



WELCOME TO OUR

# MBUST Insights

**Contributors of this Newsletter Issue:**

*Dr. Sarbesh Das Dangol, Dr. Anupama Shrestha, Dr. Sabina Shrestha, Dr Bhushan Shrestha and the students*

## MBUST Perseveres Amid Thankot-Chitlang Road Closure

MBUST TEAM COMMUTES DAILY DESPITE THE ROAD CLOSURE

BY Dr. Sarbesh Das Dangol



Cable car station and the cable car  
(Photo by Mukesh Maharjan)



Trekking down the hill  
(Photo by Rabina Shrestha)



Queuing at the cable car station  
(Photo by Dr. Sabina Shrestha)



Buses queue near the Chandragiri hill  
(Photo by Dr. Sarbesh Das Dangol)

The Kathmandu Road Division, Department of Roads, announced a complete month-long closure of the Thankot-Chitlang road, starting December 22, citing the need of urgent construction and maintenance. The announcement drew severe objections from MBUST team, as it would shatter the academic calendar of the university. The department agreed to partially open the roads following MBUST's and Thaha Municipality's persistent lobbying. Nonetheless, this has not alleviated the challenges currently faced by the MBUST students and staff. The partial road opening occur late in the evening, causing significant delays in our travel time. Long queues in the shivering cold night of Chandragiri hills, with 30 minutes to over two hours waiting time, has significantly disrupted the work-life balance.

The MBUST commuters travel early in the morning, 7 AM sharp from Pulchowk to cross Chandragiri hills by 8 AM, and travel back to Pulchowk often at night. Notwithstanding, the MBUST staff and student team endure these hardships daily to uphold their commitment to academic excellence, research, and innovation, the prerequisites for our nation's development and prosperity. Some staff and students have also resorted to alternatives, including statying in Chitlang, traversing forested steep hillsides on foot, and the cable car travel. However, reaching the top of the cable car station from Chitlang requires approximately 30-minute (or more for some) long trek. The university calls on the federal government to take into consideration the hardships faced by MBUST and Chitlang community, and help the university by timely opening the roads from and to Kathmandu.

# GATC and PPBCR Labs Collab with NPDA and CDBT-TU

## UNRAVELING THE GENETIC CODES AND SECRETS

*By Dr. Sarbesh Das Dangol*

The university laboratories namely Genomics and Tissue Culture Laboratory (GATC Lab) and Plant Protection Biological Research Centre (PPBCR) are working together on genetically decoding blast pathogens occurring in rice and millet. This work is in collaboration with Central Department of Biotechnology, Tribhuvan University (CDBT-TU) and Nepal Plant Disease and Agro Associates Private Limited (NPDA).



MBUST team, namely GATC and PPBCR labs, working in collaboration with CDBT-TU and NPDA

## GATC AND PPBCR LABS ON SOCIAL MEDIA COMMUNICATING FOR SCIENCE DIPLOMACY

*By Dr. Sarbesh Das Dangol*



GATC and PPBCR Labs are on Instagram.  
Please scan to follow.



GATC Lab is on X

# Representing MBUST

## PPBCR LAB PARTICIPATION AT DIFFERENT EVENTS

*By Sabnam Subedi and Dr. Anupama Shrestha*

### 1. Participation of PPBCR Lab on the celebration of World Soil day on December 5 2024.

The World Soil Day 2024 celebration, hosted by the Land for Future, Nepal Bioscience Research Laboratory (NBRL) in collaboration with several institutions, focused on raising awareness about soil health and promoting sustainable land management practices. This event brought together experts, researchers, and stakeholders to explore innovative approaches for conserving and managing soil resources.

Dr. Anupama Shrestha, Assistant Professor at MBUST delivered the talk on Role of Microorganisms and Biofertilizers in Soil Health. Key points included were:

- The critical contribution of microorganisms in enhancing soil fertility,
- The role of biofertilizers, and their benefits for organic farming systems.

### 2. Networking event with women scientists in ICIMOD

Dr. Anupama Shrestha participated in a networking event organized by ICIMOD for women scientists in Nepal. Dr. Paudel from OWSD presented on OWSD's research themes, while Sijal Pokhrel, a UNESCO officer, presented on the UNESCO initiative, "Closing the Gender Gap in Science."

Dr. Shrestha shared insights about MBUST's mission, vision, and research areas. The networking session concluded with a discussion on developing a concept note for collaboration between women scientists, UNESCO, and OWSD-N.

