are ready to work with NUMS on collaborative projects. Syed Muhammad Imran Majeed praised the leadership and team MNSUAM and regarded it as a role model for other institutions. Afterwards, he visited the research farms, labs and site of the under construction 'Fatima tuz Zahra Mosque' mosque of the Varsity.

9.23. Special Lecture by Renowned Cricketer, Mr. Saeed Anwar

Renowned Former Cricketer and Islamic scholar Mr. Saeed Anwar delivered a spiritual talk at MNSUAM on February 24, 2021. The session attracted a large gathering of students, faculty and staff members. Emphasizing on teachings of Quran and Hadith, the reverent scholar said that life without religion is empty. The real pleasure and satisfaction could only be gained by putting Islamic guidelines into practice. He advised the students to learn the real purpose of their life and render services for humanity.

Stressing upon the need of synchronizing one's life and deeds with the instructions given by the Prophet Hazrat Muhammad (PBUH) and the injunctions of the Holy Quran, he urged all those present to mold their lives accordingly. He added that it is important for the youth to understand the essence of the teachings of Islam so that they may lead the way as ambassadors of their religion. At the end, he prayed for the well-being of the country and the unity of Muslim Ummah.

9.24. Awareness Webinar on World Water Day

Department of Agricultural Engineering, MNSUAM organized an awareness webinar "Reckoning Impact of Changing Climate upon Agricultural Water" regarding World Water Day on March 22, 2021. This day was observed under the international theme of "Valuing Water". The main objective of this seminar was to create awareness regarding declining water resources and associated problems. Another objective was to sensitize the farming community and general public towards judicious use of water for sustainable water management. Scientists from Australia, China and Pakistan presented research and learning experiences to improve the balance of water-cycle to help overcome water related challenges of the 21st century. Prof. Dr. JF. Punthakey (Charles Sturt University, Australia), Ms. Aye A. Myat (Chinese Academy of Science) and Dr. Manzoor Ahmad Malik (Ex Director, Pakistan Council of Research in Water Resources) were the key speakers of this webinar. Prof. Dr. Puntahkey talked about water distribution on the planet, water layer balance and withdrawals. Ms. Aye A. Myat emphasized on the use of high efficiency irrigation system rather than conventional irrigation practices to increase the water productivity of crops. She advocated the cultivation of crop with low water requirements especially in water scarce conditions. Dr. Manzoor shared his views about importance of fresh water resources for agriculture in Pakistan. He proposed innovative ideas for water conservation at domestic, industrial and farmer's fields. He further added that the climate change, shrinking and degradation of water underneath and on earth's surface is causing water crisis around the globe. Other speakers, Dr. Allah Bakhsh (Ex-Dean, Agri. Engineering, UAF), Prof. Dr. Irfan Ahmad Baig (Dean, Faculty of Social Sciences and Humanities, MNSUAM), Prof. Dr. Zulfiqar Ali (Professor, Institute of Plant Breeding and Biotechnology, MNSUAM) and Dr. Sarfraz Hashim (Chairman, Department of Agri. Engineering, MNSUAM) said that farmers should irrigate their crop fields based on soil analysis and crop requirements and highlighted the current situation and future challenges pertaining water scarcity. Other faculty members and a large number of students also participated in the webinar.

9.25. Webinar on Latest Agri. Technologies and ICM Gadgetry for Precision Farming

MNSUAM is building synergistic partnership between academia and industry for strengthening sustainability and local successful adoption of latest agri. technologies. In this regard, under industry-academia linkage program, a webinar on "Performance and Impact of Latest Agri. Technologies and ICM Gadgetry in Precision Farming and Effective R&D Programs" was jointly organized by MNSUAM and Farm Dynamics, Pakistan. The objective of this activity was to establish collaborative and proactive engagement of academia and industry for successful adoption and local transfer of latest agri. technologies and ICM gadgetry. For this purpose, team MNSUAM and FDP organized a brief interactive session to explore and discuss potential and impact of innovative technologies for precision and climate smart agriculture in Pakistan.

These technologies include: on-farm real time weather station with early warning alerts, drill and drop (Enviroscan) for irrigation scheduling, TDR, Digital insect pest monitoring systems, hand held plant and soil analysis and profiling gadgetries and role of ICTs and IOTs integration in agriculture. Mr. Muhammad Saood (Technical Manager, FDP) and Mr. Husnain Atta (Business Development Manager, FDP) were the key speakers of this webinar, while, Prof. Dr. Hammad Nadeem Tahir (Institute of Plant Breeding and Biotechnology, MNSUAM) and Ms. Memoona from FDP were the moderators of this event. Mr. Saood acknowledged that the MNSUAM is playing an important role in promoting the growth of the agro-based industries. Together with MNSUAM, we will be able to engage academia, researchers, industry players, and farming communities to tap the tremendous potential of precision farming for economic and environmental benefits. Prof. Dr. Asif Ali, Vice Chancellor, MNSUAM, said, "We are keen to strengthen our connection with public and private sector and to explore new opportunities for academic excellence". South Punjab is a predominantly agrarian economy and the team MNSUAM is striving hard to take up innovative research and engage with the farming community for productivity enhancement, he further added. A large number of students, faculty and researchers from allied institutes attended this event.

9.26. Upscaling of Climate Advisory Services

In pursuit of its moral obligation to serve the farming community of the region, MNSUAM has launched farmer advisory services that comprises of daily crop and weather specific tips and information. Farmer advisory services are ensuring demand driven and need based agro-technology transfer to farmers with different farming backgrounds. In order to make climate advisory more meaningful and to broader the impact, an online seminar was organized with the active involvement of all stakeholders. Seminar was attended by Dr. Natalie Suckall, Research Fellow, School of Earth and Environment, University of Leeds, England; Dr. David Corbelli, UK Met Office; Mr. Muhamamd Riaz Khan, Director General, Pakistan Meteorological Department; Mr. Pema Gyamtsho, Director General, The International Centre for Integrated Mountain Development; Mr. Barak Ullah, Additional Secretary Agriculture, South Punjab and Prof. Dr. Asif Ali, VC, MNSUAM. The participants agreed that climate and weather information is indispensible for climate resilience and adaptation and to avoid climate induced migration and decline in crop productivity. To counter act climatic extremes, medium and long term strategies need to be prioritized and make part of holistic policy drafted after stakeholder engagement and participatory research. It was agreed to extend the geographical and demographical range of climate advisory services to expand the outreach canvas so that large number of communities are benefitted from this activity. Prof. Dr. Irfan Ahmad Baig, Dean, Faculty of Social Sciences and Humanities, MNSUAM, Prof. Dr. Muhammad Ashfaq, Institute of Plant Protection, MNSUAM and Dr. Ghulam Rasul, Ex-Director General, Pakistan Meteorological Department also attended this meeting.

9.27. Vice Chancellor's Message on the Eve of Holy Month of Ramdan

Prof. Dr. Asif Ali in his message to the campus community highlighted the significance of this Holy month and its impact on human lives and the society as a whole. He 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 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. During this Holy Month, we should pray for the peace and prosperity of our homeland and to defy the COVID-19 pandemic that has affected every pillar of routine life. COVID-19 has affected our education system and people livelihoods are also at stake, he laminated. He urged that people can be protected by following the SOPs recommended by Government of Pakistan. This is an emergency situation which requires proactive and prudent measures to ensure health and safety of everyone. Further, as an academic and research based institutions, it is our responsibility to take it as an opportunity and find alternate ways to minimize the disruption of teaching and research schedule and reduce the risk of damage. We must act smartly as desperate times need desperate measures.

9.28. Celebrating World Bee Day and International Conference on Bee Pollination under Changing Climate Scenario

The Institute of Plant Protection, MNSUAM organized an International Online Conference on Bee Pollination under Changing Climate Scenario on May 20, 2021. 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.

9.29. Walk for Palestine Cause

To showcase solidarity with Palestinians, campus staff and students organized a walk for the Palestinian cause on May 21, 2021, calling for an immediate stoppage of atrocities by Israeli armed forces. The participants of the walk stated that "we may not live in Palestine, but Palestine lives in us". They chanted slogans against Israeli aggression and called for an end to Israel's aggression towards innocent Palestinians. Prof. Dr. Asif Ali (T.I), Vice Chancellor condemned Israeli terrorism against innocent Palestinians and said we would continue to raise this issue at every forum. He said that all Muslim countries of the world need to unite for the cause of Palestine's freedom. Other participants also condemned the Israel's ongoing and intensifying settlement activities in all manifestations in the occupied Palestinian territory and called for an end to the forced eviction of local Palestinians. The participants prayed for a "progressive and prosperous Palestine".

9.30. MNSUAM'S Inevitable Role to Combat Non-Traditional Security Threats in the Region

A briefing was organized at MNSUAM with renowned media houses regarding "Non-Traditional Security Threat and Our Role" on June 3, 2021. Prof. Dr. Asif Ali (T.I) said that the University is trying its best to cope with the upcoming challenges of non-traditional security threats.

