



**INTERNATIONAL CONFERENCE
ON
SCIENCE, SOCIETY AND SUSTAINABILITY**
*Integrating Scientific Innovation with
Societal well-being for a sustainable future*

25th to 27th October 2025

Powered By



ABSTRACT



Organised By

**HORIZON – Science Forum, and IQAC
Mariani College, Jorhat, Assam (India)**

DIAMOND JUBILEE CELEBRATION YEAR : 2025



In association with
**Nepal Aquaculture Society, Nepal &
Women in Science & Humanity, Nepal**



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International Conference on
Science, Society & Sustainability

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Prof. Jiten Hazarika, M.Sc., Ph.D., PGDOR

Vice-Chancellor



MESSAGE

It is an immense pleasure for me to extend my greetings to all participants of the International Conference on Science, Society and Sustainability, organized by Mariani College, in association with Nepal Aquaculture Society (NAS), Kathmandu and Women in Science and Humanity (WISH), Nepal, on the theme "Integrating Scientific Innovation with Societal Well-Being for a Sustainable Future." This conference is a commitment to fostering a dynamic dialogue between science and society in pursuit of sustainable development. The theme of this conference resonates deeply with the mission of imparting inclusive, value-based and quality education. By integrating scientific innovation with social responsibility, the conference not only provides a platform for researchers, educators and students to share ideas and discoveries, but also encourages a collective commitment to shaping a sustainable and equitable future. Science and technology are key drivers of progress, but their true value emerges only when aligned with societal needs and ethical considerations. Conferences like this encourage a holistic understanding of the interconnections between scientific research, human welfare, environmental stewardship and sustainable growth. By facilitating interdisciplinary discussions, they help bridge the gap between theoretical knowledge and practical implementation, inspiring new solutions to pressing global issues of today's world like climate change, resource depletion, inequality, public health etc.

I congratulate the organizers, participants and contributors to this conference for their dedication and scholarly engagement. The publication of this Abstract Book is a reflection of the intellectual spirit and collaborative effort that define the organizers. May this initiative inspire continued inquiry, innovation and cooperation for the betterment of society and the environment.

A handwritten signature in blue ink, appearing to read "Jiten Hazarika".

(Jiten Hazarika)

Dated Dibrugarh, the 16th October, 2025



ASSAM UNIVERSITY

(A Central University)

SILCHAR-788011, ASSAM, INDIA

E-mail:supriyo_chakraborty_2008@rediffmail.com

Supriyo Chakraborty, Ph.D.

Professor

Date : 14 October 2025

MESSAGE



It is a great pleasure for me to learn that Mariani College is going to organize an International Conference on Science, Society and Sustainability (ICSS 2025) on 25-27 October 2025. The sub-themes of the conference spanning from eco-friendly fish production to water management, biodiversity conservation to nutrition and food security, indigenous knowledge to sustainability speak of the diversity of the topics that will be presented and discussed by the participants in the conference. I am sure that the conference will foster scientific curiosity among the students, participants and future researchers. Active research is the bed-rock of continued development in any society. No society in present day world can survive without the inputs of policy making decisions arising out of such conferences. I sincerely thank the organizers for holding such a great conference in the rural vicinity of Mariani town surrounded on all sides by tea gardens for the greater benefit of the society. I wish a grand success for the international conference going to be hosted in Mariani College.

(Supriyo Chakraborty)

Professor



Rupjyoti Kurmi
MLA
101 No Mariani LAC

ADDRESS
Old MLA Hostel
House No. C-1, Block - C
Guwahati, Dispur, Assam
Mob : 9435092981

MESSAGE



It is with great pleasure that I welcome all the distinguished delegates, researchers, academicians, and participants to the International Seminar on "Science, Society and Sustainability: Integrating Scientific Innovation with Societal Well-being for a Sustainable Future", organized by Mariani College from 25th to 27th October 2025.

In an era marked by rapid scientific advancement and pressing global challenges, the interconnection between science, society, and sustainability has become more vital than ever. This seminar provides a dynamic platform for scholars and innovators from diverse disciplines to share ideas, present research findings, and explore pathways that harmonize technological progress with human and environmental well-being.

We are honored to host such an esteemed gathering that embodies the spirit of collaboration and knowledge exchange. It is our hope that the discussions and deliberations held during these three days will inspire meaningful action and pave the way for a more sustainable and equitable future.

On behalf of the organizing committee, I extend my heartfelt thanks to all our participants, collaborators, and supporting institutions for their invaluable contributions to making this event possible.

With regards

Rupjyoti Kurmi

Dr. Ashok Borthakur, Ph.D.

President
Governing Body, Mariani College
(Retd. Professor, J.B. College, Jorhat)

MESSAGE



It is excellent news that, Mariani College in partnership with Nepal Aquaculture society is organizing an International Conference on Science, Society and Sustainability. I believe that the three day agenda will facilitate comprehensive discussion and the sharing of essential research making it a highly valuable event for all the attendees.

I wish a grand success of the event.

With regards,

Dr. Ashok Borthakur
President
Governing Body
Mariani College





OFFICE OF THE PRINCIPAL
MARIANI COLLEGE
Mariani, Jorhat, Assam (India)

Dr. Horen Goowalla
Principal

MESSAGE



As we prepare to publish the Abstract Volume of the ICSS 2025 – International Conference on 'Science, Society, and Sustainability: Integrating Scientific Innovation with Societal Well-being for a Sustainable Future' - I take great pride and pleasure, in my capacity as the Principal of Mariani College and Chairperson of the Seminar Organizing Committee, to share a few words on this upcoming event scheduled from 25 – 27 October, 2025.

The theme of this conference reflects our commitment to inclusive, value-based, and quality education. By linking scientific innovation with social responsibility, it creates a platform for researchers, educators, and students to share knowledge and inspire collective action for a sustainable future. True progress in science and technology comes when it serves ethical and societal needs. Through interdisciplinary dialogue, the conference bridges theory and practice, fostering solutions to global challenges such as climate change, inequality, and public health. The International Seminar aims to enhance understanding of key issues and promote the development of constructive, practical solutions to address them.

I am thankful to all the participants from the different parts of the world for sharing their dimensions to the principal issue.

With regards,

Dr. Horen Goowalla
Principal

From the Desk of Organizing Secretary, ICSS 2025

Dr. Bhaskar Buragohain

M.Sc., B.Ed., M.Phil., Ph.D.

Department of Botany

Mariani College

Mariani, Jorhat, Assam (India)



Science Forum (Horizon) and IQAC, Mariani College, Mariani, Jorhat, Assam (India) organizing an International Seminar on 'Science, Society and Sustainability' to be held from 25th to 27th October 2025. Science Forum was established in the year 2019 by the faculty and non-teaching staff of the Science Stream of Mariani College with their monthly contribution and student participation for the welfare of the Science stream, student welfare, and celebration and observation of various National and International days and programmes. This forum promotes scientific awareness in the student community as well as in society. After the inception of "Horizon", this is the first attempt to organize this International Conference on Science, Society, and Sustainability with a theme that is very much relevant to the present World Scenario. We believe that through this Conference, a strong network can be built between Academia, Researchers, Students, Entrepreneurs, and Social groups, etc., for the betterment of Society, Environment, and the World. We are also looking forward to the conference will come out with distinct action plans and resolutions to resolve the critical issues that exist between development and sustainability.

We sincerely offer our gratitude to each and everyone who has participated directly or indirectly in the massive success of the conference.

With best regards,

Dr. Bhaskar Buragohain

Organising Secretary

ICSS 2025

From the Desk of Convenor, ICSS 2025

Dr. Hamen Saikia

Department of Zoology
Mariani College
Mariani, Jorhat, Assam (India)



It gives me great pleasure to welcome all distinguished delegates, researchers, academicians, and participants to the International Seminar on ***“Science, Society, and Sustainability : Integrating Scientific Innovation with Societal Well-being for a Sustainable Future.”***

This seminar serves as a collaborative platform for exchanging knowledge and ideas that connect scientific advancement with the pressing social and environmental concerns of our time. By fostering dialogue among diverse disciplines, the event aspires to promote innovation that is not only progressive but also ethical, inclusive, and sustainable.

I am confident that the discussions, research presentations, and interactions during this seminar will lead to meaningful insights and practical outcomes that contribute to building a more responsible and sustainable future.

On behalf of the organizing committee, I extend my heartfelt gratitude to all participants and partner organizations for their valuable contributions and enthusiastic support in making this event a success.

Dr. Hamen Saikia
Convenor
ICSS 2025

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INVITED LECTURES

THE STORY OF OUR NATIONAL AQUATIC ANIMAL – GANGETIC DOLPHIN

Prof. S.P. Biswas

Department of Life Sciences
Dibrugarh University, Assam -786 004
Corresponding author : spbsdu@dibr.ac.in

INTRODUCTION :

The Gangetic dolphin, scientifically known as *Platanista gangetica gangetica* (Roxburgh, 1801), is the national aquatic animal of India and a keystone species in the river ecosystem. Historically, the Gangetic dolphin was recorded throughout the entire Ganga-Brahmaputra-Meghna (GBM) basin, including many remote areas in northeastern India. The species has been classified as Endangered on the IUCN Red List of Threatened Species since 1996, primarily due to a declining population across its distribution range. It was declared India's national aquatic animal in 2009, and in 2010, the Indian government approved a National Dolphin Action Plan to protect this critically endangered freshwater mammal and the species is afforded the highest level of protection under the 1972 Indian Wildlife Protection Act. Additionally, October 24th is celebrated as International Dolphin Day. Due to its crucial role in maintaining freshwater ecosystems, the Gangetic dolphin is becoming a symbol or ambassador for riverine systems, much like the tiger in forest ecosystems; thus, it is also recognized as a flagship species for river systems.

The term ‘**dolphin**’ originates from the Greek word ‘*delphis*,’ meaning ‘with a womb.’ Despite their fish-like appearance, dolphins are not fish; they are aquatic mammals closely related to whales and porpoises. Of the roughly 40 species of dolphins found worldwide, only four are confined to freshwater habitats, one of which is the Gangetic dolphin (*Platanista gangetica gangetica*) in the Ganga-Meghna-Brahmaputra river systems. Much folklore surrounds this river dolphin. In Assam, it is known by various names such as sihu, petukari, nasubi, susuk, and foo-machh.

About the habit and habitats of Gangetic dolphin :

The Gangetic dolphin has a long, pointed beak known as a rostrum, with studded teeth and a small triangular hump instead of a dorsal fin. Its flippers and

flukes are broad, and males are generally smaller than females. Gangetic dolphins are virtually blind and use echolocation to locate prey and communicate with one another. During echolocation, they emit sounds at frequencies of 40-50 kHz, sometimes reaching as high as 380 kHz. By listening to the echoes of these sounds, dolphins can estimate the distance and nature of objects, allowing them to "see" their environment through sound. The scientists are currently working to decode the meanings of the various sounds made by dolphins during their communication with one another.

Dolphins are primarily piscivorous, although invertebrates such as prawns and clams have also been found in their stomachs. Their preferred habitats are river confluences, where counter currents disorient fish, making hunting easier. Other favored environments include river meanders, deep pools, and areas around sandbars. Dolphins are excellent swimmers, capable of moving at speeds of 15-20 km/hr, even against current velocities of 0.5-0.7 m/sec. They prefer relatively slow currents of 0.2-0.3 m/sec, a sandy substrate, and a water depth of about 3 m.

In a river system, dolphins may be found alone or in groups while foraging in their feeding grounds. The gestation period for dolphins is approximately 9 months, and females typically give birth to one calf at a time, usually between April and September. The new born baby is dark grey in contrast to pale colour of the adults. Mother dolphins exhibit a high degree of parental care and nurse their calves with milk. Nursing mothers closely stay with their calves and can become aggressive if their young are disturbed continuously.

Major dolphin habitats and threats in northeast India :

The Gangetic dolphin, once abundant in the twin valleys of Assam, now faces a highly fragmented population due to both man-made and natural causes. This species enjoys a protection status equivalent to that of a tiger, but factors such as poor awareness, habitat loss, and an inadequate prey base are driving them toward extinction. During the 1960s and 1970s, dolphins were frequently sighted throughout the plains of the Brahmaputra basin, from Parsuram Kund in Arunachal Pradesh to Gualando in Bangladesh and beyond. They are usually spotted in river confluences, including those of the Dikrong, Ranga, and Kathakhal rivers.

This endangered species, once abundant throughout its range, now suffers from a fragmented population due to both man-made and natural factors. Although dolphins enjoy protection status equal to that of tigers, challenges such as poor awareness, habitat loss, and inadequate prey availability are driving them toward extinction. In some areas of the Upper Brahmaputra basin, dolphin meat is occasionally consumed, and their body oil is traditionally used as fish bait and for various

ailments. A particularly worrying situation exists in the Barak River of southern Assam, where no dolphins have been sighted in winter in the specified deep pools since 2015. There may be 500 to 600 dolphins in neighboring Bangladesh, Nepal, and Bhutan, all part of the GBM basin; however, the Gangetic dolphin has not been observed in Bhutan since 2015.

Once plentiful, this species has been decimated by overhunting for its oil, habitat degradation, and shrinkage, and is now localized in certain pockets of the Brahmaputra and Barak Valleys of Assam. The gradual decline of the Gangetic dolphin is due to various natural and human-induced factors. A major cause was intentional killings of dolphins for their oil. Some communities traditionally use dolphin meat or oil for healing burns and treating various ailments. Additionally, dolphin oil has been used for catching catfish, particularly *Clarias garua*.

At present the Gangetic dolphin is restricted to only certain pockets of the Brahmaputra basin and virtually no dolphin has been reported from the Barak in southern Assam since 2014. The impact of river embankments and barrages on aquatic biodiversity is a serious concern. Dolphins are the hardest hit because of the regulation of the river. Research conducted over the last 30 years has enriched our understanding of the ecobiology and threats faced by these endangered cetaceans; however, significant knowledge gaps remain critical for their conservation.

A significant factor in the decline of river dolphins in Assam is the lack of awareness about these animals. Many locals mistakenly view dolphins as fish; in the Barak basin, they are called 'Foo Machh,' meaning "fish that produces a hissing sound." While fishermen are often indifferent, ferry passengers enjoy watching them. In a notable incident in 1985-86, over 50 dolphins were killed for their oil near Narain Dahr, close to the Assam-Manipur border. Although the dolphin is revered by most people in Assam, its meat is occasionally consumed in certain areas of the state.

Revival of Gangetic dolphins in N.E. India :

River dolphins prefer deep water and particularly favour counter-current pools of eddies, which provide refuge from the swift current of the river. Fish being the primary food of the river dolphin, it is assumed that adequate water cover (depth) and prey base (fish food) are the two most important factors for the existence of the dolphin. Maintenance of the free flow of water and sediment discharges is a necessity for the aquatic biodiversity. The river embankments should not be hurdles for water recharging and autostocking of thousands of open beels scattered across the twin valleys of Assam. Implementation of the existing fisheries, environment, and forest acts in letter and spirit is a must to protect the dolphins in our river.

EDUCATION IN LEADERSHIP : Empowering Communities through Transformative Learning

Dr. Rita Kakati-Shah
President, Uma Global, USA



In an era defined by rapid technological shifts, social transitions, and global sustainability challenges, education in leadership stands as a cornerstone for building resilient, equitable, and forward-thinking societies. Leadership education is not confined to positional authority - it is the cultivation of vision, empathy, and adaptability among individuals who can inspire collective progress. Rooted in the values of inclusivity, collaboration, and ethical responsibility, leadership development in education empowers students to become agents of change within their communities and beyond.

In Assam, where academic institutions such as Mariani College continue to champion accessible and value-based education, the integration of leadership principles into learning frameworks reflects the broader mission of nurturing human potential. This approach aligns with the United Nations Sustainable Development Goals (SDGs), particularly Goal 4: Quality Education and Goal 8 : Decent Work and Economic Growth, by preparing youth with the mindset and competencies to navigate complex global landscapes while remaining anchored in local identity and culture.

Through cross-disciplinary collaboration, mentorship, and experiential learning, leadership education fosters creativity, critical thinking, and emotional intelligence-skills vital for addressing societal and environmental challenges. Programs such as the Uma Global Leadership Development initiative exemplify how global partnerships can strengthen leadership pipelines in regions like Assam by connecting students with international mentors fostering cross-cultural understanding, and curbing brain drain through community engagement and sustainable innovation.

This lecture explores how leadership education can transform both individuals and institutions, highlighting models that blend academic learning with civic responsibility. It underscores the importance of empowering young minds—especially from rural and underrepresented backgrounds—to lead with confidence, compassion, and purpose. By investing in leadership as an educational philosophy, we not only build capable professionals but also nurture global citizens committed to advancing knowledge, sustainability, and social harmony.

MICROBIAL DIVERSITY, REPROGRAMMING AND SUSTAINABLE DEVELOPMENT

Dr. Pranaba Nanda Bhattacharyya

Department of Botany

Nanda Nath Saikia College, Titabar 785630, Jorhat, Assam, India

Significance of Microbial Diversity and Reprogramming :

Diversity is defined as the variety of markedly distinct creatures and their relative abundance within a natural collection. Biological diversity is an essential element of life on Earth, fostering intricate ecosystems that humans could never replicate. It can therefore be described as the diversity of species within an environment, in relation to their genetic makeup, reflecting the extent of variation among living forms within a specific ecosystem, biome, or the entire globe (Bhattacharyya 2012).

The microbial world is recognized as the most unexplored reservoir of biodiversity on Earth, rendering research in microbial ecology a significant frontier in contemporary biological science. Until the previous century, the nature and identity of merely a tiny portion (less than 10%) of this microscopic world remained unexplored. Consequently, microbes exhibit significantly greater diversity in both their life forms and distribution than hitherto imagined.

Microbial diversity refers to the various types of microorganisms and their relative abundance within a specific community or natural habitat. When analysing the complete microbial communities within an ecosystem, inquiries typically emerge regarding the population sizes of these communities and their potential activities, despite our nascent understanding of the extensive microbial diversity that exists. The latest estimate indicates that merely around 5% of fungal species and approximately 0.1% of total bacterial populations are recognized, with only a small subset having been analysed for their metabolic profiles. Data is

currently being generated on microbial distributions in the cold Arctic and Antarctic regions, the heat of geysers, oceanic hydrothermal vents, and deep within rocks, so establishing microorganisms as the omnipresent custodians of Earth. A comprehensive array of microbial metabolic pathways is essential for ensuring conservation of global genetic resources, as well as for comprehending microbial ecology in soil (Bhattacharyya and Jha 2012). For millennia, diverse microbial species have yielded important biological materials including the antibiotics, drugs, enzymes, fertilizers, herbicides and other growth promoters, etc. The study of microbial diversity is also important to solve new and emerging pathological problems in plants (Bhattacharyya and Sarmah 2018) and animals, thus, assists to support in reprogramming modern biotechnology. Interest in exploration of global microbial diversity has been heightened due to the critical roles of microbes in diverse ecosystem, as they perform numerous vital ecological functions essential for the biosphere, including the maintenance of biogeochemical cycles and nutrient dissemination.

Despite the acknowledged value of microbes, our knowledge of their diversity and many of their key roles in sustaining global life support systems is still very scarce. Exploration, evaluation and utilization of microbial diversity are essential for scientific, industrial and social development. In North-east India, it is even more relevant to explore the hitherto-unexplored microbial resources due to their integral significance in advancing human interests (Bhattacharyya et al. 2011). Besides, prospectives of microorganisms in biogeochemical cycling and nutrient allocations, their extensive role in the decomposition of organic matter, degradation of xenobiotic compounds and plant nutrient accessibility under changing climate scenario can never be ignored. Therefore, continued research is needed to describe and protect the unexplored microbial resources in pristine locations for the preservation of natural ecosystems and future sustainability. For instances, microbes are consecutively influenced by various crop management patterns or land use intensifications (Bhattacharyya et al 2024a). Thus, identifying the factors that affect significantly on microbial diversity and distribution needs to be worked out for proper implementation of microbial conservation strategies. Exploration, evaluation and conservation of microbial diversity are thus, essential for developing proper scientific measures and sustainability in soil, plant and ecosystem. Figure 1 depicts the role of precision agriculture in climate mitigation, where, microbes play integral role to offer a sustainability towards climate mitigation, resulting more sustainable and resilient food systems.

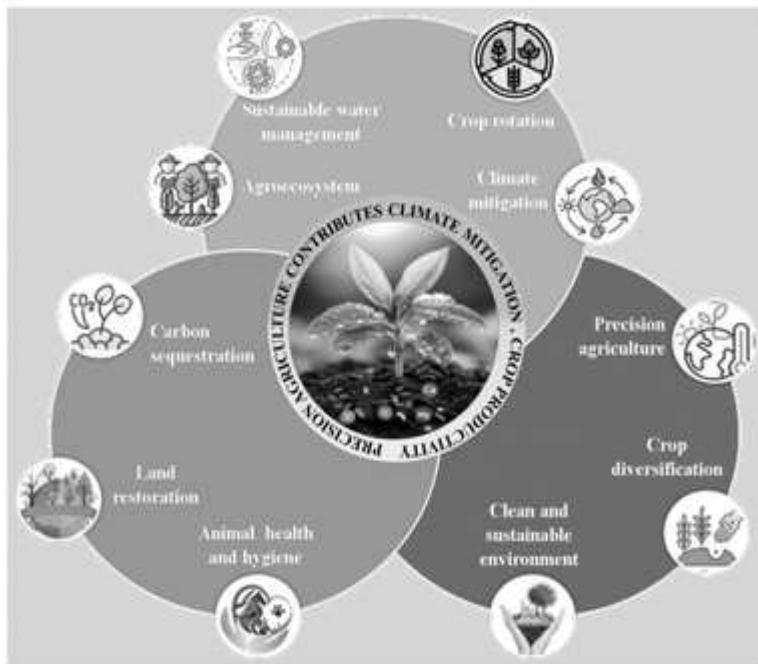


Fig. 1: Microbe-integrated precision agriculture for enhanced sustainability

Several aspects of exploring hitherto-unexplored microbial diversity, and advancing environmental sustainability through microbial reprogramming has been highlighted as follows:

A. Microbes and Maintenance of Ecological Functions :

Nutrient Cycling and Decomposition : Microbes act as key decomposers that disintegrate deceased organic matter and recycle crucial nutrients such as carbon, nitrogen, phosphorus, and sulphur, which are vital for maintenance of soil health and fertility.

Ecosystem Stability : Diverse microbial communities in an ecosystem enables it to be stable and resilient. Even if certain species become extinct as a result of natural disasters, the ecosystem will still be able to function because of functional redundancy in a diversified population.

Atmosphere Regulation : Photosynthetic marine microorganisms (phytoplankton) contribute a minimum of 50% of the Earth's oxygen and significantly aid in the absorption of atmospheric CO₂, thereby assisting in the regulation of global climate.

Environmental Engineering : Over billions of years, microbes have shaped the waters and atmosphere of our planet, paving the way for the evolution of multicellular life. They may help to reduce the impact of climate change, such as the melting of permafrost, thereby plays vital role in the creation of natural mineral reserves, such as uranium.

B. Role of Microbes in Climate Smart Agriculture

Development of Improved Germplasms : Microbes enhance plant traits and resilience, enhancing modern plant breeding and agricultural practices. They influence plant phenotypes through "microbiome gene (M-gene) breeding" programs.

Land restoration and improving Soil Fertility : Microbes enhance soil fertility, plant tolerance, and soil health through forming aggregates, fixing nitrogen, and forming symbiotic relationships like those with Frankia and arbuscular mycorrhizal fungi (AMF) (Bhattacharyya and Jha 2015; Bhattacharyya et al. 2024b), thereby reducing the dependence on chemical fertilizers and pesticides.

Bioenergy Generation and Sustainable Agriculture: Generation of biofuels such as biomethane and ethanol are made possible by microbes, which also serve as key agricultural inputs in the form of biofertilizers and biocontrol agents, thereby assists in minimizing the need of conventional agrochemicals and pesticides and promotes agricultural sustainability (Bhattacharyya et al. 2022; Bhattacharyya et al. 2024c; Bhattacharyya et al. 2024d; Bhattacharyya et al. 2024e).

