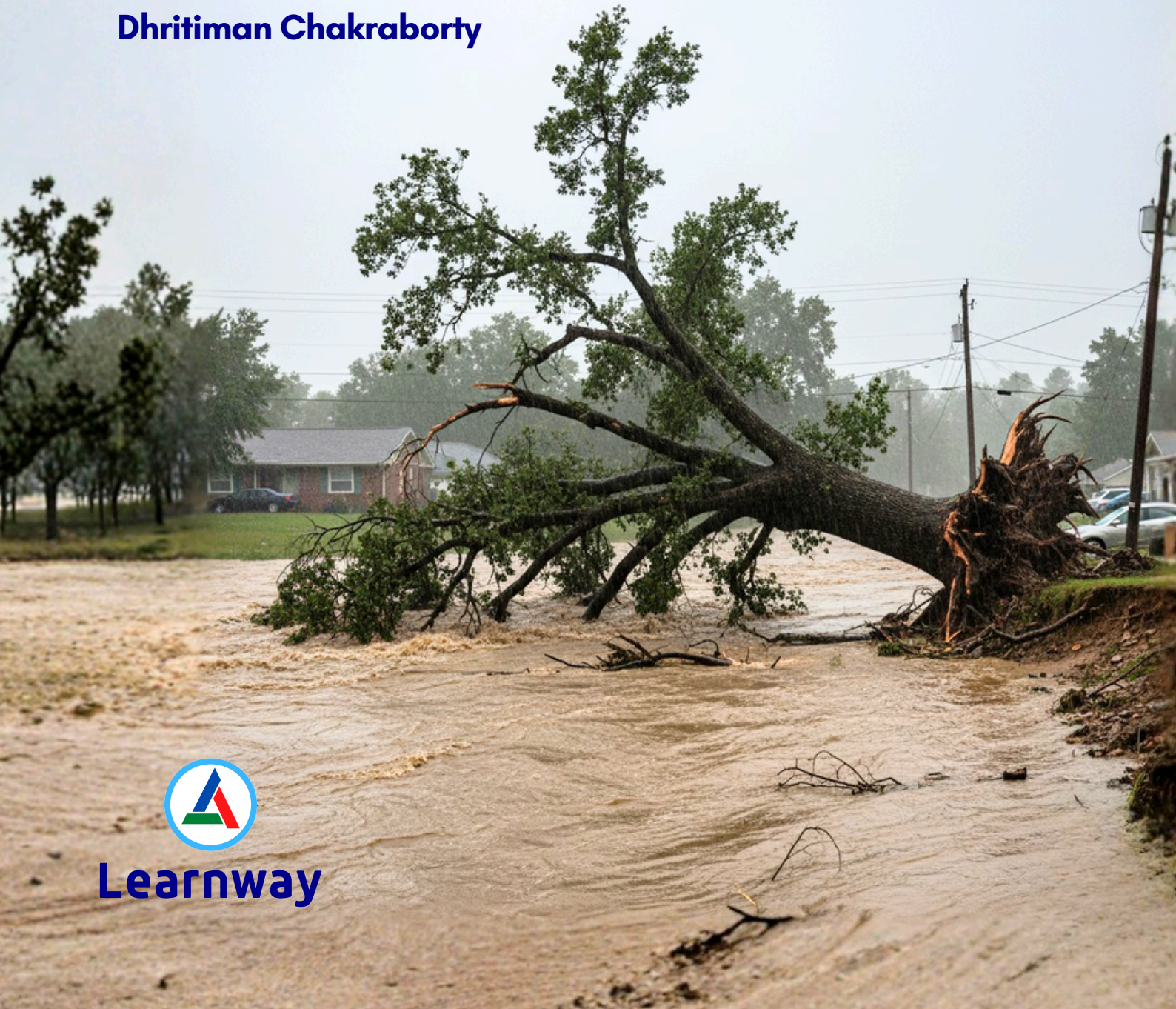
The book of abstracts of the International Seminar on "Disaster and its afterlife : A Multidisciplinary Response to Environmental Crisis from North-Bengal and North-East India (DAIA-2025)"

Editors
Debarshi Ghosh
Debarati Dutta
Dhritiman Chakraborty



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Disclaimer:

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Welcome Note

The Conveners of this ICSSR-ERC Sponsored International Conference take this opportunity to extend thanks and regards to everyone who contributed in myriad ways to make this Conference possible, and that too for the very first time at Dhupguri Girls' College which is still in its nascent stage, and was established only in 2013. The NAAC Accreditation (1st Cycle) for the college came in 2025. Therefore, in multiple registers, organising this International Conference has been a monumental task in first roping in a collaborating institution, including diverse disciplines, and attracting hundreds of paper presenters, internationally recognised academicians, panellists, and last but not the least, a whole State-Level Convention to make sense of the disastrous times that we inhabit and the future that looks incredibly uncertain. This Conference wants to kick start discussions around these issues in a dialogic and deliberative fashion to safeguard the only planet where life exists.

The idea of this conference has been shaping up for over one year now. Gour Mahavidyalaya hosted an ICSSR sponsored International Conference on 'Catastrophe Studies' back in 2023, and as a sequel to it, conversations rolled out between the two institutions and subsequently an MOU was signed in 2023 to organise academic events that concern this region. We wanted to mull over disaster from the very place where it is a lived reality, and it was in that collective spirit of revisiting things from the very immediacy, plans were finally chalked out in one fine afternoon at the IQAC room in Dhupguri Girls' College. Rest is now fully laid out for everyone to watch out for. We wanted to think from the scratch, rethink at the cusp and think beyond horizons/limits.

We are grateful to Principals of Dhupguri Girls' College and Gour Mahavidyalaya, the two host institutions, for becoming part of this shared collective will. We are extremely obliged to ICSSR-ERC for recognising our sincerity and the topical urgency of the Conference. Geoteck and NESPON need special mention for extending financial support, and Learnway for meticulously attending to all conference needful. Finally, what could have made things more fruitful than to get Springer (Japan) as the Academic Partner. We earnestly value their response and the anonymous reviewer's comments that only emboldens our resolve.

In a changing scenario, where academic exchanges have increasingly become metropolitan centric or confined to elite institutions, which in a recursive fashion

reimposes the social and educational divides that they purportedly try to whittle out, hosting a conference of this scale and intensity in a remote sub-divisional town, in collaboration with a college from the middle part of Bengal, is no mean job. We honestly believe that this International Conference will definitely unravel new possibilities to reimagine issues from the very sites where they are obtrusively prevalent. North Bengal faced a major flood that destroyed thousands only in October 2025, and its reverberation will be felt in all the presentations. We want a future that will be able to accommodate co-living with nature, with animals and with communities that are not like us, and therefore always already an ethical Other.

Warm regards,
Debarshi Ghosh
Debarati Dutta
Dhritiman Chakraborty
Convenors
International Conference on
"Disaster and its afterlife: A
Multidisciplinary Response to
Environmental Crisis from
North-Bengal and North-East
India (DAIA-2025)"

Message

It gives us immense pleasure to present the Abstract Volume of the International Seminar titled "Disaster and Its Afterlife", jointly organized by the IQAC, Dhupguri Girls' College and the IQAC, Gour Mahavidyalaya, Malda. The seminar seeks to initiate a meaningful dialogue on one of the most urgent issues of our time—the recurring natural disasters and their far-reaching consequences, with special focus on the North Eastern States of India, a region known both for its breathtaking natural beauty and its ecological vulnerability as also multispecies diversity.

Every year, the monsoon brings devastation in the North- East and North Bengal in the form of floods, landslides, and erosion, resulting in the tragic loss of human and animal lives. The recent spate of natural calamities has once again reminded us of the pressing need to strengthen our preparedness and adopt sustainable strategies to mitigate disaster impacts. At the same time, these events compel us to reflect upon our relationship with nature—urging a shift from exploitation to coexistence and care.

We are happy to see a gathering of international scholars, researchers, and policymakers, both online and offline, in this Conference to deliberate on the ecological, social, and cultural aftermath of disasters, exploring how communities cope, rebuild, and redefine their relationship with their environment. We hope that the papers presented here will encourage deeper reflection and practical engagement towards building a resilient and harmonious future.

We express our sincere gratitude to all participants, contributors, and organizing members who made this academic endeavor possible. May this volume serve as a small yet significant step toward understanding disasters not merely as natural events, but as profound lessons in sustainability, empathy, and coexistence.

Dr. Bijoy Debnath
Principal,
Dhupguri Girls' College
&
Chairperson
Organising Committee
DAIA-2025

DEPARTMENT OF GEOGRAPHY & APPLIED GEOGRAPHY
UNIVERSITY OF NORTH BENGAL
Accredited by NAAC with Grade B+

Prof. (Dr.) Ranjan Roy
Professor & Former, Head
Dept. of Geography & Applied Geography
University of North Bengal

MESSAGE

I am extremely happy to note that the IQAC, Dhupguri Girls' College, Jalpaiguri, West Bengal, India in collaboration with IQAC, Gour Mahavidyalaya, Malda, West Bengal, India is going to organize Three (03) days ICSSR-ERC Sponsored International on 1st November and 3rd & 4th November, 2025. The theme of the conference is designed very carefully, "DISASTER AND ITS AFTERLIFE A Multidisciplinary Response to Environmental Crises from North-Bengal and North-East India (DAIA-2025)". The topic is of people centric, specially the vulnerable population of the country who are exposed to multifaceted hazards and disasters and recurrent victims of such events. I wish the deliberations of the three days' conference will extend with some viable suggestions providing a path making solutions for policy makers and development agencies.

Finally, I take this opportunity to congratulate the Conveners, Organising Secretary, members of the Organizing Committee in particular, Faculty, Staff and Students of this College for holding the Conference. I convey my greetings and best wishes for the grand success of the Conference.

Prof. (Dr.) Ranjan Roy

Message

It is a matter of great pride and pleasure to present the Abstract Volume of the International Conference on "Disaster and Its Afterlife", organized by IQAC, Dhupguri Girls' College, Jalpaiguri, in collaboration with IQAC, Gour Mahavidyalaya, Malda. The conference, scheduled in hybrid mode (online and offline) on 1st, 3rd, and 4th November 2025, brings together academicians, researchers, and students from diverse disciplines to share their insights on the multifarious dimensions of disasters and their long-lasting socio-economic, cultural, and environmental repercussions.

I extend my heartfelt thanks to all contributors, participants, and organizing members for their dedicated efforts in making this academic initiative meaningful and successful.

Abdul Momin Hoque
Organising Secretary
International Conference on
"Disaster and its afterlife: A
Multidisciplinary Response to
Environmental Crisis from
North-Bengal and North-East
India (DAIA-2025)"

Paradigm Shift in Disaster Management in India: From Relief to Resilience

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Abstract

A disaster is a manifestation of natural or man-made causes that leads to sudden disruption of normal life, causing severe damage to life and property to an extent that available social and economic protection mechanisms are inadequate to cope. Primarily, disasters are triggered by natural hazards or human-induced, or as a result from a combination of both. The combination of hazards, vulnerability, and inability to reduce the potential negative consequences of risk results in disaster. India, due to its locational and varied geographical conditions, is extremely prone to a multitude of natural as well as man induced disasters. Out of the 36 States and Union Territories in the country, 28 of them are disaster prone. About 85% of the regions of India is vulnerable to single or multiple disasters. Disaster management plays a vital role in minimizing the impact of unforeseen events. Disaster management is how we deal with the human, material, economic or environmental impacts of said disaster; it is the process of how we "prepare for, respond to and learn from the effects of major failures". When disasters strike, it is crucial to have a well-prepared and coordinated response in place. The disaster management approach in India traditionally focuses on relief and rehabilitation in post disaster scenario and the management of disasters is carried out through a multi-tiered approach where little attention has been paid to disaster risk reduction strategies that have the potential to save thousands of lives by adoption of simple preventive measures. Even after the formulation of Disaster Management Act in 2005 and its leading role to combat the impact of disaster on human lives and environment, over the years' losses due to disasters have shown growing in terms of lives and resources. Hence, India requires comprehensive disaster management strategies that extend beyond post-disaster relief, involving the paradigm shift form crisis management to resilience building.

Keywords: Hazard, Disaster, Vulnerability, Disaster risk, Disaster management, Mitigation, Preparedness, Response, Recovery

Displaced but Not Invisible: Socio-Economic Implications of Myanmar Refugees in Mizoram

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Abstract

This study explores the livelihood strategies and socio-economic challenges faced by Chin refugees from Myanmar who have settled in relief camps in Aizawl, Mizoram, India, following the 2021 military coup. Drawing on qualitative fieldwork across four major refugee sites—Sihhmui, Sairang, Synod Revival, and Luangmual-this research analyzes how refugees navigate displacement through informal labor, community support, and cultural kinship. The findings reveal sharp disparities in access to resources and social integration between camps, with some communities demonstrating greater resilience due to remittances and stronger support networks. Framed within a human rights lens, the study highlights the precarious legal status of these refugees in India, a country that is not a signatory to the 1951 Refugee Convention. Refugees face systemic barriers to employment, education, and healthcare, often living without documentation or formal protection. These conditions constitute serious human rights challenges that deepen the vulnerabilities of an already marginalized population. The study also emphasizes the pivotal role of informal, community-based social work-primarily carried out by churches, the Young Mizo Association (YMA), and faith-based volunteers—in sustaining refugee well-being. These grassroots interventions provide essential services such as housing, food, informal education, and psychosocial support, filling critical gaps left by the absence of state-sponsored aid. By integrating perspectives from human rights and social work, this research contributes to broader discussions on forced migration policy in South Asia and advocates for a rights-based, community-empowered framework to support refugee resilience and integration.

Keywords: Chin; YMA; Myanmar; Mizoram; refugees.

DEVASTATING CLOUDBURST AND HEAVY RAINFALL IN NORTH BENGAL EARLY OCTOBER, 2025: A WITNESS OF METEREOLOGICAL & ENVIRONMENTAL HAZARDS

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Abstract

On the 4th and 5th of October 2025, North Bengal witnessed a devastating cloudburst and extremely heavy rainfall. The hills and foothill zones of the Himalayas, along with the adjacent plains, experienced severe downpours. Some areas recorded between 270 mm-370 mm of rainfall within just 15 to16 hours. The primary cause was the high inflow of moisture-laden south-eastern monsoon winds from the Bay of Bengal, which played a vital role in the orographic uplift and rapid condensation of moisture over the Himalayan foothills and surrounding regions such as Darjeeling, Kalimpong, Jalpaiguri, and Alipurduar districts. The steep terrain of North Bengal acts as a significant barrier to the movement of air masses. Additionally, the interaction between the monsoon and western disturbances intensified atmospheric convection, resulting in stationary clouds and prolonged rainfall. Consequently, within a short period, an enormous amount of precipitation occurred, especially over the catchment areas of the Jaldhaka, Teesta, Torsa, and Mahananda rivers. Furthermore, the local topography and vulnerability of river basins—particularly the narrow and steep Teesta and Jaldhaka basins—contributed to rapid runoff. This led to flash floods and landslides. Unplanned construction, hill cutting, and deforestation have worsened these impacts by destabilizing slopes and reducing natural drainage. Additionally, water discharge from Bhutan and Sikkim into North Bengal's rivers aggravated the situation, causing man-made flooding across several regions.

This burning issue emphasizes the need for regional-scale monitoring frameworks, cross-border data sharing, and early-warning systems integrating remote sensing, field instrumentation, and community-based preparedness. The changing cryosphere of the Eastern Himalaya poses an emerging challenge for sustainable mountain development, demanding international cooperation and adaptive strategies under a rapidly warming climate.

Keywords: Cloudburst, eastern monsoon, convection, airmass, western disturbances, local topography, manmade floods

Reading Earth's History: A Rock (Mylonite) Record of Multiple Geological Events

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Abstract

The geological doctrine "The Present is the Key to the Past", proposed by Sir Charles Lyell (1797–1875), emphasizes interpreting Earth's history through present-day geological evidence. Guided by this principle, the present study seeks to unravel the sequence of multiple geological events recorded in the rock formations of the Eastern Himalayan foothills, particularly in the eastern Duars region. The abundant rock fragments transported by the turbulent rills of this area reveal significant insights into its geological evolution. The research focuses on the analysis of Mylonite samples collected from Rocky Island, located on the banks of the River Murti near Samsing village in Jalpaiguri district, West Bengal. Geologically, the study area belongs to the Extra-Peninsular region and comprises rock formations ranging in age from the Precambrian to the Quaternary period. The lithological composition includes the Siwalik Formation, Darjeeling Gneiss, and the Daling Group of the Proterozoic era, along with extensive Quaternary deposits such as boulders, gravels, pebbles, sands, and silts formed through glacio-fluvial and fluvial processes. A detailed macroscopic analysis of the collected Mylonite sample was undertaken to determine its provenance — tracing the origin, transport, and depositional history of the rock material. The findings offer valuable insights into the tectonic activities, geological processes, and historical evolution of the region.

Keywords: Geological history, Provenance, Mylonite, Geological formations, Eastern Himalayas

Bank Lithofacies characteristics and its sequel consequences on bank failure of River Ganga in Malda District, West Bengal: A field-based Documentary Approach

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Abstract

Bank collapse is a frequently occurring event in case of mighty rivers caused by widespread reaction of both natural and human-induced disturbances. Bank collapse is a natural occurrence in river systems and refers to all the processes associated with river bank erosion and bank wasting. Two primary geomorphic processes viz. (i) the removal of bank materials by flowing water and (ii) the collapse of supersaturated bank especially unstable bank lithofacies, which is sometimes preceded by erosion that weakens the banks are highly visualized in case of bank erosion like the case of river Ganga. Research on bank collapse has mostly examined the effectiveness of various storm flows in carrying away bank materials and identified the elements that lead to the erosion of banks. The material composition of a bank, including its texture and layering, is a significant factor contributing to bank collapse. From a Geological point of view, the Malda district was created from the alluvial deposits of recent Holocene of late Pleistocene. Along the bank-side areas from Manikchak to Panchanandapur, newer alluvium is found known as Khadar. Pedological analysis reveals two main nomenclatures of division in the Malda one is the Entisols, and the other is the Inceptisol along the Ganga river-side areas. The present study is a field-based lithofacies analysis of river Ganga from Manikchak to Farakka to document the bank character attributing as major cause of bank failure. Lithofacies profiling, geo-technical textural analysis of soil constituting separates through laboratory tests and field noting with photographic evidences are the main methods implemented in this research which resulted grossly 80% and slightly above of sands, 10-15% of silts and 5-8% of clay dominated banks are causing scooping, cavitation, areal collapse resulting into havoc and disastrous bank erosion. The study is scopened to develop some documentary and detailed academic contribution in the field of riverine geomorphological studies.

Keywords: Bank collapse, Lithofacies Holocene, Khadar, separates.

Tracing the Scars of an Event - Remnant Sand Mining and Flood Splay Signatures

Priyank Pravin Patel

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Abstract

Natural disasters are episodic, but can have longer physiographic footprints. The scars of an event can continue to persist for long in the landscape and bear evidence to the occurred event. Here we examine the signatures left behind by floods in the form of splay deposits along the Dulung River in Jhargram district of West Bengal, from a single event in 2007, whose ground surface evidence was still discernable in 2016. The sediment tongues still remnant were instrumental in altering the local soil texture, with implications for its fertility and use. Another example is taken from the same region, examining the impacts of sand mining from the riverbed. Though not considered directly as a "disaster" still in common parlance, the effects of sustained sand mining are no less deleterious on the landscape, creating a new class of anthropogeomorphic landforms that are classified as sand pools, sand hollows and sand mounds. We show how this activity modifies the riverbed, changes stream ecological attributes and leads to enhanced channel instability.

The Testament of Teesta: Tracing Teesta's Turbulence and Its Afterlife through Debesh Roy's Teesta Parer Brittanto and Teesta Puran

Shaonli Bhowmik

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Abstract

This paper examines how the shifting geographies of bank erosion and sediment deposition along the river Teesta shape the cultural memory of North Bengal, as evoked in the richly imagined landscapes of Debesh Roy's Teesta Parer Brittanto and Teesta Puran. Widely regarded as the lifeline of North Bengal, the river Teesta is portrayed as a sentient and living entity embedded within local cosmologies in Roy's ethnographic novels. These texts not only animate the emotional geographies and agrarian life but also skilfully depict the cultural identity of the Rajbangshi community amidst the river's braided uncertainty. Literary imagination is intertwined with scientific accounts in portraying the affective, embodied dimensions of adaptation, erosion, and ecological belonging. Undertaking an interdisciplinary exploration, this paper critically synthesises literary representations, historical research, and hydrological studies to examine Teesta not merely as a biophysical force but as a cultural archive. Tracing the river's transformations from the colonial period to the present, the paper foregrounds how rivers mediate political control, ecological vulnerability, and community imagination in a fragile borderland ecosystem. Tirthankar Ghosh's analysis of colonial flood governance (1871–1922) and embankments, particularly in the ecology and society of colonial North Bengal, reveals how infrastructural interventions redirected the river morphology, intensifying both human and ecological displacement. In tandem with this, Dutta and Sarkar's (2022) critique of the inadequacy of legal-institutional frameworks surrounding hydro-power project plants in North Bengal highlights the absence of community voices in the organisational framework for environmental and social governance. Taking into consideration these historical accounts, my study foregrounds the river's braided and highly dynamic morphology that is characterised by alternating erosion and accretion across decades. This paper will further explore how culturally rooted literary narratives provide crucial insights into the "afterlives" of environmental disasters. These are often slow, ongoing processes of coping, recalibration, and resistance that are often overlooked in dominant ecological discourse. By fusing historical-hydrological literature with vernacular cultural memory, this project aims to reinstate the need for a participatory, place-based model of river restoration that honours both material realities and imaginative landscapes in the Eastern Himalayan foothills, and centres community belonging in shaping resilient ecological futures.

