Training Report

Title: Basics of Biosafety and Biosecurity

July 28, 2024

Organized by:

Agri-Tech Solutions (Biosafety Division)

Location:

Business Incubation and Agriculture Entrepreneurship Centre (BIAEC),

Muhammad Nawaz Sharif University of Agriculture, Multan

Table of Contents

Introduction……... 1

Objectives……. 2

Training agenda…… 3

Participation…….. 4

Pre-Evaluation…….. 5

Resource persons…….. 6

Hands on activities…… 7

Lunch break…….. 8

Post-Evaluation……. 9

Evaluation and feedback……... 10

Outcomes…….. 11

Benefits……. 12

Future directions……... 13

Outcomes……... 14

Future directions…… 15

Conclusion……. 16

Acknowledgment

We extend our sincere gratitude to all individuals and organizations whose contributions made this biosafety and biosecurity training program possible. Special thanks to our dedicated trainers and resource persons for their expertise and commitment in sharing invaluable knowledge. We also acknowledge the support and collaboration of Business Incubation and Agriculture Entrepreneurship Centre (BIAEC), MNS-University of Agriculture for hosting and facilitating this training initiative. Our heartfelt appreciation goes to all participants whose active engagement and feedback enriched the learning experience. Thank you all for your contributions towards promoting biosafety and biosecurity practices for a safer future.

Introduction

Biosafety and biosecurity are critical fields that ensure the safe management of biological materials, protecting both public health and the environment. The concept of biosafety revolves around preventing unintentional exposure to pathogens and toxins or their accidental release. Biosecurity, on the other hand, focuses on preventing the intentional misuse of biological agents and materials. Together, these practices form the backbone of modern efforts to handle biological risks safely and responsibly.

In recent years, the importance of biosafety and biosecurity has gained global recognition due to the increasing frequency of biological incidents, including laboratory accidents, outbreaks of infectious diseases, and the potential threat of bioterrorism. The rapid advancement of biotechnology and life sciences has amplified these risks, necessitating robust frameworks and protocols to safeguard both human and environmental health.

Importance of Biosafety for All Sectors

Biosafety is not confined to laboratories and research facilities; it spans across various sectors, each with its unique challenges and requirements:

Healthcare: In hospitals and clinics, biosafety protocols are crucial to prevent the spread of infectious diseases. Proper handling and disposal of medical waste, vaccination of healthcare workers, and rigorous hygiene practices are essential to protect patients and staff.

Agriculture: Biosafety in agriculture involves controlling pests and diseases that affect crops and livestock. Implementing biosecurity measures ensures food safety, secures the livelihoods of farmers, and maintains the stability of the food supply chain.

Research and Development: Laboratories conducting research on infectious agents must adhere to strict biosafety standards to prevent accidental releases. This ensures the safety of researchers and the public, and protects the integrity of scientific research.

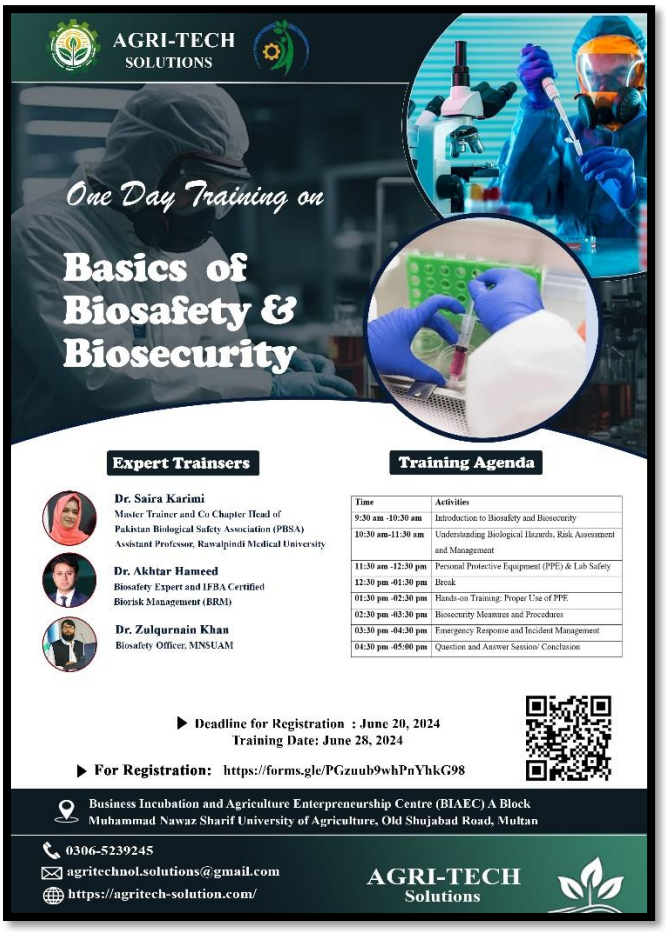
Industrial Biotechnology: Companies involved in biotechnology must manage biological risks associated with the production and handling of bioengineered products. This includes containment practices, risk assessments, and emergency response plans.