Adoption of Integrated Crop Management: Microbes are essential to integrated crop management (ICM) programs, serving as biopesticides for insect control, biofertilizers for nutrient enhancement, and plant growth-promoting agents (Bhattacharyya and Jha 2012; Bhattacharyya and Sarmah 2018; Laith et al. 2025) that enhance crop health and yield, thereby reducing reliance on chemical inputs and promoting sustainable agriculture.

C. Microbial Biotechnology and Industrial applications

Production of Novel Compounds : Microbes offer potential for developing new drugs to combat antimicrobial resistance, as they possess rich sources of enzymes, metabolites, and bioactive compounds.

Industrial Processes : Microbial enzymes are used in numerous industries, including in food production (e.g., cheese, yogurt), detergents, textiles, tea and pulp and paper making industries.

Bioremediation Potential: Hydrocarbon-degrading microbes are used to clean up oil spills and other emergent pollutants including the persistent organic pollutants (POPs), while other microbes are being explored for their potential to deal with plastic wastes and heavy metal toxicity.

Reprogramming in Phytoremediation through Microbe Assistance : Microbe-assisted phytoremediation (MAP) is an environmentally sustainable technique that utilizes the synergistic interaction between plants and microbes to remediate contaminated environments, including the soil and wastewater. Microbes facilitate plant growth, increase the availability of pollutants to plants, and immediately degrade or sequester toxins, thus, providing a more efficient and sustainable remediation option.

D. Advancements in Human and Animal Health :

Human Microbiome : Comprehending the diversity of the human gut microbiota is essential for maintenance of human health, as it significantly influences digestion, immune system development, and provide sufficient defense against severe infections.

Disease Treatment and Prevention : The identification of novel microorganisms is crucial for the diagnosis of infectious diseases and the development of effective therapies and vaccines.

Recent advancements :

The current article highlights the need to conserve vast microbial diversity for future sustainability. Scopes in using genetic engineering and metagenomics has been highlighted to improve the knowledge and understanding on using microbe-based technologies in agriculture, industry and medicine. According to molecular biologists, genetic engineering and omics-approach can strengthen in creating efficacious microbial strains that could be best utilized under wider range of agricultural and industry settings. Nanoformulations are becoming popular approach in agriculture for developing quality microbial biocontrol agents with numerous benefits such as elevated surface area, adjustable characteristics, and the capacity produce reactive oxygen species (ROS) upon extreme light exposure conditions, thereby plays key role in remediating metal polluted soil and water bodies. Additionally, the use potential of bibliometrics to analyze the trends, patterns, and research developments in exploring microbial diversity, community structure, scopes and applications in diverse sectors of human interest has recently been worked out (Figure 2).

Furthermore, incorporating advanced technologies like internet of things (IoT) and machine learning, artificial intelligence (AI) has recently revolutionized the adoption of microbe-based technologies in human interests. For instances, IoT-enabled devices can monitor essential environmental factors, including the temperature, humidity, and soil moisture, as well as strategic effects of biotic interferences that influence the rapid pest and pathogen development and succession trends. Even combined with AI, Scientometrics and IoT can process vast datasets to predict pest and pathogen outbreaks, identify invasive species, and eventually assists in pest control effectiveness in real-time challenges. AI-based models, particularly those using machine learning technologies, can optimize pest management by adjusting treatment schedules and dosages according to real-time data analysis. Besides, fuzzy logic, when adopted in agricultural pest management, can handle uncertainties in pest behavior and prevailing environmental conditions, thereby enlightening the researchers while improving the decision-making targets within the integrated pest and disease management programmes.

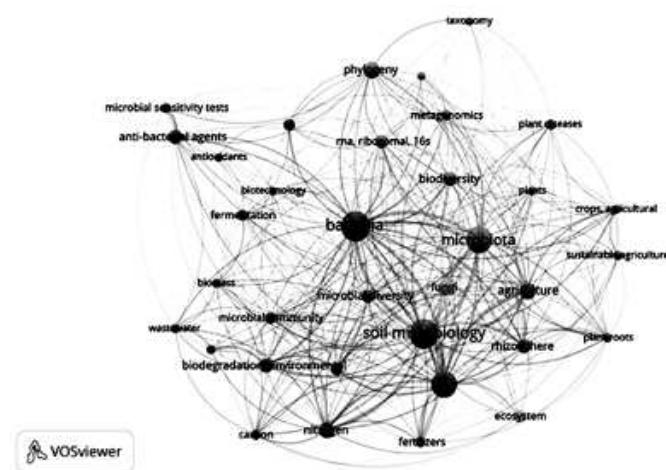


Fig. 2 : Scientometrics to analyse the trends, patterns and research developments in microbial diversity and community structure.

ABSTRACTS

THE ROLE OF EDUCATIONAL PSYCHOLOGY IN ENHANCING TEACHING EFFECTIVENESS IN NEPALESE INSTITUTIONS

Yashodhara Bhetuwal Prasai

Vice President: Women in Science and Humanity (WISH), Nepal

Institute of Crisis Management Studies (ICMS), Tribhuvan University (Affiliated)

Dhumbohali-4, Kathmandu, Nepal

Corresponding author : pyashobya@gmail.com

ABSTRACT :

The Kathmandu Valley, comprising the districts of Kathmandu, Lalitpur, and Bhaktapur, is the cultural and educational hub of Nepal. It is home to a diverse population, a blend of community (public) and private schools, and serves as a representative center for the country's educational development. Nepal's education system, structured into primary, secondary, and higher levels, has made significant progress over the past decades, yet challenges remain in teaching effectiveness, student engagement, and learning outcomes. Within this context, the application of educational psychology becomes crucial, as it provides teachers with principles and practices that directly address student motivation, classroom management, pedagogy, and assessment. This study examines the role of educational psychology in enhancing teaching effectiveness in Nepalese schools, with particular focus on the Kathmandu and Lalitpur districts. A quantitative research design was employed, using a structured survey administered to 50 high school teachers across community and private schools. The research investigated how teachers' knowledge and application of psychological principles, motivation strategies, classroom management techniques, teaching methodologies, and assessment practices impact teaching effectiveness and student achievement. Data analysis through descriptive statistics, correlation, and multiple regression models demonstrated a significant positive relationship between teachers' understanding of educational psychology and high school students' learning outcomes. The findings suggest that when teachers apply psychological principles in their practice, they not only improve classroom management and instructional delivery but also foster better student engagement and academic performance. The study underscores the need to integrate educational psychology more systematically into teacher education and professional development programs in Nepal. Strengthening teachers' capacity in areas such as motivation, behavior management, cognitive learning processes, and effective assessment can substantially enhance teaching quality, thereby contributing to broader educational reforms and improved student outcomes in Nepalese schools.

Keywords : *Educational psychology, Effective teaching, Nepalese schools.*



ENHANCING EMOTIONAL WELL-BEING IN TEENAGERS THROUGH PSYCHOSOCIAL COUNSELING : *A Study in Kathmandu Valley, Nepal*

Sudha Sapkota

Ex-Principal, Bijeshwori Gyan Mandir Sainik Mahavidyalaya (BGMSMV), Kathmandu, Nepal

Executive Member : Women in Science and Humanity (WISH), Nepal

Corresponding author : krisudha00@gmail.com

ABSTRACT :

Adolescence is a sensitive and transitional phase of human development marked by rapid physical, mental, and emotional changes. In Nepal, teenagers encounter unique psychosocial challenges, particularly in urban centers like Kathmandu Valley, where traditional family expectations, academic competition, peer pressure, and the growing influence of social media often intersect. These stressors can lead to identity confusion, anxiety, depression, and interpersonal conflicts if left unaddressed. Psychosocial counseling plays a pivotal role in addressing such complex emotional, behavioral, and social concerns. It provides a safe and supportive environment where teenagers can express their feelings, develop coping strategies, and enhance self-awareness. In this study, the Psychological Counselling Scale was employed as the primary tool for data collection, while SPSS software was used for statistical analysis. The main objective was to examine the relationship between emotional well-being and the overall quality of life among teenagers enrolled in plus two colleges in Kathmandu Valley, with a particular focus on the predictive validity of emotional well-being. The findings revealed that factors such as realistic orientation, self-confidence, self-control, empathy, communication, cooperation, optimism, self-awareness, creativity, analytical skills, social effectiveness, and leadership significantly contributed to teenagers' satisfaction with their quality of life. These psychosocial attributes not only improved emotional resilience but also enhanced interpersonal relationships and academic performance. Overall, the study underscores that psychosocial counseling is a vital intervention for Nepali adolescents, as it fosters emotional well-being, strengthens problem-solving and decision-making abilities, and prepares them with adaptive skills to cope with the challenges of adulthood. By integrating psychosocial support into educational settings, Nepal can ensure healthier, more resilient, and socially adjusted future generations.

Keywords : *Psychology, Counseling, Adolescents, Emotional well-being, Resilience, Coping strategies, Nepal*

DIVERSIFY AND CHALLENGE OF AQUACULTURE AND FISHERIES IN BANGLADESH

B. K. Chakraborty

Swami Vivekananda Subherti University, Meerut, UP, India &
Mud eel, Mud crab, Aquaculture and Management Centre, Bangladesh &
Department of Fisheries, Bangladesh &Bangladesh Agricultural University

ABSTRACT :

An ecosystem is an ecological unit consisting of a biotic community together with its abiotic environment. An ecosystem includes indicators of habitat, species, and resources. An aquatic resource of Bangladesh belongs to a. Inland Open Water (Capture) : River and Estuary, Sundarbans, Floodplains, Beel, and Kaptai Lake b. Inland Close Water (Culture): Pond, seasonal cultured waterbody, Baor, Shrimp, Prawn, and crab Farm, Pen Culture and Cage Culture, Marine Fisheries, Industrial and Artisanal. The country has an inland water area of about 4.72 million ha and a about 710 km long coastal belt. Data and information sources are used from the direct interview with the individual, the publication of the Department of Fisheries, the internet, and related grey literature. The data were analyzed through one-way ANOVA to find out whether any significant difference existed among the different data. The fisheries sector contributes 2.53 percent to the national GDP, 22.26 percent to the agricultural GDP, and more than 0.90 percent to the total export earnings. The total fish production was recorded by producing 5.018 million mt in 2023-24, whereas Inland culture fish produced 2.978 milmt, accounting for about 59.34 percent of the total fish production. The total fish production was increased about six times more (0.754 mil.mt to 5.018mil.mt) during the last 40 years, and the regression type was Exponential and the equation was $y = 0.6528e^{0.0531x}$ (where $R^2=0.9908$). In aquaculture, the ecosystem of the waterbody and biological management (live feed production and outlet of polluted substances) are necessary. In recent years, the fisheries resources have been facing challenges posed by numerous natural and anthropogenic causes such as climate change, natural disasters, environmental pollution, industrialization, overexploitation, the use of destructive fishing gears, pesticides, and agrochemicals. New aquaculture and fisheries technology would be developed to mitigate natural and anthropogenic causes for aquaculture and open water management to restrict the decline of resources and enhance production.

Keywords : *Ecosystem, Aquatic resources, Aquatic resources management, Production, Food security, Livelihood*

SUSTAINABLE SCIENCE FOR SOCIETY : Navigating the Opportunities and Challenges of the 21ST Century

Shyam Narayan Labh

Professor (Retired) and Former Chair (Zoology), Amrit Campus, TU, Kathmandu, Nepal
INSA-Fellow-2015, ICAR-CIFE, Mumbai; Fulbright Scholar-2019 : University of Idaho-USA
Chief Editor : Current Science: Weser Books, Germany
Researcher ID : ABC-1450-2021 (PUBLONS)
Corresponding author : snlabh@gmail.com

ABSTRACT :

Science, society, and sustainability are deeply interconnected dimensions of contemporary human progress, shaping the trajectory of development and survival in the 21st century. The integration of scientific knowledge into societal frameworks provides unparalleled opportunities for innovation, resilience, and inclusive growth, yet simultaneously poses significant challenges due to ethical dilemmas, uneven access, and ecological constraints. As humanity confronts climate change, biodiversity loss, food insecurity, and water scarcity, science emerges as both a tool of empowerment and a contested domain that can either bridge or widen socio-economic divides. On one hand, science offers transformative opportunities to accelerate sustainability through renewable energy technologies, climate-smart agriculture, green chemistry, digital innovations, and circular economy models, enabling societies to decouple economic growth from environmental degradation. It creates pathways for evidence-based policies, predictive modeling of environmental risks, and community-driven participatory approaches that strengthen governance and equity. On the other hand, the societal acceptance and translation of science into practice is fraught with challenges, ranging from misinformation and lack of trust to cultural resistance and policy inertia. The global North-South divide illustrates how scientific advancements often benefit resource-rich nations while marginalizing vulnerable populations, thereby creating sustainability paradoxes where the pursuit of progress can exacerbate inequality and ecological harm. The challenge also lies in balancing rapid technological advancement with ethical considerations, such as genetic engineering, artificial intelligence, and geoengineering, which raise profound questions about justice,

responsibility, and intergenerational equity. In this context, sustainability is not merely an environmental goal but a societal contract that demands collaboration among scientists, policymakers, industry, and communities. Addressing these complex issues requires a holistic and transdisciplinary approach that integrates natural sciences, social sciences, indigenous knowledge, and ethical frameworks. Such collaboration can foster adaptive capacities in societies, enabling them to mitigate risks and capitalize on opportunities. The future trajectory of sustainability, therefore, depends on whether science is mobilized inclusively, democratically, and responsibly, ensuring that technological gains are shared equitably while respecting planetary boundaries. Ultimately, science, society, and sustainability together represent both an opportunity and a challenge an opportunity to reimagine development as just, inclusive, and ecologically sound, and a challenge to overcome the systemic barriers of inequality, misgovernance, and short-termism. By embracing innovation, nurturing public trust in science, and embedding sustainability into the cultural and political fabric of societies, humanity can transform global challenges into opportunities for resilience, justice, and long-term well-being. Thus, the interplay of science and society is not only central to sustainability but also defines the moral and practical choices that will determine the fate of future generations.

Keywords : *Science, Society, Sustainability, Opportunity, Challenge, Innovation, Equity, Climate change, Technology, Ethics, Governance, Resilience, Intergenerational justice.*

ICHTHYOFAUNAL DIVERSITY ASSESSMENT OF THE SUNKOSHI, NEPAL : A Seasonal Study

Prabha Chitrakar, FNAS

Director, The Times International College, Kathmandu-44600, Nepal
Senior Vice-President: Nepal Aquaculture Society, Nepal
Corresponding author : prabhachitrakar@gmail.com

ABSTRACT :

The Sunkoshi River, a major trans-boundary tributary of the Koshi River (Saptakoshi River system) in Nepal, originates from the Zhangzangbo Glacier in Tibet; its upper course is the Bhote Koshi (known as Poiqu in Tibet), and the combined river basin covers approximately 3,349 km². The river is joined by the Indrawati River/Melamchi Khola at Dolalghat, after which it flows eastward through the valley situated between the Mahabharat Range and the Himalayas, receiving the Tamakoshi, Likhu, Dudhkoshi, Arun, and Tamor as left tributaries and the Indrawati as its right tributary. A dedicated study, conducted at the Dolalghat confluence from March 2024 to February 2025 to examine the seasonal ichthyofaunal diversity, identified a total of 65 fish species belonging to 4 orders and 10 families; the family Cyprinidae showed the highest diversity, while Anguillidae and Ailiidae recorded the lowest. This research highlights the Sunkoshi River's importance as a critical ecological channel connecting Tibet and India through the Himalayan basins of Nepal, thus emphasizing the necessity for further exploration and conservation efforts to protect its fish diversity.

Keywords : *Dolalghat, Sunkoshi River, Fish diversity, Species richness, Nepal*

FROM MIND CONTAMINATION TO MENTAL CLARITY : Exploring the Roots and Remedies of Mental Pollution

Babita Labh Kayastha, FNAS

Ex-Principal, Nepal Armed Police Force School, Kirtipur-4, Kathmandu

President, Women in Science and Humanity (WISH), Nepal

Corresponding author : babitalkayastha@gmail.com

ABSTRACT :

In today's world, the idea of mental pollution is becoming more important for analyzing the subtle but widespread factors that harm people's thinking, morality, and community health. The term "mental pollution" describes the gradual degradation of human and societal awareness brought about by the buildup of unhelpful ideas, prejudices, views, and assumptions. Mental pollution differs from environmental contaminants in that it is intangible, takes root within, and gently influences attitudes, actions, and decision-making via cultural influences, educational systems, media, and social standards. The effects of this phenomenon on individual growth, interpersonal harmony, community togetherness, and overall social advancement are far-reaching and significant. This study seeks to delve into the causes, symptoms, and outcomes of mental pollution, as well as practical methods for attaining mental clarity. The study's primary objective is to catalog the various personal, familial, societal, and cultural factors that contribute to mental pollution. Individuals are most affected by cognitive distortions, internalized social prejudices, and unfavorable self-conceptions. Upbringing, socialization, peer pressure, and media exposure all contribute to the transmission of retrograde ideas within families and communities. Mental pollution persists from one generation to the next due to long-standing prejudices, discriminatory practices, and stereotypical views. In order to thoroughly examine the phenomenon, a mixed-methods approach is used. Qualitative interviews and case studies gather in-depth perspectives from educators, psychologists, spiritual practitioners, and social leaders, whereas quantitative surveys measure the prevalence and perception of mental

pollution across demographic groups. Connectivity among mental pollution, cognitive biases, psychological health, and social conduct can be investigated using data analysis that combines theme interpretation with statistical modeling. Furthermore, intervention studies investigate the effectiveness of approaches like value-based cultural programming, media literacy, mindfulness training, and critical thinking education in reducing mental contamination and increasing clarity. It appears from the preliminary results that mental pollution has a negative impact on emotional resilience, creativity, social harmony, and decision-making. It shows up as a tendency to think negatively, less ethical reasoning, and accepting unfairness or inequality. Cognitive clarity, self-confidence, social responsibility, and ethical conduct can be improved by mental purification measures such as education, cultural reform, psychological counseling, and awareness initiatives. In addition to bettering their personal lives, empowered people with clear minds help build communities that are more accepting, self-aware, and progressive. Finally, the study highlights the importance of having a clear mind as a social necessity rather than an individual goal, and how the quest for ethical awareness of thought lays the groundwork for a more equitable and enlightened society.

Keywords : *Pollution, Society, Community, Awareness, Psychology, Education*

BEEL FISHERIES OF ASSAM : PRESENT SCENARIO

S. P. Biswas

Retd. Professor, Dibrugarh University, Dibrugarh, Assam-786004, India

Corresponding author : spbsdu@dibru.ac.in

ABSTRACT :

Beels or flood plain lakes of Assam are the real storehouses of capture fisheries. 3600 odd beels of Assam provide livelihoods for millions of people directly or indirectly. However, a gradual decline of fish production from the beels has been reported since the 1970s. Construction of embankments, heavy siltation, and encroachment of beel areas are identified as the major contributory factors for the loss of beel habitats and their biota. Of late, attempts have been made to convert selected beels for aquaculture purposes. This move needs careful consideration. Species selection for the stocking of beels should be a priority. Peripheral areas of identified beels should be stocked with indigenous varieties like *Channa aurantimaculata*, *C. Barca*, *C. bleheri*, *Mystus dibrugarensis*, *Systoma sarana*, etc., which will be helpful for species revival. Captive rearing and propagation of rare and endemic species will not only boost the conservation strategies but also open new avenues for employment opportunities for thousands of youths. A holistic and pragmatic approach is the need of the hour.

Keywords : *Beel fisheries, Endemic murrels, Captive breeding, Assam*

ENVIRONMENTAL ENDOCRINE DISRUPTORS : A Brief Review

Jogen Chandra Kalita

Professor, Department of Zoology,
Gauhati University, Guwahati, Assam, India
Corresponding author : jogenck@yahoo.co.in

ABSTRACT :

According to the Environmental Protection Agency (EPA), Environmental Endocrine Disruptors are those chemicals that can mimic or interfere with the hormone biosynthesis, transport, secretion, and binding in the human body. Currently, there has been a greater concern raised by the scientists and by the media across the globe regarding the occurrence of various chemicals of different origins, mostly industrial sources and from nature identified as Environmental Endocrine Disruptors (EDC) in our environment which have been able to interfere with normal functioning of endocrine system and can cause deleterious effect on human, animals and wildlife. Endocrine Disruptors, due to their persistent occurrence and bio-accumulation nature in our body, it gets distributed over a wide region in our environment and may impact generation after generation. Dietary, occupational, and environmental (water, soil, and air) are the major routes of exposure which can create a great impact on humans. EDC can show agonist and antagonist properties to many natural endogenous hormones and so responsible for many life-threatening diseases, including hormone-dependent cancers. Moreover, EDCs have potential impacts on many vital organs of the body, including the thyroid, lung, liver, breast, adrenal, gonads, and bones, thereby causing dysfunction and abnormal metabolism in the body. The present study aims to understand the vulnerability and adverse effects of endocrine disruptors on humans, animals, and wildlife, emphasizing environmental concern for the occurrence of EDCs, their adverse impact on the entire ecosystem. Moreover, the present study also attempted to look at the beneficial effects of some oestrogenic chemicals of herbal origin, reported to have a positive impact on humans with their health benefits.

Keywords : *Endocrine Disruptors, Hormone receptors, environmental oestrogens, Hormone-dependent cancers, Phytoestrogens.*

THE CURRENT CONSERVATION STATUS OF GIBBONS IN ASSAM, INDIA

Sudha Balajapalli

George Mason University, Fairfax, VA

Corresponding author : sbalaja2@gmu.edu

ABSTRACT :

There are two species of gibbons in India. The Western Hoolock Gibbon is considered endangered, while Eastern Hoolock Gibbon is considered vulnerable, which is found in Assam. Both species are listed on Schedule 1 of the Indian (Wildlife) Protection Act 1972. Threats to gibbons include habitat loss, hunting, human-wildlife conflict, and infrastructure development. Management of gibbons includes habitat conservation and local community engagement. In addition, policy solutions may include international measures on species specific conservation and international cooperation.

Keywords : *Endangered, Hoolock Gibbon, Wildlife Protection, Human-wildlife conflict*

SUSTAINABLE MANAGEMENT OF CAPTURE FISHERIES IN JORHAT DISTRICT

Swarupa Bhattacharjee¹ & Sanchita Boruah²

¹ Department of Zoology, Bahona College, Jorhat, Assam, India

² Department of Zoology, D.H.S.K College, Dibrugarh, Assam, India

Corresponding author : bhattacharjeeswarupa@gmail.com

ABSTRACT :

Jorhat district of Assam is enriched by both lentic and lotic water bodies. Mighty Brahmaputra flows through the district, and Borsola, Potiasola, and Gelabael are the prominent wetlands that provide various ecological and economic services. People in and around Borsola and Potiasola beels close to Jorhat town are from the poor socio-economic strata and depend mostly on the fishery-related activities and traditional practices for their livelihood. Waste management, wetland siltation, capture of undersized fish, and implementation of fishery laws are the common issues that need attention. This paper highlights the socio-economic issues of the fisherfolk and suggests sustainable management of captured fisheries of the Jorhat District and various ways for their improvements of livelihood improvements and proper management of these water bodies and sustainable utilization of the resources, and addresses the associated environmental concerns. A survey of the area concerned shows that it has a good potential for the alternate livelihood generation for the stakeholders, which includes processing of various weeds into biofibers and checking their potential for their sustainable, futuristic use. Horticulture in the form of water-grown flowers can also be explored for the purpose of livelihood generation.