Participants also expressed interest in the MBUST program, with some mentioning their desire to pursue a Ph.D. but facing challenges related to equivalency issues. All the scientists showed a keen interest in potential collaborative work, and we look forward to future projects.



Representing MBUST at national events

# The AGS-300kNX Universal Testing Machine

A NEW ALLY FOR ENGINEERING STUDIES AT MBUST

*By Dr. Sabina Shrestha*

Shimadzu AGS-300kNX Universal Testing Machine (UTM) at the MBUST facility. This cutting-edge equipment is recognized as the industry's best performing autograph precision universal tester, featuring a robust capacity of 300 kN. This testing apparatus assesses both tensile and compressive strength, making it invaluable for quality control and research projects across various fields. This state-of-the-art equipment enables advanced tensile measurements crucial for our studies in bamboo structural engineering and beyond. This new addition will significantly enhance our research capabilities, allowing for more comprehensive studies and innovative applications in material science. We look forward to seeing the impact this equipment will have on our projects!



AGS-300kNX Universal Testing Machine (UTM) installed at MBUST facility



UTM in testing and training phase

# My Experience at MBUST

## A JOURNEY OF LEARNING

*By Srijana Dangri*

My name is Srijana Dangri, and I am from Kohalpur-10, Banke. Recently, I graduated from Prithu Technical College, Dang under Tribhuvan University with Bachelor's degree in Agriculture. Through my seniors, I learned about Madan Bhandari University of Science and Technology (MBUST) and its academic programs. With a keen interest in the field of mycology, I decided to apply for internship in mushroom lab under Organic Agriculture Program of MBUST. This decision marked the beginning of one of the most enriching experiences of my life.

The journey started on Mangsir 13, 2081 (Nov. 28, 2024), when I arrived at Chitlang, a breathtakingly beautiful hilly area, just southwest of Kathmandu Valley. Upon being selected, I was welcomed to the university with incredible warmth and acceptance. On my very first day at MBUST, I was amazed by how everyone, from the staff to Professors, already knew my name. This personal attention made me feel valued and encouraged.

From the very beginning, I started learning new things. During my last four years of Bachelor's course, most of my learning was based on theoretical knowledge. However, at MBUST, the learning became a blend of theoretical and practical experiences. I was introduced to various instruments and learned how they operate. My knowledge expanded immensely in areas such as tissue culture, medium preparation, mushroom foraging, medicinal properties of wild mushrooms, domestication of mushroom, demonstrating lab activities to students and general public and much more. The practical approach has significantly broadened my understanding.



What stands out about this university is its focus on multidisciplinary approach and also the depth of knowledge available in every faculty. The objectives of the university, along with its collaborative spirit, punctuality, and ethical standards, are truly inspiring. The unique teaching methods here foster creativity and innovation, encouraging research-oriented individuals to explore their interest in progressive ways.

However, the journey is not without its challenges. Initially, I struggled with comprehensive review and analysis, an essential skill for conducting in-depth research. Gradually, through perseverance and support from the faculty, I am overcoming these difficulties and improving my analytical capabilities. The chilly weather here feels a bit challenging for me, as someone from the warm plains of Terai. Adjusting to it is a little tough, but it's also part of the unique charm of being here. I genuinely love working here. Working under someone like Dr. Bhushan Shrestha, is a privilege I deeply cherish. His caring and nurturing nature creates an environment that feels like home, allowing me to feel truly at ease and connected with myself. This experience has not only enhanced my practical skills but also deepened my passion for learning and research. The environment at MBUST exemplifies the transformative power of education and innovation. I am incredibly grateful to be part of this journey and look forward to contributing further to this incredible field.

# Empowering Nepalese Industries

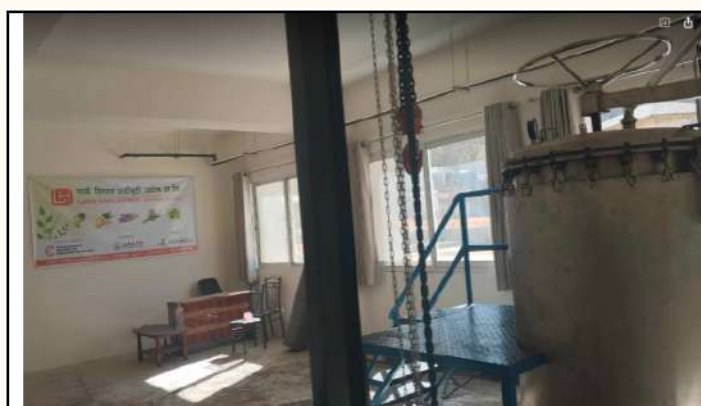
## SCALE UP OF ESSENTIAL OIL DISTILLATION VESSEL INSTALLED BY LARKE HIMAL JADIBUTI (LHJU) AT MBUST FACILITY

