



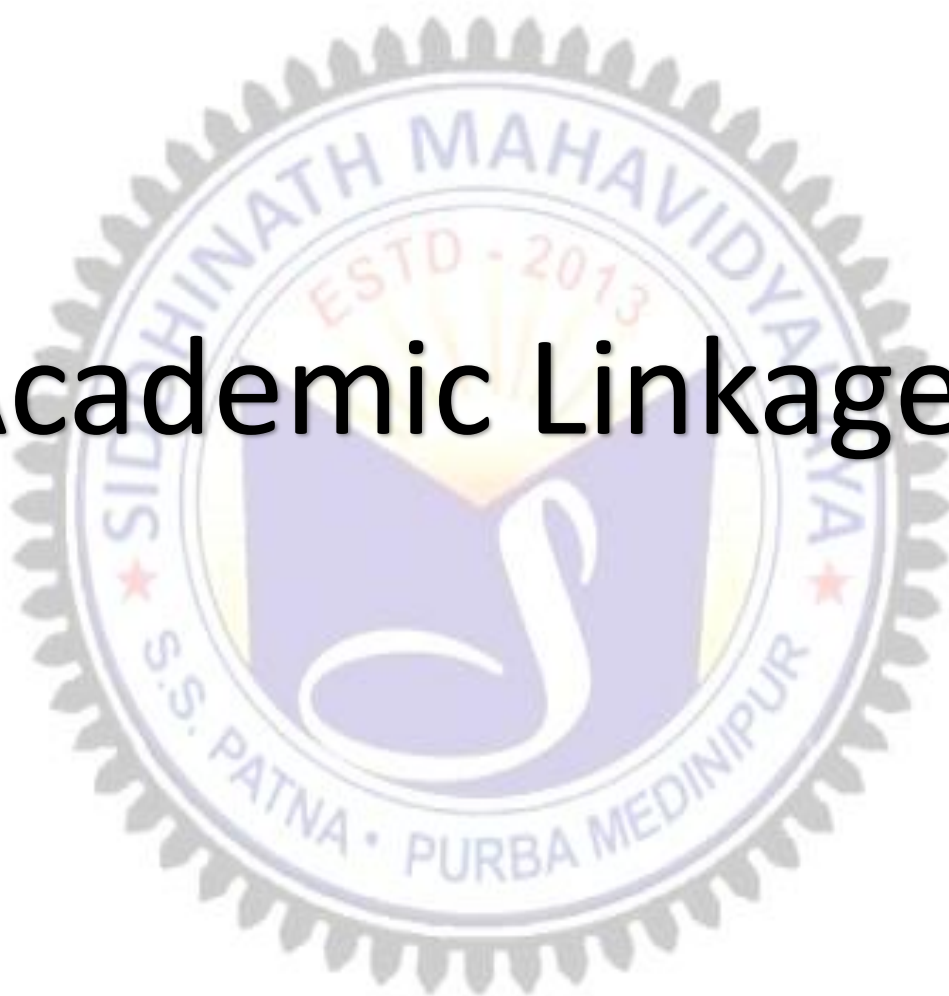
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Ph.D. COURSE WORK EXAMINATION APRIL 2023 GRADE SHEET CUM CERTIFICATE

School	: SCHOOL OF ARTS & HUMANITIES
Student's Name	: ARPITA CHAKRABORTTY
Father's/Husband's Name	: GOURISANKAR CHAKRABORTTY
Mother's Name	: SHIPRA CHAKRABORTTY
Enrollment No.	: 22AHM10PSN120008
Roll No.	: PHDAH22068
Programme	: Ph.D.
Semester	: I
Subject	: SANSKRIT

Subject Code	Subject Name	Credit	Grade	Remarks
PHD101	Research Methods and Methodology	4	A	
PHD102	Computer Application	4	A	
PHD103 SAN	Sanskrit Literature	4	B+	
PHD201 (CPE-RPE)	Research and Publication Ethics (RPE)	2	B+	
PHD202	Literature Review (Report and Presentation)	2	A	
Total Credits :		16		
Result :	Pass	SGPA : 7.63		
Percentage :	76.3	Division : First		

Equivalent Percentage = SGPA x 10

F Grade in Repeat Examination

This is certified that Mr./Ms./Mrs. **ARPITA CHAKRABORTTY**

has successfully completed the Ph.D. Course Work as per UGC Regulations, 2016 and the Ph.D. Ordinance of the University.

Date of Ph.D. Entrance Test : 17-07-2022

Date of Issue : 05-07-2023



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Science of the Total Environment 907 (2024) 167933

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Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



Evaluation of overwash vulnerability and shoreline dynamics in cyclone-prone Sagar Island, Sundarbans (India)

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HIGHLIGHTS

- Overwash vulnerability evaluated in Sagar Island, showing increased susceptibility.
- Shoreline change from 2000 to 2020 analyzed, factoring severe cyclonic events.
- Three indices (OSR, MOIR, CBO) used to reveal critical overwash intrusion patterns.
- Positive correlation identified between shoreline recession and climatic influences.
- Study results can guide coastal planning and adaptive strategies for climate change.