Keywords : *Sustainable fisheries, Alternate livelihood, Borsola, Potiasola, Jorhat.*

ROLE OF WASTE MANAGEMENT IN ENHANCING ENVIRONMENTAL SUSTAINABILITY IN THE RELIGIOUS PLACE OF GUWAHATI CITY

Souwick Baruah & Mreeshi Agarwala

Assam Institute of Management

Assam Science and Technology University, Assam, India

Corresponding author : souwickbaruah@yahoo.com; mreeshiagarwala@gmail.com

ABSTRACT :

Waste management, encompassing the processes of waste generation, collection, transportation, processing, and disposal, is a critical aspect of human life. It involves managing various types of waste, including solid, liquid, and hazardous waste material. Effective waste management is crucial for protecting the ecosystem, conserving resources, and preventing pollution. Solid waste is the waste that is discarded by the individual as undesired by the human body; it is considered to be non-dangerous, particularly in country side areas. Religious waste is a waste which is generated in temples and religious areas. People worship God and are accustomed to going to the temples offering flowers, fruits, sweets, and coconuts etc. The bulk of flowers, leaves of different plants, milk, curd, and coconut shells are piled up and then disposed of exclusively in water bodies. Everyday, flowers are offered by devotees in temples and are left unused. Hence, the present paper seeks to study the perceptions of diverse groups of people of the society towards waste in the religious places in Guwahati City, Assam. At the same time, the study also seeks to find out the impact of such waste on environmental degradation.

Keywords : *Waste Management, Religious places, Solid waste, Hazardous waste.*

WATER RESOURCES, CLIMATE CHANGE, AND BIODIVERSITY CONSERVATION : An Integrated Review of Challenges and Adaptive Strategies

Ranjeeta Kar

Department of Geology, Sibsagar University, Sivasagar-785665, Assam
Corresponding author : rkar@sibsagaruniversity.ac.in

ABSTRACT :

Water resources, climate change, and biodiversity conservation are intricately interconnected components of the Earth's natural systems. Climate change alters hydrological cycles, influences precipitation patterns, and intensifies extreme events such as droughts and floods, thereby affecting the availability and quality of water resources. These changes, in turn, directly and indirectly impact biodiversity, disrupting ecosystems and threatening species survival. Conserving biodiversity is essential for sustaining ecosystem services, including water purification, soil fertility, and carbon sequestration, which are vital for climate change mitigation and adaptation. The current endeavour, presented as a review, examines the interconnections among water resources, climate change, and biodiversity conservation. It synthesizes evidence from recent studies, discusses methodological approaches in integrated assessment, and highlights pathways for adaptive management. The findings suggest that ecosystem-based adaptation, integrated water resources management (IWRM), and cross-sectoral governance are crucial for building resilience against climate change while safeguarding biodiversity.

Keywords : *Water resources, Climate change, Biodiversity conservation, Ecosystem-based adaptation, Sustainability.*

SMALL INDIGENOUS FISH SPECIES AND THEIR SUSTAINABLE MANAGEMENT FOR NUTRITIONAL SECURITY AND LIVELIHOOD OF RURAL COMMUNITIES IN UPPER BRAHMAPUTRA BASIN, NORTH EAST INDIA

Satabdi Saikia & Jugendra Nath Das

Department of Zoology, Sibsagar University
Joysagar, Sivasagar, Assam-785 665 (India)
Corresponding author : satabdisaikia69@gmail.com

ABSTRACT :

Fisheries play a significant role in alleviating nutritional deficiencies, ensuring food security, and livelihood support in a developing country like India. Small Indigenous Fishes (SIFs) refer to relatively small-sized fishes that reach a maximum length of about 25 cm when fully grown and constitute an essential source of nutrition for many communities across the world. The mighty Brahmaputra and its tributaries, as well as associated water bodies, especially the flood plain wetlands ('beels'), streams, canals, and seasonal water bodies like low-lying paddy fields, sustain 60-odd species of SIF having considerable commercial value. SIFs are excellent suppliers of a variety of micro and macronutrients and provide better nutrition with high protein, essential fatty acids, vitamins, and mineral contents, which are often lacking in impoverished diets. Being readily and affordably available, all these fish species are very crucial in providing the essential nutrition and earnings for many impoverished people of this region, thereby playing a significant role in preventing malnutrition, ensuring food security, and, more importantly, contributing meaningfully to the livelihood of the underprivileged rural families. The present communication reports on the diversity of SIFs and their conservation status in the upper Brahmaputra basin, their role in nutritional stability, and upliftment of socio-economic conditions of the local communities in rural areas. Additionally, this study also reviewed the prospects of future usage of SIFs through sustainable management involving regulated harvesting from wild waters, promoting awareness for their conservation, including their habitats, enhancement of commercial culture or culture-based fisheries towards strengthening public health, nutrition security, and livelihoods of the local communities of this region.

Keywords : *Small indigenous fish species, Micronutrients, Vitamins, Sustainable management, Conservation status, Livelihood*

ECONOMIC IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES AND BIODIVERSITY

Rupamoni Talukdar

Department of Economics, Geetanagar College, Guwahati, Assam, India

Corresponding author : rupamoni2may@gmail.com

ABSTRACT :

Climate change imposes growing economic costs through its impacts on water resources and biodiversity. Altered rainfall patterns, prolonged droughts, floods, glacier melt, and rising temperatures disrupt freshwater availability and degrade aquatic ecosystems. These changes reduce water supply for agriculture, industry, hydropower, and households, while increasing demand for water treatment and adaptation measures. The resulting economic damages include lost agricultural yields, increased irrigation costs, reduced hydroelectric output, infrastructure damage from floods, and public health costs linked to water-borne diseases. Biodiversity loss-through habitat degradation, species extinction, and declining ecosystem resilience, further undermines vital ecosystem services such as pollination, water purification, carbon storage, and flood regulation. Recent estimates suggest that freshwater ecosystem degradation is threatening hundreds of trillions of dollars in annual economic value globally. Mitigation and adaptation strategies-such as restoring wetlands, improving water management, protecting habitats, and investing in resilient infrastructure-offer promising returns. However, realizing these gains requires coordinated policies, adequate funding, and recognition of non-market values. Without such action, both water security and biodiversity loss pose escalating economic risks, especially for vulnerable regions and communities.

Keywords : *Climate change, Water resources, Biodiversity loss, Economic impacts.*

RESTORATION OF AQUATIC MEGA-FAUNA : Issues and Challenges

Priyanka Sarkar¹, Parthankar Choudhury², S.P. Biswas³

¹Department of Ecology & Environmental Science

Assam University, Silchar, Assam-788011

² E.P. Odum School of Environmental Sciences

Assam University, Silchar, Assam-788011

³ Department of Life Sciences, Dibrugarh University, Assam- 786004

Corresponding author : priyankasarkar634.ps@gmail.com

ABSTRACT :

The Brahmaputra and Barak river systems of North-East India were the abode of various types of aquatic megafauna, the most important being the Gangetic dolphin (*Platanista gangetica gangetica*). Besides gharials (*Gravialis gangetica*) and several species of turtles were reported in the 80s and 90s from the Brahmaputra basin. A steady decline of the aquatic megafauna population due to various natural and anthropogenic reasons was reported by several workers. Habitat degradation, poaching, fishing pressure, and siltation of the river bed were often described as major contributing factors. For the near extinction of most of these aquatic reptiles and mammals. Maintenance of environmental flows is also treated as a vital factor of aquatic life. An in-depth study was made to assess the present situation of aquatic mega-fauna in the twin river systems of Assam, and suggestions were made to improve the conditions.

Keywords : *Megafauna, Gangetic dolphin, Barak River, Brahmaputra River, Assam*

EXPLORING THE TEA MYCOBIOME : INSIGHTS INTO THEIR CULTURAL TRAITS AND SUSTAINABLE PEST MANAGEMENT

Sangeeta Hazarika¹, Dipsikha Bora², Bichitra Kumar Barthakur³

¹ Botany Department, Eastern Karbi Anglong College, Bokajan -782840

² Life Sciences Department, Dibrugarh University, Dibrugarh -786004

³ Tocklai Tea Research Institute, Jorhat - 785008

Corresponding author : Sangitahazarika.hazarika@gmail.com

ABSTRACT :

Tea, the highly valued beverage enjoyed by people worldwide, plays a significant role in the economy. Its unique aroma and flavor are ascending from the leaves of the tea plant (*Camellia sinensis*). The tea ecosystem is inhabited by a variety of insect pests that cause considerable damage to the plants and, in turn, impact the economy of the country. The fungal microbiome, also known as the plant mycobiome, is essential to the survival and well-being of plants. They help in nutrient acquisition, enhance stress resistance, and help fend off diseases and pests. The present work was undertaken to study the mycobiome of tea plants prevalent in the Assam region. During the studied period, we also screened out the entomopathogenic fungi from the tea mycobiome based on morphological characteristics and subsequently examined their cultural characteristics and biocontrol efficacy in vitro conditions against *Odontotermes obesus*, a significant pest that poses a major concern in tea-growing areas of Assam. A wide variety of soil mycoflora, including multiple entomopathogenic fungal strains, were found in the tea mycobiome, according to investigations. The results also indicated that some of the isolated endemic fungal strains, particularly *Metarhizium anisopilae*, *Purpureocillium lilacinum*, *Aspergillus flavus*, *Fusarium oxysporum*, and *Fusarium* sp, have high levels of pathogenicity against *Odontotermes obesus* under laboratory conditions.

Keywords : *Tea, mycobiome, Odontotermes obesus, Metarhizium anisopilae, Purpureocillium lilacinum, Aspergillus flavus, Fusarium oxysporum*

INTEGRATED APPROACHES FOR PREDICTING REPRODUCTIVE SEASONALITY IN FRESHWATER FISHES

Akash Kachari, Bipul Saikia & Tarun Ch. Taid

Department of Zoology, North Lakhimpur University, Lakhimpur, Assam
Corresponding author : akashkachari20@gmail.com

ABSTRACT :

Understanding the reproductive seasonality of fish is essential for assessing breeding patterns, population dynamics, and effective conservation strategies. The present study highlights the integration of multiple analytical tools to predict and delineate reproductive periodicity in freshwater fishes. Morphometric parameters such as length-weight relationship (LWR) and condition factor (K) serve as primary indicators, reflecting the physiological condition of fish in response to environmental and reproductive changes. The gonadosomatic index (GSI) provides a direct measure of gonadal development and spawning periodicity, while fecundity estimation and oocyte diameter analysis reveal the reproductive potential and timing of maturity. Histological examination of gonadal tissues offers microscopic confirmation of reproductive phases, allowing precise identification of maturation and spawning stages. Additionally, biochemical and hormonal assays, including quantification of sex steroids like 17β -estradiol, testosterone, and 11-ketotestosterone, complement morphological findings and help establish the peak breeding period. Together, these multidisciplinary approaches, morphometric, histological, and biochemical, offer a robust framework for understanding reproductive seasonality in fishes. Such integrated methodologies not only provide insight into species-specific breeding strategies but also aid in developing conservation measures and artificial propagation programs for threatened or economically important fish species.

Keywords : *Fish reproduction, GSI, Histology, Fecundity, ELISA.*

AQUATIC BIODIVERSITY AND CONSERVATION WITH SPECIAL REFERENCE TO FRESHWATER INSECTS IN MAJULI, ASSAM

Anup Kumar Doley

Department of Zoology, Majuli College, Kamalabari, Assam, India
Corresponding author : anupkumardoley77@gmail.com

ABSTRACT :

Aquatic biodiversity has enormous economic and aesthetic value and is largely responsible for maintaining and supporting overall environmental health. Humans depend on freshwater resources for food and medicine. Insects that live in freshwater environments, such as swamps, ponds, lakes, streams, and rivers, etc. are called aquatic insects. There are about 4500 species of insects known to inhabit diverse freshwater ecosystems. Aquatic insects are the structural and functional organisms of the freshwater ecosystem. Aquatic insects are an integral part of the aquatic ecosystem; they have both ecological and economic value. They have been the primary tool for studying ecology, growth of population growth, evolution, genetics, and many other areas of biology. Majuli, the largest freshwater river island, provides every possibility of exploring the aquatic insect fauna of the island. Majuli contains approximately 155 wetlands of varying sizes and shapes, locally known as beels and dubis. The occurrences of 6 orders of aquatic insects were observed during the study periods. Conservation of natural resources and biodiversity has become an urgent concern for an environmentally sustainable future. This paper tries to highlight the aquatic insects of the Majuli river island, its conservation measures for a sustainable future.

Keywords : *Aquatic insects, Biodiversity, Majuli, Conservation.*

PROSPECTIVE OF ECOTOURISM DEVELOPMENT AT BORDOIBAM BILMUKH BIRD SANCTUARY, ASSAM, INDIA

Budhin Gogoi¹, Parishmita Gogoi² & Hamen Saikia³

¹ Department of Zoology, Moran College, Charaideo, Assam-785670

² Department of Anthropology, Dhakuakhana College (Autonomous), Lakhimpur, Assam-787055

² Department of Zoology, Mariani College, Jorhat, Assam -785634

Corresponding author : budhinrgu2012@gmail.com

ABSTRACT :

Eco-tourism is a sustainable avenue that promotes the well-being of local people and also conserves natural resources. The Bordoibam Bilmukh bird sanctuary is one of the A1 category important bird area (IBA) of North East India, located between 27.2°N and 94.2°E of Lakhimpur and Dhemaji districts of Assam. This sanctuary is a thriving habitat for diverse avian fauna that includes endangered and threatened bird species. A total of 167 species of birds were recorded in 1997; 133 species of birds in 2011; 120 species of birds in 2018, and only 47 species of birds were recorded in 2024, indicating a 71.85% decline in the avian diversity. This sharp decline in avian diversity draws global attention regarding the conservation of the sanctuary. A total of 58 ornamental fishes were recorded in 2012; 68 species of fish were recorded in 2018; 133 species of macrophytes and 7 species of aquatic ferns were recorded in 2018. It is the breeding ground for bird species like the large whistling duck, Purple swamphen, Bronze-winged jacana, white breasted waterhen, and watercock. The rich biodiversity, landscape, various scientific endeavors, observation, and information from secondary sources indicate its potential to be a destination of eco-tourism, but no attempt has ever been made by the concerned authority in this context. The indifferent attitude of conservation promotes anthropogenic pressures such as fishing, poaching, egg collection, and land-use changes affecting the biodiversity of the sanctuary. Therefore, this study anticipated the development of eco-tourism in the sanctuary through the collective involvement of concerned authorities, NGOs, and the local community for conservation and also to support rural livelihood.

Keywords : *Avian diversity, Eco-tourism, Rural livelihood.*



SYSTEMIC STUDY ON *MYSTUS DIBRUGARENSIS*, AN ORNAMENTAL FISH OF ASSAM

Bhenila Bailung¹ & S.P. Biswas²

¹ Department of Zoology, Sonari College, Assam

² Department of Life Sciences, Dibrugarh University, Assam

Corresponding author : bhenila.bailung@gmail.com

ABSTRACT :

Mystus dibrugarensis is an indigenous fish that has both food and ornamental value. Realizing the importance of its ornamental value and its market preference, smaller size, and its export potential in the overseas market, the present investigations were aimed at achieving a descriptive study of this species. The body of *Mystus dibrugarensis* is laterally compressed, having two distinct black spots, one at the base of the operculum and another in the caudal peduncle region, and a distinct black mid-lateral line connecting the two spots. It is moderate in length, and its maxillary barbel was found to reach the anal fin origin. This species was found to possess a short adipose fin as compared to *M. tengara*, *M. armatus*, *M. oculatus*, and *M. cavasius*. The RLG value was found to increase with an increase in total body length. The highest feeding intensity (Gastrosomatic-Index) was recorded in females during the maturing stage, and the lowest in the ripe stage. However, in males, the highest and lowest were recorded in the spent stage and ripe stage, respectively. Active feeding was mostly noticed in the immature and spent stage in females and males, respectively, whereas empty stomachs in both sexes were observed in the ripe stage. Further, GSI was found to be lowest in the ripe stage of maturity for both male and female. From the overall gut content analysis, insect and insect larvae together form the dominant food item of the species throughout the year. Crustacean and annelids were found second preferred item. Five maturity stages were identified, and most of the gravid specimens were encountered during rainy (monsoon) months, with the highest value of Gonadosomatic-ratio in May in both sexes.

Keywords : *Mystus dibrugarensis*, Ornamental fish, Gastrosomatic index, Gonadosomatic-ratio, Feeding habit.

FISHERIES AS A SUPPLEMENTARY LIVELIHOOD FOR SMALLHOLDER FARMERS IN NAMSAI DISTRICT, ARUNACHAL PRADESH

Bipul Bez & Sumita Sarkar

Department of Sociology, Arunachal University of Studies, Namsai, Arunachal Pradesh, India

Corresponding author : sumi.sarkar36@gmail.com

ABSTRACT :

Aquaculture, the farming of aquatic organisms such as fish and aquatic plants, plays a significant role in sustaining livelihoods, especially in rural communities. Fisheries have emerged as an important supplementary livelihood option for smallholder farmers in Northeast India, where agricultural production alone often fails to ensure household food security and income stability. This study explores the contribution of small-scale fisheries to the socio-economic well-being of farming households in Namsai District, Arunachal Pradesh, with a focus on four villages, namely- Tengapani, Nanam Khamyang II, Nanam Khampti, and Pothargaon, as aquaculture can be a crucial tool for sustainable rural development, providing various economic, social, and environmental benefits that help to sustain livelihoods and uplift communities. This study examines the role of small-scale inland fisheries as a supplementary livelihood for smallholder farmers in Namsai District, Arunachal Pradesh. Combining household surveys, key-informant interviews, focus-group discussions, and field observation, it investigates (i) the extent of household engagement in fisheries, (ii) the share of fisheries in household income and nutrition, and (iii) the constraints and opportunities shaping sustainable fish-based livelihoods. Findings reveal that while fisheries contribute modestly to total household income, they play a critical role in bridging seasonal agricultural gaps, providing accessible protein, and enhancing livelihood resilience. Constraints such as inadequate access to quality fish seed, high feed costs, and limited market infrastructure hinder expansion, yet opportunities exist through integrated rice-fish systems, community-based pond management, and support from Self-Help Groups. The study concludes that strengthening fisheries through targeted extension services, improved input supply, and collective marketing can significantly enhance the socio-economic condition of smallholder farmers in Namsai District.

Keywords : *Aquaculture, Sustaining livelihoods, Rural development, Food security, Smallholder farmers.*

AN INSIGHT INTO THE DWINDLING BASISTHA HILL STREAM OF ASSAM AND ITS UNIQUE FISH FAUNA

Jafrin Farha Hussain¹ & Sabitry Bordoloi²

¹ Nanda Nath Saikia College, Titabar-785630, Jorhat, Assam

² Institute of Advanced Study in Science and Technology, Paschim Boragaon, Guwahati-35

Corresponding author : jafrinfarhahussain@gmail.com

ABSTRACT :

The Basistha hill stream, traversing through the heart of Guwahati city of Assam, is a unique freshwater body, endowing several fish fauna with unique adaptive characteristics. However, over the years, factors involving problems like climate change, uninterrupted anthropogenic activities, continuous deforestation, soil erosion, siltation, sand mining, etc., have led to a rapid decline of the overall health of this hill stream ecosystem. Hill streams in general are perennial, fresh water bodies, and are characterized by low temperature, turbulent water current, and a sandy, rocky substratum. The fish fauna inhabiting hill streams are efficiently adapted and are equipped with certain unique anatomical peculiarities, which help them adapt to the torrent environment. Anthropogenic problems faced by hill streams require immediate attention and address so that the fauna inhabiting these hill streams are protected and left undisturbed. In present perspectives, increased pressure on the water bodies for livelihood and daily necessities has put our hill streams prone to pollution and at high risk to the survival of aquatic life.

Some prominent morphological peculiarities in hill stream fishes include: presence of an adhesive apparatus/adhesive disc; and modifications in lips, barbels, and pectoral fins. Degradation and deterioration in any form to the health of these ecosystems could directly lead to the decline of these unique fauna. The present work is based on the study of adaptive modifications observed in two hill stream fishes recorded from the Basistha hill stream at Guwahati, namely, *Garra* and *Schistura*. The study is of scientific interest due to the fact that the morphological peculiarities of these fish reflect their adaptation to their habitat, and any ecological imbalance in the hill stream habitat would significantly impact their survival as well as adaptive strategies. In the present study, adaptive modifications exhibited by the adhesive apparatus, lips, and paired fins of hill stream fishes, *Garra* and *Schistura*, were studied, where ultra-structures were analysed under the Scanning Electron Microscope (SEM).

The study revealed the presence of spines, stub-shaped tubercles, mucous pores, and micro ridges in the lips and paired fins of these fish. Cumulative functions associated with these modifications render a suitable adaptability of such hill stream fishes in a torrential environment. Observation of unique modified morphological features in these hill stream fishes is the major highlight of the present study, providing information regarding their habitat characteristics, feeding ecology, and breeding.

Keywords : *Adaptive modifications, Hill-stream fishes, Basistha, Guwahati*

ENDOPHYTIC MICROBES ASSOCIATED WITH *DRYMARIA CORDATA* AND *CYPERUS ROTUNDUS* AS A SOURCE OF ANTIMICROBIAL METABOLITES

Diksha Saharia¹, & Laishram Shantikumar Singh¹

¹ Department of Microbiology, Faculty of Science, Assam DownTown University

Guwahati - 781026, Assam, India

Corresponding author : dikshasahariaaimt1995@gmail.com; Sk1laishram@gmail.com

ABSTRACT :

Endophytes are recognized as valuable sources of bioactive natural products with therapeutic potential. In the present study, endophytic fungi were isolated from the leaves and stems of *Drymaria cordata* and the roots of *Cyperus rotundus*, two medicinally important plants. A total of 20 fungal isolates were obtained and screened for the production of crude secondary metabolites. These extracts were subsequently evaluated for antimicrobial activity against a panel of clinically relevant human pathogens, namely *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Bacillus subtilis*, and the opportunistic fungus *Candida albicans*.

The majority of the isolates exhibited pronounced antimicrobial activity, demonstrating both antibacterial and antifungal potential. Interestingly, the inhibitory effect was more pronounced against *Candida albicans* than against the tested bacterial strains, indicating stronger antifungal efficacy. This observation suggests that metabolites derived from these endophytic fungi may represent a promising source of antifungal agents. The results highlight the importance of endophytes associated with medicinal plants as reservoirs of novel bioactive compounds and emphasize their possible applications in combating microbial pathogens of clinical concern.

Keywords : *Endophytic fungi, Drymaria cordata, Cyperus rotundus, Secondary metabolites, Antimicrobial activity*

NEP 2020'S VISION FOR INDIAN KNOWLEDGE SYSTEMS : HARNESSING INDIGENOUS KNOWLEDGE FOR ECOLOGICAL EDUCATION

Kanchana Das

Department of Education, Mariani College, Mariani, Jorhat, Assam
Corresponding author : kanchanadas266@gmail.com

ABSTRACT :

The National Education Policy (NEP) 2020 aims to bring back India's traditional and indigenous knowledge called Indian Knowledge Systems (IKS) into modern education. This is especially important for ecological education: teaching students about the environment, conservation, agriculture, forest management, and sustainability using wisdom passed down through generations. Using secondary data from policy documents, research papers, and government reports, this seminar paper examines how NEP 2020 proposes to include Indian Knowledge Systems (IKS) in school and higher education curricula. Key points include how NEP 2020 encourages teaching methods that include tribal knowledge, traditional farming practices, local ecological observations, and the use of Indian languages. It also asks how teacher training, course materials, and textbooks can reflect the local environment and cultural heritage. This paper points out challenges found in the literature: lack of trained teachers, uneven resource availability, and possible risk of cultural knowledge being treated superficially. Recommendations are drawn from existing studies: develop culturally appropriate teaching materials, involve Indigenous communities in designing educational content, and strengthen teacher preparation to use IKS meaningfully. The goal is to help students not only learn about ecology but also feel connected to their own heritage while becoming responsible stewards of the environment.

Keywords : *NEP 2020, Indigenous knowledge system, Sustainability education, Teacher preparedness, Ecological education.*

MUD EEL (*MONOPTERUS CUCHIA*) FARMING : OPPORTUNITIES AND CHALLENGES IN ASSAM.