Environmental Conservation: Biosafety practices in environmental management help protect biodiversity and ecosystems. Controlling invasive species, managing genetically modified organisms, and monitoring wildlife diseases are critical for maintaining ecological balance.

Comprehensive Approach to Biosafety

An effective biosafety and biosecurity strategy requires a comprehensive approach involving education, regulation, and collaboration. Training programs, such as the one recently conducted, play a pivotal role in raising awareness and building capacity among professionals across different sectors. By fostering a culture of safety and security, these programs help mitigate biological risks and ensure a safer, healthier world for all.

On July 28, 2024, a comprehensive training session was successfully conducted on “Basics of Biosafety and Biosecurity” at Business Incubation and Agriculture Entrepreneurship Centre (BIAEC), Muhammad Nawaz Sharif University of Agriculture, Multan. The aim of the training was to enhance the biosafety practices and to ensure compliance with safety standards.



Objectives

- To improve understanding of biosafety protocols.
- To train participants on the safe handling of biological materials.
- To foster a culture of safety within the organization.

Training Agenda:

Day 1		
Opening Session		
Time	**Topic**	**Speakers**
8:30 – 9:00	Registration	
9:00 – 9:05	Recitation of Holy Quran	
9:05 – 9:15	Welcome Remarks	
9:15–9:30	Introduction of Participants & Facilitators	
9:30 – 10:00	Pre-Test Evaluation	
10:00 – 10:15	Scope and Objectives of the Training	
	Technical Session	
10:15-11:00	Introduction to the key points of workshop	Dr. Zulqarnain Khan
11:00 – 11:20	Biorisk management in GMOs and regulatory framework	Dr. Zulqarnain Khan
	Introduction to Biorisk in health care setting	Dr. Saira Karimi
11:20 – 12:00	Laboratory Acquired Infections and waste management	Dr. Saira Karimi
12:00 – 12:30	Occupational Health and medical Surveillance	
12:30 - 1:00	Risk Assessment and Emergency responses	Dr. Akhtar Hameed
1:00 – 2:00	**Lunch & prayers Break**	
	Practical session (03 Groups, rotations among stations)	

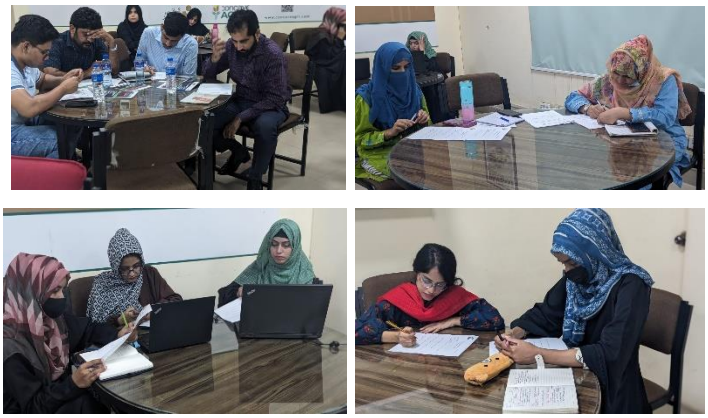
2:00 – 3:15	Needle prick response and Eye Wash (25 minutes) Beaking method of gloves removal PPE (25 minutes) Spill Clean-up (Small Spills and Spill inside Biosafety Cabinet) (25 minutes) and Waste management/ segregation (25 minutes)	Dr. Akhtar Hameed Dr. Saira Karimi
3:15-3:30	Q&A Session and Conclusion	Dr. Zulqarnain Khan
3:30-3:45	**Evening Tea**	
	End of Day	

