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UNIVERSITY NEWS PEOPLE IN SCIENCE STUDENT SPOTLIGHT PUBLICATION SNAPSHOT
RESEARCH OUTREACH ACADEMIC ENGAGEMENTS

MBUST INSIGHTS

RESEARCH I INNOVATION I IMPACT



THE RESEARCH NEWSLETTER OF MBUST

Advancing Research, Innovation, and Impact at MBUST

Editorial Note

Welcome to the October 2026 edition of MBUST Insights. This issue highlights MBUST's growing engagement in international research, scientific innovation, and industry collaboration, reflecting the university's commitment to connecting academic knowledge with emerging societal and technological needs.

Our coverage includes MBUST's participation in the Future Universities Alliance Global Summit at Duke University, contributing a Nepali perspective to global discussions on the future of higher education. We also feature open science hardware innovation at GOSH 2026, advances in forest monitoring through LiDAR and environmental sensing in collaboration with Technical University Berlin, and new partnerships with Lumbini Herbaceuticals and Himali Superfoods to translate research on natural products into practical applications.

The growing importance of sustainable materials and green technologies also took center stage at the 6th International Conference on Advanced Materials (KαSAM-2026) [Bio/Nano]. The conference provided an international platform for scientific exchange, emerging technologies, and research collaboration.

Together, these engagements demonstrate how MBUST is building research capacity, strengthening global and industry partnerships, and advancing science-driven solutions for a sustainable future.

Editor-in-Chief
MBUST Insights

Universities worldwide are changing rapidly by advances in artificial intelligence (AI) and post-industrial socio-economic transformations offering challenges and opportunities as well. To address challenges and explore the future of higher education, education leaders and innovators gathered at Duke University in Durham, USA, for the Future Universities Alliance Global Summit, held from October 3–5, 2026. The summit brought together representatives from 49 institutions across 23 countries to exchange ideas, share experiences, and discuss innovative approaches to transforming higher education. Madan Bhandari University of Science and Technology (MBUST) represented Nepal at this international gathering, and contributed Nepali perspective to global discuss on the future of universities and higher education.

MBUST Joins Global Higher Education Summit at Duke University

-By Dinesh Raj Bhuju, PhD, and Kirti Kusum Joshi, PhD
Vice President(Academic and Research)
Director, Institute of Applied Sciences

The Future Universities Alliance is a global network that brings together leaders from startup, emerging, and established universities to accelerate innovation in learning, expand access to higher education, and exchange practical insights for improving educational quality across diverse institutional and national contexts. Initiated by Duke University, the Alliance selected MBUST from among several applicants to participate in this international initiative, providing an opportunity for the university to engage with a diverse community of institutions committed to reimagining higher education.

For the inaugural Innovation Sandbox program, a shared, cohort-based experience, MBUST is placed in Pod 6 (Applied STEM, Sustainability and Problem-Driven Learning) along with Plaksha University (India), Zamorano University (Honduras), and Harper Adams University (UK), under Pathway 2 (New Initiatives and Structural Transformation). Through the Innovation Sandbox, MBUST proposes to develop and test a Problem-Driven Research and Learning Ecosystem (PULSE) model that structurally embeds interdisciplinary collaboration and real-world problem solving within the university's academic model. The initiative will prototype a set of institutional mechanisms that connect research, teaching, and external engagement.



The Future Universities Alliance summit focused on several interconnected objectives. These included fostering reciprocal learning among universities at different stages of development; addressing systemic challenges such as work-connected credentials, credit transfer across learning environments, evolving faculty roles, and institutional financial and structural sustainability; and strengthening connections among innovation initiatives through collaborative networks and shared knowledge resources, including the Innovation Sandbox and Knowledge Commons. The gathering also provided an opportunity for participants in the year-long Innovation Sandbox program to reflect on their experiences, exchange insights from ongoing pilot projects, and explore new approaches to university design.

All photographs on this page: D. Bhuju

A central message emerging from the summit was that no university and no country can fully understand or respond to the rapidly changing higher education landscape in isolation. Technological advancements, demographic changes, economic restructuring, political developments, and shifting societal expectations are collectively transforming the role, structure, and purpose of universities. Addressing these changes requires institutions to move beyond isolated initiatives and embrace collaboration, shared learning, and cross-border partnerships.

