3.3.1.1: Number of Research papers published per teacher in the journals notified on UGC care list during the last Five years

Academic Year	Total Number of Publication
2022-23	07
2021-22	15
2020-21	14
2019-20	12
2018-19	12

13/07/24

Signature of the Principal

PANDIT RAGHUNATH MURMU SMRITI MAHAVIDYALAYA ESTD.-1986 P.O.-Jamboni Dist.-Bankura BARAGARI

Principal
P.R.M.S. Mahavidyalaya
Baragari, P.O.- Jamboni,
Dist.- Bankura

3.3.1.1: Number of Research papers published per teacher in the journals notified on UGC care list during the last Five years

SL.No	Title of paper	Name of the	of the teacher	Name of journal	Year of publicati	Month	Session	ISSN	Paper link	Link to the recognition in UGC enlistment of the Journal
1	Visco-elastic properties of multi-component mixtures of hockey stick-shaped liquid crystal compounds	Chakrabort y	Department Of Physics	Journal of Molecular Liquids	2018	June	2018-19	1873-3166 (Electronic)	https://www.sciencedirect.com/science/article/abs/pii/S0167732217361329	https://www.sciencedirect.com/journal/journal-of-molecular-liquids
2	Socio-Economic Condition of Kharia Tribes of South-West Bankura of West Bengal	ANUP KUMAR	DEPT OF HISTORY	Ajker jodhan	2018	Nov - Decemb	2018-19	0871-5819		
3	A Geo-spatial study for analysing temporal responses of NDVI to rainfall	Arnab Kundu	of Geo-Informatics	Singapore Journal of Tropical Geography	2018	January	2018-19	1467-9493	https://onlinelibrary.wiley.com/doi/abs/10.1111/sjtg.12217	https://onlinelibrary.wiley.com/journal/14679493
4	A geo-spatial inter-relationship with drainage morphometry, landscapes and NDVI in the context of climate change: a case study over the Varuna river basin (India)	Arnab Kundu	of Geo-Informatics	Spatial Information Research	2019	April	2018-19	2366-3286	https://link.springer.com/article/10.1007/s41324-019-00264-2	https://link.springer.com/journal/41324
5	Drought assessment for kharif rice using standardized precipitation index (SPI) and vegetation condition index (VCI)	Arnab Kundu	of Geo-Informatics	Journal of Agrometeorology	2019	June	2018-19	0972-1665	https://journal.agrimetassociation.org/index.php/jam/article/view/230	https://journal.agrimetassociation.org/index.php/jam
6	Abnormal urbanization in West Bengal: A District Level Study	Jaidul Islam	Department of Geography	Indian Journal of Regional Science	2018	Decem ber	2018-19	2456-6519	https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=6yvG4rEAAAAJ&citation_for_view=6yvG4rEAAA	https://www.indianjournals.com/ijor.aspx?target=ijor:ijrs&type=home
7	Comparative analysis of carbon dioxide emission in West Bengal and India	Kartick Mondal	Department of	Engineering Application & Management (IJREAM),	2019	May	2018-19	2454-9150	https://ijream.org/papers/IJREAMV05I0250004.pdf	https://www.ijream.org/
8	Synthesis, characterisation and biological activity of Copper (II) complexes with NSO donor ligand	Madhumita Hazra	Department of Chemistry	International Journal of Current Research in Life Sciences	2018	February	2018-19	2319-9490	https://scholar.google.co.in/scholar?q=Synthesis,+characterisation+and+biological+activity+of+Copper+(II)+complexes+with	https://www.journalijcrls.com/about-us
9	International Globalization of Santali Literature	Ram Mandi	Department of Santali	JETIR	2019	April	2018-19	2349-5162	NA	https://jetir.org/?gad_source=1&gclid=Cj0KCQjw7ZO0BhDYARIsAFttkCgk7xuggT0qWbLWAEVRkyQYSC2-m5gt-NaSfyw11g7emCOaEpCVLIcaAu-
10	Status of large mammalian species in Urgam beat of Nanda Devi Biosphere Reserve (NDBR), Uttarakhand, India.	Subhasis Mahato	Department of Forestry	journal of Entomology and Zoology Studies	2019	January	2018-19	7078, Print ISSN: 2349-6800	https://www.entomoljournal.com/archives/2019/vol7issue1/PartH/7-1-105-977.pdf	https://www.entomoljournal.com/
11	A Study on Solid Mechanics and Wave Propagation	Tapas Halder	Department of	International Journal of Research and Analytical Reviews	2019	January	2018-19	E-ISSN 2348-1269,P-ISSN 2349-5138	NA	https://ijrar.org/?gad_source=1&gclid=Cj0KCQjw7ZO0BhDYARIsAFttkChhFc4a-
12	A Mathematical Modeling on Prey-predator System	Tapas Halder	Department of	International Journal of Research and Analytical Reviews	2019	June	2018-19	E-ISSN 2348-1269,P-ISSN 2349-5138	NA	https://ijrar.org/?gad_source=1&gclid=Cj0KCQjw7ZO0BhDYARIsAFttkChhFc4a-
13	Dielectric investigation on some binary mixtures of hockey-stick-shaped liquid crystal and octyloxy cyanobipheny	Chakrabort y	Department Of Physics	Phase Transitions	2019	July	2019-20	0141-1594 (Print), 1029-0338 (Online)	https://www.tandfonline.com/doi/abs/10.1080/01411594.2019.1642476	https://www.tandfonline.com/toc/gpht20/current
14	Changing pattern of urban landscape and its effect on land surface temperature in and around Delhi	Arnab Kundu	of Geo-Informatics	Environmental Monitoring and Assessment	2019	August	2019-20	0167-6369	https://link.springer.com/article/10.1007/s10661-019-7645-3	https://link.springer.com/journal/10661
15	An appraisal of flood events using IMD, CRU, and CCSM4-derived meteorological data sets over the Vaigai river basin, Tamil Nadu (India)	Arnab Kundu	of Geo-Informatics	Sustainable Water Resources Management	2019	Decembe r	2019-20	2363-5037	https://link.springer.com/article/10.1007/s40899-019-00325-2	https://link.springer.com/journal/40899
16	Dynamics of Vegetation Response to Seasonal Rainfall in the Gomati River Basin (India) using Earth Observation Data Sets	Arnab Kundu	of Geo-Informatics	Journal of Scientific Research	2020	January	2019-20	0447-9483	https://www.bhu.ac.in/research_pub/jsr/Volumes/JSR_64_01_2020/3.pdf	https://www.banglajol.info/index.php/JSR
17	An Estimation of Hydrometeorological Drought Stress over the Central Part of India using Geo-information Technology	Arnab Kundu	of Geo-Informatics	Journal of the Indian Society of Remote Sensing	2020	January	2019-20	0255-660X	https://link.springer.com/article/10.1007/s12524-019-01048-9	https://link.springer.com/journal/12524
18	Bankura jelar sades vanaya nari jagoron (1915-1930): Ekti Oitihasik Bisleson	Bidyut Kumar	Department of History	Ebong Mahua	2020	March	2019-20	NA	NA	https://abcdindex.com/Journal/Ebong-Mahua-(print-only)-NA
19	Changing Urbanisation Scenario & It's Effect on Urban Environment: A Study of Kolkata (KMC), Salt Lake and New Town	Jaidul Islam	Department of Geography	Economy Polity Environment	2019	Decembe r	2019-20	2583-6390	https://www.google.com/search?q=Changing+Urbanisation+Scenario+%26+It%E2%80%99s+Effect+on+Urban+Environment	https://www.epef.in/index.php/epe
20	A Geographical Analysis of Slums in the Kolkata Municipal Corporation Area, West Bengal	Jaidul Islam	Department of Geography	Indian Journal of Spatial Science	2019	Septemb er	2019-20	2249-3921	https://www.citefactor.org/article/index/164640/a-geographical-analysis-of-slums-in-the-kolkata-municipal-	https://www.indiansss.org/ijss/

SL.No	Title of paper	Name of the	of the teacher	Name of journal	Year of publicati	Month	Session	ISSN	Paper link	Link to the recognition in UGC enlistment of the Journal
21	Selina Hossainer 'Neer Mayurer Youban' : Akti Samiksha	Pradip Kumar	Department of Bangla	Tabu Ekalabay	2020	January	2019-20	0976-9463	NA	NA
22	Vidyasagarer 'Kothamala' : Bartamaner Prekshite	Pradip Kumar	Department of Bangla	Ebong Mahua	2020	March	2019-20	NA	NA	https://abcdindex.com/Journal/Ebong-Mahua-(print-only)-NA
23	Urban Environmental Retrogression and Measures for Its Mitigation: A Case Study of Berhampore, Murshidabad	Samiran Dutta	Department of Geography	Journal of Information and Computational Science	2020	June	2019-20	15487741	https://drive.google.com/file/d/1aNzpU4SB8yjRqwWMk2rOQjgkvHjk9Pqv/view	https://joics.org/
24	Wood Specific Gravity of Temperate Forest Species of Garhwal Himalaya, India.	Subhasis Mahato	Department of Forestry	Indian Forester	2019	October	2019-20	0019-4816	https://indianforester.co.in/index.php/indianforester/article/view/149914	https://indianforester.co.in/index.php/indianforester
25	Calorimetric study of critical behaviour near the smectic A to nematic phase transition in a polar-polar binary system	Chakraborty	Department Of Physics	Phase Transitions	2020	September	2020-21	0141-1594 (Print), 1029-0338 (Online)	https://www.tandfonline.com/doi/abs/10.1080/01411594.2020.1832226	https://www.tandfonline.com/toc/gpht20/current
26	Estimating urban growth in peri-urban areas and its interrelationships with built-up density using earth observation datasets	Arnab Kundu	of Geo-Informatics	The Annals of Regional Science	2020	August	2020-21	0570-1864	https://link.springer.com/article/10.1007/s00168-020-00974-8	https://link.springer.com/journal/168
27	Evaluation of socio-economic drought risk over Bundelkhand region of India using analytic hierarchy process (AHP) and geo-spatial techniques	Arnab Kundu	of Geo-Informatics	Journal of the Indian Society of Remote Sensing	2021	February	2020-21	0255-660X	https://link.springer.com/article/10.1007/s12524-021-01306-9	https://link.springer.com/journal/12524
28	Forest fire risk mapping using analytical hierarchy process (AHP) and earth observation datasets: a case study in the mountainous terrain of Northeast India	Arnab Kundu	of Geo-Informatics	SN Applied Sciences	2021	March	2020-21	2523-3971	https://link.springer.com/article/10.1007/s42452-021-04391-0	https://www.springer.com/gp/about-springer/media/press-releases/corporate/first-articles-in-new-sn-applied-sciences-journal-now-
29	An alternative approach to delineate wetland influence zone of a tropical intertidal mudflat using geo-information technology	Arnab Kundu	of Geo-Informatics	Estuarine, Coastal and Shelf Science	2021	March	2020-21	0272-7714	https://www.sciencedirect.com/science/article/abs/pii/S0272771421001611X#:~:text=Hydrological%20regimes%20with%20s	https://www.sciencedirect.com/journal/estuarine-coastal-and-shelf-science
30	Impervious surface growth and its inter-relationship with vegetation cover and land surface temperature in peri-urban areas of Delhi	Arnab Kundu	of Geo-Informatics	Urban Climate	2021	May	2020-21	2212-0955	https://www.sciencedirect.com/science/article/abs/pii/S2212095521000298	https://www.sciencedirect.com/journal/urban-climate
31	A statistical analysis and prediction of carbon dioxide emission in Himachal Pradesh, Punjab and Haryana states of India	Kartick Mondal	Department of	ESEMBLE, A Bi-lingual peer reviewed academic journal	2021	May	2020-21	ISSN: 2582 - 0427 (Online)	https://www.ensembledrms.in/wp-content/uploads/2021/05/ensemble-2020-0202-a001_01-	https://www.ensembledrms.in/
32	Biological activity of fluorescent copper complex: Synthesis, crystal structure, DFT and protein binding study	Madhumita Hazra	Department of Chemistry	Journal of Advanced Scientific Research	2021	February	2020-21	ISSN-0976-9595	https://sciensage.info/index.php/JASR/article/view/626	https://sciensage.info/index.php/JASR
33	Dwandwikatar Prekshite Manibhushan Bhattacharyaer Kavita	Pradip Kumar	Department of Bangla	Antarmukh	2020	July	2020-21	2249-3751	NA	https://antarmukh.com/
34	Prabhat Kumar Mukhopadhyayer 'Kurano Meye' : Bishoy O Boichitrye	Pradip Kumar	Department of Bangla	Ebong Mahua	2021	May	2020-21	NA	NA	https://abcdindex.com/Journal/Ebong-Mahua-(print-only)-NA
35	Pither Satkahan : Bankurar Utkal Samaj	Pradip Kumar	Department of Bangla	Ebong Mahua	2020	November	2020-21	NA	NA	https://abcdindex.com/Journal/Ebong-Mahua-(print-only)-NA
36	Bankim Bipsa : Toulan Sahityaer Aloke	Pradip Kumar	Department of Bangla	Ebong Mahua	2020	September	2020-21	NA	NA	https://abcdindex.com/Journal/Ebong-Mahua-(print-only)-NA
37	A study on Joyadeva'Gitagovindam (1st Author Among 2), PP.42-59	Sanghamitra Sinha	Department of Saskrit	Journal of Sanskrit Research Foundation,	2020	December	2020-21	0975-4067	NA	https://sites.google.com/view/kiranavalionline
38	A few selected sloka of Mundaka Upanisada in light of 21st Century	Sanghamitra Sinha	Department of Saskrit	Journal of East-West Thought	2021	June	2020-21	2161-7236	NA	https://journals.calstate.edu/jet
39	Determination of optical birefringence and orientational order parameter of octyloxycyanobiphenyl from a voltage-dependent optical transmission technique	Chakraborty	Department Of Physics	Phase Transitions	2022	February	2021-22	0141-1594 (Print), 1029-0338 (Online)	https://www.tandfonline.com/doi/abs/10.1080/01411594.2022.2041016	https://www.tandfonline.com/toc/gpht20/current
40	Vaidik Sanskriti o Naitikata	ANUP KUMAR	DEPT OF HISTORY	Ebong Mahua	2021	July	2021-22	NA	NA	
41	Prachin Banglar Banik o Banijaya akti yatihasik Anushandan	ANUP KUMAR	DEPT OF HISTORY	Ebong Mahua	2021	August	2021-22	NA	NA	
42	Rad Banglar Mandir Staphataya bhaskaracharjay Vishnupurar Madanmahan Mandir	ANUP KUMAR	DEPT OF HISTORY	Ebong Mahua	2021	September	2021-22	NA	NA	
43	Kharoyar Andal Nara Udhavab o pravhab	ANUP KUMAR	DEPT OF HISTORY	Ebong Mahua	2021	October	2021-22	NA	NA	
44	Regional variation of drought parameters and long-term trends over India using standardized precipitation evapotranspiration index	Arnab Kundu	of Geo-Informatics	Journal of Environmental Management	2021	July	2021-22	0301-4797	https://www.sciencedirect.com/science/article/abs/pii/S030147972101118X	https://www.sciencedirect.com/journal/journal-of-environmental-management
45	Investigating forest fragmentation through earth observation datasets and metric analysis in the tropical rainforest area	Arnab Kundu	of Geo-Informatics	SN Applied Sciences	2021	July	2021-22	2523-3971	https://link.springer.com/article/10.1007/s42452-021-04683-5	https://www.springer.com/gp/about-springer/media/press-releases/corporate/first-articles-in-new-sn-applied-sciences-journal-now-
46	An Appraisal of Kerala Flood-2019	Arnab Kundu	of Geo-Informatics	Journal of the Indian Society of Remote Sensing	2022	April	2021-22	0974-3006	https://link.springer.com/article/10.1007/s12524-022-01544-5	https://link.springer.com/journal/12524
47	Evolution of opencast mines in the raniganj coalfield (India): An assessment through multi-temporal satellite data	Arnab Kundu	of Geo-Informatics	Journal of the Geological Society of India	2022	April	2021-22	0974-6889	https://link.springer.com/article/10.1007/s12594-022-1990-5	https://link.springer.com/journal/12594/volumes-and-issues
48	Prediction and spatial distribution mapping of soil electrical conductivity using geo-statistical method for Mirzapur district, Uttar Pradesh	Arnab Kundu	of Geo-Informatics	The Pharma Innovation Journal	2022	June	2021-22	2349-8242	https://www.thepharmajournal.com/archives/2022/vol11issue8S/PartK/S-11-8-49-461.pdf	https://www.thepharmajournal.com/
49	GIS-based multi-criteria approach to delineate groundwater prospect zone and its sensitivity analysis	Arnab Kundu	of Geo-Informatics	Applied Water Science	2022	March	2021-22	2190-5495	https://link.springer.com/article/10.1007/s13201-022-01585-8	https://link.springer.com/journal/13201
50	Understanding land use/land cover and climate change impacts on hydrological components of Usri watershed, India	Arnab Kundu	of Geo-Informatics	Applied Water Science	2022	May	2021-22	2190-5495	https://link.springer.com/article/10.1007/s13201-021-01547-6	https://link.springer.com/journal/13201

SL.No	Title of paper	Name of the	of the teacher	Name of journal	Year of publicati	Month	Session	ISSN	Paper link	Link to the recognition in UGC enlistment of the Journal
51	Slums in India: Making Sense of Place in Urban Planning	Jaidul Islam	Department of Geography	GeoJournal	2022	June	2021-22	0343-2521	https://link.springer.com/article/10.1007/s10708-020-10357-3	https://link.springer.com/journal/10708
52	Dispersion of Love-type wave and its Limitation in a nonlocal elastic model of nonhomogeneous layer upon an orthotropic extended medium	Tapas Halder	Department of	SoIL Dynamics and Earthquake Engineering	2022	February	2021-22	107117	https://www.sciencedirect.com/science/article/abs/pii/S026772612100539X	https://www.sciencedirect.com/journal/soil-dynamics-and-earthquake-engineering
53	A practical outlook towards Abhijana Shakuntalam by Kalidasa	Sadhan Rudra	Department of Englidh	IJCRT	2022	January	2021-22	2320-2882	INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS - IJCRT (IJCRT.ORG)	https://ijcrt.org/papers/IJCRT2201166.pdf
54	Assessing vegetation fragmentation and plantation efficiency in an intertidal mudflat of eastern India using Radar Forest Degradation Index and spatial metrics	Arnab Kundu	of Geo-Informatics	Geocarto International,Taylor and Francis	2022	December	2022-23	1010-6049	https://www.tandfonline.com/doi/full/10.1080/10106049.2021.2017014	https://www.tandfonline.com/journals/tgei20
55	Spatial and temporal trends of urban green spaces: an assessment using hyper-temporal NDVI datasets	Arnab Kundu	of Geo-Informatics	Geocarto International	2022	October	2022-23	1010-6049	https://www.tandfonline.com/doi/abs/10.1080/10106049.2021.1989499	https://www.tandfonline.com/journals/tgei20
56	Future prediction of water balance using the SWAT and CA-Markov model using INMCM5 climate projections: a case study of the Silwani watershed (Jharkhand), India	Arnab Kundu	of Geo-Informatics	Environmental Science and Pollution Research	2023	July	2022-23	1614-7499	https://link.springer.com/article/10.1007/s11356-023-27547-4	https://link.springer.com/journal/11356
57	land-use efficiency and sustainable urban development (SDG 11.3.1): a study on Kolkata metropolitan area, India	Jaidul Islam	Department of Geography	Geocarto International	2022	October	2022-23	1752-0762	https://www.tandfonline.com/doi/full/10.1080/10106049.2022.2136259	https://www.tandfonline.com/journals/tgei20
58	Al Mahmuder Kavitay Dharamavabna	Pradip Kumar	Department of Bangla	Tabu Ekalabay	2022	July	2022-23	0976-9463	NA	https://portal.issn.org/resource/ISSN/0976-9463
59	Late quaternary sediment from barakar damodar basin, eastern India	Samiran Dutta	Department of Geography	Journal of Asian earth science	2023	January	2022-23	98220002883	https://www.sciencedirect.com/science/article/pii/S2590056022000561	https://www.sciencedirect.com/journal/journal-of-asian-earth-sciences
60	Unveiling the Capitalist Society's Wasteland: the Struggle for Liberation in the Play Bhoma by Badal Sircar	Sadhan Rudra	Department of Englidh	International Journal of All Research Education and Scientific Methods	2023	May	2022-23	2455-6211	https://www.ijaresm.com/	https://www.ijaresm.com/unveiling-the-capitalist-society-s-wasteland-the-struggle-for-liberation-in-the-play-bhoma-by-badal-sircar

3.3.1.1: Number of Research papers published per teacher in the journals notified on UGC care list during the last Five years

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Volume 265, 1 September 2018, Pages 536-543

Visco-elastic properties of multi-component mixtures of hockey stick-shaped liquid crystal compounds

Anish Chakraborty [a], Susanta Chakraborty [b], Malay Kumar Das [b], Wolfgang Weissflog [c]

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Visco-elastic properties of multi-component mixtures of hockey stick-shaped liquid crystal compounds

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Splay elastic modulus
Rotational viscosity

ABSTRACT

Measurements of optical birefringence (Δn), permittivity ($\varepsilon_{\parallel}$, $\varepsilon_{\perp}$), splay elastic modulus (K_{11}) and rotational viscosity (γ_1) have been carried out on the nematic (N) phase of a few multi-component liquid crystal mixtures having the hockey stick-shaped 4-(3-*n*-alkyloxy-2-methyl-phenyliminomethyl)phenyl 4-*n*-alkyloxycinnamate compounds. Three eutectic mixtures (tri-, tetra- and penta-component) were prepared using the Le Chatelier, Schröder and Van Laar (CSL) equation. The nematic range in all the investigated mixtures has been found to be relatively greater than that in most of the pure components. The Δn values have been found to be comparatively smaller than those for the constituent compounds. A temperature dependent inversion in the static dielectric anisotropy ($\Delta\varepsilon = \varepsilon_{\parallel} - \varepsilon_{\perp}$) has been observed for all the mixtures on entering the anticlinic smectic-C (Sm-C_A) phase. No trace of pretransitional divergence has been detected in the temperature dependence of K_{11} in vicinity of the nematic to lower smectic-C transition. At a fixed reduced temperature, the γ_1 values are either slightly higher or close to those of the pure compounds. The outcomes are explained in the framework of influence of molecular structure on the phase behaviour of multi-component mesogenic system.