Participants.

The training session was attended by 20 participants, including staff members from various departments and guests from external organizations. This diverse group provided a rich environment for learning and discussion.

Pre-Evaluation

Prior to the commencement of the biosafety and biosecurity training, participants underwent a comprehensive pre-evaluation assessment. This assessment aimed to gauge their existing knowledge, skills, and attitudes regarding biosafety practices across different sectors. Participants completed surveys or quizzes that covered fundamental concepts such as the handling of hazardous materials, personal protective equipment (PPE) usage, and basic laboratory safety protocols

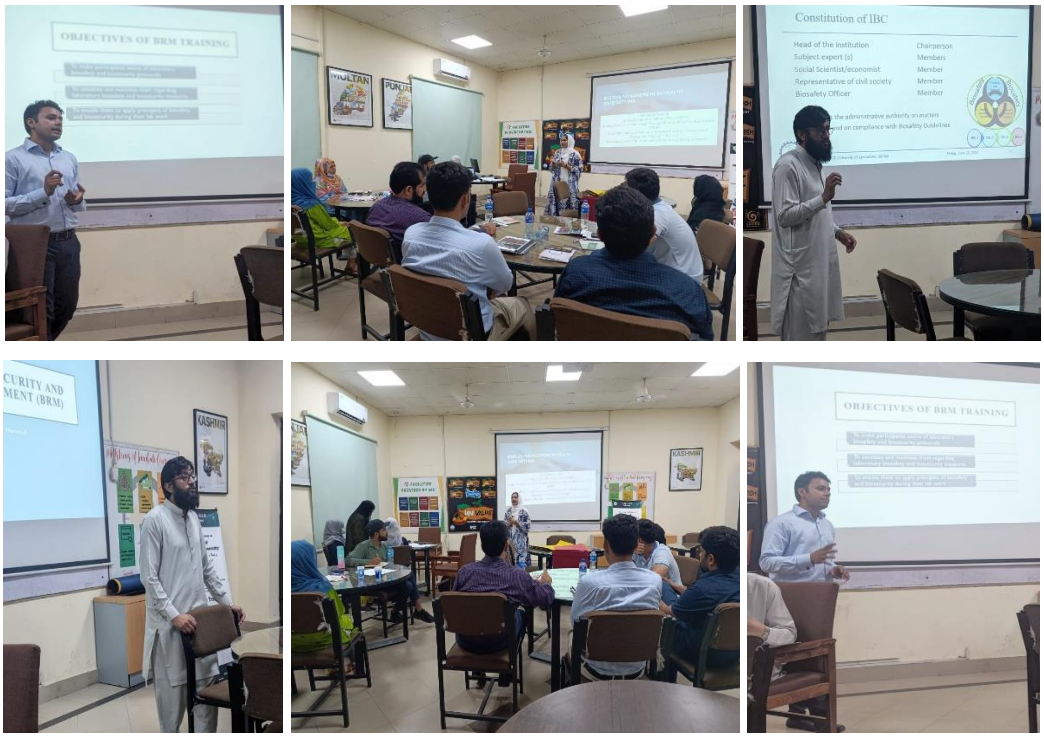


Resource Persons

The success of our biosafety and biosecurity training program is largely attributed to the expertise and dedication of our resource persons. These individuals brought a wealth of knowledge and

practical experience, ensuring that the training was both comprehensive and impactful. Below is a table detailing the resource persons who contributed to the training:

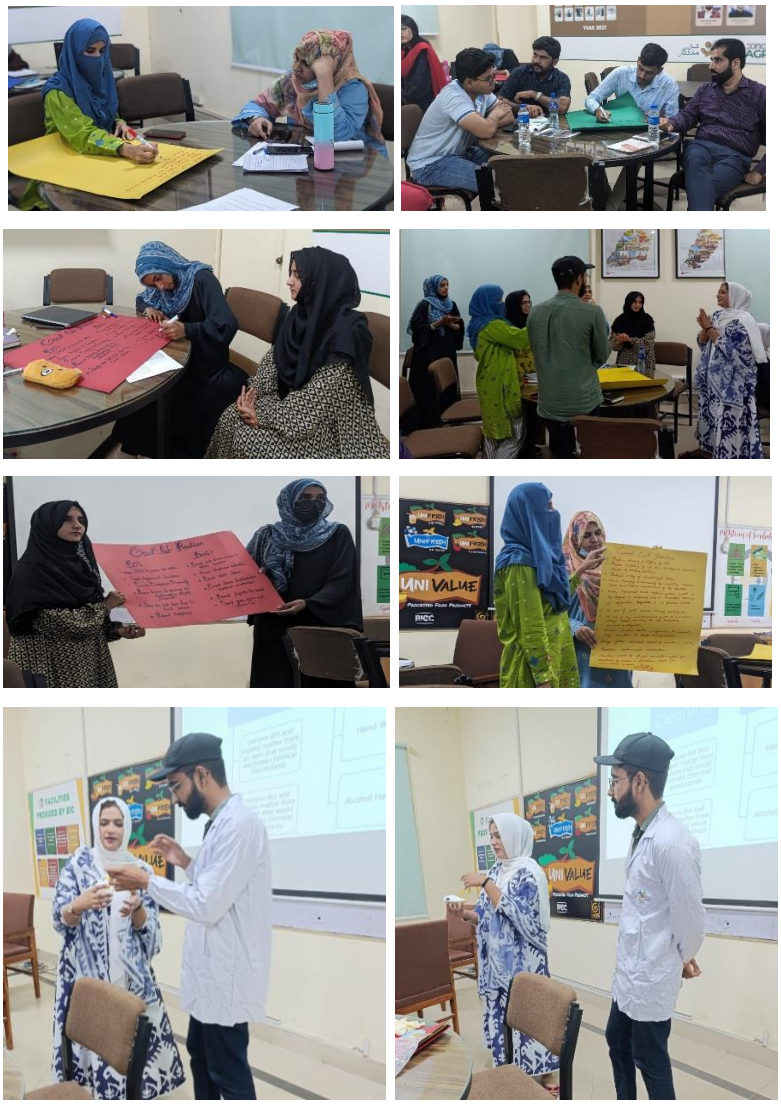
Speaker	Position
Dr. Zulqarnain Khan	Biosafety Officer, MNS-University of Agriculture, Multan
Dr. Saira Karimi	Master Trainer and Co Chapter Head of Pakistan Biological Safety Association (PBSA), Assistant Professor, Rawalpindi Medical University
Dr. Akhtar Hameed	Biosafety Expert and IFBA Certified Biorisk Management (BRM)



Hands-On Activities

The hands-on training sessions in our biosafety and biosecurity program provided participants with practical skills in donning and doffing personal protective equipment (PPE). Participants learned the proper sequence for putting on and taking off PPE to minimize the risk of contamination. They practiced step-by-step procedures, ensuring each piece of equipment was worn and removed in the correct order. This included gloves, masks, gowns, and face shields, with emphasis on maintaining hygiene and safety throughout the process. By mastering these techniques, participants gained