Partha Hazarika¹, & Nabajyoti Neog²

¹ Department of Zoology, Nanda Nath Saikia College, Titabar, Jorhat, Assam

² Department of Political Science, Dibrugarh University, Dibrugarh, Assam

Corresponding author : parthanironjon2023@gmail.com

ABSTRACT :

The freshwater mud eel (*Monopterus cuchia*) leads leading amphibious life and is commonly found in stagnant waters, mud-holes in shallow beels, and paddy fields with low oxygen content. Being nocturnal carnivores, they prefer animal-based food like small fish, mollusks, worms, etc. The freshwater mud eels are rich in protein with high nutritional value and various bioactive compounds that have pharmaceutical properties and can be used for various medicinal purposes. It is commonly found in Bangladesh, India, and Nepal. People can be economically stable by cultivating freshwater mud eel, which has a high national and international market value. A good source of income can be generated by exporting mud eel into another country, as they are very easy to cultivate and don't require too much economic support. Nowadays, the population of mud eel tends to decrease due to several reasons, like limited seed availability, overfishing, using chemicals and pesticides on the crop field, weak market linkages, limited farmer awareness, aggressive catching, and less rearing. In this review article, an attempt has been made to highlight the threats to this ecologically and economically important fish, ensuring their proper preservation.

Keywords : *Freshwater mud eel, Medicinal value, Rearing feasibility, Market linkage*

CULTURAL HERITAGE, INDIGENOUS KNOWLEDGE AND SUSTAINABILITY

Ananya Roy

Department of Bengali, Geetanagar College (Formerly Kanya Mahavidyalaya)
Geetanagar, Guwahati, Assam
Corresponding author : ananyamanasroy@gmail.com

ABSTRACT :

Cultural heritage and indigenous knowledge represent the collective wisdom, values, and traditions of human civilization. These elements not only preserve the identity of communities but also guide modern societies toward sustainable living. Indigenous knowledge, rooted in centuries of experience, provides practical solutions to issues such as agriculture, health, water management, and environmental conservation. Sustainability, in this context, can only be achieved when cultural practices and indigenous knowledge systems are respected and integrated with modern development. This paper attempts to highlight the interconnection between cultural heritage, indigenous knowledge, and sustainability, emphasizing the need for their preservation in the face of globalization and rapid modernization.

Keywords : *Cultural heritage, Indigenous knowledge, Sustainability, Traditional practices, Environment, Globalization*

STATUS, THREATS, AND CONSERVATION PERSPECTIVES OF *BOTIA ROSTRATA* (GANGETIC LOACH) IN SIVASAGAR DISTRICT, ASSAM

Zakir Hussain

Department of Zoology, Sibsagar Girls' College, Sivasagar, Assam, India
Corresponding author : zakirhussaindjn1@gmail.com

ABSTRACT :

Botia rostrata, commonly known as the Gangetic loach, is a small freshwater fish native to the Ganges and Brahmaputra river systems and has been listed as Vulnerable (VU) on the IUCN Red List since 2009. Although no species-specific survey has been conducted in Sivasagar district, its inclusion in the Brahmaputra drainage basin suggests that the species is present in the region. This study synthesizes available literature and extrapolated data from Assam and Northeast India to evaluate the probable status, threats, and conservation needs of *B. rostrata* in Sivasagar. Regional studies indicate a population decline exceeding 30% due to habitat degradation, destructive fishing, pollution, and unregulated harvest for the ornamental fish trade. The loach inhabits hill streams and wetlands such as those prevalent in Sivasagar, but these ecosystems face pressure from mining, overfishing, and encroachment. National and state initiatives, including the Scientific Conservation Programme for Indigenous Fishes (SCoPIF) and the Pradhan Mantri Matsya Sampada Yojana (PMMSY), provide indirect benefits through sustainable fisheries management. However, targeted conservation action for *B. rostrata* remains limited. Community awareness, habitat restoration, and regulation of the ornamental fish trade are recommended for regional conservation planning. This paper highlights the need for species-specific studies and localized management to secure the persistence of *B. rostrata* populations in Sivasagar vis-à-vis the Brahmaputra basin.

Keywords : *Botia rostrata*, *Gangetic loach*, *IUCN Vulnerable*, *Sivasagar*, *freshwater biodiversity*, *Assam*, *ornamental fish trade*, *Conservation threats*

CULTURAL SIGNIFICANCE AND PREPARATION OF BLACK RICE BEER (POKA) AMONG THE GALO TRIBE OF NARI, ARUNACHAL PRADESH

Bhaskar Das¹ & Mukpe Sora²

¹ Department of Anthropology, DHSK College (Autonomous), Dibrugarh, Assam

² Government Primary School, Nari Village, Nari, Lower Siang District, Arunachal Pradesh

Corresponding author : 2drdas@gmail.com

ABSTRACT :

Traditional rice beer holds a vital place in the cultural and social life of the Galo tribe of Nari village in the Lower Siang district of Arunachal Pradesh. The Galos prepare two varieties of rice beer-black (*Poka*) and white (*Nyogin*), each serving distinct purposes. Black rice beer, considered sacred and prestigious, is indispensable in every social and religious occasion, such as festivals, marriages, community gatherings, and other celebrations within the Donyi-Polo society. It symbolizes hospitality and unity, and no event is deemed complete without its presence. During clan conferences, the community often brews large quantities, sometimes exceeding 20 quintals, reflecting its cultural importance. In contrast, white rice beer is consumed casually as an individual drink and holds little ceremonial value. Although modern beverages like beer and whisky are increasingly used today, traditional black rice beer remains central during major festivals such as Mopin, where the use of commercial liquors is discouraged. The present paper highlights the traditional methods of preparing black rice beer and its continuing cultural significance among the Galo people of Nari.

Keywords : *Botia rostrata, Gangetic loach, IUCN Vulnerable, Sivasagar, freshwater biodiversity, Assam, ornamental fish trade, Conservation threats*

ENTOMOPHAGY AND ENTOMOTHERAPY PRACTICED AMONG THE TAI-AHOM PEOPLE AND THEIR PRESENT STATUS IN SIVASAGAR DISTRICT, ASSAM

Chitralekha Gogoi

Department of Zoology, Sibsagar Girls' College, Sivasagar, Assam- 785640
Corresponding author : chitralekhagogoi18@gmail.com

ABSTRACT :

Sivasagar District is enriched with traditional knowledge among the different communities. Tai-Ahom is the dominant community among the various ethnic groups of the study area. The Tai-Ahom people are well acknowledged with ethnozoological concepts, especially referring to entomophagy and entomotherapy. But these practices have been eroding, especially among the young generations, due to modernization and changing lifestyles. An attempt has been made to explore the indigenous knowledge regarding the practices of entomophagy and entomotherapy among the Tai-Ahom people and also to ascertain the present status in the district.

Keywords : *Tai-Ahom community, Ethnozoological concepts, Entomophagy, Entomotherapy.*

STUDY ON SOME SELECTED AROIDS OF JORHAT DISTRICT OF ASSAM AND THEIR USE IN TRADITIONAL MEDICINE

Ashish Pratim Hazarika¹ & Preasenjit Bhagawati²

¹ Department of Botany, Kakojan College, Kakojan, Jorhat, Assam

² Department of Botany, Assam Down Town University, Guwahati, Assam

Corresponding author : ashishpratim1982@gmail.com

ABSTRACT :

Aroids are large herbs, shrubby with rhizomes, corms, and tubers of often with milky juice. The flowers of the aroids are unisexual, and the inflorescences are called a spadix, which bears male and female flowers. Flower is the distinguishing feature of all aroids. Flowers are small, pollinated by insects, and often have a bad smell.

The size of the aroids varies widely, and the plants are different in colour. The large size of aroids is *Alocasia odora*, *Alocasia macrorrhiza*, etc., and one of the common small-sized aroids is *Colocasia esculenta*. The specific nutritional content can differ based on the species and part of the plant. Generally, aroids are considered good sources of carbohydrates and fiber, with some also providing notable amounts of protein and fat.

Regarding the aroids of Jorhat district of Assam, they constitute a potential source of diet, nutrition, and livelihoods. In this area, aroids are generally found in wild habitats. People used to gather the plants from these habitats for consumption and also for medicinal purposes. The corms and tubers of aroids are the source of starchy food; although all the parts of aroids are consumed, the whole plant is collected and used in the case of a few species, like *Colocasia esculenta*. Baking, roasting, and boiling are the most common practices of preparing food. Aroids may play a significant role in the local cuisine and traditional medicine, offering both nutritional and potential health benefits. Aroids may be important sources of potentially bioactive constituents for the development of new therapeutic agents.

Keywords : *Aroids, Jorhat, Nutrition, Traditional medicine, Therapeutic agents*

EVALUATION OF REPRODUCTIVE STRATEGIES OF THE ASSAMESE KING FISH CYPRINION SEMIPILOTUM (MCCELLAND, 1839) IN ARUNACHAL PRADESH : CONSERVATION AND EFFECTIVE MANAGEMENT

Rashmi Dutta¹ & Debanshu Narayan Das²

¹ Department of Zoology, Gargaon College, Simaluguri, Sivasagar, Assam

² Department of Zoology, Rajiv Gandhi University, Doimukh, Itanagar, Arunachal Pradesh

Corresponding author : rashmidutta07@gmail.com

ABSTRACT :

This study was investigated to assess growth patterns, sex ratio, first sexual maturity, gonadosomatic index (GSI), fecundity, and gonadal development of Assamese King fish *Cyprinion semiplotum* in the Dikrong River of Arunachal Pradesh for long-term management and conservation purposes. The results of the study indicated that the population had a significantly higher proportion of females than males (χ^2 test, $p<0.05$). Using a logistic regression, it was determined that the standard lengths at 50% maturity were 159.0 mm for males and 167.5 mm for females. Based on the monthly proportions of macroscopic gonadal maturity stages and monthly variations in the gonadosomatic index, *C. semiplotum* spawned over a long period from June to September, with a peak in August. According to the size distribution of oocytes, *C. Semiplotum* appeared to show a high degree of spawning synchronicity. The fecundity of *C. semiplotum* increased linearly with the standard length, body weight but had no significant correlation with ovary weight. The mean absolute fecundity of 12040.57 and mean relative fecundity of 60.15 eggs per gram of body weight suggest that *C. semiplotum* might be especially vulnerable to exploitation. The microscopic study of gonadal tissues identified five different stages of gonadal development. This study will contribute to comprehending the reproductive traits of *Cyprinion semiplotum* and further contribute to sustainable fisheries management in the northeastern region of India.

Keywords : *Gonadosomatic index, Cyprinion semiplotum, Fecundity, Arunachal Pradesh, Spawning season.*

HABITAT MAPPING OF ORNAMENTAL FISH SPECIES IN THE UPPER BRAHMAPUTRA BASIN

Shatabdi Deb & S.P. Biswas

Department of Life Sciences, Dibrugarh University, Assam-786001, India
Corresponding author : subashreede12@gmail.com

ABSTRACT :

A gradual decline of fish catches has been observed in inland waters due to over-fishing and habitat degradation. 80% of India's freshwater aquarium fish are caught from the N.E. region, exerting tremendous pressure on the natural stock. Mapping of the selected wetlands and rivers having high fish diversity using Remote Sensing and GIS Technique was done; Analysis of the status of aquatic health of selected water bodies; Distribution of fish species in relation to physical habitat characteristics, and strategies for conservation of fisheries in the selected water bodies were suggested. Five rivers and two wetlands/ beels were selected for carrying out the research -River Dibr, River Sessa, River Burhidihing, River Brahmaputra, Nimaighat; River Jia Bhorali, Maguri Beel, and Mer Beel. An advanced mapping technique was used to prepare maps of the catchment areas of the studied waterbodies with more information on specific importance using geographic information systems (GIS) and remote sensing techniques. The area distribution of the catchment area in the form of raster maps and geomorphology maps was analysed. Based on fish landings, waterbodies were identified and classified, and fish samples were collected through regular field surveys of selected waterbodies. Water parameters were mostly found within the permissible limit and exhibited a narrow range of seasonal variation.

The highly demanded ornamental species recorded during the present study were *Channa aurantimaculata*, *C. bleheri*, *C. stewartii*, *Badis assamensis*, *B. badis*, *Botia dario*, *Canthophrys gongota*, *Devario devario*, *Erethistes hara*, *Securicula gora*, *Salmostoma bacaila*, *Paracanthocobitis botia*, *Mystus dibrugarensis*, and *Trichogaster* spp. An elaborate mapping of the study areas in the form of raster maps, which reveals the morphological features of the catchment area. The K value for most of the fish was greater than 1, indicating that the fish were in a favorable condition. Unevenness in the distribution of some fish species might be a consequence of a variety of factors, such as habitat loss, changes in environmental conditions, unauthorized fishing practices, siltation, eutrophication, overexploitation, and the unsustainable ornamental fish trade.

Keywords : *Aquarium fish, Geographic information system (GIS), Remote Sensing, Hydrobiology, Habitat mapping, Aquatic health*

STUDY ON THEFISH DIVERSITY OF THE BORSOLA BEEL, JORHAT, ASSAM

Hamen Saikia

Department of Zoology, Mariani College, Mariani, Jorhat, Assam

Corresponding author : hamensaikia43@gmail.com

ABSTRACT :

An investigation was carried out from the Borsola beel of Jorhat district, Assam, during July 2022 to June 2023. Borsola beel is a floodplain wetlands (N 26°50' 22.3" & E 94°13'12") in Jorhat district, Assam . It is an open type of beel, directly linked through a connecting channel with the river Brahmaputra, and one of the largest floodplain lakes in Upper Assam. During the study periods, 39 fish species were listed with IUCN status from the Borsola beel. Among the recorded fish species, those from Cyprinidae were the dominant group (14 species), followed by Channidae (3 species), Notopteridae (2), Cobitidae (2 species), Bagridae (2 species), Siluridae (2 species), Belontidae (2 species), and Mastacembelidae (2 species). The presence of these fish in the studied beel indicates the low level of pollution in the water body. Proper care of the wetland is very important for assuring the potential habitat for these fish species.

Keywords : *Borsola beel, Fish diversity, Cyprinidae, Assam*

ASSESSMENT OF THREATS TO THE AVIAN DIVERSITY AND HABITAT IN PANIDIHING BIRD SANCTUARY, SIVASAGAR DISTRICT, ASSAM

Tribeni Hazarika & Monjeet Sonowal

Department of Zoology, Faculty of Science and Technology, Arunachal University of Studies,
Namsai, Arunachal Pradesh, PIN : 792103, India
Corresponding author : sonowal.monjeet@gmail.com

ABSTRACT :

The Wetlands in Panidihing Bird Sanctuary in Sivasagar district, Assam, provide a crucialecosystem which serves as keystone territories for migratory and resident waterbird communities and is considered an Important Bird Area (IBA). The study recorded 56 waterbird species, including migratory species, but simultaneously observed increasing threats from anthropogenic and natural stressors during three years from 2021 to 2023. The waterbird diversity was recorded using standardised field methods, while threats were assessed atboth protected and fringe sites. Diversity indices (Shannon-Wiener, Species Richness, Pielou's Evenness) were generated using MS Excel and SPSS, along with ANOVA, Tukey's, Chi-square tests, and correlation analyses. Results inferred as species richness peaked during winter (45.0 ± 1.0) and was lowest in the monsoon (15.3 ± 2.1), with significant seasonal variation ($p < 0.001$). Flooding (16 sites), drought (16 sites), and invasive aquatic weeds (15 sites) were dominant natural threats, while unplanned fishing (11 sites) and cattle grazing (10 sites) were prominent anthropogenic stressors. Seasonal threat scores negatively correlated with diversity and richness ($p = -0.40$) but positively with evenness ($p = 0.80$). These findings represent seasonal threat dynamics key role of shaping avian communities in the study area. The study also accounted for wetland management in Panidihing Bird Sanctuary for restrictions of any fishing disturbance, initiation of invasive species control, water-level management, and local participatory approaches of communities, to ensure long-term conservation of waterbirds in the study area.

Keywords : *Panidihing Bird Sanctuary, Avian biodiversity, Threats, Wetland conservation, Assam*

TRADITIONAL CULTURE: BASIS OF SUSTAINABLE DEVELOPMENT IN NORTHEAST INDIA

Bosanta Kumar Borah

Department of History, Mariani College, Jorhat, Assam, India

Corresponding author : bosanta.kr@gmail.com

ABSTRACT :

Traditional culture and sustainable development with it, is an important phenomena which the world today has emphasized. Development of knowledge in the field of science and technology is not a one-day process; it has a thousand years of background. Close observation in the tradition-bound societies, most of them belonging to the East, clearly reveals that much of the collective wisdom and effective knowledge about natural phenomena and objects, which have been passed down from one generation to another, by word of mouth, is nothing but what is called 'science' and 'technology' in the modern age.

Sustainable development is ensured when the benefits of the development which are being enjoyed by the present generation are carried forward to future generations as well. On this backdrop, every society has its own heritage of science and technology stored in its traditional wisdom, and they form the basis of later development in the field of science and technology. For example, we can mention traditional medicinal systems, traditional agricultural methods, etc.

Keywords : Traditional culture, Ethnic groups, Sustainable traditional knowledge, Biodiversity, Endemic varieties, Ethno medicine.

CLIMATE CHANGE AND ITS IMPACT ON HOUSE PATTERN AND HOUSEHOLD AMENITIES : THE CASE OF NORTHEAST INDIA

Moon Moon Bora

Department of Geography, Mariani College, Jorhat, Assam, India
Corresponding author : mb.ogeom@gmail.com

ABSTRACT :

Climate change has become one of the most significant drivers of socio-environmental transformation in the 21st century, particularly in vulnerable regions such as Northeast India. The region's fragile geomorphology, high rainfall variability, and dependence on natural resources make it acutely sensitive to changing climatic patterns. This paper examines the impacts of climate change on the pattern of housing and household amenities across the northeastern states of India. Using secondary data, literature review, and regional observations, the study highlights that increased flood frequency, riverbank erosion, landslides, and temperature fluctuations have directly influenced architectural designs, building materials, settlement locations, and household infrastructure. Traditional stilt houses (chang ghar) are being revived and modified to withstand floods, while in urban and peri-urban areas, concrete structures are replacing bamboo and timber homes. Simultaneously, household amenities such as water supply, sanitation, and energy systems face growing stress due to climatic hazards. The paper concludes that integrating indigenous architecture with climate-resilient technology, sustainable material use, and adaptive community planning is essential for the long-term resilience of housing systems in Northeast India.

Keywords : *Climate change, Housing pattern, Household amenities, Northeast India, Flood-adaptation, Indigenous knowledge*

INDIGENIZING EDUCATION FOR SUSTAINABILITY : INTEGRATING CULTURAL HERITAGE AND LOCAL KNOWLEDGE INTO CURRICULUM

Bonomali Bori

Department of Economics, Mariani College, Mariani, Jorhat, Assam, India
Corresponding author : bonobori2012@gmail.com

ABSTRACT :

In an era marked by ecological crises and cultural homogenization, education systems face the dual challenge of cultivating sustainability while honoring cultural diversity. This seminar investigates how educational frameworks can be transformed through the integration of indigenous knowledge and cultural heritage, thereby fostering more meaningful, place-based, and sustainable learning. Drawing from global and local case studies, the presentation outlines pedagogical strategies such as storytelling, land-based learning, place-centred curricula, and participatory projects that embed indigenous worldviews within mainstream schooling. It examines both successes and challenges: e.g., language barriers, epistemic tensions between Western science and local knowledge, teacher training gaps, and institutional resistance. The seminar argues for a decolonial approach to curriculum design, one that positions indigenous knowledge not as an 'add-on' but as a co-equal epistemology, ensuring that students learn from multiple worldviews and that local heritage becomes central to sustainability education. Further, the presentation highlights collaborative models where indigenous elders, community members, and educators co-create content and pedagogy, ensuring authenticity and empowerment. Ultimately, this approach fosters learners who are not just environmentally literate but culturally grounded and socially responsible. In weaving together education, heritage, and sustainability, the seminar offers a vision for educational transformation, one that bridges global challenges with local wisdom and prepares future generations to steward both people and planet.

Keywords : *Cultural heritage, Sustainability education, Decolonial pedagogy, Place-based learning, Curriculum innovation, Community engagement, Epistemic pluralism*

CULTURAL HERITAGE AND INDIGENOUS KNOWLEDGE IN FISHERIES : PATHWAYS TO SUSTAINABLE AQUACULTURE AND BIODIVERSITY CONSERVATION

Bhargov Bora

Girjananda Chowdhury University, Azara, Guwahati- 781017, Assam, India
Corresponding author : Sumanbora11@gmail.com

ABSTRACT :

This chapter explores the vital role of cultural heritage and indigenous knowledge (IK) in shaping sustainable aquaculture practices and conserving aquatic biodiversity. Drawing from case studies across India and global indigenous communities, it highlights how traditional ecological knowledge (TEK), community-based governance, and spiritual-ritual practices contribute to ecosystem resilience, food security, and socio-cultural continuity.

Keywords : *Cultural heritage, Sustainable aquaculture, Biodiversity conservation, Traditional ecological knowledge (TEK).*

REPERCUSSIONS OF CLIMATE VARIABILITY ON WATER RESOURCES : A PERIPHERAL FOCUS

Dhananjoy Biswas

Department of Political Science, Mariani College, Mariani, Jorhat, Assam

Corresponding author : biswas.dhananjoy87@gmail.com

ABSTRACT :

Climate variability itself implies that the climate of the future will be different from the past and present as well. The indiscriminate meddling with nature is discernible and has already caused enormous stress on all other segments of nature, including water. Reduced surface water levels, rising sea levels along most of the coasts, rapidly disappearing sea icebergs, harming and death of aquatic creatures, and polluting drinking water in unprecedented ways are, to name a few, the axiomatic effects of climate change on water resources. Its repercussions are ubiquitous and scattered. None can spare and are immune to its impacts; nevertheless, the sufferings differ by region, sector, scale, and segment, and are surely severe for the marginalized and vulnerable segments of the world. People, especially those from the underdeveloped regions engaging in agriculture, fishing, and farming, as well as those who live close to the natural environment and forests, are bound to suffer acutely as a result of climate variability. People from marginalized sections are still lacking access to safe drinking water and proper sanitation, and are facing waterborne diseases and water-related conflicts, and losing life due to devastating floods and droughts. Disturbing precipitation patterns and variations in rainfall, which impact cropping patterns and jeopardize the livelihood of the marginalized and disadvantaged sections, are some of the repercussions of climate variability that the disadvantaged sections experience frequently. Therefore, anticipating the future in light of climate variability forecasts is a paramount challenge of our era. Hence, the paper aims to look at the repercussions of climate variability on water resources and its severity on the marginalized.

Keywords : *Climate variability, Water resources, Cropping patterns, Marginalised farmers*

QUALITY OF GROUND WATER OF DIFFERENT AREAS OF KALIABOR CO-DISTRICT OF NAGAON, ASSAM

Pratap Medhi, & Manisha Goswami

Department of Chemistry, Kaliabor College, Nagaon, Assam, India

Corresponding author : pratapmedhi71@gmail.com

ABSTRACT :

Groundwater quality typically describes how the chemical, physical, and biological characteristics of groundwater are evaluated to determine its suitability for drinking and irrigation. The purity of water cannot be measured by visibility and odour. Even clean water might contain impurities. This study highlights the importance of the assessment for sustainable resource management and public health. This study is mainly based on the investigation of the quality of groundwater of different villages of Kaliabor Co-District of Nagaon (Assam).

Keywords : Sustainability, Public health, Purity of water, Nagaon, Assam.