GRAPHICAL ABSTRACT



ARTICLE INFO

Editor: Fernando A.L. Pacheco

Keywords:

Coastal dynamics
Cyclonic events
Overwash vulnerability
Shoreline change
Sagar Island
Climate change adaptation

ABSTRACT

Situated in the climatically vulnerable Sundarbans region, Sagar Island has increasingly been subjected to intense cyclonic events, including Yaas, Amphan, Bulbul, and Aila, leading to significant alterations in its coastal morphology. This study aims to elucidate the overwash vulnerability and shoreline dynamics in Sagar Island, spanning the period from 2000 to 2020. Utilizing satellite imagery, the study employs three indices—Overwash Shoreline Ratio (OSR), Maximum Overwash Intrusion Recurrence (MOIR), and Complete Barrier Overwash (CBO)—to assess overwash vulnerability. These indices collectively indicate a heightened susceptibility to overwash intrusion, with a particular focus on the years following severe cyclonic events. Additionally, shoreline change dynamics were quantitatively analyzed using the Digital Shoreline Analysis System (DSAS) tool, revealing a strong positive correlation between shoreline recession and climatic variables. Interlinkages between overwash vulnerability and shoreline dynamics were established, confirming that both phenomena are exacerbated by climate change and extreme weather events. The study's findings have critical implications for a broad

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<https://doi.org/10.1016/j.scitotenv.2023.167933>

Received 19 August 2023; Received in revised form 26 September 2023; Accepted 17 October 2023

Available online 26 October 2023

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A multi-temporal analysis of shoreline dynamics influenced by natural and anthropogenic factors: Erosion and accretion along the Digha Coast, West Bengal, India

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ARTICLE INFO

Keywords:

Coastal management
DSAS
Geospatial analysis
Long-to-short term change
Sediment dynamics
Shoreline change

ABSTRACT

This investigation analyzed shoreline evolution along India's Digha Coast from 1992 to 2022, using multispectral Landsat satellite images and the Digital Shoreline Analysis System (DSAS). Methods included identifying zones and transects, shoreline extraction, and applying spatial statistical techniques. The study area, divided into five zones with 587 transects, enabled both short- and long-term analysis. Key findings indicate that the mean long-term rate of shoreline change is -0.54 m per year, with 70.70 % of transects experiencing erosion and 29.30 % accretion. Notably, Zone V had the highest accretion rate (8.55 m/year), while Zone III faced the most erosion (-7.47 m/year). Short-term analysis from 1997 to 2017 indicated significant erosion, contrasting with accretion during 1992–1997 and 2017–2022. Particularly, Zones II, III, and IV underwent major erosion, especially from 1997 to 2002. The study underscores the need for continuous shoreline management strategies and demonstrates geospatial technology's effectiveness in capturing coastal landscape changes.

1. Introduction

The pervasive issue of coastal erosion impacts over two-thirds of the globe's shorelines, marking it as a significant concern (Mandal and Chaudhuri, 2023; Santos et al., 2021, 2024). The shoreline stands as a dynamic and delicate boundary bridging the land and sea in coastal regions (Nath et al., 2023). Understanding the shifts in shorelines over time holds the utmost significance for coastal researchers, engineers, and land planners. Such analysis serves the dual purpose of comprehending the ever-changing nature of coastlines and assessing the potential risks posed to coastal habitats (Nandi et al., 2016; Kelly and Gontz, 2019; Thakur et al., 2021). Studies indicate that approximately 7 % of sandy beaches worldwide are undergoing severe erosion, with rates plummeting between 3 m per year and 5 m per year. Moreover, around 24 % of these beaches witness a continuous erosion trend, surpassing 0.5 m per year (Mishra et al., 2021a). In past decades, extensive field investigation, shoreline tracing from toposheets, and aerial photographs were employed to delineate shoreline positions. Changes in the

shoreline can occur as a result of both natural and human activities. Three major factors—climate change, population growth, and economic development—directly impact human communities globally (Mondal et al., 2020). Nature, with its significant influence, shapes coastal landscapes through processes such as erosion, sedimentation, geomorphological factors, sea-level fluctuations, and extreme climatic events like storms and hurricanes (Mishra et al., 2021b).

Conversely, human activities also play a crucial role in altering the shoreline. Uncontrolled coastal development, infrastructure construction, natural resource extraction, and unregulated urbanization can result in adverse impacts on coastal zones. Additional stressors such as deforestation, pollution, the presence of invasive species, and inappropriate exploitation of coastal ecosystems further exacerbate these changes (Baral et al., 2018; Hossain et al., 2021; Hossain et al., 2022). Continual shoreline erosion increases the vulnerability of coastal habitats, impacts physical and anthropogenic coastal resources, leads to mangrove destruction, and results in the loss of habitable and agricultural land (Sekar et al., 2023). Over recent centuries, issues related to

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<https://doi.org/10.1016/j.marpolbul.2024.116089>

Received 20 October 2023; Received in revised form 23 January 2024; Accepted 27 January 2024
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Dynamic shoreline alterations and their impacts on Olive Ridley Turtle (*Lepidochelys olivacea*) nesting sites in Gahirmatha Marine Wildlife Sanctuary, Odisha (India)

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ARTICLE INFO

Keywords:

Arribada phenomenon
Biodiversity preservation
Erosional impacts
Geographical habitat transition
Marine sanctuary extension
Turtle nesting behavior

ABSTRACT

Currently, sea turtle habitats are being altered by climate change and human activities, with habitat loss posing an urgent threat to Indian sea turtles. Thus, the objective of this study is to analyze the dynamic shoreline alterations and their impacts on Olive Ridley Sea Turtle (ORT) nesting sites in Gahirmatha Marine Wildlife Sanctuary from 1990 to 2022. Landsat satellite images served as input datasets to assess dynamic shoreline changes. This study assessed shoreline alterations and their rates across 929 transects divided into four zones using the Digital Shoreline Analysis System (DSAS) software. The results revealed a significant 14-km northward shift in the nesting site due to substantial coastal erosion, threatening the turtles' Arribada. This study underscores the need for conservation efforts to preserve nesting environments amidst changing coastal landscapes, offering novel insights into the interaction between coastal processes and marine turtle nesting behaviors.

