

Satellite gravity observation and hydrological modelling-based integrated groundwater storage change in Northwestern India

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ABSTRACT

This paper presents a novel approach for an improved estimate of regional groundwater storage (GWS) change in Northwestern India by integrating satellite-based Gravity Recovery and Climate Exchange (GRACE) gravity observation and hydrological modelling of satellite/*in situ* hydrometeorological data. Initially, GRACE observation-based terrestrial water storage (TWS) change and hydrological model-based TWS change products were integrated using weight coefficients derived from multi-linear regression analysis of TWS change vs governing hydrological components. Later, the monthly average soil moisture change was subtracted from the monthly average individual and integrated TWS change products to obtain GWS change products. By spatial correlation analysis, three GWS change products were then compared with groundwater level (GWL) fluctuation-based *in situ* GWS change. Hydrological model, spaceborne GRACE observation, and integrated GWS change products show a positive correlation in ~59, ~69, and ~73% of the area with *in situ* GWS change. While a hydrological model-based estimate considers geology, terrain, and hydrometeorological conditions, GRACE gravity observation includes groundwater withdrawal from aquifers. All the factors are included in the integrated product. The approach overcomes the limitations of GRACE observation (spatial resolution, geology, terrain, and hydrometeorological factors), hydrological modelling (groundwater withdrawal conditions), and conventional GWL fluctuation-based method (inadequate spatial continuity and cumbersome, labour-intensive exercise).

Key words: GRACE groundwater storage change, *in situ* groundwater level, integrated groundwater storage change, Northwestern India, spatial correlation and integration, water balance hydrological model

HIGHLIGHTS

- An algorithm for estimating improved regional groundwater storage change is proposed by integrating satellite gravity observation and hydrological modelling.
- Integration weight coefficients are derived by multi-linear regression analysis of TWS change vs governing hydrological components.
- Hydrological model takes into account geology, terrain, and hydrometeorological factors; GRACE gravity observation includes groundwater withdrawal from the aquifers.

VULNERABILITY ASSESSMENT OF NATURAL HAZARDS: A CASE STUDY OF COASTAL DISTRICTS OF ODISHA

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Abstract:

Natural hazard vulnerability assessment refers to the assessment of vulnerability to natural hazards covering the vulnerability of human and environmental systems. It is generally assumed that only the socio-economic factors determine the degree of impact of the natural hazards on the human life and on the environment, but this paper argues that both natural as well as socio-economic factors decide the level of impact of natural hazards on social life. Several studies have shown that in case of disaster events, socially vulnerable populations are more likely to be adversely affected, i.e. they are less likely to recover and more likely to die. Effectively assessing and addressing social vulnerability decreases human suffering and the economic loss caused during and after a hazard by strengthening the mechanisms of providing social services and public assistance. This paper attempts to construct a composite vulnerability index (CVI), based on selected socio-economic and natural variables to assess the level of spatial variation in degree of vulnerability to natural hazards by taking nine coastal districts of Odisha into account.

Key Words: Composite Vulnerability Index, Disaster, Hazard, Social Vulnerability.

INTRODUCTION:

A natural hazard is a threat of natural event and when the hazardous threat actually happens and harms human society and ecosystem, the event becomes a natural disaster. A system is vulnerable to hazards due to its specific social structure, its economic conditions and its ecological meaning (Walker et al., 2004). As every system has a capacity to buffer, the resilience factor or the adaptation capacity has to be opposed to vulnerability. Vulnerability and resilience balance each other. The outcome of this relation is the residual risk. i.e. $Risk = Hazard * (Vulnerability - Resilience)$. This remaining risk can be addressed as social risk, economic risk and ecological risk (Klein et al, 2003). Resilience and Resources are directly related to each other. The individual or collective perception of risk plays a crucial role in the whole concept of vulnerability (Brooks et al., 2005, Birkmann 2007). How risk is perceived may determine where people settle, how they are prepared, how they behave in case of an emergency, and finally of importance for management what kind of risk they accept (Brooks. 2003). Vulnerability is defined as the degree to which a system is susceptible to, or unable to cope with the adverse effects of natural hazards such as floods and cyclones (IPCC, 2001). Vulnerability is the function of three components—exposure, sensitivity, and adaptive capacity – which are influenced by a range of biophysical and socio-economic factors (IPCC, 2001). Vulnerability is assessed in the context of a region, a country, a community, a household, a sector or a system with respect to the different types of hazards. Once vulnerability is assessed and evaluated; regulations, capacity building



The Geography of Women's Fear of Crime: Spatial Confidence and Constraints

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Abstract

Fear of crime is a critical problem in its own right. Although levels of fear are related to levels of criminal victimization, fear is influenced by other factors, such as a sense of vulnerability, signs of physical and social decay, and incivilities and disorders. This paper sought to explain the geography of women's spatial confidence and fear of crime. Data were collected through a convenience sample of 65 women aged 18–49. The analysis used responses to open-ended survey items asking women to explain their confidence level and fear of crime in Sambalpur city. Results suggested that some women were spatially confident for some reason, but some women's spatial confidence was undermined by the fear of being victimized in the city. It is essential to evaluate the effectiveness of police strategies not only in terms of their capacity to control crime but also in terms of their capacity to reduce fear.

Keywords Crime · Fear · Women · City · Victimization · Vulnerability

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Urbanization and Informal Economy: A Case Study of Street Vegetable Vendors in Sambalpur City

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ABSTRACT

The study was undertaken to examine the urbanization trends and the socio-economic status of the street vegetable vendors in Sambalpur city. The results revealed that the urban population of Sambalpur City witnessed an increasing trend over the last five decades (1971-2011). At the same time, the land use pattern of the city showed increasing trends for residential, industrial, and transportation areas because of urbanization. The study further revealed that most street vendors were illiterate, and their daily income was less than ₹500. The research findings will help the policymakers to set plans, strategies, and policies for improving the street vending business and the street vendors' socio-economic status.

Keywords:

Informal economy, land use, socio-economic status, urbanization.

JEL Codes:

E26, O17, Q12.

INTRODUCTION

Street vending is a significant part of the informal urban economy, especially in developing countries (Li et al., 2022). Zhang et al. (2022) reported that 1.8 billion people worldwide are engaged in diverse informal economic activities. The process of urbanization is an increasing trend throughout the world; the population of urban areas show the same trend. While nearly 31 per cent current population of India lives in urban areas, according to Census 2011, Odisha continues to be among the least urbanized states, with an urban population of approximately 17 per cent. However, the pace of urbanization in Odisha continues to intensify, owing to rapid industrialization and good economic performance. Odisha has 114 urban local bodies across three categories, that is, five municipal corporations, 47 municipalities, and 62 notified area councils, as per the report of Odisha Urban Infrastructure Development Fund, 2017-18.

The street vendors offer a wide range of goods and services in convenient locations and contribute essential

services to the poor by providing low-cost goods in small quantities (Chen, 2016). In urban areas, the availability of new job opportunities promotes a shift from rural to urban areas. However, the growth of the formal sector in urban areas may not provide adequate job opportunities to its growing population and continuing rural-urban migration. Thus, most urban workers in developing countries earn their livelihood in the informal sector (Elgin & Oyvat, 2013).

The informal sector is also increasing because of urbanization in developing countries (Kapoor, 2020). Further, in the informal sector, the socio-economic condition of people has been worse over the years. Many current studies revealed that the unorganized or informal sector accounts for over 90 per cent of India's workforce, and almost 50 per cent of the national income evolves from this sector (Srija & Shirke, 2014; Kapoor, 2020; Mishra, 2017).

Hart defined the informal sector as employment opportunities beyond large-scale commercial enterprises,

Water Quality Assessment of Some Rivers Near Railway Bridge Construction Sites

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ABSTRACT

In this study, analysis of the water quality parameters of three rivers i.e. Tangari, Ghaggar and Markanda in the state of Haryana, India was done with the standard procedures. After analysis and testing, water quality parameters were represented numerically. All the permissible limits were noted as prescribed by the MoEF & CC, BIS, etc. and compared with the observed values. The water quality parameters like pH, TDS, TSS, TA, TH, Ca²⁺, Mg²⁺, Cl⁻, F⁻, PC, Pb and Cr, near the railway bridge construction sites, were observed below the permissible limits. However, the average values of turbidity in all the rivers near the construction site exceeded the permissible limits, indicating that it may adversely affect the biota of that region.

Key words: River water, water quality, pH, turbidity, chloride

INTRODUCTION

The sustainability of every development project needs consideration of environmental, economic and social factors from the conceptual stage of the project (Armenia *et al.*, 2019). For the reduction of adverse impacts and for the betterment of the environment, economic and social enhancement opportunities an environmental impact assessment study of railway bridge projects is necessary (Henke *et al.*, 2020). Railway bridge construction over natural streams may affect the environment in many ways (Angyal *et al.*, 2016). Trains travelling over the railway bridge create noise and vibration. Therefore, all bridge construction projects have to identify possible potential impacts on the environment of the local community (Ongkowitzo *et al.*, 2020).

The construction of a railway bridge is very important for the growth of the economic status of the community and country as a whole and also enhances mobility (Pulido *et al.*, 2018). The impacts due to the construction of railway bridges over any river or natural stream include deterioration of natural landscape,

ecosystem, air, water, soil quality, etc. (Singh and Singh, 2017). However, railway bridges that were planned, designed and constructed inappropriately have more negative consequences (Xue *et al.*, 2015). Therefore, Railway bridges should be of high quality so that they can minimize the adverse impacts. This can be achieved by implementing a suitable environmental plan at all stages of railway bridge construction.

The construction of railway bridges over any river or stream will affect river water quality and quantity either directly or indirectly (Iqbal *et al.*, 2018). Therefore, baseline data collection is very important to assess the negative consequences on river water quality and biota (Musonge *et al.*, 2019). The physico-chemical and biological qualities of water that are generally affected by any construction project (Naveen *et al.*, 2017) are pH, suspended solids, turbidity, total dissolved solids, chlorides, phytoplankton, fish life, etc. Realizing the above facts, a systematic study was planned and conducted to assess the river water quality near the railway bridge construction site. However, significant studies related to river water quality were done by many researchers (Arun *et al.*, 2015a, b; Chadetrik *et*

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Assessment of Ambient Air Quality Status at Different Railway Bridge Construction Sites

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ABSTRACT

Assessment of the ambient air quality status near three railway bridges, namely, the Tangari, Ghaggar and Markanda in the state of Haryana, India, was done according to the standard procedures. After sampling, air quality parameters like PM_{2.5}, PM₁₀, NO₂, SO₂, CO and the noise levels were analyzed and presented numerically. All the permissible limits were considered as per NAAQS limits (prescribed by CPCB) and compared with the observed values. The observed concentrations of NO₂, SO₂ and CO were found below the permissible limits. However, in most cases, the observed concentrations of other air quality parameters like PM_{2.5}, PM₁₀ and noise levels, at different sampling locations, were found above the permissible limits of NAAQS as prescribed by CPCB.

Key words: Railway bridge, air quality, PM_{2.5}, PM₁₀, NAAQS, CPCB

INTRODUCTION

Air pollution, in general, refers to any undesirable changes in the quality of air that may be harmful to any living organism and is one of the most significant risk factors for human health. Air pollution is a silent killer which lurks around us, influencing both younger and older generations (Bala *et al.*, 2021). It is a major concern in the assessment of the global burden of disease (GBD), and the World Health Organization (WHO) estimates that it accounts for 6.7% of all mortality and 7.6% of disability-adjusted life years (DALYs) globally, as well as the fourth most important risk factor for premature death (Brauer, 2016). Lung cancer, chronic obstructive pulmonary disease and respiratory infections, including heart disease, stroke and pneumonia, are the most affected pathologies (dos Santos *et al.*, 2022). Nine out of 10 people breathe polluted air, which penetrates deep into lung tissue as well as the cardiovascular system (Tiotiu *et al.*, 2020; Sekar *et al.*, 2021). However, epidemiological cohort studies suggest that the health effects are dependent on the presence of long-lived ambient particulate matter and related risk factors may differ from region to region (Maji *et al.*, 2017). Some significant findings suggest that when the air becomes

polluted with dust, the prevalence of cardiac and pulmonary diseases rises (Khaniabadi *et al.*, 2019; Tajudin *et al.*, 2019) and long-term exposure to particulate matter reduces life expectancy (Sarkodie *et al.*, 2019). Clinical studies also suggest that the cells of the respiratory system are remedied or replaced at a slower rate than those of the body's other organs (for instance the coating cells of the digestive system). Moreover, studies suggest that millions of people worldwide die prematurely as a result of cardiovascular and respiratory diseases caused by air pollution (Viegi *et al.*, 2020).

Rapid industrialization and urbanization in India have caused significant economic changes in the last decade and become one of the world's fastest growing economies (Franco *et al.*, 2017). However, this growth has come at a significant cost to the country's public health and environment (Maji *et al.*, 2017). Rapidly expanding urban areas account for 44% of India's carbon emissions and currently facing a number of environmental challenges, including air pollution, lack of clean water, river water pollution, deforestation and desertification (Maji *et al.*, 2017). High levels of air pollution have a negative impact on the health system and the economy, resulting in negative health outcomes (Chadetrikrout *et al.*,

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How does the COVID-19-related restriction affect the spatiotemporal variability of ambient air quality in a tropical city?

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Abstract The ambient air, a significant hazard to human health in most Indian cities, including Rourkela, is something we are strangely neglecting in the age of industrialization and urbanization. High levels of particulate matter released from various anthropogenic sources over the past decade have had a significant negative impact on the city. The COVID-19 lockdown situation brings understanding and realization towards the improvement of air quality and its subsequent effects. The present study investigates the impact of the COVID-19-related lockdown on the spatiotemporal variation of the ambient air quality in Rourkela City with a tropical climatic setup. The concentration and distribution of various pollutants are well explained by the wind rose and Pearson correlation. There is considerable spatiotemporal variation in the city's ambient air quality, as determined by a two-way ANOVA test comparing sampling sites and months. During the COVID-19 lockdown phases, the air quality of Rourkela witnessed an improvement in annual AQI ranging from 12.64 to 26.85% across the city. However, the air quality in the city deteriorated by 13.76–65.79% after the revocation of COVID-19 restrictions. The paired sample *T*-test justified that the air quality of Rourkela was significantly healthier in 2020 compared to both 2019 and 2021. Spatial

interpolation reveals that the ambient air quality of Rourkela ranged from satisfactory to moderate categories throughout the entire study period. 31.93% area of the city has experienced an improvement in AQI from the Moderate to the satisfying category from 2019 to 2020, whereas about 68.78% area of the city has witnessed a decline in AQI from satisfactory to moderate category from 2020 to 2021.

Keywords COVID-19 · Air quality index · Spatial interpolation · Correlation matrix · ANOVA test · *T*-test

Introduction

The early twenty-first century witnessed a swift growth in urbanization and industrialization in developing countries across the world. It has not merely improved the economic status of the urban residents but decreased urban air quality. This phenomenon is more prominent in South Asian developing countries like India. Ambient air pollution and related human health issues are major concerns in most Indian cities (Agrawal et al., 2021). Several recent studies have informed that over three-quarters of people in India are exposed to pollution levels higher than the limits prescribed by the National Ambient Air Quality Standards (NAAQS) in India and drastically greater than the limits recommended by the World Health Organization (WHO).

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Altitude governs the air pollution tolerance and heavy metal accumulation in plants

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Abstract Plant response to changing air pollution is a function of various factors including meteorology, type of pollutants, plant species, soil chemistry, and geography. However, the impact of altitude on plant behavior has received little attention to date. A study was therefore conducted to evaluate the impact of altitude on the air pollution tolerance index (APTI), heavy metal accumulation, and deposition in plant species. The results favor the hypothesis of a definite impact of altitude on biochemical and heavy metal accumulation in plants. While a significant decline ($p < 0.05$) in the relative water content (RWC), APTI, and heavy metal accumulation with increasing altitude was evident in the studied plant species, the behavior of ascorbic acid, leaf extract pH, chlorophyll content, and the particle heavy metal deposition was erratic and did not display any statistically significant differences. The metal accumulation index was in the following order: Ni > Zn > Cu > Pb > Cd > Co. Similarly, the particle heavy metal deposition on the leaf

surface ($\mu\text{g}/\text{cm}^2$) displayed significant species variability ($p < 0.05$) and was in the order: Cu (0.303) > Pb (0.301) > Ni (0.269) > Zn (0.241) > Cd (0.044) > Co (0.025). The accumulated heavy metal and RWC showcased a significant positive correlation with the APTI, suggesting the dominant role of RWC in the plant's tolerance against air pollution in an altitudinal gradient. Future studies on the role of micrometeorological conditions in altering APTI may be fruitful in ascertaining these postulations.

Keywords APTI · Bio-concentration factor · Metal accumulation index · Phytoremediation

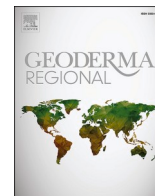
Introduction

The air pollution tolerance index (APTI) is an age-old tool for the assessment of plants' performance against rising air pollution. It is an integrated formula derived basically from the ascorbic acid content, leaf extract pH, total chlorophyll content, and relative water content. On some occasions, APTI has been merged with the socio-economic aspects of trees for evaluation of their performance in polluted air (Sahu & Sahu, 2015). Some researchers have also tried to diagnose the changes induced in the bio-physicochemical aspects of plants by the particulate matter in the air and the heavy metal content in the soil (Nadgorska-Socha et al., 2017). Plants have multiple functional dimensions through the remediation of soil and air

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Land-use change affects carbon storage and lability in tropical soil of India

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ABSTRACT

Soils are storehouse of organic carbon that is amenable to different degrees of degradation. But, information on the impact of land use change on carbon storage and lability in tropical soil is scarce. The present investigation aimed to study the carbon fractionation of tropical soils concerning their accumulation based on differential chemical oxidation involving potassium dichromate and sulphuric acid. The work was carried out in a tropical forest and pasture lands (located at a mean distance of 60 m from each other) in India. The readily oxidizable carbon (active carbon pool) dominated both the studied land uses (forest and pasture) more than the less oxidizable fraction (passive carbon pool). The carbon pool index and the carbon management index computed from the results of the two carbon pools favored the forest land for long-term carbon sequestration and were significantly correlated with the active carbon pool ($p < 0.05$). The results further showed a significant variation in the cumulative soil organic carbon stock of the forest (248.92 t/ha) and the pasture (184.21 t/ha) land ($p < 0.05$). Soil depth did not show any impact on the carbon fraction distribution. It can, thus be, concluded that land use change alters the stability and lability of organic carbon and its storage in tropical soils. Therefore, regular evaluation of carbon pools and subsequent carbon management can enhance the prospects of the long-term stay of carbon in the soil.

1. Introduction

Land use and land cover (LULC) changes are unavoidable in this rapidly growing urbanized and industrial society. The LULC change not only impacts the soil quality but also governs the carbon dynamics through alternation in the litter input rate, soil biodiversity loss, nutrient recycling, biotic influence, temperature fluctuation, canopy changes, etc. (Fan et al., 2016). Therefore, the influence of different soil management practices and LULC changes on carbon stock has been a topic of evaluation across the globe for decades (Aller-Rojas et al., 2020; Trivedi et al., 2020). Although several investigations on soil organic carbon (SOC) stock and carbon fractions have focused attention on different categories of cultivated lands, forest lands, grasslands etc., (Mattila et al., 2022), the investigations of land use change under tropical conditions have not been sufficiently evaluated.

The organic carbon in the soil is amenable to differential oxidation following microbial secretions and degradation. These organic carbons are categorized based on the degrees of degradation and are grouped into very labile, labile, less labile, and recalcitrant fractions (Debnath et al., 2020). While the former two constitute the active pool, the passive

component comprises the latter two fractions. The active pool is easily mineralized and readily bio-available (Alvarez and Alvarez, 2000), while the passive pool is a build-up for long-term carbon storage in soil (Bayer et al., 2002). The dynamics of these two pools affect the overall residence time and distribution of soil organic carbon (SOC) stock which ultimately plays a vital role in maintaining the carbon source-sink ratio (Singh et al., 2020). Various computations like the lability index, carbon pool index and carbon management index calculated from the different categories of oxidizable carbon have been utilized previously to understand the carbon residence in soil (Rigarlsford et al., 2020; Li et al., 2021). The lability index provides an idea of the overall mobility and ease of mineralization of the organic carbon. Similarly, the carbon pool index and carbon management index are considered to be more reliable than a single parameter for understanding the nature of organic carbon degradability in soil (Sainepo et al., 2018).

Many attempts have been made previously to study the impact of different forms of soil carbon on SOC stock (Lopez-Carrasco et al., 2015; Upson et al., 2016; Abdalla et al., 2018; Reyna-Bowen et al., 2020; Zhang et al., 2021). These investigations have analyzed the biophysicochemically bound organic carbon fractions of soils under

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Particle and heavy metal accumulation by two plant species in a coal mining area of Odisha, India

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Soil organic carbon fractionation of spoiled and unspoiled soils under different land use and land cover systems

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Abstract Alteration in land use and land cover is the key factor affecting the soil carbon fractions and its distribution. A study was carried out to estimate the carbon fractions in soils of agricultural, forest and pasture lands in two different areas separated on the basis of industrial activities (spoiled and unspoiled) to get an insight on the long-term soil carbon storage potential. The results showed that the mean values of the total organic carbon (TOC) and various fractions are significantly different between the land use types ($p < 0.05$). Irrespective of the land uses, the forest land showed significantly higher TOC (7.97) than agricultural land (6.98) and pasture lands (6.68). Further, evaluation of carbon management index (CMI) indicated that forest lands had highest CMI value compared to the other land uses. The spoiled area had significantly higher TOC and carbon fractions than their respective counterparts in the unspoiled area ($p < 0.05$) due to the negative industrial impact on soil biological processes. The PCA separates the sources of different carbon fractions and revealed an association of N (nitrogen) and K (potassium) with VL (very labile) and L (labile) fractions and the association of

P (phosphorous) with stable R (recalcitrant) form. Therefore, it can be inferred from the present study that alterations in land use not only result in soil quality degradation but also trigger a reduction in potential for long term soil C sequestration.