Keywords: Teesta, North Bengal, riverine ecology, erosion, embankment, hydro-power project, environmental disaster

Living on the Oars: Exploring Riparian Livelihoods and Climate Crisis in the Context of Rivers Mahananda and Fulahar

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Abstract:

This paper is an endeavour to address the issues and livelihood of the Haldar and Mahaldar fisherman communities belonging to North Malda, West Bengal. Both the Haldar and Mahaldar fishing communities live near the villages, such as Bajitpur Colony and Mahaldar Para. These villages are surrounded by three water bodies, such as the Baromasia River (part of the Mahananda), a large pond or Dighi locally known as "Kol," and Fulahar, which merges with the Ganga near Manichak and Rajmahal Ghat (Located between Malda and Jharkhand). These communities have witnessed significant transformations in their riparian livelihoods, brought about by changes in river directions and severe riverbank erosion. From the ecological perspectives they are losing their existence and glory due to the incessant and massive climate crisis. There was a time these communities used to have a golden era of fishing in the rivers since the rivers were abounded with varieties of fish. They used to celebrate the vibrant presence of the Gangetic Dolphin and witnessed the blue sky filled with flight of birds with their flurry calls along the rivers. Apart from the cultivation of fishing, they have dreadfully seen the soil erosion along the banks of river Fulahar, which has left a colossal impact on their lives. The researcher spent almost two decades with his father in the laps of various rivers across Bihar, and West Bengal. The researcher, through this paper, will share and elaborate on his lived experience to strengthen his thoughts and perceptions regarding the riparian livelihoods by integrating the theme of the climate crisis.

The researcher formulates a few questions in order to persuade the readers within the precincts of this research paper. These are as follows: In what ways are the issues of the climate crisis affecting the riverine ecology? How does the factor of ecological imbalance create a sense of eco-anxiety among the fisherman communities? Does their indigenous knowledge of river and nature matter in maintaining and restoring riverine ecology? The researcher, in this paper, will employ the conceptual coordinates of the emerging Blue Humanities as a theoretical framework to interpret and analyse his arguments.

Keywords: River Fulahar, Mahananda, Riparian Livelihood, Riverine Ecology, Indigenous Knowledge, Blue Humanities

Rooted Selves: Becoming Tree as Ecocritical Resistance in Sumana Roy's How I Became a Tree

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Abstract

This paper explores Sumana Roy's How I Became a Tree through Cheryll Glotfelty's foundational ecocritical framework, which emphasizes the study of literature in relation to the environment and its interconnected crises. Glotfelty defines ecocriticism as "the study of the relationship between literature and the physical environment" and emphasizes that "literary studies had for too long ignored the natural world" (Glotfelty, 1996). The purpose of this research is to explore how Roy's metaphor of "becoming tree" serves as a form of ecocritical resistance against the dominant anthropocentric and capitalist paradigms. The principal findings suggest that Roy reimagines subjectivity beyond human-centered definitions by aligning the self with vegetal life. Her rootedness challenges the speed, productivity, and fragmentation of modern life, embodying an alternative ethics of sustainability and care. Moreover, Roy's text reflects the dual critique that Glotfelty highlights: resistance to both ecological degradation and the cultural marginalization of nature's voice. By embracing tree-ness, Roy subverts binaries of nature/culture and human/nonhuman, inviting readers to recognize ecological kinship. The major conclusion of this study is that How I Became a Tree exemplifies ecocritical resistance by envisioning the self as permeable, relational, and rooted. Through Glotfelty's ecocritical lens, Roy's work underscores the power of literature to imagine ecological subjectivities that resist exploitation and assert interconnected life. Through a literary analysis that integrates Glotfelty's call to consider the relationship between literature and the physical environment, this study applies her insights to interpret Roy's text as a philosophical and poetic enactment of ecological consciousness. The protagonist's desire to be a tree is read as a progressive response to the destructiveness of human civilization and a reimagining of identity in symbiosis with the non-human world.

Keywords: Ecocriticism, rootedness, environment crisis, non-human, resistance.

Air Quality Dynamics in Siliguri, West Bengal: A Decadal Assessment (2014–2024)

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Abstract

Air pollution has emerged as a critical environmental issue across India, yet precise data on individual exposure remains limited due to the inadequate network of monitoring stations, leaving many unaware of their daily exposure levels. Siliguri, a rapidly expanding city in northern West Bengal at the foothills of the Darjeeling Himalaya, is increasingly confronting air quality challenges driven by urbanization, traffic congestion, industrial activities, and changes in land use.

This study assesses air quality trends in Siliguri using data from the West Bengal Pollution Control Board's automatic monitoring station (2014–2024), supplemented by primary field surveys. This study evaluates air quality in Siliguri to trace pollution sources, seasonal patterns, and potential mitigation strategies.

The analysis shows that the average AQI in 2014 exceeded 100, posing risks to sensitive groups, but briefly improved between 2014 and 2017. From 2018 onwards, AQI values rose steadily, peaking at 126.38 in 2021—the highest in the last decade—high enough to cause respiratory discomfort and aggravate asthma and cardiovascular illnesses. AQI levels were found to be highest in winter (January–March), exceeding 200 in 2021 due to temperature inversions, low wind speeds, vehicular emissions, and biomass burning.

Additionally, regular primary field surveys were conducted at various locations to pinpoint main pollution sources and understand their effects on public health. The result shows that amount of PM 10 and PM 2.5 in the air are excessively high. Overall, the study highlights that air pollution in Siliguri is strongly influenced by seasonal variations, meteorological conditions, and vehicular standards. The results emphasize the urgent need for adaptive, location-specific, and targeted management strategies to mitigate health risks and improve urban air quality.

Keywords: Air Pollution, AQI, PM 10, PM 2.5, meteorological conditions, biomass burning.

Who are the Environmental Refugees? The Displacement Process of Mimetic Connotation with Respect to Majuli Island

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Abstract:

This paper responds to the scholarships on the spatial and temporal displacements on Majuli Island of Brahmaputra River. Owing to the contemporary need to ascribe a particular meaning to a geographically shifting group of people – the inhabitants of Majuli are no longer functions as inhabitants. They are now a part of culturally ascribed group, the environmental refugees. The humanitarian narratives around Majuli spanning from geographical conditions to anthropogenic conditions, narrates inadequate analogies by overgeneralizing the diachronic human condition of Majuli with a 'crisis' required to be solved by synchronic understandings. Within this context, this essay offers perspectives on how both the anthropological as well as non-anthropogenic biosphere acts as both the carriers of a changing landscape and an acceptance of it on their existence. It also argues critically on how the extensive researches; the visual and cartographical identifications are shaping and re-shaping new symptoms on the inhibited islanders – ideologically forcing them to accept their natural condition as degraded. As a result, literature focusing on the resultant continuous migrations at a surface level highlights the plight as synonymous with a desire for better living conditions. The resultant scenario leads to a gyre of empirical and non-empirical literary atmosphere from which the educated inhabitants of Majuli are discarding their natural roots and are perceiving their existent conditions in the negative axis – leading to both the annihilation of landscape and a mimetic identification with what is culturally prescribed as 'living condition'.

Keywords: Human Displacement, Societal Resettlement, Planetary Mimesis, Ethical Vulnerability, Adaptation.

Atmospheric Pressure Plasma Treatment as a Novel Strategy for Inducing Drought Tolerance in Zea mays L.

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Abstract

With the increasing prevalence of abiotic stresses due to climate change, developing sustainable technologies to enhance crop resilience is paramount. This study investigates the efficacy of atmospheric pressure dielectric barrier discharge (DBD) plasma as a seed priming agent to induce drought tolerance in Zea mays L. (maize). Maize seeds were exposed to DBD plasma for varying durations (0, 2, 4, and 6 minutes). Treated seeds and subsequent seedlings were evaluated under well-watered and polyethylene glycol (PEG)-induced drought stress conditions. Plasma treatment significantly enhanced germination kinetics, with the 4-minute treatment showing a 28% increase in germination rate under drought stress compared to the untreated control. Treated seedlings exhibited superior morphological traits, including a 35% increase in root length and a 42% increase in shoot fresh weight under water deficit. Physiological and biochemical analyses revealed that plasma-primed plants maintained higher relative water content (RWC), lower electrolyte leakage, and elevated levels of osmolytes like proline. Furthermore, a significant enhancement in the activity of antioxidant enzymes (superoxide dismutase, catalase, and peroxidase) was observed, mitigating oxidative damage by reducing malondialdehyde (MDA) levels by 40%. These results demonstrate that DBD plasma treatment systematically primes maize seeds, leading to enhanced root architecture, osmotic adjustment, and robust antioxidant defense, culminating in superior drought tolerance. This physical seed treatment presents a promising, chemical-free strategy for sustainable crop improvement in water-limited environments.

Keywords: Cold Plasma, Drought Stress, Seed Priming, Zea mays, Antioxidant Defense, Osmotic Adjustment, Sustainable Agriculture.

Integrated Assessment of Flood-Affected Areas, Building Vulnerability, and Future Flood Forecasting under Changing Climate Scenarios: A Case Study of Jalpaiguri District, India

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Abstract

Floods are among the most common and damaging natural disasters in India, especially in the Jalpaiguri District of West Bengal. Due to changing climatic conditions, flooding events have become more frequent, causing significant financial losses. This study aims to develop an integrated geo-spatial and machine learning (ML) framework to identify flood-affected areas, assess building footprint vulnerability, and predict future flood events. Various geo-environmental factors, such as elevation, slope, land use, drainage density, and rainfall, were integrated into a supervised ML modeling framework to delineate flood-prone zones. Synthetic Aperture Radar (SAR) data were applied to identify recently flooded and flood-extended areas. To assess building vulnerability, the study examined the proximity of buildings to flood zones, which helps classify existing structures based on their exposure and vulnerability levels. To understand future flood risks, the study considered precipitation data under climate scenarios SSP245 and SSP585 of CMIP6 for forecasting the timing and spatial extent of future flood-prone areas. The results provide a comprehensive view of flood dynamics and highlight critical areas of high building footprint density and potential future expansion zones. This approach supports the development of effective flood management and mitigation strategies and provides valuable information for regional planners, policymakers, and disaster management authorities to strengthen community resilience in flood-prone areas.

Keywords: Machine learning (ML) modeling, Flood-prone area, Flood extend, Building footprint, SSP245, SSP585, future floods timing forecast

Sustainable Development and Environmental Degradation: An Interlinked Debate

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Abstract

The concept of sustainable development gained global importance with the Brundtland Report Our Common Future (1987), which defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987). In essence, sustainable development promotes an economic and social model that prioritizes environmental protection, equitable resource distribution, and long-term planetary well-being. It encourages improving the quality of life for both present and future populations while ensuring that global communities do not consume resources beyond the Earth's ecological capacity (European Commission, 2019).

However, the accelerated pace of development in recent decades has promoted environmental degradation. Earlier, the International Union for the Conservation of Nature (IUCN) emphasized sustainable development as a global necessity in the World Conservation Strategy (IUCN, 1980). Despite conservation efforts, continuous population growth and expanding human needs have exerted increasing pressure on finite natural resources. Large-scale deforestation, biodiversity loss, and over-exploitation of non-renewable resources indicate that sustainability remains difficult to achieve in practice. Griffith Taylor's Neo-determinism highlights that human actions are guided but not unrestricted by nature (Taylor, 1951), while Malthus (1798) warned that unchecked population growth leads to environmental strain. Therefore, a truly sustainable future requires global cooperation, responsible resource utilization, and strict adherence to environmental policy frameworks.

Keywords: Sustainable Development, Environmental Degradation, Brundtland Report, Resource Management, Neo-determinism, Malthusian Theory, Green Economy, Conservation Policy

Gendered Vulnerabilities to Climate Change: Unequal Burdens on Women and Girls

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Abstract:

Gender vulnerability to climate change means that women and girls face an unequal burden due to intersecting gender imbalances and socio-economic factors, which expose them to heightened risks during extreme weather conditions and hinder their ability to adapt to climate impacts. Women and girls living in poverty, particularly those dependent on natural resources, often bear the added responsibility of securing food, water, and fuel. This increased burden, combined with limited access to resources, information, and decision-making power, enhances their vulnerability during climate crises and leads to negative outcomes such as a higher risk of gender-based violence and greater likelihood of displacement. The impacts of climate change further accelerate social, political, and economic stresses in fragile and conflict-affected settings—contexts where women and girls are already vulnerable to multiple forms of gender violence. For instance, in rural economies, prolonged droughts or devastating floods that damage agriculture can destroy livelihoods, food supplies, and access to safe drinking water. As a result, poverty and instability intensify, often leading to increased incidences of conflict-related sexual violence, human trafficking, and child marriage. This paper undertakes an intensive study of how climate change disproportionately affects vulnerable sections of society, with a particular focus on women and girls, their causes of vulnerability, and the consequences they face.

Keywords: Gender Vulnerability, Climate Change, Women, Adaptation

Crisis of Northern Bengal Rivers and its Consequences

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Abstract:

The norther Bengal, the districts of Jalpaiguri, Coochbehar, and Alipurduar has faced several first flowing river channels. Starting from the the river Tista, there are rivers like Jaldhaka, Raidak, Kaljani, Sankosh are the notable rivers. Besides these, there are innumerable channels and jhoras appear in the Himalayan foothills which becomes furious when there is continuous rain in the hills or upstream. In the recen times, the crisis of North Bengal's rivers is multifaceted, driven by a combination of climate change-induced heavy rainfall and human activities like illegal debris dumping and unsustainable development. This has led to increased siltation, which raises riverbeds and exacerbates flooding, causing rivers to overflow, change course, and inundate villages and farmlands. This year, the flood situation causes havoc floods in all the major rivers of this part by failure of embankment. The crisis lasts for months and even today when the flood victims have taken shelter to nearby schools, relief camps, railway lines etc. Many NGOs, Govt organizations render their services to overcome the situations. There needs a strategic view to overcome the crisis of North Bengal Rivers. Attempts have been made in this paper to overview the crisis of northern Bengal rivers and strategic guidelines.

GLOBAL WARMING AND IT'S EFFECTS ON ENVIRONMENT

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Abstract

Global warming, a phenomenon characterized by the gradual increase in the Earth's average surface temperature, is having a profound impact on the environment. The burning of fossil fuels, deforestation, and industrial agriculture are releasing massive amounts of greenhouse gases, such as carbon dioxide and methane, into the atmosphere, leading to a global average temperature increase of over 1°C since the late 19th century. One of the most visible effects of global warming is the melting of polar ice caps and glaciers. The effects of global warming are far-reaching and devastating, with consequences for ecosystems, wildlife, and human societies. It is imperative that we take immediate action to reduce greenhouse gas emissions and transition to renewable energy sources to mitigate the worst impacts of global warming. Global warming is having a profound impact on the environment, leading to catastrophic consequences. The good news is that the solutions to global warming are available, and many are already being implemented. Renewable energy technologies such as solar and wind power are becoming increasingly cost-competitive with fossil fuels, while sustainable land use practices like reforestation and agroforestry can sequester significant amounts of carbon dioxide. Moreover, the transition to a low-carbon economy presents numerous opportunities for economic growth, job creation, and improved public health. However, realizing these benefits will require coordinated action from governments, businesses, civil society, and individuals around the world. This paper addresses the global threat of warming and creates a more sustainable, equitable, and resilient future for all.

Keywords: Climate Change, Environmental Degradation, Biodiversity Loss, Ecosystem Disruption, Human Impact.

Integrating Multiple Decision-Making Methods for Enhanced Flood Risk Mapping in Sub-Himalayan North Bengal

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Abstract

Flood susceptibility mapping in the Sub-Himalayan piedmont of North Bengal is challenging because flood footprints shift and multiple drivers interact. This study develops a transparent, updatable multi-criteria ensemble that aggregates four established decision models-TOPSIS, VIKOR, EDAS and PROMETHEE-II-after min-max normalization and direction-of-influence harmonization (higher = more susceptible). To avoid overfitting and preserve interpretability, equal weights are applied to the four model scores; PROMETHEE-GAIA is used for post-hoc interpretation of factor contributions. Using an independent multi-event flood inventory, the ensemble shows superior discrimination and calibration relative to single methods (AUC = 0.80, 95% CI 0.76–0.82; Brier = 0.200), with gains supported by DeLong tests. Five susceptibility classes are mapped; High–Very High hotspots align with the Torsa-Raidak-Jaldhaka corridors and low-lying confluences, with over 70% of High-Very High cells occurring within ~2 km of major channels. At the block scale, Tufanganj I–II and Mathabhanga I emerge as priority units for screening and mitigation. Polar plot diagnostics are used complementarily to probability-based metrics, summarizing pattern agreement without supplanting them. Findings support corridor-focused drainage maintenance, risk-aware siting of critical facilities and targeted early-warning outreach, offering a policy-ready pathway to priorities flood risk reduction in data-limited Himalayan piedmonts.

Keywords: Flood Susceptibility Mapping; Multi-Criteria Decision-Making; Ensemble; PROMETHEE-GAIA; North Bengal; Sub-Himalayan piedmont

What Could Not Be Said: Silence and the Afterlife of the 2023 Sikkim GLOF

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Abstract

Disasters do not end when the waters recede, they persist as afterlives of managed sound and deliberate silencing. This paper explores how silence functions as a form of power in post-disaster narration. The study focuses on the October 2023 Sikkim GLOF, analyzing fifteen texts (official press releases, state media reports, and newspapers in English, Hindi, and Nepali) published during the two weeks following the event. Using critical discourse analysis, it examines how administrative, linguistic, cultural, and archival silences shape what can and cannot be said about loss. The analysis finds that official statements name individuals yet strip them of agency, producing selective visibility. Vernacular outlets reproduce state relief jargon, creating vernacular bureaucratization that replaces local emotional registers, ecological knowledge, and ritual practices, while fragmented vernacular archives further erase community memory. Even Rongnyu (Teesta) sacred in Himalayan cosmology is rendered as geography, not divinity.

These findings suggest that disaster afterlives are governed as much by structured forgetting as by remembrance. Drawing on Trouillot's historical silencing, Das's "speech by other means," and Connerton's insights on organized forgetting, the paper argues that listening for silence is both a methodological and ethical act, an effort to recover what official discourse leaves unsaid.

Keywords: disaster memory, vernacular bureaucratization, selective visibility, archival silence, Himalayan floods

Cartographies of Aftermath: Geospatial Evidence, Local Memories and Adaptation in the Singimari River Floodplain of Dinhata-I and Sitai Blocks, West Bengal

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Abstract

Riverine disasters are never only hydrological events; they are socio-ecological processes that reshape landscapes, livelihoods and cultural memory. The present work synthesises geospatial analysis with community perspectives to examine disaster afterlives along the Singimari River in North Bengal. Drawing on a 30-year assessment (1995–2025), channel migration, quantification of village-level land loss/gain and delineation of flood-susceptibility zones have been done, while situating these findings within debates on displacement, intersectional vulnerability and non-human agencies in recovery.

Methodologically, the integration of multi-temporal Landsat imagery (TM/OLI), Modified Normalised Difference Water Index (MNDWI)-based channel extraction, and transect-wise measurements (A–V) has been done to estimate lateral shifts and bank retreat. Flood susceptibility is evaluated through an AHP-MCDA framework that weighs fourteen parameters (elevation, slope, geomorphology, lithology, soil texture, Bare Soil Index, MNDWI, Topographic Wetness Index, rainfall, land use and land cover, proximity to rivers/roads/settlements, and Normalised Difference Vegetation Index) to classify risk into five zones. Field visits and conversations with residents of 42 riverine villages inform the social reading of these maps, foregrounding displacement histories, livelihood precarity and differential exposure by gender, caste and class.

