



Annual Report 2023-24







Foreword

The Government of Pakistan and United States of America signed a US\$ 12.4 million Food for Progress agreement on September 15, 2003. Under this agreement, the Syndicate under section 25(2)(i) of the University of Agriculture, Faisalabad Act, 1973 approved to establish Endowment Fund at UAF. The Ministry of Finance transferred Rs. 650.00 million through HEC to UAF in 2006. The Endowment Fund, UAF has an independent Board which possesses all of the powers necessary to carry out its activities.

The income generated from investment of this fund is allocated for different activities which focus on food security, poverty alleviation and sustainable agriculture. Agricultural technology has a key role to play for sustainable development and requires investment in human and social capital because they are more knowledge-intensive. According to FAO, one of the major constraints to realizing the potential for increased productivity in Pakistan is the woeful lack of a mechanism to transfer existing technology from government research institutions to farmers. Endowment fund provides an opportunity for the scientists to get financial support for transfer of technologies to the stakeholders.

Research Commercialization is the process that converts ideas, research, or prototypes into viable products that retain the desired functionality. To provide an ecosystem for startups, Endowment Fund Secretariat established "Business Incubation Center" in 2009, with the joint support of Competitive Support Fund (CSF) and Higher Education Commission (HEC), Islamabad. For display/demonstration of developed and tested innovative technologies, a state of the Art Exhibition Centre has been constructed.

Prof. Dr. Iqrar Ahmad Khan

Vice Chancellor/Chairman BoD & TAC



Prof. Dr. Ijaz Ahmad Bhatti

Executive Director



Dr. Naeem Mahmood

Additional Director



Mr. Amir Saeed Rana

Deputy Director



Mr. Muhammad Yousuf
Office Assistant



Mr. Shahzad Afzal
Office Assistant



Hafiz Shoaib Ali Raza
Office Assistant



Mr. M. Waseem Ahmad
Jr. Computer Operator



Mr. Qaiser Waqas
Jr. Computer Operator

Contents

1	Vision & Mission		06
1	Introduction	1.1 Establishment of Endowment Fund at UAF 1.2 Management of the Fund 1.3 Endowment Fund Secretariat 1.4 Programs 1.5 Activities 1.6 Geographical Distribution of EFS Funded Projects	08 08 09 09 09 10
2	Faculty Development	2.1 Achievements of the years 2.2 Travel Grants for presenting paper abroad 2.3 Short Visits for Institutional Collaboration 2.4 Seminars/Conferences/Workshops/Trainings organized at UAF 2.5 Highlights of some Events 2.6 List of Foreign Visitors/Experts Invited	14 14 15 16 19 62
3	Technology Transfer	3.1 Projects Initiated 3.2 Projects Ongoing 3.3 Projects Completed 3.4 Highlights of Some Significant Projects 3.5 University Outreach Program 3.6 Highlights of some Outreach Activities	64 65 67 68 75 77
4	Research & Development	4.1 Projects Initiated 4.2 Projects Ongoing 4.3 Highlights of some Significant Projects	98 99 101
5	Product Commercialization	5.1 Projects Initiated 5.2 Project Completed 5.3 Scholar Block at UAF 5.4 Farm Display & Lodging Facility at UAF	110 111 111 112
6	Monitoring & Evaluation	6.1 Monitoring and Evaluation	114
7	Financial Report	7.1 Income from investment 7.2 Expenditure	120 121

Vision & Mission



Vision

To assist the agriculture sector in becoming competitive, profitable and sustainable through innovation and commercialization.

Mission

1. To support UAF faculty and the national scientific community working for the cause of agricultural and rural development.
2. To promote competitiveness in agriculture through competitive/commissioned Research & Development initiatives.
3. To explore ways and means for strengthening of Endowment Fund for Research & Development.

Section

1

Introduction

1. Introduction

1.1 Establishment of Endowment Fund at UAF

Endowment Fund was established with the assistance of USDA with seed money of Rs. 650.00 million. The Syndicate under Section 25(2)(i) of the University of Agriculture Faisalabad Act, 1973 approved the MOU to establish Endowment Fund at UAF. The major objectives of funds are:

- To support UAF programs for advanced training in biotechnology, agricultural sciences research, technology transfer and product commercialization.
- To strengthen faculty and support R&D activities of UAF.
- To support similar programs with other institutions of higher learning, private sector, not-for profit organizations, domestic and international organizations.
- To encourage increased cooperation among scientists conducting agriculture-related research at universities in Pakistan and the United States of America.

1.2 Management of the Fund

The Board of Directors (BoD) is the governing body of this Fund and is responsible for Fund's program, its financial and managerial policies. Following is the composition of Board:

- | | |
|---|-------------|
| • Vice Chancellor, UAF (Chairman) | Ex-off |
| • Vice Chancellor, Agriculture University Peshawar, KPK | Ex-off |
| • USDA Agri. Attache in Pakistan or his nominee | Ex-off |
| • Agri. Specialist, USDA, US Embassy in Pakistan | Ex-off |
| • Eminent Scientists (Two) | For 3-years |
| • Progressive Farmer (One) | For 3-years |
| • Executive Director, ALP (PARC), Islamabad | Ex-off |
| • Registrar, UAF | Ex-off |
| • Treasurer, UAF | EX-off |
| • Executive Director, EFS, UAF (member/Secretary) | Ex-off |



1.3 Endowment Fund Secretariat

Endowment Fund Secretariat is responsible for the operation of the Fund which consists mainly of the selection, processing, approval, monitoring, evaluation and coordination of projects supported in whole or in part by it. All the activities are planned, approved and coordinated through Endowment Fund Secretariat (EFS) under the supervision of Executive Director. The Endowment Fund Secretariat staff is as under:

1. Executive Director, Professor nominated by Vice Chancellor, UAF
2. Additional Director, Regular (One)
3. Deputy Director, Regular (One)
4. Administration/Supporting Staff (5 Nos)

1.4 Programs

With the approval of Board, the following programs are being sponsored by EFS, UAF

1. Faculty Development
2. Technology Transfer
3. Product Commercialization
4. Research & Development

1.5 Activities

The Endowment Fund was established in 2006 at the University of Agriculture, Faisalabad with the assistance of USDA under "Food for Progress" agreement with an amount of Rs. 650.00 million through the Government of Pakistan and Higher Education Commission, Pakistan. The principal amount was invested in banks and the profit generated was allocated for different activities approved by the Board of Directors. Endowment Fund supports the whole value chain of Agriculture including human resource development, sponsoring Research & Development, dissemination of knowledge intensive technologies and promoting University Industry linkages for commercialization of research output.

Since its inception in 2006, Endowment Fund Secretariat (EFS) has been able to support diverse activities in the university and national level. Up till now EFS has granted 203 projects, 215 international travel grants and 340 seminars/workshops/conferences. Endowment Fund has provided technical assistance to all segments of the rural community through Faculty Outreach Program started in 2011 with the focus on skill development and gender mainstreaming. Up till now, EFS has supported 172 outreach activities conducted by UAF faculty at the door step of farmers

1.6 Geographical distribution of EFS funded projects

Endowment Fund Secretariat (EFS) provided widespread financial support throughout Pakistan. EFS regularly publishes CALL FOR PROJECT PROPOSALS in the domains of Technology Transfer, Research & Development and Product Commercialization throughout Pakistan via different print media and also issues individual invitation letters to different organizations. EFS had awarded projects to following institutions (other than UAF) since its inception.

SN	Year	Institution	No. of projects
1.	2007-08	University of Arid Agriculture, Rawalpindi	01
2.	2008-09	Lesbela University of Agriculture, Water and Marine Sciences, Uthel, Balochistan	01
3.	2008-09	Soil Salinity Research Institute, Pindi Bhattian	01
4.	2011-12	University of Arid Agriculture, Rawalpindi	04
5.	2011-12	Forman College, LHR	01
6.	2013-14	Ayub Agricultural Research Institute, Faisalabad	01
7.	2014-15	Ayub Agricultural Research Institute, Faisalabad	01
8.	2014-15	Nuclear Institute of Biotechnology & Genetic Engineering, Faisalabad	01
9.	2014-15	Islamia University Bahawalpur, Bahawalpur	01
10.	2015-16	UAF Sub Campus, Burewala, Vehari	02
11.	2016-17	UAF Sub Campus, Burewala, Vehari	01
12.	2016-17	UAF Sub Campus, Toba Tek Singh	01
13.	2016-17	University of Veterinary and Animal Sciences, Lahore	02
14.	2016-17	Islamia University Bahawalpur, Bahawalpur	01
15.	2019-20	UAF Sub Campus, Burewala, Vehari	01
16.	2020-21	University of Veterinary and Animal Sciences, Lahore	04
17.	2020-21	Muhammad Nawaz Sharif University of Agriculture, Multan	01
18.	2020-21	UAF Sub Campus, Toba Tek Singh	01
19.	2021-22	Muhammad Nawaz Sharif University of Agriculture, Multan	02
20.	2021-22	UAF Sub Campus, Toba Tek Singh	01
21.	2021-22	University of Poonch, Azad Jammu & Kashmir	01
22.	2022-23	University of Arid Agriculture, Rawalpindi	01
23.	2022-23	University of Agriculture, Peshawar	01
24.	2022-23	UAF Sub Campus, Burewala, Vehari	01
25.	2022-23	UAF Sub Campus, Depalpur, Okara	01

SN	Year	Institution	No. of projects
26.	2022-23	Shaheed ZA Bhutto Agricultural College Dhokri, Larkana	01
27.	2023-24	Lasbela University of Agriculture, Water & Marine Sciences (LUAWMS), Baluchistan	01
28.	2023-24	UAF-Sub Campus, Depalpur, Okara	01
29.	2023-24	University of Poonch, Azad Jammu & Kashmir	01

Evaluation of the Project Proposals

The project proposals are processed in accordance with the procedures approved by the BoD as under:

- Invitation of proposals in the National Press.
- Initial evaluation at Endowment Fund Secretariat.
- Shortlisting of proposals through committees nominated by Chairman BoD/Vice Chancellor.
- Review of proposals by three national experts (nominated by the Chairman BoD/Vice Chancellor).
- Presentation of recommended project proposals (at least by two experts) to TAC along with comments of experts for evaluation.
- Rationalization of the recommended proposals by the Committee constituted by the Chairman BoD.
- Final selection/approval by the Board.
- Signing of Implementation Agreement between the executor/PI and UAF.
- Issuance of Administrative approval of the projects.





Section

2

Faculty
Development



2. Faculty Development

The Technological Innovations require Investment in human and social capital because they are more knowledge-intensive. Capacity-building in agriculture and allied disciplines has been the prime focus of Endowment Fund, UAF. Further, interaction with the international community and exposure to the developed systems are the additional benefit of this program. A Faculty Development Committee comprising senior faculty recommends such applications to the Chairman BoD for approval.

2.1 Achievements of the year

During 2023-24, following are the achievements under Faculty Development:

- | | | |
|----|--|----|
| 1. | Travel Grants for Presenting Papers (Abroad) | 02 |
| 2. | Short Visit for Institutional Collaboration (Abroad) | 07 |
| 3. | Seminars/Workshops/Conferences organized at UAF | 21 |

2.2 Travel Grants for Presenting Paper abroad

Endowment Fund Secretariat encourages faculty members to have international exposure by presenting their research findings at various international seminars, conferences, workshops, etc. Following travel grants were provided to faculty members for presenting papers at international events.

SN	Name & Address of the Grantee	Title/Organizer/Country
1.	Dr. M. Kashif Saleemi, Associate Professor, Department of Pathology, UAF	Pathological Effects of Feeding Aflatoxins Contaminated Feed on Immune Status and Reproductive Performance of Juvenile White Leghorn Males and its Mitigation with α Tocopherol and <i>Moringa Oleifera</i> in the XXII Congress of World Veterinary Poultry Association (WVPA-2023) Organized by World Veterinary Poultry Association (WVPA) September 04-08, 2023 Verona, Italy

SN	Name & Address of the Grantee	Title/Organizer/Country
2.	Prof. Dr. Babar Shahbaz, Director, Institute of Agri. Extension, Education & Rural Development, UAF	Challenges to Effective Agricultural Cooperatives: An Empirical Analysis from Pakistan in the XIV International Agriculture Symposium "AGROSYMP2023". Organized by University of East Sarajevo, Bosnia & Herzegovina October 05-08, 2023 Bosnia & Herzegovina

2.3 Short Visits for Institutional Collaboration

Travel grants for short visits abroad are provided for strengthening international collaboration and participation in events after nomination by the Vice Chancellor to represent UAF. Following faculty members were awarded grant under short visits program:

SN	Name /Department	Title/Country
1.	Prof. Dr. Bushra Sadia, CABB, UAF	To participate in 2nd Youth Biotechnology Forum. July 04-05, 2023 Astana, Kazakhstan
2.	Prof. Dr. M. Asif Kamran, Institute Agri. & Resource Economics, UAF	To participate in 2nd Youth Biotechnology Forum. July 04-05, 2023 Astana, Kazakhstan
3.	Prof. Dr. M. Sarwar Khan, PVC/ Dean, Faculty of Agriculture, UAF	To participate in 2023 Asia – Europe Expo and Education International Exchange and Cooperation Forum. September 13th to 16th, 2023 in Urumqi, Xinjiang, China.
4.	Prof. Dr. Farzana Rizvi, Dean, Faculty of Veterinary Sciences, UAF	To participate in 2023 Asia – Europe Expo and Education International Exchange and Cooperation Forum. September 13th to 16th, 2023 in Urumqi, Xinjiang, China
5.	Mr. Irfan Abbas, Director, P&D, UAF	To participate in 2023 Asia – Europe Expo and Education International Exchange and Cooperation Forum. September 13th to 16th, 2023 in Urumqi, Xinjiang, China
6.	Prof. Dr. Iqrar Ahmad Khan, Chairman, BoD, EFS/Vice Chancellor, UAF	To attend the 2nd IOFS High- Level Forum on Food Security, featuring the Sub-Forum on Advanced Agri-Tech, October 02, 2023 in Doha, Qatar

SN	Name /Department	Title/Country
7.	Prof. Dr. Muhammad Sarwar Khan, PVC/Dean, Faculty of Agriculture, UAF	To participate in the Pakistan Biosafety Capacity Building Program January 23-26, 2024 in Dubai

2.4 Seminars/Conferences/Workshops/Trainings organized at UAF

Endowment Fund provides financial support to UAF faculty members to organize seminars/conferences/workshops at the campus. During the year 2023-24, EFS sponsored following events.

SN	Organizer	Title of Seminar/workshop/conference	Nature
1.	Prof. Dr. M. Jafar Jaskani, Director, ORIC, UAF	Funding for Visit of Foreign Delegate from Hubie Province, China for Academic Collaboration. July 03-08, 2023	International
2.	Dr. Waseem Ahmad, Associate Professor, IBMS, UAF	International Conference Agribusiness and Investment Forum on Afghanistan, Pakistan and Regional OIC Countries. September 14-15, 2023	International
3.	Prof. Dr. Bushra Sadia, Director, CABB, UAF	2-Days Workshop on Molecular Biology in Forensic Science: from Sampling to Data Processing October 04-05, 2023	National
4.	Prof. Dr. Hammad Ahmad Khan, Chairman, Department of Zoology Wildlife & Fisheries, UAF	One-day seminar on Conservation Strategies of Wildlife. October 16, 2023	National
5.	Prof. Dr. Ahmad Sattar Khan, Director, Institute of Horticultural Sciences, UAF	4th BRI Sino-Pakistan Agriculture Forum. November 09-10, 2023	International
6.	Dr. Iftikhar Ahmad, Associate Professor, Institute of Horticultural Sciences, UAF	Workshop on Demonstration of Chrysanthemum & Autumn Flower Production & Handling Technology to Growers and Stakeholders. December 12-14, 2023	National
7.	Prof. Dr. Farzana Rizvi, Chairperson, Department of Pathology, UAF	One day Sino-Pakistan Workshop on Control of Major Livestock Diseases. November 17, 2023	International
8.	Prof. Dr. M. Saqib, Director, Directorate of External Linkages, UAF	International Seminar on Knowledge Sharing at UAF to Promote China-Pak Cooperation in Modern Agriculture, Bioengineering, and Biotechnology. November 07-11, 2023	International

SN	Organizer	Title of Seminar/workshop/conference	
9.	Dr. Nadeem Akbar, Associate Professor, Director, Water Management Research Centre (WMRC), PARS, UAF	Seminar on DSR as Resource Conservation Technique in Rice-Wheat Cropping System of Punjab. November 06, 2023	National
10.	Prof. Dr. M. Jafar Jaskani, Director, ORIC, UAF	Agriculture Exhibition at Chief Minister's House, Lahore. October, 30, 2023	National
11.	Dr. Aftab Ahmad, Associate Professor, Department of Biochemistry, UAF	Workshop on Applications in Biological Systems. November 30 to December 01, 2023	National
12.	Mr. Amir Saeed Rana, Assistant Professor/Incharge, Horse Riding School (HRS)/ President Tent Pegging Team, UAF.	Seminar on Equitation Knowledge Dissemination among Farmers and Stakeholders through Equestrian Federation of Pakistan (EFP). November 29-30, 2023	National
13.	Dr. Umair Gull, Assistant Professor, Department of Agronomy, UAF	Consultative Session on Sustainable Fodder Production and Utilization. December 01, 2023	National
14.	Prof. Dr. Asif Kamran, Institute of Agri. Resource Economics, UAF	Training workshop on Dynamic Human Environment Games. January 29 to February 02, 2024	International
15.	Dr. Raheela Rehman, Assistant Professor, Department of Plant Breeding & Genetics, UAF	International Conference on Emerging Technologies for Crop Improvement in Pakistan. February 19-20, 2024	International
16.	Mr. M. Umar Farooq, Librarian, Department of Library, UAF	Training for Capacity Building of Library Staff: Basic Skills (UAF Departmental Libraries and UAF-Sub Campuses Libraries). February 20-21, 2024	National
17.	Prof. Dr. M. Anjum Zia, Principal, UAF-Community College, PARS	Two-day International Symposium on Medicinal Plants and Natural Product. March 07-08, 2024	International
18.	Dr. Fatma Hussain, Associate Professor, Department of Biochemistry, UAF	International Symposium on Drug Discovery and Development. March 01-02, 2024	International
19.	Prof. Dr. M. Jafar Jaskani, Director, ORIC, UAF	A Series of Workshops during May 13, 2024 – June 21, 2024 • Climate Resilience, Precision Agriculture and Bioenergy. • Precision System in Seed Processing Plant.	International

SN	Organizer	Title of Seminar/workshop/conference	
20.	Dr. Irfan Ahmad, Chairman, Department of Forestry and Range Management, UAF	International Day of Forests. March 21, 2024	National
21.	Prof. Dr. M. Sohail Sajid, Department of Parasitology, UAF	Three days International Conference on Biodiversity and Biosafety. May 27-29, 2024	International



2.5 Highlights of Some Events

Title of the Event: **Visit of Foreign Delegate from Hubei Province, China for Academic Collaboration**
July 03-08, 2023

Name of Organizer: **Prof. Dr. M. Jafar Jaskani, Director, ORIC, UAF**

Objectives

- Demonstration of modern mechanized nursery production and transplantation method to stakeholders in Pakistan.
- To explore new methods and technologies for the planning and design of Agricultural Parks with regional characteristics.
- To actively promote information sharing on the conservation study of agricultural heritage and explore the multi-level management and protection system of agricultural (horticultural) landscape resources.
- Exchange of students from China and Pakistan, jointly carry out and set up online international courses such as horticultural management and technology, landscape design, and so on.

Proceedings

A Chinese delegation led by Mr. Wu Yuelang, Department of Science and Technology, Hubei Province, China visited the Agriculture Secretariat, Punjab as part of their visit to Pakistan. Prof. Dr. Iqar Ahmad Khan, Vice Chancellor, University of Agriculture Faisalabad, and Dr. Muhammad Jafar Jaskani, Director ORIC, Prof. Dr. Muhammad Saqib, Director External Linkage along with other officials from the University of Agriculture Faisalabad were also present at the occasion. Mr. Iftikhar Ali Sahoo, Secretary Agriculture, Government of Punjab welcomed the delegation and briefed the Provincial Government initiatives in the field of Agriculture, Livestock, and how this Government was supporting innovation in the agriculture industry. He emphasized establishing partnerships with both local and foreign institutions to conduct agricultural research and development across Punjab Province. He further stressed on fostering long-term collaboration between Agri. Research Institutes in the Punjab and Chinese Agricultural Research Institutions. Prof Dr. Iqar Ahmad Khan briefed the delegation regarding the cropping pattern of major crops in the Punjab Province. Mr. Wu Yuelang, briefed the Secretary, Agriculture, Punjab regarding their visit to Pakistan and extended his cooperation on behalf of Hubei Province in the field of Agriculture, Livestock, Poultry, agricultural implements, etc. In addition, he urged to establish joint research labs, faculty/researchers, and student exchange programs. The delegation also visited M/S Packages (Pvt.) Ltd.

The University of Agriculture, Faisalabad, and Huazhong Agriculture University of the Chinese province of Hubei will encourage cross-border collaboration to raise agricultural productivity by cutting-edge contemporary methods. To accomplish the goals of CPEC, they will collaborate on ICT, drone technology, animal breeding, and modern technology for cotton, soybeans, and citrus fruits at the University of Agriculture, Faisalabad, which was already approved by the Government of Punjab.

Prof Dr. Iqar Ahmad Khan shared his opinions with a group from Huazhong Agriculture University in Hubei Province, China that the university's newly built technological park will mark a significant turning point in the growth of agriculture by ensuring not only an increase in production but also the introduction of innovative concepts like value addition and precision technologies. According to him, the Confucius Institute is actively promoting the Chinese language and culture, which will lead to increased ties between the two nations. He also said that university professors and students were availing the chance to travel to China to sharpen their abilities.

Mr. Wu Yuelang, the head of the Chinese team, reported that a delegation led by Dr. Iqar Ahmad Khan visited Hubei Province Huazhong Agriculture University to find potential areas for cross-border cooperation. This delegation from Huazhong Agriculture University in Hubei, comprising nine members, was a continuation of their shared interests. He further added that they had begun a series of meetings with Punjab's secretary for agriculture, Iftikhar Ali Sahu, and other authorities to figure out how to foster cooperation for the expansion and development of agriculture in both countries.

Moreover, the delegation showed keen interest in the ongoing research projects while visiting the Central Library, Confucius Institute, National Incubation Centre, Centre for Advance Studies in Agriculture and Food Security (CAS), and other research facilities established at the University. The delegation also visited the Pesticide manufacturing unit of M/S Zhangbang Ltd at Sahianwala Industrial Estate, Faisalabad.

The Chinese delegation visited Higher Education Commission (HEC), Islamabad on July 07, 2023. Prof. Dr Mukhtar Ahmad, Chairman, HEC welcomed the delegation and briefed in detail about HEC international and national education and research programs. Furthermore, he added that education promotion was emerging and an essential part of the China-Pakistan Economic Corridor (CPEC), a flagship project of the BRI. The cooperation spans a variety of undertakings, such as academic institution establishment, joint research projects, faculty and student exchange programs. Collaboration in higher education between Pakistan and China will benefit both countries relations, economies, knowledge sharing, human resource development, and educational systems. By attracting Pakistani students to study there, China can increase its soft power and influence there. By promoting the languages, cultures, and values of both countries, these students can serve as cultural ambassadors. He also distributed souvenirs among the Chinese delegation.

The Chinese leader of the delegation Mr. Wu Yuelang, Department of Science and Technology, Hubei Province, China visited the National Agricultural Research Center (NARC) in Islamabad as part of their visit to Pakistan. Prof. Dr. Iqar Ahmad Khan, Vice Chancellor, University of Agriculture Faisalabad, and Dr. Muhammad Jafar Jaskani, Director ORIC, along with other high officials from the University of Agriculture Faisalabad also accompanied him.

The Chairman of the Pakistan Agricultural Research Council (PARC), Dr. Ghulam Muhammad

Ali, welcomed the distinguished guests and provided a summary of PARC's initiatives aimed at supporting innovation in the agriculture industry. Dr. Ali emphasized how PARC established partnerships with both local and foreign institutions to conduct agricultural research and development across 10 unique agroecological areas of the nation. Dr. Ali further emphasized the long-standing collaboration between PARC and Chinese agricultural research institutions. Mr. Wu Yuelang thanked Chairman PARC for the nice hospitality and highlighted the Hubei Agriculture Research Institute's noteworthy experience in fields such as hybrid rice, soybean, citrus, and animal vaccine. He also emphasized the institute's remarkable skill in conducting scientific research operations. To learn from the experiences of Pakistani agricultural researchers, Mr. Yuelang expressed a strong desire to share their research findings and promote collaboration with PARC. He added that encouraging cooperation in agricultural research would strengthen the bonds of brotherhood between the two countries while also advancing science.