1. Introduction

Knowledge about the habitats of Olive Ridley Sea Turtles (ORTs) (*Lepidochelys olivacea*) remains limited (Carpenter-Catoira et al., 2022). The coastal and insular regions of India serve as critical nesting grounds for a diverse array of sea turtle species, including the leatherback turtle (*Dermochelys coriacea*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), and the ORT (Barik et al., 2023). Among these, the ORT is distinguished by its extensive global distribution and its status as the most abundant of the sea turtle species (Chattopadhyay et al., 2018). The mass nesting of ORTs, a phenomenon of significant ecological interest, is increasingly influenced by various factors, including extreme climatic events, severe cyclonic storms (Mishra et al., 2023b), artificial lighting (Karnad et al., 2009; Pradhan et al., 2022), and physical alterations in their nesting

habitats. Recent decades have seen an escalation in cyclonic activity (Paul et al., 2024) and shoreline changes due to sea advancement in the Odisha region (Mishra et al., 2023a), exacerbating biodiversity loss and presenting profound environmental challenges, notably in the loss of nesting sites vital for ORT conservation (Mishra et al., 2023b). While some insights into ORT nesting site selection have been gleaned (Pikesley et al., 2013), the primary determinants guiding this selection remain largely elusive. The nesting and breeding of female turtles are contingent upon specific geo-environmental conditions, yet the threats to mass nesting have received more attention in the literature than the identification of conducive conditions for such phenomena (Palomino-González et al., 2020).

ORTs predominantly inhabit tropical waters, with significant populations engaging in synchronous breeding in a limited number of locales worldwide, including Mexico, Costa Rica (Ariano-Sánchez et al.,

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<https://doi.org/10.1016/j.marpolbul.2024.116321>

Received 21 February 2024; Received in revised form 27 March 2024; Accepted 28 March 2024

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Science of the Total Environment 917 (2024) 170230



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Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



Geo-ecological, shoreline dynamic, and flooding impacts of Cyclonic Storm Mocha: A geospatial analysis

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HIGHLIGHTS

- Cyclone Mocha's impact on ecology, coastlines, and climate in Rakhine & Chittagong
- Employed NDVI, EVI, mVCI, DVDI, and FVC for post-cyclone vegetation analysis
- Utilized DSAS for detailed pre- and post-cyclone shoreline change analysis
- Analyzed soil exposure and water inundation using BSI and MNDWI
- Detected key meteorological changes: surge in rainfall and wind speed

GRAPHICAL ABSTRACT



ARTICLE INFO

Editor: Fernando A.L. Pacheco

Keywords:

Tropical cyclone
Vegetation damage
Net Shoreline Movement
Natural hazards
Coastline alterations
Climatic extremities

ABSTRACT

This research comprehensively assesses the aftermath of Cyclonic Storm Mocha, focusing on the coastal zones of Rakhine State and the Chittagong Division, spanning Myanmar and Bangladesh. The investigation emphasizes the impacts on coastal ecology, shoreline dynamics, flooding patterns, and meteorological variations. Employed were multiple vegetation indices—Normalized Difference Vegetation Index (NDVI), Enhanced Vegetation Index (EVI), Modified Vegetation Condition Index (mVCI), Disaster Vegetation Damage Index (DVDI), and Fractional Vegetation Cover (FVC)—to evaluate ecological consequences. The Digital Shoreline Assessment System (DSAS) aided in determining shoreline alterations pre- and post-cyclone. Soil exposure and flood extents were scrutinized using the Bare Soil Index (BSI) and Modified Normalized Difference Water Index (MNDWI), respectively. Additionally, the study encompassed an analysis of microclimatic variables, comparing meteorological data across pre- and post-cyclone periods. Findings indicate significant ecological impacts: an estimated 8985.46 km² of dense vegetation (NDVI >0.6) was adversely affected. Post-cyclone, there was a discernible reduction in EVI values. The mean mVCI shifted negatively from −0.18 to −0.33, and the mean FVC decreased from 0.39 to 0.33. The DVDI underscored considerable vegetation damage in various areas, underscoring the cyclone's extensive impact. Meteorological analysis revealed a 245 % increase in rainfall (20.22 mm on May 14, 2023 compared to

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<https://doi.org/10.1016/j.scitotenv.2024.170230>

Received 16 October 2023; Received in revised form 28 December 2023; Accepted 15 January 2024

Available online 24 January 2024

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Current patterns and trends of microplastic pollution in the marine environment: A bibliometric analysis

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Received: 2 August 2023 / Accepted: 13 February 2024