Results indicate persistent, spatially uneven channel instability, accompanied by land erosion in several settlements and accretion elsewhere, creating a mosaic of risk and opportunity that fuels cyclical migration and resettlement. The composite flood map identifies contiguous corridors of very-high (9.21%) and high (11.18%) susceptibility aligned with low relief, high wetness and recent depositional surfaces. The integrated evidence identifies priority villages where targeted drainage rehabilitation and climate-smart agronomy could yield the greatest marginal risk reduction. The study demonstrates how combining geospatial analytics with community knowledge produces actionable, fine-grained adaptation maps. It also argues for embedding such "evidence-with-memory" approaches into block-level disaster risk reduction and land-use planning.

Keywords: Floodplain; Geospatial analysis; Participatory mapping; Singimari River; AHP model

Exploring the Unsung Heroes of Bhopal Gas Tragedy in The Railway Men - The Untold Story of Bhopal 1984 (2023)

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Abstract

Tragedy sometimes unravels the true nature of human beings; during the most vulnerable and critical phase of life, one gets to see the actual characteristics of one's fellow beings. On the night of 2nd December 1984, and thereafter, many people became heroes and acted selflessly. Some of their accounts have been premiered in the web series The Railway Men - The Untold Story of Bhopal 1984 (2023) by Yash Raj Films under the direction of Shiv Rawail. The series reveals the tireless efforts of Station Master Ghulam Dastagir and his team at Bhopal Junction railway station on the night of the tragedy. However, this series also highlights the behaviour as well as the actions of people during such a high time when one desperately needs the help of another. The way a robber undergoes a paradigm shift in terms of his characteristics keeps the audience's hope intact, along with the diligent efforts of the station master to care for as many people as possible. Therefore, this paper attempts to explore the bravery of the unsung heroes of one of the worst industrial disasters in the world that claimed countless lives and also brought forth people like Ghulam Dastagir and his team. In order to understand these characters in a better way, psychoanalysis and related theories have been discussed. Thus, the paper unravels the mindset of human beings during the tragic situation and in the aftermath.

Keywords: tragic incident, untold heroes, bravery, psychology, etc

Dynamics of Riverbank Erosion and its Impact on Population Displacement in Malda District of West Bengal, India

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Abstract

Riverbank erosion is a major environmental hazard that has long affected the socio-economic fabric of the Malda district in West Bengal. The district, located along the dynamic course of the River Ganga and its tributaries, experiences recurring channel shifting, resulting into severe erosion, particularly in the CD blocks of Manikchak, Kaliachak I, Kaliachak II, Kaliachak III, Ratua I and Ratua II. These calamities lead to extensive loss of agricultural land, destruction of houses and infrastructure, and large-scale displacement of local populations. As the river Ganga shifts its course gradually and frequently, thousands of families are forced to migrate, resulting in overcrowding in safer areas and increasing pressure on limited resources and infrastructure. Moreover, riverbank erosion particularly during the monsoon and post-monsoon have led to a steady decline in crop productivity, severely affecting food security and forcing many farmers to change their occupation. Affected people not only lost their land, houses and other belongings, but sometimes they lost everything, including their identity. The combined loss of livelihood opportunities and limited access to education and healthcare has further deepened poverty and social vulnerability. This study aims to examine the socio-economic impacts of riverbank erosion in the Malda district, with a particular focus on population displacement. It also highlights the long-term implications of these issues for sustainable development. The findings emphasise the urgent need for riverbank management, community-based adaptation strategies, a holistic approach and strong policy interventions to mitigate the adverse effects of these hazards and strengthen the resilience of affected communities.

Keywords: Riverbank erosion, Displacement, Livelihood, Socio-economic Impact, Vulnerability

Climate Induced Displacement: An Emerging Humanitarian Crisis In Reference To North Bengal, India

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Abstract

One of the greatest challenges of present time, both nationally and globally, is the unpredictable and peculiar nature of climate change. Rapid change in the environmental condition causes frequent and extreme weather change in the form of flood, cloud burst, heavy rain, landslide and cyclone. In this context Eastern and North Eastern states of India are facing multiple challenges. In fact, these areas are climate-centric vulnerable regions, as in the recent past these states are recurrently facing difficulties due to climate change and alteration. This creates an interconnection between climate crisis and human displacement referred as climate-induced-displacement.

Human mobility is a regular phenomenon, but displacement due to extreme shocks of climate crisis is the present-day challenge and concern. Though climate-induced-displacement is not a new concept yet its visibility and severity are increasing day-by-day affecting the life of the people-socially, economically, psychologically. The reality is often the damage related to climate crisis are calculated in financial terms and loss of resources. But the other side of the story is equally important that is the human cost associated with it. Climate-induced-displacement have become one of the main reasons behind internal displacement which is associated with many hardships and known/unknown challenges.

The large-scale impact of climate crisis is ultimately forcing the people to move from their place of residence either for a temporary period or for permanently. Thus, the consequence of climate-induced-displacement includes the human pain both in the decision of displacement and also after the displacement. Displaced peoples have no option rather than settlement on remote locations or unauthorized locations, which is extremely crowded with lack basic facilities and services which result into expansion of vulnerability in terms of insecurity, lack of opportunity, discriminatory treatment, powerlessness etc. It is in this context the paper is interested to see the how climate-induced displacement not only affect the ecosystem, finance, resources, goods and services, an also from the angle increasing human vulnerability in terms of their life, livelihood and existence.

Keywords: Climate change, displacement, humanitarian crisis, vulnerability, resettlement

Listening to the Teesta's Afterlife: Ecoacoustics, Sonic Memory, and Multispecies Recovery after the 2023 GLOF Himalayas

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Abstract

This paper proposes an ecoacoustic and humanities-led investigation of the Teesta's post-disaster soundscapes following the 4 October 2023 GLOF across Sikkim–North Bengal. Reading the "afterlife" of disaster through sound, this paper investigates how human and non-human acoustic practices like river turbulence, construction hum, sirens, devotional loudspeakers, birdsong, and insect choruses register loss, repair, and ecological rearrangement. Conceptually, the study bridges environmental humanities, disaster studies, and acoustic ecology to foreground who is heard, who is silenced, and how listening can become a method of care. Methodologically, it combines (1) longitudinal field recordings with ecoacoustic indices (Acoustic Complexity Index, Bioacoustic Index, Normalized Difference Soundscape Index) to track habitat stress and recovery; (2) participatory mapping in Teesta-adjacent communities to co-produce "maps of noise and care" layered with land-use and mobility shifts; (3) oral histories with women, indigenous groups, migrant workers, and river-dependent livelihoods to document sonic memory and everyday adaptations; and (4) lightweight ML classifiers differentiating biophony, geophony, and anthrophony to quantify changing rhythms of species return and human activity. The outcome is a "Sonic Afterlife Atlas" that is interlinked spectrograms, testimonies, and GIS layers that reframes risk communication and restoration through listening, advancing sound as evidence, archive, and intervention for a just, more-than-human Teesta.

Keywords: Oral Histories; Participatory Mapping; Multispecies Resilience; Risk Communication; Biodiversity

Forest biomass estimation of Sal forests through non-destructive field approaches: Evidences from Panchet Division of Bankura

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Abstract:

Forests are among the most significant terrestrial ecosystems on Earth, functioning as vital reservoirs of carbon and playing a fundamental role in global climate regulations. This study attempts to quantify the biomass stock of the natural tree species and the forest, without hampering the forest ecosystem. Adopting the non-destructive field-based approaches the estimation of the biomass stock was carried out. The region's forests are primarily tropical dry deciduous, dominated by native species such as Shorea robusta (Sal). The findings indicate that the tree height, DBH, and tree density influences the biomass of the trees. The study also identified that the in terms of areal coverage the highest biomass stock was 5.50Mt belonging to Fairly Dense Sal patches followed by Dense Sal patches having 1.65Mt and Open Sal patches possessing at 0.27Mt. The highest carbon sequestration rate was also found in the fairly dense Sal Forest area which (340.22 t/ha) followed by Dense Sal and open Sal forests which are 225.41 t/ha and 140.05 t/ha respectively. The total Biomass stock of the natural forest of the study region amounted to 7.42Mt having an average carbon sequestration rate of 235.22t/ha. This estimation of forest biomass would help the policy makers in estimating the carbon storage, assessing ecosystem productivity, and formulating effective climate mitigation strategies.

Keywords: Above-ground biomass, Below-ground biomass, Total biomass, Natural forest, Allometric equation

Assessing Urban Encroachment Impact on Siliguri's Panchanai River Flood Risk Using GIS & Markov Chain Model

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Abstract

This research uses an analysis of urban expansion to estimate the Panchanai River in Siliguri's future flood danger. From 1980 to 2020, we measured the rate at which natural land cover was being replaced by populated areas using GIS and satellite data. Continued encroachment was predicted by simulating land usage till 2035 using a Markov Chain model. To identify possible flood inundation zones, a digital elevation model was combined with this prospective land-use plan. The findings show that nearby urban settlements are much more vulnerable to flooding, highlighting areas of high risk. To enhance resilience in the foothills of the Himalayas, the research offers a spatial framework for proactive land-use planning and flood mitigation strategies.

Keywords: Land Use Change; Predictive Modeling; Risk Assessment; Geospatial Analysis; Himalayan Foothills

Teesta Beyond Treaties: Ecological and Human Dimensions of a Shared River in Crisis

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Abstract

The Teesta River, a transboundary waterway shared by India and Bangladesh, is affected by hydrological stress, extreme floods, and upstream water management conflicts. While immediate attention often focuses on acute damages and political disputes, the prolonged ecological and socio-economic processes "afterlife" of water crises remains understudied. This research explores how communities, ecosystems, and governance frameworks adapt, reorganize, and negotiate survival in the aftermath of recurrent Teesta-related crises. The objectives are to examine ecological health indicators, including water quality, flow regimes, and biodiversity; document human adaptation strategies and livelihood vulnerabilities; identify gaps in transboundary water governance; and propose integrative strategies for resilient river management. A mixed-methods approach is employed, combining ecological assessments, household surveys, stakeholder interviews, policy review, and GIS-based mapping. By centering long-term adaptations and post-crisis trajectories, this study illuminates the layered "afterlife" of riverine disasters in North Bengal and Bangladesh.

The findings highlight ecological hotspots requiring conservation, reveal patterns of community resilience and livelihood adaptation, quantify impacts of altered flow regimes on agriculture and fisheries, and offer recommendations for equitable, sustainable water governance. By emphasizing the layered aftermath of water crises, the study provides a nuanced understanding of human-nature interactions and informs long-term planning for North Bengal's riverine landscapes.

Keywords: Flood Resilience, Community Adaptation, Biodiversity Conservation, Transboundary Water Management, Socio-Ecological Systems.

Erosion Zonation Mapping by adopting Analytic Hierarchy Process (AHP) and Remote Sensing GIS Approach: A study on Pagladia Watershed, Nalbari, Assam

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Abstract

Erosion is one of the burning problems of Assam as the region is experiencing high intensity of rainfall every year which leads to flood in low lying areas of floodplain region and it triggered the settlement of village areas, sometimes it devasted the infrastructure, agricultural land, properties and then the process of erosion becomes disaster. In this present study primarily emphasised on a quantitative mapping of erosion prone region of Pagladia river watershed by applying Analytical Hierarchy Process (AHP) and Remote-Sensing GIS data. AHP method includes several parameters such as Channel slope, drainage density, Relative relief, flow accumulation and with the help of comparison matrix table, criteria weight have allotted against each parameter. After the calculation of Consistency ratio (Cr) the erosion zonation map has been prepared with the help of weighted Overlay analysis in GIS software and most erosion prone zone has been identified. The Pagladia river, mostly erosion are takes place in the upstream of the basin as this region consists of high gradient and active in transportation process, therefore, this region comprises high erosion process and get deposited into downstream of the basin mostly comprises of floodplain of Nalbari district. It is necessary to study the rate of erosion and intensity of flood occurred in the floodplain region of Nalbari district as the Nalbari is highly affected from river bank erosion and people are suffered from huge loss as well as physical environment got destructed. Therefore, erosion is considered as one of the significant natural calamities which is required to study and explore suitable scientific remedies to reduce bank erosion of a specific region. Study also beneficial for those are engaged in hydrological and geomorphological research for further exploration of the issues, it helps to assist the proper planning and implementation of mitigation measures.

Keywords: Erosion, AHP, GIS, Pagladia, flood

Flood Zonation Mapping Based On Analytical Hierarchy Process Method: A Study on Jiadhal River Basin of Assam, India

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Abstract

Globally, flood is considered as one of the most common and dangerous natural hazards which impact on both natural and social environment. The river's which are flowing from the high-altitude areas with a steep slope and receive high rainfall often creates devastating flood in the low-lying plain areas. The Jiadhal River is selected in the present study to identify the flood zone by applying the AHP method. The river is a sub tributary of Brahmaputra River which originated in the High mountainous areas of Arunachal Pradesh and flowing towards the Brahmaputra plain. The river inundated the lower catchment areas of the basin during the monsoon time period annually and it creates huge loss in the environmental and socio-economic properties of the nearby areas of the basin. The nine numbers of geomorphic flood influencing factors were selected in the study to perform the analysis and identify the flood affected zones within the basin. The result of the study found that low flood zones occupy the upper section of the basin and most of the lower catchment areas include in the high flood zones. The resulted flood hazard map has classified into five classes, viz., very low to very high and the maximum areas has occupied the moderate flood hazard zones which is 1320.46 sq. km and observe in the lower and middle section of the basin The current study will be help to understand flood behaviour of the basin for determine the proper mitigation measures to reduce the flood vulnerability of the area.

Keywords: Jiadhal River, AHP method, GIS and remote sensing, Flood zonation map

Flood hazard zonation of the Sankosh-Raidak II interfluve using AHP and GIS technique

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Abstract:

Floods repeatedly threaten lives, livelihoods and infrastructure in the Sankosh-Raidak II interfluve of the Brahmaputra Basin, where settlements and croplands occupy low-lying areas between two perennial rivers. This study developed a spatially explicit flood-hazard zonation using an integrated Analytic Hierarchy Process (AHP) and GIS workflow. Ten conditioning factors (elevation, slope, distance to streams, drainage density, soil, rainfall, topographic wetness index (TWI), land use and land cover (LULC), NDVI and curvature) were standardised and combined through weighted overlay after deriving factor priorities from an AHP pairwise comparison with a satisfactory consistency ratio of 7.2%. The resulting weights highlighted elevation (20.10%), slope (17.00%) and proximity to streams (15.30%) as dominant controls, followed by drainage density (12.40%), soil (9.60%), rainfall (7.80%), TWI (5.80%), LULC (5.30%), NDVI (4.00%) and curvature (2.70%). The hazard map classifies the interfluve into very low (0.04%; 0.13 km²), low (10.20%; 34.86 km²), moderate (56.34%; 192.55 km²) and high (33.42%; 114.23 km²) zones, revealing that approximately 89.8% (306.78 km²) of the mapped area falls within moderate to high hazard classes concentrated along active channels, flood-prone depressions and gently sloping alluvial tracts. These findings provide a decision-ready basis for flood-plain zoning, embankment prioritization, micro-drainage improvements and targeted early warning and evacuation planning, while the transparent AHP-GIS framework supports periodic updates and transferability to adjacent reaches of the Brahmaputra Basin.

Keywords: Flood hazard; AHP; GIS; Sankosh-Raidak II interfluve; Weighted overlay

"Environmental Displacement and Place Identity Transformation in the Erosion-Prone Samserganj Region"

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Abstract:

The Samserganj region of Murshidabad district, West Bengal, represents one of the most erosion-prone areas along the Bhagirathi River, where environmental displacement has become an annual phenomenon. Continuous riverbank erosion leads to large-scale land loss, forcing thousands of inhabitants to migrate and reconstruct their livelihoods in fragile and often temporary settings. This study investigates the dynamic relationship between environmental displacement and the transformation of place identity among affected communities. Adopting an integrative geographical approach, the research combines spatial analysis through remote sensing and GIS with qualitative methods such as field surveys, participatory mapping and oral narratives. The findings reveal that beyond physical dislocation, erosion disrupts the deep emotional and cultural bonds between people and their ancestral land, resulting in a profound "loss of place". Displaced households experience both psychological stress and socio-economic insecurity, yet many demonstrate resilience by re-establishing new networks and adapting their cultural practices in resettlement areas. The study highlights that environmental displacement in Samserganj is not merely a spatial crisis but a transformation of identity, memory and belonging. It underscores the urgent need for sustainable riverbank management, community-based adaptation, and inclusive rehabilitation policies to mitigate the socio-spatial consequences of erosion in the lower Ganga basin.

Keywords: Riverbank erosion, Displacement, Migration, Bhagirathi River, Place identity.

Flood and rivers: Analysing the role of governance in flood disaster management in North Bengal

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Abstract

Floods are common threat for ecological people that also include other biotic components and construction of hydrological dams and embankments are seen as solution for this. Recently, flood occurred on 5th October, 2025 in North Bengal and the forecasting of breaking down of Tala dam of Bhutan gate created an intense and deep threat into the mind of local inhabitants specifically for those living along the side of the catchment area of the rivers and hydrological dams. Scholarly articles on flood management emphasises on "man-made flood" caused because of hydrological dams. Besides, a few environmental historians also argue that flood is natural character of rivers and it is not always be a curse. Instead, Indo-Gangetic plain land and Brahmaputra plain land became fertile and suitable for agricultural land due to sedimentation carries by the flood. In consideration with these two aspects, this paper seeks to analyse the role of governance of flood management in North Bengal. Methodologically, it follows conceptualisation of flood in governments reports, archival documents etc. This study may contribute towards nature-based solution of flood by critically analysing meaning of flood and already prescribe solution for it.

Keywords: Flood, governance, threats, solution, flood management

Hyperobjects in The Hungry Tide and Environmental Ethics

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Abstract

Amitav Ghosh's The Hungry Tide has been studied for its social, political and ecological dialogues and the narrativisation of how human activities have disturbed the Sundarban ecosystem. However, the paper foregrounds a shift from the human centric action like encroachment to the expansiveness and incomprehensibility of natural phenomena, which leave the human subjects overwhelmed and powerless. To analyse this complex ethical crisis, the study will foster a twofold approach: (i) a scrutiny of the material objects as vibrant agents and (ii) a contextualisation of ecological imbalance, destruction of habitats and displacement. Drawing on Timothy Morton's theoretical framework, the paper aims to address the representation of ecological instability in Sundarbans as a "Hyperobject". Primarily, the paper will examine how the complex material environment of the Sundarbans wield power and elusiveness, challenging the notion of human exceptionalism. The focus is to look at how non-human ecological entities such as rivers, tides, mangroves and endangered animals like Irrawaddy dolphins acquire agency, rather than withdrawing as parts of the ecological background. Secondly, it endeavours to consider how the nonhuman in the narrative reflect the five facets of hyperobjects - viscosity, nonlocality, temporal undulation, phasing, and interobjectivity- in order to emphasise the lively presence of ecological materiality in shaping the lives of humans. In the process, the paper will reveal the destabilised Sunderbans as a hyperobject. Also, it is an exploration of "mesh" or relations between humans and their material environment. Ultimately, the article contributes to a new ecological framework which challenges anthropocentric perspectives and relies on the autonomy of material objects in shaping the human experiences.

Keywords: Hyperobjects, nonhuman entities, Sunderbans, ecology, Object oriented philosophy

From Marginality to Ethnicity: The Matua as a Reconstituted Political Subject

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Abstract:

Matua community, which initially arose out of the Namashudra reformist movement spearheaded by Harichand and Guruchand Thakur in the nineteenth century, has been transformed into an assertive ethnic-political group from a marginalized caste group. The processes through which the Matuas have been reconstituted as a political subject in contemporary identity politics in Bengal are the focus of this study. Based on historical, ethnographic, and political research, it inquiries into how displacement, religious reform, and the politics of recognition have constructed Matua consciousness. It points to how cultural symbols like Kirtan, pilgrimage to Thakurnagar, and Harichand-Guruchand narratives have been used in electoral mobilization. By following the transformation from socio-religious reform to political instrumentalization, this study contends that the Matua identity is a culmination of both resistance against caste exclusion and calculated accommodation to competitive democratic politics. The remaking of the Matuas as a politicized ethnic group demonstrates the intricate intertwinement of faith, migration, and citizenship in postcolonial Bengal.