PARTHENIUM HYSTEROPHORUS L. : A HEALTH HAZARD PLANT AND ITS MANAGEMENT STRATEGIES

A. Kutum¹ & M. Chetia²

¹ Department of Botany, D. R. College (Autonomous), Golaghat, Assam, India

² Department of Chemistry, D.R. College (Autonomous), Golaghat, Assam, India

Corresponding author : animakutum.drc@gmail.com

ABSTRACT :

A survey was carried out on the *Parthenium hysterophorus* L. (Asteraceae), a notorious invasive plant that has spread across many regions of Golaghat district in Assam. It is commonly referred to as "gajar gha" due to its resemblance to the carrot plant. It poses significant global challenges, causing severe health issues in humans and animals, such as dermatitis, asthma, and bronchitis, as well as agricultural losses and threats to biodiversity. Farmers often face increased costs for weed management and reduced productivity. The use of chemical herbicides, such as glyphosate and atrazine, presents significant environmental hazards and has led to the development of resistant weed species. Alternative methods, including specific plants like *Cassia tora* and *Imperata cylindrica*, effectively suppress *Parthenium*. This paper explores the challenges and strategies in managing the invasive weed, *Parthenium hysterophorus*.

Keywords : *Parthenium, Health issues, Weed management, Environmental hazards.*

CLIMATE CHANGE : ITS IMPACT ON WATER RESOURCES AND BIODIVERSITY

Madhulika Dutta

Department of Zoology, C N B College, Bokakhat, Assam, India
Corresponding author : duttamadhulika@gmail.com

ABSTRACT :

Climate change harms water supplies by changing how much rain falls, causing more droughts, and raising temperatures. These changes harm wildlife by messing up their natural homes, changing how animals act, and possibly leading to the loss of some species. To deal with these connected problems, we need a combined strategy that involves protecting water supplies, building strong systems that can handle climate change, and making plans to protect nature that take into account how water, climate, and wildlife are all connected. Climate change is changing how rain and snow fall, causing some areas to have more droughts and others to face more floods. This makes it harder to know when and how much water will be available. Higher temperatures in the air and oceans are changing the way water moves through the environment, which can cause shortages and make water less clean. As people use more water for farming, energy, and industry, this increased demand, along with climate change, is putting more stress on water supplies. These changes in water levels and quality also harm the homes of many species, especially those in freshwater areas. Many animals and plants are very sensitive to water temperature and how much water is available. For example, warmer streams could make it impossible for some species to survive because they can't handle the heat. Climate change can also change when animals and plants reproduce, how they behave, and when they grow, which can mess up the balance of nature. A comprehensive strategy is necessary that connects water management with climate preparedness and protecting nature. Upgrading and building infrastructure like drainage systems and restoring floodplains can help deal with water-related dangers. Planting trees and protecting wetlands can strengthen ecosystems and provide a more reliable water source. Using farming methods that save water and collecting rainwater can lower water shortages and help keep water sources healthy. Clear policies should be created by the Government that recognize the importance of natural resources and promote teamwork between different sectors to handle these linked challenges.

Keywords : *Climate change, Water resources, Biodiversity conservation, Freshwater ecosystem*

CULTURAL HERITAGE OF THE FISHING COMMUNITIES OF ASSAM

Bikash Dutta

Department of Political Science, Mariani College, Mariani, Jorhat, Assam, India
Corresponding author : bikashdutta.2009@rediffmail.com

ABSTRACT :

The fishing communities of Assam, notably the Jalia/Kaibarta, Mising (Mishing), Rabha, and other riverine groups, possess a distinctive cultural heritage that is both material and immaterial. Their heritage includes traditional fishing technologies (nets, traps, boat-types and seasonal gear), river-based lifeways and settlement patterns, specialized ecological knowledge of the Brahmaputra and its linked ecosystems, ritual and festival practices associated with communal fishing, oral traditions and caste/occupational identities, and social institutions (guilds, cooperatives and communal rules) that regulate access to aquatic resources. These elements together shape local identity, food security and intergenerational knowledge transmission across Assam's floodplain landscapes.

Traditional fishing practices are often communal and seasonal. Ethnographic and development studies document events such as community fishing drives and cooperative harvests (for example, the Rabha "Bahow" style of community fishing), where harvesting is both an economic activity and a social ritual that reinforces solidarity, transmits skills (especially from elders to youth), and reaffirms customary resource-sharing norms. Women play central roles in many of these practices, from net-making and processing fish to participating in communal harvests, underscoring gendered dimensions of cultural knowledge.

Material culture - boats, indigenous net types, fish-traps, curing and smoking implements, and fishing-related craft skills embodies centuries of adaptation to Assam's dynamic riverine ecology. Local taxonomy of fish, seasonal calendars tied to monsoon and flood cycles, and place-based ecological indicators (for spawning grounds, beels, and channels) reflect a sophisticated environmental knowledge that supports sustainable livelihood strategies when community governance is strong. Studies of Kaibarta and Mising gear and methods show persistent use of indigenous technologies alongside selective adoption of modern equipment.

Keywords : *Community fishing, Kaibarta, Mising, Rabha, Fisherfolk, Assam*

BIODIVERSITY OF EDIBLE INSECTS : A STUDY IN TITABOR SUB-DIVISION OF JORHAT DISTRICT, ASSAM

Junmoni Boruah

Department of Zoology, Kakojan College, Kakojan, Jorhat, Assam

Corresponding author : junmonikc@gmail.com

ABSTRACT :

Edible insects are very popular among the tribes of Assam because it gives the alternative food. It has been found that insects form part of the traditional diet of at least two billion people in the world. More than 1900 species have reportedly been used as food in India. The edible insects provide food to many tribes of north-east India. Besides as food, these insects also play an important role as a pollinator of flowers and biological pest control. These insects are highly nutritious with higher fat, protein, vitamins, and fiber. The Thengal Kachari is one of the major plain tribes of Upper Assam. The people from this tribe have chosen edible insects as a sustainable source of food in their day-to-day life, which has been practiced since childhood. Some edible insects like cricket, grasshopper, beetle larva, silk worm larva (domestic), locust, etc., are consumed by the Thengal Kachari tribe in Assam. The main objective of the paper is to study the impact of edible insects as alternative food sources, as well as their preservation by the Thengal Kachari tribe to maintain ecological balance. For this purpose, the Titabor sub-division of Jorhat district has been selected as the study area.

Keywords : *Edible insects, Biodiversity, Sustainability,
Tribal community, Pest management*

EXPLORATION AND ENLISTING OF EDIBLE AQUATIC MACRO-INVERTEBRATES OF POBA RESERVE FOREST, DHEMAJI, ASSAM, INDIA

*Jitu Chutia¹, Purbajyoti Saikia¹,
Muhammed Khairujjaman Mazumder¹, Devid Kardong²*

¹ Department of Zoology, Dhemaji College, Dhemaji, Assam, 787057, India

² Department of Life Sciences, Dibrugarh University, Dibrugarh, Assam, 786004, India

Correspondence author : jituchutia.j.c@gmail.com

ABSTRACT :

Aquatic macro-invertebrates are important components of the diet across different communities of the world. In India, most ethnic tribes consume different invertebrates as important sources of protein, as a local delicacy, and a taboo. However, systematic explorations of such edible macro-invertebrates from Assam are extremely limited. In the present study, a survey was conducted to enlist edible aquatic macro-invertebrates found in the water bodies of the Poba Reserve Forest (RF) (Dhemaji, Assam) and its fringe villages during the period 2024-2025. The survey included a questionnaire (open and closed-ended) with local people (110 respondents), field and market visits. The vegetation of the Poba RF is broadly tropical evergreen, with high rainfall and humidity. The RF is located on the north bank of the mighty Brahmaputra River, and is a transitional region between the Brahmaputra River and the Eastern Himalayas, making it timid to wildlife. Altogether 13 freshwater edible macro-invertebrate species, 6 belonging to the phylum Arthropoda, including *Cybister tripunctatus*, *Lethocerus indicus*, *Sartoriana spinigera*, *Barytelphusa* sp., *Lobothelphusa woodmasoni*, *Macrobrachium assamense*, and 7 belonging to the phylum Mollusca, including *Bellamya bengalensis*, *Pila globosa*, *Brotia costula*, *Parreysia corrugata*, *Lamellidens marginalis*, *Lamellidens corrianus*, and *Parreysia favidens* were recorded. These invertebrates are consumed by the local ethnic communities, such as Bodo, Mising, Ahom, Kachari, Sonowal, etc., who are harvested from the water bodies and crop fields adjacent to the RF. The most commonly consumed or harvested species

are *Sartoriana spinigera*, *Barytelphusa* sp., and *Cybister tripunctatus*. A few of the species are sold in the local market, in live or partially processed forms, at rates between INR 200 - INR 300. The local people believe that species such as *Pila globosa* and *Lethocerus indicus* have analgesic properties, while the shells of mollusks have antiseptic potentials. Interviewing the local people revealed that the abundance of species such as *Lethocerus indicus*, *Barytelphusa* sp., *Lobothelphusa woodmasoni* has declined in recent years, indicating over-exploitation of the species. Thus, it is suggested that these invertebrate species should be conserved, and their edible and ethno-zoological uses should be sustainable. The present study is expected to provide baseline information on edible aquatic macro invertebrates of the region, which may be helpful in the sustainable use of these alternative non-conventional food resources.

Keywords : *Arthropoda, Ethno-zoology, Non-conventional food, Mollusca, Sustainable uses*

FISHERIES, NUTRITION, AND FOOD SECURITY : STATISTICAL INSIGHTS INTO A SUSTAINABLE HEALTH PATHWAY, ASSAM

Achinta Saikia

Department of Statistics, Mariani College, Jorhat-785634, Assam, India
Corresponding author : achintasaikia373@gmail.com

ABSTRACT :

Fisheries play a crucial role in promoting public health, ensuring food security, and improving nutrition, particularly in developing nations where fish serve as an affordable and accessible source of animal protein and micronutrients. However, disparities in access and the effects of environmental and economic pressures raise questions about the sector's sustainability and its overall contribution to population health. This study provides statistical insights into the interrelationship between fisheries, nutritional outcomes, and food security to inform evidence-based policy planning. The study combines nationally representative fisheries production data, household consumption surveys, and health indicators. Descriptive statistics, Pearson's correlation, multiple linear regression, and logistic regression models were applied to analyze relationships between fish consumption, dietary diversity, and nutritional status indicators (BMI and prevalence of under nutrition). Spatial statistical analysis using GIS identified geographic clusters of fish-dependent populations vulnerable to food insecurity and environmental changes. Trend analysis over the past decade evaluated shifts in aquaculture and capture fisheries output. Statistical analysis revealed a significant positive correlation between per capita fish consumption and dietary diversity index ($r = 0.72$; $p < 0.01$). Logistic regression showed that a one-unit increase in household fish intake reduced the odds of under nutrition by 35% ($OR = 0.65$; 95% CI: 0.52-0.81). Temporal trends indicated that growth in aquaculture production has compensated for declines in capture fisheries, contributing to overall food supply stability. Nutrient profiling confirmed that fish

accounts for nearly 55% of animal-source protein intake and provides essential micronutrients such as omega-3 fatty acids, iron, and vitamin D. Despite these benefits, inequality in fish access remains notable, with a consumption Gini coefficient of 0.41 between coastal and inland populations. Thus, fisheries significantly contribute to sustainable nutrition and public health by improving dietary quality and food security. Regional disparities and environmental vulnerabilities necessitate equitable resource distribution and resilience-focused fisheries management. Strengthening statistical monitoring, integrating nutrition-sensitive policies, and promoting sustainable aquaculture are vital to achieving SDG-2 (Zero Hunger) and SDG-3 (Good Health and Well-Being). A statistically grounded approach to fisheries management can serve as a cornerstone for sustainable food and health systems.

Keywords : *Fisheries, Nutrition, Food security, Logistic regression, Public health, Assam*

EVIDENCE-BASED DECISION MAKING : BRIDGING THE GAP BETWEEN RESEARCH AND PRACTICE

Amarjyoti Bharali

Department of Education, Bahona College, Jorhat, Assam, India
Corresponding author: amarjyotib20@gmail.com

ABSTRACT :

In an era of information abundance and rapid social transformation, the challenge is not the lack of research but the underutilization of existing knowledge in decision-making processes. This paper explores the concept of Evidence-Based Decision Making (EBDM) as a strategic framework for bridging the persistent gap between research, practice, and policy in the domains of Library Science and Education. The study argues that while both fields generate substantial research outputs, these often remain under-communicated to practitioners and decision-makers due to weak knowledge translation mechanisms. Academic libraries, as key facilitators of information management and dissemination, hold a pivotal role in overcoming this divide.

Drawing from interdisciplinary perspectives, the paper highlights how libraries can function as knowledge brokers, curating, synthesizing, and contextualizing research evidence for educators, policymakers, and social stakeholders. Through digital repositories, open access platforms, and research support services, libraries can democratize access to credible evidence and foster a culture of data-informed decision-making. On the other hand, within the educational and social science landscape, integrating research insights into teaching practice, curriculum design, and institutional policies remains crucial to ensuring quality and relevance in learning outcomes.

The paper also examines challenges such as limited research literacy, inadequate collaboration between academics and policymakers, and institutional inertia that hinder evidence-based practices. It proposes a participatory model where librarians, educators, and researchers co-create knowledge ecosystems, spaces that encourage evidence sharing, dialogue, and mutual learning. Such an approach not only enhances the visibility and utility of research but also ensures that educational and social interventions are grounded in reliable data and contextual realities.

Lastly, this interdisciplinary framework positions libraries and educational institutions as joint catalysts for informed policy formulation, professional development, and sustainable societal progress. The study underscores that bridging research and practice through evidence-based decision-making is not merely an academic exercise but a transformative pathway toward inclusive and effective governance in education and beyond.

Keywords : *Evidence-based decision making; Knowledge translation; Academic libraries; Educational policy; Research-practice gap*

FISH DIVERSITY OF DIHINGMUKH OF UPPER BRAHMAPUTRA BASIN AND INFORMATION ON THE PROSPECT OF AQUA ECOTOURISM FOR SUSTAINABLE CONSERVATION

Anurag Protim Das¹ & Tonmoyee Mahanta²

¹ Department of Zoology, Gargaon College, Sivasagar, Assam

² Centre for Library and Information Science Studies, Dibrugarh University, Assam

Corresponding author : anuragprotim.99@gmail.com

ABSTRACT :

The northeast region of India is endowed with an abundance of aquatic resources, including swift-moving rivers, stagnant wetlands, slow-running streams, and transient ephemeral streams. The recent situation shows a sharp loss in aquatic biodiversity. The current study was conducted from January 2022 to December 2024 at Dihingmukh, an important stretch of the Upper Brahmaputra Basin of Sivasagar District of Assam. A total of 48 species from 16 families were identified from six distinct fish landing zones, comprising 25 km. Cyprinidae was the most dominant group, consisting of 15 species. The fish diversity of the area has been observed to be seriously threatened, which could result in a catastrophic loss of our biodiversity. This research aims to analyse the anthropogenic hazards, inventory of the fish community that inhabits the Dihingmukh, and explore the potential of aqua ecotourism as a conservation strategy.

Keywords : *Dihingmukh, Ornamental fish, Biodiversity, Conservation status, Aqua-ecotourism.*

WATERSHED ANALYSIS AND PROBLEMS OF SOIL EROSION IN KULSI CATCHMENT AREA, ASSAM

Chinmoyee Borpujari

Department of Geography, Mariani College, Mariani, Jorhat, Assam, India

Corresponding author : chinmoyeeb@gmail.com

ABSTRACT :

Soil erosion threatens agricultural productivity, water quality, and riverine ecosystems in the humid subtropics of Northeast India. This study uses an integrated GIS and remote-sensing approach to analyze the morphometric characteristics of the Kulsi catchment (Assam), model spatial patterns of erosion susceptibility, and identify priority sub-watersheds for conservation. Multi-source datasets — digital elevation models (DEMs), rainfall, land-use/land-cover (LULC), and soils-were used to derive drainage networks, surface runoff potential. Terrain indices such as slope, erodibility, and LS-factor were computed. The study proposes a tiered management plan emphasizing ridge-to-valley measures for the existing problems of the watershed.

Keywords : *Kulsi River; Assam; Watershed morphometry; Soil erosion risk; LULC; Hydrological modeling; Conservation.*

ACCOUNTING RESEARCH: A BRIDGE BETWEEN FINANCIAL TRANSPARENCY AND DECISION-MAKING

Kritika Agarwal¹ & Ritika Agarwal²

¹ Department of Accountancy, Mariani College, Mariani, Jorhat, Assam, India

² Department of Humanities, Jorhat Engineering College, Jorhat, Assam, India

Corresponding author : kritikaagarwal429@gmail.com

ABSTRACT :

In today's globalised and data-driven business environment, accounting has moved beyond mere record keeping and serves as a backbone of effective business and policy decisions, enabling more transparent, evidence-based based and ethical decision making. The main aim of the study is to examine the role of accounting research in connecting academia, professional stakeholders, and policymakers to enhance financial transparency and sustainable economic growth. The paper explores the impact of accounting research on better corporate governance and regulatory practices in the area of financial reporting, auditing, and sustainability accounting to foster sustainable financial practices and strategic decision-making. The study also attempts to identify the challenges faced in translating the research outcome into policy and professional practices. The study is completely based on secondary data. The data required for the study have been collected from global accounting frameworks as IFRS and GAAP, financial statements, and research journals. The findings of the study reveal that Accounting Research is not merely theoretical but dynamic for bridging the gap and shaping transparent, accountable, and informed decision-making. It contributes to improved financial reporting quality and corporate accountability, and also focuses on ESG (Environmental, Social, and Governance) reporting.

Keywords : *Accounting Research, Financial Transparency, Decision-making, Sustainability, ESG Reporting.*

INDIGENOUS KNOWLEDGE AND SUSTAINABLE POTTERY TRADITIONS AMONG THE KUMAR COMMUNITY OF MAJULI, ASSAM

Niranjan Borah

Department of Anthropology, Nandalal Borgohain City College, Dibrugarh, Assam

Corresponding author : borah.niranjan@gmail.com

ABSTRACT :

Indigenous knowledge refers to traditional wisdom and skills passed down through generations within indigenous communities, rooted in their close and sustained interaction with nature. It is based on long-term observation, experience, and engagement with the environment. This knowledge spans various domains, including agriculture, medicine, art, culture, and resource management. Indigenous knowledge plays a vital role in promoting sustainable development and preserving cultural identity, connecting people to their environment and guiding them in maintaining ecological balance. This paper explores the interconnection between indigenous knowledge, cultural heritage, and sustainability among the Kumar community of potters in Assam, with a special focus on Salmora village in Majuli. The Kumar community, an indigenous group historically renowned for their pottery and boat-making skills, has long relied on river clay pottery as a primary livelihood. Despite facing increasing threats from riverbank erosion and changing market dynamics, the community continues to uphold its traditions. Kumar women, in particular, play a vital role in practicing and transmitting pottery skills and marketing finished products. The community has preserved ancient techniques of clay craft that reflect a profound relationship between humans and their natural surroundings. However, modernization, environmental degradation, and declining market demand present significant challenges to the survival of these traditional practices. The indigenous knowledge of the Kumar potters holds not only cultural significance but also serves as a valuable model for sustainable rural development in Assam. This study is based on extensive fieldwork, including observations, interviews, and focus group discussions with individuals from different age groups, as well as data from secondary sources.

Keywords : *Indigenous knowledge, Pottery tradition, Kumar community, Cultural heritage, Traditional craft, Sustainability, Majuli, Assam*

A STUDY ON SUSTAINABLE ENVIRONMENT : CHALLENGES, OPPORTUNITIES, AND SOLUTIONS

Parthana Gogoi

Department of Education, Mariani College, Mariani, Jorhat, Assam

Corresponding author : parthanao65@gmail.com

ABSTRACT :

This abstract emphasizes the importance of adopting a holistic, sustainable environment for the betterment of human lifestyle without endangering the resources of future generations. This abstract highlights the challenges posed due to the scarcity of clean water, different types of health issues due to insufficiency of clean water, environmental degradation due to hazardous air pollutants, climate change, deforestation driven by rapid industrialization, urbanization, and population growth. It explores the effective strategies and solutions for promoting sustainability among people, sustainable development, conserving natural resources, reusing and recycling, taking actions to reduce negative environmental impacts, protecting biodiversity, and minimizing pollution. There are also many opportunities to move toward a sustainable future. The use of renewable energy sources such as solar, wind, and hydro power can greatly reduce pollution and dependence on fossil fuels. A sustainable environment primarily helps to promote eco-friendly lifestyles, recycling, sustainable agriculture, and proper waste management can also contribute to a cleaner environment. Educational institutions, government policies, and community participation play a key role in spreading awareness and encouraging sustainable practices. Achieving a sustainable environment is not the responsibility of any one sector or one city, but rather it is the responsibility of everyone. Smart city planning can transform cities into a healthier and more efficient environment for now and for future generations. Thus, we can conclude that one small step towards sustainability, such as promoting waste management, planting numerous trees, and supporting sustainable products, can create a healthier and more balanced planet.

Keywords : *Sustainability, Conservation, Recycling, Environment, Environmental protection*

STATUS OF SOME PHYSICOCHEMICAL PARAMETERS OF FOUR HISTORICAL PONDS OF JORHAT, ASSAM

Priyanka Saikia¹, ShymolimaHazarika² & Manashi Bortamuly³

¹ Department of Life Sciences, Dibrugarh University, Dibrugarh, Assam,

² Titabar, Jorhat, Assam, India

³ Department of Zoology, Nandanath Saikia College, Titabar, Assam

Corresponding author : manashibortamuly@gmail.com

ABSTRACT :

Jorhat, a historically significant district of Assam, India, is home to several ancient water bodies excavated during the Ahom reign. Among these, Rajmao Pukhuri, Mithapukhuri, Bongalpukhuri, and Tinikunia Pukhuri are the most renowned. The present study was undertaken to evaluate the physicochemical characteristics of these ponds to assess their current ecological status and conservation needs.

The analysis revealed that Rajmao Pukhuri and Tinikunia Pukhuri possess comparatively better water quality, with higher dissolved oxygen (DO) levels, 11.13 mg/L and 8.35 mg/L (pre M) and 10.12 mg/L and 6.82 mg/L (post M.), respectively. In contrast, Mithapukhuri and Bongalpukhuri showed lower DO values 3.05 and 2.98 mg/L (pre M.) and 2.25 mg/L and 0.60 mg/L (post M.) respectively, indicating greater organic pollution. Regarding free CO₂ concentration, it was found to be 11.13 and 11.35 mg/L in Bongalpukhuri and 12.28 and 12.45 mg/L in Tinikunia Pukhuri during pre- and post-monsoon seasons. The pH values indicated that Rajmao Pukhuri (6.19 Pre M. and 6.00 post M) and Tinikunia Pukhuri (6.70 Pre M. and 6.00 post M.) were less acidic compared to Mithapukhuri (5.80 Pre M. and 6.20 Post M.) and Bongalpukhuri (5.15 pre M. and 6.40 post M.). Turbidity levels were generally higher during the pre-monsoon season across all sites.

Overall, the findings suggest that all these historical ponds are under threat, although Rajmao Pukhuri and Tinikunia Pukhuri are relatively less polluted and ecologically safer than Mithapukhuri and Bongalpukhuri. Conservation and restoration of these historically significant aquatic ecosystems are essential to preserve both their ecological integrity and cultural heritage.

Keywords : Water parameters, Historical ponds, Jorhat, Assam.

WEAVING WISDOM : INTEGRATING INDIGENOUS KNOWLEDGE SYSTEMS AND CULTURAL HERITAGE FOR ENHANCED ECOLOGICAL AND ECONOMIC SUSTAINABILITY IN NORTHEAST INDIA

Sujay Borthakur & Pratyosh Gogoi

Department of English, Kaliabor College, Kaliabor, Nagaon, Assam, India

Corresponding author : sujay.or.borthakur@gmail.com

ABSTRACT :

Prevailing sustainability frameworks frequently emphasize technological innovation, often overlooking the value of indigenous knowledge (IK) systems and cultural heritage in resource management and environmental stewardship. Traditional practices in Northeast India-developed through sustained interaction with the region's ecosystems-provide holistic, context-sensitive approaches to biodiversity conservation, food security, and social well-being. This paper investigates the relationship between cultural heritage, indigenous knowledge systems, and sustainability in Northeast India.