He added that we need to rationalize the water and land use for food production which is going to be a national as well as an international challenge. He mentioned that the varsity is already working on these issues and has given priority to food and water. The University has a special focus on non-traditional security threats that have become an important part of overall national security agenda, he added. Pakistan is rapidly running out of fresh water resources for agriculture, which is an essential element to sustaining life. He said that population explosion posed another grave threat to its sustainability. Environmental pollution could be a non-traditional security threat for which University is working as part of Clean and Green Pakistan Program. The MNSUAM is ranked third in International UI Green Metric Ranking as an environmentally friendly organization in Pakistan. The Vice Chancellor remarked that to save our future generations, we need to have a clean environment and control on the population to ensure food security without depleting our natural resources. The audience including several media heads appreciated the research, educational services, and community work of the University and shared good vibes to see MNSUAM as a hub for Agricultural research in South Punjab.

9.31. World Environment Day Celebrated at MNSUAM

The Department of Soil and Environmental Sciences, MNSUAM celebrated the World Environment Day on June 07, 2021, by organizing an international webinar. The objective of this event was to highlight the importance of environment and to discuss possible strategies for mitigating environmental issues especially land degradation and water pollution. The Chief Guest of the webinar was Prof. Dr. Riaz Hussain Qureshi, Former Vice Chancellor, University of Agriculture, Faisalabad, and Prof. Dr. Javed Akhtar, Dean Faculty of Agriculture, UAF and Director, Institute of Soil and Environmental Sciences, UAF was the Guest of Honor. Prof. Dr. Riaz Hussain Qureshi stressed on the protection of environment and suggested some sustainable solutions in this regard. Scientists from Australia, China and Pakistan gave valuable presentations on different environmental issues and their sustainable solutions. Prof. Dr. Asif Ali (T.I), Vice Chancellor, MNSUAM said that it is an established fact that quality of our environment has 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. It is great honor as well as responsibility that Pakistan is the global host for the year for World Environment Day. The keynote speakers were Prof. Ed Barrett Lennard, Murdoch University, Perth, Australia; Dr. Hafiz Muhammad Warris, Chinese Academy of Sciences, Jiujiang, China; and Dr. Mohsin Nawaz, MNSUAM. Meanwhile, a digital poster and video competition on the theme of WED-2021 "Ecosystem Restoration" was also held among the University's students to sensitize the youth regarding the environmental issues. More than 100 students participated in the competition. Trees were also planted by the Vice Chancellor, Staff and students to mark the event. The event ended with the vote of thanks by Prof. Dr. Taveer UI Haq, Chairman, Department of Soil and Environmental Sciences, MNSUAM.

9.32. Engro to Establish a Learning Center with MNSUAM

Engro Fertilizers Limited has signed a Memorandum of Cooperation (MoC) with MNS University of Agriculture, Multan, to establish and develop Engro Learning Center at the varsity. Mr. Nadir S. Qureshi, CEO of Engro Fertilizers, and Prof. Dr. Asif Ali, (T.I,) Vice Chancellor, MNSUAM signed an MoC in a virtual ceremony.

Under the agreement, the ENGRO will identify and conduct research and development projects involving the academia and students, and support capacity-building of the university's students through internship program. Speaking on the occasion, Prof. Dr. Asif Ali stated that there is a clear need to strengthen academia-industry linkage to commercialize technologies and conduct joint outreach programs for benefit of the farming community. He thanked Engro Fertilizers for their urge to seek advancement in collaboration with academia and stepping forward to promote innovative technologies and playing an active role in the transformation of country's agricultural sector. The CEO said that the Engro Fertilizers is committed to bridging the gap between industry and academia to modernize and transform our agricultural landscape. Engro Learning Center will InshaAllah prove to be a step ahead to enable farmers with knowledge about modern farming practices and technology that will help boost farm productivity and improve the food security of Pakistan. Mr. Amir Iqbal, Chief Commercial Officer of Engro Fertilizers, added that this partnership will enhance the skills of young agrarians and support the development of new technologies to provide sustainable “seed to harvest solutions” to the farmers. Thus, the farmers will be able to grow by improving their profitability and crop output to make Pakistan more food secure.

9.33. Educating Cotton Farmers about Nutrient and Weed Management

An online seminar on "Nutrient Management and Weed Control in Cotton" was organized by MNSUAM in collaboration with BASF and Engro Fertilizers on June 9, 2021. The objective was to create awareness and sensitize farming community about these important production issues. Prof. Dr. Asif Ali (T.I) said that, we are always trying to contribute towards the betterment of the farming community. Crop nutrition and weeds are important aspects for enhancing cotton yields. Dr. Saghir Ahmad, Director Cotton Research Institute, Multan elaborated different aspects of cotton production including development of climate smart cotton varieties. Dr. Abdul Ghaffar, Chairman, Department of Agronomy emphasized for the integration of cultural practices that confer a competitive edge to crop on weeds with other control measures. Mr. Asif Ali from Engro Fertilizers discussed the cotton nutrition management program and important considerations in this regard. Mr. Malik Haider from BASF educated the participants about the significance of weed management and chemical weed control options.

9.34. Webinar on World Father Day

To mark the World Father Day, an online event was organized by the Directorate of Public Relations and Publication MNSUAM on June 22, 2021. The objective of the day was to recognize the contribution and services of fathers for their children. Mr. Amar Haider Gurru, a motivational speaker from Education University Lahore delivered a talk to offer tribute to all fathers on "Father's Day". He said that a loving father is like a tree with deep shadow The relationship of father is pure from every personal interest, artificial attitude and worldly benefits. Addressing on 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.

9.35. MNSUAM will Train Agriculture Finance Officers of National Bank of Pakistan

A team from National Bank of Pakistan comprising Mr. Saleem Khawaja (Product Development and Institutional Relations Wing), Mr. Tariq Lateef Ansari (Executive Vice President and Agriculture Divisional Head) and Dr. Khurram Shahzad (Product Manager, Rural and Agriculture) visited MNSUAM on June 27, 2021 and met with Prof. Dr. Asif Ali, Vice Chancellor. He informed the delegation that South Punjab has become the heart of agricultural activities in Pakistan, and the University is facilitating the farming community of this region through research innovations and technology transfer. Mr. Tariq Lateef said that the varsity is providing community services through effective outreach programs across South Punjab, particularly focusing on capacity building of the farmers and its achievement are exemplary. He showed his desire for collaboration and requested training of their Agriculture Finance Officers and other staff in areas of irrigation management, high efficiency irrigation systems, bee keeping, hydroponics, tunnel technology, kitchen gardening, fisheries and aquaculture, high density orchards and biofloc system. He emphasized that his staff want to benefit from University's learning experiences and technical resources. Prof. Dr. Asif Ali assured the technical support of MNSUAM for the cause of serving the farming community and strengthening the ties with other organizations.

9.36. COVID-19 Initiatives

In order to provide the safe environment to the faculty and staff working in the MNSAUM and the students studying in different degree programs, tangible actions were taken right after the breakout of the pandemic. Various activities are performed on a daily basis to ensure the implementation of SOPs regarding Corona pandemic management at MNSUAM. These activities are as follows i.e. First of all, all the rooms, corridors, staircases, door handles, staircases etc. of the University building (Postgraduate Block) are disinfected early in the morning on daily basis. Visitor counters have been established at all ports of entry into the buildings. It is also ensured that no one (faculty, staff, students and visitors) enter in the building without wearing of masks. Moreover, wearing of masks is also monitoring in classes on daily basis. Temperature checking of all entrants, including faculty, staff, students and visitors is also ensured on daily basis. Hand sanitization/washing facility is also available at all building entrances of the Postgraduate block. A policy of 50% of students presence at the campus is observed at all possible levels in order to avoid serious concerns about this disease. With mandatory requirements of vaccination for everyone, if someone has found the mild symptoms of COVID-19, he/she is allowed to work from home for the safety of other fellows and students. Moreover, social distancing of at least 6 feet has also been maintained in all offices, classrooms, labs, library, and canteen and is monitored on daily basis. Traditional greetings, handshake, gatherings have also been avoided in offices, classrooms, labs, library, canteen.

9.36.1. Academic Activities Contiued Despite COVID-19 Pandemic

Due to prevailing situation of Corona Virus Pandemic and subsequent directions by the Higher Education Commission of Pakistan, Federal and Punjab Governments, the University Administration announced closure of the University w.e.f. 16th March, 2020. However, as per HEC policy, classes are being conducted online in order to save students' precious time and involve them in academic activities.

Despite the COVID-19 pandemic, learning process was not stopped even for a single day as varsity is already on track to confront the same via effective online learning platforms and creation of hybrid/ blended courses.