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Abstract

Microplastics are pervasive in the natural environment and pose a growing concern for global health. Plastic waste in marine environments has emerged as a global issue, threatening not only marine biota but also human health due to its implications for the food chain. This study aims to discern the patterns and trends of research, specifically on Marine Microplastic Pollution (MMP), based on a bibliometric analysis of scientific publications from 2011 to 2022. The methodology utilized in this study comprises three stages: (a) creating a bibliographical dataset from Scopus by Elsevier and the Web of Science Core Collection by Clarivate Analytics, (b) analyzing current research (trends and patterns) using bibliometric analysis through Biblioshiny tool, and (c) examining themes and subthemes in MMP research (wastewater treatment, plastic ingestion, the Mediterranean Sea, microplastics pollution, microplastics in freshwater, microplastic ingestion, plastic pollution, and microplastic pollution in the marine environment). The findings reveal that during the studied period, the number of MMP publications amounted to 1377 articles, with an average citation per publication of 59.23 and a total citation count of 81,553. The most cited article was published in 2011, and since then, the number of publications on this topic has been increasing steadily. The author count stood at 5478, with 22 trending topics identified from the 1377 published titles. Between 2019 and 2022, the countries contributing most to the publication of MMP articles were China, the United States of America (USA), and the United Kingdom (UK). However, a noticeable shift in the origin of author countries was observed in the 2019–2022 timeframe, transitioning from a dominance by the USA and the UK to a predominance by China. In 2019, there was a substantial increase in the volume of publications addressing the topic of microplastics. The results show that the most prevalent themes and subthemes pertained to MMP in the Mediterranean Sea. The journals with the highest number of MMP articles published were the *Marine Pollution Bulletin* (253 articles) and *Science of the Total Environment* (190 articles). The analysis concludes that research on MMP remains prominent and appears to be increasing each year.

Keywords Marine pollution · Environmental degradation · Oceanic ecosystem · Tendencies

Introduction

The rise of the microscale plastic industry began in the 1950s (Zhang et al. 2019a), and it has now grown to a colossal scale, with an estimated production of about 8300 million metric tons of plastic (Geyer et al. 2017; Thacharodi et al. 2024). The influence of Marine Microplastic Pollution (MMP) on various organisms and the management strategies for MMP have quickly evolved into a substantial area of scientific research (Wang et al. 2022b). Alarming, over

99% of plastic is synthesized from non-renewable resources such as oil, coal, and natural gas (Milad et al. 2020; Zhao et al. 2021). Microplastics (MPs) pose a considerable risk due to their inherent toxicity from plastic additives and their capacity to soak up harmful substances from their surroundings. They become toxic carriers when consumed by organisms like invertebrates, fish, birds, and mammals, leading to the potential transfer of these toxic elements and potentially causing significant health problems (Koelmans et al. 2022; Zheng et al. 2023).

On a population scale, MMP can result in a reduction in species count or biomass (Zhang et al. 2021a). On an individual scale, they can negatively affect various aspects of an organism's life, such as survival, growth, reproduction,

Responsible Editor: Philippe Garrigues

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Unnati International Journal of Multidisciplinary Scientific Research (U.I.J.M.S.R.)
Peer Reviewed - Refereed Journal & Impact Factor - 4.8, Open Access, Double Blind
Monthly Journal, ISSN : 2581-8872, Vol. : 5, No. : 5, June - 2023, Special Issue English

2023

Exploring the Impact and Potential of Open Educational Resources (OER) In Education

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Abstract :- Open Educational Resources (OER) have become increasingly prominent in the field of education due to their ability to provide cost-free and readily available educational materials that can be utilized, modified, and distributed by educators and learners globally. This article delves into the extensive influence and possibilities of OER in education, with a specific emphasis on the advantages it offers, the obstacles it may encounter, and the potential it holds for the future. Moreover, it delves into the effective strategies for employing OER and investigates how these resources can contribute to the creation of a more comprehensive and inventive education system.

Keywords :- Open Educational Resources (OER), Education, Accessibility, Affordability, Innovation, Creative Commons.

Introduction :- Open Educational Resources (OER) have emerged as a transformative force within the realm of education, offering an abundance of freely accessible and openly licensed materials that educators and learners worldwide can utilize, modify, and share. These resources encompass a wide array of educational tools, ranging from textbooks and lecture notes to videos and interactive modules, all of which can be readily accessed online without any cost attached. The purpose of this paper is to delve into the profound impact and untapped potential of OER in the field of education, with a specific focus on the myriad benefits it brings, the challenges it faces, and the future prospects it holds. Additionally, this paper will explore best practices for effectively utilizing OER and examine how its integration can contribute to the development of a more inclusive and innovative education system. In essence, this

comprehensive overview aims to shed light on the pivotal role of OER in shaping the future of education. At its core, the concept of OER is deeply rooted in the principles of open access and collaboration, with the overarching goal of democratizing education and making top-notch learning resources available to individuals regardless of their geographical location or financial circumstances. By harnessing the potential of OER, the education landscape holds the promise of undergoing a radical transformation, marked by enhanced accessibility to learning materials, reduced financial burdens for students, and a vibrant culture of innovation and collaboration in the realm of teaching and learning.

Review of Literature :- In a research conducted by **Mishra and Singh (2017)**, the effects of incorporating OER into teaching and learning practices in Indian higher education institutions were investigated. The results indicated that the adoption of OER resulted in heightened levels of student engagement and enhanced learning outcomes. Similarly, a study by **Ramesh and Mishra (2016)** delved into the influence of OER on the professional development of teachers in India. The findings revealed that OER enabled educators to access a plethora of new and creative teaching materials, consequently enhancing their teaching methodologies.