Keywords: Matua Community, Ethnicization, Political Mobilization, Caste Politics, Identity Reconstitution

Displacement, migration and resettlement: shaping new cultural and social Geographies

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Abstract

Displacement, migration, and resettlement are transformative processes reshaping cultural and social geographies in an increasingly interconnected world. Driven by conflict, economic disparities, climate change, and political instability, these movements disrupt traditional demographic patterns and forge new socio-cultural landscapes. This paper explores how displacement—often involuntary due to war or environmental crises—uproots communities, while migration introduces diverse cultural practices, languages, and identities into host regions. Resettlement, whether planned or spontaneous, further reconfigures social structures, fostering hybrid identities but also sparking tensions over integration and belonging. Drawing on global case studies, including the Syrian refugee crisis and climate-induced migration in the Global South, the study examines how these processes create vibrant multicultural hubs in urban centers while challenging social cohesion and resource allocation. It highlights the dual nature of these phenomena: they enrich cultural diversity and economic dynamism but can also exacerbate marginalization and xenophobia. By analyzing demographic shifts, policy responses, and community adaptation through a geographical lens, this research underscores the role of migration in redefining borders, identities, and social fabrics. It argues for inclusive frameworks to manage these transitions, ensuring equitable integration while preserving cultural heritage, thus shaping sustainable social geographies for the future.

Keywords: cultural diversity, social cohesion, multiculturalism, identity, urbanization, diaspora

New-Normal Education Scenario: Experience of the Pandemic Days in Cooch Behar Sadar Sub-Division of Koch Bihar District

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Abstract

The outbreak of Novel Corona Virus Disease in the late 2019 has been classified as a biological disaster which created a disorder in the lives of the people throughout the world where students were no exception. The country experienced nationwide lockdown and consequent closure of normal activities. The system of education shifted to online mode. As a result, a long gap in student-teacher face-to-face interaction was initiated. This prevailed till February 2nd, 2022. The closure of schools gave rise to a new type of teaching- learning methodology in the form of digital interface. Our country as it is known for its diversity also maintained this attribute and created a digital divide among its population. Some could afford e-classes, others could not; some experienced excellent internet network, while others faced disrupted connection; some could remain connected with their pupils through e-platform while others experienced lack of infrastructure and other economic pressures. They could only survive through distribution of incentives and class assignments, at an irregular basis. This study endeavours to explore the profound and enduring impacts of the pandemic on society, focusing on the upheaval in school education. With a specific focus on Koch Bihar district of West Bengal, particularly Cooch Behar Sadar Sub-Division, the research aims to examine and evaluate the new-normal education system which could become a useful guide for similar kind of emergent, unforeseen circumstances.

Keywords: Biological Disaster, Online mode, Societal disparities, New-Normal Education System, Digital Divide

Study of Kinetic, Isotherm, and Thermodynamic Properties of Chitosan for the Adsorption of β-Lactam Antibiotic, Amoxicillin in Simulated Wastewater

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Abstract

The presence of micropollutants, such as pharmaceuticals, in water bodies is a rising global concern, as conventional approaches are often ineffective. The present study focused an alternative approach i.e. adsorption, using shrimp shell-derived chitosan as an adsorbent, evaluating its efficiency against β-Lactam antibiotic, amoxicillin. The formulated chitosan was characterized using SEM, FTIR, XRD and UV-Vis spectroscopy. Kinetic properties were explained using Pseudo-1st and 2nd order kinetics, Elovich and intra-particle diffusion model. The isotherm characteristics were demonstrated through Langmuir, Freundlich, Temkin and Redlich–Peterson models. SEM images showed rough and porous surface, semi-crystallinity nature was observed through XRD analysis, FTIR confirmed characteristic functional groups of the developed chitosan product. The adsorption kinetics were clearly expressed by the pseudo 2nd order model (R2 = 0.9999), with small contributions from intra-particle diffusion and Elovich models, whereas equilibrium followed the Langmuir isotherm (R2 = 0.9998). The thermodynamic analysis verified spontaneous, entropy-driven, and mildly exothermic adsorption ($S° = +19.89$ J mol^{-1} K^{-1}, $\Delta H° = -3.00$ kJ mol^{-1}, and $\Delta G° = -8.81$ to -9.22 kJ mol^{-1}). The observation justified the use of chitosan, as a sustainable and effective adsorbent to eradicate pharmaceuticals such as amoxicillin from wastewater.

Keywords: wastewater management, micropollutants, pharmaceuticals, adsorption, biomolecules

The Afterlife of Conflict Multi-Species Coexistence and Sustainable Futures in Salkumathat, Alipurduar

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Abstract:

Located in the Himalayan foothills of North Bengal, Notunpara Gram, an agragian village in the Salkumarhat area of Alipurduar, south of Jaldapara National Forest, exists at the uneasy boundary between forest and farmland. The "afterlife" of disaster for this community of under a thousand dwellers is not a singular event but a cyclical reality, shaped by extreme poverty, lack of employment opportunities, a stark absence of modern amenities, and recurrent elephant incursions leading to human fatalities. During my fieldwork with this community in October 2024, I learnt how each family has its own oral chronicle of loss: fathers, sons, friends trampled to death by elephants, granaries and houses crushed during nocturnal raids, crops and families destroyed – echoing patterns seen in nearby regions such as Bagdogra and Terai, where too fragmented forest corridors have forced elephants into human-dominated habits. Recent state and private initiatives at employment generation have led to the development of a few resorts in the area, aiming to draw tourists in fairly large numbers. However, these corporatized solutions may further intensify the human-animal struggle and hostility. More community-oriented, small-scale, home-grown models of livelihood, as seen in, for instance, Mawlynnong village in the northeastern Indian state of Meghalaya, or Preah Dak village in Cambodia, could offer more sustainable alternatives for the residents of Notunpara village. Drawing from ethnographic interviews, video testimonies, and photographic records, this paper traces how the human-animal divide in this foothill region of North Bengal demands restraint, resilience, and coexistence, as opposed to a technocratic fix. My paper will refer to the aforementioned data collected during my fieldwork alongside discussing potential "development" plans that may be explored in the area. In doing so, this paper will contribute to a reconceptualisation of post-disaster life in the Alipurduar/ Jaldapara region of Bengal, not merely as human recovery from nature's onslaught, but also as an on-going negotiation of belonging among humans and animals, and emerging ecologies of care.

Keywords: North Bengal, oral testimony, community resilience, sustainable tourism, Salkumarhat case study

Remembering the Teesta: Memory, Voice, and the Poetics of Survival in Post-Flood North Bengal

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Abstract

This paper examines how the afterlife of a disaster finds expression through the language of memory and storytelling in post-flood North Bengal. Focusing on oral narratives, folk songs, and local myths surrounding the Teesta River, it explores how marginalized voices articulate both loss and resilience through creative expression. The study reads these narratives as literary acts—where the rhythm of recollection becomes a form of witnessing and the metaphor of water embodies both destruction and renewal. By engaging with the frameworks of ecocriticism and trauma theory, the paper interprets how environmental catastrophe reshapes cultural imagination and community identity. In doing so, it foregrounds the aesthetics of survival—how language, song, and story preserve the fragile continuities of life amid ecological uncertainty. Ultimately, the paper argues that these oral traditions transform disaster into narrative endurance, revealing a deeply human poetics of coexistence between memory, nature, and the spoken word.

Keywords: Memory, oral narratives, ecocriticism, Teesta River, poetics of survival

Methodological Frameworks and Praxis in Environmental Humanities to Study Disaster and its Afterlife: A Systematic Narrative Review (SNR) with Global Case Study with Special Emphasis on Ecologically Vulnerable North-Bengal and North-East India

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Abstract

The Eastern Indian ecology is already fragile due to environmental disasters like floods, landslides, cyclones, and the recent Glacial Lake outburst flood (Glacial Lake Outburst Flood) of 2023 in Sikkim and North Bengal, showing the interdependence of the crises of human displacement, biodiversity loss, and delicate mountain-river ecosystem. However, academic and media fixations tend to fade once the disaster is over, and little is known about the long-term post-disaster existence, of the environment, of people, and of interspecies sustenance.

This chapter is devoted to the methodology and praxis of the Environmental Humanities as the way of re-conceptualizing the disaster aftermaths in pluralistic and ethical-based readings. It builds on critical research in the global scholarship and case studies, synthesizing interdisciplinary approaches (ethnography, participatory mapping, oral histories, and eco-critical analysis) and focuses on post-humanist, feminist, and decolonial approaches. The data review has been a systematic narrative review done based on databases, including Web of Science, Scopus and Google Scholar on publications, which include ecological resilience, community narratives, and adaptive practices published in 2010-2025. Screening was done according to PRISMA procedures and the results were subjected to a thematic clustering in order to come up with new structures that incorporate the approach of qualitative humanistic inquires with quantitative spatial and environmental information.

The research highlights important gaps in methodology in integrating cultural stories and ecological modeling, and indicates the need of hybrid, community-based, and place-based research models. This chapter offers an inclusive praxis concerned with placing the disasters into their long temporal patterns of adaptation, reminiscence, and flux between a global theoretical discourse and the lived realities of the North Bengal and North-East India, identified as areas with unstable geographies, multi-species dependencies, and cultural diversity. Finally it reconstructs the Environmental Humanities as an essential interpretive discipline in the humanitarian recovery of sustainable lifeworld, ethical co-existence and policy imaginations in post disaster terrains.

Keywords: Environmental Humanities, Disaster Afterlife, Ecological Vulnerability, North-East India, Methodological Frameworks

Remembering the Deluge: Folktales as Ecological Memory in Himalayan Oral Traditions

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Abstract

Folktales often serve as cultural archives of lived experiences, preserving the memory of ecological disruptions long before the language of "disaster management" existed. This paper examines how Bhutia, Lepcha, Limbu, and Nepali folktales from the collection Folktales from Sikkim (edited by Rosy Chamling and Abrona L.P. Aden) register the afterlives of natural disasters - floods, landslides, epidemics, droughts, and storms - as collective memory, moral pedagogy, and ecological wisdom. By situating these tales within the framework of environmental humanities and the "afterlife of a disaster," this paper will explore how narrative traditions encode both warning systems and modes of adaptation across generations. Through close readings of selected texts from the collection, the paper will argue that these folktales articulate a multi-species consciousness where mountains, rivers, forests, and spirits are active participants in shaping human survival and resilience. The recurrence of motifs like divine retribution, imbalance between humans and nature, and renewal after destruction mirrors the cyclical processes of environmental recovery. In doing so, these oral narratives offer an indigenous epistemology of disaster response, rooted not in fear, but in interdependence and reverence. Ultimately, the paper will reclaim folktales as living ecological texts that continue to inform community preparedness and coexistence in the Himalayan fragile mountain ecosystem.

Keywords: Environmental humanities, Indigenous knowledge, Oral traditions, Multi-species resilience, Ecological memory

River Conservation in North Bengal: A Call to Action

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Abstract

River research in India is focused primarily on the pollution level of different human activities, industrial activities and other activities only. Likewise, Jalpaiguri, Alipurduar and Coochbehar these three districts of North Bengal are rich with diverse forest ecology surrounded by rivers. The forest ranges like Mahananda, Jaldapara and Gorumara have spread over these three districts now at stake. Other districts in North Bengal, like North and South Dinajpur, are also experiencing major problems with their waterways. Small rivers in the Duars area, such as Leesh, Gheesh, Dayna, Murti, etc. have likewise lost their natural flow. Pollutants and other dangerous chemicals used in Tea Gardens and farming areas along the banks among these rivers are immediately contaminating the water and rendering it poisonous. It also affects the neighboring river's flora and wildlife, as well as the forest. The water quality is no longer helpful to the adjacent riparian population. The conservation of river biodiversity in North Bengal is critical for maintaining a healthy river ecosystem and the sustainable utilization of its resources. The legislative measures proposed in the study emphasize the necessity for effective laws and regulations that prioritize the protection and preservation of river ecosystems and their biodiversity.

Keywords: Biodiversity, pollution, riparian, water-flow, measures

Witnessing Hunger: Visual and Literary Testimonies of the Bengal Famine (1943)

Prachi Priyanka

Ph.D., English

Abstract

The Bengal Famine of 1943 remains one of the most devastating and politically charged humanitarian crises in colonial India, claiming millions of lives while exposing the moral failures of imperial governance. This paper examines how the famine was represented, remembered, and resisted through intersecting visual and literary narratives that foreground the suffering and resilience of the marginalized. Moving beyond official documentation and statistical histories, the study engages with photographs, wood-cut prints, and textual depictions produced by artists and writers such as Chittaprosad Bhattacharya, Zainul Abedin, Sunil Janah, and Bhabani Bhattacharya, whose works transformed hunger into a haunting aesthetic of protest.

Through an analysis grounded in visual culture studies and subaltern historiography, the paper explores how these creative responses destabilized the colonial state's discourse of "natural disaster," re-inscribing famine as a man-made catastrophe shaped by neglect, exploitation, and racialized indifference. The juxtaposition of image and text is read as a form of witnessing—one that gives voice and visibility to bodies otherwise erased from historical record.

By tracing how famine imagery and narratives circulated in both colonial and nationalist contexts, the paper argues that such representations did not merely record suffering but also functioned as ethical and political interventions, reclaiming agency for the subaltern through acts of artistic resistance. Ultimately, this study situates the famine archive as a crucial site for rethinking trauma, representation, and the politics of humanitarian vision in colonial Bengal.

Keywords: Trauma, Subaltern studies, Visual culture, Protest art, Cultural memory

From Majuli to Banda: Interrogating Disasters, Anthropocene and the Political Ecology

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Abstract

This paper examines how the Anthropocene serves as a critical framework for understanding environmental disasters in Mitul Baruah's Slow Disaster: Political Ecology of Hazards and Everyday Life in the Brahmaputra Valley, Assam and Amitav Ghosh's The Nutmeg's Curse: Parables for a Planet in Crisis. Through the lens of eco-criticism and Anthropocene studies, the paper investigates how human-induced ecological transformations, historical violence, and capitalist extractivism have destabilised both natural and cultural systems. Baruah's ethnographic portrayal of the Brahmaputra's eroding landscapes and Ghosh's geopolitical narrative of Banda Island collectively reveal the interconnectedness of local vulnerabilities and global environmental histories. By reading these texts comparatively, the paper foregrounds how "slow" and "fast" disasters, ranging from gradual riverine erosion to colonial ecocides, constitute overlapping expressions of Anthropocene-driven precarity. Ultimately, the study argues that both authors reposition the Anthropocene not as a uniform geological epoch, but as a condition of unequal responsibility, historical continuity, and ecological injustice, urging a rethinking of human–nonhuman entanglements in the age of planetary crisis.

Keywords: eco-catastrophe, extractivism, colonial modernity, ecological injustice, slow violence

Impact of Climate Change on the Rainfall Extremes and Drought Patterns in Bundelkhand Region of Uttar Pradesh

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Abstract

This study evaluates rainfall extremes and drought dynamics in Bundelkhand from 1980 to 2023 using the Standardized Precipitation Index (SPI), Sen's slope Estimator (SSE), and NDVI trends. Annual rainfall declined at –3.4 mm yr^{-1} ($p < 0.05$), driven by reduced monsoon precipitation, while winter and pre-monsoon seasons showed negligible trends. SPI analyses across 1-, 3-, 6-, 9-, 12-, and 24-month scales reveal persistent drought in eastern districts (Hamirpur, Jhansi, Mahoba), with twelve-month SPI indicating the most severe deficits. Spatial interpolation highlights west–east gradients in drought severity, and NDVI time series correlate strongly with annual rainfall ($r = 0.94$) yet show no long-term greening or browning trend. Seasonal NDVI peaks during June–July and declines sharply in winter. District-level analyses underscore Hamirpur's consistently high drought index and Jhansi's wide year-to-year variability. Modified Mann–Kendall trends confirm significant rainfall declines but stable SPI slopes. These findings align with recent regional studies on increasing aridity and underscore the need for district-specific water management and drought preparedness. Limitations include reliance on gridded precipitation and coarse NDVI data. Future work should integrate high-resolution remote sensing and groundwater assessments to support adaptive strategies under climate variability.

Keywords: Drought, Standardized Precipitation Index (SPI), Normal Difference Vegetation Index, Drought severity, Water management.

When the Forest Burns: Intersectionality, Vulnerability, and Coexistence in Anvita Dutt's Bulbbul

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Abstract

Anvita Dutt's Bulbbul (2020) reimagines the gothic folktale through a feminist and ecological lens, where the landscape becomes a vital participant in articulating trauma, resilience, and regeneration. The film's recurring motifs of the forest—both as sanctuary and site of violence—underscore an environmental politics that intertwines with gendered suffering and resistance. In the climactic burning scene, the destruction of the forest mirrors the patriarchal impulse to dominate and erase spaces of feminine agency, transforming the natural world into a witness and casualty of systemic violence. Yet within this act of devastation lies a subtext of renewal: the fire simultaneously signifies purification and re-inscription of autonomy, gesturing toward the cyclical relationship between vulnerability and resilience. Reading Bulbbul through the framework of ecofeminism and intersectionality reveals how the film destabilizes binaries between nature and culture, human and nonhuman, victimhood and empowerment. The forest, thus, emerges not as a passive backdrop but as an active metaphor for coexistence and ecological memory—a space where survival, haunting, and reclamation coalesce.

Keywords: Environmental Representation, Gendered Ecology, Resistance, and Landscape

Ecocritical Subalternities & Disaster Narrative in Indra Sinha's Animals' People: Reimagining Planetary Crises through Indian Ecocriticism.

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Abstract

Indra Sinha's Animals' People (2007), a novel inspired by the Bhopal gas tragedy, emerges as a pivotal text in Indian ecocriticism, offering a searing narrative of environmental injustice and subaltern resilience. This paper proposes an investigation into how Sinha's creative fiction reimagines planetary crises through an Indian lens, intertwining ecological devastation, postcolonial critique, and subaltern agency to challenge dominant global environmental narratives. Set in the fictional city of Khaufpur, Animal's People follows Animal, a young man deformed by a chemical disaster, navigating a landscape scarred by corporate negligence. Sinha transforms the historical trauma of Bhopal into a universal allegory of environmental violence, where land, water, and marginalized bodies bear the marks of industrial exploitation. The novel's ecocritical potency lies in its portrayal of nature as a co-victim with the subaltern, not a mere resource. Animal's raw, irreverent voice weaves a visceral connection to his poisoned environment, highlighting how ecological crises intersect with social hierarchies of caste, class, and global inequality in India. Sinha's narrative engages postcolonial ecocriticism by critiquing colonial and neoliberal legacies. The "Kampani," a stand-in for Union Carbide, embodies global capitalism's disregard for the Global South's ecosystems and communities. Yet, Sinha transcends despair, foregrounding subaltern agency through Animal's defiance and the community's collective resistance. The novel's ecological vision, rooted in Indian realities—polluted rivers, toxic air, displaced communities—invokes a planetary consciousness that aligns with global climate justice movements. Its nonlinear storytelling and polyphonic voices disrupt Western literary conventions, offering an ecocritical aesthetic that is both locally grounded and globally resonant. Animal's People provide a lens to explore how Indian fiction redefines human-nature relationships in the Anthropocene. Sinha's depiction of Khaufpur as a microcosm of planetary crises invites reflection on how marginalized voices can reshape environmental discourse. The novel's blend of dark humor, tragedy, and hope challenges ecocritics to embrace non-Western epistemologies in addressing global ecological challenges. By Centering subaltern perspectives, Animal's People critique environmental devastation while imagining alternative futures, making it a vital contribution to Indian ecocriticism and a call for solidarity in confronting planetary crises.

Keywords: Ecocriticism, Postcolonialism, Subaltern Agency, Environmental Justice, Planetary Crises

From Nurturer to Nemesis: The Poetics of Witnessing and the Cosmological Rupture in the Afterlife of Disasters

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Abstract

Environmental disasters in North Bengal and the North-East are not only ecological or social ruptures but also sources of psychic disturbance that unsettle human–nature relations. Drawing on literary trauma theory, this paper examines how floods, landslides, and glacial outbursts generate collective and cosmological trauma, extending beyond individual suffering to destabilize a community's faith in the natural and universal order. While classical trauma theory (Freud, Caruth) locates trauma in the belated return of a psychic wound, environmental trauma emerges as an ongoing crisis of dwelling, where nature turns from a nurturing mother into a destructive force, destroying what she once sustained. Like Euripides' Medea, nature becomes the vengeful mother who turns upon her offspring, enacting destruction born not of hatred but of a shattered cosmic balance. This paper further argues that witnessing unbearably catastrophic events—such as the loss of innocent lives, homes, and livelihoods—amplifies the traumatic experience and transforms memory into a site of perpetual haunting. Through readings of oral testimonies, regional narratives, and eco-literary texts from the Himalayan and North Bengal regions, the paper integrates trauma studies, affect theory, and environmental humanities to reveal how the "afterlife of a disaster" reconfigures memory, ecology, and metaphysical fear.