1. Introduction

The aspects of the molecular structure and conformational perspectives appear to be of fundamental importance in deciding the mesogenic behaviour of liquid crystalline compounds. During past few decades a number of exotic shaped liquid crystal molecules encompassing a rich variety of phase topologies with unusual molecular ordering and layer frustrations have been synthesised and studied extensively. Such exotic phases, residing chiefly at the interface of the calamitic and columnar mesophases, are not only important for the understanding of molecular behaviour from the view point of basic sciences but they are also crucial because some of them are of great potential for technological relevance's as well. Among them the bent-core or banana-shaped compounds have appeared as a field of considerable interest in soft matter research. Revelations of the exceptional structure induced mesomorphic behaviour and unconventional phase sequences in those nonlinear molecules have unveiled a stimulating new horizon in the science of thermotropic liquid crystals (LCs). Exceptional findings, including the observation of supramolecular structure, ferroelectricity and spontaneous chiral symmetry breaking in such smectogenic fluids despite the tremendous impact on the general field of soft condensed matter. Such group of remarkable characteristics also set off a huge research effort in the area of "banana-shaped" or bent-core mesogens, especially after the pioneering discovery of electro-optical switching in such achiral mesogenic compounds by Niori et al. [1].

From the view point of functional applications of liquid crystalline materials, such as in modern displays, the visco-elastic properties serve as a key parameter in resolving the performance of the concerned device. For bent-core LCs, the curved shape of the molecules and hence, the steric hindrance and molecular association in the mesophases have a crucial influence on the visco-elastic behaviour and so lead to a number of unique outcomes as the occurrence of sign-reversal in dielectric anisotropy, negative values of elastic anisotropy or high rotational viscosity coefficients [2–8]. However, the general trend and features relating those material properties in bent-core compounds and in binary and multi-component mixtures of them in attempt for optimization of the mesogenic characteristics, are still not well explored and comprehended. Thus, it is of great interest to study the visco-elastic properties in the nematic phase of both symmetric bent-core and hockey stick-shaped liquid crystals as well as

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প্রদীপ বন্দ্যোপাধ্যায়, উৎপলেন্দু মাল, অভিজিৎ চৌধুরী, সুব্রত হালদার,
বৃন্দাবন মণ্ডল, কল্পনা মিত্র, প্রশান্ত মণ্ডল, বিশ্বনাথ চক্রবর্তী

প্রচ্ছদ
মৌমিতা প্রসাদ

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মূল্য : ৫০/-

আমাদের কথা

এ বছর আজকের যোধনের ছয়টি সাধারণ সংখ্যা এবং চারটি বিশেষ সংখ্যা প্রকাশ হচ্ছে। সহযোগিতায় কয়েকজন বিশেষ আন্তরিক অধ্যাপক বন্ধু। আগামী বছর আজকের যোধনের কাজ আরো বৃদ্ধি পাবে। ইতিমধ্যে আরো অনেক জায়গায় সাহিত্যসভা আয়োজিত হয়েছে। হবে আরো অনেক। অনেক নতুন জায়গায়। বহু মানুষকে সাহিত্যের প্রকৃত আসনে আনতে হবে। আমাদের রাজ্যে প্রতি ব্লকে বইমেলা ও লিটল ম্যাগাজিন মেলা, প্রতি গ্রাম পঞ্চায়েতে রবীন্দ্র জয়ন্তী আয়োজন করতে হবে। প্রতি জেলার লেখকদের বইপত্র নিয়ে বছরে একবার তিনদিনের বই প্রদর্শনীর ব্যবস্থা করতে হবে।

এগুলি করতে পারলেই বিরাট সামাজিক পরিবর্তন হবে। আজকের যোধন সতত এসব কাজের নিবিড় আয়োজক এবং বিশ্বস্ত সঙ্গী।

—সম্পাদক, আজকের যোধন

Socio-Economic Condition of Kharia Tribes of South-West Bankura of West Bengal

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The Kharias are Dravidian cultivating tribe of ChotaNagpur classed on linguistic ground as Kolarian.[1] Racially the hill kharias belong to the Proto-Australoid group. They are called Pahari (Hill) Kharia because they lived in the midst of forest and dependent upon forest produces.[2] They are mostly found in West Bengal, Orissa, Bihar and Jharkhand. In West Bengal they are mostly found in the district of Purulia, Bankura and Midnapur (west) and Jhargram. In Bharatkoshkharias are described as they are the kindred's of the primitive Kol tribes. The Khariasare traditionally hunters. They depend fortheir livelihoodon hunting, agriculture and collecting fruits from forest and manual labour. They are very close to the nature and culture of the tribe is influenced by its ecological and cultural surroundings.[3] During Colonial period they were declared as criminal tribes under the Criminal Tribes Act 1911 by the administration of Manbhum district of Bihar. The life of kharia had become very difficult due to this stigma.

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A Geo-spatial study for analysing temporal responses of NDVI to rainfall

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Climate change has become a serious concern worldwide owing to its multifaceted impact upon the physical as well as socio-economic environment (IPCC, 2013). Vulnerability to climate change is much higher in the developing countries like India, where the economy is mainly agro-based and productivity from the agricultural sector is dependent upon summer monsoon rainfall. Hence, assessing the quantitative relationship between vegetation patterns and climatic influence has become an increasingly important study conducted on regional and global scales. As vegetation cover plays a key role in conserving the natural environment, studying the spatio-temporal trend of vegetation is crucial in identifying changes in the natural environment. We analysed the spatial responses of SPOT-VGT NDVI to TRMM based rainfall during a sixteen year period (1998–2013) in the Bundelkhand region of Central India. The Normalized Difference Vegetation Index (NDVI) has proven to be a strong indicator of global vegetation productivity. Among climatic factors, rainfall robustly influences both spatial and temporal outline of NDVI. In this study, we used linear regression for analysing the statistical relationship among NDVI and rainfall and their trends. The study reveals a varying pattern of vegetation dynamics in response to rainfall over the area.

Keywords: NDVI, TRMM, vegetation dynamics, linear regression, trend analysis, Bundelkhand (India)

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Introduction

According to the latest report of the IPCC, the global climate has been experiencing significant changes in the last couple of decades. As a consequence of such changes, natural hazards and extreme climatic events are expected to occur more frequently. Amongst the different natural hazards, although drought is considered as a slow hazard, its effects are far more devastating next to floods. Despite being blessed with monsoonal rainfall, India is not spared from the occurrences of prolonged dry spells and droughts. In fact, irregular monsoon plays a significant role in recurring drought and

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A geo-spatial inter-relationship with drainage morphometry, landscapes and NDVI in the context of climate change: a case study over the Varuna river basin (India)

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Abstract Watershed development and management is essential for the present as well as future constancy of water resources in a river basin. Watershed prioritization, planning and development are depending on the morphometric analysis of a basin. The drainages of a basin are mainly influenced on geomorphic appearances which show a dynamic role for monitoring the basin's hydrology as per topographical characteristics. In this paper, the morphometric study was characterized by set of parameters i.e. linear, aerial and relief aspects of Varuna river basin (India) with the integration of geo-spatial techniques. The mean annual rainfall, Normalized Difference Vegetation Index, Digital Elevation Model and Land Use/Land Cover (LULC) were taken into account for this study. The annual rainfall pattern and its percentage departure were shown by high frequencies of drought conditions while the seasonality index depicts that mostly rainfall occurred in less than 3 months. Moreover, indices such as Standardized Precipitation Index and Standardized Precipitation Evapotranspiration Index were used to conclude past extreme drought conditions (1996–2002, 2010–2017) over the basin. LULC changes were monitored over the south-east and north-west part of river basin during the period 1977 to 2013. The results revealed that an increasing trend of quantitative depiction of basin geometry as well as land use pattern for future development of agricultural growth.

Keywords SPI · Seasonality index · SPEI · Morphometric analysis · NDVI · Rainfall · LULC

1 Introduction

The Varuna river basin is surrounded by south to north as Vindhyan rocks and Gomati river basin forming the peripheral bulge in the central alluvial plain of the Indo-Gangetic Basin (IGB) [1, 2]. The fine particles like sand, silt and clay formed interfluves surface where river flow deeply incised along narrow valley [2, 3]. Varuna river and its sub-watersheds are one of the foremost controlling drainage systems of Varanasi city as well as controls groundwater flow over the adjoining area [4, 5]. Owing to fast urbanization and in-depth pumping, groundwater is depleting rapidly over parts of the basin [6]. Hence, Varuna river is deteriorating continuously forming as a drain with carrying domestic wastes and sewerage of dense urbanized Varanasi city that sound for instant attention of watershed management in the study area [2, 3]. Tectonic activity and

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Drought assessment for *kharif* rice using standardized precipitation index (SPI) and vegetation condition index (VCI)

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ABSTRACT

The monthly weather data for 31 years from 1985-2015 was used to analyze the extent of meteorological drought using standardized precipitation index (SPI) over Allahabad, Kanpur and Lucknow. MODIS NDVI data from 2000-2015 was used for monitoring of agricultural drought through NDVI based vegetation condition index (VCI) for all the three districts. The monthly SPI and VCI values from July to October were correlated with productivity index (PI) of *kharif* rice.Both the indices (SPI and VCI) were positively correlated with PI for all the districts. In Allahabad SPI and VCI during September month showed a significant correlation (0.70**& 0.61*) while in Kanpur VCI during October and SPI of July and August were significantly correlated with PI of *kharif* Rice. The multiple regression equation developed for predicting *kharif* rice PI in Allahabad, Kanpur and Lucknow districts explained 69 to 76 per cent variability in PI.

Keywords : Drought indices, standardized precipitation index (SPI), vegetation condition index (VCI), productivity index (PI).

Drought is a recurring major natural climatic hazard that occurs in almost every climatic zone around the world and causing socio–economic challenges. It leads to increase food prices, food insecurity, poverty and famine which make it the worst among all the natural hazards.

Drought monitoring is an essential component for contingency planning of crop suffered due to water stress (Sahu *et al.*, 2018) and usually carried out using drought indices/indicators. The standardized precipitation index (SPI) is a powerful and simple index as only rainfall is vegetation condition index (VCI) *etc* for identifying agricultural drought in different regions with varying ecological conditions (Amri *et al.*, 2010; Ghaleb *et al.*, 2015 and Dutta *et al.*, 2015). Therefore, the present study was conducted to assess the pattern and frequency of drought and its relationship with *kharif* rice productivity in Allahabad, Kanpur and Lucknow districts of Uttar Pradesh by using two widely used indices *viz.* SPI and VCI.

MATERIALS AND METHODS

Study area

ABNORMAL URBANISATION IN WEST BENGAL: A DISTRIC LEVEL STUDY

Jaidul Islam* and Chandradip Paul**

The rate of urbanisation has increased almost in every states and union territories of India. West Bengal holds leading position in eastern India in relation to urbanisation but urbanisation scenario of the state is quite different from other states over decades. West Bengal recorded the highest number of census towns (CTs in 2011) while the number of statutory towns (STs) remained same for long time. This study focuses the unusual characteristics of urbanisation in West Bengal and also shows the sluggish growth of statutory towns in comparison to the growth of Census Towns of the state. Location Quotient Technique and simple percentage technique have been deployed. For the lucid understanding and better representation of facts, GIS environment have been preferred for the study.

INTRODUCTION

Urban population of India increased over decades and shows remarkable growth. Population Ce 2011 shows 377.10 million urban people in India which is 31.16 per cent of total population (Ce of India, 2011). About 29 million people of West Bengal live in urban area which is 31.87 per ce its total population, little more than national average (31.16 per cent) and contributes 7.71 per urban population at country level (Census of India, 2011). As per census report, the past tr of level of urbanisation of West Bengal has declined and presently the gap between urbanisa West Bengal and national level is 0.71 percentage point which was 6.59 percentage point in 1 (Giri, 1998).

India's urbanisation constitute with three types of towns namely, Statutory Towns (S Census Towns (CTs) and Out Growths (OGs), otherwise it can be said that urbanisation addi three types of towns e.g., Statutory Towns (STs), Census Towns (CTs) and Out Growths (O respectively (Census of India 2011). Any settlement accounted as towns/cities only when such enacted by the law of concerned state or union territory government and have Urban Local Bo (ULBs) like Municipality, Municipal Council, Municipal Corporation, Nagar Panchayat, Noti Town Area Committee, Town Committee, Cantonment Board etc. and this type of town calle Statutory Towns (STs). Moreover, settlements with demographic criteria i.e., minimum popula 5000 persons, at least 75 per cent of male main workers engaged in non-agricultural activities population density at least 400 persons per sq. km are considered as Census Towns (CTs). out Growth is a part of village, situated outside of statutory towns' boundary but contiguous t core town; determining of Out Growths (OGs) as town depends on its urban features, such road condition, electricity, drainage facility, supply of safe drinking water etc. Some scholar sp that the identification and recognition of urban unit especially STs based on administrative cr while case of census town or non-municipal town depend on demographic criteria (Sivaramakris 2007); though few of them consider demographic and economic criteria to be census town (Bh & Mohanty, 2008; Bhagat, 2011).

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Comparative analysis of carbon dioxide emission in West Bengal and India

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Abstract: – During the last few years we, the human being is feeling the effects of extreme heat due to global warming caused mainly for the reckless carbon dioxide emission of various sector such as industry, agriculture etc. The average temperature of Earth is rising up in such a way that the friends to the environment are seriously worried about our existence. The situation has reached such a alarming stage that all the countries around the world find it difficult to retain the sustainability of natural resources for the next generation. In the Paris convention, the policy of "zero emission" is adopted specially for the developed and developing countries. In this paper we have tried to develop a mathematical model to find the tendency carbon dioxide emission in West Bengal and India. For this purpose, we have considered the data set about 21 years of the gas emission and tried to fit a third-degree algebraic polynomial curve by the non-linear regression method. From our proposed model one can predict the long term or short-term evolution trend of the said gas emission in India and the state of West Bengal.

Keywords —Global Warming; Green House Gas; Least square method; Residual analysis; R square.

I. INTRODUCTION

We are surrounded by air but unfortunately the airs from which we breathe become highly polluted. The average temperature of the Earth has been increased by 2°C during the last two decades. Scientists are very much anxious to overcome the problem. Several conferences from Rio-Je-Zane to Paris has been organised but there is no sign in mitigating the problem. Various environmental problems induced by global warming has become a global issue throughout the universe. According to the Intergovernmental Panel on Climate Change (IPCC), emission of carbon dioxide (CO_2) gases is mainly responsible for the extreme heat of the Earth [9]. It has serious evil effect on human health [2]. For example, the name of Erythromelalgia can be taken [1]. According to World Health Organization (WHO), the impact of extreme heat on human health causes various ailments such as cardiovascular disease, disease, asthma etc. Not only the physical health impacts of climate change are well known but the impact on mental health has been identified in the last decade [10].

The nature of global rainfall, stream flow, evaporation, snow etc. is changing as the weather and climate warms up. India is an agriculture-based country and a significant amount of greenhouse gases (GHG) emitted during agricultural food production system [4]. As the report of IPCC, the emission rises up 10-20% even it become 17% during the changes of land due to agriculture. Extreme heat is directly related to some water-based disaster like flood, tsunami etc that destroy homes and habitats and peoples are bound to take shelter elsewhere [3].

The motivation of the paper is understanding the CO_2 in India as a whole and one of the agricultural states as a contributory part. The work of Basak and Nandi, 2014[6] and Tokos and Xu, 2009 [5] is followed where authors suggested a third-degree polynomial model to explain the emission pattern of the gas. Third degree polynomial is taken using the data set of about 21 years (1980-2000) following the non-linear least square method. Instantaneous rate of change (IROC) is calculated for future prediction of the emission of CO_2.

II. MODEL AND DATA

A] Data source

Carbon dioxide emission data is exported from the paper of Ghoshal and Bhattacharyya, 2008[8].

B] Model formulation

The data of CO_2 emission for the 21 years (1980-2000) is utilized for the purpose of modelling. We formulated a third-degree polynomial model for the analysis of CO_2 emission of the state of West Bengal and India. For generating the model of CO_2 emission, we followed the work of Jin *et al.*, 2010 [7], Tokos and Xu (2009) [5] and Basak and Nandi (2014) [6]. Authors suggested a third-degree polynomial model for emission of CO_2 such as

$$Y = a + bx + cx^2 + dx^3 \quad \ldots\ldots(1)$$

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RESEARCH ARTICLE

SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL ACTIVITY OF COPPER (II) COMPLEX WITH NSO-DONOR LIGAND

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ABSTRACT

A five coordinated Trigonal bipyramidal copper (II) complex formulated as [Cu(L) NClBrS(H_2O)] (1) (HL= 4-Bromo-2-[(2-thiophen-2-yl-ethylimino)-methyl]-phenol (BEP)) was synthesized and characterized by elemental, physico-chemical and spectroscopic methods. The interactions of copper (II) complex towards bovine serum albumin (BSA) were examined with the help of absorption and fluorescence spectroscopic tools. The ligand and copper complex-1 has been screened for antimicrobial activity by agar disk diffusion against two Gram-positive bacteria and one Gram-negative bacterium. The compound showed good antibacterial activity when compared with known antibiotic chloramphenicol.

Key words: Copper complex; NSO-donor ligand; BSA binding; antibacterial activity.

Citation: Madhumita Hazra, Subrata Kumar Dey and Animesh Patra, 2018. "Synthesis, Characterization and biological activity of copper (II) complex with NSO-donor ligand" *International Journal of Current Research in Life Sciences*, 7, (02), 911-914.

INTRODUCTION

Investigations concerning the structural configuration and chemical properties of polynuclear transition metal compounds have aroused considerable interest mainly because of their implications for topics such as the nature of orbital interactions, electron transfer in redox processes, and biological electron transport chains (Saadeh, 2013). Transition metal complexes coordinated to tetradentate Schiff base ligands have been studied extensively(Solomon *et al.*, 2001). Redox nature of the complexes is important to control nuclease activity (Reichman *et al.*, 1954). In the present work, we simulated the interaction between copper complexes with BSA under physiological conditions by spectroscopic methods. The compound is strongly bound with protein, and then we investigate the antibacterial activity by agar disk diffusion method against two Gram-positive bacteria *(Bacillus cereus and Bacillus subtilis)* and one Gram-negative bacterium (*Vibrio parahaemolyticus)*.

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International Globalization of Santali Literature

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Abstract: The Santhal society is one of the oldest castes in India and the most prominent tribe in India. The Santhals, who have more than 5 million people, consider themselves to be tribal people who speak an Austro-Asian language and have a different way of life and value than the Hindus. For society's framework. The population of Santhal is dependent on subsistence farming. It leads a very distinct and modest life. And this is their principal cause of backwardness. They believe in superstition. The research discusses how the social and cultural dimension of Santhal migrants is affected by globalisation and how various modern values in their tribal civilisation have been pushed. It has also developed how, after its return to origins, new agricultural technology has been applied and how modern values are promoted every day. It helps to overcome the Conservatives and society has transformed and improved its way of life. They have altered a great deal in their social, economic and political outlook. Therefore, the Santhal has overcome its lethargy and claims to be a major part of this magnificent universe.

Keywords: Globalisation, Education, Modernity, Modern Technology, Govt. Policy& Santhal

Introduction:

More than five million Santals think of themselves as a "tribal person" who speaks a certain (Austrian-Asian) language and shares a lifestyle that has different values than the Hindus. While tribal children form their own society of children, they continue their own norms and objectives in a certain way in the adult world. Nowadays, adults in Santal deplore the failure of predecessors to transmit their expertise as previously. In a shifting knowledge group, the distribution of knowledge such as the network of trust and identity is changing, with the location of power and power free changing. In order to comprehend Santal childhood as a social and collective process, the traditional culture in most rural areas must be considered first. Then inquire how knowledge in Santal society is presently transferred, taking into account that Santals commonly live and migrate to cities such as Kolkata or Rourkela, the steel town. In multiethnic cities, Santal's children reside. Since India became independent, tribal culture has altered, developed and propagated in public negotiations. In short, the model for cultural transmission and events influences the exogenous variables like unemployment, deprivation and the marginalisation of the 'tripes' such that children are new agents and develop peer cultures. I will investigate how much education has been helping the youngsters of Santali create new cultural patterns in Santali and how much education has been helpfully analysed [9]. These cultural behaviours are part of child socialisation and must be seen as a collective activity. In this way, the child has his own knowledge in a society which shares his social sense of membership, a peer group.

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Status of large mammalian species in Urgam beat of Nanda Devi Biosphere Reserve (NDBR), Uttarakhand, India

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Abstract
The current study was conducted in Urgam beat of the Nanda Devi Biosphere Reserve, in the month of April 2017. The study area is covered by 2350 ha and located in Urgam forest beat in NDBR, Chamoli district Garhwal Himalaya in Uttarakhand state. A total of 8 large mammals species were recorded during the study period. Direct and indirect methods were used to assess the diversity of large mammals found in the study area. Six trail-transects of different lengths were laid and total distance 16 km were covered within 45 hours effort. Density of large mammals was recorded based on the presence and absence in the study area. The result shows that maximum encounter rate (5.44 group/km) was estimated for *Hemitragus jemlahicus*. The maximum density was observed for *Hemitragus jemlahicus* (14.50±2.89) followed by *Semnopithecus schistaceus* (5.06±0.52). This is a short term study in this area but further detailed study will be needed for the conservation and management aspect.

Keywords: Density, diversity, Garhwal, mammals, NDBR, Urgam

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A study on Solid Mechanics and Wave Propagation

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Abstract: In our paper, we present a quick and reliable technique to simulate wave propagation in complex structures composed of heterogeneous substances. Wave propagation is studied based on the proposed nonlocal elastic shell principle in carbon nanotubes (CNTs). The small-scale effect on wave dispersion relationships for various CNT wavenumbers have been specifically shown in the longitudinal and circumferential direction and at wavelengths in the circumferential sense for both theoretical analysis and numerical simulations. The proposed solution, the spectral cell method, combines the finite cell method with the spectral element method, which reduces pre-processing and computing expense substantially. The spectral cell approach uses explicit time integration schemes and a diagonal mass matrix to minimise the time needed to resolve the equation system. This method can also help eradicate some problems associated with mesh production by using a fictitious domain approach. We also research the efficiency of the low-order and high-order variants of this method, based on several numerical examples, in addition to implementing a correct, precise mass lumping technique. The results show that, in conjunction with explicit time integration algorithms, a high-order variant of the spectral cell system needs less storage and CPU time than other alternative variants. Furthermore, since implementing the proposed method efficiently in available programming of finite elements such as structural sanitation, quantitative ultrasound or active vibration or noise control, these features transform the technique into an efficient tool for practical applications.
Keywords: Cell method, Wave Propagation, Mass lumping, Fictitious domain approach

Introduction:

It is a difficult job to simulate structures and complex geometries. When the structure concerned consists of heterogeneous materials, this is much more demanding. Those situations are found in many engineering disciplines, such as civil, mechanical, naval and materials sciences [2]. The curse in which a body-fitted mesh is generated when standard technics like FIM are used is a major challenge in simulating such structures. The mesh generation typically needs an experienced user and takes nearly 80% of the modelling time. A fruitful approach to the management of difficult geometry involves the Finite Cell Method (FCM), which incorporates a fictitious domain approach with FEM [1]. This method greatly simplifies the mesh generation procedure using an imaginative domain approach that integrates the complicated physical domain in an extensive domain. The vast territory is thus used to estimate the field of interest by a finite element method. The FCM typically uses a cartesian grid. CT images directly obtain complex microstructure issues like foam-like structures, composites, or geometries, i.e. voxel-based geometries, are easily addressed. The FCM was tested and applied successfully to a range of problems such as cell and foam homogenization, non-linear geometry, Elastoplast city issues, city optimisation problems, and multi-materials etc multi-physics.