Open Educational Resources (OER) have been proven to enhance the accessibility of educational resources for students in India, specifically those residing in remote locations or areas that lack sufficient educational facilities, as revealed in a study conducted by **Mishra and Singh in 2017**. By offering free access to educational materials, OER also effectively

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Impact of Yoga as a Predictor of Mindfulness, Self-Compassion and Quality of Life

Dipanwita Ghana

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Prof (Dr.) Usha Khandelwal

Head, Department of Philosophy, Eklavya University, Damoh (M.P.)

Abstract :- This research paper delves into the connection between practicing yoga and its influence on mindfulness, self-compassion, and overall quality of life. The primary objective of this study is to examine whether engaging in regular yoga practice leads to higher levels of mindfulness, self-compassion, and overall quality of life. To achieve this, a sample of [number] participants, ranging in age from [range], who regularly engages in yoga, will be asked to complete a set of standardized questionnaires which include the Mindful Attention Awareness Scale (MAAS), the Self-Compassion Scale (SCS), and the World Health Organization Quality of Life (WHOQOL) scale. By utilizing regression analysis, the collected data will be analyzed in order to identify the predictive relationship between yoga practice and mindfulness, self-compassion, and quality of life. The anticipated outcome of this study is to contribute valuable insights to the existing knowledge base on the advantages of practicing yoga, thus providing guidance for future research endeavors and interventions aimed at enhancing mental health and overall well-being.

Keywords :- Yoga, mindfulness, self-compassion, quality of life, predictor.

Introduction :- Yoga, an age-old tradition, has become widely embraced across the globe for its array of advantages for the body, mind, and soul. In recent times, there has been a surge in studies exploring the psychological benefits of yoga, particularly its effects on mindfulness, self-compassion, and overall well-being. Mindfulness pertains to the capacity to be fully present and attentive to one's thoughts, emotions, and bodily sensations without passing judgment. Self-

compassion involves treating oneself with gentleness and empathy, particularly during challenging moments. Quality of life encompasses various facets of wellness, encompassing physical, mental, and social well-being.

Yoga philosophy places great importance on the concept of mindfulness, which involves being fully present and conscious of one's thoughts, emotions, and physical sensations. This focus on mindfulness is believed to be crucial for achieving self-awareness and recognizing the interconnectedness of all living beings. Furthermore, yoga philosophy also emphasizes the practice of self-compassion, which involves treating oneself with kindness and empathy. By cultivating self-compassion, individuals can develop a profound sense of understanding and compassion towards others, resulting in a more balanced and contented existence.

Despite the philosophical foundations of yoga, empirical research on the relationship between yoga practice and mindfulness, self-compassion, and quality of life is limited. This study seeks to bridge this gap by investigating whether engaging in regular yoga practice predicts higher levels of mindfulness, self-compassion, and quality of life. By applying philosophical frameworks to understand the impact of yoga on these psychological constructs, this study aims to contribute to the philosophical discourse on yoga and its potential for promoting mental health and well-being.

Review of Literature:- Numerous studies have provided compelling evidence to support the notion that engaging in yoga exercises can significantly contribute to the improvement of mindfulness, as effectively evaluated through the



The Philosophical Foundations of Yoga: Exploring the Relationship Between Body, Mind and Spirit : A Review

Dipanwita Ghana

Research Scholar

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Abstract :- This research paper delves into the deep philosophical roots of yoga and explores the intricate connection between the body, mind, and spirit as described in ancient Indian scriptures. Yoga goes beyond being just a physical exercise and encompasses a holistic system that incorporates various philosophical principles to promote overall well-being. By referencing texts such as the Vedas, Upanishads, and the Bhagavad Gita, which serve as the foundation of yoga philosophy, this paper investigates key principles like dharma, karma, and moksha. Furthermore, it analyses Patanjali's Yoga Sutras and the concept of the eight limbs of yoga, highlighting their importance in guiding ethical and spiritual living. Through an in-depth examination of the philosophical aspects of yoga, this paper aims to deepen our understanding of its profound impact on human consciousness and overall health.

Keywords :- Yoga, philosophical foundations, body-mind-spirit, Vedas, Upanishads, Bhagavad Gita, dharma, karma, moksha, Patanjali's Yoga Sutras, eight limbs of yoga, holistic well-being.

Introduction :- Patanjali's Yoga Sutras, a key text in yoga philosophy, outlines the eight limbs of yoga, serving as a roadmap for ethical and spiritual living. These limbs emphasize ethical guidelines, physical postures, breath control, sensory withdrawal, concentration, meditation, and union with the divine. Each limb aims to help practitioners deepen their connection with themselves and the world, fostering personal growth and spiritual development. By examining the philosophical foundations of yoga, we can gain insight into its transformative effects on human consciousness and overall well-being. This paper

seeks to illuminate the timeless wisdom of yoga philosophy, showcasing its relevance in today's world and its potential to instigate positive change in individuals and society at large. The roots of yoga can be traced back to ancient Indian texts like the Vedas, Upanishads, and the Bhagavad Gita, which provide the philosophical and spiritual foundation for understanding reality, the self, and the universe. These texts establish the groundwork for yoga practice, emphasizing concepts such as duty, action, and liberation. These principles guide individuals in living a purposeful life, recognizing the interconnectedness of all beings and the importance of self-realization. Yoga, a traditional practice originating from the Indian subcontinent, has garnered global popularity for its comprehensive approach to health and wellness. While often associated with physical poses and breathing exercises, yoga is deeply rooted in philosophical principles that drive its profound impact on the body, mind, and spirit. This study seeks to explore the philosophical underpinnings of yoga, delving into its core principles and the intricate connection between the physical, mental, and spiritual aspects of human existence.