The delegation had the chance to tour the research facilities at the Plant Genetic Resources Institute (PGRI) and the National Institute of Genomics and Agricultural Biotechnology (NIGAB), where they expressed their admiration for the ongoing research projects. The Chairman of PARC arranged a briefing on the ongoing projects and notable discoveries being made at NARC in a variety of fields, such as improving agricultural genetics and making strides in functional genomics. Prof. Dr. Iqar Ahmad Khan, Vice Chancellor, University of Agriculture, Faisalabad, and his team deserved special thanks and commendation for the superb organizing and facilitating of the visit, and the Chairman of PARC also expressed his gratitude to them. By doing so, he recognized their efforts to improve cooperation between the two nations in agricultural research. In the end, Dr. Ghulam Muhammad Ali presented PARC shields as a token of appreciation to the delegation.



Meeting with the Secretary Agriculture Govt. of Punjab



Visit to Packages Industries Ltd. Lahore and meeting with Syed Babar Ali renowned Pakistani businessman, philanthropist, and founder of Pakistan's leading business school, Lahore University of Management Sciences (LUMS).



Meeting with the Vice Chancellor, Deans, Directors, and Administration of University of Agriculture, Faisalabad



Visit to Confucius Institute, UAF



Visit to Center of Advance Studies (CAS), UAF



Visit to Zhang bang Limited at Sahianwala



Meeting with the Chairman Higher Education Commission (HEC)



Visit to NARC National Agri Research Center

Outcome

The collaboration between Chinese universities and Pakistani higher education institutes has yielded fruitful and impactful outcomes.

- Joint research projects have led to scientific advancements in areas like Agriculture, Energy, Livestock, Dairy Sciences, and other allied disciplines.
- Offered scholarships and funding opportunities for Pakistani students to study in Chinese universities of Hubei province contributing to the educational development of Pakistan's youth equipped with innovative science & technological mindset.
- This partnership has not only enriched academic environments but also strengthened economic ties and fostered innovation between the two brotherly countries in terms of good Agricultural Practices/Precision & Climate-Smart Agriculture.

Results of the Impact Assessments

Chinese and Pakistani researchers often collaborate on joint research initiatives, particularly in areas such as energy, agriculture, infrastructure development, and technology. These partnerships can lead to valuable scientific discoveries and technological advancements. The collaboration can potentially have a positive impact on the economies of both countries by fostering trade, investment, and technological innovation. In the upcoming years, faculty & student exchange, the establishment of Campuses of Chinese Universities in Pakistan, and Capacity Building followed by Hands-on Training of Researchers of Pakistan in world-renowned Chinese Universities/ R&D Institutes. Furthermore, strategic planning for food security by both countries will open new prospects for innovation and resource management. The present visit has kicked off all the above-mentioned initiatives.



Title of the Event: International Conference: Agribusiness and Investment Forum in Afghanistan, Pakistan and Regional OIC Countries

September 14-15, 2023

Name of Organizer: Dr. Waseem Ahmad, Associate Professor, IBMS, UAF

Objectives

- To explore the opportunities for developing trade between regional OIC countries
- To build a platform for linking potential investors with projects, exchanging experiences, discussing global investment trends, strategies and forecasts
- To develop the business to business connections among agri good participants of regional OIC countries particularly inclusion of sub sectoral themes on cold storage solutions, cold chain logistics, poultry, fruit processing and packaging as the urgent needs of the sector.

Proceedings

The event started with the recitation of the Holy Quran and verses of Naat. Afterwards, Professor Dr. Khalid Mushtaq, Dean Faculty of Social Sciences, University of Agriculture, Faisalabad welcomed all the national and international delegates, faculty members and the participants. He said that the agriculture sector was directly linked with poverty alleviation in Pakistan and Afghanistan and called for innovative ideas to cope with the challenges. He emphasized the importance of regional cooperation for achieving the goal of regional prosperity. Mr. Khan Jan Alokozai, Co-President of Pakistan Afghanistan Joint Chamber of Commerce and Industry (PAJCCI) discussed the history of Pakistan and Afghanistan trade. He explained different cycles of trade, how the trade between two countries was going up and down. He discussed various challenges and their possible solutions. He stressed the need to shift conventional agriculture to modern agriculture in the country for which UAF should cooperate with it. He was of the opinion that both the Islamic countries should make close ties to boost the trade between both the Islamic countries. Mr. Syed Saad Ali Pasha, representing Islamic Chamber of Commerce, Industry and Agriculture, an affiliated OIC organization discussed various



challenges relating to various Business in Afghanistan and Pakistan. COMSTECH is the ministerial standing committee on Scientific and Technological cooperation of the OIC member states. Miss Khazima Muazin discussed various initiatives of COMSTECH in the areas of precision Agriculture, Data analysis and AI, supply chain management, and Agri-Tech Start ups. She called for the enhanced cooperation among the member states of the OIC in the domains of technology transfer, and regional investment to ensure food security in member states in general and Afghanistan in particular.

Prof. Dr. Iqrar Ahmad Khan, Vice Chancellor University of Agriculture, Faisalabad argued that knowledge had no boundaries and coordinated efforts should be made to address the issue of food security. He stressed the importance of global collaboration in addressing food security challenges and learn from each other's experiences. He also discussed that the UAF plays an important role for the knowledge transfer and training of Afghanistani students. Mr. Yerlan A. Baidaulet, Director General, Islamic Organization for Food Security (IOFS) graced this event as Chief Guest. He said food security was a critical issue that resonated not only within the Islamic world but also at the global level. He said the IOFS was overseeing 16 strategic programs aimed at improving food security in the OIC member countries and expanding cooperation in agriculture, rural development and trade. He said that IOFS has taken several initiatives. These initiatives focus on agricultural mechanization and introduction of improved agricultural technologies, quality seeds, fertilizers, agricultural machinery, and post-harvest technologies in OIC member states.



Panel Sessions of 1st day

Mr. Saad Ali Pasha Business Development Head of ICCIA gave a presentation on Green Waqf Initiative in OIC. He spoke about the historical precedence of green waqf initiative in different Islamic countries like Turkey, Egypt, Greece, Iran, Algeria and Tunisia. He also emphasized the potential of green Waqf initiative in Afghanistan. He explained the road map, implementation strategy and Eco system development for the Green Wqaf Initiatives of OIC. He also called for innovative financing models to promote green waqf initiative. He underscored several current initiative including MOU with UAF, partnership with Mauritania, partnership with Ziauddin University and the launch of Green waqf Website. Mr. Rao Fazal Ur Rehman, Director, Trade Development Authority of Pakistan (TDAP) presented his view on Regional Business Challenges and Opportunities. He highlighted the long history of bilateral trade and cooperation between

Afghanistan and Pakistan. he strongly contended that a huge potential bilateral trade exist between Afghanistan and Pakistan. He also identified different areas of bilateral cooperation between these countries. Prof. Dr. Kamil Ekinici, Isparta University of Applied Sciences, Faculty of Agriculture, Department of Agricultural Machinery and Technologies Engineering, Türkiye. He explained his business model of organic fertilizer made by composting of the agricultural waste. He explained that a huge potential of organic fertilizer exists all over the world particularly in Afghanistan. He spoke about different completed projects of Biohumus Technology including in Abu Dhabi, Ankara, Eskisehir and Zenizli as well as on going projects including recent ones in England and Mauritania. He also identified the potential of innovative business models of livestock waste management in the organic fertilizer sector. He argued that such business models can play a critical role in bringing sustainability to Afghanistan Agriculture. Dr. Tahir Iqbal, Product Manager of Atyab International Services from Sultanate of Oman gave the presentation on the topic of Certification and Technology Advances for Islamic countries. Status and Prospects. He explained the business model of Atyab International in the areas of Testing, Inspection and Certification and how it can play a critical role in the certification of Afghanistan Agricultural produce to enable them to effectively compete in the international market. He also emphasized the role of his company in certification of processed fruits and value added products to make a mark in the international market including Gulf countries as well as Europe and Central Asia. Dr. Habib Aslam Gaba, Chairman, Standing Committee on Academia Industry Linkages, Policy Advocacy and Tech Development, Faisalabad Chamber of Commerce and Industries spoke on the topic of Pakistan – Afghanistan Agri and Food Trade Pattern.

He highlighted the long history of trade among brotherly nations of Afghanistan and Pakistan. He strongly recommend bilateral cooperation among the trade associations and Chambers of Commerce and Industries from Pakistan and Joint Chamber of Commerce and Industry in Afghanistan. He rightly pointed out that extensive bilateral trade relationships are key to peace and stability in the region. He was optimistic that several mutually beneficial investment opportunities can be explored in Afghanistan. He concluded his talk by saying that peace and prosperity is the shared destiny of both Afghanistan and Pakistan in this region.

The panel discussion was concluded with an interactive Q&A session. The participants, specially Afghan PhD Students, questioned the panelists about the border management issues that stifle the trade with Afghanistan. The panelists argued that political stability, peace and mutual regional cooperation was key to dealing with such issues. They further highlighted that the Forums like IOFS as well as the technology and knowledge transfer by regional universities can play a pivotal role in enhancing the business prospects in Afghanistan. Participants raised questions relating to the possibility of technology transfer and multi lateral cooperation and the potential challenges to realize that possibility. Panelists were of the view that peace and political stability because of the recent end of the war has opened avenues for investment into Afghanistan. It was highlighted that Afghan government is offering various tax incentives like the lowest rate of Tax in the region to promote foreign direct investment in Afghanistan, particularly in Agriculture sector of Afghanistan.

Prof. Dr. Jaffar Jaskani, Director, Office of Research Innovation and Commercialization (ORIC), University of Agriculture, Faisalabad (UAF) presented the topic of “Role of UAF in Agricultural Development of Pakistan: Lessons for Afghanistan. He highlighted the history of University of Agriculture, Faisalabad as the oldest agricultural University in the region. He elaborated different avenues of cutting edge research being undertaken at UAF. He explained that the excellence of teaching and research at UAF is reflected through its international rankings in the area of Agriculture. He emphasized that UAF is already contributing to the agricultural development of Afghanistan through training of a large number of Afghan national students in multiple disciplines of agriculture at UAF. He stressed the need of institutional cooperation to be strengthened for the efficient transfer of knowledge.

Panel Sessions of 2nd day

Mr. Athar Hussain Khokhar, CEO Pakistan Horticulture Development and Export Company (PHDEC) talked about the potential of export of horticulture products in the region. PHDEC is a department of ministry of commerce of Pakistan, that was created due to enormous potential of Pakistan’s horticulture products in the global market. Mr Khokhar pointed out that PHDEC can play a pivotal role in the development of Agro Processing Zones, Cold Chain Systems, and value addition facilitation centers in Afghanistan to boost the horticulture exports of Afghanistan. Mr. Jawed Saleem Qureshi, Owner, Four Brothers Group participated online and spoke about the potential of genetic research and seeds exports. Four Brothers is a diversified company with a track record of excellence for last 25 years. He also emphasized the criticality of industry academia linkage in the field of genetic research and seeds development. Mr. Faizan Qureshi, Marketing Head, Syngenta, Pakistan praised the role of UAF in leading the research in Agriculture sector. He highlighted the 150 years of industry experience of Syngenta in the field of agriculture to improve global food security by enabling millions of farmers to make better use of available resources. He mentioned that he is willing to supply agricultural inputs in different countries. Dr. Habib Aslam Gaba, Chairman Standing Committee on Academia Industry Linkages, Policy Advocacy and Tech Development, Faisalabad Chamber of Commerce and Industries briefly spoke about the potential of bilateral trade. The event concluded with a vote of thanks from Dr. Abdul Ghafoor, In-charge Institute of Business Management Sciences. He extended his gratitude for the team of IOFS for co-organizing the event. He thanked all the foreign delegates from different countries including Afghanistan, Turkiye, Kazakstan and Sulatanate of Oman. He thanked the members of UAF Faculty and the students, specially the Afghan students for taking keen interest in the proceedings of the Afghan Agro Business Investment Forum. He further stressed the need to maintain a follow up on this forum and the continuity of multilateral cooperation among the member states of IOFS for the shared purpose of Food Security.

Sites Visited

In this segment of the participants of investment Form visited the following sites at University of Agriculture, Faisalabad.

- Center for Advance Studies in Agriculture and Food Security- CAS AFS
- National Institute of Food Science and Technology- NIFSAT
- Solar Energy/Irrigation project
- Institute of Horticultural Sciences (IHS)
- Institute of Soil and Environmental Sciences (ISES)
- Central Library UAF
- National Incubation Center (NIC)

Outcome

- The capacity building of faculty members of Institute of Business Management Sciences and Institute of Agricultural and Resource Economics, UAF.
- Provision of platform for linking potential investors with projects exchanging experiences, discussing global investment trends, strategies and forecasts
- Development of linkage among the Institute of Business Management Sciences and Institute of Agricultural and Resource Economics, UAF and regional stakeholders of OIC members.
- Development of research collaboration of UAF faculty with the regional OIC experts Results of the Impact Assessment
- Capacity building of the faculty member of Institute of Business Management Sciences and Institute of Agricultural and Resource Economics, UAF.
- Opportunity assessment for developing trade in the regional OIC member countries.
- Strategy development to ensure food security in regional OIC member countries.



**Title of the Event: 2-days Workshop on Molecular Biology in Forensic Science from Sampling to Data Processing
October 04-05, 2023**

Name of Organizer: Prof. Dr. Bushra Sadia, Director, CABB, UAF

Objectives

- Hands-on training of cutting edge technologies of Molecular Biology in Forensic Science.
- Hands on training of the participants on DNA isolation, PCR, Data analysis and results interpretation
- Practical demonstration of molecular biology with their possible application in forensic science
- Give participants knowledge about jobs in Forensic Science fields after Degree in Biotechnology

Proceedings

In this event, very well renowned and eminent experts of this field participated and delivered very interesting talks. The event started with recitation from Holy Quran and Naat-e-Rasool (PBUH). Chief Guest, Pro-Vice Chancellor University of Agriculture Faisalabad and Dean Faculty of Sciences, Prof. Dr. Muhammad Sarwar Khan said, in his welcome address, that Biotechnology and Molecular Science are Interdisciplinary Sciences and this kind of training workshop is very useful both for researchers as well as students in which they have hands-on training. Prof. Dr. Muhammad Qasim Awan, Chairperson Bioinformatics & Biotechnology Department, GCUF explained the basic concepts as well as techniques and tools of molecular biology which are used in forensic sciences. Dr. Nasir Siddique, Manager Crime Scene Investigation Units, Punjab Forensic Science Agency (PFSA), Lahore discussed some famous cases which were solved with the help of PFSA using different forensic techniques. Dr. Muhammad Naeem, Forensic Scientist DNA and serology, PFSA, Lahore briefed about the working layout of Forensic DNA analysis explaining all the steps from sample collection from crime scene till conversion into forensic evidences.



Ghulam Farid, Crime and Death Scene Investigator, PFSA, Faisalabad discussed aspects of crime scene investigation and job opportunities for biotechnology students in Crime Scene Unit and Forensic department.

Next day, firstly, Dr. Adnan Khan Niazi briefed about all the steps to be performed in different labs as hands-on-training. After that, students performed all the steps discussed as hands on training in different labs of CABB including DNA extraction, quantification, amplification using PCR, gel preparation and gel electrophoresis to visualize the results. In the last step, sequencing results were discussed by Dr. Saad Sarfaraz. Certificates were distributed to participants by Pro-Vice Chancellor UAF and Dean, Faculty of Sciences, Prof. Dr. Muhammad Sarwar Khan. Event formally ended with vote of thanks by Prof. Dr. Bushra Sadia, Director CABB.

Outcome

- Knowledge dissemination among young Faculty, M Phil and PhD scholars and researchers
- Networking of the faculty with stakeholders
- Discussion-based hands-on training sessions of participants



**Title of the Event: 4th BRI Sino-Pakistan Agriculture Forum
November 09-10, 2023**

Name of Organizer: Prof. Dr. Ahmad Sattar Khan, Institute of Horticultural Sciences, UAF

Objectives

- To facilitate knowledge exchange and technology transfer between China and Pakistan to promote agricultural research and innovation.
- To promote the adoption of modern agricultural technologies and best practices to improve productivity and sustainability.
- To attract private sector investment in agriculture along the BRI.

Proceedings

Caretaker Federal Minister for National Food Security and Research, Dr Kausar Abdullah Malik, Provincial Minister for Agriculture SM Tanveer, Vice-Chancellor University of Agriculture Faisalabad, Prof Dr Iqrar Ahmad Khan, Vice-Chancellor PMAS Arid Agriculture University, Rawalpindi, Prof Dr Muhammad Naeem attended the forum in person. Many leading scientists and agricultural experts attended the event in person or online. More than 70 quality presentations were given.

Scientists came from multiple agricultural related universities and institutions such as UAF, PMAS Arid Agriculture University, Rawalpindi, Huazhong Agriculture University (HZAU), Chinese Academy of Agricultural Sciences (CAAS), Xinjiang Agriculture University, etc.

Mr. Li Zhaohu, President Huazhong Agricultural University presented an overview of University's history and functionality. Mr. Li also emphasized potential areas of collaboration with UAF, specifically focusing on Genetic Improvement of Crops, Vegetable Molecular Breeding and Quality Improvement, Infectious Diseases of Animals, and Genetic Enhancement of Aquaculture. He also highlighted the importance of scientific collaboration in genetic diversity, Biotechnology, germplasm exchange and conservation. Mr. Li expressed the hope of strengthening collaborative research on



agricultural advancement and promoting agricultural trade with Pakistan.

The representative from CAS, provided a comprehensive overview of the university's agricultural research initiatives.

The session tracks of the forum were:

- Biotechnology and Functional Genomics in Agriculture
- Animal Health and Disease Control
- Sustainable Horticulture for Food Security
- Plant protection and green control technologies
- Advances in Food Science and Technology
- Agriculture for Socio-Economic Development



TECHNICAL SESSION I

Biotechnology and Functional Genomics in Agriculture

Nanobiotechnology and Sustainable Development of Crop Production

by Honghong Wu

Mr. Wu focused on Nano biotechnology potential in improving crop production to facilitate the sustainable development of agriculture. Nano sensors such as carbon nanotubes have been widely used to detect crop stress signaling molecules such as hydrogen peroxide.

Plant Viruses, Their Impact and Genome Editing Based Strategies to Control

by Imran Amin

Mr. Amin emphasized that Phytopathogenic viruses are a major biotic constraint to agricultural productivity and, throughout the warmer parts of the world, many of the most important diseases of crops are caused by arthropod-borne viruses of the family Geminiviridae. The symptoms caused by these viruses include enations, leaf curling and stunting, which resemble developmental abnormalities.

Genetic Analysis of Drought Resistance and Innovation of Drought Resistant Germplasm Resources in Cotton

by Xiyan Yang

Mr. Yang presented that Water-saving and drought-resistant measures are significant requirements for the green development of cotton industry. Understanding the molecular mechanism of the interaction between cotton and drought stress and improving drought resistance and water use efficiency are the main ways for the green and sustainable development of cotton industry.

Utilizing High-Throughput Phenotype and GWAS to Explore Cotton Drought Resistance QTN

by Qin Chen

Mr. Chen told that in recent years, the frequent occurrence of extreme weather has seriously constrained the development of China's cotton industry. Xinjiang is located in an arid and semi-arid region, with scarce water resources. Cultivating drought resistant varieties through molecular marker assisted selection is an effective way to address drought hazards and promote sustainable development of cotton in Xinjiang.

Genome-Wide Association of the Metabolic Shifts Underpinning Dark-Induced Senescence in Arabidopsis

by Feng Zhu

Mr. Zhu said that dark-induced senescence provokes profound metabolic shifts to recycle nutrients and to guarantee plant survival. To date, research on these processes has largely focused on characterizing mutants deficient in individual pathways. We adopted a time-resolved genome-wide association-based approach to characterize dark-induced senescence by evaluating the photochemical efficiency and content of primary and lipid metabolites at the beginning, or after 3 or 6 days in darkness.

Applications of Plant Genomics: Improving Crop Production for Sustainable Agriculture

by Bushra Rashid

Ms. Rashid suggested that plant genomic strategies along with molecular biology approaches are making progress in improving plant protection and production policies. These approaches with improved technologies may find the solution to identify and characterize the new genes to be allowed to introduce new crop varieties. The newly developed transgenic plants may have better performance in severe weather conditions and produce higher yields and improved quality of crops.

The microRNA-7322-5p/p38/Hsp19 Axis Modulates Chilo suppressalis Cell-Defenses Against Cry1Ca

by Weihua Ma

Mr. Ma demonstrated that Cry1Ca-mediated downregulation of microRNA-7322-5p (miR-7322-5p), which binds to the 3' untranslated region of p38, negatively regulates the susceptibility of Chilo suppressalis to Cry1Ca. Moreover, Cry1Ca exposure enhanced phosphorylation of Hsp19, and Hsp19 downregulation increased susceptibility to Cry1Ca. Further, Hsp19 phosphorylation occurs downstream of p38, and pull-down assays confirmed the interactions between Hsp19 and Cry1Ca, suggesting that activation of Hsp19 by the miR-7322-5p/p38/Hsp19 pathway promotes Cry1Ca sequestration.

Diverse Role of Mycoviruses and Potential Applications for Sustainable Agriculture

by Muhammad Faraz Bhatti

Mr. Bhatti presented that mycoviruses can have cryptic, hypervirulent, or hypovirulent effects on host fitness. Hypovirulent mycoviruses harbouring phytopathogenic fungi can be used as biocontrol agents in fungal disease management. Fungal pathogens harbouring mixed infection of mycoviruses have been known to overcome host silencing machinery and alter phenotype, and expression of host genes.

Accurate Identification of Cold Tolerance in Rice Germplasm Resources and Gene Mining of Cold-Related Genes

by Pang Hongbo

Mr. Hongbo said that our findings offer novel perspectives on comprehending the mechanisms underlying cold tolerance. In subsequent investigations, we will focus on the molecular mechanisms of these recently identified cold tolerance genes aiming to provide additional support for the breeding of cold-tolerant rice varieties.

TECHNICAL SESSION II

Sustainable Horticulture for Food Security

Genetic Basis of Agronomically Important Traits in Tomato and Its Applications in Breeding

by Yuyang Zhang

Mr. Zhang presented that the genetic basis of important traits of tomato was deciphered, and the genetic variation of important traits was also identified. For example, the 3-bp Findel in the promoter of the ALMT9 gene is the causal variation for tomato fruit malate. Based on genetic variation and genomic information, molecular markers and genomic markers were developed and applied to tomato molecular breeding.

Integrating Precision Agriculture Technologies to Increase Sustainability of Valuable Horticultural Crops

by Muhammad Azam Khan

Mr. Khan demonstrated that the application of PAT within the field of horticulture showcases a potentially effective strategy for achieving enhanced production and farm profitability. He emphasized on the significance of achieving an ideal balance among these elements to promote sustainability. Sections of this paper comprehend a review on the utilization of PAT in diverse horticultural contexts specifically for fruit and vegetable crops under rainfed conditions.

Key Technologies for the Sustainable and Healthy Development of Citrus Industry

by Liu Yong-Zhong

Mr. Zhong claimed that we have developed some simplified and high-quality cultivation techniques from the establishment of the orchard, soil management, water and fertilizer management, tree blossom and fruit management, pest management, etc., to ensure that the orchard managements can be completely implemented in the case of insufficient labour force, then to reduce costs and improve the fruit quality which will promote the sustainable and healthy development of the industry, and in the end meet the people's demand for citrus.

Near Freezing Temperature Alleviate Peach Chilling Injury and Improve Aroma Quality During Postharvest Storage

by Hongru Liu

Mr. Liu presented that the content of C6 compounds, esters and lactones derived from fatty acids were elevated dramatically than fruits kept at 0 and 5. Correspondingly, the transcript levels of PpLOX1, PpHPL1, PpADH1 and PpAAT1 were induced significantly. NFT increased the chilling tolerance and kept aroma quality in peach fruit by keeping the ROS metabolic balance via regulating activities of related enzymes and expression level of genes.

Role of BrSDG8 on bolting in Chinese cabbage (*Brassica rapa*)

by Wei Fu

Mr. Fu told that bolting is an important event in Chinese cabbage to transition from vegetative growth to reproductive growth and is regulated by a complex gene network and epigenetics (e.g., histone methylation), and flowering transition targeting FLC is closely associated with epigenetic modifications.

Innovative Technologies for Sustainable Urban landscape

by Aamir Nawaz

Mr. Nawaz alleged that traditions and culture have always had an impact on how decisions are made about designing a landscape but as environmental concerns have become more prevalent, modern trends like vertical, green wall, layered landscaping, green roofs, and diverse land use for things like spiritual, cultural, and functional gardens by use of organic products in landscape design have been a success.