Their new electronic and mechanical properties and carbon nanotubes (CNTs) are one of the most promising new material for nanotechnology [3][5]. CNT microscopes, field emitters and nanophillers of compounds and nanoscale electronic equipment and even rubber less nanoactuators, nano-engines, nano-rotationary coils, and nano-springs are examples of CNT applications [6]. Huge possible applications for CNT rely on a detailed understanding of their mechanical characteristics and behaviours. The CNT modelling is divided into two principal groups. The first concerns atomic models like methods, such as classical molecular dynamics, tight molecular dynamics and functional density models which are restricted to small-scale modelling systems with

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A Mathematical Modeling on Prey-predator System

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Abstract - **We Seek to propose and analyze a mathematical model in respect with two species Prey-predator system. The existence, uniqueness and boundedness of the solution of the proposed model are discussed. All the equilibrium points are determined. The local stability analysis of them are examined. In this paper are investigated the role of reserved zone on the dynamical behaviour of Prey - predator in the case of when predator species are totally depends on Prey species. The condition for the system to be uniformly persistent have been derived. We shown that the reserve zone has a stabilizing effect on Prey- Predator interactions.**

Key words- **Prey predator, reserved zone, Stability, persistence.**

I. INTRODUCTION

The development of qualitative analysis of ordinary Differential equations is derived to study many problems in mathematical biology. The biosphere is an important zone for biological activities that are mainly responsible for the changes in ecology and environment [1]. The co- existences of interacting biological species has been of great interest in the past few decades and has been studied extensively using mathematical models by several researcher [2 – 5]. Here we assume a habitat where prey and predator species are living together. We divided habitat consisting of two zones : an unreserved zone where prey and predator can move freely and reserved zone where prey can live but predators are not allowed to enter there. We examined of the case when the predator species wholly dependent on the prey in the unreserved zone. We consider the model developed by incorporating and additional equation for predator in the unreserved zone [1].Then we study the co-existence and stability behaviour of predator- prey system in the habitat. Instead of developing explicit formulas for these differential equations, we instead make only qualitative assumption about the form of the equations. We then derive geometric information about the behaviour of solutions of such systems based on these assumption [3].

II. MATHEMATICAL MODEL

At first we consider that the prey species are growing reserved zone as well as in unreserved zone logistically. Let us consider the density of prey species in unreserved zone be $x(t)$ and the density of prey species in reserved zone be $y(t)$. Beside these we consider the density of predator species at any time $t \geq 0$.

Now let ∂_1 be the migration rate coefficient of the prey species from unreserved zone to reserved zone and ∂_2 be the migration rate coefficient of prey species from reserved zone to unreserved zone [3].

Then the dynamical system may be generated by the of ordinary Differential Equations [4], given below

$$\left.\begin{aligned} \frac{dx}{dt} &= w_1 x - K_1 x^2 - \partial_1 x + \partial_2 y - b_1 xz \\ \frac{dy}{dt} &= w_2 y - K_2 y^2 + \partial_1 x - \partial_2 y \\ \frac{dz}{dt} &= \psi(z) - C_0 z \end{aligned}\right\} \text{---------(A)}$$

Where, $x_0 = x(0) \geq 0$

$y_0 = y(0) \geq 0$

$z_0 = z(0) \geq 0$

Dielectric investigation on some binary mixtures of hockey-stick-shaped liquid crystal and octyloxy-cyanobiphenyl

Susanta Chakraborty, Anish Chakraborty, **Malay Kumar Das** & Wolfgang Weissflog

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ABSTRACT

We report the measurement of temperature-dependent dielectric parameters in some binary liquid crystal mixtures comprising of a hockey-stick-shaped mesogen 4-(3-decyloxyphenyliminomethyl) phenyl-4-decyloxycinnamate (SF7) and calamitic compound 4'-octyloxy-4-cyanobiphenyl (8OCB). All the investigated mixtures possess a large positive dielectric anisotropy ($\Delta\varepsilon$), although a noticeable reduction has been found by increasing the diverse-shaped dopant concentration. Investigation on the pretransitional behavior in the vicinity of isotropic to nematic (*I*–*N*) phase transition suggesting a tricritical character for all the studied mixtures. Parameterization of dielectric permittivity close to the nematic to smectic-*A* (*N*–Sm-*A*) phase transition exhibits non-universal values of the critical

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Changing pattern of urban landscape and its effect on land surface temperature in and around Delhi

Dipanwita Dutta · Atiqur Rahman · S. K. Paul · Arnab Kundu

Received: 10 April 2019 / Accepted: 10 July 2019

Abstract The last couple of decades have seen remarkable spatial growth in the urban areas of developing countries. The process of urbanization is directly linked with land transformation which can be an effective way to monitor the spatio-temporal pattern of urban growth. New Delhi, the capital city of India has experienced a large-scale urban growth during the last decade. In order to identify the pattern of urban expansion in and around Delhi, the present study aims to assess the process of land transformation using multi-temporal Landsat datasets (1977–2014). The areas under various land use and land cover (LULC) extracted by support vector machine (SVM) hybrid classifier reveal asignificant Land transformation maps indicate rapid growth of few urban centres located outside Delhi National Capital Territory (NCT), like Gurgaon, Gautam Buddha Nagar, Faridabad and Ghaziabad. These centres have been remarkably expanded because of transformation of agricultural and vegetated lands. However, green patches within the city have not been affected by the consequences of urbanization. In tune with the rapid urbanization in the periurban centres of Delhi, the Moderate Resolution Imaging Spectro-radiometer (MODIS)-derived land surface temperature (LST) images revealed significant change in the level of LST. The interrelationship of impervious surface fraction (ISF) and

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ORIGINAL ARTICLE

An appraisal of flood events using IMD, CRU, and CCSM4-derived meteorological data sets over the Vaigai river basin, Tamil Nadu (India)

Satish Nagalapalli[1] · Arnab Kundu[2] · R. K. Mall[2] · D. Thattai[1] · S. Rangarajan[1]

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Abstract

The study of the impact on climate change on water resources provides useful information for long-term trend analyses of important issues such as control of floods, management of drought, agricultural production, etc. This work is an attempt to assess the flood events in Vaigai watershed, Tamil Nadu (India). The Mann–Kendall test was performed to assess the rainfall and temperature trends on data extracted from Climatic Research Unit (CRU) and Community Climate System Model 4 (CCSM4) model for historical and future scenarios. The CCSM4 model was compared with India Meteorological Department and CRU data sets to analyze the performance and consistency of model data among the years of flood, viz., 1993, 2010, and 2015. The CCSM4 model was able to capture, in a few instances, the historical as well as future flood events over the region. The maximum rainfall (738.11 mm) was predicted for 2021 followed by 2038 and 2040, and the lowest rainfall (43.40 mm) was predicted for 2036. Besides, the temperature increased by 1 °C and rainfall was mostly maximum in September corresponding to the south-west monsoon (SWM) season. The predicted increases in rainfall can result in flash floods, which have serious implications on the agricultural sector and water resources of the basin, while the decreasing rainfall during the other seasons helps to reduce the flood severity.

Keywords Extreme events (floods) · IMD · CRU · CCSM4 · MK test · Vaigai river basin (Tamil Nadu)

Journal of Scientific Research

Institute of Science,

Banaras Hindu University, Varanasi, India.

Dynamics of Vegetation Response to Seasonal Rainfall in the Gomati River Basin (India) using Earth Observation Data Sets

Diva Bhatt[1,2], Arnab Kundu[2], RK Mall[1,2] and KN Prudhvi Raju[3]

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[2] DST-Mahamana Centre of Excellence in Climate Change Research, Banaras Hindu University, Uttar Pradesh, India
[3] Department of Geography, Institute of Science, Banaras Hindu University, Uttar Pradesh, India

Abstract: **Present study evaluates the vegetation responses towards the rainfall variability in the Gomati basin during 1901-2015. To accomplish the same, high resolution observed daily gridded rainfall data from India Meteorological Department (IMD) was analysed using non-parametric trend test. The long-term rainfall showed significant decreasing trend (α=0.05) which varied from -0.96 to -4.89 per year. Identified trends in rainfall were then evaluated in tandem with the basin-wide changes in the vegetation signatures during the recent extreme years (two pairs of dry and wet years). Each pair of extreme years was assessed for its seasonal Normalised Difference Vegetation Index (NDVI) related to the seasonal rainfall variations with special emphasis to rice and wheat yields (major crops). Contribution of spatio-temporal occurrences of rainy days with that of the heavy rainfall events was also analysed. The findings suggest that the prevalent basin-wide long-term rainfall deficiency intensified during the extreme dry years e.g. 2002 and 2009 and impacted the health of vegetation in the basin. Vegetation of the basin was found closely related with rainfall variability; regular and well distributed occurrences of rainy days benefited the basin's vegetation as well as the yields of rice and wheat crops.**

Index Terms: **Crop yield, Extreme weather events, NDVI, Rainfall variability, Gomati River Basin**

I. Introduction

River basins are the most commonly used spatial units taken Harding et al. 2013). This disturbance has negotiated itself in the form of alterations in various water balance parameters, be it altered runoff or be it altered potential evapotranspiration. Thus, the occurrences of basin wide hydro-meteorological events like extreme wetness (rainfall), extreme dryness (drought) or decrease in the revisit periods of frequent dry years intermittent with wet years have disrupted the basin hydrology worldwide (Awange et al. 2014; Gebre and Getahun 2016; Oguntunde et al. 2017; Pandey and Khare 2018). The association between the rain fed crop yield e.g. rice and the climate variability especially, the rainfall variability on a basin scale have not been explored much. However, many studies were focussed at the level of country and state (Kang et al. 2009; Mishra et al. 2013; Guan et al. 2015; Reda et al. 2015; Dhekale et al. 2017; Dubey and Sharma 2018; Prabnakorn et al. 2018; Bhatt et al. 2019). So, with the rising uncertainty in the rainfall variability across the Gangetic basin, it becomes important to take up the impact studies on crop yield at sub-basin scale to comprehend the regional influence of climate on agriculture. Rainfall and yields have been found to correlate with to each other; variability in rainfall resulted in yield variability (Kumar et al. 2004; Mall et al. 2006; Rowhani et al. 2011; Prasanna 2014). Therefore, an assessment of crop yield is determined by seasonal rainfall (dryness and wetness) over a site or in a region. Satellite derived Normalized Difference Vegetation Index (NDVI) is a very popular and efficient tool to validate such rainfall influenced crop yield studies (Quarmby et

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RESEARCH ARTICLE

An Estimation of Hydrometeorological Drought Stress over the Central Part of India using Geo-information Technology

Arnab Kundu[1] · N. R. Patel[2] · D. M. Denis[3] · Dipanwita Dutta[4]

Received: 7 February 2019 / Accepted: 20 September 2019 / Published online: 10 October 2019

Abstract
Drought is a creeping natural hazard commencing from lack of rainfall and generally associated with various climatic aspects. Drought-related water deficiency has severe consequences upon environmental processes and socioeconomic activities. In the past few decades, a number of drought indices have been developed for assessing the extent, onset, duration and intensity of drought. The Bundelkhand region located in the central part of India has been affected by recurrent drought events during the past few decades. This study seeks to examine hydrometeorological drought stress of that area using remote sensing and meteorological indicators, i.e., standardized precipitation index (SPI), hydrology-based rainfall anomaly index (RAI) and standardized water-level index (SWI). Daily rainfall data from Climate Hazards Group InfraRed Precipitation with Stations (CHIRPS) and Tropical Rainfall Measuring Mission (TRMM) were integrated with station-based groundwater datasets (1998–2015) to analyze the hydrometeorological drought condition of the area. In addition, groundwater datasets were used to evaluate the long-term hydrological drought situation and compared with meteorological drought indices. The study reveals a good agreement among all hydrometeorological drought indices distinctly in few years (2002 and 2013). However, the findings were not coherent in all years due to high rate of runoff and poor groundwater recharge. In spite of having normal rainfall, the undulating terrains of this rugged land confine the infiltration process and cause hydrological drought stress in several parts of the area.

Keywords Drought assessment · SPI · RAI · CHIRPS · TRMM · SWI · Bundelkhand

Introduction

Drought is considered as an extreme climatic phenomenon, having widespread impacts with large spatial and temporal scales and causes severe damage to crops, livestock and human society (Lin et al. 2013; Gupta et al. 2014). It is a creeping hazard with slow onset, indefinite commencement and termination. Unlike other natural hazards, drought has been considered as a most costly natural disaster (Hao et al. 2014) which affects large number of people comparing to other natural hazards across the world (Wilhite 2000). It has been categorized into three major groups: meteorological, agricultural and hydrological according to its concept of utilization.

Among various established indices of meteorological drought, the SPI is a popular and robust method for mon-

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TO WHOM IT MAY CONCERN

CERTIFICATE OF ACCEPTANCE, PAPER PUBLICATION

This is certify that Bidyut Kumar Mishra, Research Scholar, Department of History, Seacom Skills University, We are happy to inform you that your paper has been selected for our International Refereed Multi-Disciplinary Journal 'Ebong Prantik' (Vol.8th Issue 16th), January 2021. Paper entitled 'Dakshin Paschim Banger Jelagulite Britis Birodhi Janomater Utthane Samajik o Dharmanoitik Pratisthaner Bhumika : Ekti Oitihasik Bisleson' (দক্ষিণ পশ্চিম বঙ্গের জেলাগুলিতে বৃটিশ বিরোধী জনমতের উত্থানে সামাজিক ও ধর্মনৈতিক প্রতিষ্ঠানের ভূমিকা : একটি ঐতিহাসিক বিশ্লেষণ) in Bengali.

It is to be noted that your paper will be published in the International Refereed Multi-Disciplinary Journal 'Ebong Prantik' (Vol.8th Issue 16th), January 2021.

Yours sincerely

Ashis Roy

(Dr. Ashis Roy)
Editor-in-Chief

Date: 18.01.2021

এবং মহুয়া' -বিশ্ববিদ্যালয় মঞ্জুরী আয়োগ (UGC-CARE)
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বাংলা, কলা বিভাগের পত্রিকা ক্রমিক নং-৩২।

এবং মহুয়া

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)
২২ তম বর্ষ, ১১৯ সংখ্যা
মার্চ,২০২০

সম্পাদক
ড. মদনমোহন বেরা

যোগাযোগ :
ড. মদনমোহন বেরা, সম্পাদক।
গোলকুঁয়াচক, পোষ্ট-মেদিনীপুর,৭২১১০১,জেলা-প.মেদিনীপুর, প.বঙ্গ।
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কে.কে. প্রকাশন
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লেখক পরিচিতি

...মূল হক : সহকারী অধ্যাপক,সংগীত বিভাগ,ঢাকা বিশ্ব বিদ্যালয়,ঢাকা,বাংলা দেশ।
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শুভজিৎ সিংহ :সহকারী অধ্যাপক, ইংরাজী বিভাগ, দেশপ্রাণ মহাবিদ্যালয়, মারিশদা,

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ECONOMY POLITY ENVIRONMENT

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Changing Urbanisation Scenario & It's Effect on Urban Environment: A Study of Kolkata (KMC), Salt Lake and New Town

Jaidul Islam[1] [and] Chandradip Paul[2]

Abstract

The literature of urban history evidenced that, urbanization throughout the world occurred either planned way or unplanned way. Planned urbanization is a consequence of unplanned urbanization of old cities dramatically practiced after the Second World War. This study seeks to investigate the effect of types of urbanization (either planned or unplanned) on the urban environment. Kolkata Municipal Corporation (KMC) is one of the largest and oldest municipal corporation in India and Kolkata is the capital city of West Bengal which emerged not in a planned way whereas Salt Lake and New Town emerged as planned urban segments in the recent past. Several environmental problems i.e., air pollution, rising temperature, shrinking of green space and open space etc. increasing day by day in both the unplanned and planned urban places. This work has been made a comparative study of the urban environment of KMC, Salt Lake and New Town Rajarhat using air quality data of West Bengal Pollution Control Board (WBPCB), percentage of open space and Land Surface Temperature acquired from satellite imageries especially in OLI band. Different statistical techniques, as well as GIS software have been deployed to fulfil the objectives of the work. The outcomes of the present work conclude that the planned city offers a better urban environment to the dwellers than an unplanned city.

Keywords: *Urbanization, Urban Environment, Air Quality, Urban Open Space, Land Surface Temperature*

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A Geographical Analysis of Slums in the Kolkata Municipal Corporation Area, West Bengal

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Keywords

Urban Agglomeration
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Thikedar
Colony
Locational Shift

Abstract

Kolkata is the largest urban agglomeration of eastern India and Kolkata Municipal Corporation (KMC) is one of the oldest Municipal Corporations of India. About a-third of the total population of KMC live in slums that dates back to pre-independence period. The present article is an attempt to assess the origin, growth and spatial pattern of slums in Kolkata. Slum population along with density and frequency varies from one ward to another. During the period 2001 2011, the mean centre of slum population shifted significantly in SW direction while that of the urban population shifted in SSE direction.

Introduction

Kolkata is the largest urban agglomeration of eastern India and Kolkata Municipal Corporation (KMC) is one of the oldest Municipal Corporations of India. It has a long history of industrialization and urbanization. It acted as the growth pole in the whole of eastern and northeastern India. The population of Kolkata was about 4,580,544 in 2001. Its area is 185 km^2 with a crude density of about 24,759 persons/km^2. The total population living in the slums of the KMC was 1,490,811, i.e. about 30.72% of the total. In 2011, the total population was 4,496,694 of which about 32.11% lived in slums. 'There are 141 Wards of which Ward No. 66 is the most populous and Ward No. 45 is the least populous one.

The Calcutta Municipal Act, 1899 defined a *"bustee"* as "the area containing land not less than '10 *cottahs*' or 700m^2 in area occupied by a collection of hutments or other structures intended to be used for human habitation. The entire slum population live in about 2011 registered and 3500 unregistered slums in the KMC, containing about 13 million hutments or 338,000 rooms (Kundu, 2003). Thus a huge population live below poverty line as the 'urban poor' are concentrated in the slums (Bose and Ghosh, 2015).

Objectives

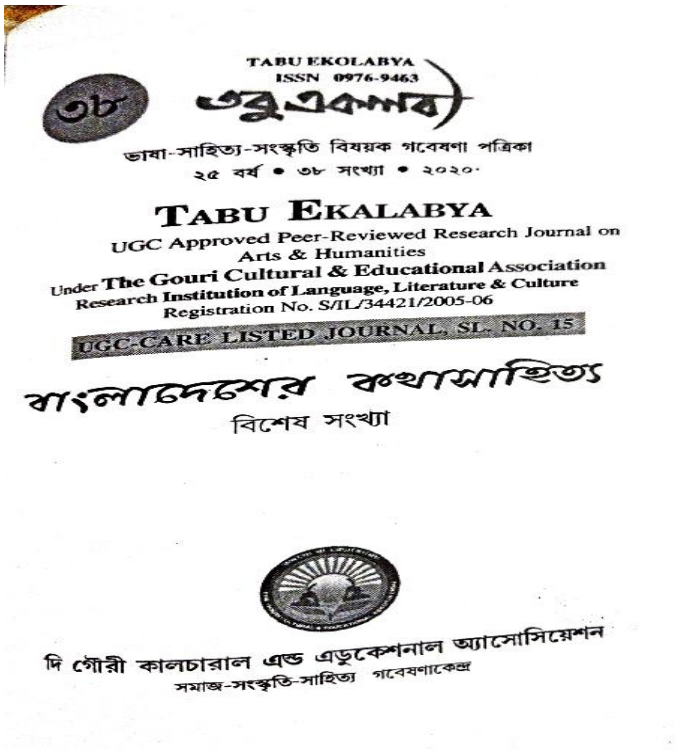
The major objective is to assess the origin, growth and pattern of slums in the city of Kolkata.

Methodology

A variety of literatures related to the origin of slums in Kolkata has been consulted and at the same time, a number of Govt. and Non-Govt reports have been considered. Slum related data of Kolkata have been acquired from Census of India report of Government of India. Besides, to recognize the pattern of slum concentration over different Wards of Kolkata Municipal Corporation (KMC), simple percentage technique has been adopted. The shifting of urban and slum population over time has been shown applying 'locational shift of mean center' method. Finally, information has been presented using Arc GIS software.