This study examines the Ethnic Hub at Kaliabor College, established under the institution's Centre for Promotion of Local Language, Art and Culture, as a case of integrating traditional weaving knowledge into formal education for sustainable development. The Ethnic Hub serves as a site for experiential learning, enabling students to acquire weaving skills rooted in the indigenous practices of Assam. Through a qualitative methodology that incorporates participant observation, semi-structured interviews with student participants, and analysis of institutional records, the study documents how engagement in weaving supports both cultural preservation and economic self-sufficiency for students.

Findings indicate that the structured transmission of weaving knowledge contributes to skill development, while also fostering a sense of community identity and cultural continuity. Students' participation in the Hub has led to increased self-reliance, with several students beginning to generate independent income through their craftwork. The study also highlights the Hub's role in promoting gender-inclusive participation and intergenerational knowledge exchange. Based on these outcomes, the paper argues for the inclusion of indigenous skill-based education within higher education curricula as a viable pathway toward sustainability and empowerment.

Keywords : *Cultural heritage, Sustainability, Traditional ecological knowledge (TEK), Co-management, Northeast India, Community conservation.*

USE OF ORCHIDS IN THE INDIAN VEDIC AND POST-VEDIC MEDICINAL SYSTEM

Bhaskar Buragohain

Department of Botany, Mariani College, Mariani, Assam, India, 785 634

Corresponding author : bhaskar.mariani@gmail.com

ABSTRACT :

The use of orchids in India can be traced back to the Vedic period. The traditional medicine system of India has been advocating the use of orchids since the Vedic and post-Vedic ages. Ayurveda is the documented form of medicinal science of the Vedic period. In the indigenous medicinal system of India, as many as 40 sp. of orchids have been used as ingredients of various medicines. Some of which are well documented in Ayurveda. Ashtawarga, a Vedic documentation, is a group of eight plants of which 4 belong to the family Orchidaceae, Viz. Jivaka (*Crepidium acuminatum*); Rishabhaka (*Malaxis muscifera*); Riddhi (*Habenaria intermedia*); Vriddhi (*Habenaria edgeworthii*) other four are Meda (*Polygonatum verticillatum*); Mahameda (*Polygonatum cirrhifolium*); Kakoli (*Roscoea purpurea*); and Kshirakakoli (*Lilium polyphyllum*). They were known to impart Jeevaniya - Vitality, Vayasthapan - revival of youthful conditions, body nourishment, and antioxidant effects. The great Ayurvedic sages Charak and Sushrut made mention of 5 of the Astavarg plants for use in Chyavanprash, which is still considered as best herbal tonic. The very common drugs of Ayurveda, Jivanti (*Pholidota articulata*) and Rasna (*Vanda roxburghii*) are orchids, which have been used in Ayurvedic drug preparation from the past centuries. The major chemical constituents reported from orchid species are alkaloids, terpenoids, flavonoids, and stibenoid. All the orchid species of the world are categorized as endangered plants due to their high rate of extinction, therefore conservation measures on a local and global basis must be undertaken to save this precious family : Orchidaceae.

Keywords : *Ayurveda, Medicine, Orchids, Ashtawarga, Chyavanprash*

HYDROPHYTIC FLORA AND THEIR LOCAL USES AS FOOD : A CASE STUDY IN JORHAT DISTRICT OF ASSAM

Bobita Phukan Borah

Department of Botany, Mariani College, Mariani, Assam, India

Corresponding author : babitaphukan2016@gmail.com

ABSTRACT :

Hydrophytes are plants adapted to grow in water or extremely wet environments and play a vital role in maintaining aquatic ecosystems. Based on their relationship with the aquatic habitat, hydrophytes are broadly classified into four groups-free-floating hydrophytes, rooted hydrophytes with floating leaves, rooted submerged hydrophytes, and rooted and emerged hydrophytes found in shallow or marshy areas. Common examples include *Nymphaea* (water lily), *Nelumbo* (lotus), *Lemna* (duckweed), *Marsilea*, *Salvinia*, *Pistia* (water lettuce), *Eichhornia* (water hyacinth), and several species of algae. These plants provide food and shelter to aquatic fauna, serve as substrates for benthic invertebrates, and act as an important food source for herbivorous wildlife. Many hydrophytes are also consumed by humans and have medicinal value due to their rich mineral content, being used in traditional remedies.

The present study was conducted in the Jorhat district of Assam, located along the banks of the Brahmaputra River, which contains numerous wetlands, beels, and ancient tanks such as Borsala Beel, Sarala Beel, Rajmao Pukhuri, and Bongal Pukhuri. Random field surveys were carried out in these wetland and marshy areas to document the diversity of hydrophytic flora. The study aims to highlight the variety of hydrophytes present in greater Jorhat, examine their ecological and plant community interactions, and explore their ethnobotanical significance. Emphasis has been given to the sustainable utilization of these aquatic plants for future ecological and socio-economic benefits.

Keywords : *Hydrophytes, Wetland, Diversity, Ethnobotanical.*

METAL-CATALYZED C-H BOND ACTIVATION AND ANNULATION REACTION FOR THE SYNTHESIS OF PYRIDO QUINAZOLINONES

Gauri Duarah

Department of Chemistry, Mariani College, Jorhat, Assam, India

Corresponding author : gauriduarah@gmail.com

ABSTRACT :

Quinazoline-4(3H)-ones and their derivatives represent an interesting class of nitrogen-containing heterocycles because of their occurrence in a wide range of pharmaceutically important natural products, drug candidates, agricultural chemicals, and functionalized organic materials. They exhibit a wide range of biological and pharmacological properties, e.g., protein tyrosine kinase inhibitory, cholecystokinin inhibitory, anti-microbial, anticonvulsant, sedative, hypotensive, anti-depressant, anti-inflammatory, and anti-allergy properties. Some of these compounds also have interesting biological properties, such as anti-malarial activity, biofungicide, and diuretic properties. Among a lot of quinazolinone derivatives, pyrido-fused quinazolinones play a vital role in drug discovery and development are recognized as a useful class of organic scaffolds in medicinal chemistry that exhibit unique biological and pharmaceutical properties. Specifically, these compounds exhibit strong tuberculostatic activity. Many efficient procedures have been developed to access quinazolinones. Representative fused quinazolinones in natural products and drug discovery research are illustrated in Figure 1.

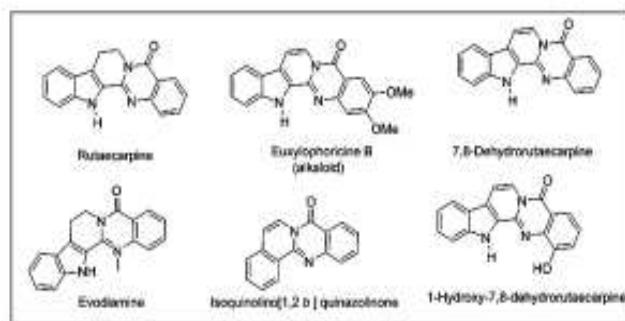


Figure 1 : Biologically active pyrido-fused quinazolinone natural products.

Keeping the remarkable value of quinazolinones and their analogs in mind, chemists have developed various methodologies for their synthesis. Conventional methods suffer from various disadvantages. Although there are numerous reported methods for the synthesis of these organic scaffolds, the development of easy, simple, atom-economic approaches is still desirable. The general procedures for the preparation of tricyclic pyrido-fused quinazolinones involve the lactamization of 2-(pyridin-2-ylamino)benzoic acid, which is prepared by the reaction of 2-chlorobenzoic acid and 2-aminopyridine. In this work, we have tried to develop a new method for the construction of this scaffold using vinyl quinazolinones and alkyne as the starting materials.

Keywords : *C-H/N-H activation, Ru catalysis.*

CULTURAL HERITAGE AND SUSTAINABILITY OF THE AHOM COMMUNITY : A STUDY OF HULUNGAPARA, ASSAM, INDIA

Himanta Pratim Borgohain

Department of Sociology, Dr. Nobin Bordoloi College, Jorhat, Assam, India

Corresponding author : borgohainhimanta38@gmail.com

ABSTRACT :

The Ahom community is well known for its rich cultural heritage and historical significance within Assam and India. The community faced numerous challenges in the process of preserving traditions and practices due to assimilation, modernization, and environmental changes. The study focuses on exploring the cultural heritage of the Ahom community in Hulungapara and analyzing the sustainability of their cultural practices in the context of recent challenges. Through the analytical approach, the researcher investigates to identify core factors that together contribute to the preservation and sustainability of the Ahom cultural identity.

Keywords : *Cultural Heritage, Sustainability, Community, Ahom community*

THE BIOCHEMISTRY OF THE LEAF EXTRACT OF TERMINALIA MYRIORCARPA (COMBRETACEAE)

Koustuv Buragohain¹ & Liza Handique²

¹ Department of Life Science & Bioinformatics, Assam University, Silchar, Assam, India

² Department of Botany, J. B. University, Jorhat, Assam, India

Corresponding author : koustuvburagohain632@gmail.com

ABSTRACT :

Terminalia myriorcarpa, the East-Indian Almond, (Assamese name- Hollock) is a tree species in the genus Terminalia under the family Combretaceae. Found in the countries of Southeast Asia. This is a timber and landscape tree native to India and South East Asia; the range of natural distribution extends from the Himalayan foothills east to Myanmar, Thailand, Malaysia, Indonesia, Nepal, Bangladesh, and South China. *T. myriorcarpa* is an evergreen tree, attaining a height of 35 m in the forest, but is typically 15-25 m tall in open areas. The trunk is usually straight with large buttresses, supporting a wide, branching crown made up of long, slender, gently dropping branches. Leaves opposite; petiole 0.5-1.5 cm, stout, with 2 stalked glands at apex; leaf blade oblong-elliptic or oblong-lanceolate, thickly papery, brownish when young, hairy abaxially and subglabrous adaxially. The blooming occurs between summer to autumn, coinciding with the rainy season in its native range. The qualitative estimation of the biochemical metabolites in *T. myriorcarpa* was done, and the presence of the following compounds is confirmed, viz., alkaloids, tannins, flavonoids, lignin, etc. The quantitative estimation of the metabolites, such as phenolics, flavonoids, DPPH assay, and GC-MS analysis, was performed, and the leafextract was found to have a high amount of phenol, flavonoid, flavonol, and phytochemical contents. Antioxidant property was also estimated.

Keywords : *Terminalia myriorcarpa, Leaf extract, Phytochemical, Bioactive compounds, Alkaloids, Antioxidant*

ECOLOGICAL SIGNIFICANCE OF ASSAMESE RITUALS

Mouchumi Phukan

Department of Assamese, Auniati University, Jorhat, Assam, India
Corresponding author : mouchumiphukon999@gmail.com

ABSTRACT :

The ecological significance of Assamese rituals lies in their profound interconnection with nature, reflecting a harmonious relationship between cultural practices and environmental conservation. Assam's indigenous traditions, deeply rooted in agrarian and riverine lifestyles, embody ecological wisdom passed down through generations. Rituals such as Bihu, Ali-Aye-Ligang, Kati Bihu, and Me-Dam-Me-Phi are not merely cultural celebrations but serve as mechanisms for sustaining biodiversity, maintaining soil fertility, conserving water, and protecting flora and fauna. For instance, Bohag Bihu marks the onset of the agricultural cycle and reinforces the community's dependence on seasonal changes, emphasizing respect for natural resources and sustainable farming practices. Similarly, Kati Bihu rituals, like lighting earthen lamps near paddy fields, symbolize prayers for crop protection and act as a form of pest control rooted in traditional ecological knowledge. The reverence for trees, animals, and water bodies in folk worship, such as offering prayers to the Tulsi plant, serpent deities, and the Brahmaputra River, demonstrates how spiritual beliefs function as cultural tools for ecosystem preservation. Tribal festivals like Ali-Aye-Ligang among the Mishing community promote organic cultivation and prohibit hunting or deforestation during the sowing period, highlighting a deep sense of ecological ethics. Moreover, rituals involving sacred groves and community forests, such as Than and Devalaya worship, indirectly contribute to forest conservation and biodiversity maintenance. Through oral traditions, songs, and folk performances, Assamese rituals transmit environmental values to younger generations, reinforcing community-based stewardship of nature. In a time of rapid modernization and environmental degradation, these eco-centric traditions hold critical relevance, offering sustainable models of human-nature coexistence. By merging cultural identity with environmental consciousness, Assamese rituals illustrate that ecological balance is not a new scientific discovery but a lived philosophy embedded in traditional wisdom. Thus, understanding and preserving these rituals is essential not only for safeguarding Assam's cultural heritage but also for promoting an inclusive and sustainable approach to environmental conservation in the broader context of global ecological resilience.

Keywords : *Assamese rituals, Ecological significance, Traditional knowledge, Environmental conservation, Sustainable culture*

A STUDY ON TRADITIONAL KNOWLEDGE FOR CONTROLLING STORED GRAIN PESTS IN MAJULI DISTRICT, ASSAM

Prasanna Hazarika

Department of Zoology, Kakojan College, Kakojan, Jorhat, Assam, India
Corresponding author : hazarikaprasann82@gmail.com

ABSTRACT :

In the developing countries, substantial losses occur annually on various stored commodities due to damage by insects and other organisms during the post-harvest handling processes. World storage losses for all grains have been estimated as about 10% of the annual production, which in quantitative terms is over 100% million tonnes. The stored grain pest can be controlled by preventive measures, proper storage, and disinfection methods. The majority of people of Majuli used different traditional methods for controlling stored grain pests. Different traditional management strategies applied by farmers in Majuli District for controlling stored grain pests are listed and discussed here.

Keywords : *Traditional, Stored grain pests, Traditional management*

TREES AND TRADITIONAL BELIEFS IN ASSAM : INDIGENOUS KNOWLEDGE AND BIODIVERSITY CONSERVATION

Ranajit Gogoi

Department of Geography, Dr. Nobin Bordoloi College, Jorhat, Assam, India
Corresponding author : ranajitgogoi228@gmail.com

ABSTRACT :

The complex relationship between human societies and the natural environment has long been studied through cultural beliefs and practices. In Assam, trees hold a sacred place in the social, religious, and ecological apprehension of its people. Traditional Assamese society, comprising diverse ethnic and tribal communities, has maintained a harmonious coexistence with nature through rituals, taboos, and indigenous conservation ethics. The worship of trees and their symbolic integration into Assamese communities' spiritual lives are examined in this paper, along with how these long-held beliefs support biodiversity preservation. The study looks at real-world instances of ecological stewardship, ritual tree worship, and sacred groves using secondary research techniques. The results show that Assamese practices surrounding trees are not merely superstitions but rather reflect a pragmatic ecological ethic based on sustainability. The study concludes that community-based environmental management in Assam might be greatly strengthened by the resuscitation and incorporation of indigenous belief systems into contemporary conservation strategy.

Keywords : *Trees, Traditional beliefs, Assam, Indigenous Knowledge, Biodiversity Conservation, Sacred Groves*

**DEGUMMING POTENTIAL OF RHIZOSPHERE FUNGI
ASSOCIATED WITH
RAMIE (BOEHMERIA NIVEA L. GAUD)**

Rubul Saikia

Department of Botany, Mariani College, Mariani, Jorhat-785634, Assam, India

Corresponding author : drrubulsaikia@gmail.com

ABSTRACT :

Ramie (*Boehmeria nivea* L. Gaud), one of the strongest natural textile fibres known as 'steel fibre', is obtained from the bark of a plant belonging to the family Urticaceae. Despite its high potential in the textile industry, ramie remains underutilized due to the difficulty of fibre extraction. This study investigated the rhizosphere fungi associated with ramie plants and its degumming potential. The dominant fungal species identified were *Aspergillus niger*, followed by *A. flavus*, *Penicillium italicum*, *Curvularia* species, and *Trichoderma viride*. Fungal population density peaked during the rainy season (April-August) and was lowest in winter (November-February). Thirteen fungal isolates were screened for their ability to degum ramie fibres, and four isolates belonging to the genera *Aspergillus*, *Curvularia*, and *Trichoderma* showed promising results. Among them, *Aspergillus* sp. and *Curvularia* sp. were found to be most efficient, suggesting their potential application in large-scale, cost-effective ramie fibre production.

Keywords : *Rhizosphere fungi, Ramie, Degumming.*

STUDY OF A FUZZY APPROACH TO PRISONER'S DILEMMA

Sibiya Tanbhir

Department of Mathematics, Mariani College, Mariani, Jorhat, Assam, India
Corresponding author : sibiyatanbhir98@gmail.com

ABSTRACT :

The Prisoner's Dilemma (PD) is a foundational model in game theory that illustrates the conflict between individual rationality and collective benefit. Traditionally, the PD assumes that players make crisp, binary choices-either to cooperate or defect. However, real-world decision-making often involves uncertainty, partial trust, and degrees of cooperation that cannot be captured by classical game theory. A fuzzy approach to the Prisoner's Dilemma introduces the concept of fuzzy logic to model such ambiguity, allowing players' strategies, payoffs, and perceptions to exist on a continuum between full cooperation and full defection.

In this framework, the players' choices are represented by fuzzy sets with membership functions defining the degree of cooperation. Payoffs are then computed using fuzzy inference systems, reflecting the uncertain nature of human decision-making. This approach accommodates subjective judgments, incomplete information, and emotional or contextual influences that affect rational behaviour. For instance, instead of strictly defecting or cooperating , a player might cooperate with a confidence level of 0.7, expressing partial trust based on past interactions or perceived reputation.

The fuzzy extension of the PD also refines the concept of equilibrium. Traditional Nash equilibrium assumes deterministic strategies, while a fuzzy equilibrium allows for a stable balance of partial cooperation, capturing the dynamic equilibrium often seen in social, economic, and biological systems. Studies using

fuzzy PD models have shown that the inclusion of linguistic variables (e.g., mostly cooperative, slightly selfish) leads to richer strategy evolution and promotes higher average cooperation compared to the crisp model.

Applications of the fuzzy Prisoner's Dilemma extend across disciplines—from modelling cooperation in distributed systems and multi-agent environments to analyzing trust in social networks and decision-making under uncertainty. It provides a realistic framework for understanding human-like behaviour, where decisions are rarely absolute and often influenced by fuzzy perceptions of risk, reward, and morality.

In conclusion, the fuzzy approach to the Prisoner's Dilemma bridges the gap between classical game theory and real-world behaviour by embedding uncertainty and gradation into strategic interactions. It enhances the descriptive and predictive power of the model, offering valuable insights into the emergence of cooperation and trust in complex adaptive systems.

Keywords : *Fuzzy Logic, Prisoner's Dilemma, Game theory, Fuzzy equilibrium, Cooperation, Decision-making, Uncertainty, Multi-agent systems, Trust modelling, Strategic interaction*

ETHNIC BELIEFS AND SUSTAINABLE DEVELOPMENT : INSIGHTS FROM ASSAM

Saruj Saikia

Department of Geography, Dr. Nobin Bordoloi College, Jorhat, Assam, India
Corresponding author : saikiasaruj@gmail.com

ABSTRACT :

Ethnic beliefs from an integral part of cultural identity and social organization among indigenous and ethnic communities in Assam. These beliefs often interrelated with rituals, festivals and traditional practices, influence how communities interact with their environment. This research paper prepares to explore the relationship between ethnic beliefs and sustainable development in Assam. The paper demonstrates how traditional values, religious rituals and moral codes of ethnic communities contribute to environmental conservation, resource management and social cohesion. It also discusses challenges posed by modernization and globalization and suggests strategies for preserving ethnic beliefs to promote sustainable development. This study highlights the importance of educating younger generations about traditional beliefs and responsible of care and management of environment.

Keywords : *Ethnic beliefs, Indigenous practices, Environmental conservation, Sustainable development.*

A REVIEW ON THE WATER FERN AZOLLA AS A TOOL FOR SUSTAINABLE AGRICULTURE PRACTICE FOR PLANTATION CROPS

Raj Kr. Gohain Baruah

Department of Botany, Mariani College, Mariani, Jorhat, Assam, India

Corresponding author : rkgbaruah@gmail.com

ABSTRACT :

Azolla is an aquatic fern found in freshwater bodies in warm-temperate and tropical regions of the world. The fern has a symbiotic relationship with the blue green alga *Anabaena azollae* that lives within the body cavities of the fern and fixes atmospheric nitrogen, making it available to the host. Use of *Azolla* as an N-fertilizer source in various SE Asian countries is a very old traditional practice where the fern is cultivated in the field along with rice. The N-content of *Azolla* ranges from 2%- 5% on a dry-weight basis. The fern is very easy to cultivate and harvest in the farmland itself involving little financial need. *Azolla* works as an N-source by virtue of its symbiont N-fixer and adds organic matter to soil, improves microbial biomass, soil health and fertility, releases available P and K by nutrient cycling that leads to enhanced growth and yield of rice plants. Various trials on application of this bio fertilizer as an N-source have been successful on different crops, now being used worldwide, especially in sustainable practices like organic farming and integrated nutrient management. However, *Azolla* biofertilizer has not been adequately used globally in the plantation crops sector, which conventionally depends heavily on synthetic N-fertilizers causing ecological concerns. This systematic literature review and scientific evidence could help policymakers and researchers to know the benefits of *Azolla* as a cost-effective and eco-friendly N-source. The paper tries to review the hidden potential of *Azolla* as a biofertilizer for sustainable cultivation of plantation

crops and summarizes its benefits by collecting information from different sources and presenting under different subheadings viz., organic and integrated use of *Azolla* biomass, factors affecting growth and N-fixation and the contributions in soil health, release and availability of *Azolla*-N in soil and contribution to yield of rice and plantation crops and cropping systems. Literature indicated that the use of *Azolla* biomass as green manure before transplanting or grown together with rice and left until a few days of harvest alone or integrated with other synthetic fertilizers in the wetland rice cultivation saved the N need of rice up to 60 kg N/ha, which enhances the availability of nutrients, improves soil physico-chemical properties, minimizes soil salinity and reduces soil pH. Information on *Azolla* biomass, both as single and integrated use with chemical fertilizers showed comparable and significant benefits of growth, yield as that of conventional synthetic N-source and enhancement of soil health by increasing beneficial microbes in tea and coffee soil. Further research on application of *Azolla* as a cheaper and eco-friendly alternative tool to chemical fertilizers and testing different *Azolla* species in different agro-climatic zones will help in cheaper biomass production for further environmental conservation.

Keywords : *Azolla, Anabaena, N-source, N-fertilizer, Sustainable agriculture, N-fixation, Biofertilizer*

ECOLOGICAL CONSCIOUSNESS IN JANICE PARIAT'S EVERYTHING THE LIGHT TOUCHES

Udeshna Tai

Department of English, Mariani College, Mariani, Jorhat, Assam
Corresponding author : udeshnatai@gmail.com

ABSTRACT :

In today's Anthropocene world, one of the burning issues that affect human society is environmental degradation. Janice Pariat's novel *Everything the Light Touches* (2002) explores different environmental concerns undergoing in Indian society. This paper will discuss the efforts taken by pioneers during the ecological journey in communicating with nature. Various issues related to nature connectedness will be discussed. Through the lens of environmental concerns, this paper will analyze the consequences of forest fires, air pollution, and loss of biodiversity on different regions of India. This paper will also examine how literature reflects ecological concerns and inspires change by questioning anthropocentrism and advocating sustainability.