Keywords Carbon fraction · Labile carbon · Recalcitrant carbon · Total organic carbon

Introduction

The carbon content in soil is reported to be twice more than the atmosphere and thrice more than the terrestrial vegetation (Yan et al., 2017). Soil carbon in carbon cycling thus plays a pivotal role in countering the rising surface temperature. Soil behaves both as a source and sink of carbon (Wei et al., 2013). The entering organic matter upon decomposition results in carbon emission to atmosphere. On the other hand, the decomposition of soil organic matter is enhanced due to rising surface temperature and global warming. This prompts for a regular monitoring of soil organic carbon (SOC) dynamics in the prospects of long term C sequestration.


Land use and land cover (LULC) alteration directs the behavior of SOC pools and consequently impact the global C cycle (Post & Kwon, 2000). The LULC change manipulates the pace of input–output dynamics of soil through the regulation of the input of plant litters and output by SOC mineralization, thereby

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RESEARCH ARTICLE

Sediment organic carbon and heavy metals: A bibliometric analysis

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Abstract

Bibliometric analysis is an important tool for the assessment of research trends on a topic of interest. With the rising demand for research on sediments, the current work is aimed to evaluate the number of publications, major countries involved, and major thrust areas of research using the search keywords “sediment organic carbon” and “sediment heavy metals.” The bibliometric recovery of 1367 publications was done from the Scopus database during the study period of 23 years, that is, from 2000 to 2022 (till August) and the analyses were performed using VOSviewer and Biblioshiny software. The result showed a greater number of publications on sediment organic carbon than the heavy metals. Research articles were the most preferred publication type as compared to book chapters, conference proceedings, review articles, and so on. No particular journal was found to have a significant impact on the topic of research, but *Chemosphere* and *Marine Pollution Bulletin* showcased the highest impact on publication with an H-index score of 36 each. While, China dominated the research on the concerned topic followed by India and the United States, a low level of inter-country collaboration was however detected in the analysis suggesting a regional influence on sediment-related topics. “Risk assessment,” “Geo-accumulation index,” and “Potential ecological risk” were the major focal areas that were associated with the assessment of sediment quality and heavy metal accumulation. It can be concluded that sediment related research has been regionally focused. More inter-country collaborations can aid in trans-disciplinary research related to sediments in the future.

KEYWORDS

citation, co-authorship, co-occurrence of keywords, heavy metals, research collaboration, sediment organic carbon

1 | INTRODUCTION

Sediments form a major reservoir of organic carbon and heavy metals. While on one hand, a brief residence of organic carbon aids in global carbon sequestration, the heavy metals influence the water quality and aquatic toxicity. Sediments have a unique quality of behaving both as a source and sink of organic carbon and heavy metals. Therefore, periodic analysis and regular research concerning the interaction

between organic carbon and sediment heavy metals is needed. Further, the associated source-sink dynamics and their impact on water chemistry, and geological interactions is also a bare necessity. A bibliometric analysis thus becomes important to assess the state of past, present, and need-based future research on this topic (Gariano & Guzzetti, 2016). An insight into the bibliometric output can pave ways not only to identify the potential areas of research interest but also to address the troubled area demanding a collaborative work

In-silico Prediction of Drug Target, Molecular Modeling, and Docking Study of Potential Inhibitors against *Burkholderia pseudomallei*

Raghunath Satpathy*

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Abstract

The infection of the *Burkholderia pseudomallei* causes the disease melioidosis, for which the treatment method takes longer time, and sometimes it is difficult to completely eradicate the bacteria from the body. Moreover, its antibiotic resistance in nature created great concern in recent times. Hence, there is an urgent requirement to identify new drug molecules that can improve the current process of treatments and reduce the risk to people. This study analyzed the pyrimidine metabolic pathways of *Burkholderia pseudomallei* strain K96243, and UMP (Uridine monophosphate/Uridylate) kinase enzyme was selected as the drug target. After structure prediction by the AlphaFold server, the validation of the structure was performed by using Procheck, Verify3D, and Errat tool. Further, six probable inhibitor molecules were selected from the PubChem database, including the natural inhibitor of the enzyme, Uridine triphosphate (UTP). The molecular docking study predicted that the UTP (CID 6133) had the highest docking score, followed by another compound PubChem (Compound ID) CID 284262. Then, Toxicity and ADMET properties were computed and analyzed. Further, a 5 nanosecond molecular dynamics simulation of the complex of UMP-Kinase and CID 284262 was performed by using the Gromacs 5.1.1 software to analyze the stability of the best complex. It was predicted that the CID 284262 might be considered a suitable inhibitor of the enzyme.

Keywords: Metabolic pathway analysis, UMP kinase enzyme, Molecular docking, Drug target prediction, Molecular dynamics simulation, Inhibitor compounds

Introduction

Burkholderia pseudomallei is a pathogenic gram-negative, bi-polar, aerobic, motile, rod-shaped soil-dwelling bacterium, and the infection in the tropical and subtropical regions causes the disease melioidosis (Wiersinga *et al.*, 2018; Savelkoel *et al.*, 2022). These bacteria are also known for the resistant to various environmental conditions, including deficiency of nutrients, extreme temperature, and pH (Inglis *et al.*, 2001). It infects humans and animals, primarily cattle and livestock such as goats, pigs, and sheep (Ekakoro *et al.*, 2022). Bacterial infection

in humans is associated with different pathogenic conditions like widespread pulmonary infection, septicemic infection, diabetic patients, and renal disease (Gassiep *et al.*, 2020). Continuous exposure to infected soils and groundwater leads to an increased risk of causing melioidosis. Pneumonia is the most common symptom of melioidosis, observed in half of all cases (Leung *et al.*, 2023). The seriousness of the disease varies widely, such as illness with high fever, tiny cough, inflamed pain, and difficulty breathing (Khattab *et al.*, 2022). Presently the drug doxycycline is widely used as one of the most efficient therapeutic strategies for infection (Sridharan *et al.*, 2021). However, studies reported that the *B. pseudomallei* bacteria also shows resistance to doxycycline while testing against the drug with different strains (Zueter *et al.*, 2022). This bacterium is also naturally resistant to many antibiotics, including penicillin, cephalosporins, macrolides, rifamycins, polymyxins, and aminoglycosides (Di Fiore *et al.*, 2022). The process of antimicrobial resistance has been studied as the bacterial antibiotic efflux pump was characterized as the key cause of the resistance (Somprasong *et al.*, 2021). Since no licensed versions of vaccines are available for melioidosis disease, new therapeutic measures and vaccination strategies are expected to come shortly as a preventive measure against the infection (Morici *et al.*, 2019; Currie 2022). In drug design strategies against bacteria, nucleotide metabolism is frequently studied to identify the drug targets, as the pathway's enzymes are considered essential (Kumari, & Tripathi, 2021; Perveen & Sharma, 2022). The nucleoside monophosphate (NMP) kinases are a critical group of enzymes involved in the pyrimidine synthesis metabolic process (Beji *et al.*, 2020). The *de novo* of the pyrimidine nucleotide biosynthetic process consists of different vital metabolic enzymes conserved among the prokaryotic and eukaryotic organisms, including humans (Uddin *et al.*, 2020; Wylie *et al.*, 2022).

The current work aims to discover some inhibitor molecules from the database and investigate the inhibition potential against the UMP kinase of *Burkholderia pseudomallei* (strain K96243) bacteria.

Materials and Methods

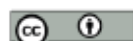
Computational Resources Used for Molecular Docking and MD Simulation Study

Processor: AMD Ryzen 3900*4.6GHz, Mother Board: Gigabyte B550 Aorus pro AC, RAM: Corsair 16*2 vengeance 3200NH 32GB, GPU: Asus dual GT 165004G, Operating system: Ubuntu Version 2021

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Recent Advances in the Development of Novel Inhibitors Targeting RNA Helicase Enzyme of SARS-CoV-2

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Abstract

The rapid spread and infection rate of novel severe acute respiratory syndrome coronavirus (SARS-CoV-2) has created a worldwide pandemic since its origin in 2019. Another concern for improvement in controlling the infection is the non-availability of effective medications against the virus. So, these challenges generate the general scientific interest to focus on the development of novel drug molecules that can prevent viral propagation. The virus contains an RNA helicase enzyme known as nonstructural protein 13 (nsp13), a critical viral replication regulator. Hence this enzyme can be used as a target so that the potential inhibitor molecules can be used to stop its function. Furthermore, the virus is related to other members of the Coronaviridae family, for which inhibitor molecules are available. Recently, the crystallographic structure of the nsp13 of SARS-CoV-2 has been resolved and is available in the protein data bank (PDB). Hence, this information provides the opportunity to apply several computational and experimental approaches to elucidate the enzyme's functional aspects and help to propose new inhibitor molecules. Several natural products, synthetic compounds, and previously proven effective compounds have been studied for their binding affinity and inhibition properties of the molecule. This review presents the basic idea about the genomic arrangement and structural and functional aspects of the RNA helicase enzyme of SARS-CoV-2. Also, the inhibition strategies of the enzyme by the inhibitor molecules along with challenges have been highlighted by narrating the recent literature.

Keywords: RNA helicase, Nonstructural protein 13, Novel inhibitor molecules, SARS-CoV-2, Drug repurposing, Drug target

Introduction

RNA viruses are usually more common and complex pathogens in terms of their genetic makeup, mutation frequency, and the modes of transmission to various host bodies to cause disease. Currently,

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there are about 180 species of RNA viruses have been recognized that can infect human beings (Andrei *et al.*, 2015). RNA viruses have the potential to cross the species barrier between humans and other (animal and bird) hosts and are ultimately responsible for creating public health concerns (King *et al.*, 2006; Woolhouse *et al.*, 2013; Woolhouse & Adair, 2013). A recent challenge exists for the development of new therapeutics due to the epidemic outbreak of the novel coronavirus (SARS-CoV-2). The disease caused by the novel coronavirus is a highly contagious and infectious one, and it was first reported in Wuhan city of China, in December 2019 and further spread worldwide (Aljehany & Allily, 2022). The virus is closely related to the other members of the *coronaviridae* family, such as the severe acute respiratory syndrome (SARS) virus and middle-eastern respiratory syndrome (MERS) spotted by the genomic analysis (Tudoran *et al.*, 2022). Presently, there is no effective mode of a drug therapy approach that is successful for treating the novel coronavirus virus (Oran *et al.* 2021). Several successful research tests (clinical trials) for the SARS-CoV-2 therapy are currently undergoing (Tam *et al.*, 2022). Other emerging methods, such as repurposing the effective studied drugs, have been found as suitable alternatives to discover novel potential inhibitors against the virus (Omolo *et al.*, 2020; Wu *et al.*, 2020). The wild type of genomic constituent of the SARS-CoV-2 is positive-stranded RNA and contains 29903 base pairs (Figure 1).

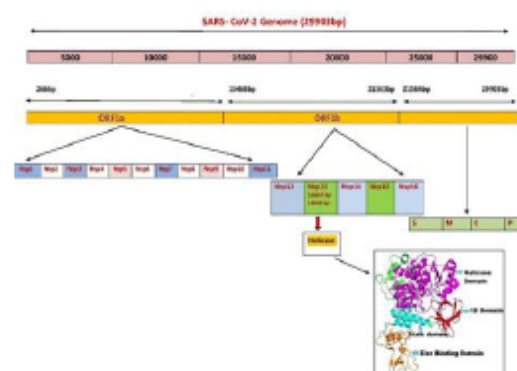


Figure 1. Genomic structure of SARS-CoV-2 highlighting the Helicase enzymes.

The viral genome contains two major open reading frames (ORF 1a and ORF 1b) from which the 16 numbers of nonstructural proteins were produced and the regions in which the four numbers of structural proteins are produced





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Comparative genomics reconciliations of genus *Streptococcus* resolves its taxonomy and elucidates biotechnological importance of their constituent species

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ARTICLE INFO

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ABSTRACT

The current taxonomy of *Streptococcus* is primarily based on low-resolution methods such as biochemical analysis, single housekeeping gene-based phylogeny, or conserved sequence identity of species groups resulting in various amendments in the taxonomic positioning of their constituent species. We reported genome similarities assessment and phylogeny using several methods to provide a robust taxonomic framework with inclusion of 115 type strains and 23 unclassified species. Phylogeny based on the 16S rRNA gene suggests no integrity of the earlier classified species groups, which cannot be used for taxonomic classification. The whole genome phylogeny does not support the existence of the earlier defined species groups. Genome similarity assessment suggests the presence of sixteen novel genomospecies, including some of the amendments in the earlier classified species and subspecies. A highly stringent antibiotic resistance gene search resulted in widespread fluoroquinolones resistance. It is noteworthy that among the 42 genomes analyzed, which include strains of probiotic significance such as *S. thermophilus* NCTC 12950T and *S. salivarius* NCTC 8618T, no properly curated antibiotic resistance genes were discovered. However, the presence of partial hits for resistance genes in such strains requires further experimental validation before their downstream application.

1. Introduction

Over two centuries, *Streptococcus* has been extensively explored, especially in clinical and industrial settings. It was first observed in 1868 by the German surgeon Theodor Billroth as chain-forming cocci from wounds [1], later used in a generic sense in 1894 by Rosenbach [2]. *Streptococcus* belongs to the family Streptococcaceae within order Lactobacillales [3], constituting a broad range of Gram-positive, facultatively anaerobic, spherical, or ovoid cells arranged in chains or pairs. The nomenclature of *Streptococcus* has lacked international consensus [4] and has witnessed significant revisions in the past with the implementation of novel techniques to understand its taxonomy. *Streptococcus* is misspelled with more than 64 different names similar to its true taxonomic name (<https://ipen.dsmz.de/genus/streptococcus>). Early taxonomy of *Streptococcus* was based on biochemical, physiological, and

serological characterization [5]. Lancefield's serological grouping scheme (1933) is based on cell-wall polysaccharides where strains are designated as A, B, C, E, F and G [6]. This is extremely useful for identifying β -haemolytic streptococci (pyogenic group) from human and animal infections during early days. However, phenotypic characteristics in earlier studies like haemolytic reaction, Lancefield grouping, or lactose fermentation etc was more concerned towards classification into groups rather than taxonomy of the species of genus *Streptococcus* [7]. Subsequently, due to the progress in chemotaxonomic techniques, whole genome DNA hybridization, and taxonomic classification based on the 16S rRNA gene, there have been substantial revisions to its taxonomy [8–10].

According to current standing in nomenclature, *Streptococcus* encompasses 111 species as of October 2021 [11]. Streptococci were isolated from a wide range of habitats like humans, animals, and plants.

Abbreviations: CSI, conserved sequence index; ANI, Average Nucleotide Identity; dDDH, digital DNA-DNA hybridization; ML, maximum likelihood; CARD, Comprehensive Antibiotic Resistance Database; RGI, Resistance gene identifier; GS, genomospecies.

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Evaluating the Biocontrol potential of Indigenous *Trichoderma* spp. against soil borne pathogens of rice and their impact on rhizospheric functional microbial populations

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Abstract

Trichoderma spp. is naturally mycoparasite and the most widely used biocontrol agent (BCA). This *Trichoderma* spp. is also naturally growth enhancer in crop plants. However, their uses in rice plants are limited to few reports only. The use of excessive *Trichoderma* as BCA may have effect on soil or soil microflora.

We have also characterized *Trichoderma* spp. biochemically especially for their chitinase and protease activity. The impact of *Trichoderma* spp. showed that *Trichoderma* inoculation increases the growth of specific bacterial population and decreases the soil fungal population in rice soil, which indicated that the isolates may be the best potential strains to control the soil pathogens. Antagonism effect of isolated *Trichoderma* spp. was found effective against various soil borne pathogens like *R. solani*, *S. oryzae* than *S. rofsii*.

Keywords: *Trichoderma*, Microbial diversity, Biocontrol, *R. solani*, *S. rofsii* and *S. oryzae*.

Introduction

Rice is common cereal food crops grown in India and the staple food of the people of Orissa and southern parts of the country. The production of rice is always influenced by different environmental constraints and combination of biotic and abiotic factors^{22,39,41}. In modern agricultural practices, for better growth and yield of crops, farmers use heavy amount of chemical nitrogenous fertilizer and fungicides, pesticides to control the disease and pest³⁶. It is well reported that the use of chemical fertilizer and fungicides has led not only to the decrease in soil fertility and deteriorating soil health but also is polluting the environment. The excessive use of chemical fertilizers in the current decade has led to soil toxicity through the presence of many heavy metals which are toxic in nature and are also adversely affecting the health of plants¹³.

To overcome the decrease in soil fertility and deterioration in soil health caused by the use of chemical fertilizers and different pesticides it is necessary to look for alternative ways to improve soil fertility and stimulate the growth of rice plants. One of these is to use natural microbial populations

as biocontrol agent and biofertilizers, where potential microorganisms are used having strong antifungal, antimicrobial effects and growth enhancer for the crop plants as well as they are eco-friendly. Microorganisms especially PGPRs play an important role in sustainable agriculture. Microbes maintain the ecosystem and consequently inhibiting the growth of phytopathogens which causes various diseases in plant.

Microbes also have been reported to be key factors in maintaining soil quality and increasing crop yield and growth. The use of microbes to enhance crop growth while making the plant resistant to pathogens has been reported as an eco-friendly way to maintain the ecosystem. For more than decades, the application of microbes in a sustainable agroecological manner has increased rapidly due to their ability to act as plant growth promoters^{1,2,5,21,26,29}.

Trichoderma is one of the best known and well described biocontrol fungi for its lytic activity and antagonistic properties against phytopathogens. *Trichoderma* spp. is among the most studied fungal BCAs and commercially marketed as biopesticides¹⁴. The success behind the *Trichoderma* strain as a secondary opportunistic invader, a fast-growing fungus, a strong spore producer, a source of cell wall degrading enzymes and important antibiotic producers¹⁰ is on ability to survive under extremely unfavourable conditions. The main biocontrol mechanisms exhibited by *Trichoderma* in direct confrontation with fungal pathogens are mycoparasitism^{15,18,25} and antibiosis^{18,34}.

Rice crop is affected by several soil borne fungi and microbes which cause diseases like blast, seedling blight and more which lead to loss of yield. Many researchers have demonstrated the potential use of *Trichoderma* spp. in controlling various diseases of crop plants due to *Fusarium* sp., *R. solani*, *S. rofsii* and *S. oryzae*. The present study aimed to study the biocontrol efficacy of the local indigenous strains of *Trichoderma* for the control of pathogens commonly found in Odisha like *R. solani*, *S. rofsii* and *S. oryzae* which caused diseases in rice plant and also to evaluate the soil structural and functional microflora after soil application of *Trichoderma* sp.

Material and Methods

Site description and soil sampling: Soils from different rhizospheric and non-rhizospheric of agricultural fields from



Impact of Gamma Irradiation on Biochemical and Physiological Characteristics of Black Rice

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Abstract

Rice (*Oryza sativa* L.) is a fruit caryopsis, well known for its high calorific value and presence of high antioxidant phytochemicals such as flavonoids and anthocyanins. Further exposure of crops to different doses of physical mutagens is useful to give insight into development of quality traits for plant breeding. So, the objective of the present study was to analyse the effects of gamma irradiation on black rice seeds that were exposed to different radiation doses and to evaluate the irradiation effect on physiological and biochemical characteristics of plants. Variations were observed among different doses from non-enzymatic antioxidant activities that showed the increasing flavonoids, phenolics and carotenoids accumulation from low to high doses. A high dose irradiation releases, high amount of H_2O_2 as compare to O_2 , indicating the involvement of enzymatic antioxidants as a defence mechanism. An inverse relation was shown between peroxidase and catalase enzyme and concentration of Superoxide dismutase also increased with increasing doses. To know the level of stress on cellular metabolism, total proline and malon dialdehyde accumulation was estimated and both showed positive results for increasing doses. In case of measurement of photosynthetic parameters, chlorophyll concentration increased from 50 Gy to 100 Gy and decreased from 150 Gy to 200 Gy due to peroxidation of membrane. Significant effect was not observed in the concentration of soluble sugar among various doses. Thus, the present study, was useful to isolating effective dose (50Gy, 100 Gy) that may contribute towards advancement of qualitative traits for future breeding purposes.



Article History

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Keywords

Antioxidants;
Mutagen;
Phytochemicals;
ROS.

Introduction

Rice (*Oryza sativa* L.) is a primary source of food for one third of the world's population and cited as

a most important cereal crop¹ belongs to family Poaceae having chromosome no $2n=24$.² Two main cultivated species of *Oryza* genus are *Oryza sativa*

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Exploring the Mangrove Based Phytochemicals as Potential Viral RNA Helicase Inhibitors by *in silico* Docking and Molecular Dynamics Simulation Method

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Abstract. The high molecular diversity of plant-derived compounds in mangroves has drawn attention to the discovery of their antiviral capacity against several pathogenic viruses. Therefore, screening for effective antiviral compounds with fewer harmful side effects is needed. This study aimed to screen several bioactive compounds from mangrove plants that could be appropriately used as an RNA helicase inhibitor against pathogenic viruses. Fifty-nine compounds were selected from literature and databases for initial study and screening according to Lipinski's rule of five. The chosen compounds obtained were subjected to another series of screening by molecular docking study with five different RNA helicase enzymes of the pathogenic virus using the Autodock Vina tool, followed by ADMET (absorption, distribution, metabolism, excretion, and toxicity) analysis. In addition, the best compound-bound helicase RNA complexes were included in a 50 nanosecond molecular dynamics simulation using the Gromacs 5.1.1 software, followed by Molecular Mechanics Poisson-Boltzmann Surface Area (MM-PBSA) analysis. This comparative study predicts that phytochemical gedumin is an excellent inhibitor of the RNA helicase enzyme of SARS-CoV-2, followed by the Japanese encephalitis virus and hepatitis C virus (HCV). The results of the study may lead to the development of antiviral compounds against RNA helicase enzymes of pathogenic viruses.