Keywords: Cosmological Trauma; Ecocriticism; Medea Complex; Memory; Testimony

The Supreme Court of India's Interventions in Development-Induced Displacement and Environmental Degradation: Insights from the Teesta Basin and Meghalaya's Limestone Belt in North-East India"

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Abstract

Development-induced displacement and environmental degradation are persistent challenges in India, particularly in regions undergoing large-scale infrastructure and resource extraction projects. The Supreme Court of India has played a pivotal role in adjudicating disputes and setting legal precedents in cases involving the Teesta Basin, the Meghalaya limestone mining belt, and the Sardar Sarovar Dam. Lafarge Umiam Mining Pvt. Ltd. v. Union of India (2011) case, set in the ecologically fragile limestone belt of Meghalaya, represents a turning point in India's environmental jurisprudence. Beyond its legal verdict, the case exposes the economic and ecological costs of resource extraction in the North-East — a region where development projects often culminate in displacement and landscape degradation. This paper examines the Lafarge judgment as a case study of how the Supreme Court balances economic imperatives with environmental justice. Using an environmental economics framework, it analyses how judicial reasoning incorporates natural-capital valuation, community participation, and intergenerational equity to mitigate the afterlife of environmental disasters. The paper further situates this jurisprudence within the broader developmental context of North Bengal and the Eastern Himalayas, arguing that a regionally adapted application of these judicial principles could reshape post-disaster recovery into a sustainable development model rooted in ecological economics.

Keywords: North-East India, Supreme Court, Development-Induced Displacement, Environmental Economics, Judicial Environmentalism

Tackling Biodiversity Loss through Community Engagement: The Way Forward

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Abstract

Food security depends closely on biodiversity, which includes both wild and cultivated species. However, species are disappearing at an alarming rate, threatening the stability of ecosystems that support food production. The extinction pace is now faster than they were in the past. Furthermore, projections indicate that a significant number of species will become extinct within the next century. Such trends pose a serious threat to long-term food security. Without urgent action, the erosion of biodiversity will continue to undermine the foundations of food security. In this paper, we suggest viable strategies that local communities can adopt to counter biodiversity loss, drawing on local knowledge and participatory stewardship practices. These community-led approaches have the potential to enhance species richness, strengthen ecosystem resilience to climate change, support sustainable livelihoods, and reinforce the foundations of sustainable food systems, thereby ensuring resilience for future generations.

Keywords: Climate change, sustainable livelihood, food systems, local knowledge, participatory stewardship.

Spatio-Temporal Assessment of Paleochannels and Their Socio-Environmental Impacts: A Case Study of Cooch Behar District, West Bengal

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Abstract

Food security depends closely on biodiversity, which includes both wild and cultivated species. However, species are disappearing at an alarming rate, threatening the stability of ecosystems that support food production. The extinction pace is now faster than they were in the past. Furthermore, projections indicate that a significant number of species will become extinct within the next century. Such trends pose a serious threat to long-term food security. Without urgent action, the erosion of biodiversity will continue to undermine the foundations of food security. In this paper, we suggest viable strategies that local communities can adopt to counter biodiversity loss, drawing on local knowledge and participatory stewardship practices. These community-led approaches have the potential to enhance species richness, strengthen ecosystem resilience to climate change, support sustainable livelihoods, and reinforce the foundations of sustainable food systems, thereby ensuring resilience for future generations.

Keywords: Climate change, sustainable livelihood, food systems, local knowledge, participatory stewardship.

Natural Disaster, Flood, and Displacement in Assam: Impact on Muslim Minority and State Propaganda

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Abstract

The Assam floods of 2020 hurt more than 5 million people, including among whom the Muslim The 2020 floods were among the worst in recent history with over 30 districts hit by the disaster and over 1,500 relief camps opened for the displaced. Ethnic Muslim Assamese people reside mostly in rural areas and are situated in low-lying plains and are hence more prone to floods. Muslim families mostly lost their homes, means of sustenance, and property and have had to shift to relief camps. Floods also polluted water sources, and water-borne diseases have started. The government response has been classified as discriminatory and inadequate. The Assam state government itself accused the Muslim community of being the cause of the flood, labelling them Bangladeshis who have settled along rivers and wetlands. The propaganda led to fear and insecurity among the Muslim community, exposing them to greater vulnerability for displacement and exclusion. The government propaganda has the following consequences: Increased vulnerability. The Muslim community is already vulnerable because of their socio-economic status and geographical location. The government propaganda makes them even more vulnerable because it puts them at a level of increased marginalization and displacement. Denial of access to relief: Blame game by the government has resulted in denial of access to the Muslim community of relief and rehabilitation efforts. exclusion: Social exclusion is a product of propaganda, where Muslims felt excluded and isolated.

Keywords: Low-lying plans, Ethnic, Govt propaganda, Bangladeshi, social exclusion.

Reading the Teesta as Living Archive: Survival at the Margins in Debesh Roy's Tidings from Teesta-strands

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Abstract

Debesh Roy's Tidings from Teesta-strands (তিস্তাপারের বৃত্তান্ত) revolves around the people residing along the Teesta River, which is both a giver and a destroyer. The novel's milieu—the floodplains of the Teesta in North Bengal—does not merely serve as a background; it evolves into an entity that embodies human struggle, memory, and renewal. This paper perceives the Teesta as such a living record, imprinting in it the stories of loss and endurance of those living by its course. It concentrates on the portrayal of how the commons, that is to say men and women, and particularly the destitute and people living on the margins revive themselves from each inundation or the change in the river's flow. By means of concepts from the environmental and literary disciplines, the article argues that Roy creates a single voice of a shared life which is not only between people and the river but also where survival equals getting by, recalling, and persisting. His work thus acts as an opening to a local mode of reckoning with the past, the present, and the future which still resonates with the bigger issues of the environment and justice.

Keywords: struggle, memory, displacement, subaltern, endurance

Negotiating volatility and kinship: Ecoethics, ecotopia, and personified recalcitrance of Gimur in Mamang Dai's The Black Hill

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Abstract

The paper examines the central figure of Gimur in Mamang Dai's The Black Hill through the ecoethical and ecotopian perspectives, positioning her within the intricate framework of the eastern Himalayan region, tribal cosmography and feminine subjectivity in environmentally rich yet systematically disenfranchised land of Arunachal Pradesh. The central female character of the novel, Gimur, is a tribal woman living in this natural majestic indigenous land whose life revolves around the adventures of love, ostracism, ecological complexities and existential distress. The paper presents the moral and ethical relationships between humans, animals and the ecotopian vision of an imaginary world. Her recalcitrance and defiance of patriarchal structures intersect with gender, ecology and spirituality in understanding the ethics of the post – disaster terrain. The study explores the forest as an ecotopian space, which serves as an indigenous storehouse of wisdom preventing the dominance of colonial modernity. The paper reinterprets disaster not as an end, but as a metaphorical progression, where ecological ethics and cultural memory merge to envision a sustainable, interdependent future for Northeast India.

Keywords: Ecoethics, Ecotopia, Feminine Subjectivity, Indigenous Ecology, Mamang Dai, Northeast India

When the Hills Turn to Dust: Ecological Grief and the Ethics of Survival in Ruskin Bond's "Dust on the Mountain"

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Abstract

Ruskin Bond's "Dust on the Mountain" offers a poignant meditation on environmental degradation and the moral costs of human progress within the fragile ecology of the Indian Himalayas. This paper interprets the story as an early literary articulation of the Anthropocene, foregrounding how nature's transformation into commodity leads to both ecological and ethical collapse. Through the life of Bisnu, a young boy forced by poverty to seek employment in a quarry, Bond captures the paradox of survival—where economic compulsion renders human beings participants in their own environmental undoing. The blasting of the hills and the rising clouds of dust emerge as potent metaphors for the disintegration of ecological harmony and the moral corrosion of society. Read through an ecocritical and environmental-humanities framework, the story reveals the slow and silent disaster of modernisation—its 'afterlife' persisting not merely in the scarred landscape but in the collective conscience of those who witness the devastation. The mountain, stripped of vitality, becomes both victim and witness to the violence of extractive human ambition. Bond's understated narrative thus transforms an ostensibly simple tale of livelihood into a profound reflection on ecological grief and moral accountability. By situating "Dust on the Mountain" within the context of North India's ongoing environmental crises—deforestation, unregulated mining, and fragile mountain ecologies—this paper contends that Bond anticipates the central dilemmas of the Anthropocene. His story resonates as a cautionary parable about the spiritual and material consequences of unchecked exploitation, urging an ethical reawakening to the symbiotic relationship between human life and the natural world. In connecting the intimate with the planetary, Bond's narrative becomes an eloquent plea for ecological responsibility in an era when the hills themselves seem to cry out beneath the weight of dust.

Keywords: Ecocriticism; Anthropocene; Ecological Grief; Environmental Ethics; Himalayan Ecology

The Deluge and the Hills: Unpacking the 2015 Darjeeling Landslides

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Abstract

The July 2015 landslides in the Darjeeling and Kalimpong districts of West Bengal, India, stand as a stark testament to the escalating frequency and intensity of hydro-meteorological disasters in the Himalayan region. Triggered by an unprecedented deluge of monsoon rainfall, the catastrophe resulted in significant loss of life, the stranding of thousands, and the catastrophic destruction of critical infrastructure. This article provides a detailed analysis of the 2015 disaster, moving beyond the immediate meteorological cause to explore the deep-seated anthropogenic factors that amplified the tragedy. It examines the historical context of land-use patterns, including unplanned urbanisation, deforestation, and unsustainable tea cultivation, which have rendered the slopes perilously unstable. The article further chronicles the immediate impacts—the human toll, the isolation of communities, and the economic paralysis—and delves into the complex challenges of the response and recovery efforts. Finally, it discusses the post-disaster lessons and the persistent vulnerabilities, arguing that the 2015 landslides were not a random act of nature but a predictable outcome of a long-standing and dangerous interplay between environmental fragility and human intervention. The event serves as a critical case study for re-evaluating development paradigms in the world's most fragile mountain ecosystems.

Keywords: Darjeeling, Landslides, Himalayan Disasters, Unsustainable Development, Disaster Management, Infrastructure Resilience, Gorkhaland.

Unfolding the Story of Climate Change and Livelihood Vulnerability: A PCA-Based Study of Integrated Agriculture in Gosaba Block, West Bengal, India

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Abstract

This study examines the impacts of climate change on integrated agricultural livelihoods in the Gosaba Block of South 24 Parganas District, West Bengal—one of the most climate-vulnerable regions of the Indian Sundarbans. An Integrated Agricultural Livelihood Vulnerability Index (IALVI) was developed, incorporating 38 sub-components across nine domains of exposure, sensitivity, and adaptive capacity. Principal Component Analysis (PCA) identified the most influential indicators within each dimension, revealing significant spatial disparities in vulnerability across villages. Chhota Molla Khali and Pakhiralay emerged as the most vulnerable (IALVI = 0.696), while Pathankhali exhibited the lowest (IALVI = 0.261). The first twelve principal components explained 93.54% of the total variance, validating the model's robustness. Spearman's rho analysis indicated positive correlations between exposure (r = 0.510, p < 0.001) and sensitivity (r = 0.368, p < 0.01) with vulnerability, and a negative correlation for adaptive capacity (r = –0.467, p < 0.01). The findings highlight exposure as the strongest determinant, emphasizing the need for localized adaptation strategies and policy interventions to enhance agricultural resilience in the climate-stressed deltaic landscapes of the Sundarbans.

Keywords: Climate Change; Livelihood Vulnerability; Integrated Agriculture; Principal Component Analysis (PCA); Sundarban

Submerged Voices: Rivers, Migration and Memory in Selected Bengali Poetry

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Abstract

This paper, Submerged Voices: Rivers, Migration and Memory in Selected Bengali Poetry, explores how rivers in Bengali literature emerge as living symbols of exile, continuity, and transformation. Through close readings of Rabindranath Tagore's "Sonar Tori," Jibanananda Das's "Bonolota Sen," Al Mahmud's "The Foam of Wind," and Joy Goswami's "Things Recalled at Night," this paper examines how water — in its forms as river, rain, and flood — embodies the rhythms of loss and renewal in Bengal's cultural imagination. Tagore's river becomes a metaphor for creative solitude and unattainable fulfillment, while Das transforms the journey through time and tide into a quest for rest and identity in Bonolota Sen. In Al Mahmud's poetry, the Meghna's erosive force dismantles homes and faith, turning the river into a witness to displacement and the vanishing rural world. Goswami, in contrast, envisions water as a spectral space where the dead and the living commune, the riverbank itself becoming an archive of memory and return. Together, these poets transform the river from a geographical entity into a fluid repository of collective history, revealing how the Bengali landscape and psyche are shaped by perpetual movement between loss and belonging.

Reconstructing Home after Being Homeless: A Photo Essay on the Bhutni's Displaced Flood Victims

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Abstract

When we talk about the various disasters happening across North Bengal and North-East India, we must or should think about the flood that has been ravaging the land, life and living of the people of Bhutni, an island in the remote area of Malda district, West Bengal, caged by two rivers: the Ganga and the Fulahar. The flood in Bhutni Island is not a new phenomenon. It has been happening for more than five decades since the construction of Farakka barrage in 1971. Every year, the flood water of Ganga erodes and engulfs a huge area of Bhutni island destroying villages after villages affecting the lives and the living of over one lakh people here. So many families had or have to flee with their lives in hand from their ancient motherland in search of new settlements to begin their lives anew. But, sadly enough, this disaster of Bhutni has never been properly reckoned or acknowledged either by our mainstream media or by State/Central government. Bhutni flood and the question of Ganga erosion here still stay unrepresented or under-represented in the mindscape of the people of North Bengal, West Bengal and India. So, this photo essay would like to highlight and represent Bhutni and its disaster to push it back into the memory of masses in North Bengal. Most importantly, this write up would put its prime focus on the process of survival and re-adjustments of those families that have migrated or moved somewhere else after being displaced and dislodged from their previous dear motherland, the Bhutni island.

Keywords: Bhutni, flood, erosion, displacement, readjustment

Environmental Education of Displaced and Migrated People In Mountain - Special Emphasis on Darjeeling District

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Abstract

Despite the natural and cultural heritage like other countries, India is also challenged by a multitude of environmental problems and concerns. A few challenges like depletion of forest resources and natural resources, loss of top soil and loss of biodiversity, widespread diseases, shrinking energy resources, population growth and poverty. But nowadays the most pressing environmental challenges in our country is migrated and displaced people and their rehabilitation in mountain region.

The researcher searches the truth how environmental education is relevant for human society. Our environmental education and technological knowledge is compulsory to every nook and corner in mountain region. The investigator investigates which environmental approach is most suitable for migrated and displaced people in mountain region. This paper deals with which environmental impact assessment and sustainable development goal accelerated our rehabilitation of migrated and displaced people of Darjeeling district.

Keywords: Environment, Education, EIA, Sustainable Development

Wetland Ecotourism Opportunities and Challenges: A Critical Review and Case Study in Purbasthali Ox-bow Lake of Purba Bardhaman District, West Bengal

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Abstract

The Ramsar Convention has defined wetlands (Article 2.1: 1975) in a very expansive manner to include all types of interface areas between land and water, being either lentic or lotic, and are of different spatiotemporal, physical and chemical characteristics. Neglect over the years pose serious threats to the very existence of global wetlands. In India, the wetlands are under extreme threat of being degraded and converted for immediate gains. Considering the immense values and importance of the wetlands this ecosystem is to be conserved for various productive uses including ecotourism which promotes community participation and sustainable development at grassroot level. Ecotourism, in principle, is intended to offer tourists' facilities that foster great appreciation for an ecosystem without compromising with its natural essence. Ecotourism is potential to generate revenue in the wetland areas, which in turn can be maintained to promote more employment and income. Indiscriminate use of pollutants and random land conversion have made the sustenance of wetland flora and fauna vulnerable. In the present paper the authors have attempted to explore the potential of and hindrance to ecotourism development in wetland areas by conducting a case study in Purbasthali Ox-bow Lake of Purba Barddhaman district in West Bengal. The research contextualises the issue through review of relevant literatures comprising reports, scientific articles, and generation of primary data on water quality, existing state of its biodiversity on the basis of standard methods like analysis of water samples, on-field observation and conducting interviews of the local stakeholders. It has been found that the wetland is decaying due to improper maintenance which may ultimately lead to under-utilization of the ecotourism potential of the area.

Keywords: Ramsar Convention, land conversion, Community participation, Ecotourism, Sustainable development.

From Anthropocentrism to Coexistence: Building Multispecies Resilience in the Anthropocene

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Abstract

In the face of escalating environmental crises, pandemics, and climate-related disasters, there is a growing recognition that sustainability and resilience must extend beyond human concerns to include the broader web of life. Traditional frameworks of disaster management and sustainability have long been grounded in anthropocentric thinking, prioritizing human welfare while neglecting the interdependence, agency, and vulnerability of nonhuman species. This paper proposes a multispecies approach that redefines resilience and sustainability as cooperative, interlinked processes among humans, animals, and ecosystems. Drawing on political ecology, the ethics of care, and the One Health perspective, it emphasizes the need for policies and practices that acknowledge shared ecological destinies. Methodologically, the study employs a conceptual and comparative synthesis of interdisciplinary literature from environmental sociology, human ecology, and animal studies to construct an integrated model for multispecies governance and disaster preparedness. By recognizing nonhuman contributions to community strength and ecological stability, this framework advocates a shift from human-centered management toward inclusive, relational, and ethically grounded strategies. Ultimately, the paper envisions sustainability as a collective pursuit of coexistence, where mutual care, empathy, and ecological justice guide human action toward a more balanced and resilient future in the Anthropocene.

Keywords: Ecological Interdependence, Community Governance, Disaster Preparedness, Political Ecology, Interspecies Cooperation.

The Afterlife of Disaster as Moral Ecology: A Bhagavad Gītā Perspective

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Abstract

In the aftermath of disaster, the work of rebuilding extends beyond repairing material loss; it calls for moral, emotional and ecological renewal. This paper draws upon the Bhagavad Gītā to understand resilience as a form of moral ecology, where knowledge (Jñāna), action (Karma) and devotion (Bhakti) together nurture the strength to restore balance within oneself and with the natural world. The Gītā's teaching of Karma Yoga—selfless action performed without attachment presents disaster not merely as a rupture, but as an opportunity for ethical awakening and collective care. Through this lens, the "afterlife" of disaster becomes a process of transformation, where compassion, restraint and awareness guide recovery. The study argues that such a moral-spiritual understanding of resilience can inspire sustainable ways of living that protect both human and ecological well-being. Guided by the Gītā's vision of lokasaṃgraha—the welfare of the world—it suggests that every act of rebuilding can become an act of ethical renewal and ecological care.

Keywords: Resilience, Moral Ecology, Selfless Action, Ecological Renewal, Ethical Awareness

Impact of Floods on Teesta Region Communities and Its Adaptive Measures

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Abstract

The Teesta River Basin, stretching from the Eastern Himalayas through Sikkim and North Bengal to the low-lying plains of Bangladesh, represents one of South Asia's most dynamic yet hazard-prone river environments. The region is increasingly vulnerable to severe flood events triggered by intense monsoon rainfall, accelerated glacier and snowmelt, unstable geomorphological conditions, and climate-induced hydrological extremes. Additionally, the growing frequency and scale of Glacial Lake Outburst Floods (GLOFs) in the upper basin pose a heightened risk to downstream hydropower systems, road networks, settlements, and agricultural lands. These recurring flood hazards disrupt socio-economic stability, displace populations, damage livelihood assets, hinder market connectivity, and disproportionately impact marginalized communities, including small farmers, women-led households, and indigenous populations. The study aims to evaluate the effectiveness of current flood management and adaptation strategies adopted by institutions and local stakeholders. The methodology that will be used will be a mixed-method research framework combining spatial analysis through GIS and satellite imagery. The findings will try to reveal mitigation strategies and adaptive measures to safeguard communities and ensure long-term resilience against future flood risks in the Teesta Basin.

Human Resilience in the Face of Disaster – A Study of the Works of R. K. Narayan

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Abstract

R. K. Narayan is one of India's celebrated Indo-Anglican novelists who deserves a distinctive niche as regards portrayal of common human life against the backdrop of extraordinary circumstances. The fictional town of Malgudi fancied by the novelist portrays the trials and tribulations of the characters mostly hailing from common backgrounds. At the moment of adversities - may be natural disaster or psychological turmoil, they exhibit their resilience to challenge the situations. This study explores the instances of not only the physical disasters such as floods and famines but also emotional catastrophes like mental excitement, moral crisis and worldly cares and anxiety. The novels like The Guide, The English Teacher and Some of the short stories deal with the concepts of loss and suffering leading the characters to the path of transformation and purification. The protagonists by virtue of their strength and vigour adapt to the disastrous situations and establish their identity. The study also highlights the fact that disaster does not merely destroys rather it also enables humans to be resilient to stand against the ridicule of life and nature.