9.36.2. Free Masks, Hand Sanitizers Distributed by Rover Scouts Unit

Pakistan is facing history's worst lockdown due to COVID-19 pandemic and the same is the case with the international community. So in this time of sheer instability, MNS-UAM Rover Scouts stood with the local community by caring and sharing with each other. The Rover Scouts Unit, MNSUAM conducted "on Road demonstration sessions" of physical distancing and distributed hand sanitizers and masks among local community from a fund generated through self-help, to general public en-route from University main gate, Double Phattak to Aziz Hotel Multan, and gave awareness to people regarding prevention of COVID-19.

9.36.3. COVID-19 Awareness Campaign for Farming Community

Awareness campaign for the safety of Farmers from COVID-19 during farming operations is also in progress. Precautionary guideline were prepared, published and distributed among farming community. A helpline has been established in which experts from MNSUAM is available to facilitate the farmers through expert opinion and consultancy.

9.36.4. Support to Deprived Local Community

MNSUAM Alumni Association in collaboration with students, staff, and faculty is distributing ration bags among the under privilege families of local community around the campus. More than 100 families have been facilitated under this noble drive.

9.36.5. Online Co-Curricular Activities

MNSUAM Students' Clubs/Societies/Forums are conducting online activities to keep the students and community motivated and positive during this physical distancing phase. Online competitions and training sessions for the capacity building of the students are conducted frequently.

9.36.6. Awareness through Print Media and University Website

There is no iota of doubt together we are facing a truly unprecedented situation. The global coronavirus pandemic is affecting all of our official assignments, families, our businesses, our communities, and our way of life. Faculty members of MNSUAM are sharing their thoughts through print media to promote wellbeing in the society. MNSUAM takes initiative to disseminate authentic information through university official website. For this purpose a dedicated tab of COVID-19 has been launched on university official website https://mnsuam.edu.pk/covid-19/. This tab provides information/important links about COVID-to faculty, students, staff and general public.

9.37. Social Action Projects

Sr. No.	Title	Resource Person	Date
1	"Competitiveness Entrepreneurship and Economic how to be Multilingual in Professional life"	Mr. Sardar Aslam Khan	30-5-2021
2	"Trans Education First How freelancing can change the life of Transgender community"	1. Mr. Munir (Consultant Scotish Power Scotland UK) 2. Ms. Sidra 3. Mr. Hafiz Ajmal Naseer	07-04-21
3	"How to build Leadership Qualities among Youth"	M. Tayyab	25-2-2021
4	International Seminar "Entrepreneurial Initiatives and Bigger Purpose in Creation"	Sir Wali Mutazavil	24-02-21
5	"Career Counseling with Youth at Rehman Public School Cha Kotha Wala Multan".	Dr. Rana M. Naeem P&C Specialist Mentor Active Citizenship and Community Engagement UAM 302	11-2-2021
6	"Awareness on Smoking and other Use of Tobacco Products"	Mr. M. Javed	11-2-2021
7	"Awareness on Child Sexual Abuse at Rehman Public School Cha Kotha Wala Multan".	Dr. Rana M. Naeem (P&C Specialist) Mentor UAM 302 Active Citizenship & Community engagement	11-02-21
8	"Professional Mindset and How to be Outclass in Information Technology"	Mr. Umair Majeed	30-1-2021
9	"Entrepreneurial Mindset Development Initiative of 2021"	Engr. Sayed Rizwan Ali Assistant Professor. Behria University Karachi	30-12-20
10	"Gender Equality and Entrepreneurship"	Mahar Ijaz Sayil	30-6-2021
11	"Social Entrepreneurial Mindset and Pandemic"	Imran Javed, Producer Radio Pakistan, Bahawalpur	27-05-21

12	"Inauguration of Bio Gas Plant Social Action Plan"	Dr. Rana M. Naeem P&C Specialist Mentor Active Citizenship and Community Engagement UAM 302	04-05-21
13	"Environmental entrepreneurship and today Youth"	Hassaan Bin Saadat Teacher, Trainer, Traveller Punjab University Lahore	28-05-21

SPORTS

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-10

SPORTS

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 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 for participating 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 Baig — Convener Sports
- Mr. Muhammad Arqam Iqbal — Incharge Sports
- Ms. Saima Rasheed — Member
- Mr. Qaisar Javed — Sports Coach

Sr. No.	Sports Activities	Date	Boys	Girls	Venue
1.	Cricket Championship 2021	29-06-2021	234	26	Sports Ground, MNSUAM
2.	Female Table Tennis Event at Jasmine Courts 18-22 Feb 2021. 16 Girls participated in this event	18-02- 2021	-	16	MNSUAM
3.	HEC Football Intervarsity 15-18 Feb, 2021 Championship at UAF. In this championship 11 teams participated and MNSUAM qualified for Semi Final.	15-02- 2021	17	-	UAF, Faisalabad
4.	HEC Cricket Intervarsity 2020-21 Championship Zone-E at IUB. MNSUAM won match from UVAS.	05-01-2021	15	-	IUB, Bahawalpur

1.	HEC Football Intervarsity 24-27 Feb 2020 Championship at UVAS. 18 teams participated in this championship and MNSUAM qualified for quarter final.	24-02-2020	18		UVAS, Lahore
2.	HEC Cricket Intervarsity 23-26 Feb, 2020 Championship at PU, Lahore. MNSUAM won match against UVAS, Lahore.	23-02- 2020	20	-	PU, Lahore
3.	MNSUAM Badminton Championship Dec 18-19, 2019. In this Badminton Championship 18 female and 42 male teams participated.	19-12-2020	84	36	Sports Complex, Multan

UNIVERSITIES BUILDING LEADERSHIP

Muhammad Nawaz Shareef
University of Agriculture
Multan

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

- Prof. Dr. Asif Ali received "Tamgha-e-Imtiaz" for his outstanding performance and contribution to the development of Agriculture sector as a Plant Breeder and Geneticist.
- 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 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 boll worm management, Cotton Mission, monitoring and evaluation of field activities of Agriculture Extension Department etc.
- Prof. Dr. Ishtiaq Ahmad Rajwana 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.
- Paul Harris Fellowship was conferred on Dr. Ayesha Hakim by Rotary International.
- Dr. Muhammad Saifullah, Assistant Professor Agri. Engineering is a member of board of study of 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 member of board of study of 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
- Dr. Umar Ijaz Ahmed got the honorable charge of "Assistant Leader Trainer" by Pakistan Boy Scouts Association.

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. 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 first admission inquiry to the last day at the Campus. 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 potentialities. The purpose of all such activities is to provide students 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
6. Dramatic Club
7. Media Club
8. Young Students Peace Society
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

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

11.2.1. Celebrations of National/International Days

- Flag hoisting Ceremony and tree plantation at Pakistan Independence Day Celebrations (14-08-2020)
- Online war song competition at National Defense Day (06-09-2020)
- Adbi Bethek on Iqbal Day (09-11-2020)
- Interactive Session on World AIDS Day (01-12-2020)
- Awareness Session on Anti-corruption Day (09-12-2020)
- Session on Quaid's day "Youth as Catalyst for Leadership" (25-12-2020)
- Open Theater "Kashmir Jal Raha Ha" by Dramatic Club on Kashmir Solidarity Day (05-02-2021)
- Debate Competition on Pakistan Resolution Day (23-03-2021)

11.2.2. Inter-Faith Harmony and Peace Promoting Activities

- Christmas Celebrations with Christian Community of Campus (25-12-2020)
- New Year Celebration with minorities at Campus (01-01-2021)
- Youth Conference for Countering Extreme Behaviors (25-02-2021)
- Istaqbaal-e-Ramzaan; Ramzan An opportunity to learn patience and peace (12-04-2021)

11.2.3. Capacity Building and Wellbeing

- CADRE Training in collaboration with Rescue 1122 (26-10-2020)
- Blood Screening and Medical Camp for Newly Admitted Undergraduate and postgraduate Students of MNSUAM (05-11-2020)
- Online session "Take Action on your Dreams" with Mr. George Lewis from Rotary Club of Florida (18-11-2020)
- Tajheez-o-Takfeen training session (16-02-2021)
- Awareness session "How to build leadership qualities among youth" (25-02-2021)

11.2.4. Social Drives and Volunteer Work

- Awareness of COVID-19 Seminar among TG and Public (02-07-2020)
- Awareness Session on Child Sexual Abuse (11-02-2021)
- Trans First Education, "How Freelancing can change the life of Transgender Community" (07-04-2021)

11.2.5. Competitions organized

- Quiz competition regarding the “History of Pakistan” (10-08-2020)
- Quiz competition on the topic “Movement of Pakistan 1940-1948” (18-08-2020)
- Online Debate Competition on Corruption was organized (07-12-2020)
- Online Poster Competition (08-12-2020)
- Khush Alhan Azaan Competition (18-12-2020)
- Intra-University debate competition on the topic of Kashmir (05-02-2021)
- Online Singing Competition among students (23-05-2021)
- Quiz competition on the topic “HISTORY OF MASJID-E- AQSA" (26-05-2021)

11.2.6. Entrepreneurial and Professional Skill

- Youth Conference on Entrepreneurial Mindset (30-12-2020)
- Career Counseling with Youth (11-02-2021)
- International Seminar on "Entrepreneurial Initiatives and Bigger Purpose in Creation" (24-02-2021)
- Professional Mindset and how to outclass in Information Technology (06-01-2021)
- Gender Equality Entrepreneurship (30-06-2021)
- Environmental Entrepreneurship and Today's Youth (28-05-2021)
- Competitiveness Entrepreneurship and Economic how-to Multilingual in Professional Life (30-05-2021)
- Social Entrepreneurship Mindset and Pandemic (27-05-2021)

11.3. Rover Scouts Unit, MNSUAM

Scouting in MNSUAM was started on December 02, 2016, in the supervision of Prof. Dr. Asif Ali, Vice Chancellor MNSUAM, who took oath as a Pattern-in-Chief/Chief Scout of Rover Scouts Unit, MNSUAM. It is just only one movement or society of MNSUAM in which the Vice Chancellor is also a member. Dr. Umar Ijaz Ahmed (Assistant Professor of Agribusiness and Applied Economics Department) is the President Rover Scouts Unit MNSUAM. Under the supervision of Pattern-in-Chief, the participation of girls in Scouting also started in University on February 25, 2021. Dr. Amir Bakhtavar (Lecturer, Agronomy) and Dr. Naheed Bano (Assistant Professor, Animal Sciences) took oath as the male and female Vice-Presidents, respectively.