Key words: pathogenic viruses, RNA helicase, molecular docking, molecular dynamics simulation, mangrove phytochemicals.

INTRODUCTION

Outbreaks of pathogenic viruses are the source of several infectious diseases and cause loss of life. Most infections are caused by viruses, which develop into pandemics and spread rapidly between people. Examples of severe outbreaks and pandemics are Spanish flu, Hong Kong flu, SARS H7N9, Ebola, Zika, and Covid-19 that have occurred many times [1, 2]. Pathogenic RNA viruses comprise different structural and non-structural proteins (NSPs). Structural proteins like spike, envelope, membrane, and nucleocapsid proteins are involved in viral capsid synthesis. In contrast, NSPs play an essential role in viral metabolism, such as genome replication. These proteins include polymerase, helicase, and other accessory proteins [3, 4]. Among several non-structural proteins, the enzyme RNA helicase plays a vital role in viral genome replication [5]. The functional importance of this helicase enzyme is that it acts as a motor protein that performs the coiling and untwisting of the RNA genome using adenosine triphosphate (ATP) molecules. Therefore, this enzyme can be used as a potential therapeutic target for developing bioactive molecules to control viral infections [6–8]. However, the experimental basis for designing new molecules against the viral RNA helicase enzyme is difficult. For example, monitoring the real-time cleavage of helicase enzymes and RNA (during metabolism) by high-throughput assay is challenging. Again, the drug molecule should be

Exploring the Mangrove Based Phytochemicals as Potential Viral RNA Helicase Inhibitors by *in silico* Docking and Molecular Dynamics Simulation Method

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The Daughter of Niyamagiri

(A Translation of Rajat Mohapatra's Odia tribal story "Niyamagiri ra Jhia")

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There was only one king for the nine thousand nine hundred ninety-nine *kondhs* (a tribe). The oldest *dangaria* (a person living in hills) among the indigenous mountain people of the area was called Niyama King. Sitting in the trunk of a tree with termite roaming on his beard, he implemented *niyama*, the rules; so, he was named the Niyama King. The foremost rules in his kingdom were that nobody would starve and nobody would remain naked. Also, no one could cut trees or kill animals. The forest had given them everything. Nobody was allowed to sell the land. They would refrain from being shrewd and adopting the urban ways. Nobody would be suspicious of the other or betray others. Betrayal – a layer of sweet falsehood over truth – was considered the first sign of urban civilisation. The king had also declared that nobody was permitted to be educated the way town people were educated. He believed that such education led to the destruction of rural societies. Take for instance, reading newspaper meant to cut trees and buying books implied disappearance of forest. Similarly, using shoes meant killing of cows and wearing fur denoted death of sheep. Everyone obeyed and respected the king's rules. The life of *dangaria kondh* (the kondh tribe living in the Niyamagiri hills in the state of Odisha) was tied to many such rules known and unknown to others.

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The king heard a girl crying one day. He beckoned to her and asked, “Daughter, why are you crying?” Sobbingly, the girl replied, “Father is beating me after drinking *handia*, country liquor.”

‘Don’t you have a mother?’

“No.”

“Where did she go?”

“I don’t know. She left the house because father beat her.”

“Don’t cry. Now you are my daughter. No one will beat you.”

Wiping her tears, the girl returned home. After that day no body dared even telling her anything. Everybody knew that every nook and corner of Niyamagiri, the mountain region, was under the rule of Niyama King and in his regime there was equality for all.

Soon the girl grew into a young woman. Her name was Jhumki. Her body was as smooth as the high hills. Everything about her – her eyes, ears, body and heart – was beautiful like nature. It was difficult to take one’s eyes away from her. Bideshi (the foreigner) was following her from a distance since some days. He was captivated by her beauty and had a strong desire to come near her. He was impatient to know how she spent her day and night.

Jhumki was different from other *dangaria* girls. She seemed an integral part of nature – a part of the forest and the mountain. Her ancestors had been living on the foot of the mountains since thousands of years. They nurtured the forest and the forest nourished them in return. The dark *kondh* and the dark green mountainous forest complemented each other. They lived for each other. Jhumki’s ripened body gave the impression of inscription on black stone. Her round face with smooth cheeks, her watery eyes marked with kajal (kohl), the nose ring on her flat nose, her hair tied in a round bun decorated with wild flowers and pins, the necklaces hanging from her shoulders, the brass and silver rings adorning her ears, attracted the onlookers. She had blue tattoos on her forehead consisting of geometrical shapes. She had also got her name with three stars inscribed on her hand. These tattoos were very dear to Jhumki. Her mother had wished the name inscription to ensure that if the child was lost, she could be brought back to the mother.

The foreigner secretly followed Jhumki. When the sun crept from behind the mountain, Jhumki took her bath in the river. By the riverside near the mountain in the shade of the old banyan tree, there was a stone smeared with vermilion. Jhumki offered flowers and vermilion to

that stone deity every day. She prostrated before the deity and murmurs things incomprehensible. When she rose, somewhere from the branch of a tree dropped a silver coin. She collected it and tied it in a knot to her saree. She carefully took out the coin and hid it in an old earthen pot. It happened every day. Only she and Sukru knew about it. Sukru was like a friend who protected her and helped her when she was in trouble. But soon the mystery of the coin became known to the foreigner too.

When Sukru was not nearby, the foreigner approached Jhumki and said, “You have got what I am searching for. Will you give it to me? I will give you whatever you want in return. I want to take the coins you have collected in exchange of two thousand rupees. You keep this one thousand rupee note today. I will pay the rest of the amount after taking the coins tomorrow. I am sure you have not seen such notes earlier.” He handed a one thousand rupee note to Jhumki and explained, “Do you know the value of this note. This is worth a thousand coins you get in one thousand days. You will get two such notes. You can fulfil all your wants. You can buy anything and spend it according to your wish.” Jhumki could not believe her ears. Staring at the foreigner, she said, “I will tell you tomorrow.” The foreigner said, “I will wait for you tomorrow morning at this place. Come with those coins.”

Jhumki agreed and came back home with the one thousand rupee note. Sukru met her on the way and they crossed the dark road together. The foreigner monitored from a distance. On the way, Jhumki smelled the paper note. She liked the strange scent it produced. The money in the pot lacked that fragrance. She dreamt of a wonderful future.

Next day, she handed over the half-filled pot to the foreigner and got another thousand rupees note. She carefully tied it to her saree. Then she took her bath, prostrated before the deity and waited; but there was no coin this time. She looked at the grass, looked around everywhere, but there was no sign of the coin. She returned home with a heavy heart. She consoled herself by thinking that though she lost the pot of coins, she had got notes of two thousand. She could get anything in exchange of it. Jhumki felt rich. The next moment, she felt confused. She knew that Niyama King was angry with her. That’s why she didn’t get any coin that day. Jhumki wanted to cry, “Can these two paper notes take the place of that pot of coins? It’s impossible, just impossible.” She conveyed it all to Sukru. Sukru comforted her, “I know everything. Don’t be sad. Now you have a lot of money. What do you want to do?”

“Let’s go and buy something from the market.”

Both of them went to the market, but could not buy anything because the shopkeepers had not the capacity to return rest of the amount. It was not possible to spend the money even in the weekly market. They planned to go to the nearby town to get in exchange small notes which could be spent.

Next Saturday, they went to the town and were cheated. The swindler took a thousand rupee note from them and gave them ten fake hundred rupees notes. On the return journey, the bus conductor refused to accept the fake note and forced them to get down. Luckily, Jhumki’s childhood friend Lata was in the bus and she agreed to pay the bus fare. While walking down the village street, Sukru thoughtfully said, “We are *adivasis*; it is good for us to stay away from town people. Otherwise we will be doomed.

“Yes Sukru. You are right. Our village, our forest, our mountain, our river – they are for our well-being.”

She smelled a hundred rupees fake note and murmured, “*Adivasis* can easily be cheated. What can they do?” She angrily tore all the notes and threw the papers in air. She felt light. She had no money. She was tired and could no longer walk. She felt thirsty. Resting under a tree, she asked for water.

Sukru said, “Don’t worry. I will fetch water for you. If I don’t find water, I will come back with *handia*. You stay here.” Sukru went to bring water. The spring was not far, but that day there was no sound of falling stream and no trace of clear water.

Jhumki slept while resting. She dreamt. She visualised the foreigner coming with a bottle of water. He sprinkled water on her face and insisted her to get up. With closed eyes, Jhumki could clearly hear, “Get up Jhumki; get up. I am here with you. You will not be in trouble. Take some water, biscuit and cashew. Come and get into my car. I will take you towards civilization.” Jhumki was thirsty. She felt water on her tongue. She went into a deep sleep. She sensed a close relation of man and mountain; the next moment she perceived a remoteness. Man delights in climbing the mountains. The mountain too revels in taking man into her lap. Sometimes man desires to shatter the mountain. But, standing at its foothill who has not felt insignificant. Man compares the steep rising hill with the broad captivating chest of nature. Nature is the best friend of human – the source of his strength and confidence. Nature nourishes life with food and water.

Plants, leaves, flowers, fruits, mountains, birds and animals – all are indispensable for existence. Jhumki had well understood from her childhood that nature was her parents. When she wept on the stone outside her house, she could feel somebody comforting her. She felt a pair of consoling hands wiping her tears. Now deep sleep descended on her.

Amidst the silent green mountains, Jhumki's dream seemed to stretch from one horizon to the other. The mountain was filled with healthy green field puffing its chest and the spread of golden mustard flowers shining in fuzzy dreams. From the dense branches of the mango groves came the tweeting of the wood pecker. In another direction the fisherman could be seen in deep meditation. All these wove together a beautiful dream which nature only could create. Could fear exist in such a world? Behind the closed eyelids of Jhumki hid the rainbow world of dream. Leaning against the Siali creeper, she could feel the warmth of a mother's lap. She could envision dreams flying amidst floating clouds to the tune of celestial music.

Ah! She wished this beautiful reverie to continue. She yearned to see it with open eyes. She rose to sit. The receding glow of the sun from the west turned her face into a golden fairy. On her radiant body the tattoo created the illusion of filigree work. She discarded all she was wearing. She cast off her bangles, necklaces, ear rings, *payal* (anklet) and toe rings. Stark naked, she entered the stream to feel its depth. Her eyes gestured the foreigner to swim with her.

But the foreigner was engrossed in shooting the video of her crazy mermaid-like swim. He discerned that the young woman, ecstatic with happiness before a few moments, was being drowned, lost and hidden. The darkness of the western sky engulfed the water. His camera could no longer capture that deep darkness. He threw the camera into the water. He started walking like a man who had lost all sense of direction. He could experience the horror of darkness. Sometimes a fear inducing voice intervened that darkness. He remembered Jhumki's face and marched forward.

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The Vanquished

(Originally written in Odia by Pranabandhu Kar titled “Parahata”)

**Translated by
Anjali Tripathy**

“Oh cycle baboo! Where are you going?”

My cycle stopped. I looked back – it was a lonely track of a hilly area. She called me from behind and didn’t hesitate looking shamelessly at me while laughing. I thought, “Is she mad?” Doubtfully, I got down from the bicycle and asked, “Did you call me?”

She didn’t answer and continued to gaze with a static smile.

I felt humiliated. Then I looked around. Nobody was there. It was a winter noon. Hill and forest, forest and hill – everywhere. I inspected my attire, but could not trace any reason of her call or laughter.

I was pondering: When did the Malua girls become so bold? Generally they hide in the forest, when they see baboos with coats and pants. Only one can discover their scared eyes behind the bush and they ...

I beckoned her to come near, then asked her in a rough voice, “Why were you calling me?”

The young woman playfully said, “Just like that.”

The fact that she was not afraid of me made me feel insulted. I was angry too and observed her from toe to tip. Youth was overflowing from her body, fearless was her fluency and her well-developed breasts exhibited shamelessness. She was clad in a blouse and a white saree. I asked, “What is your village?”

“Mitingia.”

“Are you a Christian?”

She nodded. Then I enquired, “Pana Christian?”

“Yes.”

“Why did you call me?”

“Why? What happened then? Stay if you want to, else you go.”

I could not decide whether I should go or stay. I continued looking at her. She smiled, gazed, turned her neck a little and said, “What are you looking at baboo? Keep your cycle behind the bushes and come with me inside the forest.”

Lonely was the mountainous valley – the dark, green Sal forest was all around. There was no covert cover to the proposal, no concealment, blatant like her high busts. A woman can express her desire to an unknown traveller in such an unabashed way. It was beyond my imagination. I was stunned. What did she think of me? I looked around with fright in my eyes. Perhaps, I would not have been so terrified even when caught by a tiger.

“What are you thinking baboo?”

Startled I turned at her.

“Are you afraid?”

“What’s your name?”

“Sunti.”

“Sunti?”

“Yes.”

Sunti smiled – it was a beautiful smile. Sunti’s face was certainly captivating. She had a long neck. Her doe eyes expressed unrepressed desire sometimes, and at times displayed idle indifference. My harsh voice was gradually turning soft. I asked,

“What class have you read?”

“Eighth standard.”

“Really? Wow! And you are doing this after reading so much.”

She was without words. Amidst the loneliness of the valley, if I were the first man in her life she was pleading and expressing her desire, it would have been different, I thought. It would have mattered to me little whether Sunti was a Malua girl or a Pana Christian, whether she was scared of me or not. But I understood that it was different. She had lured many other travellers like me. She is a conqueror. As Napoleon won several kingdoms, she has conquered many hearts one after another.

I asked, “How many baboos you have rested with?”

With bare ridicule on her lips and vanity of victory in her eyes, she said,

“Oh! Many baboos.”

“Really?”

“Do you think I am lying? Saltu baboo, Rabini baboo, Mesrot and many more.”

There was ego of a victor in her voice. I went on staring at the Napoleon of this silent valley in surprise. Perhaps she was not lying. I wondered, if this nameless Malua woman had given her strong beautiful body to those men for money only? Did she sell her attractive figure only for a blouse, a good saree or a bottle of scented oil?

I perceived soon that she was a threat to my manliness. Perhaps she had not yet experienced the pleasing pain in spite of her union with many men. Possibly those men were flitting memory just like stones in the path of her life. Her eyes acquired them, but mind didn't retain. ... I chided, “See Sunti! I will tell everything to the Padri Sahib.”

With lips twisting, she said, “Go baboo. I have seen many Padris.” After such retort, silence subjugated me. Before riding my bicycle to leave the place, suddenly I opened my purse. Sunti responded with a coquettish smile: “Do you want to give me money?”

“Don't you need?”

“I didn't call you to get money from you. Don't show me money. Go, baboo, go. You are a newcomer. That's why you are still afraid.”

With my hurt manliness, I rode my bicycle. I could hear a woman's laughter from behind – a laughter as spontaneous as a mountain spring. The desolate valley resounded with the laughter. I thought that I should go back and slap her. If she were a girl from an aristocratic or educated family, I would have definitely done that.

Two days after the incident, while getting into my office chamber my doctor friend burst out, “Oh Jeevan baboo! What did I hear about you?” I assumed he was joking. But he narrated his story and I was shocked. I said, “Me with Sunti?” I tried laughing loud. But it turned into a feeble laughter. I learnt that Sunti had spread a false story about me. I narrated the whole incident to my friend and I thought he believed in me. But I was not content. My character, honesty and reputation were at stake. In spite of my innocence, I felt ashamed. I supposed that all are watching me with scorn and hatred.

Afterwards, I crossed path with Sunti several times while visiting the market. But I didn't dare to look at her, though I wanted to. Whenever I caught her eyes, my eyes lowered against her straight forwardness.

Subsequently, I got my transfer order. I had developed a bitterness for this place called Mala. My former infatuation with mountain forest and the earnest interest to know Kandha tribe had vanished. I was glad to receive the transfer order. The day before I left, I was leisurely sitting outside my quarters on my armchair after lunch and recounting my days at Mala with a subtle sense of pain. To my utter surprise, Sunti was standing in front of me.

“Sunti.”

That day her eyes were humble. There was no trace of impertinence in that countenance. I felt that she was a different Sunti. I sensed that a swift flowing mountain river had been suddenly tamed and turned immovable.

“You.”

Sunti kept looking at me. In a trembling voice she said, “Baboo! Are you leaving the place tomorrow?”

“Yes. Why are you asking this?”

Sunti remained silent with a lowered head. I said, “I am leaving your Mala, Sunti. I will remember you a lot.”

She looked at me with questioning eyes.

I answered, “Don't you believe?”

“How can I, baboo? Who am I to you?”

I turned away my face from her. Unexpectedly, I could feel someone's touch on my feet. I saw Sunti's head on my feet.

“Oh! Get up, get up; if somebody will see then...”

Irritated, I released my feet. I said, “I know everything. Leave. I am not angry with you.” Sunti stood up. I firmly added, “Don't tell such lies to your baboos. Did you understand?”

Sunti nodded. Suddenly I remembered that she was literate. She mocked at me, when I was giving her money. I enquired, “Sunti, don't you take money from baboos who visit you?”

“I take.”

“Then why didn’t you take money from me that day?”

Sunti stared at my face. I felt that she was pained by this question. I asked, “If you didn’t want money, then why did you...?”

I was eager to know her mind. Somehow I convinced her to confess. From Sunti’s disclosure I understood that she knew the mind of these so called gentlemen-baboos. She desired to marry an educated gentleman. Everybody was attracted towards her, but nobody accepted her as a wife. Frustrated, she had not stopped attracting them. Their aristocracy was not offended while enjoying her youth and beauty. She was surprised to find that their self-respect was not insulted by this act of enjoyment and this had increased her interest. She said, “How strange are the ways of these gentlemen? They will not accept her into their society, but how eager they are to embrace her attractive body in secret. What pleading in their eyes!” Sunti had felt a devilish happiness to watch this. When they approached her, she observed the twist of their muscles, the wildness of their eyes, yet they were terribly weak, helpless. Sunti enjoyed slaying their aristocracy.

Sunti remained silent for a while. I continued looking at her till I could believe it. I heard, “I thought you are also like them, baboo.” I smiled a faint smile.

After standing there for some time, in an aching voice Sunti said, “I am going baboo; don’t forget me. Do remember me.”

I looked at her face in disbelief. What’s this? Streams of tears are flowing through her eyes to wet her cheek – a symbol of her hurt womanliness. “Strange are the ways of women,” I mused.

Sunti slowly walked away. She didn’t look back. She crossed the gate. After she left, I asked myself: “Who is the vanquished? Sunti or I?”

Bio:

Dr. Anjali Tripathy is an Associate Professor and Head in the Department of English at Gangadhar Meher University, Sambalpur, Odisha. She has authored a book of literary criticism titled *Shauna Singh Baldwin’s What the Body Remembers: A Post-colonial Feminist Study* and published research articles widely in the area of Post-colonialism, Feminism, Indian Diaspora,

Revisiting Mythology, Partition Literature and Indian Writings in English. Her research interests also include Translation Studies, Business Communication and ELT.

Pranabandhu Kar

Pranabandhu Kar (1914–1988), a playwright and short story writer, is regarded as a pioneer of modern Odia literature. As a professional educator, he drew on everyday events and situations to create stories that captivate both readers and authors. He struggled with poverty, sluggishness, frustrations, and disappointments, yet overall, he was an optimist and enjoyed life. As a result, his writings often exude positivism, highlighting the good in his characters through fine psychoanalysis. He set trends in Odia plays and short stories with his style, technique, and eagerness to try new things. His works have garnered him accolades and honours from the Central Sahitya Akademi, Central Dance-Drama Akademi, Odisha Sahitya Akademi, and many other esteemed organisations.

A Preliminary Analysis of Causative Construction in Koshli Language

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Abstract

This paper presents a preliminary analysis of the causative phenomenon in Koshli. The paper investigates the causative construction on the basis of its form and the function. Moreover, it presents the classification of causative construction on the basis of linguistic analysis. In other words, in this paper we present the morphology, syntax and the semantics of the causative verbs in the language.

Keywords: Koshli Language, Causative, Morphological, Syntactic, Semantic, Periphrastic, Lexical.

A Succinct Idea on Koshli

Koshli is an exhaustively spoken Indo-Aryan language of Western Odisha. Narang's (1937) states that, the name of the language sources from the name of the region Koshal. Grierson (2005) has observed that the grammatical similarities among the languages spoken in the region from Raigarh in the North to Kalahandi in the South and Raipur in the West to Burma in the East (Sundargarh, Jharsuguda, Sambalpur, Deogarh, Athmallick sub-division of Angul district, Bargarh, Subarnapur (Sonepur), Nuapada, Bolangir, Boud and Kalahandi). The language also is spoken by the people of South Western district of Madhya Pradesh (present Chhattishgarh) and Bihar (present Jharkhand).