Keywords: circumstances, challenge, flood, famine, catastrophe, transformation

Disaster and Its Afterlife: Tracing Ecological and Human Resilience after the 2025 Nagrakata Flood in North Bengal, India

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Abstract

On 5th October 2025, a severe flood struck the Nagrakata block in Jalpaiguri district, North Bengal, impacting the villages of Bamandanga, Tandoo, and Khairbari. Triggered by extreme monsoon rainfall, silted river channels, deforestation, and unplanned land use, the deluge caused displacement, damage to tea plantations, infrastructure loss, and disruption of local biodiversity. While immediate attention focused on casualties and material loss, the flood's longer-term effects illustrate the "afterlife" of disaster: prolonged processes of ecological recovery, human adaptation, and socio-cultural reorganization extending beyond the initial event. This study employs a multidisciplinary approach, combining environmental geography, anthropology, ecology, and disaster management to analyze both human and ecological consequences. Field narratives and secondary reports highlight how local communities—including tea garden workers, indigenous populations, and women—developed survival strategies such as raised bamboo platforms, cooperative grain banks, and adaptive agricultural practices. Concurrently, the flood reshaped ecosystems: elephants altered migration routes, fish populations thrived in temporary flood pools, and soil conditions shifted, favoring some crops while harming others.

By emphasizing both human and non-human actors, this research underscores the interconnectedness of social and ecological resilience. Recovery emerges not merely as reconstruction but as ongoing negotiation among communities, species, rivers, forests, and governance structures. The study also reveals policy gaps, showing that state interventions often overlook community-based knowledge and multi-species considerations, leading to temporary relief rather than sustainable adaptation. The 2025 Nagrakata flood offers a critical lens to rethink disaster management in North Bengal and North-East India, advocating for inclusive, ecologically sensitive, and culturally informed strategies. Recognizing the afterlife of disasters enables planning that supports both human livelihoods and environmental regeneration.

Keywords: Flood Afterlife; North Bengal; Ecological Resilience; Human Nonhuman Interaction; Disaster Adaptation

Flood Susceptibility Assessment in the Kaljani River Basin, West Bengal, Using PCA-ANN and SVM Models

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Abstract

Flood susceptibility mapping is essential for managing disasters in flood-prone regions like the Kaljani River Basin, West Bengal, India. This study integrates Principal Component Analysis (PCA) with Artificial Neural Network (ANN) and Support Vector Machine (SVM) models to evaluate flood susceptibility. A multicollinearity test indicated high Variance Inflation Factor (VIF) values for elevation (5.43) and slope (5.72), justifying PCA application to reduce redundancy and enhance model efficiency. The PCA-ANN model achieved 81.69% accuracy, improving from 56% (ANN alone), while the SVM model performed best with 91.55% accuracy, along with high sensitivity (91.18%) and specificity (91.89%). The susceptibility maps revealed that very high and high-risk zones (412.98 km²) are concentrated in low-lying riverine areas, whereas moderate zones (375.13 km²) occur along transitional terrain. Very low and low susceptibility zones (431.87 km²) are associated with higher elevation and efficient drainage. Geodetector analysis identified elevation, lineament density, and land use/land cover as the most influential parameters. The findings contribute to targeted flood mitigation, sustainable land-use planning, and infrastructure design in the basin.

Keywords: Geodetector, Multicollinearity, GIS-based analysis, Predictive modelling.

Literature as Cultural Discourse: Environmental Humanities Methodologies to Study Disaster Aftermaths

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Abstract

This paper explores how environmental humanities methodologies, specifically ecocriticism and postcolonial environmental studies, offer distinctive insights into disaster aftermaths. Unlike scientific or geographical approaches that prioritize measurement, mapping, and modeling of ecological events, environmental humanities focus on the cultural, historical, and ethical dimensions of disaster. Treating literature as a cultural discourse, the study examines how narrative forms capture both the slow accumulation of environmental harm and its sudden, spectacular manifestations, revealing how disasters unfold over extended temporalities shaped by colonialism, capitalism, and social inequality. Ecocriticism provides tools to analyze the environmental and ethical implications of these narratives, while postcolonial environmental studies situate disasters within historical power relations, highlighting how structural violence amplifies vulnerability. Through readings of colonial and postcolonial Indian texts, the paper demonstrates that the aftermath is not a discrete event but a continuous process of social, cultural, and ecological negotiation. By foregrounding memory, affect, and representation, the environmental humanities contribute perspectives that quantitative studies cannot: they illuminate human experiences, moral responsibility, and imaginative responses to ecological trauma. Ultimately, this approach shows how literature mediates understanding of disaster aftermaths, making visible the interconnections between environment, society, and history.

Keywords: Ecocriticism, Postcolonial Environmentalism, Slow Violence, Narrative Analysis, Literary Representation

Disasters and Deathscapes: Landslides and Other Weather Events in Darjeeling Literature

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Abstract

The history of Darjeeling is punctuated by disastrous weather events, particularly landslides, which are like signposts in the collective memory of its people. We may say they form a part of the lore of the land. Ever since the earliest recorded major disaster of 1899, climatic phenomena like landslides and flash floods afford a place experience that is peculiar to this region because of a variety of factors that are unique to it. The social, psychological and emotional impact of inhabiting and moving through this "weather-world" over a long period of time is not reflected in studies which are geared towards an empirical understanding of causes and disaster management strategies. The human and psychosocial aspects of natural disasters in the hills might be a subject of study for the social scientist or the psychologist but the complex interrelationship between them is explored imaginatively by writers in whose fictional representations they find expression. Literature gives space for those connections to emerge. Imaginative re-creation of disaster scenarios in fiction, for instance, enables a better understanding of the complexities involved while also hinting at possible answers to problems unique to the bioregion. It may foster disaster-preparedness while also serving a cathartic function. In what way might literature prove useful by providing tools to aid disaster management and policy-making is, however, beyond the scope of this paper which focusses primarily on drawing attention to the multiple ways in which Darjeeling has been seen, experienced and made meaningful throughout history, allowing its palimpsestic nature to surface. Among these are the visceral experience of weather and weather events, especially disastrous ones like landslides. This paper is centred on three different ways in which weather events manifest themselves in literary works, underscoring the strong place-minded quality of fiction from the region: 1. Literary Responses to 1899, 2. Fictional Representation of Natural Disasters and 3. Disaster as a Trope in Fiction.

Keywords: Darjeeling, disaster, literature, weather-world, place

Assessing Spatio-Temporal Changes in the Baiganbari Wetlands Using Geospatial Techniques, Cooch Behar-I Block, West Bengal

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Abstract

The present study investigates the spatio-temporal dynamics of the Baiganbari Wetlands in Cooch Behar-I Block, West Bengal, using geospatial techniques. Multi-temporal Landsat satellite data from 1993 and 2023 were analyzed to assess land use and land cover (LULC) changes over three decades. Google Earth Engine (GEE) was employed for cloud-based data processing and analysis. Several spectral indices were used to quantify environmental and anthropogenic influences: the Modified Normalized Difference Water Index (MNDWI) for water body delineation, the Normalized Difference Vegetation Index (NDVI) for vegetation health assessment, the Normalized Difference Built-up Index (NDBI) for urban expansion detection, and the Normalized Difference Tillage Index (NDTI) for evaluating soil and agricultural conditions. The LULC analysis revealed a significant reduction in wetland areas, with a corresponding increase in agricultural and built-up land between 1993 and 2023. Change detection indicated widespread encroachment and conversion of wetlands into agricultural zones, emphasizing rising human pressure on the Baiganbari ecosystem. The integration of multi-temporal indices with LULC mapping in GEE proved effective for analyzing wetland degradation. The results provide essential insights for sustainable management, ecological restoration, and strategic land-use planning in the Cooch Behar-I Block.

Keywords: Geo-spatial analysis, Change detection, Agricultural expansion, Environmental degradation, sustainable management

Assessing Earthquake Risk in Northeastern India Through Python and Geospatial Analysis

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Abstract

The Northeastern Seismic Zone is the name given to the seismic zone in northeastern India. This location is among the most seismically active in the nation and is characterized by significant seismic activity. States including Assam, Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, and portions of West Bengal are included in the Northeastern Seismic Zone. This area is near the border where the Eurasian and Indian plates meet. In this region, earthquakes frequently occur due to the movement of these tectonic plates. Among the significant earthquakes that have struck this region are the 8.1-magnitude Shillong earthquake of 1897, which resulted in extensive damage. Northeastern India experiences high seismic activity; therefore, it is critical that both inhabitants and authorities prepare for possible earthquakes by enforcing building rules that guarantee structures can withstand seismic pressures and having emergency response plans in place. It is essential for the people living in this region to be aware of the seismic hazard and take necessary precautions to minimize the impact of earthquakes. Arc GIS software and statistical techniques are applied to analysis the collected data.

Keywords: Seismic factors, Geotechnical factors, Priority and Rank Estimation for All the Parameters of Vulnerability

Surviving and Thriving Post-Disaster: Resilience of the Khasi Community in Northeast India

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Abstract

Disasters, whether natural or human-induced, have enduring social, economic and cultural impacts on vulnerable communities. This paper examines the resilience of the Khasi community in Northeast India. The paper is based on secondary sources to provide a broad understanding of the people and their resilience strategies. It explores how the Khasi have historically relied on traditional knowledge, cultural practices and strong social networks to cope with, adapt to and recover from disasters. Emphasis is placed on community-based strategies and collective action which help sustain livelihoods, maintain social cohesion and preserve cultural identity in post-disaster scenarios. The study also shows how geographical and regional factors shape adaptive responses, indicating that resilience is closely tied to the community's relationship with their environment. By synthesizing existing evidence, this paper strengthens understanding of indigenous resilience and suggests ways to incorporate traditional knowledge into modern disaster management. The findings highlight the value of culturally rooted, community-driven strategies for long-term resilience and improved adaptive capacity in disaster-prone regions.

Keywords: Indigenous resilience, Disaster adaptation, Community-based strategies, Traditional knowledge, Social networks

Flood Susceptibility Assessment using Geospatial Techniques: A case study of Dwarakeswar river basin, West Bengal, India

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Abstract

A flood is an overflow of a large amount of water beyond its normal limits, especially over what is normally dry land. Floods may happen gradually and take hours, or can even happen suddenly due to breach of the structures, spillover, etc. Flood forecasting and warning have become highly developed in the past two decades. With the advancement in technology, such as satellite and remote-sensing equipment, flood waves can be tracked as they move downwards. A flood susceptibility map is very much important for forecasting and preventing floods worldwide, particularly where floods occur on a regular basis. The Dwarakeswar river basin (DRB) of West Bengal is a combination of flash flood zone, monsoonal flood and tidal flood zone at the same time. This research provides some flood-causing parameters and their effects on flood susceptibility in DRB using the Analytical Hierarchical Process (AHP) method. Eight hydrogeomorphological parameters, such as elevation, slope, soil type, land use, drainage density, topographic wetness index, distance from the river and precipitation, have their influences in the occurrence of floods in the river basin. A combination of all flood-causative parameters based on their weights and ranks provides the flood susceptibility map. The Analytical Hierarchy Process (AHP), one of the multi-criteria analyses (MCA) methods, is an efficient and convenient multi-criteria decision-making method in which variables are ordered in a hierarchical structure developed by Saaty. The flood susceptibility map of the DRB is divided into different flood risk levels, spatially, and will be beneficial for flood warning and sustainable water management in the DRB, and can be further applied in other basins worldwide.

Keywords: Flood Susceptibility, Multi-Criteria Analysis (MCA), Analytical Hierarchical Process (AHP), Dwarakeswar River Basin (DRB)

Teestapuran: a saga of the making and unmaking of Riverine life

Piyali Das

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Abstract

Rivers, considered to be essentially as Bengal's nurturing mother, eventually shaped the soul of this land and also the cultural landscape. Over centuries, from sediments to sentiments, to culture, rivers have invariably sketched people's values and belief systems. The people living beside the river consequently embraced river religion as the way of their life, fabricating Bengal's folklore and traditions. Bengal's unique repository of literature and, of course, art, which can be termed as river-literature, melodiously touches every bit of joy, sorrow, suffering, and not to mention the long struggle of riparian communities. Debesh Roy, considered to be an eminent and influential writer and scholar, touched every aspect of riparian communities on the bank of the Teesta River in his two significant novels, Teesta Parer Brittanto and Teestapura. The author empathetically narrates the harrowing experiences of the sandbar dwellers, capturing their daily struggles and also their survival stories with heartfelt compassion. The area of devastation, mainly the villages around Gajoldoba in the Jalpaiguri district of North Bengal, is a multilayered consequence of both natural and human-made catastrophes. The physical devastation that is caused affects the Rajbanshi people living there over the generations. The Teesta River becomes a sinister agent of destruction due to the construction of a barrage. The paper aims to highlight the saga of the simple people whose life is made and destroyed both by natural calamities and governmental policies.

Keywords: river- religion, ecology, riparian existence

Fluidity of Riverine Scapes: An Analysis of Teesta-Rangeet Triveni Using Maarten Jacobs' Ontological Framework

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Abstract

The Teesta, which courses through Sikkim and West Bengal, flowing into Bangladesh before merging with the Brahmaputra, has garnered international as well as national attention owing to issues surrounding the sharing of its waters with Bangladesh. However, the Teesta is increasingly in the spotlight now due to the floods in the river year after year, wreaking havoc as its water rises. The river has been a site of episodic floods since the earliest recorded ones in the 1950s. While the Teesta Flood of 1968 had claimed hundreds of lives, the 2023 flood was an eerie reminder of it, as it was equally devastating. Even as the floods have impacted the lives of people residing along the river basin, they have also changed the landscape of the place, perception towards it, cultural practices intertwined with it, and the experience of the people with the place. This study employs Maarten Jacobs' theory of 'three ontological dimensions of landscape' to study the resultant new normal and new order that the floods bring about in their wake, re-establishing the relationship of both victims and witnesses with the altered landscape of Triveni, the confluence of the Teesta and Rangeet near Teesta Bazaar in North Bengal.

Keywords: River Teesta, Teesta Floods of 1968 and 2023, Matterscape, Powerscape, Mindscape

Approach of the Indian Judiciary Towards Ecocide- A Legal Vignette

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Abstract

The quest for economic development and environmental peril stands in a diametrically opposite direction, with minimum or no possibility of reconciliation, and this create the fertile field for the 'Earth Law' discourse, which up to a great extent may have a mitigating sway on this infuriating disaccord between discourses. But such comfort is momentary, as the spatial orientation of this multi-facet issue requires the cognizance of the polito-legal paradigm along with the jurido-legal approach. The apparent inability of the traditional approach of environmental law, be it anthropocentric or ecocentric, to deal with the constant increase in the demands for economic development in the pretext of globalization, contains the germ of 'Earth Law' which due to its multi-layered and somewhat non-institutionalized attitude, is more equipped to manage the otherwise constant degradation of the ecological balance, but the traditional jurido-legal approach, along with its all inherent limitations, shall have a scathing presence to maintain the element of accountability and along with it the presence of the concepts like 'Ecocide' has a supplicate presence, and this implores the encapsulation of a decentralized polito-legal apparatus, in epistemological and ontological interpretation, to prevent this discourse from dissipating into oblivion.

Keywords: Sustainable Development, Earth System Law, Anthropocene, Ecological Balance, Climate Litigation

After the Waters Recede: Tracing the Psychological Afterlife of the Flood in Porajhar, Japlpaiguri district

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Abstract

The unprecedented flood that devastated Porajhar, near Noukaghat in North Bengal, stands as one of the most severe calamities in the recent history of the region. For many inhabitants, it was an event beyond lived memory—an experience marked by the sudden destruction of homes, livelihoods, and social stability. While the immediate physical impact of the flood has diminished, its psychological consequences persist among the affected population. The present study investigates the psychological aftermath of this disaster, emphasizing the hidden mental health crisis unfolding among flood-affected communities. Employing a purposive sampling design, participants were selected from the most severely impacted households. Standardized psychological instruments were used to assess the intensity of psychological distress, anxiety, and trauma, ensuring scientific validity and comparability of findings. Thus, this study deals with the assessment of the level of psychological distress, anxiety, and trauma among individuals affected by the recent flood among the flood victims. The findings will help to highlight how disasters can cause long-term emotional suffering, while also showing the strength and resilience of affected communities. The study's scope extends toward building awareness about the significance of mental health care in disaster-affected regions and can support the development of better community-based psychological support during recovery from disasters.

Keywords: Flood disaster, Psychological distress, Anxiety, Trauma, Social support, Mental health

The Trauma of Colonial Displacement: A Postcolonial Reading of the Glass Palace

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Abstract

Amitav Ghosh's The Glass Palace intricately weaves personal histories with the grand narrative of empire, exposing the deep psychological and cultural scars left by colonial displacement. This study undertakes a postcolonial reading of the novel to explore how imperial conquest and forced migration fracture individual and collective identities. Set against the backdrop of British expansion in Burma, India, and Malaya, Ghosh portrays characters uprooted by war, exile, and shifting borders, revealing displacement not merely as a physical dislocation but as a trauma of belonging and memory. Through the lens of postcolonial theory—drawing on Homi Bhabha's concept of hybridity and Edward Said's notion of exile—the paper examines how colonial structures disrupt familial ties, distort selfhood, and transform cultural continuity into fragmented recollections. The narrative's transnational movement underscores the persistence of loss and the search for rootedness amid the ruins of empire. Ultimately, this research argues that The Glass Palace transforms historical displacement into a site of resistance, where remembrance becomes an act of reclaiming identity and restoring agency to the colonized subject.

Keywords: Amitav Ghosh, The Glass Palace, postcolonialism, displacement, trauma, hybridity, identity

A Study on Legal Protection of Biodiversity in India with Special Reference to the Himalayan Region in North Bengal

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Abstract

Different ranges and fringes of Eastern Himalaya are expanding through a number of countries like India, Nepal, Bhutan and China. Over the course of at least three centuries, plant lovers, plant explorers, and plant hunters alike have been drawn to this region's abundant and extremely attractive flora. Too much of economic exploitation, fast expansion of human settlements and its modernisation, etc are the main threats for the survival of natural habitats in the area. However, in response to the rising global awareness a number of Protected Areas has been legally established in the area. Both the terms plant diversity and conservation have recently gained popularity. Now different measures are being taken for the conservation of plant diversity globally. Darjeeling's plant diversity was destroyed by exploitative British policies. Early British policies were aimed at the exploitation or destruction of different kinds of species of plant. Forest conservation was main step in this regard. Forest laws prohibited nearly all degrading activities, which indirectly assisted in the preservation of plant diversity. The establishment of botanical garden in Darjeeling also led to the plant diversity conservation. They introduced different types of new species of plant in Darjeeling. This article will show some legal aspects to protect our biodiversity in such areas and finally give some suggestions for solving the hazards.

Keywords: Plant diversity, Conservation, Protected Area, Transboundary conservation, Corridors, Future of Biosphere.

Relocation from Buxa Tiger Reserve in Alipurduar District, West Bengal: A Study on the Willingness, Challenges, and Future Prospects of Local Communities.

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Abstract

The Terai-Dooars region of India is one of the most biodiverse areas in the country. The Buxa Tiger Reserve (BTR), located in the Alipurduar district of West Bengal, was established in 1983 and is recognized as the 15th Tiger Reserve in India. This area is home to a wide variety of wildlife, including Bengal tigers, leopards, bisons, elephants, and over 280 species of birds, along with a rich diversity of flora. Despite its ecological richness, the region faces significant challenges due to increasing population pressure, both from within and outside the forest. The area is inhabited by various tribal communities such as the Dukpa, Koch, Mech, and Rava (Sarkar, 2011). Currently, there are 37 forest villages within the reserve, along with several Fixed Demand (FD) land holdings. Many residents in these areas are partially or entirely dependent on forest resources for their livelihoods.

To reduce human pressure on the forest, the Forest Department, on February 10, 2015, decided to redefine the core area of the reserve—from 370.28 sq. km to 343.32 sq. km—as part of the Tiger Conservation Plan (TCP) 2015–2024. As part of this plan, 13 forest villages and 2 FD land holdings were identified for relocation from the core area. Of these, two villages—Bhutiya Basti and Gangutiya—have already been relocated outside the forest. Although the relocation was primarily undertaken for conservation purposes, it was found that many villagers were also willing to move due to unfavorable climatic conditions in the forest. Similar efforts are underway to relocate the Jayanti FD land holding, where climatic challenges are again cited as a major reason for resettlement. The primary focus of this study is to examine the willingness of forest villagers to relocate from the core areas of the Buxa Tiger Reserve. It also aims to assess the problems and prospects experienced by these communities both before and after their relocation from their original forest habitats.