Discussions and interactions throughout the summit highlighted a growing recognition that the future of higher education will depend on universities' ability to learn from one another, build meaningful networks, and translate innovative ideas into broader institutional and societal impact. By bringing together institutions with diverse experiences, capacities, and perspectives, the Future Universities Alliance seeks to advance a collective effort to strengthen, renew, and make higher education more responsive to the needs of a changing world.

MBUST's participation in the Summit provided an opportunity to connect with the international higher education community, exchange perspectives on emerging models of higher education, and contribute to global conversations on the universities of the future. The engagement highlighted the importance of international collaboration in exploring pathways towards innovative, relevant, and sustainable higher education in Nepal and beyond. The Summit offered valuable insights into the challenges and opportunities facing new universities and reinforced the need to rethink how we teach, learn, research, and innovate.



Professor Dinesh Bhuju, Vice President- Academic and Research and Executive Sponsor of the Project, and Dr Kirti Kusum Joshi, Director of Institute of Applied Sciences and Project Lead, participated in the Future Universities Alliance summit. The PULSE project team also includes Dr Anupama Shrestha, Assistant Professor and Coordinator of Organic Agriculture Program.

One of the models briefly shared during the meeting was MBUST's distinctive "One Student, One Research Project" approach. Under this model, every student undertakes an individual research project from day one, engaging with real-world problems, learning through research, and working towards solutions that matter. Interestingly, this concept became a talking point among participants. One participant described it as "such a compelling vision for real-world impact."

It was encouraging to see MBUST's educational philosophy resonate with the international community. Heartfelt appreciation to the MBUST faculty members whose creativity and commitment have shaped this distinctive educational model and brought it to life.

All photographs on this page: D.Bhuju

Graduate Student Spotlight

Nilkantha Regmi is a graduate student in the SRI programme at Madan Bhandari University of Science and Technology (MBUST), with an academic background in Civil Engineering from Pokhara University.

At the Computational Lab, he uses numerical modelling, including Finite and Applied Element Methods, to study how door and window size and placement affect the earthquake performance of traditional stone masonry buildings built with mud mortar. His research identifies vulnerabilities and aims to guide designs that balance seismic safety, thermal comfort, daylight, and traditional character.

Research Interests: Earthquake behavior of structures, Numerical modelling, Design optimization, Low-cost computational techniques, Heritage-sensitive rural tourism



His masonry research began with a practical question: why prioritize structural frames over masonry infill? This led him to confined masonry and MBUST, introduced by his brother, Rupesh Aryal, and Pawan Karki. Although he initially proposed studying confined masonry, Dr Kishor Timsina encouraged him to research traditional stone masonry with mud mortar. He welcomed the shift, recognizing these local materials' historical value and sustainability. Working with Dr. Timsina, an Applied Element Method expert, and MBUST's vision of a prosperous, just Nepal further attracted him.

Nilkantha Regmi

MAS in Sustainable and Resilient Infrastructure (SRI)

Computational Laboratory

Supervisor: Kishor Timsina, PhD

During graduate studies, Nilkantha advanced computational modelling and structural analysis. He calibrated a stone masonry wall model with mud mortar using wallette tests for cyclic and compressive behavior, then assessed how opening size and position affect walls. He prepared a manuscript comparing opening geometry's effect on wall stiffness with the Nepal Building Code (NBC 203), reviewed mud-mortar stone masonry performance against the Sustainable Development Goals (SDGs), presented at the 2025 7th Mountains in a Changing World (Mo.Ch.Wo) and 2026 9th Asia Conference on Earthquake Engineering (9ACEE), and joined the 5th International Joint Student Seminar in Thailand.

His research addresses a practical challenge in rural Nepal: as tourism buildings and homestays grow more popular, owners enlarge windows and doors for views, light, and ventilation, often overlooking earthquake risks. The research will guide opening size and placement so engineers, builders, and homeowners can make informed choices. Findings could strengthen building codes, improve safety and comfort, preserve traditional architecture, build community resilience, protect livelihoods, and promote sustainable tourism.