Koshli syntactically is an SOV, head-final and typologically agglutinating language. However, Koshli and Odia have some similarities with respect to their lexical items and a part of their

phoneme inventories, these can be attributed to the general similarities between languages are in close contact and come under the umbrella of South Asian languages. However, the dissimilarities between Koshli and Odia are far more significant. They differ in terms of most of their lexicons, and syntax. As shown in Naik's (2018) for example, Odia and Koshli negation behave differently when the clause in question is scrambled. Moreover, Odia is a vowel final language whereas Koshli is a consonant final language. Naik (2018) in his M.Phil Dissertation "A Digital Lexicon of Complex Predicates in Koshli" has given a transparent comparison with wonderful summary of a few differences between Odia and Koshli. Many scholars including Tripathy (undated), Das (1990), Kushal (2015), Padra (2015), Naik (2018), strongly note that Koshli is not a dialect, rather a rich and independent language, having different varieties like Sundargadia, Kalahandia, Balangaria, and Bargadia and Sambalpurai. However, language variation is inevitable and Koshli is no exception. Koshli is spoken in the ten districts and Athmallick sub-division of Angul district of Western Odisha; its varieties are spread out over these districts. Here is a list of districts given below for a clear and comprehensive understanding.

- i) Sundargarh
- ii) Jharsuguda
- iii) Sambalpur
- iv) Deogarh
- v) Athamallick Sub-division of Anugul District
- vi) Bargarh
- vii) Subarnapur (Sonepur)
- viii) Nuapada
- ix) Bolangir
- x) Boudh and
- xi) Kalahandi

Introduction

In common parlance, **Causative verbs** mean that 'some actor makes somebody else do something or causes him to be in a certain state' (Agnihotri, 2007). The causal verb indicates 'the causing of another to do something, instead of doing it oneself' (Greaves, 1983). Causative verbs

have been differently realized in different languages world-wide. So far as the causative verbs are concerned, it has been an attractive and interesting field of research among linguists and research scholars. The study of causative constructions is important as it involves the interaction of various components such as semantics, syntax, and morphology (Comrie, 1981). It semantically refers to a causative situation which has two components: (i) the causing situation or the antecedent; (ii) the caused situation or the consequent. These two combine to make a causative situation (Nedyalkov and Silnitsky, 1973).

In different languages, the causation is indicated in different ways. According to Comrie (1981), there are three different types of causatives: i) Morphological causatives, ii) Periphrastic causatives and iii) Lexical causatives. On the one hand, it is obvious from various researches that **morphological Causatives** indicate causation with the help of verbal affixes. Sanskrit, Hindi (Rajesh Bhatt and David Embick) Urdu, Persian, Arabic, Hebrew, Japanese, Khmer, Finnish and many other languages have morphological causatives. On the other hand, the periphrastic causatives indicate causation with the help of a verb which occurs along with the main verb. Here is model example, in English in a sentence to have clear understanding such as:

1) Radha makes the child write the alphabet.

We witness in the above example that the verb *make* is expressing causation which is occurring along with the verb *write*. English, German, and French are some of the languages which have periphrastic causatives. Lexical causatives are those in which there is no morphological similarity between the base verb root and the causative verb form.

However, our concern is neither to diagnose the periphrastic causative nor to see a lexical causative. Rather we will investigate the morphological causatives of Kohli (Sambalpuri) language. Causatives in Koshli language basically are derived through morphological processing. The affixation to the root of a basic verb plays a crucial role in the formation of causatives. Here is a table with some model examples. Let's have a look at it.

Table 1

Basic verbs	Running translation	Causative verbs	Running translation
k ^h a	To eat	k ^h ua	Make to eat
nac	To dance	nəca	Put to dance
cəg	To climb	cəga	Make to climb
bəs	To sit	bəsa	Put to sit
p ^h ĩg	To throw	p ^h ĩga	Put to throw
pi	To drink	pia	Make to drink

hã̃s	To laugh	hã̃sa	Make to laugh
ḍ̥əuḍ̥ə	To run	ḍ̥əuḍ̥a	Put to run
koḍ̥	To dig	koḍ̥a	Make to dig

Koshli language does not have a third type of causative like Hindi possesses, for example [k^hana, k^hilana, k^hilwana]. We have a list in the above table that conveys the addition of [-a] to the root form of verb becomes the causative form.

Let's now have the causative constructions of the language and their morphological operation. The following examples show the transitive and intransitive verbs and their derived causative forms.

For example:

2) ṭukel am k^hauc^he
 girl.3SF.NOM mango.ACC eat.PRG.PRS
 The girl is eating mango

3) ma c^hua-ke b^haṭ̥ k^huouc^hən
 Mother.3SF.NOM child.DAT rice.ACC eat.CAUS.PRS
 The mother fed the child.

4) muĩ bəhi pəḍ̥h̃sĩ
 I.1S.NOM book.ACC read.HAB.PRS
 I read books.

5) bua moṭ̥e bəhi pəḍ̥h̃asən
 Father.3SM.NOM I.DAT book.ACC read.CAUS.PRS
 My father put me study the book.

6) se nacuc^he
 S/he.3SF.NOM dance.PRG.PRS
 S/he is dancing.

7) makəḍ̥-bala makəḍ̥-ke nəcala
 Monkey owner.3SF.NOM monkeyDAT dance.CAUS.PST.PRFT
 The monkey owner made the monkey danced.

8) c^hua-ṭa sui pəḍ̥la

- Child.3S.NOM.DEF sleep.CONV fall.PST
The child slept.
- 9) c^hua-ke ma suei pəkale
Child.DAT mother.3SF.NOM sleep.CAUS.CONV fall.PST
Mother put the child slept.
- 10) gaɛmane pæn pile
Cow.3P.NOM water.ACC drink.PST
Cows drank water.
- 11) kəmiha gaɛman-ke pæn piəle
Cowboy.3SM.NOM cow.3P.DAT water.ACC drink.CAUS.PST
The cowboy made the cows drink water.
- 12) c^huaɾa suila
Child.3S.NOM sleep.PST
The child slept.
- 13) ma c^hua-ke suale
Mother.3SF.NOM child.DAT sleep.CAUS.PST
Mother made the child slept.
- 14) piə-mane k^heluc^hən
Boy.3PM.NOM play.PRG.PRS
The boys are playing.
- 15) rɛp^həri piə-man-ke k^helouc^hən
Referee.3S.NOM boy.3P.DAT play.CAUS.PRS
The referee is making play the boys.

We see from the above examples clearly that the causative construction in the language is possible which basically is derived from the base form of verb. The examples (3), (5), (7) (9), (11), (13), and (15) include the causative verb constructions where somebody causes someone or something to perform a certain action. In example (3) [ma ‘mother’] causes [chua ‘child’] to eat. Likewise in other examples including (5), (7) and (9) (11), (13) and (15) the process can be identical and observable.

To have a fundamental but transparent idea, the verbal paradigm of causative construction in Koshli is very useful; hence, it is given below in Table 2 with its corresponding verbal base.

Table 2

Verbal Base	Causative Construction
b ^h iɣ To drench	b ^h iɣɑ Cause someone to drench
caɭ To walk	cəɭɑ Make someone to walk
kãɖ To cry	kəɖɑ Cause someone to cry
kəɾ To do	kəɾɑ Cause somebody to do
lek ^h To write	lek ^h ɑ Cause somebody to write
pəɖ ^h To read	pəɖ ^h ɑ Make someone to read
uɾ ^h To rise	uɾ ^h ɑ Make someone to rise
sik ^h To learn	sik ^h ɑ Make somebody learn
gɑɖ ^h to bath	gɑɖ ^h ɑ Make someone to bath
b ^h ɑs To float	b ^h əsa Cause somebody to float
ɾɑɳ to draw	ɾəɳɑ Make someone to draw
ɖəɳ To peep	ɖəɳɑ Make to peep

In the above paradigm we observe the following causative derivation process which involves the sound alternation: there could be two possible ways.

- a) There are some of the causative constructions which have taken the affixation [-ɑ] and this is added to the verbal base, basically when the verb is in the present, past and future simple.

- b) When the verb is in the present, past and future progressive, the causative suffix [-ə] is added to the root.

However, another aspect we should notice here is the valency of verb. As Kachru (2006) and Comrie (1981) have opined that ‘in each step of causative derivation there is an increase in the valency of the verb.’ To have a comprehensive understanding of the idea again we have taken some model examples below.

- 16) c^hua k^hella
child.3S.NOM play.PST
The child played.
- 17) nani c^hua-ke k^helale
Sister.3SF.NOM child.DAT play.CAUS.PST
Sister made the child play.
- 18) c^hua-ʈa gaḍla
Child.3S.NOM.DEF bath.PST
The child took a bath.
- 19) c^hua-ke ma goḍ^hale
Child.3S.DAT mother.3SF.NOM bath.CAUS.PST
Mother made the child bath.
- 20) ma c^hua-ke goḍ^hale
Mother.3SF.NOM child.DAT bath.CAUS.PST
Mother made the child bath.
- 21) j^hi-ʈa rāṅḍ^huc^he
Daughter.3SF.NOM.DEF cook.PRG.PRS
The daughter is cooking.
- 22) ma j^hi-ke rāṅḍ^hale
Mother.3SF.NOM daughter.DAT cook.CAUS.PST
Mother made the daughter cook.
- 23) j^hi-ke ma rāṅḍ^hale
Daughter.DAT motehr.3SF.NOM cook.CAUS.PST

24) ma j^{hi}-ke b^hat r̄ṅḡ^hale
 Mother.3SF.NOM daughter.DAT rice.ACC cook.CAUS.PST
 Mother made the daughter cook rice.

The above examples offer a clear understanding that the increment of valency of verb has taken place. The examples which do not have causative verbs possess one or two arguments. When it turns to be causative constructions, the valency has been increased and the number of arguments has also increased to two, three or more than that.

Conclusion and Future Work

To sum up, the present paper presents a preliminary analysis of causative constructions in Koshli language, with a fundamental classification followed by a surface linguistic analysis, containing the form and function. The work could be of help particularly for the researchers in this area for further research in the language, and in linguistics in general.

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Corporeal Memory and the Partition

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Abstract:

This article seeks to investigate the concept of corporeal memory while dealing with the effects of violence on the female body and psyche in the context of the partition of India, as well as the potential for self-reclamation through remembering and re-membering the body. With a special focus on Shauna Singh Baldwin's partition novel *What the Body Remembers* (1999), the essay also contends that by narrating the history of Sikh women during the partition, Baldwin contests nationalist discourses in gender terms, thereby producing a counter-discourse. It draws on Maurice Halbwach's concept of "collective memory," Cathy Caruth's formulations on "trauma," and Toni Morrison's notion of "rememory," etc. to engage with corporeal memory in the novel under discussion.

Key words: Postcolonial women's writing, Contemporary women's writing, Partition novels, Memory Studies, Shauna Singh Baldwin

Introduction:

It is collective knowledge that during the partition of India in 1947, violence was performed extensively on woman's body and the ensuing misery and trauma of women have been narrativized in fiction and memoir by both female and male authors. Instead of addressing the many types of violence to which women were exposed, this article will engage with corporeal memory in Shauna S. Baldwin's *What the Body Remembers* to examine the effects of violence on the female body and psyche during the division (1999).¹ It aims to demonstrate how remembering is a narrative technique for playing out and compiling many accounts of the same horrific event, and it has the ability to create her-story.² Here, I will employ analogy from texts like Toni Morrison's *Beloved* (1987), which use the body of a woman as an archival location of community memory, remembrance, and resistance in postcolonial contexts.

Collective memory and Rememory:

The corporeality of memory is a central concern of Baldwin's novel as it is evident from the title *What the Body Remembers*. The prologue, which takes place in Undivided India in 1895 with Satya's birth, and the epilogue, which takes place in New Delhi, Divided India in 1965 with Satya's rebirth, both depict the same story: Satya's pain and anguish at being born a woman. Satya remembers in the epilogue that her body remembers without the help of words, that men who do not welcome girl-babies will not treasure her as she matures into a woman (538). The fact that women's fate did not improve between 1895 and 1965 and that they have yet to experience the liberty from dominance that independence from the British Empire promised is distressing.

Satya is the only character to talk in the first person (in the prologue and the epilogue), and her memory opens and closes the book. But the plot emphasises Roop's speaking because what Roop recalls is literally what "the body" remembers (as Roop means "bodily beauty"). The story of Roop's early years is essentially one of education, illustrating how she learns from her father and the other women in her life "what women are for" (48). Women of the household teach Roop that the primary function of a woman is to produce *sons* (italic for emphasis). As she grows into a young woman, she learns the fear of loneliness, the fear of being left behind unwedded due to lack of dowry or the fear of lust from the eyes of unrelated men. Roop is "made" a woman, and her body retains the patriarchal norms instilled in her throughout her life.

Significantly, women's experiences of oppression in everyday life in patriarchal societies before the partition, as well as their perilous fate during and after the partition, are treated as mutual corollaries by Baldwin. In other words, women's suffering during the partition was not only a tragic incident of men's violence against women's bodies, but also the natural consequence of patriarchy projecting its thirst for power, aggression, and vainglory onto the national imaginary through women's bodies and legitimizing these through the self-serving myth of *izzat* or honor of the quom. Baldwin looks at violence against women and women's subjection to patriarchal forces as remembrance from past ages which is collective in nature. Of the collective character of memory, Maurice Halbwachs writes that while collective memory remains and draws power from a coherent body of people, it is individuals as group members who remember (*On Collective Memory* 22). As a result, different groups, such as social classes, faiths, communities, gender, families, and others, have distinct types of collective memory. Their members build it over a long period of time, and they remember it as individuals. Being situated in a particular location, they use that context to remember and reenact events from the past. As a result, an individual's understanding of the past is inextricably linked to that of the group. It is depicted in Baldwin's novel on multiple occasions. Papaji tells Jeevan, "We are Singhs. Remember this" to remind him of his communal identification and reinforces it by telling him the narrative of Jalianawala Bagh (61). Sardarji's exhortation to his sons on the eve of their voyage to New Delhi, "Remember you are Sikhs" is an insistence on drawing confidence from community memory in the face of enemy onslaught (452). Whether Hindus, Muslims, or Sikhs, Baldwin's protagonists in the tale carry the intense pride and prejudices of their communities within them or to use Baldwin's powerful metaphor, the burden of "what the body remembers."

Sardarji's embodied memory of "life-preserving fear," passed down through rhymes, paintings, poetry, and stories, or Rai Alam Khan's corporeal anxiety instilled by tales of Sikh dominance, both historicize the fears aroused by partition's altering power relations (394). Sardarji and Rai Alam Khan are not the only Sikhs or Muslims who remember the violence during the split. Jeevan, Roop's brother, asserts that contrary to what the English assume, all men whose bodies can recall humiliation and resentment from this life as well as past ones are capable of fighting in the army (199). People are moving nomadically across India, according to Baldwin, not in expectation of freedom, but from the dread their bodies reminisce from another age (447). As a result, not only for women, but also for men, the novel portrays the body as a store of traumatic memories of fear and sorrow.³ When she is asked about the significance of the title *What the Body Remembers*, Baldwin explains that the title is loaded with connotations. Roop means "body," "form," and has that as its surface meaning. So in a manner, the plot of *What the Body Remembers* is what Roop remembers, is supposed to remember, and in a sense, what she "remembers" towards the end of the book when she remembers Kusum and develops into a stronger, and less ostentatious woman. Kusum and all the other women sacrificed during the Partition should be remembered in order to make history more complete. Additionally, the term alludes to communal memory, ancestral memory, and the subconscious and how these feed our worries, whether they are justified or not. When the State encourages violence by pledging not to hold anyone accountable, fear then affects our behaviour. He also added that on a deeper level, the body was the metaphor of the 1930s and 1940s in undivided India—the nation as flesh, the woman as the tribe's womb. The entire nation recalls the story (of Partition and the loss of the country's "children") as a part of its creation story and its labour pains (www.shaunasinghbaldwin.com).⁴

Significantly, in anticolonial and postcolonial contexts, this "bodily memory" can be negotiated and mapped in a variety of ways, radicalizing an otherwise passive body and strategically locating it to challenge the hegemonic discourse from the perspective of race and gender. Furthermore, such politicization of the body and corporeal memory can be valuable in dealing with trauma. Tony Morrison's works, particularly *The Bluest Eye* (1970), *Sula* (1974), *Song of Solomon* (1977), and *Beloved* (1987), establish a tradition of corporeal memory. However, I find *Beloved* the most useful of these novels because of its deep engagement with corporeal memory and usage of the body as a mechanism and a site for preserving as well as excavating memories. Furthermore, as Rushdy argues, Morrison's trope of "rememory" as a noteworthy concept in psychology and narratology has much to explain the complex patterns of discovery, rediscovery of new dimensions to one's experience of a primal scene, "the critical event (or events) whose significance to the narrated life becomes manifest only at a secondary critical event, when by a preconscious association the primal scene is recalled" (303). The primal scene, which is not sexual in the Freudian sense, is an incident or episode that an individual is compelled to recall and re-evaluate at a pivotal point in her or his life, in order to discover herself or himself through such re-evaluation. Morrison has used the term "rememory" to describe the act of recalling such fundamental scenes, which is both a heuristic and an emotive agency for self-discovery. In Morrison's novels, comprehending oneself and one's past is always a community enterprise.

Morrison creates mythic women characters like Claudia, Frieda, Aunt Jimmy, and M'Dear in *The Bluest Eye* to conjure a mythical memory to amalgamate African history, community and the women. Rememory serves as an instance of recuperative, cathartic, redeeming, and therapeutic act. The background of remembrance in *Sula* is female friendships, in *Song of Solomon* familial bonds, and in *Beloved* a slave culture (Rushdie 303).

The parallel between Baldwin's use of the concept of "collective memory" and Toni Morrison's "rememory" calls for further elaboration. Morrison defines rememory as the act of recalling a memory, whether physically or cognitively. The protagonist, Sethe, discusses rememory to her daughter Denver in *Beloved*: If a house burns down, it is lost, but the location—the image of it—remains, not only in her "rememory," but also in the outside world. She can only recall a visual that is circling around outside of her head. Even if she doesn't believe it, even if she passes away, there is still a record of what she did, knew, or saw in the same spot where it occurred (43).

"Rememories" differs from "memories" in its autonomy from the rememberer. These "rememories" not only occur external to the agent's mind, but are accessible to one who can enter through some magical anamnesis the mental domain of someone else. The said sphere of action is therefore not ordinary, but approached through imagination. It is almost like Kant's noumenon substantiated into Freud's "psychic reality" (Rushdy 304). In other words, what Morrison calls "rememory", the continual existence of a vanished or forgotten entity either by an individual or a community, consists in its retrieval, recuperation, re-evaluation collectively in an inter-personal context. Therefore, in her article "Toni Morrison's *Beloved*: History, 'Rememory,' and a 'Clamor for a Kiss,'" Caroline Rody explains that "rememory" postulates the interconnectedness of minds, past and present, and therefore, elegantly conjoins the novel's supernatural vision with its aspiration to be a communal epic, archiving "collective memory." To "rememory" for Sethe and her author, is to utilize one's imagination to realize a hidden, everlasting link to the past (101-102).

Rememory, as Morrison would have it, can be shared. Sethe describes to Denver in *Beloved*: One day, as you're crossing the street, something catches your attention. So obvious. And you assume that you came up with the idea. But no. It's when you run into the rememory that belongs to someone else (43). For Sethe a "rememory" hangs around as a "picture," a primal scene, which can enter another's "rememory" and reinforces discontent as well as the identification of women as an oppressed gender on a collective scale. In Baldwin's novel too, rememory plays a role in the collective anguish of women on their loss of an idyllic world of youth and innocence, their loss of loved ones and homes and their servitude under polygamy during the partition. The paradox of the entire process of rememory is that, while it is corporeally felt and experienced by individual bodies on the one hand, it can be shared among bodies and recovered as archived memories of the body. Roop has access to rememory of her co-wife Satya who decides to die in protest of her husband's injustice. Roop shares Satya's rage, aspirations, humiliations, and understands her association to a history of the undervaluing of women's lives. Roop concludes from the experience that the understanding of the world

will never be the same again. Roop is different now. Roop experienced what Satya's body recalled for a significant moment, and it will continue to simmer while waiting to boil someday (378).

Satya enters Roop's mind during her atonement. She declines the English names given to her children by their English tutor, Miss Barlow, drawing courage from Satya. When Satya's confident demeanour overwhelms Roop, she summons the courage to confront the Muslim soldiers on her way to Delhi. Roop still lacked a voice, despite the fact that her process of claiming the self began with an assertion of her right to her children (the offspring of her body). When her children were taken from her and given to the childless Satya, all she could do was go to her father's house to complain. Her experiences during the partition, on the other hand, changed her and made her a different woman who is more convinced, assertive, and capable of speaking for herself. While she waits for her husband Sardarji in the railway station at Delhi and watches the women pulling the remnants of rags about their breasts, Roop could hear Satya saying that they have learned shame, shame of their own bodies, from men of all faiths who cannot trust each other (498). It leads Roop to enact the boldly radical scene of parading unclothed as a radical sign of resistance.

Roop's exhibitionism is a dissent against the dishonour which the Hindu and Muslim communities have inflicted upon women's bodies by ironically inking the violent symbol of their nation's victory and honour on it. The multitude of images that mould and determine Roop's sense of self are given sequence and meaning in the narrative. Finally, through the decisive act of revealing about her one damaged ear to Sardarji (that she believes could result in her exile), she conquers her fear of the body and her transformation is complete (534). Roop must credit Satya for her transformation. The instances of transfer of memory from Satya to Roop resulting in the latter's reclaiming of self-identity, voice and moral empowerment underscore the agency of women in preserving their story within communal memory.⁵

Remembering and forgetting:

Urvashi Butalia in *The Other Side of Silence* suggests that remembering can be liberating in effect. She views that although remembering can be damaging, it is necessary—not just so that we can come to terms with it, but also because unravelling memory and remembering is an indispensable constituent of the process of resolving, even of forgetting (357). Memory is terrible as an individual experience, but it is therapeutic as a group experience. People delve into the past, repeating painful experiences to work toward the health of broader awareness and thus, remembering can be an act to overcome the “trauma.”