The mission of scouting is to contribute to the education of young people, through a value system based on the Scout Promise and Law, to help build a better world where people are self-fulfilled as individuals and play a constructive role in society. Scouting is a movement that aims to support young people in their physical, mental and spiritual development, that they may play constructive roles in society, with a strong focus on the outdoors and survival skills.

It is one of several worldwide youth organizations. Scouting is a great way to get your child involved. Through scouting organizations, children make friends, develop skills and become involved in their community. There is no doubt that parent's value what Scouting does for their children. Parents say Scouting gives their children more confidence, responsibility, a broader set of friends, a chance to pursue things they might not get to do otherwise, adventure and an extended family.
The Rover Scouts Unit, MNSUAM is a dynamic, self-reliant, educational organization providing value based, challenging and attractive program through efficient leadership and effective organizational management, making a significant contribution to the society and the country.

Scouts from unit had been participated in the following events:

- Jota-Joti (Jamboree on the Air-Jamboree on the Internet) October 15-17, 2020
- Participated in Presidential Rover Scouts (PRS) Test 2020
- 13th Provincial Desert Hike for Rover Scouts/Leaders Derawar Fort, Cholistan Bahawalpur, January 2-8 2021

Rovers from RSU MNSUAM also organized the following events at MNSUAM for students and faculty:

- 02 Days Rescue Training Course, Community Actions for Disaster Responses (CADRE) during October 26-27, 2020
- 03 Days Scouts Membership and Hamdam Badge Camp at MNSUAM during November 04-06, 2020
- Along these events Rover Scouts also organized or managed the Admission Guidance Desk during 2020 admissions at university.
- Dr. Umar Ijaz Ahmed (President RSU) has been awarded with the charge of "Provincial Coordinator (Punjab) for World Scout Environment Programme (WSEP)" from Chief Commissioner, Pakistan Boy Scout Association. He also completed Assistant Leader Trainer (ALT) course during 2020.

11.4. Career Development Center/Placement Bureau

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). Detail 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 our face book page: "Career Development Center, MNS University of Agriculture, Multan". The link of Facebook page is given here as https://www.facebook.com/MNSUAM.CDC. More than 1900 people are connected through social media which included students, faculty members and employers. It has a great effect in disseminating information among the students which included scholarship information adds, Job posts, motivational posts, information regarding seminars, trainings, 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 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 all graduates of all degree programs passed out during each year. This year also bio-data of all passing out students of session 2016-2020 and post graduate session 2018-20 are being collected. Data base of the alumni students have been established with contact numbers and postal addresses. WhatsApp group 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 required 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 played a vital role.

This year we were able to find out 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 committee. One faculty member was nominated by Chairman of each department as focal person of respective department for internship placements. The main objective of the committee was to find out internships in well reputed private organizations, institutes, private progressive farms and second option was to find out paid internships. Different organizations were contacted for internship offers. Many of the students were offered paid internships by Syngenta Pakistan Ltd, Neelum Seeds Pvt. Ltd. Jahaniann, FMC Pvt. Ltd. Multan, Sun Crop Pvt. Ltd. Multan, Evyol Group (Kanzo Ag. Pvt. Ltd.), Tareen Agricultural Farm, Lodhran (Residence+Meal), Al Karam Seeds Sadiqabad, Arain Agriculture Farm Dhanote (Residence+Meal), Rao Zarai Farm Dhanoter (Residence + Meal), UBL Multan etc. We were able to place our 85% students at private farms, Agro based Industry, Banks majority of them were offered paid internships, i.e. 53% students of B.Sc. (Hons.) Agriculture and more than 45% students of BBA Agribusiness were placed on paid internship at 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.

11.4.3.3. On Campus Recruitment Drives and Visits of Different Organizations for Job Opportunities

Career Development Center/Placement Bureau helps University graduates to find out better job opportunities at different Companies/Organizations and Institutes etc. Our initial survey indicated that majority of our graduates wanted to continue their studies. But for those, who wanted to start their career, following efforts have been made for the placement of our graduates during this year 2020-21. Different jobs and scholarship advertisements are being posted using Alumni Network and notice board.

We helped the graduates to find out jobs at different Companies/Organizations and arranged their interviews through personal contacts, social media, mobile calls, SMS and Emails. Agriculture graduates have been placed at different Agro-based companies/Organizations through personal contacts and arranged interviews.

Different organizations contacted us for assistance in recruitment process and our placement office assisted in collection of CV's of graduates and encouraged graduates to apply for recruitment.

11.4.3.4. Awareness Seminar of ATRULE Technologies

ATRULE Technologies offered internships/project-based jobs to fresh graduates of Computer Science. Campus awareness seminar was organized at Seminar Hall of Academic Block MNSUAM. Muhammad Zaeem Khan, Senior Software Analyst of ATRULE Technologies addressed the students and briefed about the process of students engagement at their organization. More than 50 final year students of BS CS attended the seminar.

11.4.3.5. Written Test and Interviews Conducted by PepsiCo Pvt. Ltd. for Paid Internship

a. Orientation Session:

PEPSICO Pakistan CU offered paid internships to Agriculture Graduates of MNSUAM. In response to an open advertisement fifty-five applications were received from students and fresh agriculture graduates. A team of four officials of PEPSICO Pvt. Ltd. visited MNSUAM. Dr. Muhammad Ishtiaq, Focal Person, CDC/PB welcomed the guests. Representative of Pepsico briefed about company and its different functions, units and business plans. He specifically elaborated paid internship offer and its objectives and appreciated cooperation of CDC/PB.

b. Computer Based Online Written Test

A computer based online written test for scrutiny of candidates was conducted in Computer Lab. One hundred students registered themselves. Whereas fifty students/graduates appeared in the test. Almost thirty-seven candidates qualified for the interview.

c. Interviews

PEPSICO Pvt. Ltd. team conducted interviews of qualified students. Ten internees were offered internship from various disciplines of Agriculture in PEPSICO Pakistan CU in Agro unit.

11.4.3.6. Interviews conducted by Syngenta:

Syngenta Pvt. Ltd. team visited MNSUAM and conducted interviews of 10 students of Plant Pathology for subject specific job position at R&D department and shortlisted some students for further processing through HR.

11.4.3.7. TARA Group Pvt. Ltd.

A recruitment drive conducted by TARA Group Pvt. Ltd. twice this year. Mr. Azhar Bukhari HR Manager visited MNSUAM on 12.11.2020 and 15.04.2021 with his team. Applications were invited for various posts in sales and R&D through open advertisement.

An orientation session was organized prior to written test for the applicants. Mr. Azhar Bukhari HR manager briefed about the company and its different functions. He also briefed about the recruitment process. In response to an open advertisement 128 & 150 graduates applied for the positions advertised.

A written test for candidates was conducted in Seminar Hall. More than eighty MNSUAM graduates appeared in both written tests. Forty-seven candidates qualified for the interview.

11.4.3.8. NRSP BISP

NRSP BISP offered paid internships to Agribusiness Graduates of MNSUAM. In response to an open advertisement sixty applications were received from students and fresh agribusiness graduates and shortlisted students were called for further selection process by the organization.

11.4.3.9. Paid Internship offered by Qureshi Farm Kehror Pacca

The owner of Qureshi Farm Kehror Pacca offered paid internship to undergraduate students of various disciplines. Ten students completed paid internship at Qureshi Farm for four months and received certificates.

11.4.3.10. Recruitment at Bank of Punjab for the Positions of "Agriculture Relationship Managers"

A written test was conducted at MNSUAM organized by CDC/PB for paid internship offered by Bank of Punjab. Representatives of Bank of Punjab conducted written test followed by interviews of qualifying students of BBA Agribusiness and B.Sc. (Hons.) Agriculture Major Agriculture Economics facilitated by CDC/PB MNSUAM. Nine students were offered paid internship at bank of Punjab.