Disaster's Lingering Legacy

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Abstract

Disasters—whether natural or human-induced—leave enduring imprints that extend far beyond the immediate destruction they cause. "Disaster's Lingering Legacy" explores the multifaceted aftermath of catastrophic events, emphasizing their long-term social, economic, environmental, and psychological impacts. In the wake of disasters such as earthquakes, floods, pandemics, and industrial accidents, affected communities often struggle with displacement, loss of livelihoods, and the erosion of social cohesion. Environmental degradation, infrastructure damage, and economic instability can persist for years, hindering recovery and development. Moreover, the psychological trauma experienced by survivors manifests in prolonged mental health challenges, shaping generational resilience and collective memory. Along with in the face of disaster, communities can come together united in their response and recovery efforts. This study highlights how inadequate preparedness, inequitable recovery efforts, and systemic vulnerabilities amplify these lingering effects, particularly in marginalized populations. By examining historical and contemporary case studies, the paper underscores the importance of sustainable recovery frameworks that integrate disaster risk reduction, mental health support, and community-driven resilience. Ultimately, understanding the long-term legacies of disasters is essential not only for mitigating future risks but also for fostering adaptive capacity and social equity in a rapidly changing world.

Keywords: Destruction, Long-term Impact, Resilience Building, Psychological Trauma, Sustainable Recovery

Women's Digital Testimonies and Emotional Resilience in the Aftermath of the North Bengal Floods 2025

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Abstract

Amid South Asia's escalating climate vulnerabilities and struggles for emotional recovery in the aftermath of ecological crises, the catastrophic floods across the districts of North Bengal in October 2025 caused extensive ecological and social disruption, leaving thousands homeless and exposing the fragile intersections of gender, environment, and media. While existing disaster communication research primarily concentrates on physical damage and institutional response, it overlooks women's emotional expressions and digital testimonies on the post-disaster recovery. This study addresses this gap using qualitative discourse and narrative analysis of 20-25 purposively selected women's testimonies and emotional narratives, including videos, interviews and news articles shared through social media platforms and online news portals. Using an integrated theoretical framework combining ecofeminism, affective publics, and intersectionality, this research investigates how women share their experiences of loss, support, adaptation, and agency within the digital aftermath of catastrophe. The study identifies recurring themes such as grief, care, solidarity and rebuilding that constitute a digital afterlife of the flood. These narratives reframe women not merely as victims of climate events but as active chroniclers and custodians of ecological memory. The findings contribute to feminist disaster communication scholarship by demonstrating how women's online storytelling serves as emotional infrastructure and ecological testimony, emphasising the need for intersectional approaches to digital witnessing and environmental resilience.

Keywords: Gendered Resilience, Ecofeminism, Environmental Communication, Digital Storytelling, Disaster Afterlife

Disaster, Desire and Departure: A Phenomenological Inquiry into the Afterlife of Development in North Bengal

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Abstract

Disasters in ecologically fragile regions like North Bengal—whether cyclones, floods, or recent events like the Glacial Lake Outburst Flood (GLOF) of 2023—are increasingly entangled with the region's developmental aspirations. This paper offers a phenomenological inquiry into how such events are lived, narrated, and interpreted by communities experiencing the long afterlife of disasters. Without depending on fieldwork, the paper draws on existing ethnographies, local media archives, and interdisciplinary environmental humanities literature to probe how recurring disasters disrupt not only landscapes but also futures. It focuses on the emerging affective landscape of "aspirational displacement"—where people begin to interpret ecological precarity as a push factor to exit ancestral geographies in pursuit of imagined developmental security elsewhere. Framing these responses through a phenomenological lens helps shift the analytic focus from macro-policy failures to lived experiences of loss, anxiety, and speculative hope. Through this, the paper explores how disasters catalyze existential reorientations—where rivers become uncertain companions, homes become transitional, and youth envision cities as ecological escape routes. This interpretive approach contributes to understanding disaster not only as rupture, but as a deeply embodied encounter with changing temporalities, infrastructures, and desires for movement.

Keywords: phenomenology, aspirational migration, ecological uncertainty, disaster affect, post-development landscape

Spatio-Temporal Variability of Soil Health Indicators under Long-Term Environmental Change in the Older Alluvial Soils of Dakshin Dinajpur District, West Bengal

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Abstract

Dakshin Dinajpur district is characterized by older alluvial soils and intensive agricultural practices, and has undergone significant hydro-climatic fluctuations and land transformation over the past few decades. The sustainability of soil health is increasingly threatened by long-term environmental changes driven by climatic variability, land-use dynamics, and anthropogenic pressures. The present study aims to assess the spatio-temporal variability of key soil health indicators under changing environmental conditions in the older alluvial zone of Dakshin Dinajpur District. A combination of geo-spatial techniques, field sampling, and laboratory analysis was employed to evaluate the trends and spatial patterns of soil physicochemical and biological attributes—namely pH, electrical conductivity (EC), organic carbon (OC), available nitrogen (N), phosphorus (P), potassium (K), cation exchange capacity (CEC), bulk density (BD) micronutrient like Boron (B), Copper (Cu), Iron (Fe), Zinc (Zn) and Manganese (Mn). Multi-temporal Landsat imagery (1995–2025) and rainfall datasets (IMD 0.25° grid) were analyzed to derive environmental variables like land-use/land-cover (LULC) change, vegetation index (NDVI), and rainfall anomalies. Statistical

tools, including Mann–Kendall trend test, principal component analysis (PCA), and spatial interpolation (IDW), were applied to quantify temporal trends and delineate soil health zones. The result highlighted that long-term environmental changes like erratic rainfall, higher temperatures, and groundwater depletion are expected to emerge as key drivers of changes in soil properties, potentially increasing soil acidity and long-term decline of SOC and NPK due to continuous cultivation and unbalanced fertilization. Besides that, the micronutrient status, like (Fe, B, Zn, Cu, and Mn) is increasing due to excessive use of chemical fertilizers, which is very close to toxic levels for crop production. The findings of this study indicate a gradual decline in soil health primarily linked to the conversion of agricultural and fallow lands into built-up and barren surfaces, coupled with erratic monsoonal patterns. The integrated spatial assessment underscores the need for sustainable soil management strategies, emphasizing organic matter restoration, balanced fertilization, and conservation tillage to enhance resilience under ongoing environmental stress for sustainable soil resource management in the older alluvial zones of West Bengal.

Keywords: Soil Health; Older alluvial soil; LULC; Sustainable soil management; Dakshin Dinajpur District

Dynamic modelling of the impact of regional climate change on eco-hydrology of the rivers of North Bengal

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Abstract

Comprehending the impact of environmental stressors, such as potential climate shifts and changes in land use on eco-hydrological status is instrumental for managing freshwater resources towards assessment of water scarcity and implementation of sustainable development strategies. The ecological response of rivers to these stressors can be assessed using a variety of physicochemical, biological, and hydro-morphological factors and computational tools. In this research, an eco-hydrological model built on the SWAT (Soil and Water Assessment Tool) framework is utilized to analyze the effects of climate change on the eco-hydrological status of rivers in the Tista and Torsha basin. The model includes predictions from five general circulation models (GCMs), each representing four different representative concentration pathways (RCPs), to simulate various chemical and biological quality indicators.

Keywords: Environmental stressor, climate change, river basin, eco-hydrology, hydro-morphology, General Circulation Model, Representative Concentration Pathways

The Anatomy of the Murder: An Eco-sociological Reading of Cross-cultural Teesta Narratives

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Abstract

This paper employs an ecocritical and postcolonial lens, anchored in Rob Nixon's slow violence—the gradual, often invisible environmental harms disproportionately affecting the lives surrounding an ecology—to examine the Teesta River as a narrative nexus across Sikkim, West Bengal, and Bangladesh. Mythological texts like the Lepcha folktale "The Race between Teesta and Rangeet" encode indigenous anxieties about protracted ecological loss, while the Rajbangsi ritual song "Teesta Buri" resists this through decolonial stewardship. Literary texts include West Bengal based Bengali writer Debesh Roy's pre-Teesta Barrage novels Teesta Parer Britanta and Teestapuran, weaving memories with geopolitics to depict the river's degradation via dams and border disputes as enduring trauma. Bangladeshi writer Harun Pasha's Teesta, penned just after hydropower projects neared completion, critiques political fragmentation amplifying environmental neglect. The personal text And the Teesta Flows… by Samita Chowdhury and Utpal Chaudhry intertwines grief—a lost lover and daughter—with the river's decline under colonial legacies. West Bengal based Bengali writer Abhishek Jha's stories Ghasjomi. Ghorbari, Murgi, Nodee, Chakri, Hauli, Pori ...Ittyadi and Death by Water, from an era when Teesta projects backfired, portray the 2023 flood post-Lhonak burst, transforming the ravaged river into a vengeful force carrying explosives and in functionality becoming an explosive itself. These narratives challenge hegemonic discourses, positioning the Teesta as a site of oppression and resistance.

Keywords: hydro-politics, Anthropocene, riverine ecology, decolonization, environmental justice

Analysing News Discourses of Resettlement Narratives: A Case Study of the 2025 North Bengal Floods

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Abstract

The 2025 North Bengal floods, caused by the overflow of rivers such as the Teesta and Jaldhaka, led to large-scale displacement and resettlement challenges across Jalpaiguri, Alipurduar and Cooch Behar. This study aims to examine how Indian news media framed the narratives of displacement, loss and rehabilitation in the aftermath of the floods. The objective of the study is to understand how Indian news media, both national and regional, represented resettlement issues resulting from the disaster. Drawing on a qualitative content analysis of newspaper reports, digital news portals and televised coverage from October to September 2025, the research aims to understand how narratives of displacement were framed in the selected media outlets. The study draws on the theoretical frameworks of media framing and environmental communication by Robert Cox, to explore how language, imagery and sourcing practices reflect broader power dynamics among the state, media institutions and affected citizens. The expected outcome of the study is to reveal disparities between regional and national media discourses, demonstrating that while regional outlets emphasise human suffering and community resilience, national media often adopt a policy-driven lens.

Keywords: North Bengal Floods 2025, Media Outlets, News Discourse Analysis, Displacement and Resettlement, Disaster Communication.

Influencers for the Environment: How Instagram Eco-Activists Narrate Biodiversity Loss

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Abstract

India, as one of the world's 17 megadiverse countries, houses approximately 7-8% of the global recorded species while facing severe biodiversity loss due to rapid urbanisation, deforestation, climate change, and industrial development. This study examines how Instagram eco-activists construct and communicate narratives about biodiversity loss in India—a country facing escalating ecological crises amid rapid development. By focusing on Indian eco-influencers with significant digital presence, the research explores the narrative frames, visual storytelling strategies, and cultural adaptations employed to make biodiversity loss visible and relatable for diverse audiences. Employing a mixed-methods approach, the study combines qualitative content analysis of influencer posts, captions, and visual elements with quantitative analysis of audience engagement patterns. The research is grounded in framing theory, cultivation theory to analyse both content and platform-specific dynamics. Findings are expected to reveal the dominant narrative strategies and visual techniques used to engage Indian Instagram audiences, the role of indigenous knowledge and cultural references in storytelling, and key factors influencing audience participation and advocacy. The outcomes will provide practical insights for conservation communication and extend theoretical understandings of digital activism in the Indian context, ultimately contributing to more effective and culturally resonant biodiversity advocacy through social media platforms.

Keywords: Eco-activism, Framing, social media, Biodiversity, Media Narratives

Interdisciplinary Research Methods in Environmental Humanities and its Relevance

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Abstract

The same threat exists even today in areas at both ends of the Himalayas, from Sikkim and North Bengal in the east to Uttarakhand and Himachal Pradesh in the west. The current construction in the hills is flagrantly exceeding the carrying capacity of the hills, ignoring the environment and nature in the name of development, security, and tourism. Science has cautioned against this on numerous occasions. Additionally, locals have repeatedly raised their voices. However, the state's growth strategies do not take into account that experience or those warnings. This is not an isolated natural disaster. It is the consequence of decades of ecological neglect, policy failure and unregulated extraction that have hollowed out North Bengal's resilience. A region once balanced between mountain, river, and plain is now buckling under human excess — its hills carved up, its rivers mined, and its forests erased in the name of progress. Environmental humanities (EH) approaches to disaster management move beyond purely scientific and technical analyses to explore the cultural, historical, and ethical dimensions of disasters. EH methods examine how human values, stories, and power structures shape a community's vulnerability to hazards and its capacity to respond and recover. The present study delves into the discussion of interdisciplinary research methods in environmental humanities, such as narrative and literary analysis, ethnography, environmental communication and rhetorical analysis, cultural representations, oral history, as well as storytelling, indigenous knowledge systems, participatory and place-based research, speculative imagination, holistic solutions; and other scientific as well humanistic approaches to tackle the on-going environmental crises.

Keywords: Cultural representations, Disaster management, Ethnography, Environmental communication, Indigenous Knowledge Systems (IKS)

After life of North Bengal Disaster: Documentation in visual and non-visual Media

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Abstract

This Paper examines the districts of Jalpaiguri, Coochbehar, and Alipurduar, situated in the ecologically fragile and flood-prone region of North Bengal, which have experienced recurring natural disasters, including floods, riverbank erosion, and landslides. Moving beyond the moment of catastrophe, it conceptualizes the "afterlife of disaster" as the prolonged and transformative existence of trauma, resilience, and collected memory within affected communities. This Paper examines how the post-disaster environment of North Bengal becomes a contested space between human survival needs and ecological preservation. This Paper also highlights how the nonhuman loss is as significant as the human loss. The afterlife of the North Bengal disaster will explore how natural forces are more powerful and can resist our artificial development strategies. This Paper examines how these lived experiences are represented, remembered, and mediated through both visual and non-visual forms of documentation. While initial reporting focused on casualties and immediate economic losses, this study traces the overlooked narratives of rebuilding and ecological rearrangement that unfold long after media attention fades. The Paper will explore the conjoined effort of sustaining process of human and nonhuman survival, adaptation, and environmental readjustment within the multispecies.

Keywords: Catastrophe, ecology, preservation, visual and non-visual media, nonhuman

Resilient Futures: Exploring the Afterlife of Disasters through Green IT and Women Empowerment in North Bengal and North-East India

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Abstract

India's North Bengal and North-East areas are among the most disaster-prone in the nation; in Assam alone, floods claim the lives of over 5 million people annually and destroy around 1.5 lakh hectares of agriculture (ASDMA, 2022). North Bengal had several landslides and flash floods between 2010 and 2020, while the 2011 Sikkim earthquake (magnitude 6.9) resulted in damages exceeding ₹6,500 crore. These frequent occurrences upset socioeconomic equilibrium and disproportionately affect women-led households and rural livelihoods. This study examines how impacted communities rebuild their lives, businesses, and surroundings after a disaster by combining women's empowerment with green information technology, or "Green IT" Climate-resilient recovery depends on sustainable digital technologies, including mobile-based early warning systems, eco-efficient data centers, and solar-powered communication hubs. Women play a crucial role in embracing and spreading these green ideas, as they make up more than 48% of the agricultural workforce in these areas. This study illustrates how ICT-enabled cooperatives, gender-inclusive governance models, and digital literacy initiatives improve resilience by looking at case studies from Assam, Sikkim, and North Bengal. It makes the case that combining women's empowerment with green IT turns the post-disaster recovery process into a driving force for climate justice and sustainable regional development.

Keywords: Resilience, Green Information Technology (Green IT) Women Empowerment, Disaster Recovery, Sustainable Development

Socio-economic Perceptions for Riverbank Risk Mapping: A VER–PCA Approach to Sustainable Management of the Raidak-II River in Alipurduar District, West Bengal, India

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Abstract

Raidak-II River in West Bengal's Alipurduar District, India, presents great challenges to local agricultural communities through its dynamic fluvial processes, causing displacement, loss of land, and economic instability. The present research brings the socio-economic vulnerability assessment to map and assess riverbank risk along the Raidak-II River with a focus on three villages: Dhantali, Lalchandpur, and Jaydebpur. A Vulnerability as Uninsured Exposure to Risk (VER) model integrating Fuzzy Analytic Hierarchy Process (FAHP) and TOPSIS estimates the vulnerability of communities by measuring exposure, sensitivity, and resilience through 21 socio-economic and environmental indicators. Principal Component Analysis (PCA) serves to enhance this by data dimension reduction and separation of main vulnerability drivers. Findings identify the most vulnerable village as Dhantali (VER score: 0.874, PC1 score: 2.31) through high exposure and low resilience, while Lalchandpur (VER: 0.099) and Jaydebpur (VER: 0.023) are more resilient through infrastructure and social cohesion. The coupling of VER–PCA with FAHP and TOPSIS enables a strong framework for the determination of priority areas for intervention. Recommendations for policy are livelihood diversification, increased community engagement, resilient infrastructure, bioengineered land management, and governance to promote sustainable development and resilience within the Raidak-II corridor.

Keywords: Riverbank risk, Vulnerability assessment, VER model, PCA, Socio-economic impacts, Sustainable management, FUZZY AHP, TOPSIS, Raidak-II River

Nature Abandoned, Nature Remembered: Locating Ecological Diaspora in Claire Buss's The Gaia Collection

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Abstract

Ecological diaspora is an emergent concept. It broadens the established definition of human diaspora and expands it to the study of the artistic, psychological, and existential displacement that results from humanity's disconnection from nature. Not only does it appear as a significant prism to comprehend the interrelationship of humans and nature, but also as a means of finding the narrative of nature exile in literature, and this is how it is contextually relevant in the modern era of environmental degradation. The paper attempts to trace this concept in The Gaia Collection (2020), a hopeful dystopian science fiction trilogy by an emerging English author, Claire Buss, that envisions a future shaped by environmental collapse and authoritarian control. Drawing on interdisciplinary conceptual frameworks such as James Lovelock's Gaia hypothesis, Lawrence Buell's concept of the environmental text, Rob Nixon's notion of slow violence, and Glenn Albrecht's idea of solastalgia, this analysis foregrounds the theme of ecological diaspora, which unfolds through the enforced exile of the characters in walled cities, nostalgia for lost natural rhythms, and physical journeys across landscapes scarred by past ecological catastrophe. In this sense, the narrative portrays its protagonists as negotiating the fragmented relationship between humanity and the living Earth—Gaia, conceived both as a scientific system and as the mythical Mother Earth. Notably, the blending of Gaia as goddess and Gaia as hypothesis produces a layered vision of ecological belonging that is at once empirical and symbolic. Through narrative elements such as artificial reproduction, collective memory, mythic invocations of Gaia, and acts of resistance against technocratic control, the trilogy portrays ecological diaspora not merely as spatial displacement but as an evolving cultural and emotional struggle to reconnect with a living Earth.

Keywords: Ecological diaspora; Gaia hypothesis; slow violence; solastalgia; belonging

Mapping Multi-Hazard Vulnerability in North Bengal: Integrating Physical and Socioeconomic Indicators

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Abstract

North Bengal, a region marked by diverse topography and climatic variability, faces recurring threats from natural hazards such as floods, landslides, and earthquakes. This study aims to develop a comprehensive vulnerability map by integrating both physical and socioeconomic indicators using GIS-based techniques. Physical factors like elevation, slope, and proximity to rivers are analyzed alongside human dimensions such as population density, literacy rate, housing quality, and access to healthcare. The objective is to identify high-risk zones and assess the resilience of communities within them. By combining spatial data with demographic insights, the research offers a nuanced understanding of multi-hazard vulnerability and provides actionable recommendations for disaster preparedness and policy intervention. This interdisciplinary approach underscores the importance of targeted mitigation strategies and inclusive planning in reducing disaster impacts across North Bengal.

Keywords: Resilience, risk assessment, spatial analysis, community preparedness, hazard mitigation

"Emerging Causes of Disasters in the Eastern Himalayas: The Case of Darjeeling, Kalimpong, Sikkim & Dooars"

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Abstract

"The Eastern Himalayas — covering Darjeeling, Kalimpong, Sikkim, and the Dooars region of North Bengal — are facing a growing risk of natural disasters, intensified by both environmental and human pressures. This delicate mountain ecosystem, already marked by unstable geology and heavy monsoon rainfall, is being severely strained by unchecked development and mass tourism. Overcrowding in North and East Sikkim and the mushrooming of homestays operating as hotels have led to rampant construction that weakens slopes and disrupts natural drainage. Frequent use of blasting for road expansion, tunnel projects, and hydropower development has fractured rock layers, while debris dumping into rivers has altered river flow and increased siltation. Deforestation and encroachment on riverbanks for public and private projects have further escalated landslides, flash floods, and soil erosion. Meanwhile, climate change and glacial melting pose fresh threats, such as glacial lake outburst floods. Poor waste management and limited disaster preparedness have worsened the situation.

Immediate measures like enforcing eco-sensitive zoning, regulating tourism and vehicle entry, and promoting community awareness are essential. Without sustainable tourism practices, resilient infrastructure, and proactive disaster management, the region's ecological stability and the lives it supports will remain at grave risk."