Keywords : *Anthropocene, Biodiversity, Sustainability*

INDIGENOUS PRACTICES FOR CLIMATE-SMART AGRICULTURE IN RURAL ASSAM

Karuna Kalita¹ & Monalisha Borthakur²

¹ Department of Economics, Mariani College, Mariani, Jorhat, Assam

² Department of Geography, Mariani College, Mariani, Jorhat, Assam

Corresponding author : karunakalita.eco@gmail.com

ABSTRACT :

Agriculture in rural Assam is increasingly vulnerable to environmental and climatic challenges like erratic rainfall, recurrent floods, and shifting monsoon patterns that undermine productivity and livelihoods (Barman & Baruah 2024). Avoiding modern techno-centric solutions alone, this study emphasizes the potential of indigenous agricultural practices as foundational components of Climate-Smart Agriculture (CSA). Local knowledge in Assam may offer viable solutions : for example, traditional rice landraces like Bao-Dhan grow tall enough to survive deep-water conditions, illustrating how generational wisdom enhances resilience in flood-prone areas (Roy et al. 2024; Dialogue Earth 2024).

This study aims to document, evaluate, and integrate indigenous practices into CSA frameworks in rural Assam. It focuses on methods such as traditional rice-fish systems, indigenous seed banks, agro-forestry intercropping, and community water-management systems-each aligning with CSA goals of productivity, resilience, and mitigation. For instance, agro-forestry systems in Assam historically integrated fruit and tree crops with field crops, which enhances biodiversity and buffers climate extremes (Grow Billion Trees 2025). The present paper uses a mixed-methods approach, including appropriate quantitative and qualitative techniques for analysis. The data used are collected from both primary and secondary sources. The primary data are collected mainly from the rural areas of Jorhat district.

Keywords : *Indigenous knowledge, Climate-smart agriculture, Rural Assam, Sustainable farming, Traditional practices, Resilience*

PROBLEMS AND PROSPECTS OF MUGA SILK IN ASSAM

Anuraj Mahanta & Bukum Doley

Department of Human Resource Management, Mariani College, Mariani, Assam, India

Corresponding author : anurajma69@gmail.com

ABSTRACT :

Muga silk is among the most precious natural silks of Assam, admired for its bright golden colour, natural glow, and lasting strength. It holds a special place in the cultural and economic life of the state. Many rural families earn their livelihood through Muga silkworm rearing and weaving activities. This silk, found only in Assam, has received a Geographical Indication (GI) tag, recognizing its unique identity in both national and international markets. At present, the Muga silk industry is facing several challenges. Major issues include diseases that damage silkworms, shortage of food plants such as Som and Soalu, and the adverse effects of changing climate and environmental pollution. This study mainly focuses on problems and growth opportunities faced by muga silk producers in Assam. Despite these difficulties, the industry has promising opportunities for development. Government initiatives like Silk Samagra and the Muga Mission aim to improve seed production, plantation activities, and marketing systems. Research organizations are also assisting farmers with scientific rearing practices and better disease management. With collective efforts-such as expanding food-plant cultivation, providing technical education, ensuring financial aid, and strengthening market networks-the Muga silk sector can achieve sustainable growth.

Keywords : *Muga silk, Assam, Sericulture, Som and Soalu, Rural livelihood, Silk industry, Silk Samagra, Muga Mission*

CULTURAL HERITAGE, INDIGENOUS KNOWLEDGE, AND SUSTAINABILITY : A Study with Special Reference to North-East India

Abdul Amin

Department of English, Nakachari College, Nakachari-785635, Jorhat, Assam, India

Swami Ramnand Teerth Marthwada University, Nanded, Maharashtra, India

Corresponding author : mailme.munna13@gmail.com

ABSTRACT :

In India, from the time unknown many communities have lived in forests and they depended on nature for their livelihood. These are the indigenous communities who are known as Adivasis or Scheduled Tribes. Though these communities are spread across the country, North East India is home to over 200 indigenous communities, constituting 68% of the country's total tribal population. The cultural heritage and indigenous knowledge of these communities represent the living identity of human societies, shaping their interaction with the environment. North-East India, being a region rich in ethnic diversity and ecological resources, has long guided sustainable practices in agriculture, forest management, and biodiversity conservation. The present paper tries to explore the multifaceted relationship among cultural heritage, indigenous wisdom, and sustainability, with special emphasis on North-East Indian communities. This research takes the examples from the states such as Assam, Nagaland, Meghalaya, and Arunachal Pradesh to analyze how traditional ecological knowledge can infuse contemporary sustainability strategies. Indigenous knowledge of NE India encompasses agriculture, medicine, natural resource management, and social organization. Due to modernization, urbanization, and external cultural influences, at present, many of these traditional practices are under threat. In this context, understanding the relationship between cultural heritage, indigenous knowledge, and sustainability becomes vital. This paper attempts to highlight the importance of indigenous knowledge as a key to achieving sustainable development in North-East India.

Keywords : *Cultural Heritage, Indigenous Knowledge, Sustainability, NE India*

ZINC OXIDE NANOPARTICLES ENABLE SUSTAINABLE DISEASE MANAGEMENT IN TEA BY DUAL NUTRIENT AND ANTIFUNGAL ACTION

***Debajit Saikia^{1, 2}, Pradip Kumar Baruah²,
Satya Ranjan Sarmah³, Hemen Sarma⁴***

¹ Department of Botany, CNB College, Bokakhat, Golaghat, Assam 785612

² Department of Botany, USTM, Ri-Bhoi, Techno City, Killing Road, Baridua, Meghalaya 793101, India

³ Department of Mycology and Microbiology, Tocklai Tea Research Institute
Cinnamara, Jorhat, Assam 785008, India

⁴ Department of Botany, Bodoland University, Rangalikhata, Debogaon, Assam 783370, India
Corresponding author : debajitsaikia79@gmail.com

ABSTRACT :

Zinc oxide nanoparticles (ZnO-NPs) are emerging as nano-enabled agrochemicals with dual nutrient and antifungal functions. Yet, their role in perennial plantation crops such as tea (*Camellia sinensis*) remains unexplored. To our knowledge, this is the first greenhouse pot study showing that soil-applied ZnO-NPs can simultaneously suppress *Fusarium solani*-induced dieback and improve zinc nutrition in tea seedlings. Greenhouse pot experiments compared ZnO-NPs (3, 6, and 9 mg kg⁻¹) with ZnSO₄ under pathogen-inoculated conditions. At 30 days, inoculated controls reached a disease severity index (DSI) of 74%, whereas ZnO-NPs reduced DSI to 61%, 44%, and 33% at increasing doses, corresponding to 18-55% suppression, compared with 21% under ZnSO₄. Soil inoculum density declined by up to 69% with nanoparticles. ZnO-NP application also enhanced soil Zn bioavailability (0.84 mg kg⁻¹) and increased leaf Zn concentrations by 2.5-fold relative to controls. Physiological improvements included higher chlorophyll a and total chlorophyll, particularly at the 6 mg kg⁻¹ dose at 14 and 30 days. MBC declines at 3-6 mg kg⁻¹ (7-12%) were comparable to the natural decline in the control (11%), but dropped ~19% at 9 mg kg⁻¹, suggesting possible ecological thresholds that require validation under field conditions.

Overall, ZnO-NPs outperformed ZnSO₄ by combining controlled nutrient release with antifungal activity. The 6 mg kg⁻¹ dose emerged as the most balanced under greenhouse conditions, supporting both pathogen suppression and nutritional benefits with minimal microbial stress. These findings highlight ZnO-NPs as a potentially promising nano-enabled amendment for sustainable disease management in tea, while emphasizing the need for further validation under multi-season field conditions.

Keywords : *Acidic soils, Chlorophyll, Microbial biomass, Soil amendment, Disease severity index (DSI), Microbial biomass carbon (MBC), Zinc uptake in leaves, Sustainable disease management, Nano-enabled nutrient and antifungal strategy*

SPECTROSCOPIC MONITORING OF WATER POLLUTANTS

Jagat Ch Gogoi, Pranpriya Rajkhowa & Chironjit Hazarika

Department of Physics, Mariani College, Mariani, Jorhat, Assam

Corresponding author : rajkhowapranpriya@gmail.com

ABSTRACT :

The spectral characteristics of water depend on its nature and the presence of organic and inorganic materials. Water bodies show a strong absorption in the near- and mid-infrared region of the electromagnetic spectrum. In this work, the interaction of optical radiation with water bodies in the visible part of the spectrum is studied by using Raman scattering. Results show that fluorescence decay spectra of oil sample present in water body can be used for quantitative and qualitative estimation of oil pollution in water. It is also observed that fluorescence emission spectra of algae differ within the intensity and spectral position of fluorescence bands.

Keywords : *Optical spectrum, Fluorescence, Scattering.*

WATER FOOTPRINT ACCOUNTING AS A SUSTAINABILITY INDICATOR IN BUSINESS REPORTING

Alimpiya Bordoloi¹ & Sudipta Nayan Bhardwaj²

¹ Department of Accountancy, Mariani College, Mariani, Jorhat, Assam

² Department of Accountancy, Chandra Kamal Bezbarua College, Teok, Jorhat, Assam

Corresponding author : alimpiyab@gmail.com

ABSTRACT :

Water scarcity and environmental degradation have emerged as critical global challenges, compelling businesses to integrate scientific innovation into their sustainability strategies. Water Footprint Accounting (WFA) has gained prominence as a vital tool that enables organizations to measure, manage, and report their direct and indirect water usage. This study explores Water Footprint Accounting as a sustainability indicator in business reporting, emphasizing its role in linking corporate accountability with societal well-being and environmental stewardship.

The research focuses on two Indian companies, ITC Limited and Tata Steel Limited, both of which are recognized for their proactive water conservation measures and transparent sustainability disclosures. By analysing data from their Business Responsibility and Sustainability Reports (BRSR) and sustainability documents, the study examines how water footprint metrics are incorporated into environmental reporting practices and how these contribute to achieving national and global sustainability goals, including SDG 6 (Clean Water and Sanitation) and SDG 12 (Responsible Consumption and Production). The paper underscores that scientific tools like WFA not only enhance environmental performance and corporate transparency but also foster community well-being through responsible water management. Ultimately, the study highlights the transformative potential of integrating scientific innovation with business ethics to create a resilient and sustainable future that balances ecological preservation, social responsibility, and economic growth.

Keywords : *Water Footprint Accounting, Sustainability Reporting, Corporate Environmental Responsibility, Business Responsibility and Sustainability Report (BRSR), Societal Well-being*

CARDIOPROTECTIVE EFFECTS OF MELATONIN IN NICOTINE-INDUCED SWISS ALBINO MICE

Dibyanee Lahon

Department of Zoology, Mariani College, Mariani, Jorhat, Assam

Corresponding author : dibyaneelahon34@gmail.com

ABSTRACT :

Nicotine is the main component of cigarette smoke, and long-term exposure increases the possibility of cardiac damage and causes the occurrence of cardiac diseases. Its effects on the cardiovascular system are not well clarified. Melatonin has beneficial effects in prevention and improving cardiovascular risk factors. So, we aimed to study the effects of nicotine on cardiac tissue and the possible protection provided by melatonin. Mice were divided into 5 groups: CON, NIC, NM25, NM50, and NM100. The histological study showed that nicotine caused deterioration of muscle fiber organization with deformation of the nucleus of cardiomyocytes and disarrangement of cardiac myofibers. Nicotine caused hyalinization in some cells, altered oxidative stress, including elevated levels of malondialdehyde (MDA), and suppressed catalase(CAT) and superoxide dismutase (SOD) activity. Biochemical assays showed a significant elevation in serum cholesterol, triglyceride, and LDL and a significant lowering of serum HDL level, indicating myocardial injury. Supplementation of melatonin in the nicotine group of mice significantly restored histological aberration of cardiac muscle, oxidative status, and lipid profile of heart tissue, including suppressed levels of MDA and increased levels of catalase and SOD activity along with decreased levels of total cholesterol, triglyceride, LDL, and elevated HDL level.

Keywords : *Nicotine, Melatonin, oxidative stress, Lipid profile assay, Cardiac muscle*

SPECTROSCOPIC MONITORING OF SOIL COMPOSITION

Pranpriya Rajkhowa, Jagat Ch Gogoi, Chironjit Hazarika

Department of Physics, Mariani College, Mariani, Jorhat, Assam

Corresponding author : rajkhowapranpriya@gmail.com

ABSTRACT :

Spectroscopic monitoring of soil quality is studied by interaction of laser radiation with the soil bodies. In this work, laser induced breakdown spectroscopy is used to investigate the soil pollutants present in the agricultural soil. Results of this investigation are helpful to detect certain chemical contents and metals with high precession and sensitivity.

Keywords : *Laser, Spectroscopy, Sensitivity, Precession*

REVIVAL OF INDIGENOUS CULTURE IN ASSAM FOR SUSTAINABILITY

Nivedita Sarmah

Department of History, Mariani College, Mariani, Jorhat, Assam
Corresponding author : niveditasarmah@gmail.com

ABSTRACT :

Environmental degradation and global warming is now a major concern threatening the very existence of life on earth. Mostly this degradation is caused by human activities. To reduce this, there is one solution and it is sustainable development. This paper is an attempt to find out and highlight some of our indigenous cultural practices for sustainability. These practices include some traditional cottage industries of Assam such as weaving, bamboo, cane, pottery, bell metal utensils production. This work is based on secondary as well as primary sources. Methodology would be analytical.

Keywords : *Indigenous, Sustainability*

FINANCIAL INCLUSION AND LIVELIHOOD STABILITY OF FISHERS IN ASSAM : A District Panel Study

Samarita Kashyap & Arupanjali Borah

Department of Economics, Mariani College, Mariani, Assam, India

Corresponding author : arupa09@gmail.com

ABSTRACT :

This paper studies how financial inclusion affects the stability of fishing livelihoods in Assam, a state in Northeast India where inland fisheries play a big role in people's lives. The present study covers the data from 2014 to 2024, covering the period when the Jan Dhan-Aadhaar-Mobile (JAM) system was introduced and when Assam's fisheries began to grow. The study mainly uses simple data analysis, such as trends over time, comparisons between districts, and basic correlations. The study also tries to suggest a basic panel regression model that can be used in future studies. Several indicators of financial inclusion, such as number of bank accounts per 1,000 adults, progress under the Pradhan Mantri Jan Dhan Yojana (PMJDY), distance to financial service points, use of digital payments and insurance, and so on are used in this study. These are compared with indicators of livelihood stability, such as fish production per hectare, variety of fish species and fishing gear, exposure to shocks like floods or market price changes, and coping capacity, vulnerability levels from government data. The present study has found three main patterns, and these are financial access has grown quickly in Assam since 2014, especially through bank accounts and digital systems, fishing households still face risks from floods and market changes even with better financial access, using financial services actively and effectively like seasonal loans, insurance, and credit designed for fishers, is more closely linked to livelihood stability than simply having access to accounts. Finally, using government reports and surveys, districts are compared and suggestions have been provided to improve financial programmes such as season-based credit, micro-insurance, and financial services for women fishers.

Keywords : *Financial inclusion, Livelihood, Fishers, Bank accounts*

THE DYING MEENACHAL :

Intersections of Ecology, Memory, and Marginality in *The God of Small Things*

Sushmita Dey

Department of English, Mariani College, Mariani, Jorhat, Assam, India

Corresponding author : deysushmita093@gmail.com

ABSTRACT :

The resources of a country and its conservation should be the primary goal of its authorities. But in the novel *The God of Small Things* one finds that resources that were once in abundance are being exploited and depleted in the name of development. Roy employs personification to depict the mood and setting of the plot, reinforcing the sense of decay and moral corrosion. Roy constructs this ecosystem to focus on the underlying corruption and moral decay of the society. The backwaters, where culture and class amalgamate, become breeding grounds for death and abuse. The author poignantly critiques the degradation of nature and human by calling the commercialisation of the area as Heart of Darkness. The bleak reality of the river experienced by the protagonist focuses how in the name of development water resources are becoming grounds for toxic waste disposals. Through this reference to Joseph Conrad's master piece *The Heart of Darkness* Roy subtly exposes the irony how capitalism and tourism have commodified even the most mysterious and sacred parts of nature. All the while shielding the tourist from seeing the real deplorable condition of the local slum areas. The wall separating affluent tourists from impoverished slum dwellers starkly illustrates how commercialisation has pushed the latter into deeper marginalisation. Roy creates the fictional town of Ayemenem and the Meenachal river to show the disregard people have for nature. She goes on to narrate how people wash clothes, defecate, bathe and dispose the dead in the river. The constant tussle between the regimes of Marxism and Capitalism takes a toll on the

people and the river itself. The Meenachal river is the backbone of the town yet people have left it in a deplorable state. This novel brilliantly captures how the polluted backwaters and commodified landscapes serves as a powerful reminder that unchecked development erodes both ecological balance and human dignity. Roy's masterpiece becomes an epitome of sustainable coexistence? one that values preservation over profit. Through such literary reflections, The God of Small Things underscores the urgent need to integrate environmental consciousness into the broader discourse of social and scientific progress.

Keywords : *Conservation, Ecosystem, Commercialisation, Meenachal, River, Ayemenem, Marginalisation, Sustainable, Co-existence*

DECOLONIZING DEVELOPMENT : INDIGENOUS KNOWLEDGE, CULTURAL HERITAGE, AND SUSTAINABLE GOVERNANCE IN INDIA'S NORTHEAST

Kundan Hazarika

Department of Political Science, Mariani College, Mariani, Jorhat, Assam

Corresponding author : kundan.hz@gmail.com

ABSTRACT :

This paper explores the intricate nexus of cultural heritage, Indigenous knowledge, and sustainability in India's Northeast, viewed through a political science lens. The region, a vibrant mosaic of diverse ethnic groups and their distinctive cultural practices, faces unique challenges in balancing development aspirations with the preservation of invaluable traditional wisdom and ecological integrity. This paper argues that conventional top-down governance models often fail to adequately recognize and integrate Indigenous knowledge systems, leading to unsustainable development outcomes and the erosion of cultural heritage.

Focusing on the political economy of resource management and identity politics, the paper examines how state policies, often influenced by national development paradigms, interact with local indigenous self-governance structures and customary laws. It delves into the political struggles over land rights, forest conservation, and cultural autonomy, highlighting how these battles are fundamentally about competing epistemologies and power dynamics. The paper analyzes instances where Indigenous communities have successfully leveraged their traditional knowledge and collective action to achieve sustainable resource management, as well as cases where external pressures have undermined these efforts.

Furthermore, the paper also investigates the role of international conventions and non-governmental organizations in advocating for Indigenous rights and promoting sustainable development practices in the Northeast, assessing their effectiveness in influencing domestic policy and empowering local communities. This paper posits that a more inclusive and participatory political framework, one that genuinely respects and empowers Indigenous voices and integrates their knowledge into policymaking, is crucial for fostering long-term sustainability and preserving the rich cultural heritage of India's Northeast. It concludes by proposing a framework for understanding and addressing these challenges, emphasizing the need for political innovations that bridge the gap between traditional wisdom and modern governance.

Keywords : *Cultural heritage, Indigenous Knowledge System (IKS), Ethnic groups, Cultural practices.*

A CASE STUDY OF ROLE OF FATHER AND MOTHERS FOR CHILD. REARING PRACTICES IN TRIBAL FAMILY AND IMPACT IN PRIMARY EDUCATION

Archana Saikia

Department of Education, Mariani College, Mariani, Jorhat, Assam, India
Corresponding author : archanadutta009@gmail.com

ABSTRACT :

Child rearing plays a vital role in shaping the physical, emotional, and intellectual development of children. In every society, parental roles and practices influence the educational foundation laid during primary education. This study focuses on assessing the child-rearing practices among tribal families in the Mariani Circle and examining their impact on the academic performance of children in primary education. The research aims to identify the number of tribal families in the area and analyze how parental involvement, socio-economic conditions, and traditional practices affect children's learning outcomes. Emphasis is placed on the roles of both father and mother in nurturing a child's emotional and educational development. The findings of this study are expected to provide valuable insights into how family practices contribute to educational attainment and to suggest measures that could enhance the quality of primary education among tribal communities in Mariani Circle.

Keywords : *Child rearing, Tribal families, Parental involvement*

A STUDY ON POTENTIAL AND CHALLENGES OF CULTURAL TOURISM IN ASSAM

Amiya Saikia

Department of English, Nakachari College, Jorhat, Assam, India

Corresponding author : saikia.amiya0@gmail.com

ABSTRACT :

Assam is a land full of rich cultural diversity and history. Cultural tourism means the form of travel to experience the distinctive traditions, the past, and the habits of a place. It includes activities like visiting places with historical significance, attending local fairs and festivals, studying about local rituals and flavour. More than 100 distinct ethnic groups, like Ahoms, Bodos, Karbis, and Mishings, reside in Assam with their unique characteristics, festivals, languages, and customs. The diverse ethnic groups and their history, and the ancient monuments provide Assam an immense scope and foundation to attract tourists with a community-based tourism experience. It generally focuses on traditional communities that have diverse customs, a unique form of art, and culture. The different communities with their distinct social practices create a different type of culture, which is unique and vibrant. While tourism in urban areas can be experienced in places like museums and theatres, rural areas can also provide the customs and traditions of the native communities.

Keywords : Assam, Cultural, Tourism, Tradition, Customs.

A STUDY ON THE CULTURAL HERITAGE OF ASSAM IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

Dinamoni Gogoi

Department of Sociology, Nakachari College, Jorhat, Assam, India

Corresponding author : dinamoni4@gmail.com

ABSTRACT :

The northeastern state of Assam is famous for its rich and diverse cultural heritage, which is deeply interlaced with its natural environment and social fabric, presenting both opportunities and challenges in the pursuit of sustainable development. The cultural heritage of Assam comprises its diverse ethnic groups, their customs and traditions, religious beliefs and practices, which reflect the region's rich historical tapestry. The cultural, socio-religious, and geographical diversity is a crucial factor for sustainable development, as it holds valuable alternative knowledge systems and fosters social cohesion. The historical landmarks and ancient monuments are also the most iconic symbols of the cultural heritage of Assam. Therefore, the present paper aims to study about the cultural heritage of Assam in the context of sustainable development.