11.4.4. Agriculture Evolutions

Mr. Sadaqat Ali, an alumni graduate of B. Sc. (Hons.) Agriculture (Entomology) 2016-2020, launched his own YouTube channel (https://www.youtube.com/channel/UCXbLi4YiaN8cWdOl3kbKHDw) to guide the public through electronic media. Technical guidance, linkages with Agriculture Extension department and motivation was provided by CDC/PB to the student. Student is earning handsome amount of money through his programs. He has more eight thousand and seven hundred viewers so far.

FINANCE

Muhammad Nawaz Shareef
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Multan

CHAPTER-12
FINANCE

12.1. Financial Year at a Glance

	Million PKR		
Particulars	Approved Budget 2020-21	Revised Budget 2020-21	Actual Budget 2020-21
Receipts			
Opening Balance	16.268	28.731	28.731
Govt. Receipts	225.806	218.723	218.723
University's Own Sources (Self-Generated Income)	261.805	239.374	238.939
Total Receipts	**503.879**	**486.828**	**486.393**
Expenditures			
Salary Expenditures	295.642	248.143	246.091
Non Salary Expenditures	232.249	218.079	211.214
Total Expenditures	**527.891**	**466.222**	**457.305**
Surplus/Deficit	**24.012**	**20.606**	**29.088**
Development Budget	246.283	237.157	237.157
Recurring Budget	527.891	466.222	457.305
Self-Generated Income	261.805	239.374	238.939

	In PKR		
Trend of Per Student Spending (Salary Expenses Basis)	73,911	74,607	73,985
Trend of Per Student Spending (Non-Salary Expenses Basis)	32,117	65,544	63,504

Note: i) Research funding details are given vide Chapter 2
ii) Scholarship avenues are provided in Chapter 14

UNIVERSITY GOVERNANCE

Muhammad Nawaz Shareef
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CHAPTER-13
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 standard of teaching, research, technological development, publication and other academic pursuits. As of June 30, 2020, a total of 29 meetings of Syndicate have been held, out of which held in 2020-21 are given below:

Sr. No.	Syndicate	Date
1	26th	11.07.2020
2	27th	04.12.2020
3	28th	24.01.2021
4	29th	29.04.2021

13.2. Selection Board

The Selection Board considers the applications and recommend 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 election boards held during current year is given below:

Sr. No.	Selection Board	Date
1	08th	20.11.2020
2	09th	23.12.2020
3	10th	27.01.2021
4	11th	01-02.03.2021
5	12th	30.06.2021

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.	F&PC	Date
1	09th	15.01.2021
2	10th	16.06.2021

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.	Board of Faculties	Date
1	09th Meeting of Board of FA&ES	27.04.2021
2	05th Meeting of Board of FABE&T	21.01.2021
3	02nd Meeting of Board of V&AS	01.06.2021
4	05th Meeting of Board of FSS&H	18.02.2021
5	06th Meeting of Board of FSS&H	04.06.2021

13.5. Board of Advanced Studies and Research (BAS&R)

The Board of Advanced Studies & Research advises on all matters connected to the promotion of advanced studies and research publications in the University. Following meetings of the Board were held during 2020-21:

Sr. No.	BAS&R	Date
1	09th	07.07.2020
2	10th	31.12.2020
3	11th	24.03.2021

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 life of the University.

OFFICE OF THE RESOURCE GENERATION/DEVELOPMENT

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CHAPTER-14
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 especially for the financial assistance of brilliant and needy students from the Higher Education Commission, Islamabad, Government of the Punjab, Industrial Partners of the university and the MNSUAM own resources.

The P&D Office is also vigorously pursuing the funding agencies with the plan proposals in order to develop a state of the art agriculture institution in the Southern Punjab.

14.1. Scholarship Program

We believe students from all economic backgrounds should have the opportunity to attend the MNS University of Agriculture, Multan. Finances should not be a barrier to getting a world-class education. There are several options of financial aid for students and need to explore the many scholarship options available that help make paying for university affordable as possible.

During the 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 Scholarship to the deserving and merited students of MNS-University of Agriculture, Multan

1. Ehsaas Scholarship
2. University Merit Scholarship
3. HEC Need Based Scholarship
4. Need Based Scholarship from own resources (MNSUAM)
5. Punjab Education Endowment Fund
6. Pakistan Bait-Ul- Mal Stipend
7. Student Loan Schemes
8. Neelum Seeds Need Base Scholarships
9. Ms. Asia Sultan Need Base Scholarships
10. Asia Feed Mills Scholarship Program
11. Colony Textile Mills Scholarship program
12. FFS Scholarship Scheme
13. Gurmani Foundation Scholarship
14. Muhammad Rasheed Memorial Scholarship
15. Mehmood Need Base Scholarship Program

14.2. Miscellaneous Facilities

1. Tuition Fee Concession (50%) to 10% students of the class by Dean Faculty.
2. Facility to deposit dues in installments for financially Constraint 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 student 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 2020-2021

Scholarship Type	Awardees	Amount (Million PKR)
Merit Scholarship	217	1.82
The Punjab Educational Endowment Fund	81	2.87
Pakistan Bait-Ul-Mal Stipends	9	0.17
HEC Need Based	80	6.00
Neelum Seed Need Based	2	0.19
Ms. Asia Sultan Need Based Scholarship	2	0.10
Asia Feed Mills Scholarship	2	0.20
Maqbool Need Base Scholarship	2	0.20
Rasheed Memorial Scholarship	2	0.12
Ehsaas Scholarship	400	34.22
Prime Minister Fee Reimbursement Scheme	7	0.23
Total	**804**	**46.11**

14.4. Planning & Development Office

The P&D office of MNS University of Agriculture, Multan is functioning under the leadership of Vice Chancellor with the following major objectives:

- To scrutinize and submit the development projects of the university for seeking funding from different donor agencies.
- To follow the already submitted projects for their approval and release of funds from competent authority.
- To monitor the implementation of approved development projects as per the approved scope, cost, and duration.
- To coordinate and furnish progress/implementation reports of development projects to the sponsoring agencies.

During a very short span, the following ADP Schemes have been approved by Govt. of Punjab and Higher Education Commission, Islamabad:

1. Establishment of Muhammad Nawaz Shareef University of Agriculture, Multan-Phase-II (Rs. 1746.258 million).
2. Provision of fresh Irrigation water and basic infrastructure at Jalalpur Pirwala Research Farm of MNSUA Multan (Rs. 170.0 million).
3. Enhancing productivity in 10 low producing tehsils through deployment of fresh Agri. Scientists at farm level-Pilot Project (Rs. 200.0 million).
4. Provision of basic facilities at MNS University of Agriculture Multan (Rs. 1356.4 million).

Besides aforementioned approved schemes, the following two schemes submitted to Agriculture Department for inclusion in the ADP 2021-22 which were cleared in the departmental appraisal and reflected in the ADP 2021-22:

1. National Crop Genomics & Speed Breeding Centre for Agriculture Sustainability (Rs. 450.0 million).
2. Feasibility study for establishment of sub-campus of MNS University of Agriculture, Multan at Khanewal (Rs. 10.0 million).