Origin of Slums in Kolkata

Slum is the product of the snowballing effect of a set of selected functions like failed policies, lack of proper regulation, corruption, lack of optimum landuse policy, mismanagement of financial asset, low people participation rate and bad



TABU EKOLABYA
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৩৮ তবু একলব্য
ভাষা-সাহিত্য-সংস্কৃতি বিষয়ক গবেষণা পত্রিকা
২৫ বর্ষ • ৩৮ সংখ্যা • ২০২০
TABU EKALABYA
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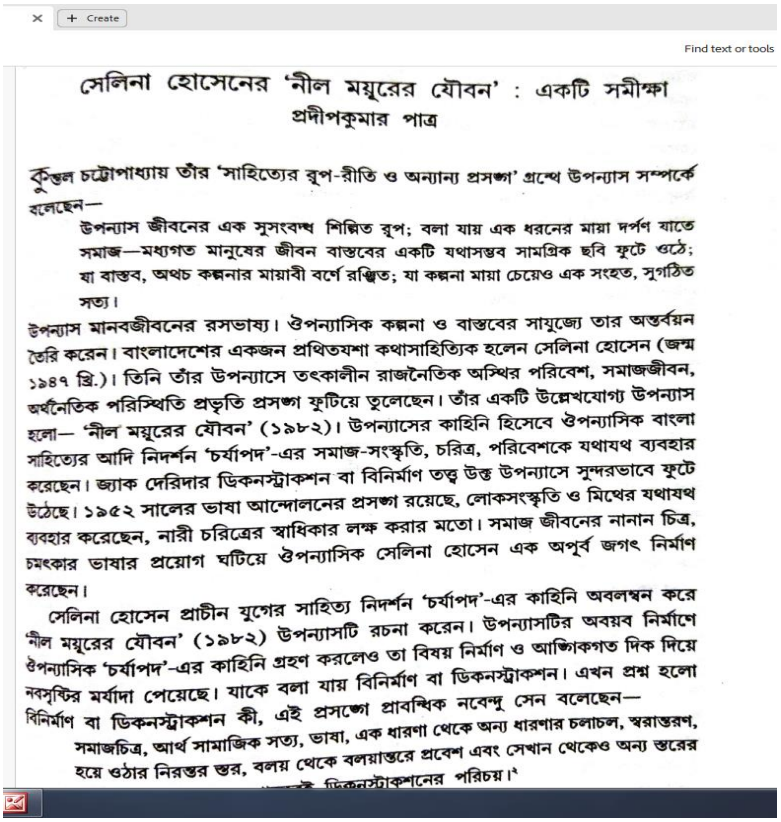
বাংলাদেশের কথাসাহিত্য

বিশেষ সংখ্যা

দি গৌরী কালচারাল এন্ড এডুকেশনাল অ্যাসোসিয়েশন
সমাজ-সংস্কৃতি-সাহিত্য গবেষণাকেন্দ্র



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সেলিনা হোসেনের 'নীল ময়ূরের যৌবন' : একটি সমীক্ষা

প্রদীপকুমার পাত্র

কুন্তল চট্টোপাধ্যায় তাঁর 'সাহিত্যের রূপ-রীতি ও অন্যান্য প্রসঙ্গ' গ্রন্থে উপন্যাস সম্পর্কে বলেছেন—

> উপন্যাস জীবনের এক সুসংবদ্ধ শিল্পিত রূপ; বলা যায় এক ধরনের মায়া দর্পণ যাতে সমাজ—মধ্যগত মানুষের জীবন বাস্তবের একটি যথাসম্ভব সামগ্রিক ছবি ফুটে ওঠে; যা বাস্তব, অথচ কল্পনার মায়াবী বর্ণে রঞ্জিত; যা কল্পনা মায়া চেয়েও এক সংহত, সুগঠিত সত্য।

উপন্যাস মানবজীবনের রসভাষ্য। ঔপন্যাসিক কল্পনা ও বাস্তবের সাযুজ্যে তার অন্তর্বয়ন তৈরি করেন। বাংলাদেশের একজন প্রথিতযশা কথাসাহিত্যিক হলেন সেলিনা হোসেন (জন্ম ১৯৪৭ খ্রি.)। তিনি তাঁর উপন্যাসে তৎকালীন রাজনৈতিক অস্থির পরিবেশ, সমাজজীবন, অর্থনৈতিক পরিস্থিতি প্রভৃতি প্রসঙ্গ ফুটিয়ে তুলেছেন। তাঁর একটি উল্লেখযোগ্য উপন্যাস হলো— 'নীল ময়ূরের যৌবন' (১৯৮২)। উপন্যাসের কাহিনি হিসেবে ঔপন্যাসিক বাংলা সাহিত্যের আদি নিদর্শন 'চর্যাপদ'-এর সমাজ-সংস্কৃতি, চরিত্র, পরিবেশকে যথাযথ ব্যবহার করেছেন। জ্যাক দেরিদার ডিকনস্ট্রাকশন বা বিনির্মাণ তত্ত্ব উক্ত উপন্যাসে সুন্দরভাবে ফুটে উঠেছে। ১৯৫২ সালের ভাষা আন্দোলনের প্রসঙ্গ রয়েছে, লোকসংস্কৃতি ও মিথের যথাযথ ব্যবহার করেছেন, নারী চরিত্রের স্বাধিকার লক্ষ করার মতো। সমাজ জীবনের নানান চিত্র, চমৎকার ভাষার প্রয়োগ ঘটিয়ে ঔপন্যাসিক সেলিনা হোসেন এক অপূর্ব জগৎ নির্মাণ করেছেন।

সেলিনা হোসেন প্রাচীন যুগের সাহিত্য নিদর্শন 'চর্যাপদ'-এর কাহিনি অবলম্বন করে 'নীল ময়ূরের যৌবন' (১৯৮২) উপন্যাসটি রচনা করেন। উপন্যাসটির অবয়ব নির্মাণে ঔপন্যাসিক 'চর্যাপদ'-এর কাহিনি গ্রহণ করলেও তা বিষয় নির্মাণ ও আঙ্গিকগত দিক দিয়ে নবসৃষ্টির মর্যাদা পেয়েছে। যাকে বলা যায় বিনির্মাণ বা ডিকনস্ট্রাকশন। এখন প্রশ্ন হলো বিনির্মাণ বা ডিকনস্ট্রাকশন কী, এই প্রসঙ্গে প্রাবন্ধিক নবেন্দু সেন বলেছেন—

> সমাজচিত্র, আর্থ সামাজিক সত্য, ভাষা, এক ধারণা থেকে অন্য ধারণার চলাচল, স্বরান্তরণ, হয়ে ওঠার নিরন্তর স্তর, বলয় থেকে বলয়ান্তরে প্রবেশ এবং সেখান থেকেও অন্য স্তরের

ডিকনস্ট্রাকশনের পরিচয়।[২]

'এবং মহুয়া' –বিশ্ববিদ্যালয় মঞ্জুরী আয়োগ (UGC-CARE)
অনুমোদিত তালিকার অন্তর্ভুক্ত।
পত্রিকা ক্রমিক নং-৯৬ (ভারতীয় ভাষার ১১৪টির মধ্যে),
বাংলা, কলা বিভাগের পত্রিকা ক্রমিক নং-৩২।

এবং মহুয়া

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)
২২তম বর্ষ, ১১৮ সংখ্যা
মার্চ,২০২০
(বিদ্যাসাগর স্মরণে শ্রদ্ধাঞ্জলি)

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(বিশেষ সহযোগী সম্পাদক)
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মো.-৯১৫৩১৭৭৬৫৩

কে.কে. প্রকাশন
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বিদ্যাসাগরের 'কথামালা' : বর্তমান প্রাসঙ্গিকতা

প্রদীপকুমার পাত্র

'চর্যাপদ'-এর হাত ধরে সৃষ্টি হয়ে বাংলাসাহিত্য আজ হাজার বছর অতিক্রম করেছে। সৃষ্টি করেছে এক এক অমূল্য সম্পদ। সৃষ্টির ফল্গুধারা আজ অব্যাহত। তবে বাংলা কাব্য সাহিত্য হাজার বছর অতিক্রম করলেও গদ্যসাহিত্যের বয়স অনেক কম। কেননা বাংলা সাহিত্যের আদি নিদর্শন 'চর্যাপদ' থেকে ভারতচন্দ্র রায়গুণাকরের 'অন্নদামঙ্গল' (১৭৫২) পর্যন্ত কাব্যের জয়জয়কার। কোনো গদ্য সাহিত্য রচিত হয়নি। গদ্য সাহিত্যের সূত্রপাত ঘটে ফোর্ট উইলিয়াম কলেজের অধ্যাপকদের হাত ধরে। রামমোহন রায় উপনিষদের অনুবাদ করে বেশকিছু গদ্য সাহিত্য রচনা করেন। তবে তাঁর ভাষা ছিল অনেকখানি দুর্বোধ্য। সংস্কৃত শব্দের আধিক্য ভাষাকে সাধারণ পাঠকের নিকট পৌঁছাতে বাধার সৃষ্টি করেছে। রামমোহন রায়ের ভাষার দুর্বোধ্যতা অনেকখানি বোধোগম্যের রূপ দিয়েছেন অক্ষয়কুমার দত্ত। তবে এই কথা ঠিক যে, তাঁর ভাষা ছিল নীরস প্রকৃতির। সাহিত্য রসনির্ভর রচনা। সাহিত্যের সেই প্রধান আধার হল অক্ষয়কুমার দত্তের সাহিত্যে পাওয়া ভারস্বরূপ। সাহিত্যকে রসসমৃদ্ধ, শক্তিশালী যথার্থ ব্যবহার, সাহিত্যের মধ্যে বনিঝঙ্কার আনয়ন এককথায় গদ্য সাহিত্যের প্রকৃত পথ চলা শিখিয়েছেন ঈশ্বরচন্দ্র বিদ্যাসাগর (১৮২০ – ১৮৯১)। কবি, সমালোচক তথা প্রাবন্ধিক মোহিতলাল মজুমদার বলেছেন— "যাহা ছিলনা তাহা সৃষ্টি করা যে কত বড় প্রতিভার কাজ— 'বেতাল পঞ্চবিংশতি'র ভাষা তাহারই পরিচয় দিতেছে।" অন্যদিকে বাংলা সাহিত্যের বটবৃক্ষ রবীন্দ্রনাথ ঠাকুর অগ্রজ বিদ্যাসাগরের প্রতি শ্রদ্ধা জানিয়ে বলেছেন— "বিদ্যাসাগর বাংলা ভাষার যথার্থ শিল্পী ছিলেন। তৎপূর্বে বাংলায় গদ্য সাহিত্যের সূচনা হয়েছিল, কিন্তু তিনিই সর্বপ্রথম কলানৈপুণ্যের অবতারণা করেন। পূর্ববর্তী গদ্যশিল্পীদের মতো বিদ্যাসাগর ভাষায় সমাসাড়ম্বর আনেননি। তিনি ভাষাকে সাধারণ পাঠকের পাঠের উপযোগী করে রচনা করেছেন। এই প্রসঙ্গে রবীন্দ্রনাথ ঠাকুর বলেছেন— "গ্রাম্য পাণ্ডিত্য এবং গ্রাম্য বর্বরতা, উভয়ের হস্ত হইতেই উদ্ধার করিয়া তিনি ইহাকে পৃথিবীর ভদ্রভাষার উপযোগী আর্যভাষারূপে গঠিত করিয়া দিয়াছেন।" বিদ্যাসাগরের লালিত্যে গদ্যভাষারূপী যে গাছ বেড়ে উঠেছিল আজ তা বনস্পতিতে পরিণত হয়েছে এবং তৈরি করেছে অরণ্যানী।

বিদ্যাসাগরের রচনা মূলত অনুবাদমূলক। তবে তিনি আক্ষরিক অনুবাদ করেননি। তাঁর অনুবাদ ভাব ও বিষয়বস্তুর উপর ভিত্তি করে গঠিত। সমাজ ও পরিবেশ অনুসারে সাহিত্যের গতিপ্রকৃতির পরিবর্তন হয়। তিনি গল্পের কাঠামো

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Urban Environmental Retrogression and Measures for Its Mitigation: A Case Study of Berhampore, Murshidabad

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Abstract

Due to various causes urban population increase day to day like health, education, and commutation advantages etc. Due to this causes we can see a trend in urban area which is vertical residential development (Flat Culture) In this trend there have two aspects, positive and

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Wood Specific Gravity of Temperate Forest Species of Garhwal Himalaya, India

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Abstract

One of the parameters for terrestrial biomass estimation is specific gravity of the woody species. Present study reports wood specific gravity of 26 species. Maximum moisture content method was used to calculate specific gravity. Specific gravity of eight species (8) was found between 0.71 - 0.80, seven species between (0.61 - 0.70) and specific gravity of 0.31 - 0.40 was recorded for only one species. Out of 26 species, Cedrus deodara has the highest specific gravity and the lowest value was recorded for Rubus ellipticus.

Keywords

Stem Core, Temperate Species, Uttarakhand Himalaya, Wood Specific Gravity.

Full Text:

PHASE TRANSITIONS
2020, VOL. 93, NOS. 10–11, 1006–1015
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Calorimetric study of critical behaviour near the smectic A to nematic phase transition in a polar-polar binary system

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ABSTRACT

Studies on critical behaviour associated with different phase transitions are of fundamental importance in condensed matter physics and may suitably be explored in the realm of soft materials. In this work, we report on high-resolution measurements of specific heat capacity (C_p) from modulated differential scanning calorimetry (MDSC) to investigate the critical behaviour at the smectic A to nematic (SmA–N) phase transition in a binary system consisting of nonyloxy-cyanobiphenyl (9OCB) and heptylcyanobiphenyl (7CB). All the investigated mixtures exhibit detectable SmA–N heat capacity anomaly with gradually increasing peak height with enhancement in the concentration of 9OCB. Critical exponent α, obtained from the analysis of temperature dependence of the specific heat capacity data at the SmA–N phase transition, has been observed to assume values between those predicted for the 3D-*XY* and tricritical systems. The outcomes are also compared with those obtained from the high-resolution optical birefringence measurements.

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KEYWORDS
Phase transition; binary mixture; specific heat capacity; critical behaviour; critical exponent

1. Introduction

Among soft materials, liquid crystal represents one of the most fascinating classes of organic compounds displaying an assortment of unique mesophases with dissimilar broken symmetries and order characteristics. Such compounds are of considerable interest for their technological importance and also for their competence to serve as good model systems to investigate the attractive features of phase transitions and thus to shed light on the relation between spatial dimensionality and symmetry at those transitions. The nematic (N) phase can be described with the aid of a long-range orientational order without any trace of positional order, whereas the smectic A (SmA) liquid crystals may be regarded as orientationally ordered fluids with quasi-long-range one-dimensional translational order [1,2]. The molecular organization in SmA phase may be characterized with the help of a mass-density wave with the wave vector in a direction parallel to the unique orientational axis. Thus, the transition between the SmA and N phase is coupled with a continuous breaking of molecular translational symmetry.

During the past few decades, despite extensive theoretical and experimental attempts to explore the characteristic features of smectic A–nematic (SmA–N) phase transition, the exact nature of this

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ORIGINAL PAPER

Estimating urban growth in peri-urban areas and its interrelationships with built-up density using earth observation datasets

Dipanwita Dutta[1] · Atiqur Rahman[2] · S. K. Paul[3] · Arnab Kundu[4]

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Abstract

Understanding the complex nature of urban dynamics, especially in the fast-growing cities of developing countries, has become crucial to the urban planners and researchers. It is also relevant from the viewpoint of smart city projects as the foundation of successful smart city lies in proper planning and urban growth analysis. In this context, the present study attempts to assess the urban expansion and land-change dynamics in and around Delhi. Multi-temporal Landsat data of 1977, 2003 and 2014 were used for analyzing the spatio-temporal pattern of built-up density, urban expansion, spatial change and their interrelationships. The annual urban expansion index of the study area reveals that it was comparatively high in Delhi National Capital Territory (NCT) during 1977–2003, but the expansion was much higher in peri-urban centers in the later period. However, the growth was not happened homogeneously across the peri-urban zones; instead, it occurred around few urban centers of peri-urban area. The annual urban expansion of Delhi NCT (2.52) was significantly less than peri-urban centers like Gurgaon (6.19) in the period, 2003–2014. Since the areas with high built-up density have little or no space for new settlement, the expansion of built-up area took place in the less dense areas. The correlation between urban expansion index and annual rate of change in built-up area shows that there is a good agreement and significant positive relationship ($r \geq 0.62$) present between them. A negative correlation ($r \geq 0.92$) between built-up density and urban expansion index indicates that areas with high built-up density have less potentiality to expand and vice versa.

JEL Classification Q56 · R14

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RESEARCH ARTICLE

Evaluation of Socio-Economic Drought Risk over Bundelkhand Region of India using Analytic Hierarchy Process (AHP) and Geo-Spatial Techniques

Arnab Kundu[1] · Dipanwita Dutta[2] · N. R. Patel[3] · D. M. Denis[4] · K. K. Chattoraj[1]

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Abstract
The Bundelkhand region situated in the central part of India has a long history of droughts. Although recurrent drought events in this region are controlled by the climatic variables, its unique soil, and physiography, the adversities associated with this devastating hazard largely depend upon the coping capacity of the local communities. Hence, estimating the socio-economic vulnerability of drought is necessary for adopting specific mitigation strategies to reduce the adverse impacts of drought. In this study, we explored the potentiality of geographical information system (GIS)-based analytic hierarchy process (AHP) for assessing drought risk in the Bundelkhand region from socio-economic perspective. The 10-day composite Satellite Pour l'Observation de la Terre Vegetation (SPOT-VGT) Normalized Difference Vegetation Index (NDVI) (1998–2013) dataset was used for computing the Vegetation Condition Index (VCI), a satellite-derived agricultural drought index for monitoring spatio-temporal dynamics of drought. NDVI maps of each year were assessed for mapping drought frequency. On the other hand, the socio-economic vulnerability of drought was estimated using five relevant parameters, viz. population density, marginalized population, cultivators, agricultural labours, and literacy rate, with employing AHP in a GIS platform. The pairwise comparison method was used for estimating the weights of each criterion. Most of the districts under hot semi-arid agro-climatic zone located in the Uttar Pradesh (UP) part of Bundelkhand are highly vulnerable to socio-economic drought, mainly due to high density of population and extensive agricultural activities. Out of the total area under highly vulnerable zone (27.8%), about 20% fall under semi-arid agro-ecological zone covering a large part of UP. The Madhya Pradesh (MP) part of Bundelkhand, located under the hot sub-humid agro-ecological zone, is comparatively less vulnerable to socio-economic drought. A substantial portion of this area is covered by forest, and the percentage of the total population involved in agricultural activities is relatively less. The study reveals that near about half of the total area is under threat to high (20.1%) and very high (29.1%) risk of socio-economic drought. Most of this drought risk zone falls under UP part of Bundelkhand. It is a matter of deep concern as this extensive fertile plain produces various cash crops, as well as cereals; therefore, high drought risk over this region needs a suitable strategy to mitigate the adversities of the hazard.

Keywords Drought assessment · NDVI · VCI · Multi-criteria decision analysis (MCDA) · AHP · Remote sensing and GIS

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Introduction

Owing to its devastating and widespread effects on the environment, economy, and society, the term 'drought' has snatched worldwide attention in recent decades. This slow hazard may occur in all climatic regions, including wet and humid areas. However, its severity and frequency may not similar everywhere. Recurrent drought events, commonly

Research Article

Forest fire risk mapping using analytical hierarchy process (AHP) and earth observation datasets: a case study in the mountainous terrain of Northeast India

Ridalin Lamat[1] · Mukesh Kumar[1] · Arnab Kundu[2] · Deepak Lal[1]

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Abstract
This study presents a geospatial approach in conjunction with a multi-criteria decision-making (MCDM) tool for mapping forest fire risk zones in the district of Ri-Bhoi, Meghalaya, India which is very rich in biodiversity. Analytical hierarchy process (AHP)-based pair-wise comparison matrix was constructed to compare the selected parameters against each other based on their impact/influence (equal, moderate, strong, very strong, and extremely strong) on a forest fire. The final output delineated fire risk zones in the study area in four categories that include very high-risk, high-risk, moderate-risk, and low-risk zones. The delineated fire risk zones were found to be in close agreement with actual fire points obtained from Moderate Resolution Imaging Spectroradiometer (MODIS) fire data for the study area. Results indicated that Ri-Bhoi's 804.31 sq. km. (32.86%) the area was under 'very high' fire susceptibility. This was followed by 583.10 sq. km. (23.82%), 670.47 sq. km. (27.39%), and 390.12 sq. km. (15.93%) the area under high, moderate, and low fire risk categories, respectively. These results can be used effectively to plan fire control measures in advance and the methodology suggested in this study can be adopted in other areas too for delineating potential fire risk zones.

Keywords Forest fire · MCDM · AHP · Geospatial approach · Northeast India

1 Introduction

Natural conservation areas that play an important role in maintaining the environmental balance are found in developing tropical regions forests [1–3]. Despite being of paramount importance, forest cover loss in these regions is occurring at an alarming rate [4–6]. Over the last few decades, decline in forest cover has been attributed to wildfires, rapid economic development, agriculture, logging, and increasing human population [7–10]. Globally, approximately, 30% of tropical forests were degraded by logging or fire between 2000 and 2012 [11, 12].

In India, approximately, 64% of the total forest area is frequently affected by forest fires [13], causing an economic loss of over 440 crores [14]. Forest fires can be caused naturally (e.g., lighting) and/or induced via human activities, however, in India the latter is dominant. About 90% of the forest fires in India are caused by humans [15]. Over the last few years, forest fires in India have received greater attention because of their ecological, economic, social, climatic, and political impacts [16]. Despite the fact that forest fires are mostly regulated by anthropogenic factors, local environment, metrological condition, and topography factors also play an important role in their uncontrolled expansion. In this regard, it is very important to identify vulnerable areas that come under "forest fire risk zones." Therefore, parameters that play an

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An alternative approach to delineate wetland influence zone of a tropical intertidal mudflat using geo-information technology

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ARTICLE INFO

Keywords:
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Vegetation health

ABSTRACT

Mudflats are important tropical coastal wetlands having high carbon sequestration and biodiversity potentials. The actual reach of a mudflat environment spreads far beyond its perennial wetland areas in a coastal site. Accurate demarcation of the extent of these buffer areas is imperative for sustainable wetland management. This study tried to delineate the wetland influence zone (WIZ) of an intertidal mudflat in the Medinipur coastal plain, India as a functional extension around the considerably smaller yet hydrous cum muddy depressions. Normalized Difference Water Index (NDWI), derived from Sentinel-2 MultiSpectral Instrument (MSI) datasets, and Temperature Vegetation Dryness Index (TVDI), derived from the coupled use of Sentinel-2 MSI and Landsat-8 datasets, had been analyzed and merged to develop nine characteristic zones. Among these, eight zones (Zone I to Zone VIII) were identified as part of the WIZ and the rest one (NDWI: < -0.15, TVDI > 0.7) was considered as a supra-tidal zone, devoid of the mudflat features. Although the overall extent of WIZ (Minimum: 339.20 ha, Maximum: 350.22 ha) did not change much from 2016 to 2020, the inter-zonal spatial arrangements of vegetation and physiography transformed continuously. The gradual disappearance of the major tidal creek from the south-western parts and increasing human footprints throughout the mudflat had expedited this transformation. Accordingly, periodic assessments incorporating microwave and optical datasets along with high precision in-situ measurements of soil moisture was suggested for the efficient monitoring of these fragile tropical ecosystems.

1. Introduction

Mudflats are one of the prominent types of tropical coastal wetlands and reckoned as sedimentary morphodynamic zones which harbour a prolific variety of fish species and benthic fauna (Shi et al., 2017). Though these wetlands seem to be impoverished in terms of vegetation, mudflats support highly productive ecosystems and are characterized by high rates of fine-grained depositions and rich organic content (Nasab and Rahnama, 2020). These low-gradient intertidal habitats also exhibit rapid carbon (C) sequestration potentials and much of the C lies below the ground (Thom et al., 2001). This C sink function is central to climate adaptation, regulation, and resilience in the present global scenario of changing climatic patterns. Besides, mudflats, along with mangroves, succour as natural buffers by adsorbing excess nutrients and pollutants, storing floodwater, and narrowing down the impact of storms (Dissanayake et al., 2018). Like other coastal wetlands, mudflats also deliver several notable ecosystem services such as provisioning of food, wastewater recycle, and erosion resistance (Paterson et al., 2019). Proper demarcation of the mudflat boundaries thus becomes imperative for their sustainable management by comprehending the actual functioning and response of mudflats to natural and human induced stresses (Datta and Deb, 2017; Nasab and Rahnama, 2020).