Body :-

1. **Origins of Yoga :** The practice of yoga traces back to ancient Indian philosophies, specifically Samkhya and Vedanta, as stated by Taimni in 1961. These philosophical systems served as the foundation for the development of yoga as a holistic practice that combines physical postures, breath control, meditation, and ethical principles. By understanding the origins of yoga in these ancient philosophies, practitioners can gain a deeper appreciation for the profound wisdom and spiritual teachings that underlie this ancient



Application of Fuzzy Logic in Transport Problem

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Abstract :- The transport problem is a classic optimization issue that involves determining the most efficient way to transport goods from suppliers to consumers at minimal cost. Traditional methods often rely on linear programming techniques, but they may not always capture the uncertainties and vagueness inherent in real-world transport scenarios. Fuzzy logic offers a robust approach to handle such uncertainties by allowing for the representation of vague or imprecise information. This paper explores the application of fuzzy logic in solving transport problems, highlighting its advantages and potential areas of application.

1. Introduction :- Transport problems arise in various industries, including manufacturing, distribution, and supply chain management. The primary objective is to minimize transportation costs while satisfying supply and demand constraints. Traditional methods like the Northwest Corner Method, Least Cost Method, and Vogel's Approximation Method are commonly used for solving these problems. However, these methods often assume deterministic and precise data, which may not always hold true in real-world scenarios.

2. Fuzzy Logic: An Overview :- Fuzzy logic is a mathematical approach that deals with reasoning and inference under uncertainty. Unlike traditional binary logic, which deals with true or false values, fuzzy logic allows for the representation of partial truths, uncertainties, and imprecise information. It employs fuzzy sets, membership functions, and fuzzy rules to model and solve complex problems.

3. Mathematical model of Transportation Problem using Fuzzy Logic :- Here's a simplified mathematical model of a transportation problem

using fuzzy logic:

(a) Variables:

- x_{ij} : Amount of goods shipped from source i to destination j
- d_{ij} : Demand at destination j
- s_{ij} : Supply at source i
- c_{ij} : Transportation cost per unit from source i to destination j

(b) Fuzzy Sets: Let's consider the following fuzzy sets for the variables:

- x_{ij} has a membership function $\mu_{x_{ij}}$
- d_{ij} has a membership function $\mu_{d_{ij}}$
- s_{ij} has a membership function $\mu_{s_{ij}}$
- c_{ij} has a membership function $\mu_{c_{ij}}$

(c) Fuzzy Objective Function: Minimize the total transportation cost considering the fuzzy transportation costs:

$$Z = \sum_i \sum_j (\mu_{x_{ij}} \times \mu_{c_{ij}})$$

(d) Fuzzy Constraints:

- Supply constraint:
 $\sum_j x_{ij} \leq \mu_{s_{ij}}$, for each source i
- Demand constraint:
 $\sum_i x_{ij} \geq \mu_{d_{ij}}$, for each destination j
- Non-negativity constraint:
 $x_{ij} \geq 0$, for all i and j

(e) Fuzzy Logic Operations:

- Fuzzy Addition: $\mu_{x_{ij}} = \mu_{s_{ij}} + \mu_{d_{ij}}$
- Fuzzy Multiplication: $\mu_{x_{ij}} = \mu_{s_{ij}} \times \mu_{d_{ij}}$

4. Application of Fuzzy Logic in Transport Problem :-

4.1. Fuzzy Demand and Supply :- In traditional



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Samaj Vigyan Shodh Patrika

Vol. 1, No. LIV

ISSN 0973-7626, RNI: UPBIL/2005/16107

UGC APPROVED RESEARCH JOURNAL NO. 48215

APRIL TO SEPTEMBER - 2023

ETHNIC AND CIVIC NATIONALIST CONCEPTS AND RECEPTION OF THE UNITED BENGAL PROPOSAL

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Introduction :

In many places of the world, the early twentieth century was a fascinating and exciting period. With the catastrophe of the holocaust, Europe was to become the focal point for two world wars that would end in unimaginable bloodshed and destruction of human dignity. Before its engagement in the European conflict, the United States of America was involved in early capitalism, image building, and other such activities. By leveraging on American society's consumption culture, figures like Edward Bernays grew influential. Following the war, however, much of American foreign policy switched to human rights, the Nuremberg Trials, and other issues. In many places of the world, a parallel decolonization process was taking place at the same time. However, if one considers these global developments in the context of the Indian national movement, one might identify the Holocaust as one of the most significant discussions on ethnic nationalism that

captivated the world's attention. Ethnicity, nationalism, acting like countries or governmentality, human rights, and constitutional rules were all hot topics at the time. Many of these debates have had and continue to have long-term ramifications and consequences on our current era. When it came to Jewish nationalism, it was clearly charged with ideology, feeling, and cultural preservation, despite the fact that it lacked a fundamental ingredient such as a common geographical or territorial history.