Nilkantha hopes to continue researching at an institution like MBUST, strengthen his skills, and pursue a PhD. Long-term, he aims to improve Nepal's building codes and promote sustainable, earthquake-resilient construction, especially for traditional stone and mud buildings.

Advice for future MBUST students

Start with a problem in your community, document each step, and seek help early. Computational work is interesting, not as hard or easy as it may seem, so explore it. You can help build the sustainable, resilient infrastructure Nepal needs for a just and prosperous future.

All photographs on this page: N. Regmi



Photo1: MOU between MBUST and Himali Superfoods Pvt. Ltd

On October 14, 2026, there were two separate MOUs with natural product-based private companies, Lumbini Herbaceuticals and Himali Superfoods. Prof Dr Rajendra Dhoj Joshi, President of MBUST, signed the document at the Center for Energy Studies, Pulchowk Campus, Pulchowk, and suggested a deep tie with industries for turning University work into sustainable consumer products for economic development.



Photo 2: MOU between MBUST and Lumbini Herbaceutical Pvt. Ltd.

Dr Dhruba Bhattarai, Chairman of Lumbini Herbaceuticals Pvt. Ltd., expressed keen interest in the initiative of the innovative work (Photo 2). Dr Shankar Khatiwada, Member of Himali Superfoods Pvt. Ltd., proposed several potential areas of applied scientific work that could be objectified as tradable commodities (Photo 1). Both companies seemed to be eager for mutually beneficial collaborative work with MBUST. The selection of research themes and details of the work are planned for the upcoming meeting.

MOU of MBUST with Lumbini Herbaceuticals and Himali Superfoods

-By Jhashanath Adhikari Subin, PhD
Assistant Professor
Forest Biomaterials Science and Engineering

All photographs on this page: J.A. Subin

The gathering for Open Science Hardware (GOSH 2026) was held in Kathmandu, Nepal, from October 4–6, 2026, bringing together scholars, scientists, researchers, entrepreneurs, engineers, makers, and technology enthusiasts from around the world to share knowledge, experiences, and innovations in open-source hardware.

The three-day international conference focused on promoting the importance of open-source hardware in advancing accessible, affordable, and collaborative scientific research and technological innovation. The program featured parallel sessions, hands-on workshops, unconferencing, technology demonstrations, and interactive discussions.

Dr Ritu Raj Lamsal Delivers a Talk at GOSH 2026 International Conference

-By Ritu Raj Lamsal, PhD, FIE, SMIEEE
Assistant Professor, Digital Technology

Dr Ritu Raj Lamsal delivered a talk on"Why Open-Source Hardware Matters in a Developing Country Like Nepal." His talk highlighted how open-source hardware can foster local innovation, affordable solutions, research capacity, and technological self-reliance in developing countries such as Nepal. Potential uses include education, agriculture, environmental monitoring, and community development. The three-day international conference promoted open-source hardware for accessible, affordable, collaborative research and innovation, featuring parallel sessions, workshops, unconferencing, demonstrations, and discussions. The article is available at the conference.







All photographs on this page: R.R. Lamsal

Advancing Forest Monitoring and Research at MBUST

German Academic Supports Forest Monitoring and LiDAR Research at MBUST

- By Manushi Sigdel and Sudip Pandey, PhD
MAS student, FBMSE Program
Asst. Prof., FBMSE Program

Assistant Professor Dr Robert Jackisch of the Technical University Berlin, Germany, visited Madan Bhandari University of Science and Technology (MBUST) to contribute to forest data collection and the installation of monitoring equipment at the university's permanent forest plot.

His visit brought together faculty and students of the Forest Biomaterials Science and Engineering (FBMSE) program for field activities involving LiDAR technology, environmental data loggers, and a phenocam. With expertise in LiDAR and hyperspectral imaging, Dr Jackisch worked with the MBUST team to collect three-dimensional data on trees and forest structure. The team also installed data loggers to monitor soil conditions and humidity, along with a phenocam to capture repeated images of vegetation and document seasonal changes over time.