Keywords: Landslides, Deforestation, Over-tourism, Glacial Lake Outburst Floods (GLOFs), Sustainable Development

Changing Cultural Landscapes under Tourism Pressure: Community Perceptions and Environmental Transitions in Santiniketan, West Bengal

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Abstract

The rapid expansion of tourism over the past few decades has significantly reconfigured Santiniketan, which is globally recognized for its cultural heritage and artistic ethos. The present study investigates how tourism growth has restructured Santiniketan's traditional socio-cultural and ecological landscapes, modifying patterns of land use, livelihood, and community interaction. It explores community perceptions of both environmental and cultural transitions associated with tourism pressure through a qualitative and spatially informed approach. Data will be collected using various methods, including in-depth interviews, focus group discussions, and participatory observations across key tourism and artisan clusters. These will be complemented by GIS-based mapping to document land-use changes and the spatial expansion of tourism infrastructure. The study also examines the dilemma between economic opportunities and cultural-environmental sustainability within the frameworks of cultural landscape theory, sustainable tourism, and political ecology. Preliminary insights suggest that while tourism has boosted local economies and enhanced cultural visibility, it has simultaneously intensified environmental stress, the commercialization of heritage, and shifts in community identity. The research aims to provide a nuanced understanding of Santiniketan's evolving landscape, emphasizing the need for culturally sensitive and environmentally balanced tourism planning that aligns with local values and promotes ecological resilience.

Keywords: Sustainable development, Cultural heritage, Land-use change, Community livelihoods, Ecological resilience

Reading the Ruins: Ecological Memory, Vulnerability, and the Aesthetics of Repair in North Bengal

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Abstract

To read the ruins of disaster is to engage with what Ann Laura Stoler terms "imperial debris," spaces where damage endures and reshapes the present. This paper extends that notion into the environmental realities of North Bengal, where floods, landslides, and glacial ruptures trace a geography of continuing loss and adaptation. Drawing on Thom van Dooren's reflections on ecological memory and Kathryn Yusoff's conception of geologic life, it examines how human and non-human communities in the Teesta basin inhabit the afterlife of catastrophe. The study foregrounds community archives, oral narratives, and local eco-art practices such as the environmental installations emerging from Jalpaiguri and Siliguri art collectives to explore how creative acts of witnessing mediate ecological grief. Referencing Nayanika Mookherjee's visual ethnographies and Sukanta Majumdar's flood photography, the paper situates ruination as both a material and ethical condition where resilience becomes an aesthetic practice of repair.

Keywords: ruination, aesthetic repair, ecological memory, environmental witnessing, resilience

Flood Susceptibility Mapping through GIS-Based AHP Approach in Kuya River Basin, Birbhum, West Bengal

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Abstract

In recent years, flooding has become more frequent and severe. This has made assessing and reducing flood risk essential. Various human activities and climate change have increased flooding risks in many areas globally. Every year, floods cause significant damage to infrastructure and property, and they result in the loss of hundreds of lives. The Kuya River basin in eastern India faces a continuous and serious threat from flooding, especially during the monsoon season. This study uses a decision-making approach that combines the Analytic Hierarchy Process (AHP) and Geographic Information Systems (GIS) to assess and map flood risk in the area. The methodology These factors include elevation, slope, distance from the river, rainfall, drainage density, land use land cover (LULC), topographic wetness index (TWI), normalized difference vegetation index (NDVI), distance from the road, curvature, and soil type. Each component's spatial indicators were weighted via AHP pairwise comparisons to reflect flood relevance. The weighted indicators were transformed into thematic layers and processed in a GIS environment (ArcMap v10.8). These maps were then combined using a weighted linear combination technique to produce a flood susceptibility map. To ensure its reliability, the final map was validated with historical flood data. This validation indicated a strong link between predicted high susceptible areas and locations that experienced past floods. The final output divides the Kuya River basin into five flood risk zones. The results revealed the total study area are classified as very high to very low risk classes, respectively. The AHP-based approach guides flood mitigation, early warning, and sustainable land use planning.

Keywords: Flood Susceptibility Mapping, Analytic Hierarchy Process (AHP), Geographic Information System (GIS), Multi-Criteria Decision Analysis (MCDA)

A Holistic Appraisal of Soil Fertility Patterns and their determinants in Koch Bihar District, West Bengal

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Abstract

Soil quality and fertility are fundamental factors influencing crop productivity and sustainable agriculture. The present study offers an extensive evaluation of soil quality and fertility across Koch Bihar District to enhance understanding of its agricultural sustainability. A systematic approach integrating field surveys, laboratory analyses, and geospatial assessments has been employed. Representative soil samples were collected from multiple sites within the district and analysed for physical parameters, including texture, bulk density, particle density, and porosity. Chemical properties such as pH, organic carbon, electrical conductivity, and essential nutrients—nitrogen, phosphorus, potassium, iron, manganese, zinc, boron, sulphur, and copper—were also examined. Geospatial techniques have been utilised to map and interpret the spatial distribution of these soil attributes. From the physicochemical properties, both the Soil Quality Index (SQI) and Soil Fertility Index (SFI) will be derived to evaluate the district's soil health. The anticipated results will highlight spatial variations in fertility status and identify critical zones requiring management interventions. The study ultimately underscores the importance of targeted soil management strategies, including balanced nutrient application, organic matter enhancement, and pH regulation. By integrating scientific and geospatial analyses, the research provides valuable insights for sustainable land use planning and agricultural resilience in Koch Bihar District.

Keywords: Soil quality, Soil Fertility Index, correlation analysis, sustainable agriculture, environmental conservation, Koch Bihar District

The River's Lament: 'Bhawaiya' as Living Archives of Flood Disasters and Community Resilience in North Bengal

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Abstract

North Bengal, particularly the districts of Coochbehar, Alipurduar, Jalpaiguri and the lower regions of Darjeeling are a perennial witness to devastating floods from the Teesta, Torsa and Jaldhaka rivers. Bhawaiya, a folk music tradition of this region is rooted in the landscape and the lived experiences of its people. Primarily associated with the 'goalas' (cattle-rearers) of these areas, these sonic compositions are rich yet under-explored repository of indigenous knowledge and collective memory. The themes include environmental disasters, specifically floods. Flood disasters are depicted in the lyrics, melodies, and performance styles of Bhawaiya songs. They document the tangible and intangible impact of floods—loss of life, destruction of homes and crops, displacement, and the psychological trauma of recurring disasters. This paper proposes to systematically analyse Bhawaiya songs not just as cultural artifacts, but as "living archives" that document the socio-ecological history of floods, articulate trauma, and encode strategies of community resilience. These songs even function as a cultural memory, preserving the history of past floods and acting as a tool for communal catharsis to build up resilience.

Keywords: environment, memory, folk, indigenous, trauma

Afterlives of the Flood: Ecological Vulnerability and Endurance in Select Assamese Films

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Abstract

North Bengal, particularly the districts of Coochbehar, Alipurduar, Jalpaiguri and the lower regions of Darjeeling are a perennial witness to devastating floods from the Teesta, Torsa and Jaldhaka rivers. Bhawaiya, a folk music tradition of this region is rooted in the landscape and the lived experiences of its people. Primarily associated with the 'goalas' (cattle-rearers) of these areas, these sonic compositions are rich yet under-explored repository of indigenous knowledge and collective memory. The themes include environmental disasters, specifically floods. Flood disasters are depicted in the lyrics, melodies, and performance styles of Bhawaiya songs. They document the tangible and intangible impact of floods—loss of life, destruction of homes and crops, displacement, and the psychological trauma of recurring disasters. This paper proposes to systematically analyse Bhawaiya songs not just as cultural artifacts, but as "living archives" that document the socio-ecological history of floods, articulate trauma, and encode strategies of community resilience. These songs even function as a cultural memory, preserving the history of past floods and acting as a tool for communal catharsis to build up resilience.

Keywords: environment, memory, folk, indigenous, trauma

The Changing Cryosphere and Glacial Lake Hazards in Eastern Himalaya

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Abstract

The Eastern Himalaya, spanning across Sikkim (India) and part of Nepal, represents one of the world's most dynamic cryospheric environments, where climate warming has accelerated glacier retreat, permafrost degradation, and glacial lake expansion. Recent multi-decadal satellite analyses and field-based assessments reveal a profound transformation of the regional cryosphere, marked by increasing glacial meltwater storage and the rapid formation of new proglacial and supraglacial lakes. Between 1974 and 2023, the number and area of glacial lakes across key basins—including Lachung–Lhonak (Sikkim Himalaya) and Tso Rolpa–Imja (Nepal Himalaya)—have more than doubled, coinciding with a sustained increase in mean annual temperature and monsoon intensity. The period 2000–2015 exhibited the highest rate of lake expansion, strongly correlated with glacier mass loss and moraine instability.

Hazard assessments using the Analytical Hierarchy Process (AHP) and multiple morphometric, topographic, and hydrological indicators identify several Potentially Dangerous Glacial Lakes (PDGLs) distributed along the transboundary Sikkim–Nepal frontier. Case studies, including the 1998 Tenbawa GLOF (Sikkim) and the Imja and Tso Rolpa lakes (Nepal), exemplify how even small moraine-dammed lakes can trigger destructive downstream floods under conditions of heavy rainfall or ice calving.

This burning issue emphasizes the need for regional-scale monitoring frameworks, cross-border data sharing, and early-warning systems integrating remote sensing, field instrumentation, and community-based preparedness. The changing cryosphere of the Eastern Himalaya poses an emerging challenge for sustainable mountain development, demanding international cooperation and adaptive strategies under a rapidly warming climate.

Keywords: Glacial Lake Outburst Floods (GLOFs), , Potentially dangerous glacial lakes (PDGLs), Sikkim Himalaya, Supraglacial lakes, Proglacial Lakes

Spatial Pattern and Geographical Analysis of Elephant Electrocution Deaths in Northern West Bengal, India

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Abstract

Human-induced mortality poses a significant threat to many species worldwide, with Asian elephants in India being notably impacted. In recent years, electrocution-related elephant deaths have increased, particularly in the Northern District Landscape of West Bengal. A major contributor is the proliferation of illegal and hazardous electric fencing near protected forest areas. In many cases, farmers install electrified fences—often unauthorized—to prevent crop damage from elephant incursions. Unfortunately, these measures frequently result in fatal outcomes, escalating tensions, and provoking retaliatory actions. This study assesses the spatio-temporal extent of elephant electrocution incidents across a forested region of approximately 12,000 km2. A total of 63 elephant deaths were documented using official records from the Forest and Wildlife Directorate. Each location was assessed for temporal factors such as year, month, and time of occurrence. Advanced geospatial techniques— including remote sensing and GIS—were utilized, with Kernel Density Estimation applied to generate a detailed risk map. The analysis reveals critical high-risk zones in Bagdogra, Apalchand, Moraghat, and Dalgaon, while Ramsai, Rajabhatkhawa, Kartika, and Kumargram exhibit lower risk levels. The study identifies key drivers of these fatalities and highlights the pressing need for intervention. The study highlights key contributing factors to electrocution deaths and emphasizes the urgency of targeted interventions. This research aims to support conservation efforts for the endangered Asian elephant and offers valuable insights into mitigating human-elephant conflict. It underscores the importance of collaborative efforts involving forest officials, Gram Panchayat bodies, NGOs, and Joint Forest Management Committees to implement effective preventive measures in identified high-risk areas.

Keywords: Asian elephant, kernel Density, Lethal fence, Elephant mortalities, Harmonious relationship

Rethinking Paradigms of Natural Disaster: A Study of the Fishing Cultures of Cooch Behar

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Abstract

Fishing is an important part of the cultural life of the Rajbanshi as well as the Bengali communities of Cooch Behar. A way of life dependent on seasonal variations and the natural environment of Cooch Behar, fishing traditions while being an intrinsic part of the community life, has long experienced grave adversities as momentous changes take place in the environment as well as the market and commerce in the region. The skills involved in making the fishing poles, the various kinds of traps and fishing nets and other fishing tools face endangerment as the practice itself is deemed more dangerous faced with an increasingly hostile natural environment and less appealing in terms of the rewards it yields balanced against the risks involved. Natural disasters as the recent floods sweeping across sections of the Dooars region act as moments that crystallize the relations between long held practices of governance, social and economic inequities of the region and cultural forms. This paper takes into account the shifts that have taken place over the last few decades in the paradigm of understanding a natural disaster that goes beyond concerns of survival and resilience, to examine the contemporary fishing culture in the context of normalization of the state of disaster.

Assessing Flow Dynamics and Hydrological Alterations for Sustainable River Basin Management

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Abstract

The Subarnarekha Basin faces hydrological stress from climate variability and land-use change. This study evaluates basin wide rainfall flow relationships using Soil and Water Assessment Tool (SWAT) and Indicators of Hydrologic Alteration (IHA). This study integrates the SWAT with IHA to assess streamflow dynamics and hydrological alterations in the Subarnarekha Basin. The SWAT model was calibrated and validated for five gauging stations (Jamshedpur, Ghatsila, Adityapur, Rajghat, and Fekoghat) using multi-decadal hydro meteorological datasets. Model performance was strongest at Jamshedpur and Ghatsila, while Rajghat and Fekoghat reflected the constraints of shorter series of data availability. Sub-basin analysis revealed marked spatial variability; upper plateau catchments were recharge-driven with higher infiltration and supportive to groundwater recharge; middle reaches expectedly having a balanced partitioning between runoff and recharge as the rainfall regime is more than 1000 mm annually. Downstream coastal sub basins (>1600 mm rainfall) were hydrologically flashy, dominated by evapotranspiration and rapid surface runoff, increasing flood risk and erosion. IHA-based flow regime analysis at Adityapur, Ghatsila, and Jamshedpur revealed significant alterations in flow magnitude, timing, and pulse frequency. At Adityapur, the most pronounced changes were observed, with elevated dry season causing mainly baseflow discharge and reduced monsoon peaks, reflecting need of channel water regulation to maintain land-use pressures for agriculture. The differential seasonal flow shifts alter sediment transport, floodplain river connectivity and aquatic habitat preservation, particularly during low-flow periods. By combining process-based modelling with regime-based indicators, the study captures both spatial hydrological variability and temporal regime shifts.

Keywords: Subarnarekha River Basin (SRB); SWAT model; hydrological simulation; flow regime alteration; Indicators of Hydrologic Alteration (IHA)

Challenges of Flood Governance: Role of Panchayats and Local Administration in North Bengal

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Abstract

In North Bengal, flooding has been a frequent occurrence that has seriously hampered infrastructure, livelihood, and daily life. The area is extremely vulnerable to seasonal flooding due to its distinct topography and the abundance of rivers that flow through it, including the Teesta, Torsa, and Jaldhaka, all of which originate in the Himalayas. The function of panchayats and local government in controlling floods and lessening their effects is examined in this article. Effective flood governance is hampered by administrative, logistical, and financial constraints in the area, even though the Panchayati Raj system decentralizes disaster management duties. Government reports and field research point to deficiencies in long-term rehabilitation, relief coordination, and early warning distribution. Despite being the first responders in rural areas, Panchayats' efforts are hindered by a lack of technical expertise, inadequate training, and a lack of funding. The article also examines how post-disaster difficulties are made worse by bureaucratic hold-ups, overlapping jurisdictions, and inadequate coordination amongst various administrative levels. The advantages and disadvantages of local disaster governance are demonstrated by case studies from districts such as Jalpaiguri, Cooch Behar, and Alipurduar. The study comes to the conclusion that enhancing flood resilience in North Bengal requires bolstering local institutions, incorporating traditional knowledge with contemporary disaster management techniques, and guaranteeing participatory decision-making.

Keywords: Flood Governance, North Bengal, Panchayati Raj, Local Administration, Disaster Management, Community Resilience, Climate Adaptation, Rural Development

Coloniality and 'Slow-Disaster' in North East India: Exploring Disaster as a (Neo) Colonial Tool through Mamang Dai's The Legends of Pensam (2006)

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Abstract

This paper attempts to re-examine 'disaster' through non-linear and non-conventional lens in extension to Nixon's (2011) and Mitul Baruah's (2023) conceptualization of "Slow Violence" and "Slow Disaster" respectively, in the context of North East India. Rather than looking at disaster as an exotic and spectacular phenomenon with immediate and obvious reasons or outcomes, the present paper seeks to understand its gradual and wider intersections with the prolonged history of coloniality of the respective nation-state. Situating Mamang Dai's The Legends of Pensam (2006) as one of the cultural responses, this paper contends that recent alarming ramifications of disasters like floods and landslides in North East India are deeply rooted in the (neo-)colonial projects and also that North East Indian imagination as part of the larger corpus of the Global South cultural representations offers unique understanding of disaster, unlike the mainstream discourses of the West, towards sustainability and alterities to cope with the crises following disaster.

Keywords: Intersections of Coloniality and Disaster, Disaster as a (Neo-)Colonial Tool, North East Indian Imagination/Cultural Representation, Mamang Dai, The Legends of Pensam

আর্থ-সামাজিক-সাংস্কৃতিক বিপর্যয়: প্রসঙ্গে 'দুখিয়ার কুঠি' উপন্যাস

জ্যোতির্কণা বর্মণ

সহকারী অধ্যাপিকা, ধুপগুড়ি গার্লস কলেজ

সংক্ষিপ্তসার (Abstract)

বাংলা সাহিত্যের অন্যতম শক্তিশালী লেখক অমিয়ভূষণ মজুমদার (১৯১৮–২০০১)। তাঁর এক বিখ্যাত উপন্যাস দুখিয়ার কুঠি (১৯৫৯), যার মূল উপজীব্য রাজবংশী সম্প্রদায়ের জীবন। ভূমিকায় লেখক যদিও বলেছেন—কোনো বিশেষ ভৌগোলিক অঞ্চলের মধ্যে এই কাহিনিকে সীমাবদ্ধ করা সমীচীন নয়; তবু নিবিড় পাঠে পটভূমিতে প্রাচীন কোচবিহার ও ডুয়ার্স অঞ্চল স্পষ্ট হয়ে ওঠে। লেখক দেখিয়েছেন, সভ্যতার অগ্রগতির সঙ্গে সঙ্গে এখানকার আদি বাসিন্দাদের জীবনচর্যা কীভাবে বদলে যাচ্ছে; তথাকথিত মানুষ-নির্মিত (Man-made) আধুনিকতা তাদের জীবনে কীভাবে বিপর্যয় ডেকে আনছে। ভাটির দেশ থেকে আগত মানুষের বসতি স্থাপনের ফলে জনবিন্যাসে (demography) পরিবর্তন ঘটছে; কৃষিজমি-নির্ভর জীবন পরিস্থিতির চাপে রূপান্তরিত হতে বাধ্য। মুদ্রা প্রথার বিস্তার, দুধের সংকট, সাপ্তাহিক হাটের সংখ্যা বৃদ্ধি, অতীতে মূল্যহীন বস্তুর মূল্যলাভ, সরকার-অনুমোদিত মদ–গাঁজা–আফিমের দোকান, এবং অসংখ্য বহিরাগত শ্রমিকের আগমনে শহরটি শ্রমিক উপনিবেশের রূপ নিচ্ছে—এই সবের মধ্য দিয়ে লেখক স্থানীয় মানুষের সংকটকে সামনে এনেছেন। উপন্যাসের শুরু থেকে শেষপর্যন্ত 'সভ্যতা' শব্দটির পুনরাবৃত্তি আমাদের যেন এক মৌলিক প্রশ্নের মুখোমুখি দাঁড় করায়—সভ্যতার অগ্রগতির মানেই কি এক পক্ষের অনিবার্য পরাজয়? 'স্থিতিশীল সহাবস্থান' কি অসম্ভব? আমাদের আলোচনায়, উপন্যাসের পাঠের মধ্যে দিয়েই এই প্রশ্নগুলির উত্তর অনুসন্ধানের প্রয়াস থাকবে।

মূলশব্দ (Keyword): রাজবংশী সম্প্রদায়; কোচবিহার–ডুয়ার্স; জনবিন্যাসের পরিবর্তন; আধুনিকতা ও সভ্যতার অগ্রগতি।

Decoding the Mystifying Phenomenon of Existential Crisis: Traversing the Terrains of *Sundarban Trilogy* by Amitav Ghosh.

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Abstract:

The word "disaster" refers to an unforeseen and catastrophic event like flood or fire or drought, causing havoc to both human and natural life. Disaster is also depicted as "a situation involving a natural hazard which has consequences in terms of damage, livelihoods/economic disruption and/or casualties that are too great for the affected area and people to deal with properly on their own". [Wisner, B., J.C. Gaillard, and I. Kelman (Eds.). (2012)]. The disastrous outcome is often characterized by collective trauma, displacement and grave existential crisis on the part of human life. Victims to any kind of a disaster are left with an abominable afterlife with unhealed scars, leading to a sense of spatial dislocation. This paper seeks to address those uncharted terrains of existential crisis borne out of natural disasters and climate change. And, in doing so, it aims to revisit and rediscover the hidden facets of *Sundarban Trilogy* by Amitava Ghosh, the chronicles of which conspicuously testify to the ecological imbalance and bring forth the displacement, migration, resettlement and collective resilience of human agency in the aftermath of a disaster.

Keywords: disaster, ecological imbalance, spatial dislocation, displacement, resilience.

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