The Indian coastline portrays a wide array of tropical intertidal mudflats having rich biological diversity (MoEF&CC, 2017; Nasab and Rahnama, 2020). These mudflats can be observed over a wide gamut of varied eco-climatic regimes, ranging from arid conditions in Gujarat to humid environments in West Bengal and Odisha. It was estimated that intertidal mudflats covered approximately 24136.42 sq. km area constituting 15.82% of the entire wetland area in India (Panigrahy et al., 2011). However, these mudflats were reported to be highly perturbed and exceedingly threatened under the burgeoning effects of infrastructural development activities in the last few decades (Nayak et al., 2018). Accordingly, the interaction of humans with mudflats had been of notable environmental concern in the recent past chiefly due to the

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Impervious surface growth and its inter-relationship with vegetation cover and land surface temperature in peri-urban areas of Delhi

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ARTICLE INFO

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Built-up surface
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Normalized Difference Vegetation Index
Land Surface Temperature
Urban Expansion
Population Growth

ABSTRACT

Spatial changes in urban areas are closely associated with the increasing impervious land and thus, monitoring the spatio-temporal changes in impervious area is crucial for identifying urban growth. The capital city of India, Delhi has become one of the most populated cities of the world for its fast-growing economy and infrastructural development. Although the city is expanding since the last couple of decades, the rate of growth has become significantly high in the previous decade. This study aims to identify the spatio-temporal pattern of impervious surface growth in and around Delhi National Capital Territory (NCT) by using bi-temporal Landsat images of 2003 and 2014. The linear spectral unmixing (LSU) technique was employed for assessing the impervious surface growth over the megacity. To understand the associated changes of such growth, vegetation surface fraction (VSF), land surface temperature (LST) and normalized difference vegetation index (NDVI) were estimated and compared with the impervious surface fraction (ISF). Further, the fractional abundance of impervious surface was validated with built-up density, urban expansion and population density of the area. This study reveals the significant growth of impervious land in the peri-urban centres surrounding Delhi. The fractional abundance of impervious surface was found highly correlated with the vegetation surface fraction, LST and NDVI. The significant ($p < 0.005$) correlation coefficients prove good agreement among these variables. Strong negative correlation ($r^2 = 0.857$) between ISF and urban expansion index (UEI) proves the potentiality for urban expansion in the less developed areas with abundant pervious surface. The study also reveals a significant polynomial relationship ($r^2 = 0.746$) between impervious surface fraction and population density indicating high ISF (0.9-1.0) in the densely populated areas and vice-versa. The expanding impervious surface especially in the peri-urban centres along with the rising intensity of urban heat island (UHI) calling for suitable planning and strategies for sustainable urban growth.

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IN HIMACHAL PRADESH, PUNJAB AND HARYANA STATES OF INDIA

A STATISTICAL ANALYSIS AND PREDICTION OF CARBON DIOXIDE EMISSION IN HIMACHAL PRADESH, PUNJAB AND HARYANA STATES OF INDIA

Authored by Kartick Mondal, Sudipta Sinha, Pijush Basak, D.P.Goswami Published on May 1, 2021 in Articles

ABSTRACT

The universe is facing heavily the evil effects of Global warming, which is aburning issue today.With the advancement of civilization, new industries have been set-up to enhance production as per the need of society along with the population explosion.India is familiar as a developing country in the world, and at present, India has a significant contribution tothe augmentation of Greenhouse Gases in the environment, which induces global warming.Global warming has serious effects of worsening the environment.It causes the melting of ice,extinction of species, prevalance ofseveral fatal

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BIOLOGICAL ACTIVITY OF FLUORESCENT COPPER COMPLEX: SYNTHESIS, CRYSTAL STRUCTURE, DFT AND PROTEIN BINDING STUDY

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Abstract

Synthesis of square planar copper (II) complex with formula [Cu (DMAP)2(NCS)2] (1) (DMAP =N,N-dimethyl-4 aminopyridine) was done and characterized by various spectroscopic and single-crystal X-ray diffraction study. Complex 1 crystallizes in the monoclinic space group, P

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দ্বান্দ্বিকতা : সাহিত্য-সমাজ ও সংস্কৃতির আলোকে

সম্পাদক
খোকন কুমার বাগ

'সম্পান'
বাদশাহী রোড, ভাঙ্গাকুঠি, বর্ধমান

দ্বান্দ্বিকতার প্রেক্ষিতে মণিভূষণ ভট্টাচার্যের কবিতা

প্রদীপকুমার পাত্র

প্রকৃতি সৃষ্টির মুহূর্ত থেকে দ্বন্দ্বের উৎপত্তি। এই দ্বন্দ্ব নানাভাবে নানারূপে পরিলক্ষিত হয়। কখনো দেখা যায় বন্ধুর সঙ্গে বন্ধুর দ্বন্দ্ব, গ্রামীণ পরিবেশের সঙ্গে নাগরিকতার দ্বন্দ্ব, প্রেমের সঙ্গে বিরহের দ্বন্দ্ব, প্রেমের সঙ্গে প্রতাপের দ্বন্দ্ব, স্বপ্নের সঙ্গে বাস্তবজগতের দ্বন্দ্ব প্রভৃতি দ্বন্দ্ব সংগঠিত হয়। অন্যদিকে, মার্কসীয় দ্বন্দ্বও লক্ষ করা যায়। মার্কসীয় দ্বন্দ্ব বলতে কার্ল মার্কস ও এঙ্গেলস 'দ্য কমিউনিস্ট মেনিফেস্টো' গ্রন্থে বুর্জোয়া শ্রেণির সঙ্গে শ্রমজীবী মানুষের দ্বন্দ্বের কথা বলেছেন। দ্বন্দ্ব আমরা প্রতিনিয়ত অনুভব করি। এই দ্বন্দ্ব সাহিত্য সৃষ্টি থেকেই সাহিত্য জগতে প্রবেশ করেছে। বাংলা সাহিত্যের আদি নিদর্শন 'চর্যাপদ'-এর পদগুলি ভালোভাবে পাঠ করলেই আমরা 'দ্বন্দ্ব' অনুভব করতে পারব। তাছাড়া 'শ্রীকৃষ্ণকীর্তন কাব্য', 'শ্রীকৃষ্ণবিজয়', মঙ্গলকাব্য, পদাবলি সাহিত্য, পূর্ববঙ্গগীতিকা অর্থাৎ মধ্যযুগীয় সাহিত্যের প্রত্যেক শাখায় কমবেশি দ্বন্দ্ব লক্ষ করা যায়। এই দ্বন্দ্ব আধুনিক যুগের প্রতিনিধিস্থানীয় সাহিত্যিক রবীন্দ্রনাথ ঠাকুর (১৮৬১—১৯৪১)-এর সাহিত্যে অন্যমাত্রা ধারণ করেছে। দ্বন্দ্ব সাহিত্যিকদের কলমে ভর করে যুগ থেকে যুগান্তরে পাড়ি দিয়েছে। এই দ্বন্দ্ব শুধুমাত্র ব্যক্তিমানুষের মনঃকষ্ট বা যন্ত্রণার দিকটা প্রকটিত করে এমন নয় এর মধ্য দিয়ে মিলন তথা সৃজনের ইতিহাসও রচিত হয়।

আধুনিক কবিতার প্রকৃত পথ চলা শুরু হয়েছে বিশ শতকের তিরিশের দশকে—জীবনানন্দ দাশ (১৮৯৯—১৯৫৪), সুধীন্দ্রনাথ দত্ত (১৯০১—১৯৬০), অমিয় চক্রবর্তী (১৯০১—১৯৮৬), প্রেমেন্দ্র মিত্র (১৯০৪—১৯৮৮), বুদ্ধদেব বসু (১৯০৮—১৯৭৪), বিষ্ণু দে (১৯০৯—১৯৮২), সমর সেন (১৯১৬—১৯৮৭) প্রমুখ কবিদের হাত ধরে। বিশ শতকের তিরিশের দশকের প্রতিনিধিস্থানীয় কবি জীবনানন্দ দাশ তাঁর 'বোধ', 'আট বছর আগের একদিন' প্রভৃতি কবিতায় ব্যক্তিমানুষের মনোজগতের সঙ্গে বহির্জগতের দ্বন্দ্ব ফুটিয়ে তুলেছেন। 'বোধ' কবিতায় কবি বলেছেন—

'আলো-অন্ধকারে যাই—মাথার ভিতরে
স্বপ্ন নয়—কোন এক—বোধ কাজ করে;
স্বপ্ন নয়—শান্তি নয়—ভালোবাসা নয়,
হৃদয়ের মাঝে এক বোধ জন্ম লয়;'...।

'এবং মহুয়া' -বিশ্ববিদ্যালয় মঞ্জুরী আয়োগ (UGC-CARE)
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এবং মহুয়া

(বাংলা ভাষা, সাহিত্য ও গবেষণাধর্মী মাসিক পত্রিকা)
২৩তম বর্ষ, ১৩৩ সংখ্যা
মে,২০২১

সম্পাদক
ড. মদনমোহন বেরা

সহসম্পাদক
পায়েল দাস বেরা
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প্রভাতকুমার মুখোপাধ্যায়ের 'কুড়ানো মেয়ে' : বিষয় ও বৈচিত্রে

প্রদীপকুমার পাত্র

সাহিত্য হল জীবনের দর্পণ। জীবনের গভীরে প্রবেশ করে সূক্ষ্মাতিসূক্ষ্ম বিষয় উন্মোচন করাই হল সাহিত্যের মূল লক্ষ্য। সাহিত্যিক সামাজিক জীব। সমাজের মধ্যস্থলে বসবাস করার সূত্রে সমাজের নানা দিক তাঁর কর্মের মধ্যে উঠে আসে; উঠে আসাই স্বাভাবিক। সাহিত্যিক সমাজ ও জীবনের মেলবন্ধন ঘটিয়ে তাঁর সাহিত্যের অন্তর্বয়ন নির্মাণ করেন। বাংলা সাহিত্যে প্রভাতকুমার মুখোপাধ্যায় (১৮৭৩-১৯৩২)-এর আবির্ভাব এক নব অধ্যায়ের জন্ম দেয়। একদিকে রবীন্দ্রনাথ ঠাকুর (১৮৬১-১৯৪১)-এর প্রবল তেজ, অন্যদিকে শরৎচন্দ্র চট্টোপাধ্যায় (১৮৭৬-১৯৩৮)-এর যাদু মন্ত্রের মতো পাঠককে মুগ্ধ করে জনপ্রিয়তার শীর্ষে অবস্থান। এই কালপর্বে সাহিত্যাকাশে প্রভাতকুমার মুখোপাধ্যায়ের বিচরণ যেন তাঁকে অগ্নিপরীক্ষা সম্মুখীন করায়। বলাবাহুল্য তিনি সেই পরীক্ষায় সম্মানে উত্তীর্ণ হয়ে সাহিত্য ময়দানে নিজের অবস্থান প্রতিষ্ঠা করেছেন। রবীন্দ্রনাথ ঠাকুর, প্রভাতকুমার মুখোপাধ্যায়ের গল্প পাঠ করে মুগ্ধ হয়ে তাঁর সম্পর্কে বলেছেন— "ছোট গল্প লেখায় পঞ্চ পাণ্ডবের মধ্যে তুমি যেন সব্যসাচী অর্জুন, তোমার গাণ্ডীব হইতে তীরগুলি ছোটে যেন সূর্যের রশ্মির মত – আর কেহ কেহ আছে যাহারা মধ্যম পাণ্ডবের মত – গদা ছাড়া যাহাদের অস্ত্র নাই – সেটা বিষম ভারি – তাহা মাথার উপর আসিয়া পড়ে, বুকের মধ্যে গিয়া প্রবেশ করে না।"[১] রবীন্দ্রনাথ ঠাকুরের এই মন্তব্য প্রভাতকুমার মুখোপাধ্যায়ের সাহিত্য প্রতিভার পরিচয়বাহী।

প্রভাতকুমার মুখোপাধ্যায়ের গল্পের সঙ্গে ফরাসি গল্পকার গী দ্য মোপাসাঁ (১৮৫০-১৮৯৩)-র গল্পের সাদৃশ্য লক্ষ করা যায়। "মোপাসাঁর মতই প্রভাতকুমারও জীবনের ভাষ্যকার নন, উপ্যেযকার।"[২] মোপাসাঁর গল্পের মতই প্রভাতকুমারের গল্পে চাবুক হাকড়ানো আওয়াজ শোনা যায়। উভয় গল্পকারের মধ্যে চিন্তা-চেতনায় কিছু সাদৃশ্য অনুভব করা গেলেও উভয়ের দৃষ্টিভঙ্গির বিস্তর ফারাক। "মোপাসাঁর রচনা ভঙ্গিমার তীব্র, তীক্ষ্ণ, তীর্যকতা এবং আত্মপ্রকাশের দুর্নিবার সাহস 'টিমিড' সমাজ সংস্কার নীতি আদর্শের প্রচ্ছায়ে মানুষ প্রভাতকুমারের মধ্যে খুঁজে পাওয়া যাবে না। সরস ভঙ্গিতে বিবৃত প্রভাতকুমারের লঘুধরনের গল্পকাহিনীর সঙ্গে মোপাসাঁর বাস্তবধর্মী উৎকৃষ্ট গল্পের গোত্রগত কোনো মিল না থাকাই স্বাভাবিক।"[৩] মোপাসাঁর সাহিত্যে মানুষের অন্তঃমূলে পাশবসত্তার লীলারহস্যই বারবার উন্মোচিত হয়েছে। তবে

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পিঠের সাতকাহন : বাঁকুড়ার উৎকল সমাজ

প্রদীপকুমার পাত্র

বাংলায় একটি প্রবাদ আছে যে ভোজনরসিক বাঙালি। বাঙালির ভোজন বা খাদ্যগ্রহণকে অন্য মাত্রা দান করে। বাঙালি ব্যতীত অন্য সম্প্রদায়ের ব্যক্তিরা খাদ্যকে শরীর রক্ষার উপকরণ হিসেবে মনে করলেও বাঙালি খাদ্যকে শরীর রক্ষা ও মন তৃপ্তির উপকরণরূপে দেখে। তাইতো বাঙালির খাদ্যের এতো বিভব ও বৈচিত্র। এখন প্রশ্ন হলো বাঙালি কারা ? এর উত্তর হিসেবে দু'ধরনের মত উঠে আসে— প্রথমত: —যারা বাংলা ভাষায় কথা বলেন, দ্বিতীয়ত: —বাংলায় যারা বসবাস করেন। এইদিক দিয়ে দেখলে উৎকল সম্প্রদায়কে বাঙালি বলা যায়। বর্তমানে যারা উৎকল সম্প্রদায় বলে খ্যাত তারা অতীতে ভারতবর্ষের ওড়িশা রাজ্যের বাসিন্দা ছিলেন বলে অনেকে দাবি করেন। যদিও এই নিয়ে মতভেদ বর্তমান। তারা নানান কারণবশত পশ্চিমবাংলায় চলে আসে এবং স্থায়ীভাবে বসবাস শুরু করে। বর্তমানে উক্ত সম্প্রদায়টি মনে প্রাণে বাঙালি। ভাষা–সংস্কৃতি–আচার–বিচার প্রভৃতি দিক দিয়ে বাঙালির ঘরানায় নিজেদেরকে মিশিয়ে দিয়েছে। বাঙালির চিন্তা চেতনা উৎকল সম্প্রদায়ের রক্তের কণায় কণায় প্রস্ফুটিত। বাংলাকে যদি অরণ্যানীর সঙ্গে তুলনা করা হয়, তাহলে উৎকল সম্প্রদায় তার মহীরুহ। যাকে অরণ্যানীর মধ্যেও খুঁজে পেতে কোনো অসুবিধা হয় না। বাঙালির খাদ্যের তালিকায় মাছ-ভাতকে প্রথম সারিতে রাখলেও উৎকল সম্প্রদায়ের তৈরি পিঠে পুলির গুরুত্বও কোনো অংশেই কম নয়। মাছ-ভাতের সঙ্গে পিঠে পুলি এসে বাঙালির ভোজন রসকে কোটিগুণ বৃদ্ধি করেছে। পশ্চিমবাংলার একটি অন্যতম জেলা হলো বাঁকুড়া। এই জেলায় নানান সম্প্রদায়ের মানুষ বসবাস করলেও উৎকল সম্প্রদায়ের প্রাধান্য লক্ষ করার মতো। এই উৎকল সমাজ রন্ধন শিল্পে খুবই উন্নত। বাংলায় একটি প্রবাদ পাক্য প্রচলিত আছে 'যে রাঁধে সে চুলোও বাঁধে'। রান্না করতে ওস্তাদ তারা খাদ্যরসিক এটাই স্বাভাবিক। তাই উৎকল সমাজ রসপিপাসা মেটানোর জন্য বিভিন্ন প্রকারের খাবারের আয়োজন করে থাকেন। উৎকল সম্প্রদায়ের খাদ্যাভাসের মধ্যে পিঠে পুলি একটি গুরুত্বপূর্ণ স্থান অধিকার করেছে। এই পিঠে পুলির বৈচিত্র উৎকল সম্প্রদায়কে একটি বিশিষ্ট জায়গা দিয়েছে। এককথায় তাদের পরিচিতি দান করেছে।

লোকসংস্কৃতি বলতে সাধারণত লোকসমাজের সংস্কৃতিকে বোঝায়। লোক বলতে একটি বৃহৎ জনগোষ্ঠী; যারা সাধারণত গ্রামে বসবাস করে এবং কৃষিকাজকে তাদের প্রধান জীবিকারূপে গ্রহণ করেছে। অর্থাৎ এক বিশেষ ভৌগোলিক সান্নিধ্যে একে অপরের পরস্পরের দৈনন্দিন আদান প্রদানে অংশগ্রহণকারী জনগোষ্ঠীকে আমরা লোক অর্থে বর্ণনা করতে পারি। লোকবিশ্বাস, লোকাচার, লোকসংস্কার, যাদুবিদ্যা, ছড়া, প্রবাদ

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এবং মহুয়া

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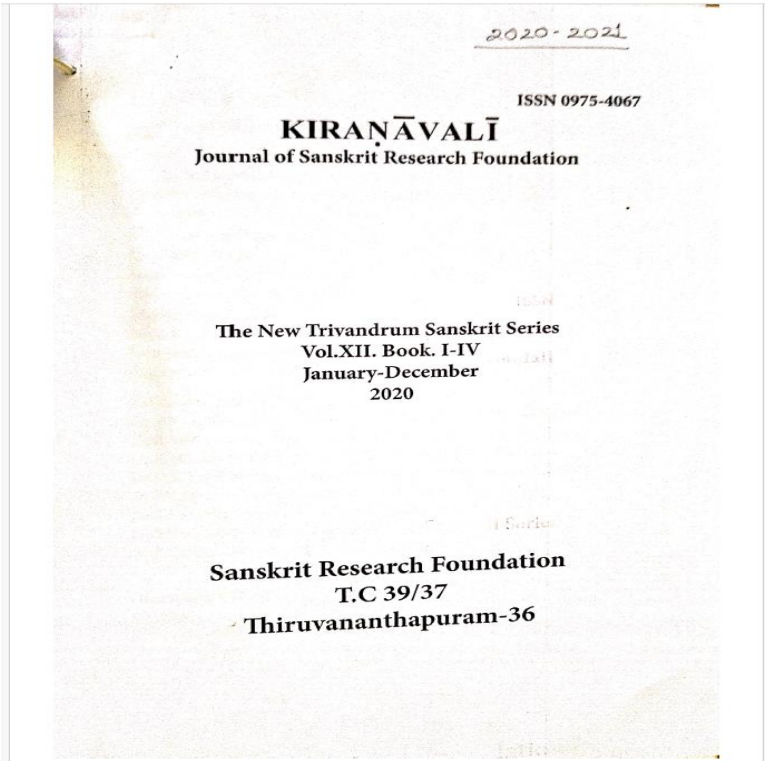
বঙ্কিম বীক্ষা : তৌলন সাহিত্যের আলোকে

প্রদীপকুমার পাত্র

সাহিত্য হলো স্রষ্টার অন্যতম কার্যভূমি। সাহিত্য প্রধানত পাঠকের মনোরঞ্জনে জন্য রচিত হলেও সমাজ সংসারের প্রতি স্রষ্টার দায়িত্বভার তথা কর্তব্যবোধের কথা অস্বীকার করা যায় না। সেই কর্তব্যের কথা মাথায় রেখে স্রষ্টা তাঁর সৃষ্টির ডালি সাজান। স্রষ্টা তাঁর বক্তব্য পাঠকের সামনে তুলে ধরার জন্য নানা পন্থা অবলম্বন করেন। তার মধ্যে প্রবন্ধ সহিত্য অন্যতম। কোনো অংশ বা উপাদান যখন যুক্তি-তর্ক-বিচার - বিশ্লেষণের মধ্য দিয়ে তত্ত্ব ও তথ্যের ব্যবহারে প্রকৃষ্ট বন্ধনে আবদ্ধ হয় তখন তাকে প্রবন্ধ বলা যেতে পারে। প্রবন্ধ পদ্য ও গদ্য উভয়েই রচিত হলেও সাধারণত গদ্যেই প্রবন্ধের আধিক্য লক্ষ করা যায়। বাংলা ভাষায় প্রবন্ধের সূচনা হয় ফোর্ট উইলিয়াম কলেজের অধ্যাপকদের হাত ধরে। এরপরে রামমোহন রায় বিবৃতি প্রধান, যুক্তিনিষ্ঠ, বিচার - বিতর্কমূলক প্রবন্ধ উপস্থাপন করে প্রবন্ধ সাহিত্যের গতিপথে রচনা করেন। তারপর 'তত্ত্ববোধিনী' পত্রিকাকে কেন্দ্র করে প্রবন্ধ সাহিত্যের জোয়ার ওঠে। অক্ষয়কুমার দত্ত তাঁর প্রবন্ধের মধ্য দিয়ে চিন্তাশীলতা, যুক্তিনিষ্ঠতা, ভাষার ওজস্বিতা ও ভাব প্রকাশে সংযম প্রভৃতি গুণে গুণান্বিত। ভূদেব মুখোপাধ্যায়ের প্রবন্ধ প্রধানত বিষয় প্রধান। সেইসঙ্গে যুক্তিনিষ্ঠা, বলিষ্ঠতা, ভাষার গাম্ভীর্য ইত্যাদি বৈশিষ্ট্য লক্ষ্য করা যায়। বাংলা সাহিত্য জগতের ধ্রুবতারা তথ্য 'সাহিত্য সম্রাট' বঙ্কিমচন্দ্র চট্টোপাধ্যায়ের আবির্ভাব সাহিত্যাকাশে এক স্বতন্ত্র অধ্যায় রচনা করেছে। তিনি একাধারে যেমন উপন্যাস সাহিত্যের স্রষ্টা ও ধ্বষ্টা তেমনই প্রবন্ধের জগতে তুলনামূলক পদ্ধতি বা Comparative Mehods -এর জন্মদাতা। তাঁর প্রবন্ধ অনেকখানি আখ্যানধর্মী। তাঁর প্রবন্ধগুলি যুক্তি, তর্ক, বিচার, বিশ্লেষণ তত্ত্ব ও তথ্যের সুচারু ব্যবহার সরস গুরু গম্ভীর ভাষায় বর্ণনা যেন এক চমক সৃষ্টি করেছে। তাঁর 'প্রকৃত এবং অতিপ্রকৃত', 'বিদ্যাপতি ও জয়দেব', 'শকুন্তলা, মিরন্দা এবং দেসদিমোনা', 'ভারত কলঙ্ক', 'ভারতবর্ষের স্বাধীনতা এবং পরাধীনতা', 'প্রাচীনা এবং নবীনা' প্রভৃতি প্রবন্ধগুলি পাঠ করলেই তুলনামূলক প্রবন্ধসাহিত্যের প্রকৃত স্বরূপ অনুধাবন করা যায়।

বঙ্কিমচন্দ্র চট্টোপাধ্যায়কে বাংলা সাহিত্যে সব্যসাচী আখ্যা দেওয়া যেতে পারে। কেননা তিনি এক হাতে উপন্যাস এবং অন্য হাতে প্রবন্ধ সহিত্যকে সমানভাবে চালনা করেছেন। তিনি যদি উপন্যাস না লিখে শুধুমাত্র প্রবন্ধই রচনা করতেন তা হলেও সাহিত্য জগতে তাঁর আসন অক্ষুণ্ণ থাকতো। তাঁর উল্লেখযোগ্য প্রবন্ধগুলি হলো - 'লোকরহস্য' (১৮৭৪), 'বিজ্ঞানরহস্য' (১৮৭৫), 'কমলাকান্তের দপ্তর' (১৮৮৬), 'বিবিধ প্রবন্ধ' (১ম ১৮৮৭, ২য় ১৮৯২), 'ধর্মতত্ত্ব' (১৮৮৮), 'শ্রীমদ্ভগবদগীতা'(প্রচারে ১২৯২ ও ১২৯৫ বঙ্গাব্দে মুদ্রিত) প্রভৃতি। তাঁর প্রবন্ধের সংখ্যা যেমন অধিক তেমনি বিষয় আঙ্গিকে রয়েছে বৈচিত্রের বাহার। তাঁর প্রবন্ধ সাহিত্যের বিশেষত্বগুলি



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Contents

A FEW SELECTED SLOKA OF MUNDAKA *UPANISADA* IN LIGHT OF 21ST CENTURY

Sanghamitra Sinha*

ABSTRACT. The Vedic literature is ancient Indic literature. The Vedic literature accompanied by the Brahmi script, Devanagari script, and Sanskrit Language. It is a combination of lyric, meter, the speech of sound, hymn, and verse. The origin and spreading history of Vedic literature is still obscure, and it started journey from vocal lyrics and ultimate reach in the authoritative scripture of Hinduism. The Vedic literature is the corpus literature, and among the four Vedas, Atharba is the latest one. The Mundaka Upanishad is the part of Atharba Veda. Here the study covers a few selected hymns of Mundaka Upanisad (ten slokas randomly selected from canto one and two), and effort has been made to create a liaison between old commentaries and contemporary thinking twenty-first-century. Mundaka Upanishad depicted immortality reality as full of abstract and allegory with the wrapper of the lyrical verse of sonic meter. Mundaka Upanisad is the doctrine of Indic philosophy, despite it contains the mystery thrill of a bundle of occidental ideologies.