Etymologically derived from the Greek *τράυμα*, the word “trauma” signifies physical damage. However, since Sigmund Freud theorized about it in *Beyond the Pleasure Principle* and *Moses and Monotheism*, its significance in psychoanalysis has become much more complex. Trauma is the unconscious concealment by the experiencer of an unintentionally violent, embarrassing occurrence such as sexual abuse or the loss of someone she or he has loved. The experiencer is so taken aback by the incident at the moment

of its occurrence that she or he does not comprehend its full implications. However, when it is remembered after a period of suppression and silence, its horror and ferocity become palpable.

Trauma is, thus, a belated recall of a past event, and it can be activated in memory by other experiences that are nothing more than the original event's misplaced referential. It can also be trans-personal, as the Holocaust and the 19th-century Great Famine have been for generations of Jews and Irish people respectively. In India, the partition of Punjab and Bengal have also taken on traumatizing dimensions for those who were directly or indirectly affected by them, and the violence and horror of the events have been remembered at various locations and times following a period of denial and amnesia. In such circumstances, trauma takes on a sacred and ethical status on a communal basis. Therefore, rememory is valuable.

Cathy Caruth notes in her book *Unclaimed Experience: Trauma, Narrative, and History* (1996) that "trauma is not locatable in the simple violent or original event in an individual's past, but rather in the way that its very unassimilated nature—the way it was precisely not known in the first instance—returns to haunt the survivor later on" (4). In this book, Caruth examines the historicity of trauma in psychoanalytic, literary and literary theory texts to show that its history is not founded on straightforward experience and reference. She examines, among other things, Sigmund Freud's work *Moses and Monotheism*, which he composed during the invasion of Austria by Germans, rise of Nazism and his escape to London. The text relates Sigmund Freud's speculation regarding how the Israelites assassinated Moses, their own redeemer, who had set them free from Pharaoh and brought them into the monotheistic fold in Canaan. However, as a namesake of Moses, who was a disciple of the volcanic God Yahweh, came to be exalted as the Prophet, and the genuine God of the original Moses was absorbed into Yahweh, this murder and the associated sense of guilt were ignored. In the words of Caruth, Freud's tale comprises the forgetting and reappearance of acts of Moses which serves as a link connecting the ancient and new gods, the people who leave Egypt with the people who eventually make up the Jewish nation. Freud resituates the fundamental possibility of history in the nature of traumatic departure by focusing his account on the nature of leaving and returning as formed by trauma. The essential question, then, by which Freud eventually investigates into the relationship between history and its political consequence is: What exactly does it mean for history to be the history of a trauma? (15).

Caruth's answer is that the precondition of the history of trauma is basically the history of the suppression of an original/original event, its displaced referentiality and distortion as well as repetition of events referring back to it in the altered and even mis-contexts. The historicity of an event lies in its suppression from memory as a precondition and the actualization of it later through its remembering via other events and thereby implicating the other events in the original one. As for repetitiveness, traumatic history paradoxically involves both repetition of events and an understanding of it so that the prevention of repetition and the end of its history can be accomplished, leading to atonement and deliverance. For example, as Caruth says that according to Freud, the murder of Moses repeats some original act of the murder of the primal father

by rebellious sons that occurred in some primeval history, and anticipates the crucifixion of Jesus that Paul talked about. The key to redemption lies in remembering and re-membering different fragmented versions of the trauma with new semantic inflections. The act of remembering is fraught with the possibilities of reliving the horror of the original event and perpetuating the traumatic history; nonetheless such memory and rememory also hold possibilities of atonement through remembering trauma, but not repeating the history of it.

Baldwin's novel explore these possibilities while unveiling Kusum's death which is the most emotionally agonizing and frightening aspect of the story and portrays the vivid horror of gendered and communal violence during the partition, first through the words of Jeevan (Roop's brother) and then by Roop's father Bachan Singh. Roop is told Kusum's story in two parts, each from a different perspective. The discovery of the literal re-membering of Kusum's dismembered body is narrated by her husband Jeevan which is powerful enough to arouse communal fury, animosity and vengeance, resulting in the perpetuation of violence. According to Jeevan, the murder of Kusum is far more than a personal tragedy; it is a direct challenge to the manhood of Sikhs from the Muslim men and such humiliation should be retaliated. Later, Papaji (father) informs Roop about the events leading up to Kusum's murder. As a result, the men's piecing together of the stories or a discursive re-membering of Kusum's body could be still another reason for the violence to continue. Papaji's story is essentially a justification of honor-killing of Kusum, who could have been raped by Muslim men, if he had not killed her. While complimenting Kusum for cooperating to turn her back and bare her neck for her father-in-law's sword, Papaji admires Kusum's understanding of the ethical value of self-sacrifice for the sake of the community's honor. This desperate yet self-legitimizing act on the part of men should be preserved and retold as part of trauma history, as it has been done by partition survivors and collated by researchers like Butalia. The history of communal violence against women, which has been repeated since the dawn of time, must be narrated in a revisionist mode, or rather, re-membered by women and incorporated into a feminist counter-discourse.

Roop listens to her father and brother telling their versions of Kusum's story and could understand the silences and gaps. She can place the gruesome incident in the larger context of history of patriarchy's oppression of women. After Jeevan finishes telling Roop about how he discovered Kusum's body, he warns her not to tell it to Papaji, but Roop silently determines to "remember Kusum's body, re-membered" (515). This is a clear evidence that she would no longer be an inexperienced, callow young girl nostalgically attached to her native place Pari Darvaza's idylls. She has come a long way from innocence to experience via corporeal fear and agony, has relived those experiences through remembering, gained a moral knowledge of the events and learned to politicize painful remembering into a political and gendered act. She learns to bolster other people's memories of woman's body, archiving memories of love, anguish, injustice and death as an antidote to both amnesia and repetition of history of communal violence. In Roop's response, Baldwin establishes how one should remember gendered and communal violence. In contrast to the literal re-membering of limbs,

which assigns meaning and value to a body in order to reawaken men's desire for vengeance and re-enact violence, Roop proposes a model of woman's remembering as witnessing, in which violent narratives must be spoken out, heard, and remembered, not for the purpose of disseminating a message of hatred or inciting acts of violence, rather for the objective of preventing a repetition of the tragic history. Baldwin offers remembering as *learning*, where the speaking and acknowledgement of this violence as part of a longer history become the grounds for transformations in the future. If we do not learn lessons from history then we are tend to repeat them as the carnage of 1947 has been repeated in Gujarat, Kashmir and elsewhere many times over in the post-independence period.

The book often focuses the suppression or manipulation of memory—or “forgetting to remember,” as the novel phrases it. It is one of the tools for the consolidation of colonial power. The novel constructs the British colonizers as people who forget to remember the history of colonial violence and propagation of “divide and rule” policy as an aid to conquest. Satya, too, forgets to remember the violence she did to Roop—she forgets to remember a baby girl taken, a certain cup of salted tea, a baby boy's birth cord fed to the fire, then the same boy taken, a flagstone that rested so heavily over a godown, a pan with a bitter almond sent as message from one hand to another's (324). Roop believes that when she goes to her father's house to protest Satya's cruelties, her father forgets a lot of things. He forgets that he locked her up in a school with twelve-foot-high walls, and that she was only allowed to attend the women's ceremonies during Huma's wedding. He forgets that she was not allowed to ride Nirvair, the horse, because he was afraid there would be no blood on the sheets. He forgets that she internalized his concerns even before she was imprisoned in purdah to the point that she was afraid of what the villagers would say, if she looked at a stranger in the village unless he was a child or an elderly man with a white beard (306). It's noteworthy that the characters didn't forget, rather “forget to remember,” which is deceptive and deliberate. Paul Connerton in his article “Seven Types of Forgetting” discusses on the issue of forgetting in the debate on cultural memory and identifies seven types of forgetting: repressive erasure, prescriptive forgetting, forgetting that is constitutive in the formation of a new identity, structural amnesia, forgetting as annulment, forgetting as planned obsolescence, and forgetting as humiliated silence. A closer look at these types of forgetting shows that the forgetting in each case is deliberate and motivated by social, political and broadly, cultural reasons. Deliberate erasure of memory reminds one of Toni Morrison's *Beloved*:

Baby Suggs recalls, ‘My first-born. All I can remember of her is how she loved the burned bottom of bread. Can you beat that? Eight children and that's all I remember’.

‘That's all you let yourself remember,’ Sethe replies. (6)

Similarly, the characters in *What the Body Remembers* did not allow themselves to remember things they did not want to remember. However, it is dangerous to forget the partition because evasion or deliberate forgetting of it allows the continuance of its violence and obscures responsibility for the past. The characters

who do not want or are unable to remember their stories contrast Roop's desire to "remember Kusum's body, re-membered" (515).

Though Roop decides to re-member Kusum, she soon realizes that she is unworthy of telling her story because she has heard it from Papaji and Jeevan, which is men's history. The lack of Kusum's voice in the story, or any other woman's voice to tell her tale, is significant. It points to the absence and gaps in the official narrative/history by men in general. Roop wishes Kusum to tell her story herself in next life. She is skeptical that her sons will ever understand her pain as they are men and they cannot be very different from Papaji, Jeevan or other men. Papaji also tells the stories of other female family members Revati Bhua and Gujri which follows Roop's comment, "he tells it as he wishes it repeated" (523). This remark of Roop is pregnant with meaning as it points to the feminists' critique of the male historiography. To interpret it at a metaphorical level, the male historians forget to remember and represent the agony and trauma of women during the partition and Baldwin seeks to supplement the gaps, lapses, silences, omissions and forgotten parts in men's narrative. She works to "rememory" and re-member her ancestors with the belief that a woman's story can be transmitted only via a woman. Her narrative itself is an act of storytelling which consolidates the history of Sikh women at the time of the partition or rather she tells her-story.

Conclusion:

Jyotirmoyee Devi, too, had a strong suspicion of man's history. She criticizes male historiography of all ages in her novel *The River Churning*, originally published in 1967 as *Itihashe Stree-Parva* (The Woman Chapter in History) and points out that even Vedavyasa found it difficult to write the true *stree-parva*. According to her, history isn't authored by cowards. Even if there were great poets among women, they could not have written about the denial of their own dignity. Therefore, the true history of the *stree-parva* is unrecorded. There is no history of that quiet disgrace, that final suffering in the chapter that is still within the authority of the husband, son, father, and the community (Intro. xxviii).

Devi points to the contractions of history, especially to women's history which has been regulated by man. Her novel *The River Churning* addresses the aporias and gaps in historical narrative and attempts to construct a *Stree Parva*. The protagonist Sutara Dutta, who becomes a lecturer in History in a Delhi college, explains to her students that history isn't confined to the pages of a book. Furthermore, the victor is always prejudiced about the history of the vanquished; he prefers to conceal. History doesn't tell about the poor and powerless (3). It is essential that women be reintroduced into history and that their voices be heard. *What the Body Remembers* reiterates the same concern. Baldwin's use of the trope of the female body as an archival site of memories to lift the veil of silence from history is an act of resistance as well as a step toward empowerment on the part of the protagonist in terms of historical knowledge and moral imagination. Baldwin seeks to resurrect many vanished sisters through the story of Kusum, Roop and others to restore

them to their places in the history of the nation, to allow their voices to break silence, speak out memories and argue for remembering/re-membering.

Notes:

1. Shauna Singh Baldwin, an Indo-Canadian-American novelist, has earned a name for herself in the world of fiction, primarily via her novels and short story collections. Her debut book is *A Foreign Visitor's Survival Guide to America* (1992), a non-fiction work co-authored with Marilyn Levine. As the name implies, it was prepared in the pre-internet period with the intention of serving as a guide for foreign visitors to America. Her fictional work began with the publication of *English Lessons and Other Stories*, a collection of short stories (1996). Baldwin's first novel *What the Body Remembers* (1999), received the Commonwealth Writers Prize for Canada/ Caribbean region (2000). Her other notable works include *The Tiger Claw* (2004), *We are not in Pakistan* (2007), *The Selector of Souls* (2012), *Reluctant Rebellions* (2016) and *We Are So Different Now* (2016).
2. Many writers have investigated into nuances of the memory and the trauma of the partition. In addition to the works cited, I find the following authors and their works valuable in the course of my research on the topic: Ananya Jahanara Kabir, "Gender, Memory, Trauma: Women's Novels on the Partition of India," *Comparative Studies of South Asia, Africa and the Middle East*, vol. 25, no. 1, 2005, pp. 177-190; Debali Mookerjee Leonard, *Literature, Gender, and the Trauma of Partition*, Routledge, 2017; Anjali Gera Roy, *Memories and Postmemories of the Partition of India*, Routledge, 2019.
3. In "Body Memory and the Unconscious," Thomas Fuchs talks about "Body memory" in phenomenology. He says that if, following Merleau-Ponty, we consider the body to be first and foremost our ability to see, touch, and sense rather than the visible, touchable, and sentient physical body, then body memory refers to the totality of these bodily predispositions as they have evolved over time—in other words, in their historical dimension. The experiences and deeds of the past are, in a sense, blended together in body memory, with none of them standing out individually. A habit structure has been developed through the repetition and superimposition of experiences: well-practiced motion sequences, repeatedly experienced forms of actions and interactions have become implicit body knowledge and expertise. Body memory does not transport one back in time, but it conveys an implicit effectiveness of the past in the present (91).
See, Thomas Fuchs, "Body Memory and the Unconscious," *Founding Psychoanalysis Phenomenologically*, editors, Dieter Lohmar and Jagna Brudzińska, Springer, 2012, pp. 69-82.
4. Baldwin uses the term collective memory in a loose sense to mean "ancestral memory, collective memory/the subconscious" which the body remembers and doesn't seem to subscribe to the debates in psychology, neurosciences, social sciences and literary and media studies on the categorisation of memory. Assmann uses the term "communicative memory" for Halbwachs' "collective memory." He makes a distinction between communicative memory and cultural memory with reference to their content,

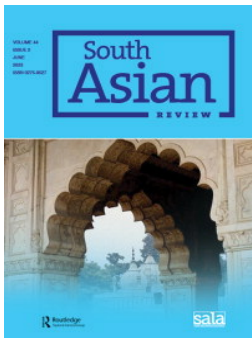
forms, media, time and participation structure. In the case of “communicative memory” the content consists of history in the form of autobiographical memory, recent past in the forms of informal traditions and genres of everyday communication. The media is living, embodied memory and communication is made in vernacular language with a time frame of 80-100 years, a moving horizon of 3-4 interacting generations which is diffusive in participation structure. “Cultural memory,” on the other hand, involves of mythical history, events in absolute past in the forms of high degree of formation, ceremonial communication. It’s mediated via texts, icons, dance rituals and performances of various kinds and uses classical or otherwise formalized language(s). The time structure may go back to absolute past, mythical primordial time, 3000 years and participation is hierarchically structured.

For a detailed analysis, see: Astrid Erll and Ansgar Nünning, editors, *Cultural Memory Studies: An International and Interdisciplinary Handbook*, de Gruyter, 2008; Jan Assmann, *Cultural Memory and Early Civilization: Writing, Remembrance, and Political Imagination*, Cambridge UP, 2011; Aleida Assmann, *Cultural Memory and Western Civilization: Functions, Media, Archives*, Cambridge UP, 2011.

5. Marianne Hirsch defines “postmemory” in “The Generation of Postmemory” (2008) as the relationship of the second generation to powerful, often traumatic, experiences that occurred before their births, but were nonetheless so deeply transmitted to them that they appeared to be memories in their own right. Her essay, which focuses on Holocaust remembrance, explores photography as a crucial medium of transmission of transgenerational trauma, the function of the family as a place of transmission and the role of gender as a remembrance idiom. Read, Marianne Hirsch, “The Generation of Postmemory” *Poetics Today*, vol. 29, no. 1, Spring 2008, pp. 103-128.

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Materializing the Memory: The Shawl in Partition Narratives

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Materializing the Memory: The Shawl in Partition Narratives

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ABSTRACT

History, displacement and relocation, mapping the border (both literal and metaphorical), home, memory, trauma, and women's suffering have been the staple of partition scholarship. Moving away from these familiar discourses on the partition, this article seeks to study the shawl as an important subject in partition narratives. Partition narratives—whether fiction or memoir—abound in numerous references to the shawl: phulkari, pashmina, Kashmiri, etc. The shawl occurs as a motif in a number of narratives to symbolize protection obviously. But a deeper probe reveals that its meaning is complex and shifting: the shawl variously represents an inheritance, an alienation from the world outside, an object associated with the inner world of the owner, a keeper of secret and intimate memories, a vessel of maternal warmth and cold shroud, and a “commodity” in the sense of Appadurai. The ramifications of each of these meanings, nevertheless, keep on changing. This article intends to explore the changing contours of meaning around the shawl in selected partition narratives, while employing the theoretical formulations of Heidegger, Appadurai and others. It argues that the shawl as a commodity is culturally and politically inflected and has a “career,” “biography,” and “social life” of its own in partition narratives.

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Introduction

The 75th anniversary of the partition of India has recaptured the attention of the researchers to the ever expanding scholarship on the partition. The existing works of scholars like Gyanendra Pande, Ananya Jahanara Kabir, Debali Mookerjea Leonard, Anjali Gera Roy, Aanchal Malhotra and many others have critically engaged with the concepts of history, displacement and relocation, mapping the border (both literal and metaphorical), home, memory, trauma, and a host of related concerns in partition narratives. This essay intends to supplement to the existing scholarship by moving beyond these already discussed concepts to explore the representation of the shawl in partition literature. In many of the partition narratives—whether fiction or

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memoir—the shawl features as an important “subject.” The shawl (i.e., phulkari, pashmina, Kashmiri, etc.) occurs as a motif in a number of narratives to assert its symbolic association with protection. But a deeper probe reveals that its meaning is complex and shifting. The shawl variously represents an inheritance, a carrier of family history, a keeper of secret and intimate memories, a vessel of maternal warmth and cold shroud, and a “commodity” in the sense of Appadurai. This article proposes to explore the changing contours of meaning around the shawl in selected partition narratives including Bapsi Sidhwa’s *Ice Candy Man* (1988)/*Cracking India* (1989), Shauna Singh Baldwin’s *What the Body Remembers* (1999), and Aanchal Malhotra’s *Remnants of a Separation* (2017). It will follow a comprehensive and interdisciplinary approach by employing the theoretical formulations of Heidegger, Appadurai and others. It argues that the shawl as a commodity is culturally and politically inflected and has a “career,” “biography,” and “social life” of its own in partition narratives.

Theoretical Framework

In the recent years, an interdisciplinary endeavor involving anthropologists, archaeologists, art historians, philosophers, and literary critics among others has increased its focus on “thingness” and materiality. The terms “object” and “thing” are used interchangeably in everyday parlance, and often in scholarly literature as well, but a theoretical tradition dating back to Heidegger’s work (1962) distinguishes between the two categories. He believes that when an object can no longer perform its usual or intended function, it becomes a thing. An object sheds its traditional function when it is broken or misused and takes on new visibility—it becomes a thing. Although “thing theory” includes discussions of “real” artifacts, it has mostly been applied by researchers in Humanities to explore how such things are represented in art and literature, particularly as a way to comprehend the significance of such representations. In other words, literature draws attention to the “thingness” of objects.

This essay explores the biography and history of the shawl as “object,” “thing” and “commodity” in partition narratives. While doing so, it draws on Appadurai’s *The Social Life of Things* (1986) in a major way which offers a different perspective on the circulation of “commodities” in social life. Appadurai, drawing on Engels and Marx, begins with the idea that a commodity is anything intended for exchange (9). He goes on to say that commodities, like people, have social lives. Different essays in the collection examine specific things or group of things as they circulate in specific cultural and historical contexts. In the introduction chapter, Appadurai argues, “Even though from a *theoretical* point of view human actors encode things with significance, from a *methodological* point of view it is the things in motion that illuminate their human and social context” (5). He refers to it as “methodological fetishism.” Igor Kopytoff’s article in the same collection takes a biographical approach to things and provides insights into how certain things are perceived as entering and exiting the commodity state. In other words, commodities have life histories.

In the burgeoning interdisciplinary scholarship on “things,” Bill Brown’s seminal essay “Thing Theory” in the special issue of *Critical Inquiry* (2001), in particular, advances the academy’s fascination with objects. Brown puts out a fresh, inclusive

approach to the study of things by contending that things should be viewed as artifacts with their own substantive significance and assessed for more than just their potential for cultural interchange. He cites Bruno Latour who asserts that “things cannot exist without being full of people” (12). His article puts things in center, highlighting how they both shape and are shaped by human subjects.

Along such theoretical context, the “things” carried across the border during the partition of India make an interesting study. Aanchal Malhotra in *Remnants of a Separation* (2017) seeks to understand the event of the partition through a collection of everyday objects that have acquired a certain cultural and historical importance due to their connection to the partition of 1947 and the mass displacement/migration following the event. Each chapter of her book is named after an object that belongs to a certain partition survivor. These everyday objects have attained significance only due to their relation to the event specific to the persons who have retained them, i. e. heirlooms, pearl necklace, kitchenware, *maang-tikka*, *khaas daan*, *hamam dasta*, Guru Granth Sahib, photographs, poems, certificates, swords, phulkari bagh and pashmina shawl. Malhotra addresses the questions, “How did the item cross the border; what were the experiences of its bearer; and what is the relevance of the object today?” (*Remnants* 20). She states in the introduction to her book that these objects are tangible, and they in turn make the intangible (memory) tangible, and evoke a sense of belonging in the viewer. She titles a part of the “Introduction” as “The Intangible through the Tangible, Belonging through Belongings.” The objects discussed in the book, thus, serve as a catalyst for the memory, a trigger for remembering and a portal into the past (24). In other words, these objects have histories. Malhotra’s book focusses on the “material memories” of various things carried across the border during the partition of India in 1947. But, interestingly, two stories in the narrative are about the shawl—“The Dialect of Stitches and Secrets: The Bagh of Hansla Chowdhary” (chapter-5) and “Memory of a Nationalist: The Pashmina Shawl of Preet Singh” (chapter-13). This essay intends to trace the nuances of meaning particularly around the shawl in selected partition narratives (including Malhotra’s *Remnants*) while following its “career,” “biography,” and “social life.”