Establishing Horticulture Value Chains: Key Learnings from Case Studies of Pakistan

by Aman Ullah Malik

Dr Malik explained the approach used for value chains development including team building, R&D backup, involving small holders, walk the chain activities, cluster development, monitoring supply chains, market linkages, capacity building, pilot demonstrations and sustainability etc. Few examples were given as how growers learned to establish their enterprises and commercial value chains of horticultural crops which would be a good source of learning and inspiration for stakeholders especially in developing countries.

Preservation, Domestication, and Value Addition of High-Value Medicinal Plants in Gilgit Baltistan, Northern Pakistan

by Ghulam Ullah Saqib

Mr. Saqib emphasized the transition from unstructured harvesting methods to a professional approach, ensuring the preservation and improved utilization of precious, rare, and valuable plant species in Gilgit Baltistan. He also focused that there is a need to preserve and cultivate the valuable medicinal flora of Gilgit Baltistan.

Breeding and Industrial Development of Tree Peony in China

by Xiuxin Zhang

Mr. Zhang claimed that his team has collected resources of wild and cultivated germplasms, cultivated new varieties with special colours such as yellow and orange using distant hybridization. We also established an accurate flowering regulation technique to make the tree peony bloom in any time of a year. We have realized a complete set of industrial processes from resources evaluation, cultivation, breeding, postharvest, etc. and also their application in rural revitalization.

TECHNICAL SESSION III

Plant Protection & Green Control Technologies

Mechanism of U-box E3 Ubiquitin Ligase of Soybean Involved in Host Resistance to *Heterodera glycines*

by Nawei Qi

Mr. Qi claimed that there are few reports on the response of soybean ubiquitination genes (GmPUBs) to nematode stress. Specific functions and mechanisms of GmPUBs genes in the interaction between soybean and SCN are still unclear. The molecular mechanisms of GmPUBs in response to SCN infection was clarified by studying the characteristics and expression patterns of GmPUBs genes, specific functions, roles of GmPUBs, and the regulatory mechanisms of GmPUBs.

The Pheromone Encoding in the Peripheral and Central Nervous System of *Helicoverpa armigera*

by Xiao-Lan Liu

Mr. Liu presented his results which showed that the major pheromone component Z11-16:Ald was detected by the ORN housed in Type A trichoid sensilla, and the information was transmitted to the glomerulus Cumulus (Cu) in the macro glomerular complex by the ORN and then sent to medial lateral horn (mLH) by the Cu-PN. The secondary pheromone components Z9-16:Ald and Z9-14:Ald were encoded by the ORN in Type C trichoid sensilla, and the information was transmitted to the dorsomedial posterior glomerulus (DMP) and then sent to lateral lateral horn (LLH) by the DMP-PN.

Turnover of Bacteria-Derived Carbon and its Mechanisms for Soil Carbon Sequestration by Tiantian Zheng

Mr. Zheng demonstrated that we traced the fate of Gram-negative (Gram-) microbial biomass carbon through the microbial food web over time, using the concentrations and isotopic compositions of biomarker phospholipid fatty acids (PLFA) in a soil incubation with isotopically (¹³C) labelled model bacterial cells (*Escherichia coli*).

White and Brown Adipose Tissues: The Fuel for Hibernation

by Xin Xing

Mr. Xing said that his team had observed the morphological differences of mitochondria among hibernating, euthermia and arousal Daurian ground squirrels. We found that the euthermia squirrels showed decreased mitochondrial cristae density comparing with hibernating and arousal squirrels. Besides, the lipid droplet area is significantly smaller in euthermia squirrels' BAT.

Key Technologies for Harmless and High-Value Conversion of Organic Solid Wastes by *Hermetia illucens* Wuhan Strain and Microbes

by Zhang Jibin

Mr. Jibin presented that isolated microbes could induce BSF adults to lay eggs used in large scale BSF breeding factory. It allows the high efficiency eggs mass production of BSF larvae to meet demand of large-scale organic waste conversion at low cost. Microbes from BSF play important roles in BSF larvae nutrition and resistance against pathogens.

Sustainable Cotton Production: Challenges and Opportunities in Pakistan

by Shafqat Saeed

Mr. Saeed presented that different plant-based extracts were evaluated against cotton insect pests during 2019-2021. The results revealed that extracts of bitter apple, neem, tobacco, and asafetida (hiing) were very effective. The cotton advisories regarding use of these plant extracts were developed and disseminated among farmers throughout the growing season 2021-23.

Introduction of International Standards and Integrated Pest Management (IPM) for Crops by Zhuang Yuanyuan

Mr. Yuanyuan shared his experience regarding relevant research and sorted out the standardization of pest's management in international organizations and countries. During the

research process, we conceived the idea of setting up a technical committee for Integrated Pest Management (IPM) for Crops under ISO. After working with experts and researchers, we formed the final version of the proposal in April 2023.

Identification of cis-Acting Replication Element in VP2-Encoding Region of Senecavirus A Genome

by Fuxiao Liu

Mr. Liu presented that one putative CRE containing a typical AAACA motif was computationally predicted to exist within the VP2-encoding sequence of SVA. To test the role of this putative CRE, 22 SVA cDNA clones with different point mutations in their CRE-formed sequences were constructed to rescue replication-competent SVAs. A total of 11 viruses were rescued from their individual cDNA clones, implying that some mutated CREs exerted lethal impacts on SVA replication.

Engineered Phage Endolysins with Extracellular Antibacterial Activity Against Gram-Negative Bacteria

by Zhang Can

Mr. Can presented that a screening platform was constructed to screen for engineered Artificial-Bp7e (Art-Bp7e) endolysins with extracellular antibacterial activity against *Escherichia coli*. An oligonucleotide of 20 repeated NNK codons was inserted upstream of the endolysin gene Bp7e to construct a chimeric endolysin library in the pColdTF vector.

Protected Agriculture Matters: Year-Round Persistence of *Tuta absoluta* in China Where It Should Not Be

by Zhaozhi Lu

Mr. Lu urged that the increasing use of APFs will increase the areas at risk of *T. absoluta* invasion significantly more than global warming because APFs effectively protect *T. absoluta* from harsh northern winters. In addition, vegetable production in surrounding open fields will be at risk of invasion during milder seasons when APFs are opened and *T. absoluta* can disperse.

TECHNICAL SESSION IV

Advances in Food Science & Technology

Characteristics and Processing Technology of Surimi and its Products Made from Freshwater Fish

by Prof. Tao Yin

Prof. Yin presented about Surimi and said that it is a kind of refined fish myofibril protein, which is produced through various step-by-step processes, including filleting de-boning, rinsing, dehydration, refining, mixing with cryoprotectant, and freezing. Surimi products are made from surimi, chopped, added with salt and water, etc., to form thick fish paste, heated, and turned into elastic gel.

Bio fortified Crops: An Opportunity for Nutritious and Affordable Diet by Munawar Hussain

Mr. Hussain presented that one quarter of the Pakistan's population is living below the poverty line, 39% is poor, 40% children are stunted, and more than 50 million people have inadequate zinc intake. The delivery model includes agricultural research, seed release and testing, seed multiplication, seed supplied to farmers, crop production, crop aggregation, crop processing, secondary processing, retailing and consumption while the scaling model includes introduction, scaling, anchoring, and sustaining.

Bactrian Camel Milk in China: Production, Research and Processing by Dr. Ablimit

Mr. Ablimit discussed that Bactrian camel milk is a popular product in China, with a milk yield ranging from 1.7-5 kg/d. The camel breeds are Alxa BC and Sonid BC from Inner Mongolia, Tarim BC and Junggar BC from Xinjing, and Qinghai BC. The milk contains 23 fatty acids, with oleic acids, palmitic, myristic, and stearic being the most predominant.

Prospects of Non-Thermal Preservation Technologies in Pakistan to Reduce Food Security Burden by Prof. Dr. Asif Ahmad

Prof. Ahmad urged that Institute of Food and Nutritional Sciences has proposed a strategy to enhance food security by implementing non-thermal preservation technologies. These techniques, including high-pressure processing (HPP) and irradiation, can reduce food waste, extend shelf life, and preserve nutrients. In Pakistan, NTPS are being used by food processors and producers, such as HPP for fruits and vegetables, irradiation for meat, poultry, and seafood, pulsed electric field (PEF) for pasteurization, cold plasma for decontamination.

Facility Agriculture and the All-Encompassing Approach to Food by Huizhuan Yan

Mr. Yan presented that In China, among all kinds of crops cultivated in agricultural facilities, the planting area of vegetables accounts for over 80%, while the areas of fresh fruit trees and ornamental plants are 11% and 7%, respectively. The future perspective for facility Horticulture is to establish a Modernization Production System of Facility Agriculture, Improve the Industrial Level of Facility Agriculture, and develop a Perfect Technic Support System.

Food Safety and Nutrition: An Important Aspect of Food Security and Health by Prof. Dr. Tahir Zahoor

Prof Zahoor said that the ultimate goal in the world's current scenario is to end hunger by achieving food security, food safety and improving nutrition. The consumption of non-optimal quantities leads to specific health disorders and malnutrition which is widely prevalent in South Asia where half of the world's malnourished children are found in just three countries - Bangladesh, India, and Pakistan. Foodborne infection and poor nutritional status reduce food intake, reducing nutrient absorption through intestinal damage and changing nutrient levels and requirements due to infection on metabolic effects.

Reducing Muscle Food Loss and Waste: Extend Shelf Life and Utilize Muscle Food By-products

by Haizhou Wu

Mr. Wu presented that 10%-20% of fresh meat products are wasted due to lipid oxidation. According to the nutritional results, sorting and choosing the best method to add value to them individually will be important to take co-product valorization to the next level. Fish make up 17% of the intake of animal proteins all over the world. Therefore, different nutritional researches emphasize the safe separation of by-products through different methods.

The Research and Application of Comprehensive Utilization Technologies of Sweet Potato By-products

by Prof. Dr. Tai-hua Mu

Prof. Mu focused that the Chinese Academy of Agricultural Sciences' Root and Tuber Crops Food Science and Technology Innovation Team is focusing on researching and applying sweet potato by-products to improve human nutrition, ensure food safety, and target wide-cultivated sweet potato crops. Sweet potato peptides, pectin, and fermented beverages with *Lactobacillus* can improve intestinal microbiota structure and immune ability.

The Role of Vitamin A in the Regulation of Glucose and Fatty Acid Metabolism

by Guoxun Chen

Mr. Chen presented that the goals of the presentation were identification of the Vitamin A (VA) in the lipophilic extract and the retinoic acid responsive element at the glucokinase gene promoter, regulation of obesity in Zucker fatty rats by VA, regulation of hepatic gene expression through Vitamin A metabolism and role of VA status reduction for Type 2 diabetes and obesity prevention in Zucker diabetic fatty rats. High-fat diet seems to reduce the need of VA or save the use of VA, as VAM rats have significantly higher body weight than VAD rats in both ZL and ZDF rats.

Outcome/ Recommendations

- Exchange of elite exotic germplasm, adaptability trials, characterization, conservation and documentation across borders
- Selection for climate-resilient crops/varieties
- Development of certified nursery production systems in economically important crops
- Adaptation of hi-tech Chinese crop production and crop management technologies
 - High-density production
 - Precision Agriculture Technologies
 - Improved solid waste management
 - Enhance farm mechanization
 - AI-based farm management technologies
- Export-oriented value addition in potential crops
- Reduction of Post-harvest losses
 - Value addition, better processing and packaging technologies
 - Development of cargo and cold storage systems near airports

- Development of one window centers for exporters
- Infrastructure and human resource
- Strengthening of faculty and student exchange programs for trainings and further studies
- Development of joint labs and research centers
- There is need to unveil the characteristics and expression patterns of specific genes such as like GmPUBs genes which can further regulate the cyst nematode in soyabean.
- Some strategies like turnover process of microbial biomass residues via the microbial food web can be utilized in soil organic matter as fungal necromass.
- The Pheromone Encoding in the Peripheral and Central Nervous System of some very invasive insect pests like *Helicoverpa armigera* (cotton boll worm) can be utilized for their effective control.
- Functional organic fertilizers can be produced by using black soldier fly through secondary fermentation via nematicidal microbes.
- In the current scenario of climate change, to control the increased pressure of insect pest on our major crops, emphases should be to increase the use of bio pesticide through international standards of IPM.
- Techniques such as Area-wide integrated pest management for fruit fly control through incorporating the Male Annihilation Technique (MAT), Bait Application Technique (BAT), and orchard sanitation should be encouraged.

Huazhong Agricultural University China signed an MoU with University of Agriculture, Faisalabad for academic collaboration and student exchange programme. Under this agreement, five students under fully funded scholarships and five students from Pakistan and five students from China can visit the partner universities for 1 year.



Title of the Event: Workshop on Demonstration of Chrysanthemum & Autumn Flower Production & Handling Technology to Growers and Stakeholders

December 12-14, 2023

Name of Organizer: Dr. Iftikhar Ahmad, Associate Professor, Institute of Horticultural Sciences, UAF

A three-day Annual Chrysanthemum & Autumn Flower Show was organized at Agriculture faculty lawns by Institute of Horticultural, University of Agriculture, Faisalabad, from December 12-14, 2023, to display and demonstrate chrysanthemum and autumn flowers along with IHS floricultural technologies. Students from Institute of Horticultural Sciences were very excited to participate in this event as they were working day and night on their assigned projects regarding floral displays since last two weeks before the show under the guidance of Dr. Iftikhar Ahmad (Convener Management Committee). It was a pleasant sunny day when all the participants completed the set-up of their displays before the judges from Lahore, Islamabad and Faisalabad started evaluating their stalls. The chief guest of the inauguration ceremony, Prof. Dr. Iqrar Ahmad Khan, (S.I., H.I.), Vice Chancellor, University of Agriculture, Faisalabad, inaugurated the event along with other dignitaries and appreciated the hardwork put by the organizing team to organizing this marvelous show. Visitors also joined in large numbers to witness the unveiling of this event. IHS, floriculture lab. technologies were also displayed along with 20 chrysanthemum exotic varieties. After inauguration, the chief guest visited IHS technologies stall and was briefed about the UAF-Gro, Rose value added products, Indigenous flower seeds, new specialty cut flowers and Registered calendula varieties, exotic chrysanthemum varieties and value chain & branding of cut flowers and potted plants).



In this show, government organizations such as Nuclear Institute of Agriculture & Biology, Directorate of Floriculture, Lahore, Parks & Horticulture Authority, Faisalabad, Nuclear Institute of Biotechnology & Genetic Engineering, Faisalabad, Institute of Horticultural Sciences, University of Agriculture, Faisalabad, Capital Development Authority, Islamabad, Rawalpindi

Cantonment Board, Rawalpindi etc. participated along with their chrysanthemum displays. Among private organizations, Millat Tractors, Lahore, Sitara Chemicals, Faisalabad, Ibrahim Fibers, Faisalabad, Horti. Club Nursery Faisalabad, Best Garden Nursery, Faisalabad, Al Rehman Nurseray, Faislaabad, Lalazar Nursery, Faisalabad, Gulshan-e-Waqar Nursery, Pattoki, Gardners Club Faisalabad, etc. also participated and displayed their chrysanthemum and autumn flowers. Along with government and private organizations, many entrepreneurs such as Agriflora, Jaranwala; PakBloomia, Faisalabad; Gulban, Lahore; Botanic enterprises, Islamabad; and GYM club UAF also participated with their products and exotic chrysanthemum varieties.

Other than professional organizations and businesses, students from Institute of Horticultural Sciences, UAF, Institute of Home Sciences, UAF, GC women University, Faisalabd, Punjab College, Faisalabad, and MNSUA, Multan, also participated in various categories and presented their ideas in the form of beautiful special displays etc. Gazebo, cactus gardens, special chrysanthemum walls, clock, flag of Palestine as symbol of peace, elegant photo frames, esthetic gardens, heritage display of chrysanthemums and floral arrangements. Along with special displays, many fresh and dry flower arrangements were also displayed. Many news channels as Suno news, 92 news, Duniya news, Express news, FM.100.4 also joined and interviewed the organizers, management team and visitors regarding their experience of this flower show. Many schools such as DPS Main Campus, DPS Premier Campus, Laboratory Girls High School, PAEC School, School of future thoughts etc. also participated with their special displays and table arrangements.

On December 13, 2nd day of the event, Engr. M. Najeeb Haroon, Chairman PEC and an Ex-Parliamentarian along with his delegate accompanied by Vice Chancellor, UAF also visited the event. He appreciated the efforts



of organizers for arranging such a wonderful event for the community. There was also a competition of photography and painting for school, college and university students. They displayed photographs & paintings on colors of autumn theme. Judges evaluated all displays and submitted results to the convener.

On day 3, Ms. Noriko Sato, Senior National Specialist/ Mission Lead of Asian Development Bank (ADP) along with Vice Chancellor UAF visited the show. She was briefed about the floriculture innovations developed at UAF and recent advances in floriculture at national level by Dr. Iftikhar Ahmad and his team. Visitors and participants were very excited after watching the mesmerizing display of flowers and participants were very confident while talking about their flower arrangements to visitors. Visitors enjoyed the event and encouraged young students about their skills and efforts. The beauty of chrysanthemums of various colors and kinds, fragrance of roses and eye-catching floral arrangements were just perfect to visit and enjoy and were praised by the visitors/participants.

At the end, prize distribution ceremony of the event was held at new senate hall where Dr. Iqrar Ahmad Khan Vice chancellor UAF, along with Ms. Noriko Sato (ADP), Mr. Pirzada Arshad Farooq, DG ALP, PARC, and Dr. Muhammad Saeed, Director Floriculture Punjab awarded shields, trophies, and cash prizes to the winners of the show and shared their views about this event. Afterwards, Dr. Ahmad Sattar Kahn Director IHS, UAF, shared his views regarding the event, and appreciated and encouraged students and organizing team. At the end, Dr. Iftikhar Ahmad paid a vote of thanks to all participants, guests, his team, and all offices of the university who supported him to organize this show in a befitting manner and making it a success story. Overall, it was an amazing and informative exhibition for students as well as visitors. These types of events are a source to enhance practical knowledge and skills among youth and to demonstrate the progress in field of floriculture in Pakistan.



Title of the Event: Seminar on DSR as Resource Conservation Technique in Rice-Wheat Cropping System of Punjab

October 30, 2023

Name of Organizer: Dr. Nadeem Akbar, Director, Water Management Research Centre, PARS, UAF

Activities

The farmer day was conducted to educate farmer community for enhancing rice productivity on sustainable basis through DSR (Direct seeded rice) technology and mechanization.

Dr. Nadeem Akbar welcomed the participants and talked about the objectives of the activity. He explained that the DSR on beds is a potential emerging technology for rice production to enhance its productivity. He shared his experience regarding different experimental trials on DSR under raised bed planting, conducted at WMRC.

The invited guests also expressed their feelings, shared their knowledge and appreciated the ongoing activities for developments in DSR technology for rice production. Dr. Iqrar Ahmad Khan addressed the participants regarding global prospects of mechanized agriculture, future challenges and the need to adopt efficient resource conservation technologies in this era of water scarcity and food security.

Afterward, Dr. Nadeem Akbar took participants to the field for demonstration of rice crop, sown on beds through DSR. The question answer session was held in field where all the participants argued regarding their concerns for shifting from conventional sowing methods to DSR for rice growing. By getting satisfactory

answers and seeing the standing crop conditions, they expressed their gratitude to scientists and showed commitment to adopt DSR at their farms during future sowing. Rice harvesting was inaugurated by Dr. Iqrar Ahmad Khan and a practical demonstration of Kubota combine harvester was given to participants to mitigate the myth that "the harvesting of rice cannot be possible with combine harvester when crop is sown on beds".

Field demonstration followed a technical session in which comprehensive discussion was made between the scientists of UAF and team from ADB. The ADB team showed their interest for piloting the DSR technology coupled with bed planting in collaboration with UAF.



Outcome

The activity was successfully executed and following outcomes were achieved:

- Demonstration was given to participants regarding rice sowing with DSR on beds as a resource conservation technology to create awareness among audience.
- Involvement of farmers in harvesting activities for their capacity building
- Collaborative discussion during the event with ADB team for piloting the DSR technology at farmer fields.



Title of the Event: International Symposium on Drug Discovery and Development

March 01-02, 2024

Name of Organizer: Dr. Fatma Hussain, Associate Professor, Department of Biochemistry, UAF

Inaugural session of the symposium was held in Iqbal Auditorium, UAF at 09:00 am on 1 March, 2024 with the commencement in the name of Allah SWT. Prof. Dr. Amer Jamil (Chairman/Principal Organizer) gave the presentation on background and objectives of the symposium. Prof. Dr. Ijaz Ahmad Bhatti, Dean (Patron) in his address apprised the importance of drug development. Prof. Dr. Alicja Nowaczyk, (Nicolaus Copernicus University in Toruń, Poland) gave presentation "Acetylsalicylic acid tetramorphism". The topic of presentation by Dr. Muhammad Asghar, (National University of Medical Sciences, Rawalpindi) was "The Importance of Bioequivalence in Generic Drugs: Ensuring Safety and Efficacy". While Prof. Dr. Mushtaq Ahmad (TI), Quaid-e-Azam University, Islamabad highlighted the importance of natural products for drug in a presentation titled "Botanicals for natural products to ensure, Health security via Natural Drugs discovery development".

Guest of honor Prof. Dr. Khalid M. Khan (Sitara-i-Imtiaz), President Pakistan Academy of Sciences, also addressed the session and emphasized to focus on clinical trials, and commercialization. Before Lunch, SESCOB Alumni proceedings and cabinet oath taking ceremony were held. Prof. Dr. Khalid M. Khan (Sitara-i-Imtiaz) took oath from newly elected members of the cabinet.

In the second technical session, started after lunch/prayer break, Dr. Łukasz Fijałkowski, Nicolaus Copernicus University in Toruń, Poland, gave presentation on "Interactions of paroxetine with selected monoamine transporters: an in silico molecular modeling study". Topic of presentation by Prof. Dr. M. Nadeem Akhtar, Ghazi University, Dera Ghazi Khan, Pakistan was "Damnacanthal and their potential cytotoxic effect on the breast cancer cell lines, MCF-7, and MDA-MB231". Dr. Saima Siddiqi, Institute of Biomedical and Genetic Engineering (IBGE), Pakistan also gave talk on "Drug discovery in genomic era". At the end of the symposium (day 1), Dr. Hira Ijaz, Pak



Austria Fachhochschule, Haripur, Pakistan gave talk on “Formulation and evolution of polymeric nexus for controlled drug delivery”. The participants also presented posters in lobby of the Iqbal Auditorium. The posters were evaluated by the Poster Evaluation Committee and 1st, 2nd, 3rd positions were announced.

On day 2, the session was conducted online through Microsoft Teams Meeting by Dr. Muhammad Ali as moderator. Prof. Dr. Athar Ata, Michigan Technological University, USA gave an impressive talk on “Natural Product Chemistry based Drug Discovery and Pharmaceutical Industry”. Topic of talk by Dr. Huawei Zhang, Chinese Academy of Sciences, China was “Cryo-EM structures of CIC-2 chloride channel” which revealed the blocking mechanism of its specific inhibitor AK-42”. Prof. Dr. Azhar Hussain, Pak. Austria Fachhochschule, Haripur, Pakistan gave presentation on “Accelerating SDG Progress through Research and Academia: Academic and Industrial Collaboration for Sustainable Drug Development”. While, Dr. Junaid Afzal, Kashmir University, India delivered lecture on “Chemico-Biological Interactions in Drug Discovery”. Topic of presentation by Dr. Raheela Jabeen, The Women University Multan, Pakistan was “Preparation, Characterization and Solubility of Binary and Ternary Complexes of Glipizide with Hydroxypropyl- β -Cyclodextrin and Tyrosine”. Aisha Ghaffar, University of Agriculture Faisalabad, Pakistan gave talk on “Recent advances in the therapeutic effectiveness of smart-responsive hydrogels for healing of diabetic wounds”. Whereas, Haram Afzal, University of Agriculture Faisalabad, Pakistan gave presentation “Recent technological advancements in mRNA vaccine development and its potential applications”. In the end, Dr. Abdul Ghaffar, Government College University Faisalabad, Pakistan gave presentation on “Effect of doxorubicin on the selective oncogenes expression level of hepatocellular Carcinoma RAS/RAF/MEK/ERK pathway in Huh 7 cell line”.

The symposium was concluded on March 2, 2024 at 3:00 p.m. Prof. Dr. Amer Jamil (Chairman/ Principal organizer) congratulated the participants on successful completion of the symposium and thanked all the organizers and collaborators for giving their time for symposium. He also thanked EFS for providing funds to the symposium, and the University for providing the space and permission to conduct the symposium in the University.