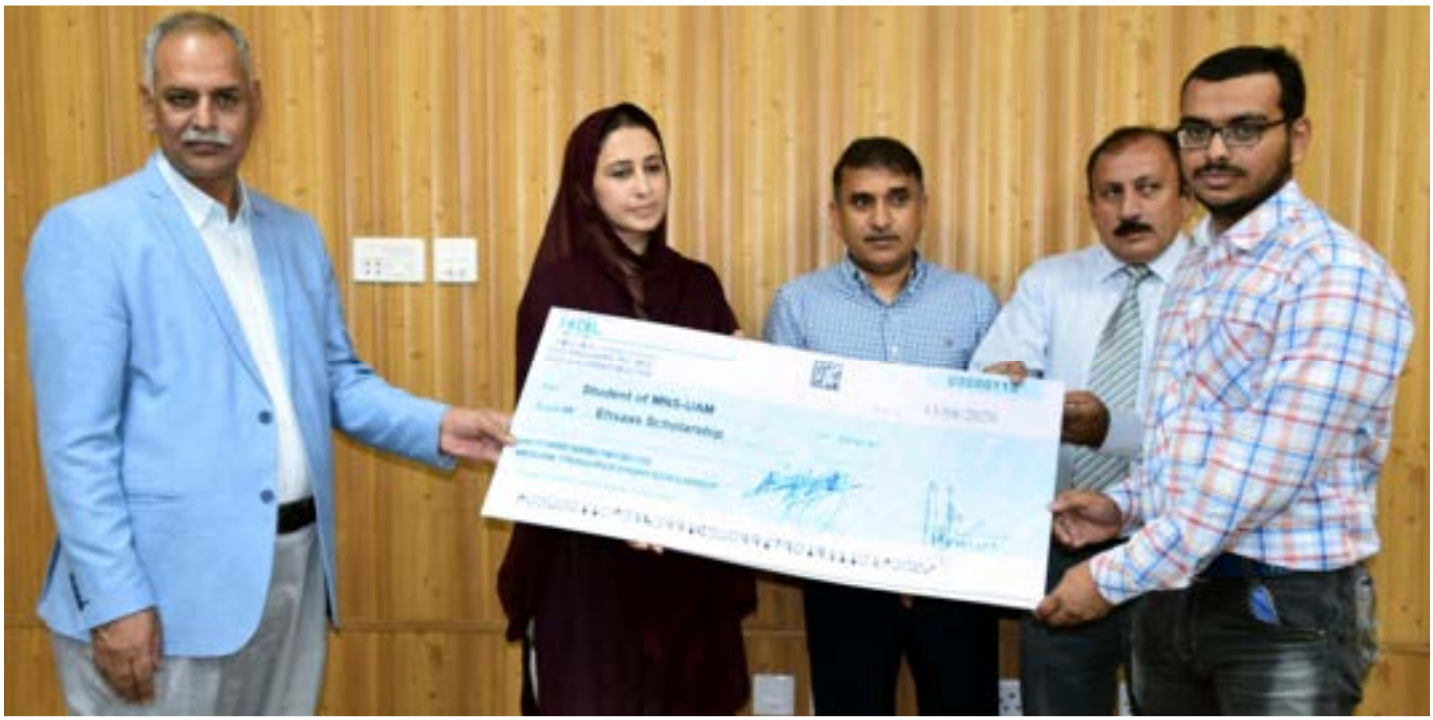
Under ADP Scheme titled "Establishment of Muhammad Nawaz Shareef University of Agriculture, Multan (Phase-II)", funds amounting to Rs. 1746.258 million were provided. The project has been completed by 30-06-2020 and its PC-IV is submitted during January, 2021. Through the said scheme, infrastructure including one Academic Block, one Administrative Block, two Hostels, 15 Staff residences, one Faculty Hostel, one Overhead Reservoir, one Utility Center, sheds for Agri. Implements and Motor Vehicles and Boundary wall with razor cut wire has been completed. Other components of the project which have also been completed include:

- 500 acres of culturable waste land provided by the Government of Punjab (free of cost) near Jalalpur Pirwala (JPPW) has been developed with the help of bulldozers and laser land levelers.
- 5000 meter long watercourse along with culverts and storage ponds has been constructed.

- Lab equipment for undergraduate and post graduate research labs have been procured.
- ICT equipment for internet connectivity of the computer labs to meet the requirements of courses related to agriculture and allied disciplines have been procured.
- Furniture & Fixtures for classrooms, offices and labs have also been procured.
- Farm and Agricultural Implements for use at research and experimentation farms has been procured.
- Transport for the faculty and students and standby generators have been procured.

The ADP Scheme Titled "Provision of fresh Irrigation water and basic infrastructure at Jalalpur Pirwala Research Farm of MNSUA Multan" comprising of Rs.170.0 million with Gestation Period 2019-20 to 2020-21 (24 Months) has been approved and utilized to carry out the Civil Work including laying of 8991 KM pipeline for irrigation water, animal shed, input store, implement shed, training hall & boundary wall. Furniture & Fixture has also been procured for training hall at Jalalpur Pirwala.

The ADP Scheme Titled "Enhancing productivity in 10 low producing tehsils through deployment of fresh Agri. Scientists at farm level (Pilot Project)" comprising of funds amounting to Rs. 200 million with the Gestation Period 2019-20 to 2020-21 (24 months) has been approved and funds is being utilized to achieve the project objectives by deploying the number of 374 internees in 10 tehsils of Punjab. The project objective would contribute to increase agricultural production, more employment opportunities in rural areas, higher income from the farming, better living standards of the farmers, and improved environment.



EXTERNAL LINKAGES

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-15

EXTERNAL LINKAGES

CHAPTER-15

EXTERNAL LINKAGES

CHAPTER-15
EXTERNAL LINKAGES

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

MNSUAM seeks to garner 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 deeper impact on the world of Agriculture, science and technology. For the 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. MNSUAM has so far developed linkages with 33 international and 74 national sister organizations.

This office also 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. Directorate of External Linkages aim to facilitate the faculty/departments/directorates/institutes for promoting R&D activities through external collaborations, attract and facilitate placement of international students in MNSUAM. Developing reciprocal understanding between the International Organizations for resource and environment conservation is the mandate of Directorate for resource mobilization and to link with public policy stake holders for seeking directions and providing policy input.

15.1. Vision

- Directorate of External Linkages aim at developing strong liaison with high ranked universities and research institutes of the world.
- Joint Degree Programs with the conscious endeavors for internationalization.
- To take public, private and non-governmental organizations on board for achieving the main goals of education, research and development in various faculties in the university.

15.2. Achievements

- During the fiscal year 2020-21, External Linkages has signed 4 MoUs/AoCs with International organizations and 25 MoUs/AoCs are signed with national private and public sector partners from Pakistan.

15.3. MoU/AoCs with International Organizations

University/College/ Organization	Country	Date	Area/Field of Cooperation	Activities/Achievements during reporting year	Focal Person
Jiangsu University, China	China	17-06-2021	To promote high-quality development of the belt and Road cooperation. To promote internationalization of MNSUAM and JSU. To develop collaborative interest in research activities of MNSUAM and JSLI. To deepen the understanding at each institution's historical, cultural and social issues as they relate to its counterpart. To work together in good faith to coordinate all academic and research areas within the scope of this agreement.	The AoC in which I am a focal person is recently signed and I have received its copy 2 days ago, yet there are no admissions under this agreement. However, an admission portal has been created for nominated faculty and staff of MNSUAM.	Engr. Shahzad Ahmed, Lecturer AE
EBERWALDE University for Sustainable Development Germany	Germany	12-10-2020	Supporting researchers in conducting field research, Exchange of researchers (Including Master Students), Scientific Seminars, Conferences on the issues of interest to both parties.	1. Ms. Mehwish Zubari, Ph.D student of EBERWALDE University for Sustainable Development Germany visited MNSUA for research fields of cotton & farmers in Multan. Due to COVID-19 she unable to visit again MNSUAM in February, 2021 2. Prof. Dr. Michael Spies will visit MNSUA in August 2021 for future research collaboration.	Dr. M. Asif Raza

Niha Corp, A California Corp-USA	USA	05-12-2020	Joint Research Activities, Combined Outreach Activities (Seminar, Workshops, international meetings and conferences), Transfer of Technology, Establishment of research lab in Multan with shared resources of both parties, Exchange of potential high yielding plant germplasm.	A project titled "Isolation and Evaluation of Halotolerant Nutrient Mobilizing Bacteria" of 0.525 million rupees is running under this collaboration.	Dr. Shakeel Ahmad
Collaboration Agreement between Razbio Ltd, UK, & Swansea University, UK & MNS-UAM	UK	24-8-2020	Seminars, Mosquitos traps installation in the Lahore, Multan and Rawalpindi.	1. Design of Mosquito traps made by used plastic bottle has been screened out & finalized 2. Studies of Entomopathogenic Fungi have also been screened out. 3. Lab trials have been successfully conducted 4. Field trails have been successfully conducted 5. One International Workshop has been conducted 6. One International webinar has been conducted 7. Capacity building of students has been done 8. Capacity building of faculty members & officers & Officials of Health department has been done regarding Smart Monitoring & Control of Dengue Vector.	Dr. Unsar Naeem Ullah

15.4. MoU/AoCs with National Organizations

University/College/ Organization	Date	Area / Field of Cooperation	Activities/Achievements during reporting years	Focal Person
MoU with NAVTTC	28-06-2021	The programme will be titled "Skills for All" Hunarmund Pakistan Program (Cohort-B) with an overall estimated cost of Rs.6,245,000/- for skill development training of 175 youth. Parties will join hands for vocational training of 175 youth for (03-06 months) in following trades (Tunnel Farming and Agri. Business, Honey Bee Farm Manager (Batch-1), Honey Bee Farm Manager (Batch-2), Fish Farming (Batch-1), Fish Farming (Batch-2), Pesticide and Fertilizer Technician and Agriculture Farm Manager).	Short Courses Classes are in progress (Tunnel Farming and Agri. Business, Honey Bee Farm Manager (Batch-1), Honey Bee Farm Manager (Batch-2), Fish Farming (Batch-1), Fish Farming (Batch-2), Pesticide and Fertilizer Technician and Agriculture Farm Manager).	Prof. Dr. Shafqat Saeed
Syngenta Pakistan Limited, Karachi, Pakistan	10-06-2021	Both Syngenta and MNS-UAM agree to make evaluation of the insecticides resistance against cotton whitefly being commercialized through field trials. Syngenta shall provide accesses to laboratory insecticides trials at MNSUAM and other such trials. conduct joint trial program to develop resistance management recommendations of different insecticides	Insecticides resistance evaluation against Cotton whitefly Lab	Steering Committee 1. Vice Chancellor MNS-UAM (Chairman) 2. Director ORIC, MNSUAM 3. Dean, FA&ES 4. Director External Linkages, MNSUAM 5. General Manager, Syngenta Pakistan