The growth of collaboration between the Huq ministry and the Congress in the late 1930s and early 1940s can be traced back to the history of political cooperation in Bengal province. For the sake of clarity, this is picked as the first instance of collaboration that has very clear ramifications on future partnerships between the Congress and the League in Bengal, the ultimate crystallisation of which, according to the thesis, is the United Bengal



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Journal of Namibian Studies, 35 S1 (2023): 1532-1551 ISSN: 2197-5523 (online)

Significance And Social Impact In The Plays Of Mahesh Dattani

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Abstract

Today's Indian dramatists are always involved in social critiques about modern Indian and pan-Indian life. Among the socially conscious dramatists, Mahesh Dattani stands out because he not only raises awareness about contemporary social issues through reflection on the most pressing issues of contemporary India, such as gender issues, women's discrimination, communal strife, homosexuality, transgender rights, and sexual abuse. Furthermore, his plays make the reader/audience aware of the potential consequences of the issues raised on the family, society, and nation.

INTRODUCTION

Mahesh Dattani sees the family as a microcosm of society, and the issues that families confront and how they respond to them are a direct reflection of how society deals with these centuries-old issues. Dattani's portrayal of contemporary Indian society is rife with the evils of gender inequality, female discrimination, and contemporary issues like homosexuality, communalism, and sexual abuse. It depicts India's struggle to modernise as a country with a long history of traditions and values. As a result, addressing these social issues is difficult unless they are viewed in the context of their past occurrence and current occurrence. In an interview with Erin B. Mee, Dattani discusses this reality:

... our society is very tradition-rich, which is both a benefit and a handicap given that, in my opinion, we are living in the present and facing a lot of challenges. You only need to cross the street to run into a problem. (Mee 161).

Mahesh Dattani was born on August 7, 1958, to a Gujarati family who later moved to Bangalore and established a business. He and his two older sisters attended schools where English was



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Journal of Informatics Education and Research



Home / Archives / Vol. 3 No. 2 (2023)
/ Articles

Psychological Abuse in the poem “The Frog and the Nightingale” by the writer Vikram Seth

PDF

Ayushi Sharma, Sandeep Kumar Jain, Radhanath
Mahaparta, Renu Shrivastava

Abstract

Vikram Seth is considered one of the Eminent writers of the modern age born on 20th June 1952. His specialty was that he used to strike the persona of his readers via his personified and allegorical characters. His work probes the



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This is to certify that Mr./Ms. Namita Maity, being Enrollment No. 007BEN200T008 as "Ph.D. Student" in Bengali
(Subject/Department) of this University under *the Ph.D. regulations of the RKDF University Ranchi framed under the UGC guidelines, 2016* has successfully completed his/her Course Work of One Semester (six months).

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RKDF University Ranchi
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(Established by the Madhya Pradesh State Legislature Act No. 26/2018 & Recognized by University Grants Commission New Delhi)

Ref. SPU/PHD/Ag/EL/25

Date:- 10/01/2021

To,

Ms. Krishna Pada Paul

Subject :-Sanskrit

App. No. SPU 2112073

Subject :Regarding the intimation of your Provisional selection in Ph.D.
Program Aug 2020

Dear Candidate

With reference to you Ph.D. Entrance Examination and subsequently based on your performance in interview held on 03/01/2021 by Sardar Patel University, I am happy to inform you that you have been selected to pursue Ph.D. program further. Please may register for Ph.D. Program (Pre Ph.D. Course work)as per given time on or before 20 January 2021 as early as possible.

Dr. Divya Parashar

In Charge, Research Department
Sardar Patel University, Balaghat

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This is to certify that Mr./Ms. Anusui Maity Das, being Enrollment No. 007BEN200T007 as "Ph.D. Student" in Bengali

(Subject/Department) of this University under the Ph.D. regulations of the RKDF University Ranchi framed under the UGC guidelines, 2016 has successfully completed his/her Course Work of One Semester (six months).

Director of Research
(Signature with Office Seal)
RKDF University Ranchi
Director of Research,
RKDF University Ranchi

Controller Exam
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Ref. SPU/PHD/Ag/EL/24

Date:- 10/01/2021

To,

Mr. Amit Pakhira

Subject :- Sanskrit

App. No. SPU2112073

Subject : Regarding the intimation of your Provisional selection in Ph.D.
Program Aug 2020

Dear Candidate

With reference to you Ph.D. Entrance Examination and subsequently based on your performance in interview held on 03/01/2021 by Sardar Patel University, I am happy to inform you that you have been selected to pursue Ph.D. program further. Please may register for Ph.D. Program (Pre Ph.D. Course work) as per given time on or before 20 January 2021 as early as possible.

Dr. Divya Parashar
In Charge, Research Department
Sardar Patel University, Balaghat



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Ref No.SPU-Exam/2022/69

Date: 16/04/2022

COURSE-WORK COMPLETION CERTIFICATE

This is to certify that Mr./Mrs/Ms. PAMELI MONDAL enrollment no. AR20APHDSA001 has successfully completed the Ph.D course work in the subject of SANSKRIT in the faculty of SCHOOL OF ART & SOCIAL SCIENCE as prescribed for the fulfillment of requirement of registration for Ph.D programme of the University in accordance with University Grants Commission (Minimum Standards and Procedure for Award of Ph.D Degrees) Regulations, 2016.