*By Dr. Sabina Shrestha*

The scale up facility at MBUST is aimed at fostering industrial integration, scaling up operations, and advancing quality product development. This facility represents a significant step forward in our commitment to supporting Nepalese industries and enhancing the quality of herbal products.

Recently, a discussion meeting was held on December 24 at the LHJU factory. The meeting was attended by Mr. Deepak Pandey, Chairperson of LHJU, along with Vice-President Padma Sundar Joshi, Dr. Sabina Shrestha, Dr. Sudip Pandey, and Dr. Saurabha Bhattarai. The focus of the meeting was on the certification requirements for Nepalese products in the international market. Other key participants included Ms. Ishu Subba, Executive Chair from the Institute of Cultural Affairs (ICA) Nepal, and Ms. Enusha Khadka from the Institute of Innovation and Quality Assurance (IIQA).

This collaboration aims to ensure that our products meet international standards, thereby enhancing their competitiveness in global markets. We look forward to the positive impact this facility will have on our research initiatives and the broader community.



Essential oil distillation vessel for scale up studies installed at MBUST facility by LHJU



Forest Biomaterials team at essential oil distillation facility recently installed at MBUST



MBUST team visit at LHJU factory



MBUT team in discussion meeting on certification requirements at LHJU

# Winter Mushroom in Chitlang

## EXPLORATION BY MUSHROOM LAB

*By Suraj Chaudhary, Saugat R.C., Nitesh Khatiwada, Prabin B.C., Pawan Kathayat, Srijana Dangl, Atmaz Kumar Shrestha and Dr. Bhushan Shrestha*

The Mushroom Laboratory group from Madan Bhandari University of Science and Technology (MBUST) carried out an engaging field exploration on December 10, 2024 in the beautiful hill of Chitlang. The purpose of this visit was to explore and record winter mushrooms flourishing in the area's distinct ecosystem.

This investigation, led by PhD student in Mushroom Lab Mr. Suraj Chaudhary, uncovered a remarkable finding of mushrooms that amazed the team. Chitlang, famous for its unspoiled natural charm, offered a perfect environment for various wild mushroom species, highlighting the area's abundant biodiversity even in winter season.

The hiking started at 10 AM with a straight uphill and ended at 3 PM with a day full of amusement, took a lunch break twice, and was able to collect dozens of different mushroom species, and finally preserved in the Herbarium Section of Mushroom lab of MBUST, after counting and measurement of each species. The team carefully identified specimens of different mushroom species for additional research. This research seeks to increase comprehension of the ecological and possible economic importance of these mushrooms, since many of them offer promising opportunities for culinary, medicinal and agroforestry uses.



Mushroom Laboratory group at MBUST

(Continued on Page 8)



Saugat Rokaya Chhetri collecting mushrooms

The Mushroom Lab at MBUST aims to increase awareness of the significance of conserving these natural resources while promoting sustainable methods for their use. These initiatives enhance academic understanding and also offer perspectives on the ecological richness of rural communities such as Chitlang.

This investigation signifies yet another achievement in MBUST's dedication to advancing research that connects science and sustainable development to benefit society and the environment.

# Knowing Plant Disease

## CERCOSPORA LEAF SPOT

By Sushil Rai and Dr. Anupama Shrestha

### Introduction

*Cercospora* leaf spot is a common fungal disease affecting a variety of plants, including chilli, soybeans, and vegetables such as carrots and celery. The disease is caused by several species of the *Cercospora* fungus, with *Cercospora capsici* being a notable pathogen for Chilli.

### Symptoms

1. Leaf Spots: Small, circular to irregular spots with brown or black centers and dark margins. As the disease progresses, these spots may merge, causing large necrotic areas.
2. Yellow Halos: Often, spots are surrounded by yellow halos.
3. Defoliation: Severe infection can lead to premature leaf drop, significantly impacting plant health and yield.
4. Reduced Photosynthesis: Infected leaves may have reduced photosynthetic capacity, leading to stunted growth and lower crop productivity.