Outcome

Participants from different Universities and institutions (University of Agriculture Faisalabad, The University of Faisalabad, University of Sargodha, The Women University Multan, GC University Faisalabad, GCWU Faisalabad, Pak Austria Fachhochschule Haripur, National University of Medical Sciences Rawalpindi, Ghazi University DG Khan) attended the symposium. The symposium resulted in delivering lectures to researchers and students to acquaint them about drug discovery and development. The symposium concluded successfully as the participants got theoretical concepts on advances in drug discovery process, role of genomics, screening in drug development, importance of human clinical trials and regulatory compliance.

Most significant outcome was the signing of an LoI/MoU between University of Agriculture Faisalabad and Nicolaus Copernicus University in Toruń, Poland for student internships and scholarships

**Title of the Event: International Day of Forests
March 21, 2024**

**Name of Organizer: Dr. Irfan Ahmad, Chairman, Department of Forestry and
Range Management, UAF**

Objectives

- To celebrate 21st March as International Day of Forests in UAF.
- To familiarize the participants with new forest innovations.
- To create awareness at mass level.

Proceeding

Keeping in view the theme of International Day of Forests, 2024 (Forests and Innovations) the event was organized for raising the awareness level of farmers, students and general public at Paroka-II Farm area of University of Agriculture Faisalabad on 21-03-2024. Before departing for Proka-farm an awareness walk was organized at main campus for highlighting the initiative regarding clean and green Punjab.

Before starting the inaugural session, tree saplings were planted by the dignitaries. Inaugural session of the seminar was chaired by Dr. Irfan Ahmad, Chairman Department of Forestry and Prof. Dr. Ahmad Sattar, Director Institute of Horticultural Sciences, UAF. Importance of forests with reference to the International Day of Forests were highlighted by Dr. Muhammad Asif (Secretary of the event). Dr. Irfan Ahmad Chairman, Department of Forestry/Convener, UAF tree plantation committee delivered inaugural address and highlighted the achievements of Department regarding tree plantation at main campus and other farms of UAF especially at Proka. He apprised the participants about the targets given by the Pakistan Government regarding tree plantation. He emphasized that University has achieved the targets magnificently and appreciated the efforts of Forestry Department in this context. Chairman supports Board, UAF Dr Irfan Afzal also addressed the audience about



innovative ideas for forest. Mr. Mansoor Ali, Divisional Forest Officer, Silvicultural Research Division, Faisalabad was the guest speaker. He pushed the students and farmers to participate in the tree plantation activities generously and appreciated the efforts of the Department of Forestry, UAF for raising seedling with the involvement of young foresters. Dr. Ahmad Sattar Director Institute of Horticultural Sciences discussed about his efforts to establish orchards at Proka farm-II.

Dr. Asadullah Haider (Land Utilization Officer) also addressed the audience and highlighted the importance of trees. Prof. Dr. H. Muhammad Saqib, Institute of Soil and Environment discussed the role of trees in the reclamation of problematic soils and in the climate change mitigation and adaptation.

Prof. (Retd.) Dr. M. Tahir Siddiqui, Prof. (Retd.) Dr. Rashid A. Khan, Dr. Shahid Yaqoob, were the guest speakers of second session. Speech competition among the students was also held. Students delivered exhilarating, educative speeches and highlighted the importance of trees in modern society. Farmers, media persons and Faculty members also participated in the event. At the end, certificates were distributed among the guests and students.

Outcome

- Before this seminar most of the participants were ignorant about the International Day of Forests.
- Dissemination of knowledge about the production and utilization of multipurpose tree species
- Participants realized the importance of trees in the reclamation of problematic soils.
- Participants, especially farmers got knowledge about the importance of agroforestry.
- Tree plantation at Proka farm
- Launch of spring tree plantation campaign.

Majority of the participants responded that seminar was really informative and quite relevant to the current issues, as Pakistan is a forest deficit country and social forestry can be promoted in different areas of Pakistan. All presentations were interesting and resource persons shared their practical knowledge and experiences regarding tree plantation especially about Ten Billion Tree Tsunami Program launched by the Federal Government. Participants suggested that such seminars should be organized on regular basis.



Title of the Event: Three days International Conference on Biodiversity and Biosafety
May 27-29, 2024

Name of Organizer: Prof. Dr. Sohail Sajid, Department of Parasitology, UAF

Detail of activities

Biodiversity and biosafety are core issues surrounding living organisms, stability and sustainability of ecosystems, research related to the genetic manipulations of living organisms and applications of such organisms for human welfare. The concrete objectives of the proposed event were to start a dialogue on the following themes among different stakeholder and advice the policy makers about the current status and future trends of biodiversity and biosafety.

1. Agro-forestry and Biodiversity
2. Livestock and Wildlife Biodiversity
3. Genetic Biodiversity
4. Socio-economics and Environment in Biodiversity
5. Food diversity and Malnutrition

Proceeding

The event comprised of an inaugural, 7 parallel technical sessions and a concluding session.

Inaugural Session

The session started with the recitation of Holy Quran followed by Nat-e-Rasool (PBUH). The Vice Chancellor of University of Agriculture Faisalabad welcomed all the international and national guests. He further highlighted the importance of biodiversity and biosafety as the common cause of humanity at large. He mentioned that idea of this event was initiated by Prof. Dr. Andreas Burkert. He further hoped that the event would be successful and achieve its objectives. Then Dr. Martin Wiehle from University of Kassel, Germany reviewed the effects of climate change on the arid and semi-arid biomes of the Near and Middle East including Pakistan in the context of biodiversity. Later, Prof. Dr. Andreas Burkert University of Kassel, Germany Talked about Urbanisation effects on use and conservation of plant genetic resources. He explained that this term is not Re-urbanisation and highlighted the conservation of plant genetic resources. Prof. Dr. K.N. Ganeshaiah from Indian Bioresource Information Network joined the session online from India and talked about measuring and mapping biodiversity

Endowment Fund Secretariat



in India. Later, there was an extensive question answer session where faculty members as well as students from various departments participated and asked questions from international speakers. The Vice Chancellor, Prof. Dr. Iqrar Ahmad Khan also responded to many questions especially on biosafety of exotic species and related regulations. Later, Prof. Dr. Muhammad Sarwar Khan, Pro Vice Chancellor and Dean Faculty of Agriculture thanked all the speakers and participants.

1. PARALLEL TECHNICAL SESSIONS ON DAY-1

1A: TECHNICAL SESSION “AGRO-FORESTRY AND BIODIVERSITY” AT CAS AUDITORIUM, UAF (MAY 27, 2024)

This technical session was chaired by Prof. Dr. Muhammad Tahir Siddiqui (Ex-Chairman, Department of Forestry, UAF) and Co-chaired by Dr. Irfan Ahmad (Chairman, Department of Forestry, UAF). Dr. Zain ul Abdin (Associate Professor, Department of Entomology, UAF) performed the duty of Moderator while the duty of Rapporteur was performed by Dr. Muhammad Dildar Gogi (Associate Professor, Department of Entomology, UAF). In this session, six presenters delivered their presentations.

Dr. Abdur Rasool Awan delivered the first presentation. He presented his speech on “Agroforestry practices for promoting biodiversity in saline soils”. He explained various concepts including cyclic processes of soil degradation, role of agroforestry in biodiversity conservation and promotion of biodiversity, agroforestry practices. He also discussed the salinity problems in Pakistan and its impacts on crop-diversity and rest of biodiversity and strategies/approaches to overcome salinity problems in Pakistan. He also discussed the objectives, activities and achievements of Biosaline Research Station with a message “More important is to avoid deforestation for climate than reforestation”.

In second presentation, Dr Irfan Ahmad, Chairman Forestry UAF presented “Climate Change and its impact on Biodiversity”. He discussed issues faced globally and in Pakistan like greenhouse gases, melting of glaciers, drought, earthquakes, storms, floods, extreme temp, etc. He also highlighted various events devastating for climate change and discussed the strategies to control them especially focusing on switching for fossil fuel to safe alternatives. He also discussed various NGOs working on climate change and highlighted the effects of climate change on biodiversity, threats to biodiversity other than climate change, role/importance of agroforestry in addressing issue of climate change, agroforestry tools and techniques (Alley Cropping, Silvopasture, Riparian, etc.) and success stories of forestry department UAF.

The third presentation was by Mr. Tanveer Hussain who spoke on “Biodiversity and conservation of Cholistan desert”. He discussed fauna and flora of Cholistan, medicinal uses of biodiversity in Cholistan.

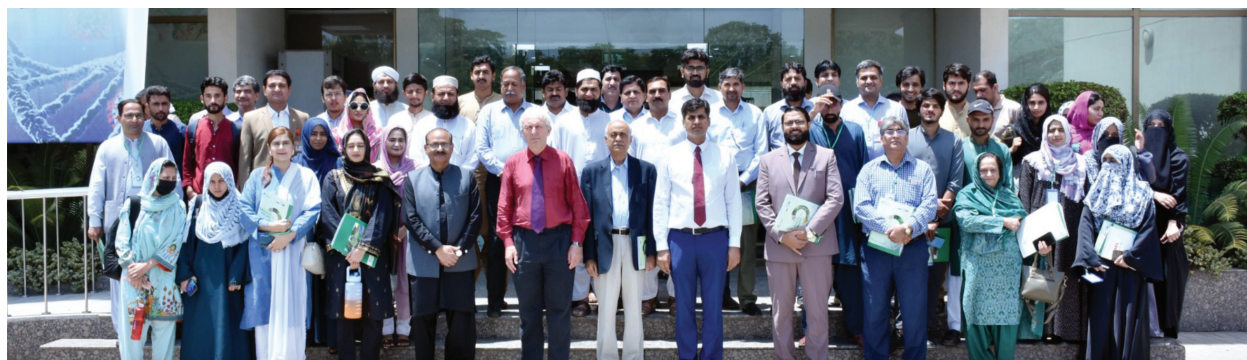
The 4th Presentation was delivered by Miss Nighat on “Various afforestation intervention for conservation of biodiversity by Punjab Forest Department. She gave an overview on biodiversity and ecosystem services of Pakistan. She also discussed the impact of afforestation on ecosystem and climate, strategies for improving air quality and restoration of wildlife and other biodiversity, techniques of combating soil erosion and climate change, and vision, mission and objectives of Punjab Forest Department. She also briefed the audience about strategic interventions of Punjab Forest Department like rehabilitation of forests in Kamalia, Chichawatni, Changa Manga,

propagation and promotion of indigenous/local trees, promotion of Green Pakistan Program, afforestation of marginal land (Muree, Muree Hill, etc.). She ended her talk putting emphasis on strengthening forest related policy and intersectoral coordination.

Dr. Abid Ali, Associate Professor Department of Entomology, UAF presented 5th talk on “Insect community dynamics in Pakistan agro-ecosystem for enhancing biodiversity conservation and sustainable agriculture”. He discussed China – Pakistan Economic Corridor and biodiversity & biosafety issues in agroecosystem of Pakistan, crop protection challenges and pest issues of Pakistan. He also presented case studies on insect biodiversity in wheat-alfalfa, Chickpea, wheat, camellia, linseed and halon cropping system. He concluded with recommendation that extension services should be active, awareness should be created among the masses/stakeholders and base line data should be developed.

Dr. Muhammad Asif, Deputy Chief Scientist, NIBGE presented the topic “Biosafety of GM crops to assess the impact on biodiversity”. He spoke on benefits and adoption of GMOs, international and national regulations, risk of GMOs, main goals of convention on biological diversity (CBD), conservation of biodiversity, sustainable use of biodiversity, Pakistan biosafety rules 2005, GMOs detection methods, biological risks, risk analysis techniques, and strategies to address biodiversity concerns.

At the end a panel discussion and questions/answers session was conducted by the chair.



1B: TECHNICAL SESSION “LIVESTOCK AND WILDLIFE BIODIVERSITY” AT CAS CONFERENCE ROOM 1, UAF (MAY 27, 2024)

This technical session was chaired by Prof. Dr. Andreas Burkert, University of Kassel, Germany. The session was Co-chaired and moderated by Dr. Khalid Abbas, Department of Zoology, UAF, while the duty of Rapporteur was performed by Dr. Urfa Bin Tahir, Department of Parasitology, UAF. The session focused on the interconnections between livestock production systems, wildlife habitats, and biodiversity conservation efforts in Pakistan.

Muhammad Kashif Shahid, Chungnam National University, South Korea, Germany joined online and talked about the impacts of livestock production systems on environment emphasizing biosafety concerns. He analyzed how different livestock management practices affect biodiversity and proposed strategies to mitigate negative impacts while promoting sustainable practices. Later, Prof. Dr. Masroor Elahi Babr, Ex. Vice Chancellor, D.I. Khan Agriculture University shared his views about saving the animal biodiversity for future generations of Pakistan. He outlined the critical need to preserve animal biodiversity in Pakistan. He stressed the importance of implementing conservation programs and policies to protect endangered

species and their habitats for future generations. Third presentation was made by Dr. Misbah Sarwar, Deputy Director, Wildlife Gutwala Forest Park, Faisalabad on the title “Wildlife Habitats in Punjab and Role of Punjab Wildlife Department in Biodiversity Conservation” In this talk the efforts of the Punjab Wildlife Department in conserving wildlife habitats were highlighted. She detailed specific initiatives and programs that have been successful in protecting biodiversity in the region and discussed ongoing challenges and future plans. Later, Prof. Dr. Hammad Ahmad Khan, Chairman, Department of Zoology, UAF talked about the biodiversity in Pakistan and presented an overview of the current state of biodiversity in Pakistan. He discussed the major threats to biodiversity, including habitat destruction and climate change, and proposed a framework for future conservation efforts to enhance biodiversity resilience.

Ms. Kiran Saleem, Deputy Director, Lahore Zoo, Lahore, presented on “Biodiversity in Captivity”. She explored the role of zoos and other captive environments in biodiversity conservation. She discussed how captive breeding programs can help preserve species that are at risk in the wild and the challenges associated with maintaining genetic diversity and animal welfare in captivity.

Then Dr. Urfa Bin Tahir, Assistant Professor, Department of Parasitology, University of Agriculture Faisalabad highlighted the role of the World Wildlife Fund (WWF) in biodiversity conservation. He outlined the contributions of the World Wildlife Fund (WWF) to biodiversity conservation and pointed out key projects and initiatives undertaken by WWF in Pakistan and globally, focusing on collaborative efforts to protect endangered species and their habitats. At the end, Dr. Muhammad Awais Rasool, Assistant Professor, Sub Campus Burewala, University of Agriculture, Faisalabad delivered an interesting talk on wintering habitat preferences and social interaction networks in migratory water birds at Dongting Lake, China. His study provided insights into these birds’ behavior and habitat use, which can inform conservation strategies to protect their wintering grounds.

Overall, the session provided a comprehensive overview of various livestock and wildlife biodiversity aspects. The presentations underscored the importance of sustainable practices, conservation efforts, and international collaboration to preserve biodiversity. At the end of the presentations, a panel discussion and questions/answers session was conducted by the chair. The discussions highlighted the need for continued research and the implementation of effective conservation policies to protect and enhance biodiversity for future generations. Finally, the event was concluded by the Chair of the session.

2. PARALLEL TECHNICAL SESSIONS OF DAY-2

On second day there were four parallel technical sessions and a genetic biodiversity/concluding session at the end of the day.

2A: TECHNICAL SESSION “AGRO-FORESTRY AND BIODIVERSITY” AT CAS AUDITORIUM, UAF (MAY 28, 2024) (Part-1)

The session was started by recitation of few verses from the Holy Quran. Subsequently, Dr. Farooq Ahmad, serving as the moderator for the day, extended a heartfelt welcome to all attendees and speakers, conveying appreciation for their active engagement and eagerness to contribute. Following this, there was an introduction of the expertise and research interests of all the speakers, cultivating a feeling of unity and excitement for the perspectives to be exchanged throughout the day. This technical session was chaired by Ms. Nighat, Director

Punjab Forest Research Institute, Faisalabad and co-chaired by Prof. Dr. Muhammad Tahir Siddiqui (Ex-Chairman, Department of Forestry, UAF). Dr. Tamsal Murtza, Assistant Professor Plant Pathology performed the duty of Rapporteur. In this session, five presenters delivered their presentations.

The first presentation was made by the distinguished Professor Mushtaq Ahmad (TI FLAPS). He provided an overview of his insightful presentation titled "Plant Biodiversity of Northern Hemisphere in Asia: A way forward along China-Pakistan Economic Corridor (CEPEC) for Cooperation and Conservation." Prof. Mushtaq underscored the critical importance of biodiversity in Asia, shedding light on its susceptibility to climate change-induced challenges. His comprehensive discussion elucidated the direct and indirect impacts of climate change, notably habitat loss, shifts in species distribution, and disruptions in breeding patterns. Moreover, he introduced focal research endeavors encompassing smart agriculture, health, and environmental sustainability. Emphasizing the significance of underutilized crops in combating nutritional deficiencies, Prof. Mushtaq advocated for multi-sector collaborations. He elaborated on biodiversity hotspots across Asia, including the Western Ghats, Indo-Burma, Himalayas, and alpine meadows, renowned for their species diversity and unique climatic conditions. The presentation also delved into adaptation strategies such as climate-resilient agriculture and ecosystem-based approaches. Prof. Mushtaq concluded with a call to action, advocating for collaborative efforts among stakeholders, government-NGO partnerships, and regional conservation alliances to address the pressing issues of biodiversity loss and climate emergencies, emphasizing the imperative for urgent action and business engagement.

The second presentation of the day was delivered by Dr. Muhammad Rauf, Deputy Director of the Environmental Protection Agency (EPA). Dr. Rauf commenced his discourse by highlighting Pakistan's involvement in the Cartagena Protocol (CP) on Biosafety, an international treaty governing the transboundary movements of Genetically Modified Organisms (GMOs/LMOs). He emphasized the obligatory establishment of the Biosafety Clearing House (BCH) under the CP, serving as a virtual platform for the exchange of information and experiences regarding the safe handling, transfer, and utilization of GMOs/LMOs. Dr. Rauf provided insights into the objectives and functions of the Pak-BCH, including regulatory oversight, information dissemination, and public engagement. Illustrating the global landscape of GM crop cultivation, he revealed Pakistan's substantial increase in planting GM crops in 2023 and emphasized the necessity of GMO regulation to mitigate unintended biodiversity loss and environmental impacts. Dr. Rauf elaborated on the application procedures and regulatory bodies such as the National Biosafety Committee (NBC), Technical Advisory Committee (TAC), and Institutional Biosafety Committee (IBC) responsible for GMO regulation in Pakistan. He concluded by advocating for future endeavors focused on implementing the Cartagena Protocol, fostering international collaborations, and enhancing information sharing through the Pak-BCH portal.

Dr Muhammad Kabeer's presentation titled "Environmental Pollution: Facts, Causes, and Effects in Changing Climate; A Critical Review." commenced by elucidating the multifaceted causes of pollution, including overpopulation, industrialization, urbanization, waste production and the combustion of fossil fuels, highlighting their detrimental impacts on biodiversity, soil health, disease transmission, and climate change. He underscored the urgent need for solutions, advocating for measures such as halting deforestation, imposing fines for illegal dumping, reducing plastic packaging, preserving natural habitats, and promoting afforestation initiatives. Dr. Kabeer concluded his talk with a sobering reflection on the potential consequences of

unchecked population growth and unbridled development, warning of increasingly destructive environmental changes if the importance of trees and sustainable practices is not recognized and implemented.

Dr. Muhammad Altaf's presentation was titled "Conservation strategy: Identification of Snakes Diversity and Human Attitude towards snakes" Dr. Altaf delved into the intricacies of snake identification, emphasizing the importance of focusing on patterns rather than colors for accurate identification. He elucidated techniques for distinguishing various snake species, including cobras, kraits, Russell's vipers, and scale vipers. Furthermore, Dr. Altaf shed light on snake venom composition, particularly metalloproteinase, detailing their effects such as necrosis, TNF- α release, MMP activation, edema, and blister formation. Addressing the significant issue of snakebites, he highlighted alarming statistics, with approximately 5.4 million people bitten each year, resulting in 2.7 million envenoming. Additionally, he discussed human attitudes towards snakes, revealing survey findings that snakes are the most commonly killed animals upon first sight, followed by lizards and frogs. He concluded his talk by stressing the importance of proper first aid for snakebites, discouraging traditional remedies such as snake charmers or ligatures, and advocating for immobilization of the affected limb and prompt medical attention.

Last presentation of the session was delivered by Professor MA Keeping on the integration of the Kunming-Montreal Global Biodiversity Framework (K-MGBF). He commenced with a reference to the 2020 UN Biodiversity Conference held in Kunming, China, emphasizing its theme of "Ecological Civilization: Building a Shared Future for All Life on Earth." He outlined the implementation strategy of the K-MGBF and elucidated the long-term goals of the K-MGBF for 2050, which encompassed maintaining, enhancing, or restoring the integrity, connectivity, and resilience of all ecosystems, alongside substantially increasing the area of natural ecosystems. Furthermore, he emphasized the fair and equitable sharing of benefits derived from genetic resources, digital sequence information, and traditional knowledge. Professor Keeping also delineated the global targets for 2030, which included effective conservation and management of at least 30% of the world's lands, inland waters, coastal areas, and oceans, with an emphasis on areas of particular importance for biodiversity. He highlighted the need to reduce the loss of areas of high biodiversity importance and prevent the introduction of invasive alien species. Additionally, he described that exploring synergies between carbon initiatives and biodiversity conservation efforts, emphasizing their potential securing biodiversity. Professor Keeping's talk concluded the pivotal role of international collaboration in addressing biodiversity conservation challenges. By outlining the long-term goals for 2050 and global targets for 2030, he provided a comprehensive roadmap for achieving biodiversity conservation objectives. After the presentations, a panel was convened for discussion and a Q&A session. Subsequently, attendees participated in a poster session at the Center for Advanced Studies (CAS).

2B: TECHNICAL SESSION "AGRO-FORESTRY AND BIODIVERSITY" AT CAS AUDITORIUM, UAF (MAY 28, 2024) (Part-2)

The session commenced with recitation from the Holy Quran. Following the recitation, Dr. Aisha Khatoon, the moderator for the day, warmly welcomed all the guests and presenters, expressing gratitude for their participation and enthusiasm. Dr. Khatoon's opening remarks highlighted the importance of the conference's themes and the collaborative spirit of the event.

Subsequently, an introduction of all the presenters took place, allowing each expert to share a brief overview of their background and research focus, fostering a sense of community and anticipation for the knowledge and insights to be shared.

The session commenced with a presentation by Prof. Dr. Andreas Burkert. His talk titled “What if the Wolf Came Back: Insights from Biodiversity Conservation in Central Europe,” delved into the complexities of biodiversity conservation. Dr. Burkert emphasized that the core issue often lies not in the overexploitation of resources, but in the erosion of traditional use rights and societal agreements. He identified several factors driving this process, including population growth, urbanization, intensification, technological change, societal modernization, new policies of national states/governments, and climate change. His presentation set the stage for a deep and engaging discussion on the challenges and strategies for effective biodiversity conservation.

Prof. Dr. Andreas Burkert concluded his presentation by outlining the key determinants for the future of biodiversity conservation and use. He emphasized that these determinants include the priorities of a concerned population and decision-makers, the willingness to pay for conservation efforts, a change in mindset towards sustainability, and the importance of education in fostering an understanding and appreciation of biodiversity. These points underscored the necessity of a collective and informed approach to effectively address the challenges facing biodiversity conservation in the modern world.

The second presentation of the day was delivered by Dr. Zahid Bhatti who spoke on the “Significance of Wildlife: Its Conservation for People and Planet”. Dr. Bhatti highlighted the critical role that wildlife plays in maintaining ecological balance and supporting human well-being. Pakistan had no major wildlife protection plans in its first three decades of independence but a drastic decline in wildlife populations was noticed in the early 1960s. In response, the government formed a wildlife enquiry committee in 1966, led by Col. Guy Mountfort, resulting in the creation of protected areas, comprehensive wildlife protection legislation, the formation of the NCCW, provincial wildlife departments, wildlife research centers, and collaboration with international agencies. These efforts aim to preserve essential natural systems and reverse the rapid decline in wildlife, including species like Indus River dolphins and snow leopards, to ensure a future where wildlife and people can thrive.

The conclusion of the presentation was that the key to mitigating these challenges lies in adopting proper management strategies, such as controlling hunting, establishing pollution-free zones, and effectively managing limiting factors. By implementing these measures, we can strive towards a sustainable coexistence where both human needs and wildlife conservation are prioritized, ensuring the well-being of ecosystems and the preservation of biodiversity for future generations.