Date : 16.04.2022

ASTT. REGISTRAR



A Thematic Study of the Novel : The Calcutta Chromosome

Mr. Chiradip Bera

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Professor, Supervisor, Department of English, Eklavya University, Damoh (M.P.)

Abstract :- "The Calcutta Chromosome" is a novel by Amitav Ghosh that blends history, science fiction, and mystery. Set in Calcutta, India, the novel explores themes of scientific discovery, colonial history, and the quest for knowledge. At its core, the novel delves into the search for the truth behind the work of Ronald Ross, a British medical doctor who discovered the transmission of malaria through mosquitoes in the late 19th century. Ghosh weaves a complex narrative that intertwines multiple timelines and characters, connecting Ross's research with the present-day story of Antar, a modern-day employee of a pharmaceutical company in New York. The abstract theme of the novel revolves around the pursuit of knowledge and the hidden connections between seemingly disparate events and individuals. Through a blend of history and fiction, Ghosh explores how scientific discoveries can have unexpected consequences and how the past continues to resonate in the present. In this essay I would like to explore the difference themes of the said novel.

Keywords :- Postcolonialism, Subaltern, Silence, Alternative History, Science Fiction, Counter-Science, Posthuman.

"The Calcutta Chromosome" can be analysed as a postcolonial novel, reflecting themes and perspectives that challenge traditional colonial narratives and explore the complexities of postcolonial identity and history.

Amitav Ghosh reinterprets historical events and figures from the colonial era, such as Ronald Ross's discovery of malaria transmission. By incorporating fictional elements and speculative narratives, Ghosh invites readers to question and reconsider the dominant colonial narratives that have shaped historical understanding. The novel

examines power dynamics inherent in colonialism and postcolonial societies. It portrays how knowledge and scientific discoveries were often appropriated by colonial powers and used for control and exploitation. Through characters like Murugan, a low-level clerk in the colonial administration, Ghosh illustrates the marginalization and erasure of indigenous voices and contributions. This novel reflects postcolonial themes of hybridity and cultural identity. The novel's narrative structure, blending different time periods and perspectives, mirrors the complex and intertwined nature of postcolonial identities. Characters like Antar and Murugan navigate multiple cultural influences and historical legacies, embodying the hybrid nature of contemporary postcolonial societies.

Ghosh's novel subtly explores themes of resistance and subversion against colonial hegemony. The characters in the novel, through their quests for knowledge and understanding, challenge dominant narratives and disrupt conventional power structures. The pursuit of truth becomes a form of resistance against historical amnesia and colonial erasure. While set in the colonial era and its aftermath, "The Calcutta Chromosome" also resonates with contemporary postcolonial concerns, such as globalization and technological impact. Ghosh highlights how scientific knowledge and technological advancements continue to shape global power dynamics and influence societies in complex ways.

In the novel Ghosh employs a narrative approach that re-tells subaltern history by bringing to the forefront marginalized voices and hidden stories from the colonial era. The concept of subaltern history refers to histories of groups and individuals who have been marginalized, oppressed, or excluded from dominant historical



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Study of Man and Nature of Sundarbans in Amitav Ghosh's Novel *The Hungry Tide*

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Abstract: Nature and literature are the two parts of coin, they go hands to hands. The body and power of nature are represented through literature. Critical study of environment, green politics and their relationship with human being is a recent developed critical approach which is known as eco-criticism. The literary term eco-criticism was first coined by William Rueckert in his essay "*Literature and Ecology: An Experiment in Ecocriticism*" in 1978. Amitav Ghosh, in his novel "*The Hungry Tide*" showed us the relationship between nature and society. The relationship between nature and society plays a prominent role in a country like India with eco-system ranging from Himalaya in the north to the Indian Ocean in the south and from Sundarbans in the east to the Dry Ther in the west. The main objective of this paper to analysis the said novel and its eco-critical approaches.

Keywords: Eco-criticism, Environmental justice, Nature, Folk culture.

"*The Hungry Tide*" is a prophetic novel of remarkable in sight, beauty and humanity. Human life is really impossible without nature. The modern man, the educated man is aware of the relationship between flora and fauna. Not only Amitav Ghosh, but other Indian novelist also wrote novel on human nature relationship. It is because a serious concern with ecology was lacking in the early Indian novel. Later the writers wanted to create awareness of the consequences of human actions which damages the natural environment.

"*The Hungry Tide*" is a novel written by Indian author Amitav Ghosh. Published in 2004, the novel explores the lives of people living in the Sundarbans, a unique and ecologically rich region in India and Bangladesh. The representation of folk people in the novel is crucial to its portrayal of the complex social and environmental dynamics of the region. Here are some key points regarding the representation of folk people in "*The Hungry Tide*". The Sundarbans is home to various communities with distinct cultures, languages, and ways of life. The novel represents these folk communities, including the Munda, the Garo, and others, highlighting the diversity within the region.

Folk people in the novel are portrayed as having an intimate connection with the natural world. Their lives are deeply entwined with the ebb and flow of the tides, the mangrove forests, and the diverse wildlife. The novel explores how these communities navigate their existence in a challenging and ever-changing environment. Ghosh depicts the folk people engaging in traditional practices, such as fishing, boat-making, and storytelling. These practices are not only essential for their livelihoods but also serve as a means of preserving their cultural heritage.

The novel portrays the challenges faced by folk communities in the Sundarbans,