### How to manage?

1. Crop Rotation: Rotate susceptible crops (e.g., chillies, soybeans) with non-host crops like grains to reduce soilborne inoculum levels.
2. Compost Application: Adding well-decomposed organic compost enhances soil microbial diversity, which can suppress pathogenic fungi and boost plant immunity.
3. Cover Crops: Planting cover crops such as legumes can help improve soil health, disrupt disease cycles, and add organic matter that supports beneficial microbes.
4. Copper-based Fungicides: Use copper-based organic fungicides (e.g., copper hydroxide or copper sulfate) with caution as a last resort. Apply according to organic certification guidelines, and avoid overuse to prevent soil accumulation and toxicity.
5. Neem Oil: Organic neem oil formulations can have antifungal properties that suppress *Cercospora* when applied preventatively or early in the infection cycle.
6. Sulfur-based Products: Elemental sulfur is an organic-approved fungicide that can reduce fungal growth. Apply at lower temperatures to avoid phytotoxicity and follow product guidelines for organic farming.
7. Biological control
  - *Trichoderma* spp.: Introduce *Trichoderma* fungi, which are known to compete with and inhibit *Cercospora* fungi through mycoparasitism.
  - *Bacillus subtilis*: Applying biological control agents such as *Bacillus subtilis* can suppress *Cercospora* by competing for nutrients and space on the plant surface.



*Cercospora* leaf spot of Chilli



*Cercospora* spp. spore

# Strengthening Collaborations

## MBUST TEAM VISITS ZEST LABORATORY

*By Dr. Sabina Shrestha*



First row, Dr. Sabina Shrestha, Mrs. Sobha Basnet, Er. Saroj Basnet. Second row Dr. Kirti Kusum Joshi, Er. Padma Sundar Joshi, Mr. Bharat Khatiwada.

On December 16, the MBUST team, comprising Vice President Padma Sundar Joshi, Dr. Kirti Kusum Joshi, and Dr. Sabina Shrestha, visited the renowned ZEST Laboratory. ZEST is the first ISO/IEC 17025:2017 accredited testing laboratory for chemical, microbiological, and mechanical testing, and it is one of the leading laboratories in Nepal. Participating from ZEST were Chairman Er. Saroj Basnet, Managing Director Mrs. Sobha Basnet, and Director Mr. Bharat Khatiwada. The laboratory is known for its commitment to quality precision and authentic reporting. This visit facilitated a fruitful discussion on mutual areas of interest and potential collaborative research opportunities.

ZEST Laboratory has established itself as a leader in providing international quality services in the testing and inspection of food, pharmaceuticals, and other commodities. The meeting aimed to explore avenues for partnership that would enhance research capabilities and promote quality assurance in various sectors.

The engagement underscores the importance of collaboration between academic institutions and research organizations to drive innovation and improve product standards. We look forward to the exciting possibilities that may arise from this collaboration.

# Navigating Development Challenges

## LESSONS FROM PROFESSOR NETRA CHHETRI'S LECTURE

*By Dr. Sabina Shrestha*

On December 29, Professor Netra Chhetri from the School for the Future of Innovation in Society at Arizona State University delivered an engaging lecture on Sustainable and Resilient Development Principles and Practices (SRI-CR-501) at Chitlang. The session aimed to critically examine the concept of development, assess current standings, and propose future approaches for effective implementation.

Professor Chhetri emphasized the necessity of uncovering the reasons behind the failures of various development projects in Nepal. He encouraged participants to undertake a thorough historical analysis, advocating for a brutally honest evaluation of past initiatives to derive valuable lessons for future endeavors. A key point raised during the lecture was the importance of transparent and well-organized institutions as the backbone of successful development. Professor Chhetri argued that development efforts should not be imposed from outside but must be rooted in local contexts, ensuring that beneficiaries are actively involved in the governance process.

He highlighted the need for generating new knowledge tailored to Nepal's unique circumstances, urging stakeholders to engage beneficiaries as participants rather than mere recipients of aid. This participatory approach is crucial for fostering ownership and accountability within communities.

Additionally, Professor Chhetri stressed the importance of understanding global market dynamics and the impacts of globalization on local development. He proposed that MBUST should aspire to become a knowledge hub in South Asia, facilitating research and innovation that addresses regional challenges.