Prof. Dr. Muhammad Sohail Sajid’s presentation on “Biodiversity and Parasitism” elucidated the critical importance of biodiversity, its benefits, and the crisis it faces due to habitat destruction, pollution, and overexploitation. The interplay between biodiversity and parasitism was explored, emphasizing the role of parasites in ecosystem balance and human health. The presentation concluded with a stark recognition of climate change’s threat to biodiversity and sustainability, underscoring the urgency of adopting sustainable development practices to navigate the challenges of a world with finite resources.

In Dr. Muhammad Imran Arshad’s presentation on “Microbial Biodiversity, Biosafety & Biosecurity,” the discussion began by highlighting the significance of microbial diversity and its pervasive presence in various aspects of human life, including agriculture, health, and

environmental sustainability. Special attention was given to soil microbes and their role in maintaining soil health and ecosystem functions, emphasizing the concept of “One Health” that links human, animal, and environmental health. However, the presentation concluded with a cautionary note, referencing the CRISPR baby scandal as an example of the ethical and societal implications of advances in microbial biotechnology. This scandal served as a reminder of the importance of responsible research practices, biosafety measures, and ethical considerations in the field of microbial biodiversity and biotechnology.

In Dr. M. Mahboob Ali Hamid’s presentation on “Sustainable Livestock – For People, for the Planet,” the discussion commenced by outlining the significant contributions of the livestock sector to various aspects of human life, including food security, livelihoods, and economic development. The presentation then delved into the drivers of consumption and future trends shaping the livestock industry, such as changing dietary preferences, population growth, and environmental concerns. However, the focus shifted towards the conclusion which highlighted key factors for practice change aimed at promoting sustainability within the livestock sector. The key factors for practice change towards sustainable livestock management encompass commitment, clarity on substance, facilitation of innovation, and creating an enabling environment.

Following the presentations, there was a panel discussion and Q&A session, followed by a poster session in the Center for Advanced Studies (CAS). Finally, the event concluded with another panel discussion and Q&A session.

2C: TECHNICAL SESSION “SOCIO-ECONOMICS AND ENVIRONMENT IN BIODIVERSITY” AT CAS CONFERENCE ROOM 2, UAF (MAY 28, 2024)

The formal proceedings commenced with the recitation of a few verses from the Holy Quran. The session was chaired by Dr. Martin Wiehle, University of Kassel, Germany and co-chaired by Professor Babar Shahbaz, Dean Faculty of Social Sciences, UAF. Dr. Shaukat Ali, serving as the moderator for this session extended a warm welcome to all attendees and presenters. Dr. Ali’s opening remarks underscored the significance of the themes conference and emphasized the collaborative ethos driving the event forward. Following this, each presenter was introduced, providing an opportunity for them to briefly outline their expertise and research focus, thereby fostering a sense of community and anticipation for the forthcoming exchange of knowledge and insights throughout the day. Dr. Waseem Abbas, Assistant Professor, Department of Entomology, UAF acted as Rapporteur of the session. The technical session commenced with a presentation by Dr. Martin Wiehle. University of Kassel, Germany. His title of presentation was “Species diversity loss since the industrial revolution - what should South East Asia consider when planning ahead”. Later, Prof. Dr. Babar Shahbaz, Dean, Faculty of Social Science, UAF delivered a talk about Terrestrial Ecosystem, Desertification and Food Security: A Study on Adaptation Strategies for Desertification in Thal Desert Region of Pakistan. Afterwards, Prof. Dr. Muhammad Asif Kamran, Director, Agri. Policy, Law and Governance, UAF was invited for his talk on “Caring of unpriced resources: economics of biodiversity”. Then, Dr. Muhammad Sanaullah, Associate Professor, Institute of Soil and Environmental Sciences, UAF highlighted his research on Impact of climate change on biodiversity losses in the potato growing areas of Punjab, Pakistan. At the end, Dr. Muhammad Tariq from Department of Livestock Management, University of Agriculture Faisalabad Sub-Campus Toba Tek Singh delivered a talk on Optimizing

livestock sustainability in Pakistan: a multifaceted approach to harmonize, biodiversity, biosafety and socio-economic dynamics and environmental resilience

The panel of experts, presenters and participants deliberated over the issues highlighted in the talks. The experts had a unanimous view that the socioeconomic prosperity of Pakistan, an agro-based economy, is linked to integrated farming. The panel agreed that the socioeconomic wellbeing of the rural household could only be materialized through a holistic and out of the box approach based on scientific knowledge and folk wisdom. After the presentations, a panel discussion and Q & A session was carried out.

2D: TECHNICAL SESSION “DIET DIVERSITY AND MALNUTRITION” AT CAS CONFERENCE ROOM 3, UAF (MAY 28, 2024)

This technical session was chaired by Dr. Masood Sadiq Butt, Dean Faculty of Food, Nutrition and Home Sciences, UAF. Dr. Beenish Israr, Institute of Home Sciences, UAF performed the duty of Moderator while the duty of Rapporteur was performed by Dr. Allah Rakha, National Institute of Food Science and Technology, UAF. In this session, six presenters delivered their presentations. At first Dr. Makhdoom Hussain, Director Nutritious Agriculture (Pvt) Ltd. presented “Bio fortified Zinc Wheat, A Success Story from Pakistan”. Dr. Makhdoom discussed the development and impact of the Akbar variety of zinc-enriched wheat, highlighting its success in reducing zinc deficiency and improving public health in Pakistan. He also emphasized the collaboration between researchers, farmers, and policymakers in scaling up bio-fortification efforts nationwide showcasing Akbar wheat as a transformative initiative in agriculture and nutrition.

Prof. Dr. Hooria Aamir, Dean of Faisalabad Medical University, Faisalabad presented about Malnutrition and its consequences on human health. She discussed the severe health impacts of malnutrition, including stunted growth, weakened immunity, and increased susceptibility to diseases. She also discussed the socioeconomic factors that contributed to malnutrition and highlighted the need for comprehensive strategies to address this public health challenge. Later, Dr. Qasim Raza, Deputy Director Punjab Food Authority, Faisalabad discussed about the Food Safety and Malnutrition. He highlighted the link between food safety issues and malnutrition, emphasizing the need for safe food practices to prevent nutritional deficiencies and food-borne illnesses. He also discussed the role of food regulations and public health interventions in ensuring safer food consumption practices in Pakistan. Fourth, presentation was made by Dr. Beenish Israr Incharge, Institute of Home Sciences, UAF on “Diet Diversity: Way Forward to Improve Nutritional Status of Mothers and Infants”. Dr. Beenish Israr focused on the role of diverse diets in enhancing the nutritional status of mothers and infants, aiming to reduce malnutrition rates, and promoting healthy communities. She also discussed the importance of education and accessible healthcare services in supporting diet diversity initiatives, particularly as only 18% of pregnant women currently consume diversified diets. Dr. Allah Rakha from National Institute of Food Science and Technology, UAF discussed about Transforming Pakistani food systems to make them healthy and sustainable. He delivered the words of wisdom regarding strategies to reform food systems in Pakistan aiming to create sustainable and healthy dietary patterns that support both human health and environmental sustainability. He also discussed the technological innovation and policy frameworks in achieving these goals, emphasizing the need for collaborative efforts across sectors.

The session provided a comprehensive overview of the role of diet diversification in addressing

the challenge of malnutrition in Pakistan. Emphasizing the benefits of bio-fortified zinc wheat and advocating for diverse diets for vulnerable populations like pregnant women and infants are critical steps forward. Collaboration in the areas of policy formulation, community involvement, and technical innovation is crucial for the development of sustainable and healthful food systems. By integrating these strategies, Pakistan can pave the way for improved nutritional outcomes and a resilient food future.

POSTER PRESENTATION & COMPETITION SESSION AT CAS IN FRONT OF MAIN AUDITORIUM (MAY 28, 2024)

On second day of the conference there was a poster presentation and competition. More than hundred abstracts were received for poster presentation out of which 49 were selected for presentation. Posters were displayed in corridor in front of CAS auditorium on 28th May and session for competition of poster presentations held on 12:20-13:30. Poster evaluation committee evaluated the posters and announced the 1st, 2nd and 3rd positions.

DAY-3: Field Trip (MAY 29, 2024)

Day-3 was planned as a tour day. Foreign delegates along with the selected members of the organizing committee visited Multan where they visited Mian Nawaz Shareef University of Agriculture, Multan and various other places including Shrines in Multan and returned back to Faisalabad in evening.

Outcome

Ecosystem comprises of biotic factors including microbes, animals and plants, and abiotic factors. Every organism has its unique role in the stability and sustainability of ecosystem. Hence, biologically diverse ecosystems would be more sustainable as such systems are less dependent on a particular type of organism. Changing climate as well as numerous human activities have resulted in extinction of various species that has brought about imbalanced ecosystem that affects human life badly. Ecosystems in countries like Pakistan have become fragile and numerous species have already become extinct while a big number is on the verge of extinction. It needs concentrated efforts from all stakeholders to devise strategies and plans to conserve biodiversity. Similarly, biosafety is the set of rules to ensure safe use of genetic manipulation work that is always need to be regulated to save ecosystem.

This event brought together various international and national experts and stakeholders of biodiversity and biosafety for sharing their ideas and having some fruitful discussions. The aim of the event to start a dialogue and guide policymakers to devise a policy for sustainable ecosystem is hereby achieved. The ecosystem is an entity equally important to all living organism around the globe especially humans. Hence, any effort of making the ecosystem better is of benefit to all human race. However, talking specifically of this event, broad audience including researchers, academicians, environment workers, NGOs and biosafety regulators, were the direct beneficiaries of this event.

Hence, this conference provided a perfect platform to all stakeholders including academia, industry and regulatory experts to sit together, have a healthy dialogue and devise strategies suitable for the local ecosystem.

2.6 List of Foreign Visitors/Experts Invited

SN	Name of person invited & Institute/Country	Event/Date
1.	Feng Guoli, from Hubie Province, China	International Seminar on Knowledge Sharing at UAF to Promote China-Pak Cooperation in Modern Agriculture, Bioengineering, and Biotechnology. November 07-11, 2023 Organized by: Prof. Dr. M. Saqib, Director, Directorate of External Linkages, UAF
2.	Zhang Jiangua, from Hubie Province, China	
3.	Zhang Hongron, from Hubie Province, China	
4.	Zhou Deyi, from Hubie Province, China	
5.	Li Xingwang, from Hubie Province, China	
6.	Wang Ruibin, from Hubie Province, China	
7.	Zhou Rui, from Hubie Province, China	
8.	Shoaib Munir, from Hubie Province, China	
9.	Prof. Dr. Andrew Bell, Department of Global Development, Cornell Prison Education Program, Cornell University, UK	Training workshop on Dynamic Human Environment Games. January 29 to February 02, 2024 Organized by: Prof. Dr. Asif Kamran, Institute of Agri. Resource Economics, UAF
10.	Dr. Alicja Nowaczyk, Department of Organic Chemistry, Faculty of Pharmacy Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University Poland.	International Symposium on Drug Discovery and Development. March 01-02, 2024 Organized by: Dr. Fatma Hussain, Associate Professor, Department of Biochemistry, UAF
11.	Prof. Dr. Qamar Uz Zaman, Dlhousie University, Canada	A Series of Workshops during May 13, 2024 – June 21, 2024. • Climate Resilience, Precision Agriculture and Bioenergy. • Precision System in Seed Processing Plant. Organized by: Prof. Dr. M. Jafar Jaskani, Director, ORIC, UAF
12.	Prof. Dr. Andreas Burkert, University of Kssel, Germany	Three days International Conference on Biodiversity and Biosafety. May 27-29, 2024 Organized by: Prof. Dr. M. Sohail Sajid, Department of Parasitology, UAF
13.	Dr. Martin Wiehle, University of Kassel, Germany	
14.	Prof. Dr. K.N. Ganeshaiah Indian Bioresource Information Network	

Section

3

Technology
Transfer



3. Technology Transfer

This component provides an opportunity for the scientists to get financial support for transfer of technologies to the stakeholders. Endowment Fund Secretariat accepts proposals for technology transfer from all public entities which demonstrate needed research and development capabilities and financial responsibilities. The portfolio under this component consists of outreach projects, on campus, demonstration, organizing Farmers' Fairs/Exhibitions, Shows, outreach activities etc.

The technologies disseminated through these projects relate to Animal, Plants, Engineering and basic sciences.

3.1 Projects Initiated

SN	Title of the Project	Name of the PI	Duration	Budget (Rs. Million)
1.	Institutional Dynamism and Performance of Irrigation Systems aimed Climate, Demographic and market Changes Cases from Pakistan	Dr. M. Asif Kamran, Faculty of Social Sciences, UAF	1 Year w.e.f 01.04.2023	2.602
2.	Technology transfer of a prototype field screening test for equine glanders (LAT-glanders) for prospective commercialization	Dr. Muhammad Saqib, Associate Professor, CMS, UAF	2 Years w.e.f 15.02.2024	2.604
3.	Application of a Non-Antibiotic Oral Formulation for the Treatment of Mastitis in Dairy Animals in District Faisalabad	Dr. Asad Manzoor, Lecturer, Department of CMS, UAF	2 Years w.e.f 15.02.2024	2.235
4.	Development of Intelligent Drone Sprayer Formulation Mobile APP.	Dr. Saqib Ali, Assistant Professor, CAS, UAF	2 Years w.e.f 15.02.2024	2.394

SN	Title of the Project	Name of the PI	Duration	Budget (Rs. Million)
5.	Development of a Decentralized Crop Insurance System Using AI and Blockchain	Dr. Syed Mushhad Mustuzhar Gilani, Associate Professor, Department of Computer Science, UAF	2 Years w.e.f 15.02.2024	1.555
6	Enhancing Yield and Profitability of Okra through Technology Transfer and Farmer Training	Dr. Amir Shakeel, Associate Professor, Department of PBG, UAF	2 Years w.e.f 15.02.2024	3.216
7.	Acidulated Value-Added Product for Bioactivation of Micronutrients to Improve Yield and Quality of Wheat and Maize	Dr. Muhammad Naveed, Associate Professor, ISES, UAF	3 years w.e.f 15.02.2024	4.717
8.	So Sweet: Stevia Promotion and Cultivation in Punjab	Dr. Muhammad Anjum Zia, Associate Professor, UAF Community College, PARS/Department of Biochemistry, UAF	3 years w.e.f 15.02.2024	3.191
9.	Demonstration of Soybean Genotype and Cropping Pattern Specific Production at Farmer Field	Dr. Safdar Ali, Associate Professor, Department of Agronomy, UAF	3 years w.e.f 15.02.2024	3.851
10.	Dissemination of Biofortification Wheat Germplasm in District Lasbela, Balochistan to Overcome Hidden Hunger	Dr. Shadab Shaukat, Assistant Professor, Department of PBG, Lasbela	3 years w.e.f 15.02.2024	1.805

3.2 Ongoing Projects

SN	Title of the Project	Name of the PI	Duration	Budget (Rs. Million)
1.	Establishment of Grapes Germplasm Unit (GPU) for Technology Transfer	Prof. Dr. M. Jafar Jaskani, IHS-UAF (Dr. M Azam, IHS-UAF w.e.f 09.05.2024)	3 Years w.e.f 01.09.2021	4.704

SN	Title of the Project	Name of the PI	Duration	Budget (Rs. Million)
2.	Popularization of home gardening in urban and peri urban areas of Punjab	PM: Prof. Dr. Muhammad Jalal Arif, ZONE-1: Dr. Muhammad Muzammil Jahangir, ZONE-2: Dr. Rashad Waseem Khan Qadri, ZONE-3: Dr. Muhammad Atiq, ZONE-4: Dr. Muhammad Dildar Gogi	3 Years w.e.f 20.10.2021	8.035
3.	Capacity building of small-scale farmers to enhance productivity and improve socioeconomic status through institutional outreach program	Prof. Dr. M. Qamar Bilal, Institute of Animal and Dairy Sciences, UAF	3 Years w.e.f 01.11.2022	5.134
4.	Establishment of Low Fruit Fly Prevalence Zone (LFFPZ) at UAF-Main Campus	Dr. Muhammad Dildar Gogi, Associate Professor, Department of Entomology, University of Agriculture, Faisalabad	3 Years 01.11.2022	3.841
5.	Demonstration of Best Production Management Practices for Chickpea Production in Irrigated Areas	Dr Rana Muhammad Atif, Assistant Professor, PBG, UAF	3 Years 01.11.2022	2.966
6.	Tunnel Grower's Training of Integrated Disease Management: An Eco-Friendly Approach	Dr. Osama Bin Abdul Hafeez, Lecturer, UAF Sub-Campus, Burewala-Vehari	3 Years 01.11.2022	2.323
7.	Promotion of Wheat Seed Production by Technology Transfer to Small Landholders' Farmers	Prof. Dr. Muhammad Arif, Department of Agronomy, the University of Agriculture, Peshawar.	3 Years 01.11.2022	5.196

SN	Title of the Project	Name of the PI	Duration	Budget (Rs. Million)
8.	Development of an Artificial Intelligence (AI) - Based Small-Scale Automated Citrus Grading Platform	Dr. Muhammad Yamin, Lecturer, Department of Food Engineering, UAF	2 Years 01.11.2022	1.660
9.	Urban Food Gardening in Twin Cities: A Step Towards Fight Against Climate Change and Malnutrition	Prof. Dr. Muhammad Azam Khan, Department of Horticulture, PMAS-Arid Agriculture University, Rawalpindi	3 Years 01.11.2022	4.410

3.3 Project Completed during the period under report

SN	Title of the Project	Name of the PI	Duration	Budget (Rs. Million)
1.	Feeding Scavenging Chicken For Deficient Nutrients- Proven Strategy to Improve Growth and Production in Rural Chicken	Dr. Umar Farooq, Assistant Professor, UAF Sub Campus Toba Tek Singh	2 years w.e.f 01.10.2021	1.417
2.	AgroChain - An Intelligent System to Track Down Counterfeit Agricultural Inputs using IoT & Blockchain Technology	Dr. Saqib Ali, Assistant Professor, Department of Computer Science, UAF	2 Years (01.11.20 to 30.10.22)	1.335



3.4 HIGHLIGHTS OF SOME SIGNIFICANT PROJECTS

Establishment of Grapes Germplasm Unit (GPU) For Technology Transfer (Ongoing)

Dr. Muhammad Azam, Institute of Horticultural Sciences, UAF

Grape is important fruit and its cultivation in Punjab is extending each year. However, the growers are struggling in finding suitable cultivars and management technologies under subtropical climate of Punjab. The establishment of GPU will serve to characterize cultivars, model vineyard for refining available technology under drip irrigation system and capacity building of growers regarding nursery and crop production, plant protection, harvesting and value addition. Grape germplasm unit will provide the extensive information about the available cultivars in Pakistan which are mostly brought from Europe, Japan and USA. It will also provide base for the training of farmers for production and management of vineyards. The activities are highlighted as under.



- A suitable site was selected at Experimental Fruit Garden (Sq. No. 9) for the establishment of vineyard for demonstration purposes.
- Trellis system was established for shifting and transplanting of grape cultivars for the demonstration of good agriculture practices and training of local grape growers.
- Almost 16 Grape cultivars have been transplanted in the demonstration block at Experimental Fruit Research Garden, (Sq. No. 9) at Institute of Horticultural Sciences.
- Surveys were conducted for the collection of good grapes germplasm from different regions such as BARI-Chakwal, and NARC-Islamabad research center.
- Grape cultivars were collected and shifted in the nursery field at Horticultural Fruit Garden (Sq. No. 32). Later, other cultivars were collected and shifted into screen house for proper care and maintenance of plants.
- Irrigation was applied weekly to grape plants in the field and screen house as well as keeping weather and plant conditions under observations. Foliar application of NPK and Confider were sprayed to plants to maintain the health of grapes.
- Grape production technology brochure was developed for the guidance of local farmers.

Popularization of Home Gardening in Urban and Peri Urban Areas of Punjab (Ongoing)

Coordinator/Project Manager: Prof. Dr. Muhammad Jalal Arif, Department of Entomology, UAF

Zone - 01 Lahore, Okara: Dr. Muhammad Muzammil Jahangir, Associate Professor, Institute of Horticultural Sciences, UAF

Zone - 02 Faisalabad: Dr. Rashad Waseem Khan Qadri, Associate Professor, Institute of Horticultural Sciences, UAF

Zone - 03 TT Singh: Dr. Muhammad Atiq, Associate Professor, Department of Plant Pathology, UAF

Zone - 04 Burewala : Dr. Muhammad Dildar Gogi, Associate Professor, Department of Entomology, UAF

People are less aware with home gardening particularly in urban areas of the country. Reasons being busy life style, poor knowledge about home gardening, limited availability of technical guidance, limited access to desired inputs, non-availability of practical vegetables, fruits, flowers and mushroom production and disease and insect control knowledge, non-availability of demonstration plots for families to get first-hand knowledge near their homes, etc. Keeping all these factors in mind, this project was initiated in four zones i.e., Zone-1 (Lahore, Okara), Zone-2 (Faisalabad), Zone-3 (Toba Tek Singh) and Zone-4 (Burewala). A field survey was conducted in the the aforementioned four zones during the first year to get feedback of interested people. After registration/clustering of interested home-gardeners, locations selection was carried out during first year. Selected inputs were procured by the PIs and Co.PIs as per requirement at appropriate time. The PIs, Co.PIs, in coordination with coordinating unit, established four demonstration plots in aforementioned four zones. These demonstration plots served as



demonstration/learning sites for interested home-gardeners around peripheral areas of each zone. Later on, all registered home-gardeners in each of four zones were guided by the team of PIs, Co.PIs, focal persons and local team members to enhance gardening facilities at their homes. The Project Manager coordinated in raising the nursery of selected winter vegetables and summer vegetables in plug trays/pots/ germination trays in growth room with controlled temperature and relative humidity and/or tunnel and open field as per requirements. The Project Manager coordinated with PIs, Co.PIs, focal persons and local team members of four zones and facilitated for transplantation of vegetable seedlings in the demonstration plots in each zone at appropriate transplanting age.

In all four zones home gardeners were registered. Home gardening demonstration-plot (20 marlas) in each of the four Zones were established and maintained. The clusters of registered and interested home-gardeners (at least 25 home gardeners) were facilitated in each zone. In each cluster home gardeners of category of low income having no space and affluent families having space at their homes were included

Selected winter/summer vegetable seeds/compost/ organic fertilizers/ plug trays/ tissue net/ low tunnel/tools/mulch, fruit plants, flower seeds, pots, tunnel structure, Bio rational/non-chemical tools (Tricho-cards, insect killer, nets and bags for netting and fruit-bagging, colored sticky-card/traps, light-reflecting ribbons, botanicals, baits, natural fungicides, bactericides etc.) etc. were purchased and distributed at the demonstration plots of all four zones; while these inputs were also distributed among registered and interested home gardeners during winter and summer seasons. Training manuals for home gardening for winter/summer vegetables, mushrooms, fruits and flowers were also developed.

In all four zones, community-meetings/group-meetings were organized at home gardeners sites for educating them about different aspects of home gardening of winter/summer vegetables, mushrooms, fruits and flowers (site selection, vegetable seed selection, nursery



raising, home garden lay out, transplanting care, integrated approaches for pest management).

Print and electronic media awareness campaigns were organized for the community mobilization of stakeholders, especially women, about home gardening in all four zones. For mass popularization of homegardening and community mobilization of stakeholders, community-meetings/group-meetings/lectures/seminars/farmer-days/training-workshops, etc. were also organized/conducted at different forums including women colleges, girl high schools, girl guide associations, press clubs, community clubs, etc.