Dr Sudip Pandey, Assistant Professor in the FBMSE program, and FBMSE students participated in the field activities, with Mr Pradip Zimba serving as the forest guide. The visit provided practical learning opportunities for students and established a foundation for long-term forest monitoring and research. The collected LiDAR data and observations from the newly installed equipment will support future investigations into forest structure and environmental conditions, subject to further data processing and analysis. Follow-up activities include soil pH and humidity measurements, with research findings to be reported as the monitoring programme progresses.







All photographs on this page: M. Sigdel & S. Pandey

Exploring New Frontiers in Advanced Biomaterials: MBUST at KαSAM-2026

Connecting scientific research with sustainable materials innovation

- By Binita Silwal & Sadikshya Chaulagain
MAS students, FBMSE Program

The growing importance of sustainable materials and green technologies took center stage as the 6th International Conference on Advanced Materials (KαSAM-2026) [Bio/Nano] brought together scientists, researchers, academicians, and industry professionals from around the world in kathm--andu. The four-day international conference, held from October 28 to 31, 2026, provided an important platform for sharing scientific knowledge, exploring emerging technologies, and strengthening international research collaboration.



Organized jointly organized by the Nepal Polymer Institute (NPI) and Tribhuvan University's Pashchimanchal Campus in Pokhara, the conference theme was "Cross-Linking Science, Innovation, and Virtues: Science for a Sustainable Future." It explored advances in materials, nanotechnology, bionanomaterials, green technology, the circular economy, and computational materials science.

The conference fostered international scientific exchange and interdisciplinary collaboration across smart and functional materials, materials design and structure-property relationships, bionanomaterials, tissue engineering, green technology, the circular economy, computational simulation, and sustainable materials development.





MBUST's Forest Biomaterials Science and Engineering program (FBMSE), represented by master's students Binita Silwal and Sadikshya Chaulagain, laboratory PI Dr Saurabha Bhattarai, and Dr Kishor Timsina, attended and contributed to KαSAM-2026's scientific program.

On October 29, Binita Silwal and Sadikshya Chaulagain presented research on sustainable, cost-effective bamboo and wood treatments that improve durability and promote renewable resource use.

Dr Saurabha Bhattarai led the October 30 round-table discussion, "Bamboo: Bridging Traditions with Advanced Materials," exploring bamboo's potential as an advanced biomaterial for bio-composites, sustainable engineering, and value-added applications. Panelist Dr Kishor Timsina highlighted bamboo's potential as a sustainable structural material, calling for building codes, design guidelines, standardization, and quality assurance to support its mainstream use. He emphasized research and innovation to improve bamboo's performance and durability, expand its use in modern construction, and establish it as a reliable alternative in Nepal's infrastructure sector.

All photographs on this page: B. Silwal & S. Chaulagian

Recognizing Research Excellence and Academic Achievement



Adding to the conference's achievements, Binita Silwal received the “Best Oral Presentation Award” in recognition of her research contribution and presentation. The award highlights her engagement in sustainable materials research and her contribution to advancing forest biomaterials.

Reflecting on her experience, Binita Silwal shared:

"It was a great privilege to be part of this conference. It provided an excellent opportunity to build research networks, gain new insights, exchange scientific ideas, and learn about emerging advancements and technologies in advanced biomaterials. Such interactions are valuable for strengthening research collaborations and exploring new possibilities in sustainable materials development."