“Social History” and “Cultural Biography” of the Bagh: The Language of Women

Relevantly, Appadurai makes a distinction between the “cultural biography” and the “social history” of things. The cultural biography perspective (of Kopytoff) is appropriate to specific things as they move through different hands, contexts and uses, thus accumulating a specific biography. But classes or types of thing transcend the biographies of particular members of that class or type and possess a social history (34). For example, Hansla Chowdhary in Aanchal Malhotra’s *Remnants* relates the “social history” of the phulkari on the *bagh* she has preserved (which is larger than a scarf or a dupatta, comparable to a full size shawl).¹ She elaborates that phulkari literally means flower work (“phul” meaning flower and “kari” meaning craft in Punjabi language) and a piece of particular length is called a *bagh*. She adds that phulkari has been mentioned in Waris Shah’s Punjabi folk tale, *Heer-Ranjha*, where

the female protagonist Heer wears many outfits with such embroidery. Because of their ancient form and the time it takes to make them, phulkaris are revered as sacred garments.

Chowdhary draws her story from a pre-partitioned world. She narrates that, traditionally, the women of the family would gather to weave a piece like the *bagh* for a young bride's trousseau. The fabric would transform or blossom from a plain piece of raw khadi into a beautifully embellished, silken tapestry. Since these women met together to talk, share cups of chai (tea), and stitch the fabric, it could be seen as a sort of social interaction. Every stitch on the fabric was an expression of the women's inner vernacular as phulkari evolved into a colorful and lovely language (115).

Carrier of Family History

Though the phulkari has a "social history" which spans over time before and beyond the partition, Hansla Chowdhary could also trace the "cultural biography" of the specific *bagh* she owned (during her conversation with Malhotra). It had been a source of pride for her family for many generations. It was created in Rawalpindi, currently in Pakistan, over the course of three or four years by her maternal great grandmother on crimson fabric with two different types of yellow stitches. She, then, passed it on to the grandmother, who mostly used it as a throw over the sofa as decoration. But she preserved it as a carrier of family history after bringing it to India during the 1947 migration of the partition. The shawl came to Hansla's possession as she asked her *nani* (maternal grandmother) in the sick bed, skipping the mother's generation, "If you must give me something ... make it something that will always remind me of the more intimate moments we shared" (121). She wanted her essence, blessings, and warmth to be close to her. The *nani* said that she had just the thing, and took the *bagh* from her cupboard, and presented it to Hansla. Along with it, she transferred her history, the knowledge of how the *bagh* was made, and the promise she had made to her mother—to continue passing the *bagh* down through the generations of her family (121). In Hansla Chowdhary's partition narrative, the evolving history of the phulkari is inextricably linked to the history of her family—during the celebrations, and happiness. Thus, a piece of phulkari becomes an inheritance—a transporter of history of the traditional craft as well as history of the family. It leads to the inference that the social history of things and their cultural biographies are not entirely distinct issues, though the social history of things over long periods of time and at large social levels constrains the form, meaning, and structure of more short-term, specific, and intimate trajectories. What remains important here is that a mundane object or an article of everyday use assumes historical importance. It's not that shawls are always preserved as carriers of family history, but the extra-ordinary circumstance of the partition functions as a determinant in its "career."

Celebrates Mother-Daughter Bond

Additionally, the phulkari *bagh* in Hansla Chowdhary's narrative commemorates the mother-daughter bond as the mother and daughter frequently stitch phulkari

together, and while doing so, the mother teaches her daughter the age-old traditional language as well as the value of patience, perseverance, practice, and perfection (116). There is a lovely passage in *Remnants* which celebrates the bond. While passing down the shawl, the mother tells her daughter,

This is my love, a stitch, this is my compassion, another stitch, here is my patience, diligence, and dedication. And this, the various threads that held the base fabric together, is your union with your husband. May it be as strong as the khadi itself... May your temperament be as smooth as the texture of these silken threads... may the various stages of your life be as consistent as the patterns that adorn this *bagh*... And may you pass on these qualities to future generations of women born from your womb. (118)

Each Phulkari stitch represents a joining together—a connection that binds the mother and the daughter as well as the giver and the taker.

Keeper of Secret

The *bagh* comes as a “gift” to Hansla Chowdhary’s grandmother before her wedding with the understanding that it would be passed down the family line as a priceless heirloom. The energy from songs about childbirth, saying goodbye to one’s daughter, or the blossoming of a womb would subtly permeate the work because the *bagh* represents these emotions. Every thread of the phulkari translates the intricate and beautiful language of the women. It voices of the family’s wealth and decadence during the time it has been used. Every stitch reveals the secret that women infuse into the things they cherish.

The silk fabric of the *bagh* serves as Hansla’s *suraksha kavach* (safety armour) in winter. She occasionally feels as though she is living in the past and can trace the beginnings of her family to this specific cloth. All the ladies who have worn and possessed this *bagh* before her are connected to her. Both she and they, who have allowed their plans, tales, and lessons to enfold its surface, and merged their body, odors, and gestures to add to its delicateness, are a part of each other (122). Thus, memory transfers through objects.

The author is struck by the idea of women’s unspoken secrets suffused into the shawl and wonders if an inanimate object can preserve them over time and across generations of a family (118). While ruminating over such thoughts, Hansla Chowdhary drapes the shawl over Malhotra’s shoulders. She instantly gets the strangest sensation. She feels as though she is trespassing into the secret and history of a family. She puts it on the shoulder of Hansla Chowdhary, its proper owner, after carefully and slowly removing it, and she thinks, it appears lovely (122). The entire narrative substantiates that with a change in the owner and its function, the shawl’s “career” is transformed. Pertinently, Willy Jansen (2017) argues in the context of art objects in Spanish popular culture that they serve multiple memories on different levels at the same time. The first level is enacting specific social, religious, economic, and political identities and materializing a history. The second level is the manifestation of personal emotions and family relationships. People remember where they belong by constantly elaborating on or renewing these objects. Similarly, the shawl

functions at both the levels in partition stories. It acquires the sanctity of an inheritance, a carrier of cultural values, and the associated emotional ties.

Shawl as a “Commodity” from Colonial and Post-Colonial Perspectives

Phulkari shawls and other types of embroidery have been a part of Punjab’s folk culture tradition for centuries, and Michelle Maskiell (1999) examines the cultural economy of these items from colonial times to the present. These items were valued in colonial discourse as indicators of highly localized cultural identities. She remarks that the colonial state tied the study of the folk to a fragmented and strongly regional perception of India. Colonial India was a living museum of many different traditions, but it lacked a single national essence that might serve as the foundation for a modern state. According to the Raj authorities, foreign control alone offered the logical patriarchal framework needed to connect the diverse indigenous cultures. Indian spirituality was identified as having a universal nature by urban middle-class and upper-class men and women, challenging this line of thinking. Cultural nationalists discovered that a gendered vision of the folk was the key to their own concepts of cultural self-determination and political freedom as they seized the reinterpretation of Indian esthetics and art from the British authority on this premise (373).

In other words, both imperial discourse and anti-colonial, nationalist discourse (a derivative discourse à la Partha Chatterjee) appropriated indigenous forms of cultural economy for their own different purposes. Maskiell’s study explains how, while the colonial discourse of Indian folk traditions within the registers of ethnography and anthropology was a part of official surveillance and epistemic control for the efficient governance of the empire, the nationalist discourse of the indigenous elite fetishized gendered (feminine) cultural artifacts and reinforced the esthetic tradition and cultural heritage of an authentic, unpolluted pre-colonial India. The materialist notion that handicrafts and cultural items have reproduced and continue to reproduce the unjust gender disparities in culture and economy to exploit women (and other groups) by taking out from them low-cost labor and skill was smartly downplayed during this process. The short story “Chief ki Daawat” (1956) by Bhisham Sahni, originally published in Hindi in *Kahani* magazine, is an effective case in the point. Various translations into English as “Dinner for the Boss” or “Feast for the Boss,” the story narrates how an Indian subordinate Shamnath invites the boss to a dinner party and bids the traditional, rural mother to stay away from the guests. But the mother is randomly encountered by the boss, who is keenly interested in Punjabi folk culture, and he asks her about the products that Punjabi women make at home. Before the mother could answer, Shamnath responds that women create phulkari and dolls. The boss is impressed by an ancient phulkari piece that the mother displays and he wishes to possess a similar piece made by her. The traditional phulkari represents, here, both patriarchy’s universally provided for feminine household space and highly particularized folk tradition of Punjab. The reluctance of the mother to conform to the boss’ wish is not merely due to her dwindling eye sight, but, more significantly, it expresses the refusal of this feminine space to be colonized. It suggests that folk culture in the

masculinist nationalist imaginary becomes, at best, a museum-like space for the preservation of Indian femininity and, at worst, a prison for its captivity.

Gendered Object

The analysis also reinforces the phulkari being a representative of the gendered (feminine) space. In pre-partitioned Punjab, women utilized their phulkaris to celebrate the relationships they had with one another—bonds that worked around and within the patriarchal framework of their families. Phulkaris were among the few material belongings that Punjabi women could inherit, and they were prized and passed down from mother to daughter. Amrita Pritam (1977) in her autobiography describes the custom of ladies sharing phulkari shawls to convey their affection, illustrating how phulkaris also represented friendship bonds. Also, Pritam's poem "A Shawl Made of Moonbeams" reveals how phulkari is connected to the women's emotional space (Puri 2020). The poem does not convey the kind of joy one might feel when anticipating a wedding or when wearing elaborate, deep-colored clothing; rather it carries a feeling of heartbreak and loss. Her lover has left. She is sad and dejected and reflects, "Who will complete the shawl's design by adding a stitch?" Obviously, the question signifies the beloved's desire for being complete by uniting with the lover, but someone needs to "stitch" the relation. She no longer has a reason to wear a phulkari because her partner has left. Pritam now believes it is unnecessary for even the moon—a favorite image with romantic poets—to muse on a wedding. Instead, all trousseau construction is halted, and all embroidered designs around the world remain unfinished much like the description in Waris Shah's tragic romance *Heer Ranjha*. In this literary tradition, phulkari is tinged with tragedy.

Against this cultural history of the shawl in partition narratives, there are scholarly works where the focus is on the production of the shawl (pashmina, phulkari, and others) and its circulation as a commodity during colonial and post-colonial periods (Maskiell 1999; Maskiell 2002; Zutshi 2009). Maskiell (1999) investigates the historical connections between phulkari production, exchange, and consumption in Punjab and the global economy. The essay focusses on the 1880s as a historical period in which phulkari consumption moved from the region of its production to an international market, and explores textile production as one aspect of the intensification of commercialization during the Raj. Pertinently, Maskiell also contends that the Indian narratives of phulkari heritage were shaped by independence and the partition of Punjab. Many of the textiles were lost or destroyed during the rioting and violence that accompanied migration of millions of Sikhs and Hindus from Punjabi territory to the new state of Pakistan. Many other phulkaris were sold by impoverished refugees. Refugee women were frequently found in India, separated from their families and with little financial support. Most of them had little wage-earning skills, but they could often embroider. A group of dedicated women, wives of high government officials and others exhibited initiative and resourcefulness in establishing and setting up camps and labor centers where the phulkari stitch was first applied as a means of decorating modern household linen and furnishings. This activity was coordinated by Edwina Mountbatten, Rameshwari Nehru, and other notable women. A Refugee

Handicrafts Sale Room was also established (which soon merged with the Central Cottage Industries Emporium), with the result that quite a large number of women earned a living by undertaking the embroidery work. Phulkari was further dispersed outside of its native territory by the exodus of Punjabi refugees outside Delhi into other regions of India (375). Thus, the partition brought about significant changes in the circulation of the phulkari as a “commodity.”

In contrast, Chowdhary’s narrative (in *Remnants*) focussed on the change in the phulkari traditions. Hansla Chowdhary apprized Malhotra that making phulkari has now become a laborious and repetitive process. Traditionally, it was created by beginning in the center of the reverse side and gradually moving across the entire fabric. Hand spun *khadi* cloth was the most popular substrate for phulkari since it would have been the least expensive and could be dyed in a range of colors. She further explained that soft and lustrous silken threads were employed in the work. Particularly, colors like red, yellow, mustard, and orange were emblematic of the phulkari because they represented joy and celebration (117). Before the embroidery process could begin, a lot of *khadi* panels were joined together to produce a big surface area for the *bagh*. The term “joint” referred to these larger stitches. In this case, three panels were carefully fitted together. Despite being simple and repetitive, the work required patience, practice, and exceptional vision because any deviation from the subject or pattern’s symmetry would be immediately apparent. Although several imperfections could be detected upon closer inspection, this feature distinguished handcrafted goods from the present day machine made phulkaris (116). Both Maskiell’s essay and Hansla Chowdhary’s narrative of the shawl trace the changing history of the phulkari before and after the partition. However, while Maskiell addresses the circulation of phulkari as a commodity in a post-partition India, Chowdhary’s narrative emphasizes on the evolving tradition. The theoretical and methodological gap between economic, and material analysis, and cultural studies might be bridged figuratively by phulkari embroidery thread.

The Story of the Pashmina

While phulkari is largely connected to the tradition and emotional life of Punjab, the pashmina and Kashmiri shawls subscribe to a different “social history.” Hence, it necessitates a distinct exploration. Chitrlekha Zutshi (2009) argues that Kashmiri shawl weaving was never a folk textile art meant strictly for local Kashmiri consumption; it was from its very inception a commercialized, and state-controlled enterprise aimed at the market. This is evident from the fact that Kashmiri shawls have distinct designs, patterns, and colors depending on the demands of different markets at particular historical moments. Maskiell (2002) points out that Kashmiri shawls have been circulating in world trade since the sixteenth century. They were coveted articles of clothing and gift exchange in Persia, the Ottoman Empire, and even Russia long before they became fashionable as women’s drapery in Western Europe and eventually North America in the nineteenth century. Agents of merchants from around the world were stationed in Srinagar—the primary center of shawl production in the Kashmir Valley—to commission and directly purchase shawls to meet demands of

particular home markets. She also illustrates the changing functions of Kashmiri shawls in British society as representing various types of commodities, from wraps that made women look like princesses to draperies for the piano, depending on the fashion of the time. The history of Kashmiri shawl, which is now consumed on a global scale as a luxury good and as a symbol of Kashmir and Kashmiri culture, is inextricably linked to “commodity fetishism” in one of its earliest manifestations, which is intertwined with the larger processes of colonialism, and European consumption and market for “Indian” goods. In the process of its circulation, Kashmiri shawl (including the pashmina) acquires the status of “political artefact.”

Since the partition of India is broadly seen as a consequence of imperialism, it is worthwhile to examine the relation between imperial politics and Kashmiri shawl. Nupur Chaudhuri and Margaret Strobel (1992) demonstrate how British women in India acted as ambassadors for Indian goods by disseminating, popularizing and inscribing meaning upon Kashmiri shawls in Britain. The assertion that colonial women, rather than merchants, commodified Kashmiri shawls is significant as it firmly establishes women as active purveyors of imperial ideology. The Kashmiri shawl’s place in nineteenth-century British culture is, therefore, entwined with the histories of race, ethnicity, and belonging. The history of Kashmiri shawl shows that this accessory was metonymic of Empire, conquest, and power. Wearing one, therefore, was a statement of a person’s wealth, status, and, by extension, their nation’s access to the Middle East and India.

Even Kashmiri shawl inspired works of Victorian literature in which shawls are characters in their own right. For example, the British author Charles White’s novel *The Cashmere Shawl: An Eastern Fiction* (1840) represents the Kashmiri shawl as a narrator. This shawl tells the story from the perspective of its own becoming from the hair on the underbelly of a peacefully grazing shawl goat in the mountains of central Asia to fleece in the markets of Yarkhand, to yarn woven into an exquisite shawl in Kashmir, to the shawl making its way through kingdoms in British India. The former shawl introduces itself to the novel’s narrator by detailing its origin and circulation with ample attention to its encounters with physical bodies as it “passed through many hands” which points to the shawl’s shifting cultural, social, and economic value. The action takes place almost entirely in the Middle East, which provides ample material to discern how British consumers interpreted foreign commodities as well as their nation’s imperial role. Zutshi reasons that many Victorian narratives on shawls, written almost always by men and women who had never actually visited Kashmir, performed two interrelated didactic functions: first, they educated readers about Kashmir through Kashmiri shawls and second, they translated the specialized, scientific knowledge about Kashmiri shawl manufacture that had been transmitted to the British shawl industry into a more popular form (like Paisley and other cheap imitations). At the same time, they highlighted the relationship between Kashmir, shawl production, and imperial politics.

The exploitative material history of the Kashmiri and pashmina shawl has been examined by Mona Bhan and Haley Duschinski as integral to the political history of Kashmir. As political artifacts, Kashmiri shawls are also linked to a lengthy history of foreign invasions, including those by the Mughals during whose rule Kashmiri shawls

received imperial support, the Afghans and Sikhs who devastated the industry via harsh taxes, and the Dogras who saw Kashmiri shawl makers as slaves. They also played a significant role in Kashmir's forcible integration into the Dogra royal family during British colonial control. The British East India Company sold a vast stretch of territory and 2.5 million people to Maharaja Gulab Singh in March 1846 for a pittance of 75 lakh rupees (around USD \$100,000 by today's standards). Gulab Singh agreed to present annually to the British Government one horse, twelve shawl goats of approved breed (six male and six female) and three pairs of Kashmiri shawls as part of the deal, a "gift" that meant acceptance of British supremacy and protection from external enemies. The Treaty of Amritsar established the Princely State of Jammu and Kashmir under Dogra authority that lasted until 1952 (n. pag.).

The history of the Kashmiri shawl takes a turn as it enters the relation of consumption in the familial space. Relevantly, Zutshi (2009) made a significant observation about the appropriation of shawl in mid-nineteenth-century novels such as British novelist Elizabeth Gaskell's *North and South* (1845): "Shawls appear in domestic, womanly settings, where women could identify with and experience them away from the male world of commerce, which was thus domesticated in the process" (433). Moreover, the domestication of the Kashmiri shawl in India (and Europe) is inextricably linked to how people adopted them into their "relations of consumption" through various gift-giving events, inheritance customs, and similar activities. The Mughal court of North India and its regional outposts (1526–1848) utilized Kashmiri shawls and shawl fabric as part of their established and evolving social relations of consumption. In their political and religious rituals, for instance, they gave shawls as *khil'at* (or "robes of honour"). Fine clothing was presented in political circumstances to establish a hierarchical connection between the giver and the receiver, and the receiver's acceptance signified subordination. In fact, "*khil'at*" originally meant "something passed on," particularly a "garment cast off" (Maskiell 2002, 32–33). Robes of honor were often presented to members of the emperor's inner circle during the rule of Akbar, but it was substantially expanded by his successors. In the seventeenth and eighteenth centuries, even after the British Raj was founded, the shawl continued to be prized presents in local administrations (Maskiell 2002).

The Kashmiri shawl, particularly the pashmina, finds several mentions as a trope in partition discourses. Besides its symbolic meaning, its significance consists in its circulation as a "gift" and a "commodity." It also complicates the notion of "gift" (which, again, does not preclude its circulation as a commodity in Indian society at the time). Aptly, Mauss's *The Gift* (1950) argues that gifts are obligatory and each gift is part of a system of reciprocity in which the honor of giver and recipient are engaged. He discusses the various esthetic, moral, religious, and economic motivations to return in ancient systems of law and ancient economies. In her foreword to Mauss's book titled "No free gifts," Mary Douglas finds the idea of a pure gift a contradiction and endorses Mauss's idea of no free gift (x). Appadurai (1986), too, refers to Mauss and goes into great detail about barter (also known as direct exchange) and gift exchange. Though gift exchange and commodity exchange appear to be diametrically opposed and mutually exclusive (as generally commodity is mediated by money/market and gift by sociality), Appadurai identifies some similarities

between the two. He draws on Bourdieu (1977), who emphasizes on the temporal dynamics of gifting, and views gift exchange as a specific form of commodity circulation. In partition narratives, the gift of shawl is reciprocatory in the sense that it extracts an obligation in return—an obligation to pass it down as an inheritance or to keep the memories alive as in case of the story of Hansla Chowdhary in Malhotra's book.

More significantly still, the Kashmiri shawl in partition narratives illustrates that good taste was not only a moral quality, but it was also clearly a quality possessed by the upper classes. For instance, in Bapsi Sidhwa's *Ice Candy Man* (1988), Shanta, the child protagonist Lenny's eighteen-year-old ayah (nanny), shivers in the sleeveless cardigan worn over her cotton sari, while she holds out the *pashmina shawl* to her mistress, and carries Lenny in pullovers, a five-foot *Kashmir shawl*, and a quilt to Colonel Bharucha's consulting room (Emphasis added, 11–12). And it could be argued that shawls do not seem to merit or require more attention than any other article of clothing in a book like *Ice Candy Man*, which is rich in clothing and fabric details—Ayah's sarees, Godmother's dress, Lenny's attire, Mother's burkha, Hari's dhoti, and clothes as markers of Hindu and Muslim identity. That, however, would ignore the important role that such insignificant details play in the recognition of class distinctions.