The Vedic literature is the ancient Indic literature, and it the literature of the post-Harappa era. Literature and religion are two dominant pillars of any cultural studies. The Vedic literature includes a bundle of cultural attributes; religion, script, language, lyrics, etc. The Upanishads are the authoritative scripture of Hinduism (P. Olivelle 1996), and its early history is almost obscure. The Upanishad is not single literature; rather, it is a corpus and the period is not well defined, and the origin of the geographical location has not been specified. Here the study covers a few selected hymns of Mundaka Upanishad (ten slokas from canto one and two), and effort has been made to make a liaison between old commentaries with contemporary thinking of selected hymns of Mundaka Upanishads. Gough defines that the Mundaka Upanishad is one of the most important documents in ancient Indian philosophy (Gough 2006 Reprint).

Here the discussion covers only the first and second canto of the Mundaka Upanishad. The study aims to create a liaison between old commentaries with new interpretations of selected hymns of Mundaka Upanishad (ten slokas from canto one and two). The study is mainly based on the commentary explanation and analysis of Shankara, discussion, and translation of Mundaka Upanishad by Max Muller and Aurobindo. The word meaning of each phase has been derived. The inner meaning has been discussed in the light of contemporary thinking. For that purpose, a literature

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Determination of optical birefringence and orientational order parameter of octyloxycyanobiphenyl from a voltage-dependent optical transmission technique

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ABSTRACT

Measurements of optical birefringence have been performed on mesogen 4-cyano-4'-*n*-octyloxybiphenyl (8OCB) from a voltage-dependent optical transmission technique. The temperature dependence of birefringence has been determined from the voltage dependence of transmitted intensity through homogeneously aligned (planar) plane-parallel liquid crystal-filled cells of different cell-thicknesses. At a particular temperature, a systematic increase of birefringence has been observed with a decrease in cell-thickness. From the optical birefringence data, related orientational order parameter values have also been calculated. The outcomes for orientational order parameter are compared with those reported from other well-known techniques for the similar mesogen. Close agreement among the temperature dependence of orientational order parameter from this study and those from other techniques validates the reliability of the present optical method in precise investigation of physical characteristics of liquid crystalline materials.

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Octyloxycyanobiphenyl; phase transition; optical birefringence; orientational order parameter

1 . Introduction

Liquid crystals are interesting condensed states of matter not only from the viewpoint of basic research regarding phase transitions but also for applications in modern technology. Liquid crystalline (LC) compounds are found to exhibit one or more distinct mesophases with symmetry intermediate between that of an isotropic liquid and a solid crystal. Most common mesophases are the orientationally ordered nematic (N) and the layered smectic (Sm) phases [1,2]. The N phase possesses only long-range orientational order without any trace of positional order. In Sm phases, in addition to the long-range orientational order, partial positional order is also present. The presence of orientational order makes a nematic liquid crystal to behave like an optically uniaxial crystal and its physical properties are found to exhibit anisotropy [1,3]. The optical birefringence (Δn) in the N phase of a mesogen is one of the basic properties that decide the use of LC materials in the display technology. In modern nematic display devices, for achieving the maximum optical contrast, an optimum value of Δn is required [4,5]. Moreover, as Δn arises from the anisotropy of the polarizibity tensor of the molecules and is always positive in the case of molecules with elongated shape, it also yields information on the ordering of molecules in the N phase. So far, several methods are often employed to determine the Δn values of mesogenic materials *viz.* the interference method [4], the wedge method [6], the laser conoscopic method [7–12], the light transmission technique for plane-parallel liquid crystal-filled cells [13–16], the modulated polarization method [17–19].

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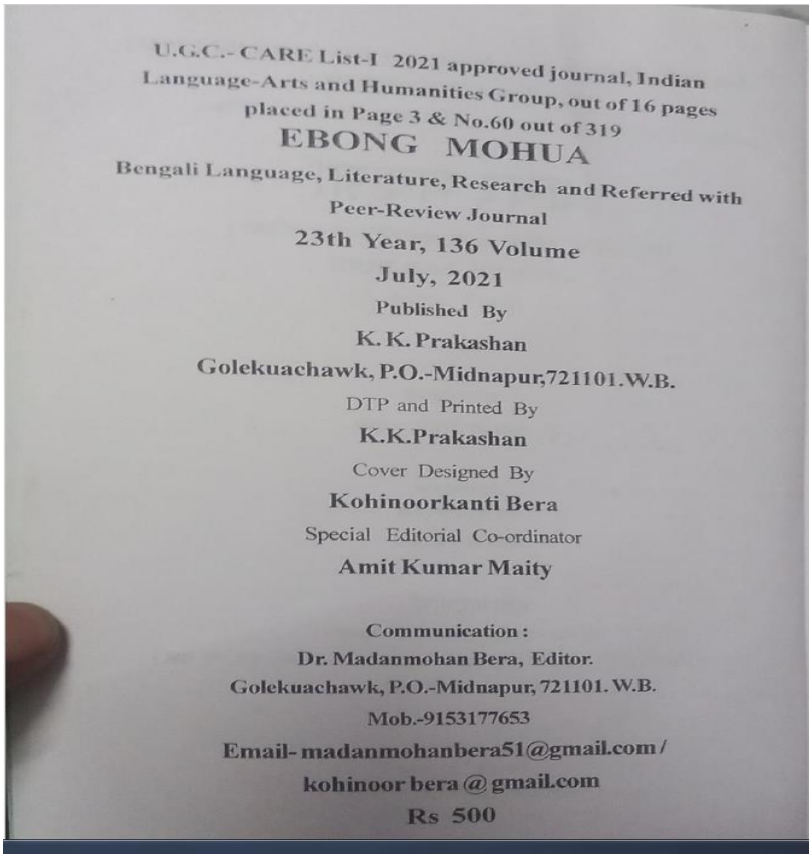

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মানব সমাজে নীতি-নৈতিকতা ও মূল্যবোধের গুরুত্ব অপরিসীম। মানুষ সামাজিক জীব, সেই সামাজিকতার প্রয়োজনে নীতি-নৈতিকতা ও মূল্যবোধের উৎপত্তি ও বিকাশ। ভারতে সামাজিকতার চিন্তা-ভাবনায় নৈতিকতা ও মূল্যবোধের সুপ্রাচীন এবং পরিপূর্ণ ঐতিহ্যশালী নিদর্শন দেখা যায়। ভারতীয় ইতিহাসের ঊষালগ্ন থেকেই এর নিদর্শন রয়েছে তবে বৈদিক সমাজ থেকে এর ব্যাপকতা দেখা যায়। বৈদিক সংস্কৃতির মধ্যেই নৈতিকতার যে ঐতিহ্যপূর্ণ নিদর্শন দেখা মেলে, সেই ধারা বর্তমান ভারতীয় সমাজে পরিলক্ষিত হয়। বৈদিক সংস্কৃতি অনুধাবনের প্রধান আকর তথ্যসূত্র বৈদিক সাহিত্য। বৈদিক সাহিত্য মূলত চার শ্রেণিতে বিভক্ত— সংহিতা, ব্রাহ্মণ, আরণ্যক ও উপনিষদ। সাম্প্রতিক কালনির্দেশ অনুযায়ী বৈদিক সাহিত্য সম্ভার এর সম্ভাব্য কাল সীমা খ্রিস্টপূর্বাব্দ ১৫০০ থেকে খ্রিস্টপূর্ব ৬০০ প্রায় সহস্র বছর ব্যাপী। ঋকবেদের নৈতিকতায় কেন্দ্রীয় চিন্তায় রয়েছে ঋত 'Rta' এর ধারণা। যার মূল কথা এক স্বতন্ত্র চিন্তা যা শৃংখল ও নৈতিকতাকে একত্রীকরণ করে। পাশাপাশি ধর্ম, কর্ম, এর ধারণা বিরাজমান। যা ব্যক্তি ও সমাজের পরিপূর্ণ বিকাশের কথা বলে। ব্যক্তি জীবনের মূল লক্ষ্য হিসেবে পুরুষার্থ ধারণা স্থান পেয়েছে। সামাজিক ক্ষেত্রে বিশ্ব ভাতৃত্ববোধ, সম্প্রদায়গত চিন্তা ভাবনা স্থান পেয়েছে। শিক্ষাচিন্তায় পার্থিব জীবনের উন্নতির থেকেও চরিত্র ও ব্যক্তিত্ব বিকাশের দিকে নজর দেয়া হয়েছে। উপনিষদ গুলির কেন্দ্রীয় চিন্তা রয়েছে সত্যের সন্ধান বিষয়ক চিন্তাভাবনা। 'সৎ' সম্পর্কে জ্ঞান সর্বোচ্চ সত্য ও পরিপূর্ণ জ্ঞানের সন্ধানে একটি প্রার্থনা উল্লেখ দেখা যায়। প্রকৃতি ও মানুষের সম্পর্ক বিষয়ক চিন্তা ভাবনা স্থান পেয়েছে, সৃষ্টি ও জীবনের পাঁচটি উপাদান পঞ্চভূত এর উল্লেখ বর্তমান। প্রকৃতি ও মানুষের সুসামঞ্জস্যপূর্ণ বিকাশের ধারণা দেয়া হয়েছে। বর্তমানে বিশ্বায়ায়িত সমাজে চূড়ান্ত নৈতিকতা এর অবক্ষয় অধঃপতনের পেক্ষাপটে মানুষ ও সমাজের সামগ্রিক বিকাশে এর বিশেষ তাৎপর্য রয়েছে। বর্তমান এই প্রবন্ধে সেই দিকটি তুলে ধরার চেষ্টা করা হয়েছে।

মূল শব্দ :

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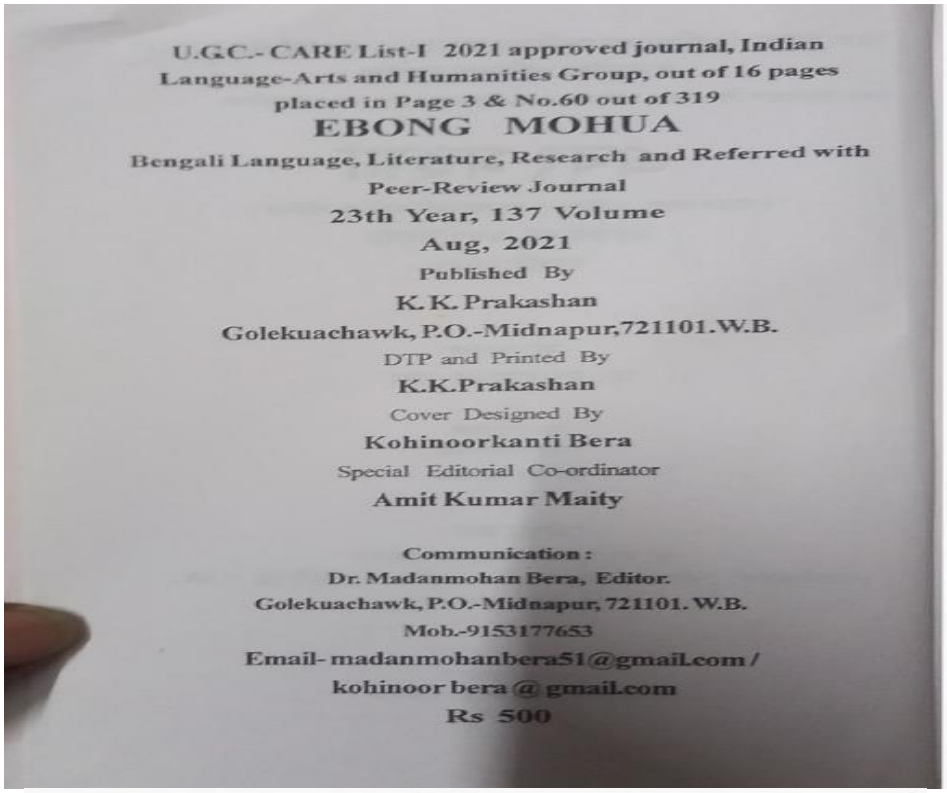

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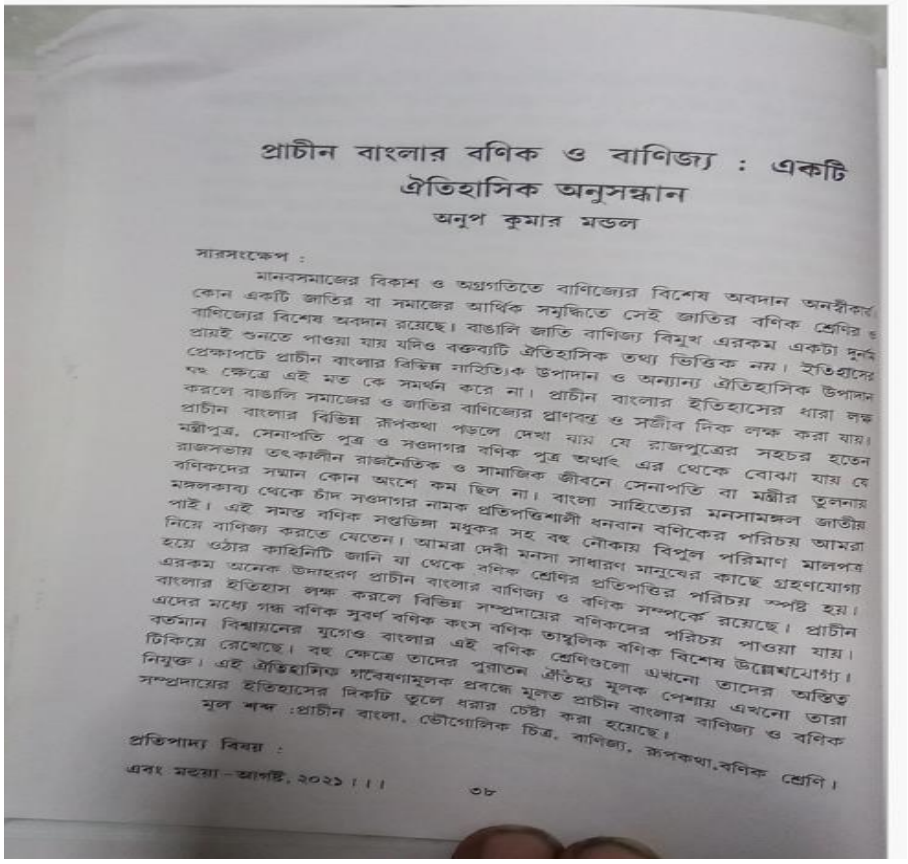


প্রাচীন বাংলার বণিক ও বাণিজ্য : একটি ঐতিহাসিক অনুসন্ধান

অনুপ কুমার মন্ডল

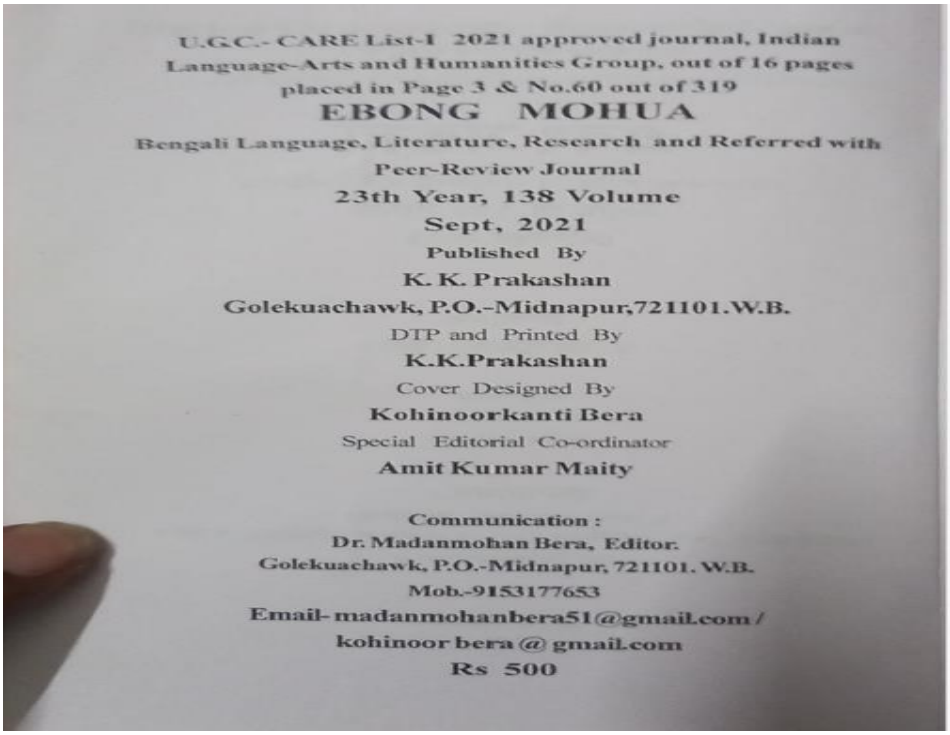
সারসংক্ষেপ :

মানবসমাজের বিকাশ ও অগ্রগতিতে বাণিজ্যের বিশেষ অবদান অনস্বীকার্য। কোন একটি জাতির বা সমাজের আর্থিক সমৃদ্ধিতে সেই জাতির বণিক শ্রেণির ও বাণিজ্যের বিশেষ অবদান রয়েছে। বাঙালি জাতি বাণিজ্য বিমুখ এরকম একটা দুর্নাম প্রায়ই শুনতে পাওয়া যায় যদিও বক্তব্যটি ঐতিহাসিক তথ্য ভিত্তিক নয়। ইতিহাসের প্রেক্ষাপটে প্রাচীন বাংলার বিভিন্ন সাহিত্যিক উপাদান ও অন্যান্য ঐতিহাসিক উপাদান যত্ন ক্ষেত্রে এই মত কে সমর্থন করে না। প্রাচীন বাংলার ইতিহাসের ধারা লক্ষ করলে বাঙালি সমাজের ও জাতির বাণিজ্যের প্রাণবন্ত ও সজীব দিক লক্ষ করা যায়। প্রাচীন বাংলার বিভিন্ন রূপকথা পড়লে দেখা যায় যে রাজপুত্রের সহচর হতেন মন্ত্রীপুত্র, সেনাপতি পুত্র ও সওদাগর বণিক পুত্র অর্থাৎ এর থেকে বোঝা যায় যে রাজসভায় তৎকালীন রাজনৈতিক ও সামাজিক জীবনে সেনাপতি বা মন্ত্রীর তুলনায় বণিকদের সম্মান কোন অংশে কম ছিল না। বাংলা সাহিত্যের মনসামঙ্গল জাতীয় মঙ্গলকাব্য থেকে চাঁদ সওদাগর নামক প্রতিপত্তিশালী ধনবান বণিকের পরিচয় আমরা পাই। এই সমস্ত বণিক সপ্তডিঙ্গা মধুকর সহ বহু নৌকায় বিপুল পরিমাণ মালপত্র নিয়ে বাণিজ্য করতে যেতেন। আমরা দেবী মনসা সাধারণ মানুষের কাছে গ্রহণযোগ্য হয়ে ওঠার কাহিনিটি জানি যা থেকে বণিক শ্রেণির প্রতিপত্তির পরিচয় স্পষ্ট হয়। এরকম অনেক উদাহরণ প্রাচীন বাংলার বাণিজ্য ও বণিক সম্পর্কে রয়েছে। প্রাচীন বাংলার ইতিহাস লক্ষ করলে বিভিন্ন সম্প্রদায়ের বণিকদের পরিচয় পাওয়া যায়। এদের মধ্যে গন্ধ বণিক সুবর্ণ বণিক কংস বণিক তাম্বুলিক বণিক বিশেষ উল্লেখযোগ্য। বর্তমান বিশ্বায়নের যুগেও বাংলার এই বণিক শ্রেণিগুলো এখনো তাদের অস্তিত্ব টিকিয়ে রেখেছে। বহু ক্ষেত্রে তাদের পুরাতন ঐতিহ্য মূলক পেশায় এখনো তারা নিযুক্ত। এই ঐতিহাসিক গবেষণামূলক প্রবন্ধে মূলত প্রাচীন বাংলার বাণিজ্য ও বণিক সম্প্রদায়ের ইতিহাসের নিকটি তুলে ধরার চেষ্টা করা হয়েছে।