This enlightening session provided valuable insights into sustainable development practices, encouraging attendees to rethink their strategies and work collaboratively towards meaningful progress in Nepal.



# Celebrating National Mushroom Day

## MEETING WITH MUSHROOM PRODUCER ASSOCIATION NEPAL (MPAN)

*By Atmaz Kumar Shrestha, Suraj Chaudhary, Saugat RC and Srijana Dangri*

On Poush 15, 2081 (December 30, 2024), Mushroom Producer Association Nepal (MPAN) organized a vibrant event at Bhrikutimandap, Kathmandu, to celebrate National Mushroom Day 2081. The event was a grand success, attracting mushroom enthusiasts, entrepreneurs, researchers, collectors, government representatives and students across the country.

Assoc. Prof. Dr. Bhushan Shrestha of Madan Bhandari University of Science and Technology (MBUST) was invited as a Guest at the event. A special mention goes to students and intern from the mushroom lab of MBUST who attended the event. Their presence and participation underscored MBUST's commitment to advancing mushroom research and fostering a new generation of mushroom experts. The event featured an array of mushroom varieties, including mushroom Momo with millet covering, mushroom sticks, and various mushroom pickles, an exhibition of rare mushrooms such as lion's mane and morel as well as commonly cultivated mushrooms (eg., oyster mushroom, button mushroom, Shiitake mushroom etc.).

The day was filled with enlightening and exciting activities. Attendees enjoyed cultural performances, live demonstrations, and practical sessions on mushroom cultivation. Speeches delivered by the guests highlighted cultural and medicinal values of mushrooms, providing valuable insights into their significance.



*Some glimpses of the event*

The MPAN, which represents over 30,000 mushroom growers from all over the country, successfully organized the event, showcasing the importance of mushroom farming and its impact on sustainable agriculture. The event not only celebrated the diversity of mushrooms, but also promoted awareness and encouraged more people to engage in mushroom cultivation. It was an inspiring day for everyone who attended, leaving us all with a deeper appreciation for the world of mushrooms and their potential benefits.

# Guest Lecture

## INSIGHTS FROM DR. BUDDHI RATNA KHADGI

*By Saugat RC and Dr. Bhsuhan Shrestha*

We were privileged to host a guest lecture by Dr. Buddhi Ratna Khadgi, Senior Scientist (Plant Pathology, retd.) of Nepal Agricultural Research Council (NARC) and former secretary of Nepal Academy of Science and Technology (NAST), at Madan Bhandari University of Science and Technology (MBUST), Chitlang on Dec. 16, 2024. His broad expertise and experience offered crucial perspectives on mushroom farming and study. Dr. Khadgi talked about different substrates for growing mushrooms, emphasizing the advantages of paddy straw and compost made from horse and chicken waste. He also shared information about well-known mushrooms like Shiitake, which thrives on logs, and Yarsagumba, with recent initiatives by the Nepal police uncovering fraudulent farms.

The guest lecture began with investigations on Cordyceps (Yarsagumba) and Ganoderma mushrooms, concentrating on their health advantages. Dr. Khadgi emphasized the morel mushroom (Guchchi Chau), which thrives in the mountainous areas of western Nepal, and presented cutting-edge research on psychedelic mushrooms, biocomponents of lion's mane mushroom and the possible application of magic mushrooms in capsules. The function of endo-mycorrhizal fungi in pine forest ecosystems was addressed and looked into the serotonin-like characteristics of Psilocybe mushroom and its farming possibilities in Nepal. Conversations also included psychoactive mushrooms, LSD, and the historical background of psilocybin.



International viewpoints on the advantages of psilocybin were also discussed, along with creative ideas such as "Stoned Ape Theory" suggested by Terence and Dennis McKenna. The possibilities of psychedelic-assisted therapy for tackling mental health challenges in Nepal were examined, alongside the legal considerations of psychedelics and individual experiences.

At the end of the guest lecture, Dr. Bhushan Shrestha, Assoc. Prof., summarized current researches being undertaken by Ph.D. scholars Atmaz Kumar Shrestha and Suraj Chaudhary on mushroom at MBUST, suggesting Dr. Khadgi as a co-supervisor/reviewer of the work in mushroom lab of MBUST. All the students of Organic Agriculture Program and Forest Biomaterials Program attended above guest lecture.



*Some glimpses of the event*

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