Capacity building of small-scale farmers to enhance productivity and improve socioeconomic status through institutional outreach program (Ongoing)

Prof. Dr. M. Qamar Bilal, Inst. of Animal & Dairy Sciences, UAF

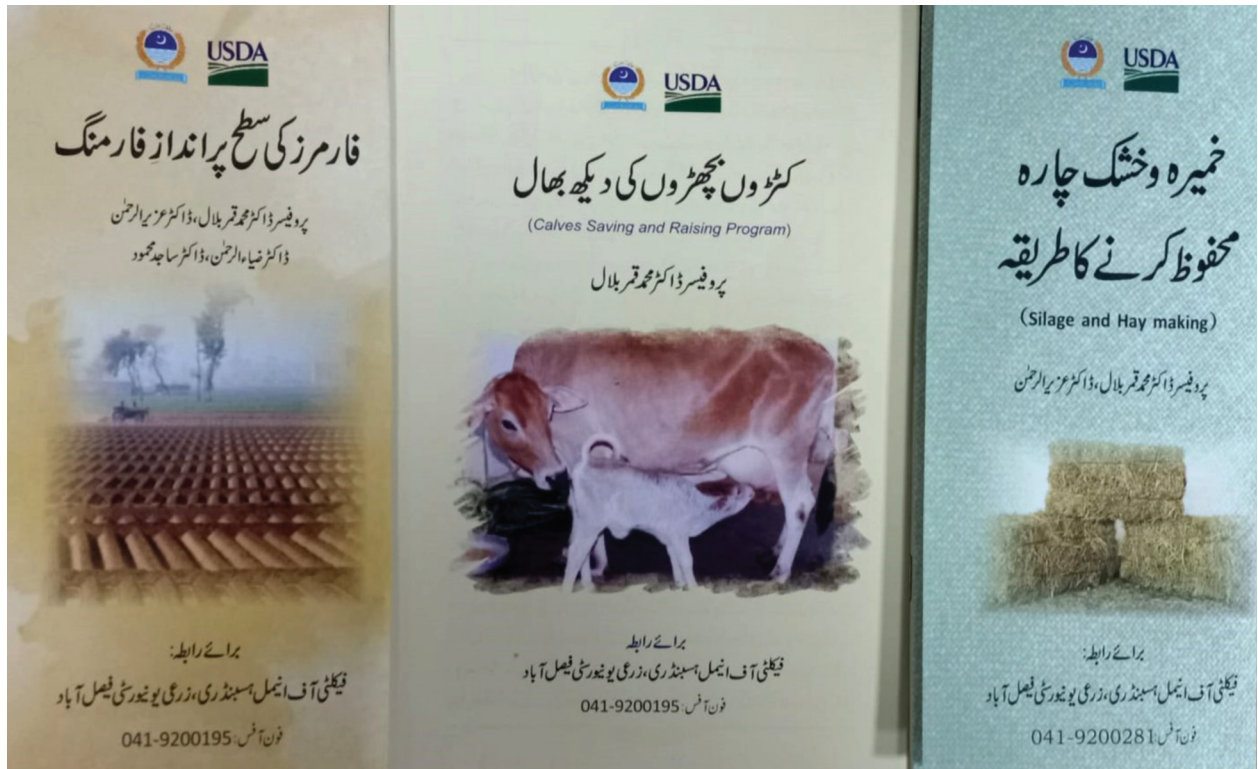
In Pakistan, majority of the farmers are small scale farmers having few animals. On overall basis, these farmers are contributing a lot in gross Agri/livestock production. However, these farmers are unable to arrange consultants for efficient utilization of resources and better management practices, imperative for enhanced productivity. Small farmers cannot afford high input system. There is a need to create awareness about low input system for



economical and enhanced production. Majority of the small farmers are layman/uneducated and they are ignorant about modern techniques and technologies. A team of experts engaged in this project focused on capacity building of the farming community in relation to good management practices (GMPs) and better utilization of available resources. Efforts were done to change the mindset of the small-scale farmers to get rid from the traditional practices and to adopt recommended techniques/ technologies that is the key to improve their socio-economic status and to ensure food security in Pakistan.

Project area was 3 sites namely Faisalabad, Toba Tek Singh and Burewala. From each site, data regarding various ongoing management practices was collected from 100 small farmers through interviews, by animal site visit and group discussion. It was found that for small farmers animals are the survival kit. Most of the farmers preferred to keep Buffalo due to public preference for buffalo milk. Cut and carry system (fodder was cut on daily basis to offer the animals) was in practice and the use of silage feeding was on lower side. Cotton seed cake was being offered as a major concentrate for lactating animals. Calves were neglected class of animals and feeding needs of calves were ignored by most of the farmers. Calves were not being fed colostrum timely and feeding requirements were not fulfilled. Source of milk let down was calves and the teats of the dams were not washed at the time of suckling. Farmers were ignorant about weaning age, naval cord care, milk replacers, calf starter, ways to control parasites and theileriosis. Calves were in poor body condition and having the problem of worm infestation. However, heifers were in good body condition to some extent. Farmers were

lacking in recommended milking management practices like correct milking order, full hand milking, teat dipping and maintenance of udder health. Majority of farmers were not fully aware about the good management practices such as vaccination, deworming, dipping and mastitis control program to keep the animals healthy. Worm infestation, pica, mastitis, ticks/mange, metritis, foot and mouth disease and unhygienic farm conditions were the common issues. Non-adoption of GMPs is the leading factor of low productivity and profitability. During the period under report capacity building was done regarding colostrum feeding to calf within an hour, navel cord cut and care, feeding milk @ 10% of the calf body weight, washing teats of dam before calf suckling, deworming at the age of one month, use of Butalex injection at the age of 10 days, weaning of calves at early age by starting the feeding of calf starter (wanda) at the age of two weeks and the use of ivomec injection @ 1ml/50kg body weight for the control of external parasites. Capacity building was done for feeding of silage to animals and stressed on the use of lucern as such/hay in combination with other fodder crops. Importance of keeping back yard poultry and goats was also highlighted. Literature having practical tips was provided.



Urban Food Gardening in Twin Cities: A Step Towards Fight Against Climate Change and Malnutrition

(ongoing)

Prof. Dr. Muhammad Azam Khan, Department of Horticulture, PMAS Arid Agriculture University, Rawalpindi

Kitchen or urban food gardening is well-used term where people grow edible products at their houses/gardens. The project team not only empowered the people for their own food production but also provided them a complete system with assistance to use as a sustainable model in urban food gardening. Quality seed is always an issue for vegetable production especially when bought in small quantities and a main reason for the discouragement of many hobby gardens at the very beginning. The provision of viable and good quality seed along with the right production technology will provide a lot of encouragement for startups. The activities conducted under the project included.

- People's perception was improved regarding significance and scope of urban gardening and data was further explored for the selection of locations and trainings
- Protocols were developed for efficient and cost effective round the year home-scale vegetable production through organic and environment-friendly practices using different media combinations and growing structures. Media having FYM and Wormicompost yield better results along with vegetables grown in plastic pots
- Provided demonstration and training to the citizens of twin cities (focused on females) to install and manage home-scale food gardens in order to fight malnutrition, poverty and climate change.
- More than 500 urban residents are trained at different locations in twin cities (50 Locations are managed by the project team for home scale winter vegetable production)



3.5 University Outreach Program

The University outreach project was started during 2010-11 with a recurring budget under Technology Transfer Component. Under this program, faculty members submit a proposal for an activity ranging from one day to one week. Under outreach program, proposals may cover hands-on trainings, demonstrations, farmers/ gathering, exhibitions and lectures/seminars for the awareness/sensitization of the community. These Programs have received enormous response and have been highly admired. The outreach activities conducted 2023-24 are as under.

SN	Name & Department	Title of Event
1.	Prof. Dr. M. Azam Khan, Dean, Faculty of Agri. Engg. & Tech., UAF	Wheat Campaign-2023 November 7-14, 2023 at Gujrat
2.	Dr. Rao Zahid Abbas, Associate Professor, Department of Parasitology, UAF.	Wheat Campaign-2023 November 7-14, 2023 at Lahore
3.	Prof. Dr. Ghulam Murtaza, Institute of Soil & Environmental Sciences, UAF.	Wheat Campaign-2023 November 7-14, 2023 at Faisalabad
4.	Prof. Dr. Babar Shahbaz, Institute of Agri. Extension & Rural Development, UAF.	Wheat Campaign-2023 November 7-14, 2023 at Sahiwal
5.	Prof. Dr. M. Riaz, Institute of Animal & Dairy Sciences, UAF	Wheat Campaign-2023 November 7-14, 2023 at Gujranwala
6.	Prof. Dr. Abdul Khaliq, Chairman, Deptt. of Agronomy, UAF	Wheat Campaign-2023 November 7-14, 2023 at Sargodha
7.	Prof. Dr. M. Jalal Arif, Principal Officer, PRP, UAF	Wheat Campaign-2023 November 7-14, 2023 at Faisalabad, Sargodha, Lahore & Sahiwal
8.	Prof. Dr. M. Sarwar Khan, Dean, Faculty of Agriculture and PVC, UAF/Chief Coordinator, Wheat Campaign, UAF	Evaluation & Monitoring of Wheat Campaign -2023 November 7-14, 2023 at Faisalabad, Sargodha, Lahore & Sahiwal
9.	Dr. Muhammad Shahid Ibni Zamir, Director Farm, UAF.	Wheat Sowing Inauguration at Directorate of Farms and Productivity Enhancement Campaign November 9 & 13, 2023 at Chak No. 218 R.B, Prokianwala
10.	Dr. Tahir Munir Butt, Principal, UAF Sub Campus, Depalpur, Okara	Promoting Gender Equitable Opportunities in Agricultural Value Chains February, 26-27, 2024 at UAF & Prokianwala

SN	Title of the Project	Name of the PI
11.	Dr. Adnan Younas, Institute of Horticultural Sciences, UAF	Knowledge Transfer and Demonstration of Floriculture Production and Landscape Gardening March, 6-7, 2024 at Moza Takkar ke Banda (Makhgna), Tehsil Depalpur, Okara
12.	Dr. Waseem Abbas, Institute of Animal and Dairy Sciences, FAH, UAF	Fancy Bird Showcase and Interactive Session with Farmers March, 5-6, 2024 at UAF
13.	Dr. Shahid Ibni Zamir, Director Farms/ Convener, Greyhound Race, UAF	To Arrange Greyhound Races During Spring Festival-2024 March 01-03, 2024 at UAF
14.	Dr. Muhammad Mahboob Ali Hamid, Institute of Animal & Dairy Sciences, UAF	Cat Beauty Show and Interactive Session on Cat Nutrition & Health Management March 07, 2024 at UAF
15.	Mr. Amir Saeed Rana, Incharge, Horse Riding School/President, Tent Pegging Team, UAF	Dissemination of UAF- Research Achievements among Horse Keepers, Farmers and Stakeholders during Spring Festival-2024 March 05-07, 2024 at UAF
16.	Dr. M. Saif-Ur-Rehman, Associate Professor, Institute of Animal & Dairy Sciences, UAF	Capacity Building of Goat Breeders to Increase Milk Production and Growth rate for commercial Purposes May 31, 2024 at UAF



3.6 HIGHLIGHTS OF SOME OUTREACHER ACTIVITIES

Title of the Event: **Wheat Campaign 2023**
November 7-14, 2023

Name of Organizer: **Prof. Dr. Muhammad Azam Khan, Dean, Faculty of Agri. Engg., & Technology, UAF**

Venue: **Mandi Bahauddin, Gujarat, Pindi Bhatian**

Activities

The major activities included media campaign and conduction of farmers' getahering. Wide publicity was also done through publishing of brochures, pamphlets and banners to highlight the activity across the province. The teams constituted for the campaign distributed the material highlighting the practices and expert's recommendations to enhance per-acre wheat production as a step towards self-sustainability. As many as 85,000 brochures were disturbed among the farming community across the province during the drive. The team interacted with the farmers and collected the information about the problems and shared the knowledge of latest techniques in the agriculture sector which is the backbone of our economy. The farmers

were informed that with certified seeds, timely sowing, weed control, balanced usage of fertilizer, efficient threshing and other technologies, the total production of wheat can be doubled. Farmers were informed that the country's average production of wheat per acre is limited to only 32 mands while progressive farmers are getting production up to 60 mands per acre. They were told that timely sowing use of improved varieties, etc will increase the productivity. Pakistan is producing a surplus of rice and corn. Farmers were informed that the



agriculture on a scientific basis is the need of the hour for agricultural revolution by ensuring increase in per acre production. It is inevitable to bring the latest agricultural technology to the doorstep of the farmers.

Outcome

Awareness about expert's recommendation and modern trends for wheat among the farming community.

Recommendation/suggestion for further improvement: It is hallmark step that will not only provoke per acre increment but also strengthen the farmers scientist's linkages and provide a line of action for future research work.



Title of the Event: **Wheat Campaign 2023**
November 7-14, 2023

Name of Organizer: **Dr. Rao Zahid Abbas, Associate Professor, Department of Parasitology, UAF**
 Venue: **Lahore Division**

Date	Activities
07.11.2023	Meeting with DG Agri. Extension Punjab and Division Director, Lahore Visited Kasur City Visited Ganda Singh Visited Lilyaani Mustafabad, Kasur
08.11.2023	Visited Muridke Agriculture Extension Office
09.11.2023	Meeting in DG office to plan next visits in different areas of Lahore Division
10.11.2023	Visited different cities of Lahore Division for wheat campaign
11.11.2023	Visited Sngla Hill and Shahkot
12.11.2023	Visited Nankana Sahib
13.11.2023	Visited Nankana Sahib
14.11.2023	Visited Sangla Hill and concluding ceremony





مرید کے محکمہ زراعت توسیع کے زیر اہتمام زیادہ گندم اگاؤ مہم پروگرام کے شرکاء سے مقررین خطاب کر رہے ہیں

محکمہ زراعت نے گندم کی پیدوار بڑھانے کی مہم کا آغاز کر دیا

ڈائریکٹر لاہور ڈویژن ڈاکٹر شیر محمد شرافت اور پروفیسر زریٰ یونیورسٹی فیصل آباد ڈاکٹر اراؤنڈ اہد کی مرید کے آمد

مرید کے (تحصیل رپورٹر) محکمہ زراعت نے گندم کی پیدوار بڑھانے کی مہم کا آغاز کر دیا۔ ڈائریکٹر لاہور ڈویژن ڈاکٹر شیر محمد شرافت اور پروفیسر زریٰ یونیورسٹی فیصل آباد ڈاکٹر اراؤنڈ اہد کی مرید کے آمد۔ اس حوالے سے محکمہ زراعت نے زیادہ گندم اگاؤ 2023-24 مہم کا آغاز کرتے ہوئے مرید کے میں ایک پروقا تقریب کا انعقاد کیا جس میں جامعہ زریہ فیصل آباد کے طلباء اور محکمہ زراعت توسیع کے آفیسر ان محمد علی باجوہ دیگر فیلڈ سٹاف سمیت کاشتکاران راناظہور الٰہی حاجی اسماعیل سید بشارت علی شاہ فرخ سلیم کی ہوجاتی ہے۔ گندم کے بیج کو دوئی لگا کر کاشت کیا جائے تاکہ فصل بیماریوں سے محفوظ رہے۔



محکمہ زراعت نے گندم کی پیدوار بڑھانے کی مہم کا آغاز کر دیا

اس حوالے سے ڈائریکٹر لاہور ڈویژن ڈاکٹر شیر محمد شرافت اور پروفیسر زریٰ یونیورسٹی فیصل آباد ڈاکٹر اراؤنڈ اہد کی مرید کے آمد، پروقا تقریب کا انعقاد



مرید کے (تحصیل رپورٹر) محکمہ زراعت نے گندم کی پیدوار بڑھانے کی مہم کا آغاز کر دیا۔ ڈائریکٹر لاہور ڈویژن ڈاکٹر شیر محمد شرافت اور پروفیسر زریٰ یونیورسٹی فیصل آباد ڈاکٹر اراؤنڈ اہد کی مرید کے آمد۔ اس حوالے سے محکمہ زراعت نے زیادہ گندم اگاؤ 2023-24 مہم کا آغاز کرتے ہوئے مرید کے میں ایک پروقا تقریب کا انعقاد کیا جس میں جامعہ زریہ فیصل آباد کے طلباء اور محکمہ زراعت توسیع کے آفیسر ان محمد علی باجوہ دیگر فیلڈ سٹاف سمیت کاشتکاران راناظہور الٰہی حاجی اسماعیل سید بشارت علی شاہ فرخ سلیم کی ہوجاتی ہے۔ گندم کے بیج کو دوئی لگا کر کاشت کیا جائے تاکہ فصل بیماریوں سے محفوظ رہے۔



Title of the Event: Wheat Campaign 2023
November 7-14, 2023

Name of Organizer: Prof. Dr. Muhammad Jalal Arif, Principal Officer, PRP, UAF

Venue: Jaranwala, Chiniot, Faisalabad

Activities

Farmers gathering road show, media coverage of the campaign, etc was conducted. Distributed brochures, pamphlets and banners to highlight the activity across the province. The teams constituted for the campaign also distributed the material highlighting the practices and expert's recommendations to enhance per-acre wheat production as a step towards self-sustainability. As many as 80,000 brochures were distributed among the farming community across the province during the drive. We met with the farmers and got the information about the problems and shared the knowledge of latest techniques in the agriculture sector which is the backbone of our economy. The farmers were informed that with certified seeds, timely sowing, weed control, balanced usage of fertilizer, efficient thresher and other technologies, the total production of wheat can be doubled. Farmers informed that the country's average production of wheat per acre is limited to only 32 mounds while progressive farmers are getting production up to 60 mounds per acre. They were told that drill and timely sowing; improved varieties and others will increase the productivity. Pakistan is producing a surplus of rice and corn. They were informed that the agriculture on a scientific basis is the need of the hour for agricultural revolution by ensuring increase in per acre production. It is inevitable to bring the latest agricultural technology to the doorstep of the farmers.



Outcome

Raised the awareness about expert's recommendation and modern trends for wheat among the farming community.

Recommendations/suggestion for further improvement

It is hallmark step that will not only provoke per acre increment but also strengthen the farmers - scientist's linkages and provide a line of action for future research work. More farming gathering will be conducted to help further improve the situation.

Title of the Event:	Wheat sowing Inauguration Wheat Productivity Enhancement Campaign November 9-13, 2023
Name of Organizer:	Dr. Muhammad Shahid Ibni Zamir, Director Farms, UAF
Venue:	Directorate of Farms & Chak No. 218 R.B, Prokianwala

Objective

To enhance wheat productivity among farmers in Chak No. 218 R.B., considering the specific crop and weather conditions of Punjab, Pakistan.

Proceeding

Dr. M. Shahid Ibni Zamir, Director Farms, UAF, welcomed the farmers and highlighted the challenges faced in Punjab's wheat production, including factors like variable rainfall and potential water scarcity. He emphasized the importance of adopting climate-smart practices for sustainable yield improvement. Prof. Dr. Azeem Iqbal Khan, Dept. of PBG, UAF, focused on selecting high-yielding wheat varieties specifically adapted to Punjab's conditions. He said that Varieties resistant to prevalent diseases like rust can significantly impact yields in Punjab. Varieties with higher drought tolerance are crucial for areas with limited rainfall or having problems of water availability. Choosing varieties with appropriate maturity periods ensures that harvest coincides with favorable weather conditions and avoids heat stress during grain filling.

Dr. Asad Ullah Hyder, Land Utilization Officer, addressed about best practices for managing wheat crops throughout the growing season, considering Punjab's specific climate. He discussed about optimizing seed depth, sowing dates, and row spacing for Punjab's soil conditions and potential water availability. He also discussed about effective methods for controlling weeds that compete with wheat for water and nutrients, considering local weed prevalence. He addressed the benefits and drawbacks of different tillage methods in the context of Punjab's soil health and water conservation needs.

Dr. Ahmad Waqas, Superintendent PARS, emphasized the importance of soil testing to identify nutrient deficiencies specific to the region. He recommended using the right combination and amount of fertilizers (Nitrogen, Phosphorus, Potassium) based on soil test results and considering potential leaching due to high rainfall events. He discussed about methods to improve soil organic matter content which can enhance water retention and nutrient availability for the crop.

Dr. Nadeem Akbar, Director WMRC, provided insights on water management practices crucial for Punjab's wheat production. He discussed about promoting methods like furrow or drip irrigation for water conservation compared to traditional flood irrigation. He also discussed

strategies to optimize irrigation timing and water amount based on weather patterns, soil moisture levels, and crop growth stages. He told about exploring potential methods for capturing and utilizing rainwater to supplement irrigation needs. A progressive farmer from Chak No. 218 R.B. expressed gratitude to the organizers and speakers for their valuable knowledge and information tailored to the specific challenges of wheat production in Punjab.

Overall, this outreach program equipped farmers with targeted knowledge and resources to enhance their wheat productivity. By adopting the recommended practices for variety selection, crop management, fertilization, water management etc. Potentially more farmers can increase their wheat yields, improve their livelihoods, and contribute to Punjab's food security.



Title of the Event:	Promoting Gender-Equitable Opportunities in Agricultural Value Chains February 26-27, 2024
Name of Organizer:	Dr. Tahir Munir Butt, Principal, Sub Campus, Depalpur, Okara
Venue:	Moza Takkar Ke Banda (Makhna), Tehsil Depalpur, Okara

Objective

- Enhancing women's empowerment in agricultural value chain.
- Bridging gender gap for inclusive agricultural development.
- Empowering women in agriculture through inclusive value chain strategies.
- Addressing gender disparities for resilient agricultural systems, and strengthening women's role in agricultural entrepreneurship.

Proceedings

The program commenced with recitation from the Holy Quran, followed by a Naat. Dr. Tahir Munir Butt (Principal UAF-SCDO) delivered a welcome speech, providing insight into gender roles in the community. Mian Imtiaz Wattoo, a progressive farmer, shared valuable perspectives on empowering communities for poverty reduction. Dr. Masood Iqbal Awan and Miss Asifa Khan (FACE Foundation) presented on women's empowerment in agricultural value chains. Dr. Khalid Naveed discussed inclusive value chain strategies for women in agriculture. Dr. Tariq Mustafa focused on strengthening women's role in agricultural entrepreneurship. Dr. Amina Ayub emphasized the role of community support in women's empowerment. Rana Waheed Anwar (Lecturer) covered policy and advocacy for gender-equitable agricultural practices.

Next day the activity started with a recitation from the Holy Quran and a Naat. Dr. Tahir Munir Butt discussed with farmers, faculty, and students in an interactive field visit, providing practical insights into agricultural practices. He also discussed about gender-responsive farming practices. Miss Asifa Khan (FACE Foundation) presented how everyone benefits from equal farming. Dr. Amina



Ayub shared helpful tools for women in farming. Miss Maryam discussed making agriculture everyone's business. Miss Alia presented on getting to know women in agriculture. Dr. Tahir Munir Butt gave concluding remarks. The program concluded with an interactive field visit for farmers, faculty, and students.



Outcomes

- Participants gained a profound understanding of the challenges faced by women in agricultural value chain, leading to heightened awareness within the community.
- Insights from expert speakers provided practical strategies to empower women, fostering their active participation and leadership in the agricultural sector.
- The program facilitated meaningful discussions and collaborations among participants, bridging gender gaps and promoting inclusivity in agricultural development initiatives.
- Participants were equipped with actionable strategies to implement inclusive value chain practices, promoting the active involvement of women at every stage of the agricultural process.
- The event emphasized the importance of gender-inclusive practices for building resilient agricultural systems, addressing disparities to enhance the sector's overall adaptability.
- Women gained insights into entrepreneurial opportunities within agriculture, fostering their skills and encouraging their active engagement in entrepreneurial ventures

Title of the Event:	Knowledge Transfer and Demonstration of Floriculture Production and Landscape Gardening March 05-07, 2024
Name of Organizer:	Dr. Adnan Younis, Associate Professor, Institute of Horticultural Sciences, UAF
Venue:	UAF

Proceedings

This three-day event provided a platform for organizations to share their knowledge and expertise in field of Horticulture. This activity provided hundreds of local citizens and horticulture enthusiasts a chance to admire the beauty of flowers and share their love towards horticulture and landscaping. The activity was primarily focused on annual flowers and ornamental houseplant display. Expo also offers a golden opportunity for house plant lovers to discover different varieties and learn about their care and maintenance. The dedication and team work of organizing committee (Prof. Dr. Muhammad Sarwar



Khan, Prof. Dr. Ahmad Sattar Khan, Dr. Adnan Younis, Dr. Iftikhar Ahmad, Dr. M. Asif, Dr. Ahsan Akram and Dr. Mohsin Bashir) made this expo a huge success. The Vice Chancellor took keen interest in various displays at flower expo and emphasized the significance of such events on campus. As ceremony commenced the venue was filled with excitement and anticipation. People from all walks of life were captivated by the variety of exhibits and creativity on display. Expo featured a section dedicated to landscape designs with displays demonstrating the art of landscaping and inspiring the visitors to create their own beautiful outdoor spaces. Display of desert flora particularly cacti with creative use of pebbles and gravel was also very remarkable. The diverse range of cacti showed their unique beauty and resilience, highlighting the fascinating world of Arid Landscape.

Many government organizations actively participated in expo, each contributing to the success of event. These organizations showcased their commitment to promote Horticulture. One noticeable participant was Gardening Wing of UAF. They artfully combined variety of plant species at their stall, creating a symphony of colors and textures. The plants were displayed in a very precise manner adding depth and dimension to the display. The Rose project from UAF had an incredible variety of products including rose water, dried buds, dried petals, UAF Grow

(organic growing media) and brochures for the commercial cut flower production at display. The DCO office also captured the festive spirit with their “Jashne Baharan” display using marigold. In addition to this mushroom lab at UAF also contributed to the exhibit with successful techniques for growing vegetables at home.