Keywords : *Assam, Ethnic groups, cultural heritage, cultural diversity, sustainable development*

অসমৰ বনৌষধি পৰম্পৰা

দেৱজিৎ গোগৈ^১, মানবী গোগৈ^২

^১ বুৰঞ্জী বিভাগ, আমগুৰি মহাবিদ্যালয়, আমগুৰি, শিৰসাগৰ, অসম

^২ অসমীয়া বিভাগ, মৰিয়নি মহাবিদ্যালয়, মৰিয়নি, যোৰহাট, অসম

সংশ্লিষ্ট লেখক : gogoimanabee@gmail.com

সাৰাংশ :

অসমৰ বনৌষধি পৰম্পৰা অতি প্ৰাচীন। আধুনিক চিকিৎসা বিজ্ঞানে তুকি নোপোৱা কালছোৱাত অসমত নানা তন্ত্ৰ-মন্ত্ৰ, জৰা-ফুকা আৰু বনৌষধিৰ দ্বাৰা ৰোগ নিৰাময় কৰা হৈছিল। অসমৰ হাবি-জংঘল, মানুহৰ ঘৰৱা বাৰী, চোতাল, আলি-পদুলি, পাহাৰ-ভোঁয়াম, নদী কাষ, আদি বিভিন্ন ঠাইত দৰকাৰী বন দৰৱ সিঁচৰতি হৈ আছে। অতি সহজলভ্য এই বন দৰবৰোৰ প্ৰাচীন কালৰেপৰা বৰ্তমান পৰ্যন্ত মানুহে ব্যৱহাৰ কৰি আহিছে আৰু সুফল লাভ কৰিছে। ভাৰতীয় আয়ুৰ্বেদ চিকিৎসা পদ্ধতিৰ ইতিহাসলৈ মন কৰিলেও দেখা যায় আয়ুৰ্বেদত প্ৰাকৃতিক উপাদানৰ ব্যৱহাৰৰ ক্ষেত্ৰত বিশেষ গুৰুত্ব দিয়া হৈছে। বিভিন্ন বনৌষধি যেনে — তুলসী, নিম, আদা, হালধি, অশ্বগন্ধা, ত্ৰিফলা আদিৰ প্ৰয়োগ কৰি প্ৰাকৃতিক পদ্ধতিৰ জৰিয়তে চিকিৎসা কৰা হয়। এই ক্ষেত্ৰত চৰক সংহিতা, সুৰক্ষিত সংহিতা, আয়ুৰ্বেদৰ মূল ভিত্তি।

বিষয় নিৰ্বাচনৰ উদ্দেশ্য : অসমৰ থলুৱা বনৌষধিসমূহৰ ব্যৱহাৰ আৰু পৰিচিতিৰ বাবে বিষয়টো নিৰ্বাচন কৰা হৈছে।

বিষয়বস্তু অধ্যয়নৰ প্ৰয়োজনীয়তা : অসমৰ থলুৱা বনৌষধিসমূহ অসমৰ অতি প্ৰয়োজনীয় সম্পদ। বনৌষধিসমূহৰ লগত মানুহৰ বিশ্বাস জড়িত হৈ আছে। বৰ্তমান ব্যয়বহুল আধুনিক চিকিৎসাৰ বিপৰীতে সহজলভ্য বনদৰৰ দ্বাৰা অসুখ নিৰ্মূল কৰিব পৰাৰ সম্ভাৱনা আছে। কিন্তু বহু লোকৰ বাবে আজিও এই বনদৰৰসমূহ জ্ঞাত নহয় বা প্ৰয়োজনীয়তা অনুভৱ কৰা দেখা নাযায়। সেয়ে এই বিষয়ত বহুল অধ্যয়নৰ প্ৰয়োজনীয়তা আছে।

অধ্যয়নৰ পদ্ধতি : আলোচনা পত্ৰখন প্ৰস্তুত কৰোঁতে ক্ষেত্ৰ অধ্যয়ন কৰি ব্যাখ্যাত্বক পদ্ধতিৰে প্ৰস্তুত কৰিবলৈ লোৱা হৈছে।

সামৰণি : অসমৰ পৰম্পৰাগত লোক ঔষধসমূহ মানুহৰ সঞ্চিত লোকজ্ঞানৰ প্ৰভাৱত সৃষ্টি। কোনো কোনোৱে হয়তো লোকবিশ্বাসৰ ওপৰত আধাৰিত লোক ঔষধক অনুবিশ্বাসৰ পৰিণতি বুলিও যুক্তি দৰ্শাৰ পাৰে। কিন্তু

লোকবিশ্বাস আৰু অন্ধবিশ্বাস দুটা বেলেগ বিষয়। লোকবিশ্বাস মানুহে যুগ যুগ ধৰি আহৰণ কৰি অহা জ্ঞানৰ ফচল। ইয়াৰ মাজত বৈজ্ঞানিক সত্যতা লুকাই আছে। অসমৰ মাটিত পোৱা বিভিন্ন ঔষধি গচ্ছ-বন সমূহৰ আধুনিক প্ৰযুক্তি বিদ্যাৰ সহায়ত উন্নত প্ৰয়োগ সন্তুষ্টি কৰিব পাৰিলে চিকিৎসা বিজ্ঞানত এক সুফল পোৱা যাব। কিয়নো বনৌষধি সমূহৰ সঠিক মাত্ৰাত প্ৰয়োগ কৰিব পাৰিলে শৰীৰত পাৰ্শ্বক্ৰিয়া কম হয়। ভৱিষ্যৎ অধ্যয়নৰ বাবে অসমৰ লোক ঔষধসমূহৰ প্ৰচুৰ সন্তাৱনা আছে। গৱেষণামূলক অধ্যয়নৰ জড়িয়তে ভৱিষ্যতে মানুহৰ অজ্ঞতে থাকি যোৱা, মানুহে চিনি নোপোৱা এনে বহু বনৌষধে দুৰারোগ্য ৰোগো নিৰ্মূল কৰিবলৈ সন্তুষ্ট হ'ব বুলি ধাৰণা হয়। কেৱল মানুহৰ বাবেই নহয়, জীৱ-জন্ম, পশু-পক্ষীৰ বাবেও সহজলভ্য বন দৰৱ প্ৰয়োগ কৰি সুফল লাভ কৰিব পাৰা যায়। নিৰ্বাচিত আলোচনা-পত্ৰখনত অসমৰ সহজলভ্য বনদৰৱ যেনে - - মানিমুনি, ভেদাইলতা, বন জলকীয়া, ভুঁই আমলখি, কেঁহেৰাজ, জেতুকা, নিম, তিতাবাহক, নেফাফু, পনোনোৱা, পদিনা, মানধনীয়া, মছলদৰী, মৰলীয়া, লাইজাবৰী, মাটিকাঁদুৰী, ইত্যাদি এশিয়াধি বনৌষধিৰ গুণাগুণ সম্পর্কে আলোচনা কৰা হ'ব।

বীজশব্দ ৪ : বনৌষধি, আয়ুৰ্বেদ চিকিৎসা, প্ৰাকৃতিক উপাদান, লোকবিশ্বাস, থলুৱা বনৌষধি।

বোকা ভাওনা : ঐতিহ্য আৰু পৰম্পৰা

(যোৰহাট জিলাৰ সকাইখঙ্গীয়া গাঁৱৰ বোকাভাওনাৰ বিশেষ উল্লিখনসহ)

বাণী বৰা

অসমীয়া বিভাগ, মৰিয়নি মহাবিদ্যালয়, মৰিয়নি, যোৰহাট, অসম
সংক্ষিপ্ত লেখক : banibora67@gmail.com

সাৰাংশ :

অসমৰ সাংস্কৃতিক ক্ষেত্ৰত এক উল্লেখযোগ্য পৰিৱেশ্য কলা হ'ল বোকা ভাওন। শ্ৰীকৃষ্ণৰ জন্ম উৎসৱৰ অৰ্থাৎ জন্মাষ্টমীৰ পিছদিনা দিনত বোকা ভাওনা অনুষ্ঠিত কৰা হয়। এই বোকা ভাওনা অনুষ্ঠানক কোনো কোনো অঞ্চলত বোকা যাত্ৰা, পাচতি আদি নামেৰেও উদ্যাপন কৰা দেখা যায়।

উজনি অসমৰ যোৰহাট জিলাৰ অন্তৰ্গত সকাইখঙ্গীয়া গাঁও বৈষ্ণৱ সংস্কৃতিৰ বিভিন্ন উপাদানেৰে সমৃদ্ধ। এই গাঁৱৰ সেঁ মাজত প্রতিষ্ঠিত নামঘৰত শংকৰী সংস্কৃতিৰ অঁকৰ নাম-কীৰ্তন, ভাওনা, জন্মাষ্টমী, জন্মোৎসৱ, বিছ, বছৰেকীয়া বৰসবাহ আদি বিভিন্ন উৎসৱ-পাৰ্বন অতীজৰে পৰা অনুষ্ঠিত কৰি আহিছে। বৰ্তমানৰ প্ৰেক্ষাপটত এই গাঁৱৰ নামঘৰত অনুষ্ঠিত জন্মাষ্টমীৰ লগত সংগতি থকা 'বোকা ভাওনা'ই বহুলোকৰ দৃষ্টি আকৰ্ষণ কৰিবলৈ সক্ষম হৈছে। ব্যস্ততাপূৰ্ণ জীৱনত কিছু পৰিমাণে আধ্যাত্মিক চিন্তা-চেতনাৰে জীৱন জীপাল কৰি তুলিব পৰা যায়। বোকা ভাওনা এনে এক আধ্যাত্মিক চেতনা সম্পন্ন উৎসৱৰ অন্যতম উদাহৰণ। বিভিন্ন বয়স, বৃত্তিৰ লগত জড়িত সকলো লোকৰ মাজত ঐক্য আৰু সংহতি বক্ষা কৰাত বোকাভাওনাৰ যথেষ্ট অৱিহণা আছে। পৰম্পৰাগত ভাবে উদ্যাপন কৰি আহা এই বোকা ভাওনাই এইবছৰ (২০২৫) শতবৰ্ষ অতিক্ৰম কৰিছে। শতবৰ্ষ গৱকা বোকা ভাওনাই এই অঞ্চলৰ লগতে যোৰহাট জিলা তথা সমগ্ৰ অসমৰ সাংস্কৃতিক ঐতিহ্যৰ লগতে বিভিন্ন ভাষা-ভাষী, জাতি, ধৰ্ম, বৃত্তি, বয়সৰ লোকৰ মাজত জাতীয় ঐক্য আৰু সংহতি বক্ষা কৰি আহিছে। এনে উদ্দেশ্যলৈ লক্ষ্য কৰি সকাইখঙ্গীয়া গাঁৱৰ শতবৰ্ষ গৱকা আধ্যাত্মিক উৎসৱ 'বোকাভাওনা : ঐতিহ্য আৰু পৰম্পৰা' শীৰ্ষক বিয়াটিৰ আলোচনাৰ প্ৰয়োজনীয়তা আছে বুলি অনুভৱ কৰা যায়। এই আলোচনা পত্ৰত বোকা ভাওনাৰ পৰিচয়, ঐতিহ্য আৰু পৰম্পৰাগত দিশসমূহৰ আলোকপাত কৰিবলৈ চেষ্টা কৰা হ'ব।

বীজশব্দ : বোকাভাওনা, নামঘৰ, পৰম্পৰা, শংকৰী সংস্কৃতি

পৰিৱৰ্তিত প্ৰেক্ষাপটত অসমৰ খাদ্য সংস্কৃতি : এটি বিশ্লেষণ

সুগন্ধি দাস

অসমীয়া বিভাগ, মৰিয়নি মহাবিদ্যালয়, মৰিয়নি, যোৰহাট, অসম

সংশ্লিষ্ট লেখক : das.sugandhi@gmail.com

সাৰাংশ :

অসমীয়াসমাজত ঐতিহ্যময়, ৰচিপূৰ্ণ খাদ্য পৰম্পৰা আছে। অসমীয়াৰ খাদ্য প্ৰণালী বিচিত্ৰ, অতিসুস্থাদু আৰু পুষ্টিকৰ। অসমীয়া খাদ্যত আমিয়, নিৰামিয় বিভিন্ন ব্যঙ্গন দেখিবলৈ পোৱা যায়। অসম বিবিধ জাতি জনগোষ্ঠীৰে পৰিপূৰ্ণৰাজ্য। ইয়াত ধৰ্মীয় ক্ষেত্ৰতো বৈচিত্ৰ্য বিৰাজমান। এই সকলো লোকৰে নিজা নিজা খাদ্য পৰম্পৰাআছে। আনন্দাতে অসমৰ ভৌগোলিক পৰিবেশ অনুযায়ী বিভিন্ন কৃষিজাত খাদ্য সামগ্ৰী উৎপন্ন হয়। পাহাৰ, ভৈয়ামৰ বৈচিত্ৰ অনুযায়ী বিভিন্ন অসম ভূমিত খাদ্য-শস্য উৎপাদনত প্ৰভাৱ পেলায় আহিছে। বিশেষকৈ মৌচুমী বায়ুৰ প্ৰভাৱত অসমত প্ৰচুৰ ধান খেতি উৎপাদন হয়। সেয়ে ধানৰ পৰা উৎপাদিত চাউল আৰু ইয়াৰ পৰা তৈয়াৰ কৰা ভাত আৰু অন্যান্য সামগ্ৰী অসমীয়া মানুহে খাদ্য হিচাপে গ্ৰহণ কৰে। কৃষিজাতসামগ্ৰীৰ উপৰিও অসমত বাস কৰা লোকে মাছ-পুঁঠি, চৰাহ-চিৰিকতি আৰু জীৱ- জন্মৰ মঙ্গ খাদ্য হিচাপে গ্ৰহণ কৰে। অসমত নদ-নদীৰ উপৰিও অনেক জলাশয় আছে। অতীতৰে পৰা এই জলাশয়বোৰত নানা তৰহৰ মাছ-পুঁঠি পোৱাযায়। সেয়ে অসমীয়া মানুহৰ খাদ্য পৰম্পৰাত মাছৰ প্ৰচুৰ ব্যৱহাৰ দেখিবলৈ পোৱা যায়। একেদৰে অনেক অসমীয়া মানুহে পোহনীয়া চৰাই যেনে — হাঁহ, পাৰ, কুকুৰা আৰু জন্ম যেনে — ছাগলী, গাহৰি আদিৰ মঙ্গ খাদ্য হিচাপে গ্ৰহণ কৰে।

সময়ৰ পৰিৱৰ্তনৰ লগে লগে মানুহৰ সাংস্কৃতিক ৰুচি-অভিরুচিৰ পৰিৱৰ্তন ঘটে। অসমীয়া মানুহৰ পৰম্পৰাগত খাদ্য প্ৰণালীতো বিভিন্ন সময়ত পৰিৱৰ্তন আহিছে। এই ক্ষেত্ৰত বিভিন্ন কাৰকে ক্ৰিয়া কৰা দেখা যায়।

আলোচনা পত্ৰ উদ্দেশ্য : অসমীয়া মানুহৰ ঐতিহ্যময় খাদ্য পৰম্পৰা আছে। এই খাদ্যসমূহ পৰিৱেশৰ লগত খাপখোৱা, পুষ্টিকৰ আৰু সুস্থাদু। বিভিন্ন জাতি জনগোষ্ঠীৰে পৰিপূৰ্ণ অসমৰ এই লোকসকলৰ সুকীয়া সুকীয়া খাদ্য বৈশিষ্ট্যই অসমীয়া খাদ্যত এক বিস্তৃতি প্ৰদান কৰি গৈছে। কিন্তু সময় পৰিৱৰ্তনৰ লগে লগে বিভিন্ন কাৰকে অসমীয়া খাদ্য পৰম্পৰাত প্ৰভাৱ পেলাইছে।

আলোচনা-পত্ৰত অসমীয়া খাদ্য সংস্কৃতিৰ পৰিচয়, বৈশিষ্ট্য, পৰিৱৰ্তন আৰু পৰিৱৰ্তনৰ কাৰকসমূহৰ বিষয়ে আলোচনা কৰাৰ বাবে, ‘পৰিৱৰ্তিত প্ৰেক্ষাপটত অসমৰ খাদ্য সংস্কৃতি’ বিষয়টি বাছি লোৱা হৈছে।

বীজশব্দ : অসমীয়া খাদ্যৰ পৰম্পৰা, পৰিৱৰ্তনৰ কাৰক, সংৰক্ষণৰ প্ৰয়োজনীয়তা।

অসমীয়া সংস্কৃতি চোতালঃ ঐতিহ্য আৰু বিৱৰণ

ৰিম্পী লাহন

গবেষক ছাত্রী, আউনীআটী বিশ্ববিদ্যালয় যোৰহাট, অসম

সংশ্লিষ্ট লেখকঃ lahan.rimpi12@gmail.com

সাৰাংশঃ

চোতাল হৈছে অসমীয়া সমাজ আৰু সংস্কৃতিৰ এক অবিচ্ছেদ্য অংগ। একেবাৰে সাধাৰণ যেন লাগিলেও চোতালে বহন কৰি আহিছে এখন সমাজৰ ঐতিহ্য আৰু পৰম্পৰা। এই আলোচনা-পত্ৰখনতো অসমীয়া সমাজত চোতালে কেনেধৰণৰ ভূমিকা পালন কৰি আহিছে তাক আলোচনা কৰাৰ প্ৰয়াস কৰা হৈছে। লগতে সাম্প্রতিক সময়ত আধুনিকতাই চোতালকো প্ৰভাৱিত কৰিছে নেকি তাকো অধ্যয়নৰ আওতালৈ অনাৰ প্ৰয়াস কৰা হৈছে। উল্লেখ্য যে, অসমীয়া সমাজত ৰীতি-নীতি, পৰম্পৰা, পৰিৱেশ সচেতনতা, লোকবিশ্বাস, সামাজিক দায়বদ্ধতা তথা জীৱন-ধাৰণ প্ৰণালীত চোতালৰ ভূমিকা সম্পর্কে আলোচনা কৰাও এই আলোচনা-পত্ৰৰ এক উদ্দেশ্য। আনহাতে, অসমীয়া লোক সাহিত্যতো চোতালৰ ভূমিকা আছে। সেই দৃষ্টিবৰ্ণেও নিৰ্দিষ্ট বিষয়ত আলোকপাত কৰাৰ প্ৰয়াস কৰা হৈছে। এখন সমাজত উপস্থিত প্ৰতিটো উপাদানৰ অধ্যয়নেহে সংস্কৃতিৰ প্ৰকৃত সমৃদ্ধতাক পোহৰলৈ আনিব পাৰে। তেনে প্ৰয়োজনীয়তাক গুৰুত্ব প্ৰদান কৰি আলোচনা-পত্ৰৰ বাবে উক্ত বিষয়টো নিৰ্বাচন কৰা হৈছে। আলোচনা-পত্ৰখনত সামগ্ৰিক ভাৱে বিষয় সম্পর্কে আলোকস্পাত কৰি বৰ্ণনাত্মক আৰু বিশ্লেষণাত্মক পদ্ধতিৰ সহায়ত অধ্যয়ন কৰা হৈছে। লগতে প্ৰয়োজন সাপেক্ষে তুলনামূলক আৰু ক্ষেত্ৰ অধ্যয়ন পদ্ধতিৰো সহায় লোৱা হৈছে। আলোচনাৰ অন্ততাসমীয়া সমাজত চোতালৰ গুৰুত্ব, ঐতিহ্যৰ বাহক হিচাপে চোতালৰ ভূমিকা আৰু বৰ্তমান সময়ত চোতালৰ প্ৰাসংগিকতা আৰু স্থিতি সম্পর্কে তথ্য লাভৰ সন্তোৱনা আছে।

বীজশব্দঃ চোতাল, অসমীয়া সংস্কৃতি, ঐতিহ্য, বিৱৰণ

অসমীয়া ঐতিহ্য আৰু পৰম্পৰাৰ প্ৰতীক হিচাপে তাঁতশাল

স্নেহা শৈকীয়া

অসমীয়া বিভাগ, মৰিয়নি মহাবিদ্যালয়, মৰিয়নি, ঘোৰহাট, অসম

সংশ্লিষ্ট লেখক : snehasaikia25001@gmail.com

সাৰাংশ :

বয়ন হৈছে অসমীয়া শিল্পকলাৰ এক প্ৰতিফলন। আতীজৰ পৰাই অসমীয়া সমাজ আৰু সংস্কৃতিত তাঁতশালে এক অবিচ্ছেদ্য অংগস্বৰূপে ভূমিকা পালন কৰি আহিছে। অসমীয়া মহিলাসকলৰ সৃষ্টিশীল তথা আৱেগিক মনটোৰ প্ৰতিফলন এই তাঁতশালত বৈ উলিওৱা থলুৱা বস্ত্ৰৰ দৰে শিল্পৰূপৰ দ্বাৰাই ঘটা দেখা যায়। কিন্তু বৰ্তমান যুগত পুৰণি পৰম্পৰাগত তাঁতশালৰ সঁজুলি, ইয়াৰ ব্যৱহাৰ নোহোৱা হোৱাৰ লগতে থলুৱা শিপিনীৰ দ্বাৰা তৈয়াৰী বস্ত্ৰৰ চাহিদাও কমি অহা লক্ষ্য কৰিব পাৰি। ফলস্বৰূপে আমাৰ জাতীয় পৰিচয়, সংস্কৃতি সংৰক্ষণৰ দিশটোতো সংকটে দেখা দিয়াৰ সমান্বালভাৱে স্থানীয় অৰ্থনীতিতো প্ৰভাৱ পৰিলক্ষিত হৈছে। এনে পৰিৱৰ্তনৰ ফলত আমাৰ ভৱিষ্যৎ প্ৰজন্ম পৰিচয় সংকটৰ দৰে সমস্যাৰ সন্মুখীন হোৱাৰ আশংকা আছে, যি এক নিতান্তই চিন্তনীয় বিষয়। সেয়েহে এই বিষয়টিৰ প্ৰয়োজনীয়তা আছে বুলিব পাৰি। আলোচনা-পত্ৰখনত অসমীয়া ঐতিহ্য আৰু পৰম্পৰাৰ দৃষ্টিকোণেৰে তাঁতশালৰ গুৰুত্বৰ উপৰি তাঁতশালৰ সৈতে জড়িত ভিন ভিন দিশসমূহক অধ্যয়নৰ যোগেদি পোহৰলৈ অনাৰ প্ৰয়াস কৰা হ'ব।

বীজশব্দ : বয়ন, তাঁতশাল, জাতীয় পৰিচয়।

অসমৰ সত্ৰ সমূহত পালিত উৎসৱ-পাৰ্বণ

অবিনাশ দত্ত

অসমীয়া বিভাগ, মৰিয়নি মহাবিদ্যালয়, মৰিয়নি, ঘোৰহাট, অসম

সংশ্লিষ্ট লেখকঃ abinashd798@gmail.com

সাৰাংশঃ

‘সত্ৰ’ হৈছে, শংকৰদেৱ আৰু মাধৱদেৱ তথা আন বৈষণেৱ ধৰ্মগুৰসকলে ধৰ্ম প্ৰচাৰ কৰিবৰ বাবে স্থাপন কৰা অনুষ্ঠান। শ্রীকৃষ্ণ কেন্দ্ৰিক উপাসনাৰ তথা ধৰ্মীয় তত্ত্ব চৰ্চা কৰা আৰু প্ৰসাৰ ঘটোৱাই হৈছে সত্ৰসমূহৰ মূল লক্ষ্য।

‘সত্ৰ’ শব্দৰ অভিধানিক অৰ্থ হৈছে – অধিবেশন, যজ্ঞানুষ্ঠান, নিবাসস্থান। ‘সত্ৰ’ শব্দ প্ৰথমে ‘শতপথ ব্ৰাহ্মণ’ গ্ৰন্থ ‘আহুতি’ বুজাৰলৈ ব্যৱহাৰ কৰা হৈছিল। ভাগৱত পুৰাণ গ্ৰন্থত উল্লেখ থকা অনুসৰি নৈমিত্যবণ্ণত শৌনকাদি খণ্ডিসকলে স্বৰ্গ প্ৰাপ্তিৰ বাবে হাজাৰ বছৰ ধৰি যি অনুষ্ঠান পাতিছিল সেয়ে ‘সত্ৰ’। কিন্তু অসমত নৱবৈষণেৱ নৱ ধৰ্মৰ আমোলত শংকৰদেৱেৱ ধৰ্ম প্ৰচাৰৰ বাবে যি অনুষ্ঠানক সৃষ্টি কৰিছিল তাকেই ‘সত্ৰ’ নামেৰে অভিহিত কৰিব পাৰি।

সত্ৰৰ আন এক অৰ্থ হ'ল ধৰ্ম, শৰণ আদি আধ্যাত্মিক শিক্ষা দিয়া অনুষ্ঠান।

সত্ৰীয়া উৎসৱসমূহৰ ভিতৰত উল্লেখযোগ্য কিছুমান উৎসৱ হ'ল – পালনাম, সত্ৰৰ গুৰসকলৰ তিথি, বাস মহোৎসৱ, ফাকুৰা / দোলউৎসৱ, জন্মাষ্টমী, পচতি সত্ৰাধিকাৰৰ নিৰ্মালি লোৱা উৎসৱ, বাৰ্ষিক অনুষ্ঠান ভাওনা আদি। এই উৎসৱসমূহ মূলতঃ শংকৰদেৱ, মাধৱদেৱ, দামোদৰদেৱ, গোপাল আতা আদি ধৰ্ম প্ৰচাৰক সকলে প্ৰচাৰ কৰা নৱবৈষণেৱ ধৰ্ম আৰু সংস্কৃতি এক অংশ। ই সামাজিক এক্য বৃদ্ধি কৰে। সত্ৰসমূহত এই উৎসৱ-পাৰ্বণসমূহৰ দ্বাৰা সমাজৰ সংস্কৃতিক আৰু আধ্যাত্মিক বিকাশ সাধনত বিশেষ ভূমিকা প্ৰহণ কৰিছে।

বীজশব্দঃ সত্ৰ, সত্ৰীয়া, সংস্কৃতি, আধ্যাত্মিকতা, সামাজিক এক্য, উৎসৱ-পাৰ্বণ

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