All photographs on this page: B. Silwal & S. Chaulagian

From Chitlang to the World

MBUST Researchers at MSV2026

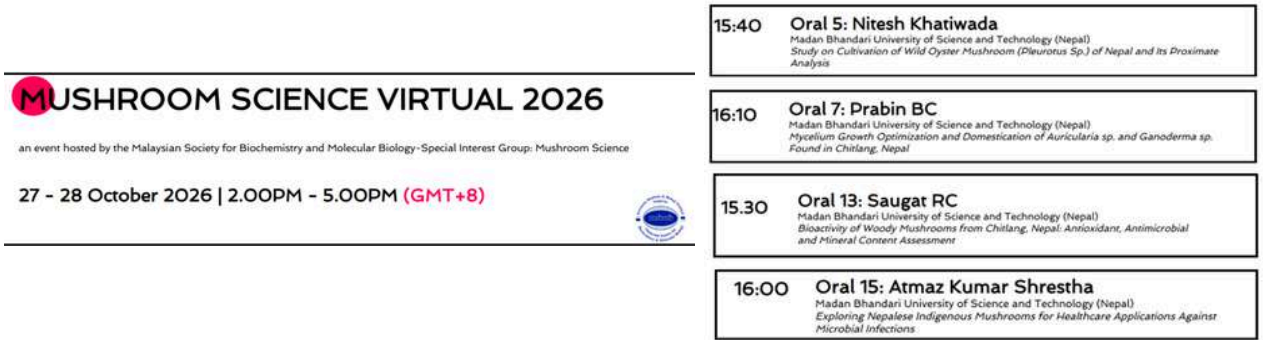
-By Saugat R.C.
Graduate Research Student
MAS student in the Organic Agriculture Program

Four graduate research students from the Mushroom Laboratory of Madan Bhandari University of Science and Technology participated in Mushroom Science Virtual 2026 (MSV2026), an event hosted by the Malaysian Society for Biochemistry and Molecular Biology-Special Interest Group: Mushroom Science on 27–28 October 2026, and presented their research findings to the international community of mushroom scientists.

As one of the presenters, I had the opportunity to share my research, “Bioactivity of Woody Mushrooms from Chitlang, Nepal: Antioxidant, Antimicrobial, and Mineral Content Assessment.”

The symposium offered a unique opportunity to showcase research on Nepal's fungal diversity, exchange scientific ideas, and learn about emerging developments in mushroom science. It was a rewarding experience to represent MBUST and contribute to an international platform for scientific exchange.

We sincerely appreciate kind support and guidance from Prof. Fung Shin Yee, Dr. Kong Boon Hong and the MSV2026 Organising Committee for providing us this valuable platform for scientific exchange, and MBUST and the Mushroom Laboratory for their continued support in advancing our research.