মূল শব্দ :প্রাচীন বাংলা, ভৌগোলিক চিত্র, বাণিজ্য, রূপকথা,বণিক শ্রেণি।

প্রতিপাদ্য বিষয় :

এবং মহুয়া – আগষ্ট, ২০২১ । । ।



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রাঢ় বাংলার মন্দির স্থাপত্য ও ভাস্কর্য : প্রসঙ্গ বিষ্ণুপুরের মদনমোহন মন্দির

অনুপ কুমার মন্ডল

সারসংক্ষেপ :

ভারতের মন্দির স্থাপত্য ও ভাস্কর্যের নিদর্শন অতি সুপ্রাচীন সুদীর্ঘ প্রাগৈতিহাসিক সময় থেকে এর নিদর্শন এখানে পাওয়া যায়। শিল্প ও সংস্কৃতি এই প্রবাহমান ধারা আজও আধুনিক সমাজে প্রবাহিত। প্রাচীন ভারতের ন্যায় সুপ্রাচীন রাঢ় জনপদেও মন্দির স্থাপত্য ও ভাস্কর্যের পরিপূর্ণ ধারা প্রবাহিত হয়েছে, বর্তমান সময়েও যার নিদর্শন মেলে রাঢ় বাংলার বিভিন্ন প্রান্তে বিরাজমান মন্দির ও স্থাপত্যের মধ্যে। এ প্রসঙ্গে "মন্দির নগরী" নামে খ্যাত বিষ্ণুপুর নগর এর মধ্যে অবস্থিত মন্দির গুলি এক অনন্য নিদর্শন স্থাপন করেছে। বিষ্ণুপুরের মন্দির গুলির মধ্যে বাংলার মন্দির স্থাপত্য এর একটি অনবদ্য নিদর্শন লক্ষ করা যায় যা আজকের দিনেও উজ্জ্বল মহিমায় বিরাজমান। বিষ্ণুপুরের মদনমোহন মন্দির, জোড়বাংলা মন্দির, ও শ্যামরায় মন্দির স্থাপত্য গুলি এই অনবদ্য নিদর্শন এর পরিপূর্ণ প্রমাণ দেয়। এই সমস্ত মন্দির স্থাপত্য রীতি, শিল্পকলা ও ভাস্কর্যের মধ্য দিয়ে রাঢ় বাংলার জীবনচর্চা, সংস্কৃতি ও সামাজিক রীতিনীতির পরিচয় ফুটে ওঠে। বর্তমানে এই গবেষণামূলক প্রবন্ধে বিষ্ণুপুরের একরত্ন মদনমোহন মন্দিরের স্থাপত্য ভাস্কর্য ও শিল্পকলার দিকটি তুলে ধরার ক্ষুদ্র প্রচেষ্টা করা হয়েছে।

শব্দ সূচক :

রাঢ় অঞ্চল, মন্দির, স্থাপত্য ও ভাস্কর্য, বিষ্ণুপুর, মদনমোহন মন্দির, শিল্পকলা।

প্রতিপাদ্য বিষয় :

মদনমোহন মন্দিরের অবস্থান ও গবেষণার মূল বিষয় :

পশ্চিমবঙ্গের দক্ষিণ-পশ্চিম সীমান্তে অবস্থিত বাঁকুড়া জেলা। এই বাঁকুড়া জেলার সদর শহর বাঁকুড়া থেকে প্রায় ৩৫ কিলোমিটার পূর্বে অবস্থিত বিষ্ণুপুর শহরে আলোচ্য মদনমোহন মন্দিরের অবস্থান। বিষ্ণুপুর বাস স্ট্যান্ড ও রেলস্টেশন থেকে অতি সহজেই এই মদনমোহন মন্দিরে যাওয়া যায়। এখানে আলোচ্য গবেষণার মূল ক্ষেত্রগুলি নিম্নলিখিত তুলে ধরা হল—

- কোন ঐতিহাসিক প্রেক্ষাপটে মদনমোহন মন্দির তৈরি হয়?
- মদনমোহন মন্দিরের মধ্যে কোন ধরণের স্থাপত্য-শৈলীর নিদর্শন মেলে?

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খেরওয়ার আন্দোলন : উদ্ভব ও প্রভাব

অনুপ কুমার মন্ডল

ঐতিহাসিক প্রেক্ষাপট :

ভারতের স্বাধীনতা সংগ্রামে সাঁওতাল উপজাতিদের গৌরবময় ভূমিকা ছিল। ১৮৫৫ সালের সাঁওতাল বিদ্রোহ ছিল উপজাতিদের সুবর্ণ যুগ প্রতিষ্ঠার রাজনৈতিক প্রয়াস। আর এই বিদ্রোহ সাঁওতাল সম্প্রদায়কে মনস্তাত্ত্বিকভাবে গভীরভাবে প্রভাবিত করেছিল। এই ধারার প্রভাবেই ১৮৭০ এর দশকে সাঁওতালদের মধ্যে খেরওয়ার আন্দোলনের জন্ম হয়। যখন খেরওয়ার রা চম্পা তে সুখী জীবনযাপন করত যা পরবর্তীকালে তার অবসান ঘটে।[১] এই আন্দোলনের লক্ষ্য ছিল উপজাতিদের সুবর্ণ যুগকে পুনঃপ্রতিষ্ঠা করা। খেরওয়ার শব্দটি এসেছে khair থেকে, যার অর্থ মানুষ। স্কেপসরু এই শব্দের উৎপত্তি সম্পর্কে বলেছেন যে, সারা ভারতের বিভিন্ন উপজাতিদের বোঝাতে এই শব্দ ব্যবহৃত হয়েছে। যেমন- Khairagar (পুরাতন সাঁওতাল দুর্গ), Kherias (নাগপুর), কুর্মি (মানভূম জেলা), Kharias (সিংভূম), Khawars (মীর্জাপুর জেলা), Korwas (মধ্যপ্রদেশ), kodaskili (ছোটনাগপুর), হোর সাঁওতাল হাড়ি (নিম্ন বর্গের নিম্নবর্গের হিন্দু) গারো (আসাম)। খেরওয়ার শব্দটি ব্যবহৃত হয় প্রাচীন সাঁওতাল উপজাতি দের বোঝাতে যখন তারা চাঁও চম্পা তে পূর্ণ স্বাধীনতা নিয়ে বসবাস করত, তখন তাদের কোন কর দিতে হত না। সাঁওতালদের কাছে খেরওয়ার শব্দ হলো একটি প্রাচীন আদর্শ, যারা নিজেদের অবস্থার উন্নয়নের জন্য হিন্দু সংস্কৃতিকে ধার করেছিল। ১৮৫৫ সালের সাঁওতাল বিদ্রোহ ব্যর্থ হলেও পরবর্তীকালে সাঁওতালরা ব্রিটিশ বিরোধী আন্দোলনের ধারা অব্যাহত রেখেছিল। সরকারের সাথে প্রত্যক্ষ সংগ্রামের পথে না গিয়ে তারা ব্রিটিশ সরকারের ওপর চাপ সৃষ্টির কৌশল গ্রহণ করে এবং ১৮৬১ খ্রিস্টাব্দে কে রাজস্ব-সংক্রান্ত ছিল এই কৌশলের একটি দিক। ১৮৮০ তথা নব্বইয়ের দশকে তারা পুনরায় ভূমি রাজস্ব বৃদ্ধির প্রতিবাদে ও মহাজনদের অন্যায় আচরণের প্রতিবাদে বড় আকারে বিদ্রোহ করে তোলে। তারা জনগণনার কাজের কাজকর্ম বাধা সৃষ্টি করে।

তবে সাঁওতাল বিদ্রোহের পর সবচেয়ে গুরুত্বপূর্ণ যা তাদের জীবনে নতুন দিগন্ত সৃষ্টি করেছিল তা হলো সামাজিক ও ধর্মীয় সচেতনতা কে কেন্দ্র করে সাঁওতাল পরগণা জেলার খেরওয়ার আন্দোলন। এই আন্দোলনের রাজনৈতিক ও সামাজিক ও ধর্মীয় দিক ছিল। রাজনৈতিক লক্ষ্য হিসাবে অপকর্মের প্রতিবাদ করা এবং ব্রিটিশ ও তার সহযোগীদের সাঁওতাল অঞ্চল থেকে বহিষ্কার করা। সামাজিক ও ধর্মীয় লক্ষ্য ছিল নানা

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Regional variation of drought parameters and long-term trends over India using standardized precipitation evapotranspiration index

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ABSTRACT

Analysing historical drought pattern is vital for implementation of efficient drought adaptation and mitigation policies. In this study, we examined the meteorological drought characteristics of India during 1901–2015, using Climate Research Unit (CRU) based Standardized Precipitation Evapotranspiration Index (SPEI) at multiple timescales i.e., 1 month (SPEI01), 3 month (SPEI03), 6 month (SPEI06), 12 month (SPEI12). Here, we applied K-means clustering algorithm on SPEI12 (December) to find out different clusters with distinct drought characteristics. The six different homogeneous regions, i.e., cluster1 (C1), cluster2 (C2), cluster3 (C3), cluster4 (C4), cluster5 (C5), and cluster6 (C6) identified by K mean clustering largely resemble with the clusters mentioned in previous researches. Different drought parameters (duration, frequency, intensity) have been also analysed for each cluster on a monthly, seasonal and interannual basis. The study indicates that northern part of India (C6, C3) experienced frequent droughts at shorter timescales whereas the western (C2) and north eastern (C4) part of the country encountered frequent drought occurrences at longer timescale. It is worthy to mention that the C2 region comprising the semi-arid and arid western part of the country including the great Indian desert, is vulnerable to frequent, prolonged and severe droughts at longer timescale (SPEI12). The study revealed a significant regional variation in drought trends identified by Modified Mann-Kendall (MMK) trend test. The annual trend analysis shows statistically significant ($p < 0.05$) increasing drought trend over C3 and C4 regions comprising the fertile Gangetic and Brahmaputra plains. The seasonal MMK trend analysis reveals significant increase ($p < 0.05$) in droughts over C3 (−0.006) and C4 (−0.005) during monsoon. The increasing drought trend over the Gangetic plain (C3) is prominent especially in the months of July ($p < 0.05$, slope = −0.005) and August ($p < 0.001$, slope = −0.006). The study provides a region-specific understanding of drought characteristics and long-term trends crucial for preparing adaptive strategies to minimize the cumulative impacts of droughts.

1. Introduction

Droughts are the most complex hydroclimatic pervasive hazards, giving rise to economic challenges and financial risks, especially for the

Singh, 2010). In their study, Wang et al. (2014) found worldwide increase in the drought areas during 1902–2008. Since the beginning of the twentieth century, several socio-economically significant regional droughts have been observed especially in Australia (2000–2009),

Research Article

Investigating forest fragmentation through earth observation datasets and metric analysis in the tropical rainforest area

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Abstract

Extensive mining operations, deforestation, jhumming, and soil erosion coupled with population stress in the study area have put an adverse effect on its forest resources. This study investigates the transition in forest cover classes and its fragmentation in the Jaiñtia Hills District of Meghalaya (India). Satellite data (multispectral images from Landsat 5 and 8) for 1995, 2001, 2007, and 2015 were classified using the supervised classification method. Landscape metrics from the classified images were calculated using FRAGSTATS. The overall accuracy of classification was found to be 87.50% (1995), 87.50% (2001), 85.00% (2007) and 91.67% (2015), respectively. The results revealed an increase in dense forest with an increase in the patch number from 1995 to 2007. Additionally, a decrease in non-forest cover with an increase in the number of patches from 2001 to 2015 was observed which further suggests fragmentation. It has been reported that 8.13% of the dense forest increased and 19.47% of non-forested areas decreased during the study period. Overall, this study highlights the changes in the distribution of forest area which could aid policy makers to adopt appropriate forest conservation strategies.

Keywords Forest cover · FRAGSTATS · Forest fragmentation · Class metrics · Deforestation · Soil erosion · Jaiñtia Hills (India)

1 Introduction

Fragmentation can be defined as a division of the landscape into smaller isolated patches which decrease the natural habitat in a landscape. Loggers, commercial cultivators, settlement planners, infrastructure developers, and expansion in the population are some of the destructive trends maximizing forest fragmentation at an alarming rate [1]. These aforementioned factors severely expose the forested area leading to vulnerability of wildlife species as well as disturbing the entire forest ecosystem.

Mining operations can also contribute to forest fragmentation which is apparent in many regions of India including the state of Meghalaya. Meghalaya possesses huge reserves of various minerals including coal, limestone, kaolin, clay, granite, glass-sand, uranium, etc. Overexploitation of such resources, e.g. extensive coal mining [2] has led to a drastic change in the land use/land cover (LULC) of the state.

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SHORT NOTE

An Appraisal of Kerala Flood-2019

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Abstract
Kerala experienced extremely heavy rainfall from 8th to 11th August 2019, which caused a widespread flood throughout the state and disrupted thousands of lives as well as a substantial amount of property. The novel approach of utilising the observed and merged satellite rainfall products along with remotely sensed optical and microwave images was applied to monitor the event. The results indicated vast inundation in Wayanad, Ernakulam, Thrissur, Malappuram, Palakkad, and Alappuzha districts on 10th August. A departure of 217% from normal rainfall for Palakkad and 123% for the whole state in the month of August were observed. The synthetic aperture radar (SAR) and optical datasets were successfully used to generate flood extent maps which can be advantageous for planners and governing bodies to control flood incidents over the region.

Keywords Extreme rainfall · India Meteorological Department · Flood event · Sentinel-1

Introduction

The influence of warming climate on the intensity and frequency of extreme precipitation events and consequent floods has increased which is causing great pressure on the population of Indian sub-continent (IPCC 2012; Ali et al., 2019; Mishra et al., 2019). The floods over larger areas cannot be monitored using gauges due to their limited coverage which makes the satellite observations a very useful tool (Mishra 2021). They have proven to be crucial in real-time and near real-time monitoring which helps in quick response and relief operations (Zheng 2012). Optical and microwave remote sensing techniques with high spatial and temporal resolution provide vital information for the monsoon of 2018 which resulted in extensive flooding in various districts with enormous economic damage and the death of more than 400 people (Mishra & Shah 2018; Vishnu et al., 2019). In the year 2019 as well, the state received extremely heavy rainfall from 8 to 11th August which caused severe flooding in multiple districts and affected thousands of people and property (Livemint 2019). Vijaykumar et al. (2021), studied the flood events of consecutive years in reference to the changes in monsoonal clouds and sea surface temperature (SST) and deduced that the rainfall events could be more severe if SST remained high. Prior to 2018, 1961 and 1924 were the only documented years that witnessed heavy flooding due to which heavy losses of life and property occurred (CWC 2018).

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ORIGINAL ARTICLE

Evolution of Opencast Mines in the Raniganj Coalfield (India): An Assessment through Multi-temporal Satellite Data

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ABSTRACT

Surface mining is the dominant driver of land use land cover (LULC) change in the Raniganj coalfield region in West Bengal, India. Owing to its multifaceted consequences on soil, water, and landholders, assessment of spatio-temporal changes in mining areas has become important. The oldest coal mine of India, Raniganj coalfield has been producing superior quality non-coking coal for the last 246 years. To reduce the cost per unit production of coal, the mining authority prefers the opencast method over underground mining. The mushrooming growth of opencast mines in this coalfield causing huge waste dumps, depletion of vegetated surface, changing slope and drainage pattern, soil erosion, and degradation of environmental quality. With this background, the present study examines the spatio-temporal changes and evolution of opencast mines using multi-temporal Landsat Thematic Mapper (*TM*) and Enhanced Thematic Mapper Plus (*ETM+*) datasets of 1991, 2001 and 2014. Further, the study assessed the dynamics of mining patches and their characteristics through spatial metrics analysis. The LULC maps reveal good agreement with in-situ observation as verified by overall accuracy (≥ 85%) and Kappa (≥ 0.75) statistics. The study showed that mining areas have

demand for energy is increasing steadily. It is the second-largest producer and consumer of coal in the world with a total production of 730.35 million tonnes of coal in 2018-19 (Ministry of Coal, Govt. of India 2018). The history of coal production in India was started with the initiative of the British East India Company in Raniganj, West Bengal in the year 1774. This coalfield is one of the major coal-producing areas of the country and belongs to the Gondwana group of Permian age (Singh and Yadav 1995). It has a large reservoir of the best quality non-coking coal. Before mining operations, the Raniganj coalfield and its surrounding areas were under thickly forested land known as 'Jungal Mahal' (Paterson 1910). Since then, this area has undergone significant changes for its rich natural resources.

Mining has a significant contribution to the economic development of a country. India, with its rich mineral resource, has experienced steady progress in the industrial sector since independence. However, the exploration for mineral resources and expansion of existing mines has been playing an important role in land use land cover change in many areas. It has caused the depletion of thick forest cover and biodiversity in many parts of the country. The Raniganj coalfield area has faced both social and environmental issues since its beginning and the problems have been exaggerated with the increasing density

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Prediction and spatial distribution mapping of soil electrical conductivity using geo-statistical method for Mirzapur district, Uttar Pradesh

Hemant Jayant, Nirmal De and Arnab Kundu

Abstract
Soil electrical conductivity is more like soil pH; a limiting factor in crop growth and production as well as it corresponds to the soil conditions that is excess of salt in the soil or not hence define suitability of soil for crops. The present research was undertaken in Mirzapur district of Uttar Pradesh to assess the spatial variation in electrical conductivity (EC), its prediction and mapping. A sum of 48 representative soil samples were yielded from twelve geo-referenced soil profiles excavated in the study area. Following physic-chemical analysis of soil samples from various depth (i.e. 0-15, 15-30, 30-45 and 45-60 cm) of 12 profiles, more specifically determination of electrical conductivity (dS/m). Further, classical and geo-statistical methods have been employed to characterize soil parameter i.e. EC (dS/m) and its spatial distribution. Ordinary kriging interpolation was used to create spatial variability map and semivariogram model was applied for quantification of electrical conductivity.

Keywords: Spatial, mapping, geo-statistics, semivariogram, kriging, soil properties, electrical conductivity

1. Introduction
Soil productivity attributed to various characteristics of the soil which contributes to soil fertility like soil pH, electrical conductivity, organic carbon content, micronutrient (Fe, Cu, Zn, and Mn) and major nutrient (N, P, and K) concentration in soil. Soil electrical conductivity is the major of soil salinity or saltiness/ accumulation of salt in the soil and determinant of different soil properties. Soil EC can be use both as direct and indirect indicator of soil physical, chemical and biological properties. Buildup of salt in soil may hamper the agriculture crop production that will be of great concern for farmers, government and agricultural scientists [1]. For this purpose mapping and accurate assessment of soil- EC which in turn correspond to soil salinization are must needed for soil management thus crop production [2]. Soil-EC governs by many environmental such as climate, rainfall, temperature and edaphic factors such as soil moisture content (porosity and water filled pore space), texture, soil type, geology as well as influenced by human activities; irrigation practices, land use, ground water

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ORIGINAL ARTICLE

GIS-based multi-criteria approach to delineate groundwater prospect zone and its sensitivity analysis

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Abstract

This study was aimed at delineating groundwater potential zones (GWPZ) using geo-spatial techniques for Ranchi district, Jharkhand (India). Data including Cartosat-1 digital elevation model (DEM), Landsat 8 satellite images, lithology, geology, soil, and water yield data were utilised in this study. The relative importance of multiple parameters including lithology, soil, slope, geology, rainfall, drainage density, and land use/land cover (LULC) that influence the availability of groundwater was determined subjectively. Analytical hierarchy process (AHP) along with pair-wise comparison decision theory was utilized to calculate the weights for each aforementioned parameter. The delineated GWPZ were categorized into four classes viz., very good zone (31.57%), good zone (45.43%), moderate zone (13.09%), and poor zone (8.53%). The sensitivity analysis indicated lithology and soil type as the most and least sensitive parameters, respectively influencing the presence of groundwater in the study area. Comparison between well discharge data and delineated GWPZ yielded a coefficient of determination (R^2) of 0.59. This study contributes to identifying priority areas where appropriate water conservation programs as well as strategies for sustainable groundwater development can be implemented.

Keywords Pair-wise comparison · Decision making · Groundwater instability · Multi-influencing factors · Ranchi (India)

Introduction

Groundwater serves as an important resource of fresh water for domestic, agricultural, animal husbandry, industrial activities, and other multipurpose uses (Singh et al. 2009). The over-utilization of groundwater resources without implementing proper management/recharge policies causes depletion in the groundwater table. The planning and management of groundwater resources gets complicated under changing climate.

Exploring new sites of groundwater rely on the integration of geophysical, aeromagnetic surveys along with the remote sensing (RS) and the geographical information system (GIS) (Mukherjee et al. 2007). Remote sensing and GIS

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ORIGINAL ARTICLE

Understanding land use/land cover and climate change impacts on hydrological components of Usri watershed, India

Mukesh Kumar[1] · Derrick M. Denis[2] · Arnab Kundu[3] · Nitin Joshi[4] · Shakti Suryavanshi[5]

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Abstract

Land use/cover (LULC) and climate are significant environmental factors that influence watershed hydrology across the globe. The present study attempts to understand the consequences of existing changing patterns of climate and LULC on the hydrology of the Usri watershed. Different water balance components were simulated using a semi-distributed Soil and Water Assessment Tool (SWAT) model. Sixteen scenarios were generated using combinations of four periods of climatic data (1974–84; 1985–1995; 1996–2006 and 2007–2016) and four sets of land use maps (1976; 1989; 2000 and 2014). The SWAT model performed well for monthly stream flows during calibration and validation. The study finds that the individual impact of LULC change contributes to increase in the streamflow and decrease in evapotranspiration (ET) primarily due to increase in urbanization and decrease in water bodies, forest cover and barren land of Usri watershed. The combined impact of climatic variations and land use change reveals complex interactions. The study provides insight into hydrological response to variations in climate and land use changes in Usri watershed in recent decades. The results of this study can be beneficial to the authorities, decision-makers, water resource engineers and planners for the best water resource management approaches in the perspective of climate change and LULC transformation of similar ecological regions as that of Usri.