A couple of examples from the text would add to the argument. Ice-candy man is curious to know the reason Ayah wears saree instead of Punjabi clothes like shalwar-kamize, though she is a Punjabi. Ayah responds, "Do you know what salary ayahs who wear Punjabi clothes get? Half the salary of the Goan ayahs who wear saris! I'm not so simple!" (29). The reference here is both to class hierarchy and fashion. And, undoubtedly, in the context of the partition, the entanglement of cloth with class (and religion) is conspicuous. This hierarchy needs to be recognized. Another complex example from the novel is that the gardener Hari's dhoti, an object of playful attention among the servants and children of the house, becomes a marker of identity during the partition turmoil. There is a scene in which the playful exercise around Hari's dhoti turns rude and offensive. They are after Hari's dhoti in a cold night which happened only in the daylight earlier. Finally, his dhoti is taken off by Ice candy man (118). Later, his forceful change of religion accompanies a change in attire—from dhoti to salwar (161). Hari's dhoti, at once, becomes symbolic of his class and religion. The broader analysis of cloth as a symbol of class hierarchy supplements to the contention that Kashmiri shawl being accessible to the rich functions as a powerful metaphor to symbolize upper class. Though shawls are generally used for protection against the weather, the *pashmina* and the Kashmiri shawl transform a staple garment into a "classy" fashion accessory.

Also, instances of gifting of shawl to the domestic servants are widespread. For example, in Shauna S. Baldwin's *What the Body Remembers* (1999), Roop gives a Kashmiri jamavar shawl, "such an expensive shawl," to her maid Mani Mai during the partition "to protect her until they meet again" (450). In Delhi, amidst the riots of the partition, she offers her Muslim maid, Jorimon, her mother's phulkari shawl in the hope that it will also shield her. Though the shawl is primarily metaphorical of protection, one cannot ignore its identification with class snobbery. Satya's

patronizing attitude toward Roop for being a junior co-wife and also of “lesser birth” is apparent in her scrutiny of the shawl. She asks the Kashmiri shawl hawker about the family the shawl comes from: “How many good women did it have? Were their relations harmonious?” (281). Finally, after being satisfied with the answers, she bought a jamavar shawl for Roop, the shawl which passes to the hands of Mani Mai later. The social conditions in which the shawl began its journey from weavers through the hands of hawker to the consumer is known imperfectly. It’s received divorced from its social context. In this case, the desire to know the context is prompted by the consumer’s purpose. The questions of Satya are not on the quality or authenticity of the shawl, rather those are about the relation between the women. Satya is hardly concerned about (or aware of) the material history of the production, rather she considers it a gendered object, a legacy passed on by women. Furthermore, the harmony of design in the shawl is loaded with familial emotion to signify supposedly harmonious relation between the women who made it.

The author Shauna Singh Baldwin states that she usually wears a shawl since she considers it to be a symbol of protection. Also, she always puts on a shawl while she writes, because it transports her back to India (qtd. in Methot). Roop constantly carries her mother’s phulkari shawl in the novel. For Baldwin and her character Roop, the shawl may have symbolic value and personal significance. However, it is important to consider the shawl’s discursive value within the setting of the novel as well as its broader cultural meaning. In discursive terms, the shawl takes on greater significance as a metaphor when the shawl-hawker relates that the Kashmiri shawls always select their owners and he only asks a fair price for bringing them to their new home. He goes on to say that the shawls guide him with whispers through the streets giving him direction. In response, Satya loudly thinks that she wishes the women could choose their owners as the shawls do (280). Choosing its “owner” may impart agency to the shawl, but when applied to women, it assigns them an “object” status. Satya’s reflection clearly mentions that women are even denied the possibility of choosing their owners/spouses. The issues of the ownership of a woman, the association of woman’s body to object, and its possession, and circulation during the partition call for a detailed analysis, but such an enquiry is beyond the purview of this study. What is pertinent and intriguing in this situation is how a seemingly unimportant object like a shawl acquires a metaphorical meaning of protection for whoever uses it and it owns the person concerned and not the person owns it. After witnessing the bloodshed of the partition and the sorting of women and children into the two nations like apricots, Roop too asks herself: Why can’t they be like Kashmiri shawls and select their owners? (530). Even Roop’s seemingly innocent query has deeper significance than she may have realized. She is attempting to explain why it is impossible to provide women the same freedom to select their husbands as they did in the mythical past. It also implies the woman’s wish to have right of choice between Pakistan and India and designates the country as the “owner.” On a deeper probe, the question’s semantic implication extends to woman’s desire to have prerogative and agency to choose and establish tradition like men in the nationalist context. The allegorical turn of the story is instantiated by this kind of semantic spillover across signifiers, from the phulkari shawl to tradition, from *swayamvar* to the radical

ambition to create nationalist tradition that Hobsbawm discusses in his book *Nations and Nationalism since 1780* (1990).

The shawl lends itself to allegorical configuration also in Preet Singh's memory of the mother's pashmina shawl in Chapter 13 of Aanchal Malhotra's *Remnants*. Preet Singh had wrapped a pure pashmina over herself, which was cosy and soft, and meticulously embroidered in Kashmir, giving the drab beige backdrop a lovely magenta floral pattern border. The edge of the shawl was haphazardly sewn with brown thread. She remembered that the shawl was so wide that her mother had to cut it down the middle and give half of it to each sister. Similar recollections can be found in Amrita Pritam's autobiography *The Revenue Stamp* (1977). She recounted that after being uprooted from Lahore, she spent some time in Dehradun getting herself back on track. She went to Delhi in quest of a job and a place to live. She could feel the wind howling at the sadness the divide had brought while riding the train "home." When she left Lahore, she only had one red shawl, which she tore in half to cover both of her infants. Discernibly, the divided shawl is a trope of the partition in both the stories. In the midst of the conversation with Malhotra, Preet Singh noticed a dark area close to the edge/border of the shawl. She found a stain on the otherwise immaculately clean shawl that had once been merely a footnote in her history. She tried to lighten it by rubbing it with the tips of her fingers, but in vain, which illustrates how difficult it is to remove the old stain of the partition from the psyche of the victims. The stain reminds one of the partition as a blemish in the history of the Indian nation. The incident is also impossible to erase, much like the stain on the fabric. It inhabits the space it has mapped for itself—a physical memory.

In addition to its allegorical implications, the story of Preet Singh is also significant because the pashmina shawl signifies the mother-daughter relationship much like the *phulkari bagh* of Hansla Chowdhary. It was her mother's "gift" to Preet. She chose to wear it while narrating her experience of the partition to Malhotra as it reminded her of her mother (257). Here, one is reminded of Victoria Campbell's short tale "The Red Pashmina" which illustrates how the shawl has been representative of mother-daughter relation. The story is not drawn from the partition of India. Nevertheless, it's a tale of the partition in a different sense—the partition of mother and daughter. In the story, the mother's red pashmina acquired significance for the narrator after the mother's death. The silky softness of the shawl next to her skin and its smell offered her comfort in the mother's absence. Significantly, in the second part of this story, the pashmina assumed the role of the narrator. It recounted that three sets of women's hands have owned it—its *Yak-Butter Mother*, *The Reader*, and *The Daughter*. It was created to serve—to adorn and protect. It has spent the majority of its life with *The Reader*, but was unable to protect her from death (4). It took on the role of surrogate mother for the *Daughter* in the months following *The Reader's* death. The *Daughter* wore it frequently, primarily in the solitariness of home. Every time it engulfed her, it released more of her mother's greedily stored memories (4). One day, the *Daughter* made a sound, and a velvety gush of air burst out of her mouth and filled the space (around six months after *The Reader's* passing). The shawl was washed shortly after that (5). The shawl offered the *Daughter* company in moments of sorrow and disease. The shawl states, "I am the guardian of calm

moments in a life of people I decorate and safeguard. But to you, if you meet me on the street, I'll just be a red pashmina, adorning and guarding" (5). The pashmina can help us reconstruct the past and it acquires "mnemonic vitality" by personal and cultural relevance.

While the shawl serves as a tangible memory in the stories discussed above, Preet Singh in *Remnants* also narrates the intangible memory of the brother in contrast to the mother's memories embodied in the shawl. This shawl preserves the mother's memory because it's a physical connection. But she reveals that it's not the case with her brother. She didn't need anything to remind her of him. His memory is so firm, and he is so intense in her mind, that she senses like they were together just yesterday (265). While the shawl is a mother's inheritance, she upholds the individual memory of the brother in the absence of mementos, but the continuity of that memory is threatened. It is likely to face extinction, when she is gone, whereas there is a possibility that the memory of the mother passes to the next generation via the shawl. Objects ensure continuity of the memory. Preet herself observes early in the narrative, "The mind often remembers things it may have forgotten when it is inspired by objects" (257).

Thus, a complex set of meanings were literally transferred between the giver/patron and the gift recipient as the Kashmiri and pashmina shawls carried complex association with class and fashion. By bestowing the Kashmiri shawls upon female relatives and servants as gifts women at once assert their superiority in domestic space. At the same time, it removes the shawls from the cash nexus, or the realm of commodification in a sense (though it extracts obligation). The shawls are often portrayed as heirlooms that women inherit rather than purchase in the discussed partition narratives. Certainly, its circulation as commodity is at stake as the shawl is handed down from the mother to the daughter. It's important that with change in its career from commodity to gift the material history of pashmina is altered and it becomes an object saturated with emotion in the context of the partition.

Conclusion

Shawl: A Material Memory

Malhotra in *Remnants* compares the mundane objects carried during the partition to archival objects in museum. She views that the mundane migratory objects, unlike those preserved in museums and private collections, are often underappreciated. Due to their everyday nature, it is rare to find them valued for their age, their rarity, their technical virtuosity, their beauty or even their serendipitous survival. But what she often noticed during her interviews was that the moment she infused importance into an otherwise mundane object, the emotions and memories latent in it came to the surface and, all of a sudden, it became precious. She narrates that if in the course of the conversation she happened to propose borrowing an object for her research—draping a shawl on her shoulder instead of its owner's; or wearing a ring on her finger instead of placing it on theirs—she witnessed in them a fervent possessiveness. "This belongs to my mother," they would suddenly claim, rather than it simply being an old shawl from before the partition (26). Shawl in the partition narratives, is not

just a vessel for memory, but a medium to claim history. It expands to transcend its own physicality, creating a tangible link to an intangible place or state of being.

Besides the shawl, many partition stories use cloth in symbolic ways. In Ritwik Ghatak's "The Crystal Goblet," the woman in the refugee camp clinged on to the blanket in which she had wrapped her child, now dead. She didn't go near the dead child in fear that "they'll take it away if they come to know who the blanket belongs to ... in these terribly cold days" (Bhalla, vol. 4, 298). The blanket was all she possessed. This blanket at once stands for protection, cold shroud and keeper of secret. In Baldev Singh's "Come Sister Fatima," a spinning wheel becomes a site of material memory. It has been preserved by Bebeji even after fifty years of being handed over to her by her friend Fatima (who left for Pakistan during the partition). The old spinning wheel would gear up memories of her friendship with Fatima and remained a symbol of trust. Before parting Fatima hoped that one day the nations might become one again and then she would come to take her spinning wheel (183). When the family wanted to sell it to a junk dealer, Bebeji refused to part with it. For the peddler "different materials carry different price ranges", but for Bebeji the spinning wheel was a symbol of love (Bhalla, vol. 4, 183). She got the spinning wheel painted. When the daughter-in-law chided her about the worth of preserving it, Bebeji decided to spin. She mended it, put the cotton and said softly, "come, Sister Fatima, let us spin!" (186). Much to the amazement of the daughter-in-law a thin long thread came out. Bebeji went on spinning and crying. The story is not only about the role of material in reconstruction of memory, but also a powerful assertion of the power of love and trust amidst the ever growing rivalry and hate following the partition. The memory buried within things sometimes is greater than what we are able to recollect as the years pass. Memory dilutes, but the object remains unaltered. It allows one to study the history within it, and for generations to live off that history and perhaps understand genealogy better.

Textiles in general, and shawls in particular, can be thought of as a kind of archive information and as a carrier of knowledge due to their ability to maintain and transmit memory in both private and public settings. What one carried across the border was often determined by the kind of life one had led, and provides incredible understanding into the social and material culture of the time (Malhotra 25–26). It can encourage remembering through spontaneous contacts with individuals in various circumstances rather than purposeful mnemonics like national sites and events or the souvenir as a mnemonic device. Hence, the partition's "archiving" and "materialising" ideas are strongly related to the shawl's social life. With a cultural history and a social life of their own, shawls are imperfectly commoditized in the partition narratives.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Note

1. The term "phulkari" refers to Punjabi traditional embroidery. Phulkari, which translates to "flowery craft," refers to both floral themes and geometrical shapes in addition to flowers.

Punjabi women masterfully manipulate the darn stitch to produce countless attractive and intriguing motifs and patterns. *Bagh* is one of the many traditional varieties of Phulkari (*Bagh, Chope, Tilpatra, Neelal, Subhar, Sainchi, and Ghungat bagh*). When compared to other kinds of phulkari, where only a portion of the fabric is exposed, a *bagh* is distinguished by having embroidery that covers the entire garment and hides the base fabric and mostly prepared for special occasions like wedding.

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MIZORAM UNIVERSITY

Buda Kirisani
(Originally written in Odia by Durga Madhab Mishra)

Anjali Tripathy
Gangadhar Meher University

He is thinking.

Buda Kirisani.

A half-burnt cigarette at the ear, a cone of *siali* leaf in the mouth – when sucked in the dark, it emits red fire.

Someone is beating the drum at a distance and the sound of *dung-dunga* is overheard.

Chaita Parab, the spring festival in March-April.

“Oh! Today is Chaita Parab.”

After the Chaita Parab of that day, fourteen other Chaita Parabs have passed in Buda Kirisani’s life like the blink of an eye. Somebody has engraved the Chaita Parab of that day on his bony frame. Every Chaita Parab freezes that frame and emanates a few drops of blood from his body.

When the young Buda Kirisani was not married, he had the strength of an elephant. Nobody could match his strength in the entire forest area. He used to pace from Khairaput to Pindajungar village and come back without resting anywhere – a distance of seventeen miles – as if he was going to the nearby pond for a call of nature.

Buda Kirisani laughs. He looks at his weak bony wrinkled chest and laughs in his sadness. Oh! How loudly the drum beats, ~~and the~~ the *dung-dunga* perfectly matches the beat. Whatever blood remains in his body multiplies fourfold. In his white haired body, there is madness for burnt cultivation. In front of his house the fire lurks beneath the ashes. He doesn't have the strength to take out the ashes. Who is there? Who is there with him? True, he has nobody now.

Buda Kirisani takes a deep breath.

Oh! It's unbearable. Life has become useless. He coughs. Fresh red blood comes out.

"If Lachchami (tribal form of Lakshmi) were there today..." he thinks. Like a torn rope, the veins in his neck release water droplets and they run to the corner of his eyes. He tries to suck the smoke – but meanwhile it extinguishes.

This happened fourteen years ago. Pindajungar to Khairaput is a distance of seventeen miles. He had taken Dangar Jamanu's *Kaudi* (to be translated here in brackets) to Khairaput. It was already twilight when he returned. He wore a dazzling coin on his ear – his payment for bringing it so far. Buda Kirisani would return that day. That day was Chaita Parab.

The Pinda forest on the mountain would resound with laughter. And the four hand red cloth of the women would slip off with their stomach-aching laughter when they danced to the beat.

How could he stay in Khairaput on this big festival day?

Impossible.

In his absence Soma would play the drum dung-dunga. Did he even know playing anything? Buda Kirisani would have to teach him for seventeen years. He had no strength in his body. He became breathless like a pregnant woman after playing the instrument for one hour only.

Buda was walking. The close association of trees had created darkness ahead of him. Forest and darkness blended together as if a student of class three had painted black and blue in patches. Buda Kirisani didn't notice that. If he didn't reach Pindajungar, his village, would he be called a man?

He would go – Surely go.

“Oh mother! Oh mother! *Baria . . . baria...baria.*”

“What happened?”

Something breathlessly came and embraced Buda's body.

Darkness was enhancing.

Buda could not see clearly.

“Who is that?”

“I ... baria.....baria.....Ah...Ah.....”

“Who are you?”

Something dark rushed from the bushes.

“Ah...Ah.....Ah....”

Somebody was shrieking and tightly embracing Buda. Buda's muscles tightened and his blood boiled in excitement. Oh, it's too dark!

From his right arm he took his bow and an arrow from his back and took aim in the blink of an eye. The arrow hurried

towards the dark animal amidst darkness. He could not go further.

Then Buda burnt a stick and started walking further. He was sweating profusely.

The arrow had hit the target. How gigantic were the teeth of that animal. It could have ground four men in a moment. Buda pulled the arrow which had pierced the neck of the animal. Warm blood gushed like stream.

Buda looked at his back.

Who was this?

Lachchami, Lachchami.

Bead necklaces were hanging from her neck through her cleavage. Red, blue, yellow – there were necklaces of all colours. To both sides lie her breasts – strong and well developed. One and a half hand span red cloth covered her waist. Youth was overflowing from her every limb.

Buda made her stand with both her arms. Pitcher of water was lying nearby. He brought water with the folds of his hands and sprinkled on Lachchami's face. He wetted his *gamcha* (a little cloth) and wiped her eyes and nose with it. He blew air into her ears. Lachchami opened her eyes.

“Oh....baria....baria...”

She fainted again. Once more he sprinkled water and she gained consciousness. She rose and tightly hugged Buda. Buda lifted her and left. The flow of blood from the pierced body of the animal had not ceased.

Baria was dead.

There was wave (a ripple?) of blood on Lachchami's lips and gratitude and shame in her eyes.

"Where have you been *dhangri*, young woman?"

"I had gone to fill water."

"Why did you go alone?"

What would Lachchami say? The danger was already over. She smiled slowly and softly.

Buda Kirisani wiped the sweat of his strong arms and looked at Lachchami for a moment. He asked, "I will go to Pindajungar. Will you go with me woman?"

Lachchami felt a lightning rush in her body. Her face brimmed with redness. Lachchami knew the reason behind the question. This question comes in the life of a tribal young woman once and the tribal man wants a direct answer then and there. There is no scope for answers like "I will think and tell," "I will tell after two days," or "I will ask my father and tell." The man does not listen to such answers and goes his way. Many young women come in the way of a man. He does not pine for one. The tribal woman knows it and knows it well.

She looked at Buda Kirisani for a full moment. Buda Kirisani – he had shining full cheeks and unspoken sparkle in his eyes. He was wearing aluminium bangles on arms, traditional necklace, *gamcha* on head with a tin frame, shining white plastic belt bought from Dumuriput market on his waist, red *koupin*, bamboo-bow on right shoulder, and iron-edged arrows on the back.

Warm blood was still flowing from *baria's* body. Lachchami rushed into Buda's arms. Her youth and beauty

faded before Buda's body. The branch of Pulang tree was burning more furiously. Buda Kirisani held Lachchami – his Lachchami – in his hands. What's this? Buda was crying. Tear streamed from his eyes and all the impurities of the eyes flew (flowed down?) with it.

Mahuri, the musical pipe, was heard more loudly. The sounds of *dhol* and *dung-dunga* deafened the ears. The night was coming to an end. The young women of the village had become tired by continuous dancing. The moon had faded behind the hills of Pindajungar. Everyone looked tired – the effect of wine was almost over.

The piper Mahuria blew the mahuri. Everyone turned to look at Buda and Lachchami. All the young men and women crowded around them in excitement like flood in Giri river. Everybody understood that Buda Kirisani had brought a *dangri* (young woman) from Khairpat. Selli was warming the dhol near the fire. He started beating it. Buda snatched the dung-dunga from Somasisa's hands and started playing. He extended the fan made of peacock's feathers to Lachchami's hand. How can one forget the way Lachchami danced with that peacock fan in hand that day? She was singing and with it overflowed her intense desire, the flood of youth.

Country liquor was cooked. Chicken was arranged and pig was brought from the lane. Goddess Mahuli looked red with sacrificial blood. The Goddess smiled.

“Baba.”

Buda Kirisani looks around. Oh! Perhaps little Lachchami is calling. Lachchami is a four years old child. With walking

stick he enters the house and feeds Lachchami with rice water and makes her sleep. After drinking the remaining rice water, Buda goes out.

He remembered the Chaita Parab of the last year. All other people from his village had accompanied him. He had to kill an animal. Then only Chaita Parab would come to an end. Buda went away. Lachchami had fed rice water to her younger daughter and made her sleep. Then she had gone to collect the leaves. She was pregnant by seven months. After climbing the steep hills of Balidangar, Lachchami felt terribly thirsty. She reached the stream and drank water to her heart's content. She fanned herself with a leaf. Oh! How painful. She felt as if somebody was taking everything away from her.

“Issssh....”

There was smell of rotten rice water in the forest. Lachchami sensed something ominous. She looked at either side, held her stomach with both hands, and then moved forward. She had hardly walked two steps...

“Oh mother.”

A tiger jumped from the other side of the mountain. It took Lachchami and went to the top of the hill in a moment. The still forest trembled with the uproar of birds. Lachchami fainted. Ah! Only if were Buda there.

“Hay! Jump down, jump down.”

“Where?”

All the villagers had chased the tiger for two miles. The mountain ended there. The tiger would be caught.

“Buda, the tiger has taken your wife.”

It was a hill with a height of two hundred feet on both sides and the river valley dividing it in the middle. Buda saw that the top of the mountain was at a distance of fifty feet. The tiger was sitting on that top with Lachchami. How will Buda Kirisani reach there? By the time he would cross the distance, Lachchami would be no more. The tiger was playing with the body of Lachchami. Buda felt an unspeakable pain in his chest.