		being commercialized by Syngenta in Pakistan. An effective role for resistance outreach, to elevate public dialog towards a broader understanding of the societal benefits of resistance evaluation. organize seminars, training and Conferences. Syngenta would be liable to appropriately label the trials in accordance with the Testing Protocols.		6. Business Sustainability and CPD Head, Syngenta Pakistan 7. Technical Support Manager, Syngenta Pakistan
Sawie Systems, Lahore	21-06-2021	Cooperate in science and technology in the fields of agriculture (crops & livestock), environment, water and natural resources, for the purpose of supporting technology innovation for improving the access of services, training, knowledge and broadening the existing knowledge base for agricultural development and strengthening the research, extension and outreach activities of the Parties.	The Parties agree to explore opportunities to develop more specific activities regarding collaborative research projects in areas including: I. Development and test data gathering tools for agritech sensing based on remote sensing and other Earth Observation tools, deployment of sensors in Punjab locations. II. Exchange of information through the development of joint knowledge exchange events/ meetings to interact with the stakeholders. III. Develop IoT application for the environment and agritech sector. IV. Develop farm management and farm economics tool to predict income and losses from a certain enterprise (crop types,	Engr. Dr. Sarfraz Hashim

			etc.) V. Develop international research links	
Jaffer Agro Services (Pvt.) Limited	02-06-2021	Conducting joint research and development projects and cooperation in individual projects. JASPL would provide paid internship opportunities for the students of MNS University of Agriculture, Multan for their efforts and services rendered by them. JASPL would provide in-depth classroom training (with refreshments), resources (hardware and Software) and field supervision/support to ensure each student's work is facilitated. Participation certificates based on performance would be provided by JASPL to all interns who successfully complete the project. MNSUAM would facilitate JASPL for advertisement of interns (through Alumni network, Noticeboard and official website etc.) interviewing process (suitable facility) and space for training (for two-day training). JASPL would provide product samples for research and MNS-UAM would facilitate in trial conduction in vivo and in vitro. JASPL would facilitate in development of diagnostic laboratory	Execution of a weedicide trial in cotton Field	Dr. Muhammad Fiaz

		in MNSUAM for Resistance monitoring. Organizing invited lectures and combined outreach activities in the form of symposia, seminar, workshops, international meetings, and conferences.		
Sybrid Private Limited Pakistan	27-05-2021	Conducting joint research and development projects and cooperation in individual projects. Organizing invited lectures and combined outreach activities in the form of symposia, seminars, workshops, joint meetings and conferences. Exchange of information, teaching materials, technological and scientific publications. Collaboration in the field of information and Technology to increase the use of other advanced features to promote agriculture with modern methods. Mutual support for the development of innovative technology-based solutions to address Agriculture sector-related challenges being faced by the country. Take joint steps for the promotion of data-driven agriculture in the 'country by sharing the available human resources along with the academic, technical and	1. Potential collaboration to use cloud services for LMS and other projects at MNSUAM. 2. Meeting is planned to discuss future line of action in coming week.	Dr. Ayesha Hakim

		commercial resources. Exchange of books, scientific publications, study programs, course information, and any other data and information of common interest. internship opportunities for students to enhance professional development outreach activities in the form of symposia, seminar, workshops, international meetings and conferences,		
Fatima AG Solutions Limited, Lahore	08-04-2021	MNSUAM will provide all facilities of Post Entry Quarantine (PEQ) which is already Defined by the department of plant protection in their updated Gazette-2019. MNSUAM will support and facilitate Fatima on all listed test locations in data collection and inspection. MNSUAM will support and provide facilities to Fatima in data extraction and analysis as per University policy. Both Parties will assure confidentiality of data, results and information about the project. The Parties will sign separate Non-Disclosure Agreement on need basis. Fatima will provide all labor, research material and overhead charges.to MNSUAM on mutually agreed terms and conditions for each	Screening of Imported Cotton Varieties	Mr. Furqan Ahmad

		project/experiment including those conducted in Quarantine or containment facilities. The Parties will mutually agree on the MNSUAM experts. In case of laboratory support required from MNSUAM. The Parties will mutually decide the scope and possible charges (labor and overhead charges) based on nature of tests. Fatima will provide schedule for inspection, and logistics support for the effective execution of this project. Fatima will be responsible for crop management on listed test locations along with all the inputs (Fertilizer, Pesticides etc.)		
Karakorum International University Gilgit	22-03-2021	Conducting joint research and development projects and cooperation in individual projects. Establish a combined Degree program/ Exchange program for Students and Researchers. Organizing invited lectures and combined outreach activities in the form of symposia, seminar, workshops, international meetings and conferences. Offer an employee exchange opportunity with the aim of sharing and furthering the scientific and	Ph.D Scholarship for Faculty and Employees	Prof. Dr. Zulfiqar Ali

		technical know-how of both parties. Offer scholarships for graduate and undergraduate Students of both parties. Exchange of information, teaching materials, technological and scientific publications. Collaboration in the field of Information and Technology to proliferate the use of other advanced features to promote agriculture with modern methods. Transfer of technology for wider distribution and implementation among more people and places. Establishment of Hightech lab in Multan with shared resources of both parties. Exchange of potential high yielding plant germplasm acquired through research by each party. Offer of services of review for thesis/dissertation for doctorate degree		
SANIFA Agri Services Limited, Lahore Pakistan	16-03-2021	MNSUAM will provide all facilities of Post Entry Quarantine (PEQ) which is already defined by the department of plant protection in their updated Gazette-2019. MNSUAM will support and facilitate the SANIFA on all listed test locations in data collection and inspection. MNSUAM will support and provide facilities to SANIFA in	Screening of Imported Cotton Varieties	Mr. Furqan Ahmad

		data extraction and analysis as per University policy. Both parties will assure confidentiality of data, results and information about the project. Each party will sign separate Non-Disclosure Agreement on need basis. SANIIFA will provide al1 labor, research material and overhead charges to MNSUAM on agreed terms and conditions as per University policy for each project/experiment including those conducted in Quarantine or containment facilities. SANIFA will provide schedule for inspection and logistics support for the effective execution of this project.		
Human Appeal (HA.), Pakistan	25-2-2021	Organize training for farmers (to improve plant management to improve their productive life. harvesting and post-harvesting management techniques to retain products and minimize losses, to develop value added products to enhance farmers revenue). Joint research /innovation funding from local/international bodies for benefit of vulnerable communities. Outreach activities in form of symposia, seminar, workshop, meeting and conferences	Bee Keeping Training to Students	Prof. Dr. Shafqat Saeed

Croplife Pakistan Association	1-2-2021	Promote mechanization in Agriculture to ensure productivity, quality of harvest and time saving in crop life cycles. Wheat Production Enhancement Advisory Paper- A field and Market Research based paper to support regulators and farmers to enhance Wheat Productivity. Better crop and resource management precision agriculture, IoT based interventions, agronomics, pest management, resistance management, IPM, pest survey/ population dynamics, pest identification	Development of Safety room in Undergraduate Block	Prof. Dr. Zulfiqar Ali
The Accountability Lab, Islamabad	18-1-2021	Creating capacity building initiative for students and faculty of MNSUAM through establishing PICs, interactive training workshops and communication and networking opportunities for students with relevant govt. departments. Creating small funding opportunities for innovative Social Enterprise Ideas and Social Actions Plans submitted by students and faculty. Creating knowledge sharing program between academia and various govt. departments	Establishment of Peace and Entrepreneurship Lab • Training on Entrepreneurship • Distribution of 40 Bicycles for female students • Think and drink stall at Mango Festival 2021	Dr. Mirza Abdul Qayyum/Dr. Sami Ullah