All photographs on this page: Mushroom Science Virtual 2026

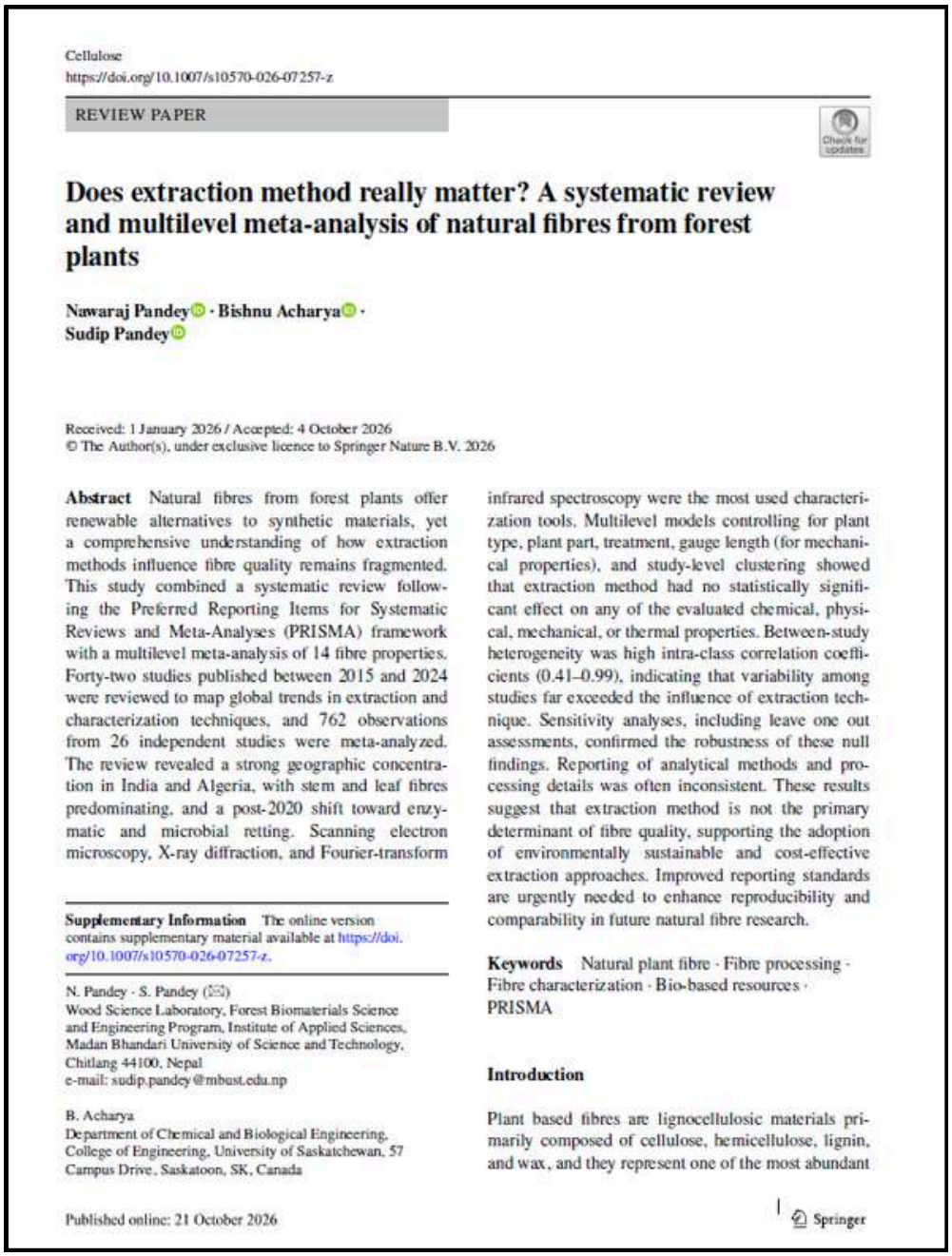
Publications

Research/Review Title: "Does extraction method really matter? A systematic review and multilevel meta-analysis of natural fibres from forest plants"

Author: "Nawaraj Pandey, Bishnu Acharya, Sudip Pandey"

Journal: "Cellulose"

DOI: "https://doi.org/10.1007/s10570-026-07257-z"



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REVIEW PAPER

Does extraction method really matter? A systematic review and multilevel meta-analysis of natural fibres from forest plants

Nawaraj Pandey · Bishnu Acharya · Sudip Pandey

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Abstract Natural fibres from forest plants offer renewable alternatives to synthetic materials, yet a comprehensive understanding of how extraction methods influence fibre quality remains fragmented. This study combined a systematic review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework with a multilevel meta-analysis of 14 fibre properties. Forty-two studies published between 2015 and 2024 were reviewed to map global trends in extraction and characterization techniques, and 762 observations from 26 independent studies were meta-analyzed. The review revealed a strong geographic concentration in India and Algeria, with stem and leaf fibres predominating, and a post-2020 shift toward enzymatic and microbial retting. Scanning electron microscopy, X-ray diffraction, and Fourier-transform infrared spectroscopy were the most used characterization tools. Multilevel models controlling for plant type, plant part, treatment, gauge length (for mechanical properties), and study-level clustering showed that extraction method had no statistically significant effect on any of the evaluated chemical, physical, mechanical, or thermal properties. Between-study heterogeneity was high intra-class correlation coefficients (0.41–0.99), indicating that variability among studies far exceeded the influence of extraction technique. Sensitivity analyses, including leave one out assessments, confirmed the robustness of these null findings. Reporting of analytical methods and processing details was often inconsistent. These results suggest that extraction method is not the primary determinant of fibre quality, supporting the adoption of environmentally sustainable and cost-effective extraction approaches. Improved reporting standards are urgently needed to enhance reproducibility and comparability in future natural fibre research.

Keywords Natural plant fibre · Fibre processing · Fibre characterization · Bio-based resources · PRISMA

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10570-026-07257-z.

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Introduction

Plant based fibres are lignocellulosic materials primarily composed of cellulose, hemicellulose, lignin, and wax, and they represent one of the most abundant

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- Biodiversity Conservation and Natural Resources Management
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