Many private organizations including Green Heaven, Spurt International, Agriflora, Green seeds and Al madina concrete also became part of the expo. The water feature acted as a focal point and enhanced the overall ambiance and creating a soothing atmosphere. Agriflora farms had a beautiful display of colorful gerbera, baby’s breath, sunflowers and chrysanthemum. Green seeds presented a diverse range of vegetables seeds and related tools, providing valuable resources for home gardeners. Spurt international on the other hand demonstrated how technology revolutionizes the way we cultivate and nurture plant in an urban setting. The urban horticulture exhibit showcased an impressive display of modern technology, products and tools. Their stall highlighted latest advancements in vegetables cultivation, offering visitors glimpse into the future of urban gardening. Over all, the exhibits highlighted the potential to cultivate one’s own fresh and nutritious produce using innovative technologies within the confines of their homes.

The expo was also a perfect platform for primary and secondary school kids to show their talent. The flower arrangement by laboratory school students are definitely worth mentioning. The young artist from laboratory school stole the show with their paintings and carefully crafted art.

Floral Arrangements

Imagine walking into the expo as you step inside, you are greeted by breathtaking display of flowers and foliage arranged with such artistry and precision. Each exhibit tells a unique story showcasing different themes like “Dream”, “Women empowerment”, “Happy graduation”, “Faith”, “Feelings of love” and “Colors of spring”. It was like stepping into a world of floral wonders where creativity knows no bounds. The arrangements were very captivating to the senses. The boat shaped arrangement representing the theme of “Feelings of love” was a masterpiece that perfectly captured the essence of love. The boat was crafted with delicate foliage, adorned with

red gerbera's, its form gracefully curving, gliding through sea of emotions. The boat served as a symbol of journey and adventure and stood as a testament to power of love in navigating the tides of life. Dry arrangements, representing theme of "Faith" were absolutely eye catching with their timeless and rustic charm. The use of elements like seed pods, dried flowers, dried foliage and cones carried deep symbolic meaning. Dried flowers and foliage, despite losing their vibrant colors and lushness continued to stand tall as a reminder of unwavering faith. Seed pods representing potential for new beginnings while cones protective nature representing the ability to withstand hardships. The flower and landscape expo was truly a celebration of nature's beauty and the art of floral design.



Special Display

The special display category at expo featured unique and creative exhibits. One outstanding display was made using recycled tires showing the art of repurposing. Another captivating exhibit featured giant glasses crafted from metal frame and flowers finely blending nature and art.

The photo booths were also a hit among visitors. The wooden frame embellished with heart shaped floral arrangement provided a charming setting for catching memories. It added a touch of whimsy and romance to the event making it an ideal spot for couples, friends, and families to create lasting memories. Additionally, the photo booth made from bamboo canes, plant and hanging umbrellas was also very pleasant, perfectly complimenting the theme of event.

Another remarkable exhibit was wooden cuttings. The intricately crafted owls symbolized unity, love and togetherness representing theme of "Happy Family" and evoking a sense of positivity. Another attractive exhibit was wishing well beautifully crafted, revealing dedication and skill poured into its creation. Overall, the special display category at expo showcased endless possibilities of repurposing material blending nature with design while encouraging viewers to appreciate the beauty and potential in everyday objects.

Mini Garden

Mini garden refers to a small scale landscape created using various elements like plants, rocks decorations. A mini garden is designed to mimic a natural landscape. Post graduate students at UAF brought the essence of spring to life in a delightful way using cheerful blooms and

vibrant colors. Each participant added personal touch to create a beautiful garden portraying the theme “Happy Spring”. The closing ceremony was held at Landscape studio, Institute of Horticultural sciences. expressed gratitude to all the participants, management team and organizing committee for their remarkable efforts and making the expo a grand success.

Outcome This activity imparted awareness among researchers, general public, farmers, civil society and students about the importance of flowers and plants in human life. This event helped to introduce modern concepts about landscape designing, recent advances in flower production technology and post-harvest handling of flowers and also enabled the participants to collaborate with other organizations concerned with Floriculture and Landscape. Latest and advanced technologies for growing indoor plants and other annual flowers to growers were practically demonstrated. Recent advancements in packing and value addition of floricultural products

were also disseminated as well as demonstrated which were developed by various research organizations. It also helped capacity building for improving ornamental crop production and to provide on-job training for the Horticulturists. This show also encouraged students, farmers, growers and nurserymen to present their talents and provide them an opportunity to look for new products, developments and technical background information in their relevant field.



Title of the Event: Fancy Bird Showcase and Interactive Session with Farmers

March 05-06, 2024

Name of Organizer: Dr. Waseem Abbas, Assistant Professor, Institute of Animal and Dairy Sciences, UAF

Venue: UAF

Proceedings

The Fancy Birds Show was a successful event that aimed to showcase various bird species and educate attendees on fancy bird farming practices. The event featured a range of activities designed to engage participants and promote awareness about fancy bird housing, care, breeding, and nutrition. Before the show, preparations were made to ensure a successful event. This involved setting up the venue, arranging tables and cages for the birds, and making necessary arrangements for the smooth running of the show. The event was inaugurated by honorable Vice Chancellor Prf. Dr. Iqar Ahmad Khan (SI, HI), Prof. Dr. M. Qamar Bilal along with respected personalities from HEC and Prof. Khalid Mahmood (Ex Vice Chancellor Arid Agriculture University, Rawalpindi).

Farmers displayed their expensive birds, showing uncommon breeds and distinctive features that highlighted the diversity of the fancy birds being reared in Faisalabad.

An interactive session was conducted with the stakeholders, focusing on their crucial role in the industry. Discussions covered essential topics such as housing and sanitation practices, lighting requirements, sex determination and breeding goals, and proper nutrition for optimal bird health.

Dean of the Faculty of Animal Husbandry, Prof. Dr. M. Qamar Bilal extended his heartfelt





gratitude to all the fancy bird stakeholders who participated in the bird showcase event. He emphasized that the interactive sessions during the event has been instrumental in fostering a strong farmer-academia interaction. He highlighted that the exchange of knowledge and experiences is crucial for the advancement of our understanding of fancy bird farming. He also mentioned that collaboration between farmers and academia is important for progress in any field, and active participation in this event exemplifies the value of such partnerships.

At the end he thanked the organizing committee, farmers, students, and staff for making this event a success.

Outcome

This activity provided unique opportunity to fancy bird's keepers, students, campus community and general public regarding good management practices and overall practical tips for keeping these birds. This event also motivated so many visitors/students for business startups. As fancy birds show is being organized on regular basis, its popularity enhanced many folds. The participants who showcased their birds took keen interest during interactive session and expressed their views that now they are able to raise these birds in a better way. They committed next time they will participate with more enthusiasm.

Recommendations/suggestion for further improvement

Faculty of Animal husbandry may organize series of farmer days for educating the fancy birds keepers through hands on training and interactive session.



Title of the Event: Cat Beauty Show and Interactive Session on Cat Nutrition & Health Management
March 07, 2024

Name of Organizer: Dr. Muhammad Mahboob Ali Hamid, Assistant Professor,
Institute of Animal and Dairy Sciences, UAF

Venue: UAF

Proceedings

The Faculty of Animal Husbandry (FAH) at the University of Agriculture Faisalabad (UAF) is dedicated to ensuring food security through empowering students and educating farmers. On the occasion of the ongoing spring festivities, FAH organized a series of significant competitions and shows under the dynamic leadership of Dean Prof. Dr. Muhammad Qamar Bilal. These events included Pigeon show, Fancy bird show, Buffalo milk competition, and a seminar on awareness regarding cats, with the main



event being the beauty contest and awareness seminar for Cats held on March 7, 2024.

The Cat Beauty show was an esteemed event hosted by Faculty of Animal Husbandry, UAF which provided a colorful stage for acknowledging the grace and charm of feline friendship. Cats were categorized into 4 classes male adult, female adult, male kitten, and female kitten. This event was in collaboration with prominent stakeholders such as Royal Canin, Happy Paw, Bin Ibrahim, and Safaiz Vet Pharma that actively participated in the show. The competition attracted over a hundred participants from across the city, showcasing a diverse array of cats, including breeds like Punch Face, Black and White Persian, and British Shorthair.

The organizers of the event, including Dr. M. Mahboob Ali Hamid, Dr. Faisal Ramzan, Dr. Waseem Abbas, and Dr. M. Aziz-ur-Rahman from FAH, successfully coordinated and executed the Cat Beauty show. The competition was judged by exceptionally talented veterinarians Dr. Akmal Rana, and Dr. Umar Iqbal Mustafa. They carefully considered each cat's physical characteristics and state of health before making their judgments. The winning cats were awarded with Feline feed bags, buckets, and commendation certificates from Royal Canin and Happy Paw. Additionally, various leading companies set up stalls offering grooming products and pet

essentials for domestic animals. Following the Cat Beauty show, a seminar on basic feline nutrition and care techniques was conducted, shedding light on the importance of dietary considerations for cats. Dr. Akmal Rana and Dr. M. Mahboob Ali Hamid, leading experts in the field, discussed the benefits and drawbacks of domestic and commercial cat diets. According to the experts, while domestic diets offer cost-effective and potentially healthier options for cats compared to commercial feeds, the significance of commercial feeds cannot be overlooked. They emphasized that a combination of domestic food components and commercial feeds can contribute to the overall health and well-being of cats.

Attendees actively participated in the discussion, posing insightful questions to the experts. Dr. Faisal Ramzan and Dr. Umar Iqbal Mustafa provided guidance on breeding practices, taking into account issues related to breed proliferation and health preservation. Additionally, strategies for avoiding nutritional deficiencies and complexities through supplementation and balanced nutrition were clarified. Furthermore, students showcased their interest in the field by creating posters highlighting the importance of nutrition. After the seminar, a post-event lunch was arranged, allowing veterinarians, field specialists, and attendees to interact and share their experiences. Certificates and shields were distributed to acknowledge the valuable contributions of the speakers, organizers, and participants. Concluding the event, Prof. Dr. Muhammad Qamar Bilal Dean of the Faculty of Animal Husbandry, expressed gratitude and optimism for the future of cat rearing, affirming his commitment to its improvement.



Outcome

Cat Beauty show and Interactive session on Cat nutrition and health management has provided the learning opportunity to the students, interaction with cat owners, their issues and solution based discussions with experts. Cat health and management is very important to avoid communicable diseases. Industrial stake holders highlighted the opportunities of modern equipment, feeds and pharma industry linked with feline family.

Recommendations/suggestion for further improvement

- Cat Beauty show event was appreciated among the participants and stake holders.
- Industrial stake holders expressed their interest to promote research and development in collaboration with the Faculty of Animal Husbandry.
- Hands on training sessions shall be conducted to promote student entrepreneurship.

Title of the Event:	Capacity Building of Goat Breeders to Increase Milk Production and Growth Rate for Commercial Purposes March 31st, 2024
Name of Organizer:	Dr. Muhammad Saif-ur-Rehman, Associate Professor, Institute of Animal and Dairy Sciences, UAF
Venue:	UAF

Proceedings

A large number of locals thronged the University of Agriculture Faisalabad to have the delight of the colors of Goat Milk, Weight and Beauty Competition May 24, 2024 to June 01, 2024. The day (May 31, 2024) dawned with many colorful events in the University including Goat Milk and Beauty Competitions and capacity building programs for Goat breeders and keepers. It was a good opportunity for Faculty to have interactive session with Goat keepers in order to improve their knowledge about husbandry practices and to educate them about good management practices. The participation of stakeholders in these events was good and certain issues were discussed in detail with farmers. The following activities were performed in the outreach program:

- **Interactive Session with Goat farmers** (Goat Breeders for Food Security & Livelihood)
- **Registration of participants**

The Goat breeders from different parts of the province participated in the event and also brought their best animals for milk, weight and beauty competitions at University of Agriculture, Faisalabad. The animals were registered on their arrival by the registration committee and rules and regulations of the competitions were handed over to the breeders in printed form to make the event fair and transparent.

- **Interactive session with Goat Breeders**

Our goats are world's best animals in terms of their beauty and potentials for growth rate. Goats are part of the traditional small mixed farming system integrated with crop production. Goat dairying is not a quite commercial activity so the level of inputs is very low. Generally, animals are fed on crop residues with some additional forage/fodder grown for the purpose.



Concentrates are fed to those animals that are kept for the sale. So, to address such issues there was need to have interactive session with goat breeders for their capacity building.

An interactive session with Goat breeders was held on May 31, 2024. The resource

persons Prof. Dr. Muhammad Qamar Bilal (Dean FAH), Dr. Muhammad Saif-ur-Rehman (Associate Professor, IADS) and Dr. Faisal Ramzan (Assistant Professor, IADS) had a very good interactive session with the goat breeders and guided them about the breeding and selection of their animals on scientific lines for improved utilization and productivity. Prof. Dr. Muhammad Qamar Bilal also informed the breeders about good management practices to rear some healthy goats especially from Kid saving point of view. The farmers were get pleased to discuss their goat production issues with the scientific community of the University and appreciated to have this session with them to answer their certain problems. The weak link between teaching, research and extension was also strengthened by this event.



Outcome

Animal Shows have long been in-vogue as a tool for networking opportunities for educationists, researchers, extension workers and industry people. University of Agriculture, Faisalabad has a tradition of organizing such shows as a teaching tool for training young people. At UAF Animal shows are a permanent feature and people wait for the occasions throughout the year. It was a good opportunity to hold interactive session with goat keepers along with milk, weight and beauty competitions at the University this year from May 24, 2024 to June 01, 2024.

The animal show provided an opportunity for livestock lovers at public level to show their breeds and compete for beauty. Availability of good breeding animals was another outcome for public who want to start livestock farming.

Within-breed, selection is a preferred strategy for improvement of traits of economic importance. The conduct of interactive session with breeders helped in their capacity building and it is expected that indigenous animal resources can be better utilized on sustainable basis if farmers get organized to augment breed development efforts.

The program was organized with the successful achievement of the following outcomes:

- Created awareness among livestock keepers and general public about unique genetic potentials and their attributes
- Training of farmers regarding recommended techniques for enhanced productivity and profitability especially for goat milk.
- Created awareness for raising of good male kids with better growth rate as sacrificial animals or for commercial purposes
- Helped in student teaching and practical demonstration of indigenous breeds of goats.



Section

4

Research &
Development



4. RESEARCH & DEVELOPMENT

The activities under this component were initiated in 2011 as a response to the Dengue outbreak in the country. This involved the commencement of projects which are entirely centered on research and development regarding Dengue. These projects have been concluded, and the activities under this component have been broadened. Nevertheless, the funding available is limited and exclusively allocated to significant projects involving applied research.

4.1 Projects Initiated

SN	Title of the Project	Name of the PI	Duration	Budget (Rs) (Million)
1.	3-Hydroxyflavone; A Multi-Targeted Approach to Combat Diabetes Induced Damages in Vital Organs	Dr. Muhammad Umar Ijaz, Lecturer, Zoology, UAF	2 Years w.e.f 15.02.2024	1.835
2.	Enhancement of Germplasm Diversity through Wide Cross Hybridization for Cotton Improvement and Sustainability	Dr. Jamshaid Ali Junaid, Assistant Professor, Department of PBG, UAF	3 Years w.e.f 15.02.2024	3.108
3.	Development of Cost Effective Wheat Rust Surveillance System	Dr. Zunaira Afzal, Assistant Professor, CABB, UAF	2 Years w.e.f 15.02.2024	1.944
4.	Marker Assisted Selection for Low Erucic Acid and High Oil Content in Progeny Derived from Indigenous Oilseed Brassica Germplasm Assessed under Rainfed Conditions	Dr. Sidra Iqbal, Assistant Professor, UAF Sub-Campus, Depalpur, Okara	3 Years w.e.f 15.02.2024	3.153



4.2 Ongoing Project

SN	Title of the Project	Name of the PI	Duration	Budget (Rs) (Million)
1.	Domestication of wildy grown black raspberries for exploiting their nutritional and commercial potential under climatic conditions of Rawalakot, Azad Jammu and Kashmir	Dr. Mehdi Maqbool, Assistant Professor, Department of Horticulture, University of Poonch, Rawalakot, Azad Jammu and Kashmir	3 Years w.e.f 01.10.2021	2.199
2.	Development and Evaluation of Chitosan Based Nanocomposites for the Control of Aflatoxicosis in Poultry	Dr. Aisha Khatoon, Lecturer, Department of Pathology, Faculty of Veterinary Science, UAF	3 Years w.e.f 01.11.2022	2.861
3.	Tandem Structured Carbon Quantum Dots and Florescent Dyes for Efficient Semi-Transparent Agri-Photovoltaics	Dr. Muhammad Zahid, Associate Professor, Department of Chemistry, UAF	3 Years w.e.f 01.11.2022	4.104
4.	Integrated Pest Management of Guava Mealybugs, infesting Guava orchards in Sindh.	Dr. Shahjahan Rajput, Assistant Prof. Shaheed Z.A. Bhutto Agricultural College, Dokri, Larkana	3 Years w.e.f 01.11.2022	2.634
5.	Surveillance of Arthropods and Arthropod-Borne Diseases of One Health Significance at the Host-Vector-Environment Interface at Various Agro-Geo Climatic Zones of Punjab, Pakistan	Dr. Muhammad Sohail Sajid, Associate Professor, Department of Parasitology, UAF	3 Years w.e.f 01.11.2022	3.867
6.	Appraisal of Hispidulin in Downregulation of Hyperglycemia; a Novel Therapeutic Approach.	Dr. Wafa Majeed, Lecturer, Department of Pharmacy, UAF	2 Years w.e.f 01.11.2022	2.563

7.	Development of a Biopesticide for the Management of Blackleg of Potato in Pakistan	Dr. Khalid Naveed, Assistant Professor, Department of Plant Pathology, UAF-Sub campus Depalpur, Okara.	3 Years w.e.f 01.11.2022	1.375
8.	Field Evaluation for Commercialization of Herbicide-Tolerant (CABB-HTS) and Insect-Resistant (CABB-IRS) Transgenic Sugarcane	Prof. Dr. Muhammad Sarwar Khan, Centre of Agricultural Biochemistry & Biotechnology (CABB), UAF	3 Years w.e.f 01.11.2022	6.569



4.4 HIGHLIGHTS OF SOME SIGNIFICANT PROJECTS

Domestication of Wildly Grown Black Raspberries for Exploiting their Nutritional and Commercial Potential under Climatic Conditions of Rawalakot, Azad Jammu and Kashmir (Ongoing)

Dr. Mehdi Maqbool, Associate Professor, Department of Horticulture, University of Poonch Rawalakot, AJK

In this project, wildly grown black raspberry plants have been domesticated at Research Farm of University of Poonch Rawalakot, AJK. For this purpose, land was prepared at Chotta Galla Farm, and clean and healthy black raspberry plants were transferred. Initially wild black raspberry plants were allowed to grow according to a hedgerow system. However, a trellising system was installed to train wild black raspberry plants. Trellising treatments consisted of hedgerow system (I-trellis) (control), V-trellis and single-sided shift trellis each having 10 wild black raspberry plants. To perform different activities, a PhD student was appointed, who is involved in all the project activities. During second year of this project, two experiments were performed. In first experiment, wild black raspberry fruits were harvested (1000 g for each maturity stage) at the turning, full red and black stages from the same orchard already established at Chotta Galla Farm and transported to the laboratory of Department of Horticulture. An initial sorting was performed to remove damaged and diseased fruits. The remaining healthy fruits were stored at room temperature ($22 \pm 2^{\circ}\text{C}$, $45 \pm 5\%$ RH). Data regarding various quality parameters was recorded on the same day of harvest (Day 1) and after that on alternate days (Day 3, Day 5, Day 7) during storage. In this study various parameters related to physical, biochemical and sensory characteristics were recorded. It was noted that as the maturity progressed from turning to black stage, fruit size, fruit weight, total soluble solids, pH, vitamin C, total soluble solids, total flavonoids, total phenols, total antioxidants and total anthocyanins increased. During storage, total soluble solids and pH increased, however, with increase in storage time fruit weight and firmness, total anthocyanins, flavonoids and phenols decreased. In the second experiment, fully ripe fruits of black raspberry were hand harvested from the same orchard and then transported to the laboratory of Department of Horticulture. Fruits were sorted to eliminate damaged, shriveled and unripe fruits and only uniform sized and colored fruits were selected for this study. After washing with pure water, fruits were dried and placed (300 berries per treatment) at room temperature as well as in cold rooms at 0°C , 5°C and 10°C . Data





regarding different postharvest quality parameters for three replicates in each treatment was recorded on day 0, 2, 4, 6 and 8 after harvest. In this study the various parameters related to physical, biochemical and sensory characteristics were observed. It was noted from this study that the black raspberry fruits harvested at full ripe stage and stored at low temperature showed maximum physical, biochemical and antioxidant characteristics. Moreover, sensory characteristics also showed good results in black raspberry fruits and it was observed that fruits stored at low temperature such as 5° C for 6 days attained maximum postharvest quality and shelf life.



Development and Evaluation of Chitosan Based Nanocomposites for the Control of Aflatoxicosis in Poultry (Ongoing)

Dr. Aisha Khatoon, Department of Pathology Faculty of Veterinary Science, University of Agriculture Faisalabad.

Mycotoxins are the secondary metabolites of certain toxigenic fungi. Among the wide range of mycotoxins, aflatoxins are considered to be more pathogenic and cause serious toxicopathological alterations in poultry birds. The harmful effects of aflatoxins can be ameliorated or mitigated using different mycotoxin binders in nano materials and nanocomposite forms in the poultry feed which leads to enhanced adsorption and biodegradation of aflatoxins. During the reporting period of the project, aflatoxin was produced by inoculating pure culture of *Aspergillus Flavus* on sterilized potato dextrose agar and incubated for 7 days at 28 °C. 100 g of rice grains was added in Erlenmeyer flasks. PDA slants containing *Aspergillus flavus* conidia were transferred in the flasks containing rice. These flasks were fixed over orbital shaker for 5-6 days. Again, the flasks were autoclaved, and content of the flasks were pooled for extraction. Extraction and quantification of aflatoxin was done through HPLC. For chitosan nanoparticles preparation, 1% chitosan solution was made in 1% acetic acid solution under continuous magnetic stirring. After that TPP solution was added. For purification centrifugation was done and supernatant was removed. For nanocomposites (bentonite and glucomannan) preparation, separate solution of chitosan, bentonite and glucomannan were made and then mixed following the adopted methodology. Afterwards, centrifugation was done to get nanocomposites in a pallet form for lyophilization.