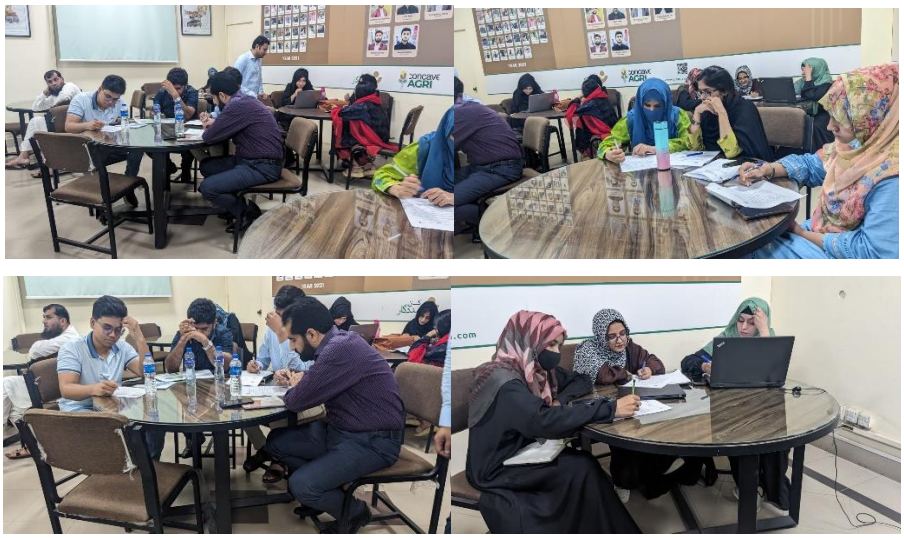
confidence in their ability to effectively use PPE to protect themselves and others in laboratory and field settings. The training underscored the importance of meticulous adherence to these protocols in preventing the spread of infectious agents and ensuring a secure working environment in various biosafety contexts.



Post-Evaluation

Following the biosafety and biosecurity training, participants underwent a comprehensive post-evaluation to assess their knowledge, skills, and attitudes. This assessment included quizzes, practical demonstrations, and feedback surveys, revealing significant improvements in understanding biosafety principles, proficiency in safety protocols, and confidence in using

personal protective equipment (PPE). Participants' feedback highlighted the training's effectiveness in equipping them with practical skills for managing hazardous materials, medical waste, and implementing biosecurity measures. These results underscored the training's success in enhancing participants' readiness to promote safety and security across various biosafety contexts.



Feedback and Evaluation

Feedback was collected from participants through surveys and verbal comments. Overall, the response was very positive, with attendees appreciating the interactive format and practical exercises. Suggestions for future sessions included more hands-on activities and advanced topics in biosafety.

Outcomes

The biosafety and biosecurity training yielded significant outcomes, equipping participants with enhanced knowledge, skills, and confidence in biosafety practices. Participants demonstrated improved proficiency in handling hazardous materials, managing medical waste, and implementing biosecurity measures. Post-training evaluations highlighted substantial gains in understanding biosafety principles and protocols, underscoring the training's effectiveness in preparing participants to safeguard public health, agriculture, and the environment against biological threats. The training fostered a culture of safety and responsibility, empowering participants to apply learned practices in their respective fields, thereby contributing to a safer and more secure working environment overall.

Benefits

The biosafety and biosecurity training delivered tangible benefits by enhancing participants' knowledge and skills in managing biological risks. Participants gained proficiency in handling hazardous materials, implementing effective biosecurity measures, and using personal protective equipment (PPE) correctly. This training not only bolstered safety protocols but also promoted a culture of awareness and responsibility across various sectors, including healthcare, agriculture, and research. By equipping participants with practical tools and strategies, the training contributed to mitigating biological risks, protecting public health, and ensuring environmental sustainability.

Future Directions

Moving forward, the biosafety and biosecurity training program plans to improve by using new technologies and updated methods. We'll focus on ongoing learning and skill-building to handle new biological risks and meet changing rules. We'll encourage teamwork across different fields to find new ways to keep everyone safe. By building more partnerships and reaching out widely, we aim to help more people use biosafety practices and stay protected from biological risks in our connected world.

Conclusion

The biosafety training was a significant step towards improving safety culture. By equipping our with essential skills and knowledge, we are better prepared to handle biological materials safely and responsibly.