Bayer Pakistan (Private) Limited	22-12-2020	Jointly organize workshops, symposiums, seminars and conferences, IoT plant health and agronomic management of crops.	Annexure-II	Prof. Dr. Muhammad Ashfaq
Shaoor Foundation for Education & Awareness (SFEA), Islamabad	24-11-2020	Foster mutual cooperation and collaboration for the promotion of peace, tolerance, civic education and entrepreneurship. Hold joint research, seminars, consultative workshops, conferences and other activities in common area of the common interest. Explore the options for sharing expertise and resources to improve the team capacities of both institutions. Collaborate in efforts for promoting harmony, inclusivity and mutual respect among different segments of society, especially the university youth. Jointly design special initiatives for youth/students in area of peace-building, entrepreneurship, gender equality and civic education	Activities that one in pipeline/Planning phase • Discussions on Peace incubation • Trainings and seminars • Women Empowerment	Dr. Mirza Abdul Qayyum
ICI Pakistan Limited, Karachi	20-11-2020	To conduct joint trials for evaluation of the performance of wheat hybrids/products that is provided by MNSUAM. To conduct joint research program to develop best practices for the hybrid wheat grain and seed		Prof. Dr. Zulfiqar Ali

		production under the terms and conditions fixed mutually being commercialized by ICI in Pakistan. To build capacity of ICI for hybrid wheat seed production. ICI has to ensure the availability of security guards at seed production sites. Both Parties agree to play an effective role for hybrid wheat and other products' outreach. MNSUAM may arrange Students-Teachers visits to the ICI fields and ICI may arrange such visits to MNS-UAM fields for learning purpose but with prior intimation to other Party. ICI agrees to offer paid/unpaid internship opportunities to MNS-UAM students, as per eligibility criteria. Conduct joint research and development projects and cooperation in individual projects. Organize invited lectures and combined outreach activities in the form of symposia, seminar, workshops, meetings, and conferences.		
Farms Dynamics Pakistan (Pvt.) Ltd.	17-11-2020	Exposure of Hi-Tech & Modern technologies for Faculty & Students, Partnership in technology transfer campaign, trainings and education seminars, Collaborative R&D activities in divers areas of interest (Local	Collaborative R&D activities in divers areas of interest, Local Seed Production through Adaptability Trials of Hybrid Corn Seed for Fodder Purposes.	Mr. Mehmood Alam

		Seed Production, Certified fruit nursery, IOTs based solution for Agriculture), Paid internship program for students, Developing Agriculture Technology Park		
All Pakistan Fruit and Vegetable Exporters, Importers and Merchant Association	12-11-2020	Research work including analysis and test reports related to Fruits & Vegetables, Provide guidance, support and technical assistance to PFVA, conduct awareness program for growers and exporters. Establishment of R&D Labs by the PFVA in various cities of Pakistan, Internship for Agri. Graduates of MNSUAM	Developing protocol for bio pesticide for postharvest management of fresh vegetable and fruits	Prof. Dr. Zulfiqar Ali
Society of Facilitators and Trainers, Islamabad (SOFT)	05-11-2020	Developing long term partnership and promoting collaboration on community co-inquiry research, capacity building, training & facilitation, development and advocacy activities leading to sustainable development in Pakistan	Partnership ACIAR Project "ASSIB"	Prof. Dr. Irfan Ahmad Baig
Metro-Pakistan	27-10-2020	Mutual exchange of experience in fields of Agribusiness, vale addition and agri. Research. Offer of services for business plan developments, joint initiatives for improving farming livelihoods, to establish mutual understanding for promotion of agriculture business and entrepreneurship	• Currently No activity carried out • Plan to start activity October onward for protected and winter vegetables	Dr. Nazar Farid

		initiatives, Supply chain development and information technology to proliferate the use of other advanced features to promote agriculture with modern methods.		
Fatima AG solutions Limited, Lahore	25-9-2020	Organize invited lectures and combined outreach activities in the form of symposia, seminar, workshops, meetings and conference. Both parties shall assess the operational cost on case-to-case basis and shall allocate budget accordingly		Prof. Dr. Zulfiqar Ali
Super Punjab Feeds, Multan	15-9-2020	Joint Research, Scholarships for graduate and undergraduate student, Transfer Technology, Paid & Unpaid Internship to students of MNSUAM	Conducted International webinars Future prospects of fisheries and aquaculture in Pakistan on 18th Oct 2020. submitted a project to PHEC related to fish feed	Dr. Naheed Bano
Huawei Technologies (Pakistan) Pvt. Ltd.	26-8-2020	Developing Network competencies for the ICT National Training packages, Seek to address the networking skills requirements in the Pakistani ICT Industry, Work cooperatively to explore other opportunities for alliances between the two organizations	1. Received ICT academy equipment awarded to institute. 2. Completed training of two Teaching Professionals for Training and Certification a. Dr. Aamir Hussain b. Mr. Israr Hussain 1. Planning to inaugurate ICT Academy in coming month. Activities/classes of ICT Academy were suspended due to COVID lockdown	Dr. Ayesha Hakim
Volka Foods International, Multan	20-8-2020	Joint Research Activities, Exchange of resources, Expertise, Information and Materials in research and innovation on quality foods and internship for students	Development of Durum Wheat for Pasta Production	Prof. Dr. Zulfiqar Ali, Prof. Dr. Umar Farooq

Fatima Jinnah Women University, Rawalpindi	29-7-2020	Conducting Joint research Projects, using joint lab facilities for gene cloning, tissue Culturing, Next Generation Sequencing, establish exchange program for students and researchers	Annexure-I	Dr. Zulqarnain Khan
Tawakkal Fish Hatchery and Farms, Muzzaffargarh, Pakistan	08-7-2020	Collaboration in field of aquaculture and fisheries proliferate the use of other advance techniques.	Conducted two International webinars: 1. Future prospects of fisheries and aquaculture in Pakistan on 18th Oct 2020. 2. Biofloc and intensive fish farming on 4th Dec 2020.	Dr. Naheed Bano
BASF Pakistan (Pvt.) Ltd.	08-7-2020	Product testing and development for BASF Agriculture Solutions, capacity building and training of students. To collaborative in organizing seminars, workshops, exhibitions symposiums and summits	**Seminar/Workshop etc.** **March 08, 2021** Seminar for mango growers of Sindh and Punjab at MNS University of Agriculture, Multan **May 25, 2021** Webinar on Whitefly management in cotton **Research Trials Activities** 1. Screening of Insecticides for sucking insect pests as MNSUAM and Chak 5 Faiz 2. Efficacy and dose response of Poncho Plus against shoot fly and stem borer in maize 3. Efficacy and response of Insure Perform against seed rot, karnal bunt, and loose smut of wheat 4. Relative performance of BAS 673 02F (Insure Perform) as seed treatment in wheat for seed germination and seedling vigor	Prof. Dr. Hammad Nadeem Tahir

MEDICAL AND HEALTH FACILITIES

Muhammad Nawaz Shareef
University of Agriculture
Multan

CHAPTER-16

MEDICAL AND HEALTH FACILITIES

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MEDICAL AND HEALTH FACILITIES

Currently following medical facilities are available:

- Arranging seminars and creating awareness about hot medical issues like Dengue and COVID-19
- Free ambulance service and vaccination for COVID-19 and seasonal influenza
- Emergency and routine check-up and medication to the students
- First aid to the students and employee of the University
- Chemical Safety Lab is being established under Industry-Academia Linkage program in collaboration with CropLife, Pakistan

16.1. Mosquito and Mosquito Borne Diseases

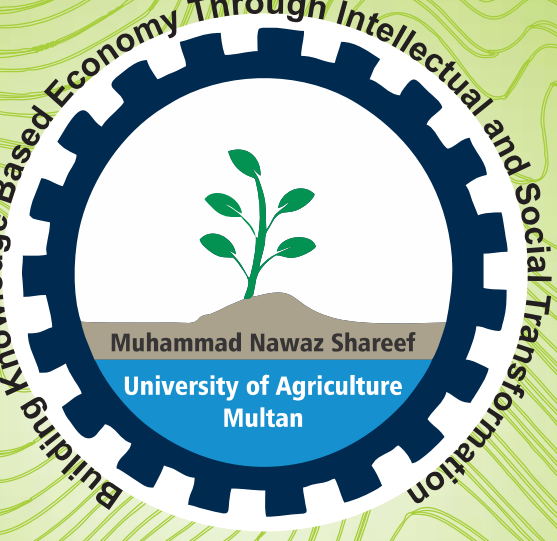
1. Surveillance of mosquito especially Dengue vectors carried out from whole of the University, every week for whole of the year, and reports were sent to Registrar, Dean FA&ES MNSUAM, and Secretary Agriculture, Lahore.
2. Identification of samples of mosquito larvae received from Health Department, Vehari, were done on regular intervals for whole of the year.
3. International Workshop on "Smart Monitoring and Control of Dengue Vector" organized by Institute of Plant Protection on 02-02-2021.
4. International Seminar on "Monitoring and Biological Control of Insect Vectors of Human Diseases" organized by Institute of Plant Protection on 08-04-2021.

16.2. COVID-19

1. The University has adopted all safety measures and SoPs as issued by the Punjab Govt. in the backdrop of COVID-19.
2. Availability of thermal guns, masks, hand washing facilities and sanitizers is being ensured.
3. 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.
4. Random Testing of more than 400 faculty, students and staff of MNSUAM for COVID-19 were done with the help of Department of Health.
5. Facilitated about 200 faculty and staff of the university for vaccination of COVID-19

16.3. Joint Degree Program on Public Health

An innovative joint degree program being started in collaboration with Nishtar Medical University is B.Sc. (Hons.) Human Nutrition and Dietetics, which is specifically designed to produce the experts of nutrition and dietetics for providing better healthy lifestyle to the society. Two Universities are striving to launch another joint degree program on public health. The program will focus on One Health approach and contemporary public health issues along with social aspects of health.



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