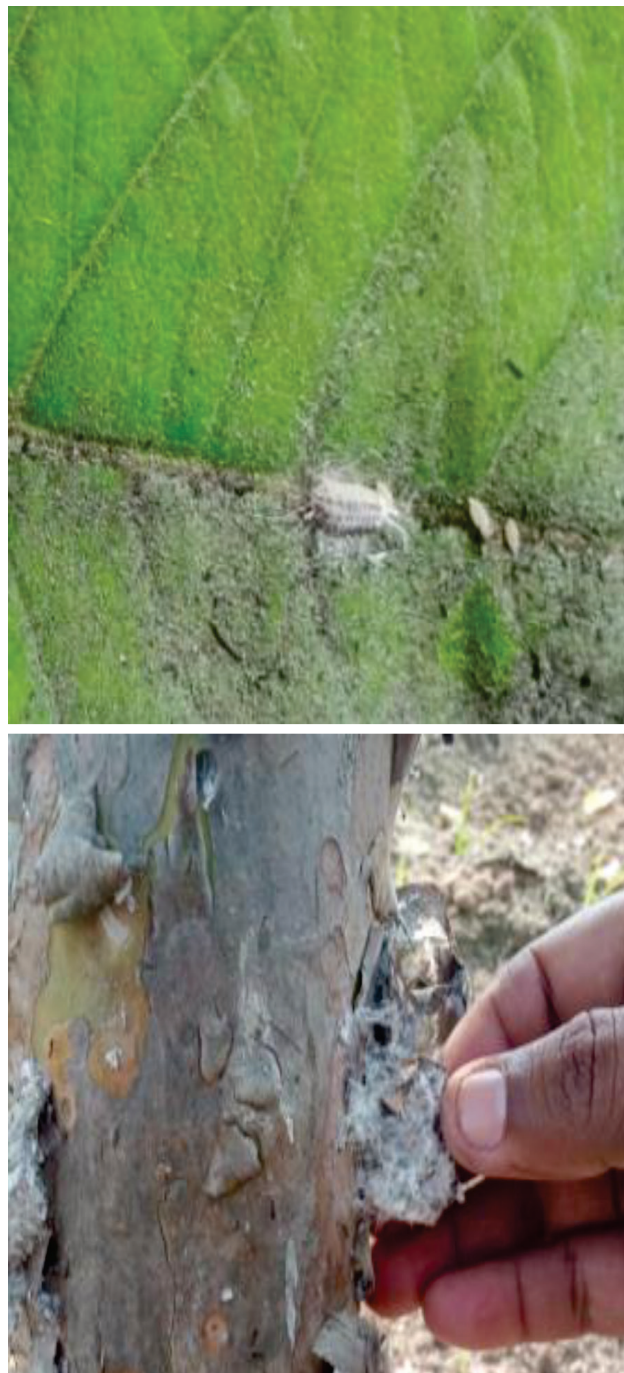
Production of aflatoxins

Preparation of different nanoparticles

Integrated Pest Management of Guava Mealybugs, infesting Guava Orchards in Sindh (Ongoing)

Dr. Shahjahan Rajput, Shaheed Z. A. Bhutto Agricultural College, Dokri, District Larkana, Sindh

The research project titled “Integrated Pest Management of Guava Mealybugs, infesting Guava Orchards in Sindh” has achieved significant milestones. A structured questionnaire was utilized to collect data on guava mealybug infestation and control measures from 51 orchards in Sindh. Predatory spiders and mealybugs were collected for further study and mass rearing. The investigation revealed guava mealybugs infestation across all surveyed orchards in Sindh, with district Larkana showing higher severity. A correlation between temperature and mealybug population dynamics was observed in all orchards, providing valuable insights into pest behavior. The survey unveiled several factors contributing to guava mealybug infestation in Sindh, including the indiscriminate use of synthetic pesticides, insufficient knowledge about pests and natural enemies, climate change, and the lack of integrated pest management (IPM) strategies. The reliance on synthetic pesticides highlighted the necessity for sustainable pest management practices. Predatory spiders collected from infested orchards were identified, mass-reared, and proposed for future release to aid in biological control efforts. Laboratory experiments evaluated various plant extracts and oils, with 31 Neem and bitter apple extracts, as well as neem and bitter mustard oils, showing significant repellence and control against mealybugs. Technical assistance and farmer training workshops were conducted to promote IPM strategies, organic farming practices, and the beneficial use of bio pesticides and bio fertilizers. Collaboration with Hara Organic Pakistan (Pvt.) Ltd. aimed to educate farmers about the effective utilization of bio pesticides and bio fertilizers, fostering the



transition towards organic agriculture. These efforts collectively contribute to sustainable pest management and organic farming practices in Sindh's guava orchards.



Surveillance of arthropods and arthropod-borne diseases of one health significance at the host-vector-environment interface at various agro-geoclimatic zones of Punjab, Pakistan (ongoing)

Prof. Dr. Muhammad Sohail Sajid, Molecular Parasitology lab, Department of Parasitology, Faculty of Veterinary Sciences, UAF

During the first year of the research project, significant progress was made across various crucial domains, showcasing the dedication and meticulous planning of the team. A key milestone was the successful recruitment of a Research Fellow after fulfilling the required requirements. Sample collection, a cornerstone of the project, was efficiently performed in the regions of Sialkot, Chiniot and Chakwal. Tours were precisely arranged to facilitate the collection process, ensuring a diverse and representative dataset. Blood samples were gathered from a spectrum of livestock and reservoir animals, including goats, sheep, buffalos, horses, donkeys, cage birds, and pigeons. The screening for arthropod-borne infections, particularly in potential reservoirs, provided a nuanced understanding of the prevalence and dynamics of these infections within the studied populations.

In tandem with sample collection, a comprehensive questionnaire was designed and distributed to individuals in the target regions. This formal and informal dissemination allowed



Figure 13. A=Project discussion with ADIO Sialkot; B=Group photo with researchers and officers; C= Visit of civil veterinary hospital Chiniot; D= Field visit.

for the incorporation of community perspectives, enriching the data collection process and ensuring a holistic approach to understanding arthropod-borne infections. The microscopic identification of arthropods, including various tick species, marked a critical step in the project. The diversity within tick species was carefully documented, providing valuable insights into the ecological context of arthropod vectors in the studied areas. The molecular diagnostic phase involved the extraction of DNA from blood samples, utilizing PCR for pathogen detection. The following gel electrophoresis allowed for the visualization of distinct bands, enhancing the precision of pathogen identification. This advanced molecular approach contributed to a deeper understanding of the genetic makeup of pathogens circulating within the sampled animal populations.

Within the research activities, challenges were addressed, exemplified by the repair of functionality to essential equipment. Furthermore, necessary chemicals and stationery were procured, emphasizing the commitment to maintaining combined project operations.



Field Evaluation for Commercialization of Herbicide-Tolerant (CABB-HTS) and Insect-Resistant (CABB-IRS) Transgenic Sugarcane (Ongoing)

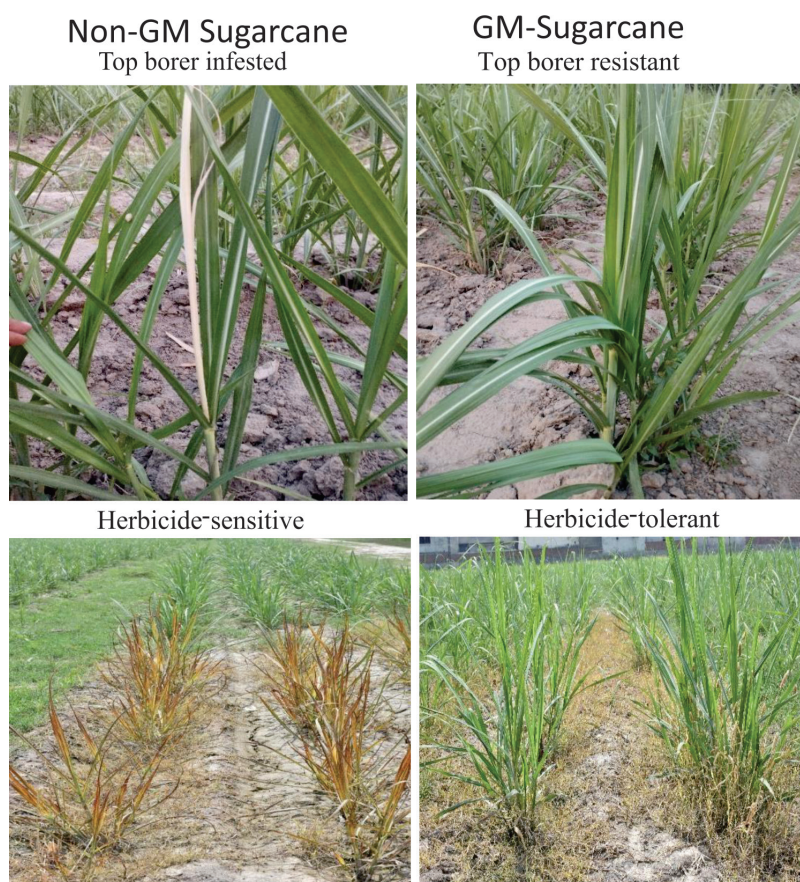
Prof. Dr. Muhammad Sarwar Khan, Centre of Agricultural Biochemistry and Biotechnology, UAF

Weeds and insect pests are the noxious agents that may cause drastic losses to sugarcane production. We have developed herbicide-tolerant and insect-resistant transgenic sugarcane.

Bar gene has been incorporated for herbicide tolerance whereas the cry1 Ab gene has been incorporated for insect resistance. The said plants have been confirmed for transgene integration. The developed transgenic plants will further be analyzed to assess the stability of the transgene and its expression at different growth stages. Bioassays will be performed to assess the level of resistance against insect pests and plants will also be tested against a field dose of non-selective herbicide Basta. Physiological and agronomic performance of the transgenic clones will also be carried out. Further biosafety risk assessment and genetic diversity analysis will also be carried out for the approval of the developed transgenic line. The developed transgenic lines

will prove a valuable addition to the existing sugarcane germplasm and will hopefully result in increased crop production. The achievements so far are as under.

- Permission has been granted by National Biosafety Committee (NBC), for the field plantation. Evaluation of herbicide-tolerant (CABB-HTS) and insect-resistant (CABB-IRS) transgenic sugarcane is being carried out.
- For field trials, sowing of transgenic sugarcane and untransformed sugarcane has been completed at University Farm and the farm of a progressive farmer, following the biosafety guidelines.
- Genetic as well as protein analyses of the field-grown plants have been carried out.
- Herbicide tolerance as well as insect resistance in the field have been evaluated.



Section

5

Product
Commercialization



5. PRODUCT COMMERCIALIZATION

EFS offers funding for researchers and scientists to commercialize innovative products or technologies that have been developed at UAF. Investors or entrepreneurs who are interested may partner with EFS to invest and establish companies focused on the commercialization of university products. Additionally, EFS has successfully accomplished significant projects under this component, such as the construction of a state-of-the-art Exhibition Centre worth Rs.16.04 million on the campus, and a Farm Market valued at Rs. 5.911 million. EFS is also supporting projects under this component aimed at commercialization of products.

5.1 Projects Initiated

SN	Title of the Project	Name of the PI	Duration	Budget (Rs.Million)
1.	Promoting the Use of Nutrition Grain Flour as a Strategy to Combat Malnutrition and Alleviate Pressure on Wheat Production in Pakistan	Dr. Muhammad Azhar Ali, Lecturer, Department of Food Engineering, UAF	2 Years w.e.f 15.02.2024	2.81
2.	Standardization and Development of Ready to Use Kit for Detection of Vancomycin Resistant Staphylococcus Aureus	Dr. Nayab Batool, Assistant Professor, Institute of Microbiology, UAF	2 Years w.e.f 15.02.2024	1.874
3.	Establishment of Laboratory Facility for the Detection of Organophosphate Residues by Developing Colorimetric Biosensor	Dr. Sidra Altaf, Lecturer, Department of Pharmacy, UAF	3 Years w.e.f 15.02.2024	2.542
4.	Development and Evaluation of Low Glycemic Index Bakery Products	Prof. Dr. Imtiaz Hussain, Professor, Department of Food Science & Tech. University of Poonch, Rawalakot, AJK	2 Years w.e.f 15.02.2024	1.006

5.2 Project Completed

SN	Title of the Project	Name of the PI	Duration	Budget (Rs.Million)
1.	MD-TSPM: Thermal Stability Prediction Method for Cancer Associated I-motifs	Amen Shamim, Assistant Professor, Department of Computer Science, UAF	2 Years* w.e.f 01.11.2022	1.88

* Completed in one year.

5.3 Scholar Block at UAF

The BoD in its 26th meeting held on May 27, 2023 approved to construct a state-of-the-art Scholar Block keeping in view to host the academic and research activities. For the purpose Rs. 77.798 million was allocated out of financial budget 2023-24. The BoD also desired to complete the project in one year and to name the floors after the name of some renowned personalities. The construction was started in 2023 and the current status is as under:

1.	Approved Cost	Rs. 77.798 Million
2.	Project Completion date	30.04.2024
3.	Fund Released upto June 2024	Rs. 77.798 Million
4.	Utilization upto June 2024	Rs. 57.995 Million

Current Status

1. Grey Structure has been 100 % completed.
2. Kitchen area (1800 Sft) has been executed under the said work.
3. Installation of Fixtures (Civil/Electrical/Public Health) is in Progress.



5.4 Farm Display & Lodging Facility at UAF

The BoD in 26th meeting held on May 27, 2023 approved to invest the funds into capital infrastructures e.g. construction of multipurpose buildings etc., in addition to existing investment. For the purpose, it was proposed to establish a "FARM DISPLAY & LODGING FACILITY" having state-of-the-art facilities like farm produce sale, UAF-Product Sale Point, farm produce storage and allied facilities, etc. and a faculty residential facility. Accommodation for faculty members will be on a rental basis as per Govt. residential/accommodation rules. This will also serve as a future income source. The construction was started in 05-03-2024 and the current status is as under:

1.	Approved Cost	Rs. 537.513 Million
2.	Project Completion date	04.11.2024
3.	Fund Released upto June 2024	Rs. 100.00 Million
4.	Utilization upto June 2024	Rs. 100.00 Million

Current Status

1. The R.C.C foundation has been completed.
2. The R.C.C structure of Farm Display Component/Basement has been completed.
3. The First roof of Residential Block has been completed.
4. The R.C.C Frame structure of Ground Floor is in Progress.



Section

6

**Monitoring
&
Evaluation**



6.1 Monitoring and Evaluation

Monitoring and evaluation (M&E) is an important aspect of the funding agency. It helps for smooth running of the projects for the benefit of the people and the country. Monitoring and Evaluation points out the weakness/shortcomings of the projects for their improvement and making these more impactful.

EFS projects are in progress in the four provinces & AJK and UAF main campus. M & E was carried out to ensure the quality of project execution and funds utility. EFS team visited the relevant HEI Department following a quality M & E plan. The project PIs presented the progress and issues of the project. A project site visit was conducted to see the progress on the ground. A comparison of the presentation and ground reality was made. Project execution issues were discussed and suggestions were made accordingly. The accounts related issues were also discussed and solution were suggested. A critical and analytical report of every M & E visit was prepared. The report was submitted to the Chairman BoD for his perusal. The report was also discussed by the Chairman BoD with the project PI. These projects will contribute towards the faculty and community development.

SN	Title of the Project & Name of PIs	Date & Duration	Budget	Monitoring Report by EFS-Team
1.	Capacity-Building of Small-Scale Farmers to enhance Productivity and improve socioeconomic status through institutional Outreach Program PI: Prof. Dr. Muhammad Qamar Bilal, Institute of Animal and Dairy Sciences, UAF	01.11.2022 to 30.10.2025 (3 Years)	5.134	The project has been running successfully. The out-reach activities have, also been running effectively by involving the farming-community and allied-departments. The project is rated as "highly successful".
2.	Establishment of Low Fruit-Fly Prevalence-Zone (LFFPZ) at UAF-Main Campus PI: Dr. M. Dildar Gogi, Department of Entomology, UAF	01.11.2022 to 30.10.2025 (3 Years)	3.841	The project has not been running in its true letter & spirit. ED-EFS was very annoyed with the progress & outcomes of the project. He conveyed the same to the PI during the M & E visit. The project is rated as "Partly successful".

SN	Title of the Project & Name of PIs	Date & Duration	Budget	Monitoring Report by EFS-Team
3.	Demonstration of Best Production Management-Practices for Chickpea in Irrigated Areas PI: Dr. Rana M. Atif, Department of PBG, UAF	01.11.2022 to 30.10.2025 (3 Years)	2.966	The PI of the project remained abroad. He has submitted six-monthly and annual-report together, after his return. But, the progress reported is questionable. The project is rated as "partly successful".
4.	Establishment of Grapes-Germplasm Unit (GPU) for Technology Transfer (TT) PI: Dr. M. Azam, Institute of Horticultural Sciences, UAF	01.09.2021 to 31.08.2025 (4 years)	4.704	The project is successfully underway. The PI has been changed as the Ex-PI has retired. The project is rated as "Successful".
5.	Tunnel-Growers Training of Integrated Disease-Management: An Eco-Friendly Approach PI: Dr. Osama, UAF Sub-Campus, Burewala	01.11.2022 to 30.10.2025 (3 Years)	2.323	The project has been running successfully. The P.I. and his team is doing their best. The project-progress is rated as "successful".
6.	Promotion of Wheat-Seed Production by Technology Transfer (TT) to Small Land Holders Farmers PI: Dr. M. Arif, Department of Agronomy Agriculture University, Peshawar	01.11.2022 to 30.10.2025 (3 Years)	5.196	The project has been running in the field. But, some observations made during the visit were reported to the PI for improvement. The project-progress is rated as "Partly Successful".
7.	Feeding Scavenging-Chicken for Deficient Nutrients to Improve Growth and Production PI: Dr. Umar Farooq, UAF Sub-Campus TT Singh	01.10.2021 to 30.09.2023 (2 years)	1.417	The project has been completed. However, the EFS-Team gave some suggestions on the issues raised by the PI, during visit. The project is rated as "Partly Successful".

SN	Title of the Project & Name of PIs	Date & Duration	Budget	Monitoring Report by EFS-Team
8.	Popularization of Home-Gardening in Urban and Peri-Urban Areas of Punjab Name of PM: Prof. Dr. Jalal Arif, Department of Entomology, UAF PI-ZONE-1: Dr. Muzammil Jahangir, Institute of Horticultural Sciences, UAF PI-ZONE-2: Dr. Rashad Waseem Khan Qadri, Institute of Horticultural Sciences, UAF PI-ZONE-3: Dr. M. Atiq, Department of Pathology, UAF PI-ZONE-4: Dr. M. Dildar Gogi, Department of Entomology, UAF	01.11.2021 to 30.10.2024 (3 years)	8.035	UAF Main-Campus & sub-campuses Burewala, Depalpur and TT Singh are the locations. The success of Burewala Sub-Campus was excellent. One-liner way forward is that the "Burewala-Modal" be followed properly for success of the home-gardening activities at other sites. The project-progress is rated as "partly successful".
9.	Development of an AI-Based Small-Scale Automated Citrus-Grading Platform PI: Dr. M. Yamin, Department of Food Engineering, UAF	01.11.2022 to 30.10.2024 (2 Years)	1.660	The PI of the project is changed. Therefore, the time of the project has been extended. The project has just been started.
10.	Urban Food-Gardening in Twin Cities: Fight Against Climate Change and Malnutrition PI: Prof. Dr. Azam Khan, Department of Horticulture, PMAS-Arid Agriculture University Rawalpindi	01.11.2022 to 30.10.2025 (3 Years)	4.410	The project has been running in an excellent manner. The project leader and his team are appreciated for their hard work, commitment and achievement. The project-progress is rated as "highly-successful".
11.	Development and Evaluation of Chitosan Based Nanocomposites to Control Aflatoxicosis in Poultry PI: Dr. Aisha Khatoon, Department of Pathology, UAF	01.11.2022 to 30.10.2025 (3 Years)	2.861	The project has been running successfully and progress is rated as "successful".
12.	Tandem Structured Carbon Quantum Dots and Florescent Dyes for Efficient Semi Transparent Agri-Photovoltaics PI: Dr. M. Zahid, Department of Chemistry, UAF	01.11.2022 to 30.10.2025 (3 Years)	4.104	The EFS team raised some sessions questions on the very slow progress being made so far. The PI was advised to follow the work plan. The subject

SN	Title of the Project & Name of PIs	Date & Duration	Budget	Monitoring Report by EFS-Team
13.	Integrated Pest Management of Guava Mealybugs, infesting Guava Orchards in Sindh. PI: Dr. Shahjahan Rajput, Shaheed Z.A. Bhutto Agri. College, Dokri, Larkana	01.11.2022 to 30.10.2025 (3 Years)	2.634	During the field-visit, farmers were busy in picking, grading and packing the Guava-product. Their views were also recorded to verify the data presented by the project-team. Farmers-views were in-line with the work presented by the project-team. The project-progress is rated as "highly-successful".
14.	Surveillance of Arthropods and Arthropod-Borne Diseases of One Health Significance at the Host-Vector-Environment Interface at Various Agro-Geo Climatic Zones of Punjab, Pakistan PI: Dr. M. Sohail Sajid, Department of Parasitology, UAF	01.11.2022 to 30.10.2025 (3 Years)	3.867	The project-team prepared a well-structured interviewing-schedule for data-collection. The field and lab. work was in progress. The project-progress is rated as "successful".
15.	Appraisal of Hispidulin in Downregulation of Hyperglycemia; a Novel Therapeutic Approach. PI: Dr. Wafa Majeed, Department of Pharmacy, UAF	01.11.2022 to 30.10.2024 (2 Years)	2.563	The project is .in operation. The project-progress is rated as "highly-successful".
16.	Development of a Biopesticide for the Management of Blackleg of Potato in Pakistan PI: Dr. Khalid Naveed, Plant-Pathology Dept., UAF Sub-Campus Depalpur, Okara	01.11.2022 to 30.10.2025 (3 Years)	1.375	The project field and lab. work is in progress. There were some questions on the methodology and field-operation of the project which could not be answered by the PI successfully. The project-progress is rated as "partly-successful".

SN	Title of the Project & Name of PIs	Date & Duration	Budget	Monitoring Report by EFS-Team
17.	Field Evaluation for Commercialization of Herbicide-Tolerant (CABB-HTS) and Insect-Resistant (CABB-IRS) Transgenic Sugarcane PI: Prof. Dr. M. Sarwar Khan, CABB, UAF	01.11.2022 to 30.10.2025 (3 Years)	6.569	The project has been running successfully and has achieved several stages. The project-progress is rated as "highly-successful".
18.	Domestication of Wildly-Grown Black-Raspberries to exploit their Nutritional and Commercial Potential in Climatic conditions of Rawlakot, AJK PI: Dr. Mehdi Maqbool, Department of Horticulture, University of Poonch, Rawlakot, AJK	01.10.2021 to 30.09.2024 (3- Years)	2.199	The PI briefed about the project and issues faced by them, on the project-site. The project was progressing according to the work-plan. On return from field, the PI presented the details of the project-work and progress in his office. The project is rated as "highly-successful".
19.	MD-TSPM: Thermal Stability Prediction Method for Cancer Associated I-motifs PI: Dr. Amen Shamim, Department of Computer Science, UAF	01.11.2022 to 30.10.2024 (2 Years)	1.880	The project was running successfully and achieved excellent results. The project is rated as "highly-successful".
20.	Institutional-Dynamism and Performance of Irrigation-Systems aimed Climate, Demographic and market-Changes Cases from Pakistan PI: Prof. Dr. Asif Kamran, Institute of Agri. & Resource Economics, UAF.	01.04.2023 to 31.03.2024 (1 Year)	2.602	The project-team has done an excellent work so far. The project-progress is rated as "highly-successful".

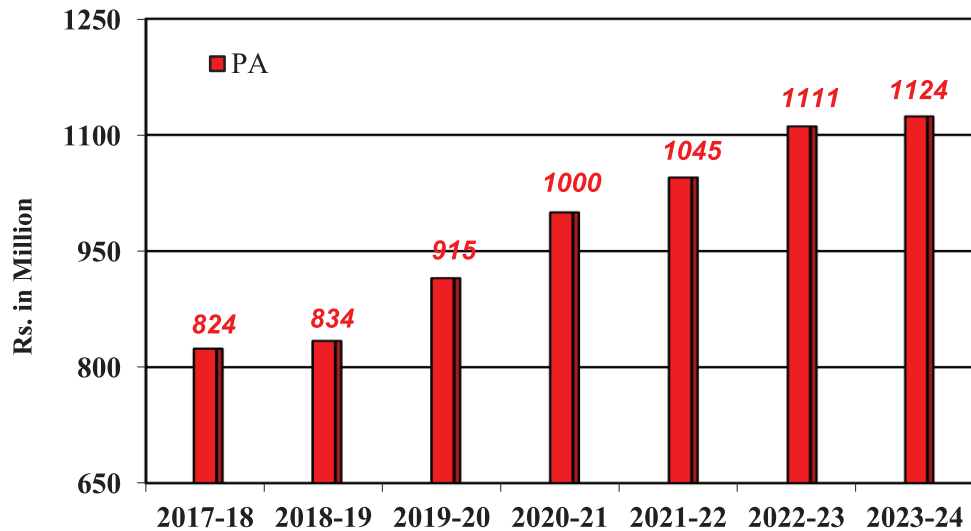
Section

7

Financial
Report

7.1 Income from Investment

The Principal amount is invested in approved banks. A portion of its profit is retained for adding in the principal amount @ 15% of the profit to counter the impact of inflation/devaluation of rupee. The volume of principal amount invested during 2023-24 was Rs. 1124.00 million.



Growth of Principal Amount

7.2 Expenditure

The financial year 2023-24 closed with savings of Rs. 64.466 million. The Receipts and Expenditure for the year, 2023-24 are shown in Table-I. The detail of other receipts and component wise expenditure is given in Table-II.

TABLE-I

(Rupees in Million)	
RECEIPTS	Actual
Opening Balance 1st July, 2023	65.488
Income from Investment 2023-24	189.710
Other Receipts *	11.500
Total Receipts	266.698
Transfer to Principal Amount (15% of the Income from investment)	Nil
Available for Allocations	266.698

*Rental income from Exhibition Center, income from ongoing projects and unspent balance from completed projects.

TABLE-II

Component wise Expenditure during the year 2023-24

(Rupees in Million)	
ALLOCATION / EXPENDITURE	Actual Expenditure
Block allocation-I for Construction of Scholar Block	49.33
Block allocation-II for Construction of Farm Display & Lodging Facility at UAF	100.000
Faculty Development	13.978
Technology Transfer	16.975
Product Commercialization	2.783
Research & Development	10.692
Operation EFS	8.477
Total expenditure/cash outlay	202.232
Transfer to P.A	Nil
Closing Balance	64.466

Component wise Allocation and Expenditure 2023-24