Keywords SWAT model · Land use/cover · Climate · Streamflow

Introduction

Land use change and climate variability are important environmental components influencing water resource management and socioeconomic activities. They directly influence the policy framework along with planning activities required for sustainable development (WMO 1966; Li et al. 2009; Wang et al. 2014a, b; Zhang et al. 2016; Yang et al. 2017; Sahoo et al. 2018). Changes in land use/land cover patterns and climate are dynamic. Prevalent process is mainly governed by natural phenomena and anthropogenic activities (Vitousek 1994; Southworth et al. 2004; Kamusoko and Aniya 2007; Xu et al. 2009; Günlü et al. 2009; Paul et al. 2017; Getachew et al. 2021). It has been observed that the changes in land use can significantly affect the streamflow, flood frequency, base flow, groundwater recharge and annual mean discharge of any watershed (Turner et al. 2001; Costa

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Slums in India: making sense of place in urban planning

Jaidul Islam · Md. Julfikar Ali · Sk Mithun

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Abstract Cities are the growth engine of national wealth and income production; however large number of city dwellers circumvents from the mainstream, are snubbed dwellers called slum population. Existence of slums in the urban units is a challenging issue in urban planning. India experiences a very sharp growth rate of slum population over the decades. Present work focuses on a conundrum of uninterrupted slum growth in spite of the implementation of many slum removal policies in India. The state-level household amenity status reflects a quite debatable agenda as to whether or not slum up-gradation policies are succeeded and works as a significant planning tool. The up-gradation of individual slum unit through the bottom-up approach of plan may act as effective action. This work finally directs a comprehensive planning tool for slum up-gradation as well as overall urban development, by placing the slum issues in urban planning practice.

Keywords Slum dweller · Policy gap · Slum up-gradation · Household amenity index · Urban planning

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Introduction

In a near future, majority of human population in developing countries is likely to live in urban area and it has been predicted that in India around 50% of its total population or 600 million people will live in the urban area in 2020 (Loughhead and Mittal 2000). With the rapid pace of urbanisation in developing countries, it is estimated that one-third of the urban population over the world lives in the dearth of even basic needs i.e., shelter, food, drinking water and so on, and they reside in overcrowded and congested environments (UN HABITAT 2003). Though cities are the growth engine of national wealth and income production and it is predicted that in India around 70% GDP will be generated by its cities (Sankhe et al. 2010) but a large number of dwellers in cities circumvent from the mainstream (National Building Organisation 2011), these snubbed dwellers are the slum population. Basically, slums are the informal settlements in an urban area characterised by improper housing stock and low standard of living (National Building Organisation 2013), socially vulnerable (Loughhead and

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Dispersion of Love-type wave and its limitation in a nonlocal elastic model of nonhomogeneous layer upon an orthotropic extended medium

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ABSTRACT

This research paper investigates the Love-type surface wave dispersion in a nonlocal elastic nonhomogeneous medium over a nonlocal orthotropic semi-infinite medium under the effect of interior initial stress component. A generalized linear elasticity theory with the nonlocal effect in the fundamental stress-strain relation is adopted to address the equation of motion in layered media. In the case of time-harmonic plane wave propagation, PDEs (cf. equations of motion) of the nonlocal elasticity are reduced to closed-form singular differential equations. The equation of dispersive wave is derived using appropriate plane stress-displacement-continuity conditions of the model. The dispersion of Love-type wave and its limitation in a nonlocal elastic media are analyzed graphically using MATLAB software. For the specific model, it is observed that the attenuation of the dispersion of Love-type wave depends on a nonlocal parameter. Also, the dispersive wave becomes nondispersive with zero attenuation for large values (−0.4) of the nonlocal parameter. In the case of dispersive wave, variation of the phase velocity of the fundamental wave mode for different values of nonlocality, nonhomogeneity, wave number and initial stress parameters are shown graphically. Some special cases are deduced from the original dispersion equation and validated with the published literature.

1. Introduction

The impact of the strain field of the distant elements on the reference element is one of the renowned principles of classical (local) continuum mechanics. The influence of these distant effects on the nonlocal elasticity theory is known as nonlocal effects. It is known from the theory of nonlocal elasticity that the stress fields in an elastic material at a particular element depends not only on the strain at that particular element but also on the strain at every other elements in that domain (cf. Karličić et al. [1]). A classical (local) elasticity theory can be treated as nonlocal elasticity if one can consider the effects of the strain at all other points. The solution of the nonlocal elastic medium eliminates the singularities obtained by the local (classical) theory of elasticity which is one of the major advantages of the nonlocal elasticity theory. It is effectively devoted to the problems of fracture mechanics, wave propagation, dispersive and nondispersive nature of waves etc.

In this paper the nonlocal elasticity theory is applied to study the dispersive and nondispersive seismic waves propagation at the interface of the combination of nonhomogeneous and orthotropic layered media in the earth's crust. It is known that the interior structures of the earth are mainly divided into three hypothetical layered media (1) crust (surface to around 50 km depth), (2) mantle (around 2900 km depth after earth crust) and (3) core (after mantle to the centre of the earth, core has outer core (around 2200 km thick) and inner core (around 1530 km thick) layers). Propagation of surface waves along the interface of the two layers is an important aspect to the theoretical seismologist due to its possible applications in geomechanics, geophysics, structural analysis and earthquakes intensity. Here, we consented to the dispersion of Love-type wave in a nonlocal elastic media, existing in the earth crust layer. The Love type surface wave was determined by the British Mathematician Love [2] in 1911. It is a transversely propagated surface wave which moves in the medium side by side. Love wave is the fastest surface wave among all the seismic waves. The basic properties of the surface wave and the nature of its propagation in an isotropic medium was well discussed in the book by Ewing et al. [3].

In the last 20 years, a sufficient amount of work on the dispersion of surface wave have been done by numerous researchers in the field of classical (local) elastic medium. But only a few works so far have been

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A practical outlook towards Abhijana Shakuntalam by Kalidasa

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Magadh University, Bodh Gaya

Abstract: The play Abhijnana Shakuntalam is written by one of the greatest poets of India, Kalidasa. This play is a beautiful tale of romance between King Dushyanta and Shakuntala. The title of the play, which is originally in Sanskrit actually means "The recognition of Shakuntala" in English. Abhijnanashakuntalam is the first Indian play to be translated into different western languages. Kalidasa had extracted the story of Shakuntala from the great epic Mahabharata and painted it even more widely in his play Abhijnana Shakuntalam. The two protagonists of the play are Dushyanta and Shakuntala. The king of Hastinapur, Dushyanta is a noble and kind ruler who is respected by everyone. Shakuntala is a beautiful maiden who is the daughter of Sage Vishwamitra and Apsara Menaka. Shakuntala has grown up in the hermitage of sage Kanva since she was disposed by her birth parents.

Keywords: love token, distressed, lamenting, apsara, bond of love.

Story of the play: Dushyanta visits the hermitage of Kanva after a day of hunting, where he first gets a glance of the beautiful Shakuntala. He gets attracted to her from the very first moment when his eyes meet her beauty. After Shakuntala's consent, both get married in the Gandharva mode of wedding. However soon after their marriage, Dushyanta leaves for his kingdom with a promise to return and take Shakuntala back with him. Enchanted by love, Shakuntala keeps on thinking about her husband the entire time, which affects her surrounding. The angry Sage Durvasa visits the hermitage and begs for water at Shakuntala's door. However, she is so lost in the thoughts of her husband, that she fails to attend to the sage. Feeling insulted Durvasa incurs a curse on Shakuntala, which completely erases the memory of Shakuntala from Dushyanta's head. However, later he modifies the curse on the request of Anasuya and Priyamvada. He tells them that the lost memory can be revived if Shakuntala shows an ornament which is a token of their love. The token is actually a ring that Dushyanta had gifted to Shakuntala. After months of waiting for Dushyanta, Sage Kanva advises her to visit the court by herself. It is revealed that Shakuntala is heavily pregnant with Dushyanta's child by then. However while on her way to the kingdom, Shakuntala loses her ring in a lake. In the court, Dushyanta refuses to accept Shakuntala as his wife, as he completely loses his memory about their marriage, under the influence of the curse. He even makes several disparaging remarks about her character, which infuriates her. She is then escorted by the Apsaras into heaven, leaving everyone surprised. Eventually, after months, the ring is found by a fisherman. Dushyanta revives his memory back about Shakuntala when he sees that ring and breaks down in guilt. He becomes lovesick and curses himself for the adversity that he had caused. Later, Dushyanta is reunited with his wife Shakuntala and their son Bharat in the hermitage of Marica. Dushyanta begs for the forgiveness of Shakuntala and asks her to return back with him. Shakuntala forgives him and they both move back to Hastinapur. By critically analyzing, it can be said that Abhijnana Shakuntalam is one of the finest plays of Indian Literature. The theme of love and romance is very well evident in the play. Not just

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Assessing vegetation fragmentation and plantation efficiency in an intertidal mudflat of Eastern India using Radar Forest Degradation Index and spatial metrics

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ABSTRACT

Potentiality of Synthetic Aperture Radar (SAR) based Radar Forest Degradation Index (RFDI) combined with field observations for monitoring spatio-temporal dynamics of intertidal mudflat vegetation was assessed in this study. Five vegetation zones were delineated in the Junput mudflat of eastern India with very high classification accuracy (Kappa coefficient $\geq$ 0.79). Fragmentation and coalescence patterns of different vegetation zones under two plantation initiatives were also analysed by different spatial metrics. Results reveal gradual degradation of tree dominated vegetation zones and growth of shrub dominated and herbaceous ones from 2007 to 2019. Plantation of exotic species like *Eucalyptus globulus* and *Casuarina equisetifolia* along the shoreline had been found to be less effective against storms and sea surges. Conversely, native mangrove plantations and associated herbs had demonstrated remarkable growth in the intertidal areas. Based on the findings, the study pointed out that a zone-wise cum site-specific plantation strategy is needed towards developing effective bio-shields.

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KEYWORDS
Casuarina plantation; fragmentation statistics; mangrove patch; microwave remote sensing; wetland vegetation zonation

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Spatial and temporal trends of urban green spaces: an assessment using hyper-temporal NDVI datasets

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ABSTRACT

Since the last couple of decades urban areas of developing countries have been experiencing unprecedented growth. However, this growth is not well planned in most of the cities. Even in recent days, there is no significant change in city planning and still, there is a lack of concern regarding environmental issues especially the changing green covers in cities. Identifying the green space dynamics of major cities is crucial considering strategic planning of smart cities, policy intervention and combating the problems associated with degreening. The present study attempts to assess the potentiality of hyper-temporal normalized difference vegetation index (NDVI) and its temporal trend as an indicator of greening or de-greening process in Delhi National Capital Territory (NCT) and its peri-urban areas. Ten days composite hyper-temporal SPOT-VGT (Satellite Pour l'Observation de la Terre Vegetation) NDVI images (1998–2013) have been used for identifying the vegetation trend and further, it was compared with long-term CHIRPS (climate hazards centre infrared precipitation with station data) rainfall data to unveil the root causes behind the variation in vegetation trend specifically the contribution of natural and anthropogenic factor in changing scenario of urban green space. The study shows that hyper-temporal NDVI data with sufficient temporal depth can be highly convenient to explore the trend of vegetation and changes in green space. The spatio-temporal pattern of NDVI trend indicates a significant part of the area including Noida, Gurgaon etc. experienced decreasing vegetation trend which can be explained by large scale conversion of vegetated land into built-up areas due to establishment of new multi-storied buildings. The strong negative correlation ($r \leq -0.8$) between rainfall-NDVI indicates that rainfall is not the major controlling factor of vegetation trend in that area rather anthropogenic activities played a significant role in depletion of vegetation. During 1998–2013, the areas of bounding zone have

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Hyper-temporal NDVI; time trend analysis; urban green space; rainfall-NDVI correlation; Delhi

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RESILIENT AND SUSTAINABLE WATER MANAGEMENT IN AGRICULTURE

Future prediction of water balance using the SWAT and CA-Markov model using INMCM5 climate projections: a case study of the Silwani watershed (Jharkhand), India

Mukesh Kumar[1] · Lakhan Lal Mahato[2] · Shakti Suryavanshi[3] · Sudhir Kumar Singh[4] · Arnab Kundu[5] · Dipanwita Dutta[6] · Deepak Lal[1]

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Abstract

The aim of this research was to simulate the future water balance of the Silwani watershed, Jharkhand, India, under the combined effect of land use and climate change based on the Soil and Water Assessment Tool (SWAT) and Cellular Automata (CA)-Markov Chain model. The future climate prediction was done based on daily bias-corrected datasets of the INMCM5 climate model with Shared Socioeconomic Pathway 585 (SSP585), which represent the fossil fuel development of the world. After a successful model run, water balance components like surface runoff, groundwater contribution to stream flow, and ET were simulated. The anticipated change in land use/land cover (LULC) between 2020 and 2030 reflects a slight increase (3.9 mm) in groundwater contribution to stream flow while slight decrease in surface runoff (4.8 mm). The result of this research work helps the planners to plan any similar watershed for future conservation.

Keywords SWAT model · CA–Markov chain model · Recent climate projections · Water balance · Water yield · Percolation

Introduction

Quantifying the future impact of climate and land use change on hydrologic variables of the watershed is a thrust area of research in the field of hydrology to understand the availability and distribution of water for different uses in the near future (Kumar et al. 2022). Furthermore, sustainability of existing structures and for the development of innovative water resource management plans for a specific basin or watershed can also be studied through such modelling studies. The spatiotemporal change of any landscape is a global concern given its impacts on human and animal lives

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Comparative framework for spatially explicit urban growth modeling for monitoring urban land-use efficiency and sustainable urban development (SDG 11.3.1): a study on Kolkata metropolitan area, India
Sk Mithun, Mehebub Sahana, Subrata Chattopadhyay, Soumendu Chatterjee, Jaidul Islam & Romulus Costache
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Abstract
1. Introduction
2. The study area
3. Database and
Abstract
Formulae display: MathJax
The present study attempts to model the spatiotemporal urban growth of the Kolkata metropolitan area (KMA), India, in a comparative modeling framework using three (remote sensing and geographic information system) RS-GIS integrated techniques, namely stochastic-choice Markov-chain (STCHOICE), cellular automata-Markov (CA-MARKOV), and multi-layer perceptron neural network (MLPNN) coupled with Markov-chain approaches intending to monitor land-use efficiency defined by United Nations for
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কলা ও মানববিদ্যা বিষয়ক গবেষণাধর্মী রেফার্ড ও পিয়ার-রিভিউড পত্রিকা

সমাজ-সংস্কৃতি-সাহিত্য

সম্পাদনা ও সংকলন
ড. দেবারতি মল্লিক
ড. দীপঙ্কর মল্লিক

আমন্ত্রিত সম্পাদক
ড. লিপিকা সরকার

দি গৌরী কালচারাল এন্ড এডুকেশনাল অ্যাসোসিয়েশন
সমাজ-সংস্কৃতি-সাহিত্য গবেষণাকেন্দ্র

আল মাহমুদের কবিতায় ধর্মভাবনা

প্রদীপকুমার পাত্র

আধুনিক বাংলা সাহিত্যের একজন প্রবাদপ্রতিম ব্যক্তিত্ব হলেন আল মাহমুদ (১৯৩৬—২০১৯)। তাঁর রচিত কাব্যগ্রন্থের মধ্যে 'লোক-লোকান্তর' (১৯৬৩); 'কালের কলস' (১৯৬৬); 'সোনালি কাবিন' (১৯৭৩); 'মায়াবী পর্দা দুলে ওঠো' (১৯৭৬); 'অদৃষ্টবাদীদের রান্নাবান্না' (১৯৮০); 'বখতিয়ারের ঘোড়া' (১৯৮৫); 'আরব্য রজনীর রাজহাঁস' (১৯৮৭); 'একচক্ষু হরিণ' (১৯৮৯); 'বারুদগন্ধী মানুষের দেশ' (২০০৬) প্রভৃতি উল্লেখযোগ্য। তাঁর কবিতায় ফুটে উঠেছে সমকাল সমাজ-রাজনীতি-সংস্কৃতি, প্রাচীন ও মধ্যযুগের সাহিত্যের সঙ্গে আধুনিক সাহিত্যের মেলবন্ধন, প্রেম ভাবনা, প্রকৃতি চেতনা, ঈশ্বর প্রেম। কবি আল মাহমুদ প্রথম জীবনে ছিলেন সংশয়বাদী, বামপন্থী, মার্কসীয় চিন্তা-চেতনার ধারক ও বাহক। তারপর ধীরে ধীরে তাঁর বিশ্বাসে নানান পরিবর্তন এসেছে। মুক্তিযুদ্ধের সময় ভারতে আশ্রয় লাভ করেছিলেন। তারপর দেশ স্বাধীন হলে নিজ দেশ বাংলাদেশে ফিরে যান। তারপর তৎকালীন সরকারের বিরোধিতার কারণে কারারুদ্ধ হন। তখন তার জীবনে গুরুত্বপূর্ণ পরিবর্তন সংঘটিত হয়। তিনি বলেন—

> আমি নিসর্গরাজি অর্থাৎ প্রকৃতির মধ্যে এমন একটা সংক্ষিপ্ত প্রেমের মঙ্গলময় ষড়যন্ত্র দেখতে পাই যা আমাকে জগতরহস্যের কার্যকারণের কথা ভাবায়। এইভাবেই আমি ধর্মে এবং ধর্মের সর্বশেষ এবং পূর্ণাঙ্গ বীজ মন্ত্র পবিত্র কোরানে এসে উপনীত হয়েছি। (আল মাহমুদ : 'কবিতার জন্য বহুদূর'; পৃ. ৩২-৩৩)

এরপর কবি আরও জোরালো ভাষায় তাঁর বিশ্বাস ও প্রত্যয় ব্যক্ত করেন—

> আমি ইসলামকেই আমার ধর্ম, ইহলোকেই আমার ধর্ম, ইহলোক ও পারলৌকিক শান্তি বলে গ্রহণ করেছি। আমি মনে করি একটি পারমাণবিক বিশ্ববিনাশ যদি ঘটেই যায়, আর দৈবক্রমে মানবজাতির যদি কিছু অবশ্য চিহ্নমাত্র অবশিষ্ট থাকে তবে ইসলামই হবে তাদের একমাত্র আচরণীয় ধর্ম। এই ধর্ম প্রতিষ্ঠার জন্যই আমার কবি স্বভাবকে আমি উৎসর্গ করেছি।...আল্লাহ প্রদত্ত কোন নিয়ম নীতিই কেবল মানবজাতিকে শান্তি ও সাম্যের মধ্যে পৃথিবীতে বসবাসের সুযোগ দিতে। পরে আমার ধারণা পবিত্র কোরানেই সেই নীতিমালা সুরক্ষিত হয়েছে। এই হলো আমার বিশ্বাস। আমি এ ধারণারই একজন অতি নগন্য কবি। (আল মাহমুদ : 'কবিতার জন্য বহুদূর', পৃ. ৩৩)

এই বক্তব্যের পাশাপাশি 'অদৃষ্টবাদীদের রান্নাবান্না' (১৯৮০); 'বখতিয়ারের ঘোড়া' (১৯৮৫);

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Late Quaternary sediments from Barakar-Damodar Basin, Eastern India include the 74 ka Toba ash and a 17 ka microlith toolkit

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Youngest Toba Tuff
Palaeolithic culture
Fossil fauna
Glass shards
Pleistocene records

ABSTRACT

The Youngest Toba Tuff (YTT, 74 ka ago) is considered as the product of one of the largest super-volcanic events in the Quaternary period, which possibly caused a disastrous effect on the climate and hominid habitation. Here, we report a rare occurrence of an ~ 2 cm YTT ash bed in the Barakar-Damodar Late Quaternary sediments, Eastern India, and the Microlith toolkits that were found in the sedimentary deposits above the ash layer. The high silica content of the glass shards with bubble walls, blocky, rod-shaped structures, and pumice morphology, are similar to other YTT ash deposits. The sedimentary facies associated with the ash layer show a transition from lacustrine to fluvial depositional environments. Sedimentological, petrographical, mineralogical, geochemical, and magnetic properties suggest the ash was deposited in a lacustrine environment. Moreover, the discovery of the ash bed, the occurrence of *in-situ* Bovid species, and microlith assemblages in the Barakar-Damodar Valley add to our understanding of late Pleistocene depositional environments, hominin occupations, and possible local migration across eastern India during the Last Glacial Maximum (LGM) period.

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Unveiling the Capitalist Society's Wasteland: the Struggle for Liberation in the Play Bhoma by Badal Sircar

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ABSTRACT

The growth of capitalistic society and its impact on rural and semi urban life has been a major concern in many Indian writings. The operation of capitalism is hegemonic. The Neo-Marxist laid bare the subtle functioning of capitalism through varied discourses like hegemony and ideologies. The culture Industry as a dominant ideology paralyzed the latent possibilities of working class for any future revolution. The present paper seeks to analyze the play *Bhoma* one of many Third Theatre productions by Badal Sircar as a critique of late capitalism. The play employed the metaphor of Waste Land to powerfully convey the exploitative nature of capitalism not only on the working-class people but also on Nature. The play is a watershed moment in Sircar's Third Theatre productions. The play is an attempt on Sircar's part to negotiate with the alienation of modern society. The paper will critically examine how the personal and social crisis of the protagonist unveils novel form of resistance.

Key Words: Third Theatre, Waste Land, Resistance, Culture Industry, hegemony

INTRODUCTION

The play *Bhoma*, one of many Third Theatre productions by Badal Sircar is an epitome of Bengali experimental drama and Alternative theatre .The composition and innovative staging of the play caught the imagination of not only local peasantry but also of the wider national theatre audience.The play is written to shock the Bengali Bhadralok or self occupied and self obsessed middle class out of their complacency. The play portrayed Calcutta as the Waste Land and the middle class gentry as the hollow men and the poor class as an invisible ghost like entity.The abject and hapless condition of poor class is given an accurate and minute delineation through the ubiquitous character of Bhoma. Though the character himself never appears in person in the play but he is the cynosure. The play is quest for Bhoma. In the context of the play Bhoma is an archetypal figure which symbolizes the indigenous or the aboriginal or the adivasi in the lap of Nature. And all have suffered at the hand of giant capitalism. The play also highlighted two sheds of our nation- one is India developing and progressive and the other is Bharatbarsha underdeveloped, poor and a site of subaltern subjugation and oppression. The play is also a critique of post-colonial hang over and jingoism and Bengali middle class complacency.

The play has no linear plot, story and as such no characterization.The play is like a collage of different scene .Regarding the composition of the play Sircar commented but Bhoma's story is not there in this play .Seeing, feeling and learning about our surroundings shock us, hurt us, anger us—these have come out in disjointed, dramatic pictures. Bhoma's picture was then part of those pieces, then somehow it was Bhoma' s image which started to become the link; (Bandyopadhyay 57) It is rather safe to say that the play contains six actors or performers instead of characters because there is no precise characterization as such. The characters have not been allotted any specific name.The actor is named as One, Two, Three, Four, Five and Six. Each actor enacts different character.It provides flexibility and fluidity to the director when it comes to the direction of the play.Namelessness to certain extant also refers to the universal nature of the story. Claire Wakden in his book *British Avant-GardeTheatre* provided an opposite observation on the namelessness of character in the avant-garde plays;

In using denotation terms, ‚Zero' and ‚A', the playwrights were directly commenting on the position of these character types in modern society; insignificant and unnoticed by the hegemony, real names are conspicuous by their absence. Yet the names also represent the position these characters have adopted for themselves, active participators in their own subjugation.