“Lachchami... Lachchami....Oh Lachchami....”

The forest trembled. Perhaps, Lachchami opened her eyes – those two black and scared eyes. The tiger put its front legs on Lachchami’s neck. At that moment Buda’s arrow pierced through the neck of the tiger. Unerring arrow. The tiger fell down hundred feet from the top of the hill with a raucous sound and Lachchami fell with it. The tiger’s head clashed against the rock of the river. The villagers rushed to the spot. The tiger was dead.

Buda brought water in leaf-cup from the river and sprinkled on Lachchami. The tiger’s nail had torn Lachchami’s neck and the veins had come out. Her heart beat could be heard faintly. Selli fanned her with salua leaves. Buda sprinkled more water. Somasisa drove others to let the air come near her.

Lachchami looked at Buda. There was sign of dedication in those big black eyes. She closed her eyes in Buda’s arms in deep contentment and never opened those again. The beating of the heart stopped for ever.

Durga Madhab Mishra (1929-1997), a noted Odia literary figure, was also an Indian

Police Service officer from 1952 and the first Odia to serve as Director General of the Central Industrial Security

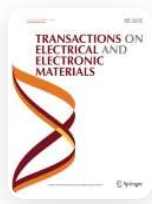
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Force (CISF). He was an editor, poet, novelist and translator at the sametime. He won the Odisha Sahitya Akademi Award (1982) for his short story collection Nishadara Nishabda Barana (The Silent Exclusion of the Night).

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Study of Variation in Optical Properties and Dispersion Parameters of Fe-Doped TiO₂ Nanopowders

Regular Paper Published: 01 November 2023

Volume 25, pages 59–66, (2024) [Cite this article](#)

Transactions on Electrical and Electronic Materials

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Abstract

TiO₂ and Fe-doped TiO₂ nanopowders with (4 and 8wt.% of Fe doping) are synthesized by using the sol–gel technique starting from powder precursor. The optical properties of the prepared samples are investigated in the wavelength range of 200–800 nm. The refractive indices and extinction coefficients are calculated from the reflectance data using the Kramers–Kronig relation. 4wt.% Fe doped sample has minimum refractive index value in comparison to others. The variation in refractive index value is studied using a single

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Fabrication of a Si/ZnO Heterojunction Diode Using a Nonconventional Sol–Gel Method

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Abstract

PN heterojunction diodes are very useful for solar cell, light-emitting diode, and photodiode applications. In this paper, PN heterojunction diodes were successfully fabricated using *p*-type silicon and zinc oxide (ZnO) grown by a nonconventional sol–gel technique. The current–voltage (*I*–*V*) characteristics of the prepared diode were measured at room temperature. The significant parameters including static resistance, dynamic resistance, and rectifying behavior were estimated. In contrast to the conventional method, the ZnO powder precursor used in this work has extremely high thermal and chemical stability. Also, this method is cost-effective due to the use of laboratory-grade ZnO powder. The effect of doping on these characteristics and parameters was studied in detail.

Graphic Abstract



Materials Today: Proceedings



Available online 30 May 2023

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Effect of annealing temperature on photocatalytic dye degradation study of TiO₂ nanoparticles prepared by non-conventional sol-gel technique

Debabandana Apta^a, Susanta Kumar Das^b, Maya Devi^a  

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<https://doi.org/10.1016/j.matpr.2023.05.498> 

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Abstract

Titanium dioxide (TiO₂) nanoparticles (NP) find several applications starting from window layer of solar-cell to dye degradation due to its varied optical and electrical properties. In this paper a low cost synthesis method of TiO₂ nano powder is reported using non-conventional sol-gel method and used for dye degradation study. Here the starting material used was TiO₂ micropowder instead of alkoxide. The prepared nano-powders were annealed at various temperatures for the variation in physical properties. The structural, morphological and photocatalytic properties of the prepared samples were studied. The XRD confirm the crystalline phase of all prepared samples and also shows the variation of crystallite size with annealing temperature. The morphological characterization by SEM confirms the uniform spherical shape of the grains. The grain size significantly decreases due to annealing. The prepared samples were used for methylene blue (MB) dye degradation study using an indogeneously built UV-reactor and compared with the degradation rate of the same dye by using raw powder. It is observed that there is

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Second harmonic generation of femtosecond laser pulses of central wavelength 1000 nm, 1100 nm and 1300 nm using ZnO nanorods

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Abstract

In this work high density ZnO nanorods were grown on glass substrate by using a two-step method. In the first step, drop-casting method was used for growth of seed layer by taking Zinc Acetate Dihydrate as precursor. In the second step, ZnO nanorods were prepared through Chemical Bath Deposition process on this seed layer by taking Zinc Nitrate as precursor. Field Emission Scanning Electron Microscope study was done to study the morphology of grown ZnO nanorods. From this study the average diameter and length of nanorods were found to be 33 nm and 270 nm respectively. These nanorods are successfully used for second harmonic generation (SHG) of femtosecond laser pulses of central



Thermo-mechanical characterization of sea water immersed GO based GRE hybrid composite

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ABSTRACT

The present work is aimed to investigate the durability of graphene oxide (GO) dispersed GFRP hybrid polymer composite subject to exposure in natural sea water for 4 weeks. Conventional GFRP and GO (0.5 wt%) based GFRP were fabricated by taking 12 layers of woven E-glass fibre as reinforcement and epoxy thermosetting polymer as matrix. GO was synthesized in laboratory by modified Hummer's method. Synthesis of GO was confirmed through XRD and Raman spectroscopy. Short beam shear (SBS) specimens of all types (both conventional and hybrid) of as-cured composites in desired dimension were immersed in natural sea water for various lengths of duration (maximum up to 4 weeks). All the sea water treated composite samples were characterized through 3-point bend test to reveal inter laminar shear strength (ILSS). About 35 % decrease in ILSS was reported for conventional GRE composite after 4 week of sea water immersion. Decrease in ILSS for GO reinforced GFRP composite was found to be 24.8 %, which is lesser than that compared to conventional GFRP composite. Low temperature Differential scanning calorimetry (DSC) test was conducted to access the glass transition temperature (T_g) of sea water immersed composite samples. After 4 weeks of sea water immersion, conventional GRE and GO-GRE composite exhibited 16% and 15.2% of decrease in T_g. Mechanism of bonding across fibre-matrix interface embedded with GO filler was investigated through the fractographic images, as obtained by scanning electron microscope (SEM).

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1. Introduction

Recently, investigators give emphasis on light weight fibre reinforced polymer (FRP) composite for their use in marine components. Glass fibre reinforced polymer (GFRP) composites with potential benefits of high specific strength, higher corrosion resistance, better fatigue limit and ease of design flexibility, can be suitable for use in some specific marine components like frame bodies of cargo ships, naval vessels, boats, wind turbines, offshore oil transporting pipes. Structural designers are seeking for improved sustainability and reduced fuel consumption in such components to be made of light weight toughened GFRP composite materials [1]. Light weight GFRP composite can replace conventional use of steel and aluminium with catastrophic fatigue damage. Corrosion

behavior of the component for long term use in structural applications is an important aspect in composite material [2–5].

GFRP composites composed of glass fibre as reinforcement and thermosetting resin as matrix, suffer thermo-mechanical degradation while exposed to moist environment with temperature fluctuations and hygroscopic stress [6]. During prolonged use in moist ambience, polymer matrix in GFRP composite suffer plasticization and swelling resulting in decrease in ultimate tensile strength due to moisture absorption. Huge gradient of thermal fluctuations can intend strain misfit between polymer and fibre owing to unequal plastic deformation [7,8].

However, the moisture induced degradation is not so severe in polymer composites while exposed to sea water [9]. The existed salts along with the trace components in sea water can decrease the osmotic diffusion in to GFRP composites owing to slower rate of moisture absorption [10].

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Effect of salinity and strain rate on sea water aged GFRP composite for marine applications

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ABSTRACT

Damage initiation and propagation in sea water immersed GFRP composites under the simultaneous effects of time, salinity and strain-rate have been investigated. Hand-laid-up 18-ply composite samples immersed in sea water with 30, 35 and 40 ppt salinity were considered. These were withdrawn in lots, every 15 days, for investigations. Six such lots were considered for investigation, the last one being withdrawn on the 90th day. Using a universal testing machine, the inter laminar shear strength (ILSS) of the material was calculated at cross-head speeds of 1, 5 and 9 mm/min. Modes of failure were investigated using the scanning electron microscope (SEM) fractographs. Glass transition temperatures (T_g) of the aged samples were measured using low temperature differential scanning calorimetry (DSC). Fourier transformation infrared (FTIR) spectra were analyzed to record thermo-mechanical degradations of the aged samples. Mode, rate and extents of deformation were concurrently affected by strain-rate, period of immersion and salinity. T_g was depressed by 7.94% while ILSS was lowered by 12.1% of the as-cured values after 90 days of immersion when these factors were at their highest extremities. Diffusion coefficient at room temperature (D_0) was seen to decrease with increase in salinity of sea water.

1. Introduction

Glass fibre reinforced polymeric (GFRP) composite [1] possesses formidable combinations of properties. These materials are light and corrosion resistant making them viable alternatives to steel. Added to that, GFRP composites possess superior fatigue properties and can be installed with considerable ease and convenience [2], needing lower maintenance cost [3]. These are strong yet have low density. These are stiff materials with good impact strength. Not surprisingly, these materials have gained momentum these days for engineering applications in different environments [4]. The extended areas of application include oil extraction industry, projects involving submarines and ocean observatories for recording of one or more properties of seawater in-situ [2] where these materials have more or less replaced steel. In addition these materials, under the Civil Engineering stream find use in bridges, roof structures, helipads, off-shore structure, cooling tower etc [3]. In fact due to remarkable corrosion resistance and high specific strength properties, the FRP composites have replaced steel to a great extent in a marine environment under which steel is no more the prime material of

choice owing to its comparatively poor life span in a high chloride ambiance [5]. FRP composites generally refer to the CFRP or the GFRP composites. Out of the two, GFRP composites find a greater use in the marine environment due to its low cost despite the exceptional strength, corrosion resistance and durability of CFRP composites [5]. Marine applications of these materials have picked up speed in recent times and several findings pertaining to sea water aged fibrous polymer composites have been reported in literature. Reduction of 8.9% in flexural strength has been reported [6] for room temperature ageing of GFRP composites immersed in sea water for 90 days. It is reported [7], in a comparative test between PET (Polyethylene Terephthalate) based and epoxy resin based glass fibre reinforced composites immersed in sea water at room temperature for 120 days that the PET based composites undergo higher extents of moisture uptake. Also, the overall mechanical properties for the PET based composites were found to decrease by about 8% as a consequence of moisture absorption. However, a very small change in glass transition temperature (T_g) has been reported for pultruded glass fibre/epoxy composite even after sea water ageing for 3 years at 75^o C [8]. Here, sea water immersion of the GFRP composite is

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Women Domestic Workers in Neo-liberal Era: A Study on Low Wage Employment

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ABSTRACT: Domestic workers are the part of the household management and also universal in nature and found in history of slavery, folk tales, international migration and highly demanded topic of discussion across the countries and human communities. However both the gender is in demand for the above specific jobs and help out the household chores. The globalization process and the development scenarios can't be completed without the reference to the status and the role of the domestic workers. The female domestic workers are the focused group here with regard to the feminization of the job and the stereotyped job requirements as females do manage in low salary and that's why they are more appropriate group to be chosen for household work. Most of the migrant people especially female population in the urban slums are engaged in this sector and domestic work is the prime source of income and the demand for their services are increasing. Taking the advantage, people are coming to the nearby urban centres to have a chance of increase in income and to experience a better life. The ILO Domestic Workers Convention, 2011 (No. 189) calls for inclusion of domestic workers into minimum wage coverage and for effective measures for ensuring compliance. Nearly three-quarters of domestic workers around the world – more than 55 million people – are at significant risk of losing their jobs and income due to lockdown and lack of effective social security coverage, according to new estimates by the International Labour Organization (ILO). The present paper is about wage problem of domestic workers in Odisha in the neo-liberal era.

KEYWORD: Domestic work, globalisation, wage, household, migration

1. Introduction

The feminisation of migration is a prominent reality in recent times although it is less explored. A large number of migrants today are females, travelling beyond the borders of their countries to escape from poverty or to improve the socio economic conditions of their families. Roughly half of the migrants in the world are females (IOM, 2000).

Conservation and management of olive ridley sea turtles and their nesting habitat: A study at Rushikulya rookery, Odisha, east coast of India

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ABSTRACT

Odisha coast, along the east coast of India, has the world's largest mass nesting sites (rookeries) for olive ridley (*Lepidochelys olivacea*) sea turtles. It has three rookeries namely Gahirmatha, Devi and Rushikulya. Olive ridley sea turtles and their habitat along the Odisha coast often face natural and anthropogenic threats leading to failure of mass nesting (arribada) and a population decline. The focus of the present study is to understand the coastal processes near the Rushikulya rookery, assess the impacts of natural and anthropogenic threats to the nesting population and their habitat, and suggest a management plan for the conservation of sea turtles and their habitat. Coastal processes and the associated geomorphological changes, shoreline change, and cyclonic disturbances at the Rushikulya rookery from 2008 to 2019 were studied. It is revealed that the natural threats for arribada are cyclonic storms, high wave exposure, and sand spit growth leading to erosion of the nesting habitat and debris accumulation. Coastal processes, such as east-southeast to south-southeast waves with moderate wave height, lunar semidiurnal tide, moderate southwest current, and predominantly southerly and easterly winds with moderate speed, are identified as favourable conditions for the sea turtles prior to and during an arribada. The study reveals that nesting on the sand spit is vulnerable because of frequent wave exposure and washout, while the beach to the north of the estuary is the most preferred and safe habitat for arribada. Coastal development, incidental capture, entanglement in gill nets, fisheries bycatch and illegal take are revealed as the major anthropogenic threats. Based on natural and anthropogenic threats, the local knowledge of the fishermen and the status of legislation, the study suggests an integrated regional management plan for the conservation of olive ridley sea turtles and their nesting habitat.

1. Introduction

Sea turtles play a vital role in maintaining healthy marine ecosystems as ecosystem engineers (León and Bjorndal, 2002; Aragones et al., 2006), nutrient transporters (Bouchard and Bjorndal, 2000), consumers (Bjorndal, 1997), and prey (Heithaus et al., 2007). Sea turtles are globally distributed in a wide variety of habitats and ecological niches (Spotila, 2004), having significant ecological and economic importance (Bjorndal and Jackson, 2002; Frick et al., 2004; Purcell et al., 2007; Gibbons and Richardson, 2008). Yet, they are vulnerable to threats due to anthropogenic and natural processes (Schlacher et al., 2007; Lut-cavage, 2017; Veelenturf et al., 2020). Many studies have focused on the conservation of sea turtle population and nesting habitats (Van de Geer

et al., 2022; Biddiscombe et al., 2020; Nel et al., 2013; Mazaris et al., 2017; Wallace et al., 2010a; Hamann et al., 2010), some yielding positive results. Conservation measures have been introduced at various levels (Wallace et al., 2011) ranging from intergovernmental agreements (e.g., Convention on International Trade in Endangered Species (CITES), Convention on the Conservation of Migratory Species (CMS) of Wild Animals, Memorandum of Understanding on conservation and management of sea turtles in the Indian Ocean and South East Asia (IOSEA)) to national (Rands et al., 2010), and from regional management units (RMUs) (Wallace et al., 2010b; Van de Geer et al., 2022), and local conservation (Rands et al., 2010). India is a signatory to two intergovernmental agreements (CITES and CMS) and has its laws and policies under the Ministry of Environment, Forest and Climate Change

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Millets In Farming System: Promoting Sustainable Diet & Lifestyle

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Abstract:

One of seventeen Sustainable Development Goals (SDG) aims to achieve "zero hunger" by 2030. The official wording of SDG two is: "End hunger, achieve food security and improved nutrition and promote sustainable agriculture". A profound change in the global food and agricultural system is needed to nourish today's 800 million people. Recently it has been realised that, It can be possible by focusing on millet production as nearly 40 percent of the global land surface is dryland and millets are the most suitable crop for dryland agriculture. Considering these aspects, the United Nations declared the Year 2023 as the International Year of Millets on 5th March 2021, on the proposal moved by India and supported by 72 countries. As evident, millets are the first plants to be domesticated for food. Before the Green Revolution millets made up around 40% of all cultivated grains, as a result contributing more than wheat and rice. But it became a forgotten food after the green revolution. The intent to revive millets came from the environment sensitive approach that realises millet as a climate resilient crop and has higher survival rate in rain fed areas. Comparatively higher nutrition value of the produce is also an added factor contributing to the movement. This paper focuses on revival of millet in the present day farming system in the state of Odisha. The current study focuses on the consumption pattern and acceptance of millet as a food in 300 sampled households from two different blocks of Bargarh district of Odisha, India. The study result revealed that millet as a diet is well accepted in those areas under study and also gaining popularity among the people day by day. Majority of the studied population have accepted millet in their daily diet though few of them are aware about its nutritional facts.

Key Words: Millet, Nutrition, Sustainability, climate resilient crop.

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I. Introduction:

'Millets' are the small-seeded cereal grains that are recently considered as a miraculous grain with a great source of nutrition. The term originated from the Latin word 'Milum' and these crops are widely grown around the world as cereal crops or grains for human food and also as fodder. These are warm weather grasses belonging to the C4 group of plants, tolerant to ecological stresses and with a short maturation period (Weber, 1998, Hunt and Jones, 2008, Pokharia et al. 2014). As evident from paleo-archaeological studies "Millets" are the first plants to be domesticated for food. Prehistoric evidence suggested that millets are cultivated for thousands of years in many parts of the world. These have been considered as an integral part of the diet of over half a billion people across Asia and Africa for centuries. There is evidence of the cultivation of millet in the Korean Peninsula dating to the Middle Jeulmun Pottery Period (around 3,500-2,000BC). In India, millets have been mentioned in some of the oldest Yajurveda texts, identifying foxtail millet (*priyangava*), Barnyard millet (*aanava*) and black finger millet (*shyaamaka*), thus indicating that millet consumption was very common, pre-dating to the Indian Bronze Age (4,500BC).

Millets was the major grain grown in India even until fifty years ago. Earlier it was considered as a staple food and integral part of local food cultures, along with many other foods. The staple food that the ancestors of man have lived on, but that they had left behind and exchanged for a more "refined" diet. Unfortunately, this said refined diet lacks the nutrients critically important for our survival. Along with such changes the state policies during the Green Revolution have also changed in favour of rice and wheat and become another factors for decline in millet production and consumption. Before the Green Revolution, millets made up around 40 percent of all cultivated grains (contributing more than wheat and rice). However, since the revolution, the production of rice has increased doubly and wheat production has tripled.

As per nutrition facts millets are rich in both macro and micro nutrients. They contain non-starchy polysaccharides, gluten-free proteins, high soluble fibre content, high antioxidants, low glycemic index, and are

**ANALYZE THE INFORMATION NEEDS AND INFORMATION SEEKING
BEHAVIOR OF A TRIBAL COMMUNITY IN THE MAYURBHANJ DISTRICT**

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Abstract

Information is an essential requirement for life, and without it, no community can grow. This study article investigates the information demands and seeking behavior of a tribal community in the Mayurbhanj District. Through a survey involving 250 participants encompassing students, daily-wage laborers, government employees, retirees, self-employed individuals, & the unemployed, the study highlights the prevalent information sources among the community, with print media and the Internet emerging as prominent channels for accessing external information. The research also uncovers challenges faced by the community in their information-seeking endeavors, encompassing issues such as limited access due to costs, inadequacies in the local library's collection, outdated resources, language barriers, scarcity of relevant materials, and

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Indian LIS Journal: Current Status and Scenario as seen through UGC CARE List in the year 2019-2020

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The present study aims at finding the current Status and scenario of Indian LIS journals as seen through UGC CARE List. There are 19 LIS journals enlisted in UGC CARE list Group I. In UGC CARE list Group II, 268 LIS journals have been enlisted from Scopus category followed by 166 LIS journals from Web of Science category separately. Some journals were found common in both the sources i.e. WoS & Scopus. The study focuses on Indian Library and Information Science Journals indexed in UGC CARE list Group I & II. The study found that very few, only 13 Indian LIS journals were enlisted in UGC CARE list Group I & II. There is an urgent need for improving the quality of Indian journals. More attention should be given from the author community to increase their productivity level of Indian journals in global databases like Web of Science (WoS) and Scopus. All the studies will be helpful for further study.

Keywords: LIS journals, UGC, CARE List, Scopus

1. Introduction

Journals play a vital role in maintaining the quality and accuracy of research. Publications are the most basic elements of the education system. New knowledge is always published in reliable and reputed journals. Unethical publishing methods are leading to an increase in the number of plagiarism and substandard journals worldwide. The percentage of scientific research papers published in journals has been reported to be high in India. The University Grants Commission (UGC), New Delhi has published an "approved list of journals"

It is important to improve quality, protect our practices and prevent academic misconduct. The increasing incidence of deteriorating publishing ethics and reduced academic integrity is a growing global problem. UGC set a list of the approved journal in the year 2017. After October 2018, UGC decided to take stricter steps to improve the quality of research and academic integrity.

To make these ideas come true, from the year 2019, UGC has established a "Consortium for Academic

Preservation and Promotion of Sambalpuri Saree Designs through Digital Archive

Rosalien Rout

Abstract

Cultural heritage plays a significant role in our life. The Indian hand-woven fabric is the oldest form of cultural artefact that denotes a major part of the Indian cultural heritage which is made up using indigenous fabrication techniques. But day by day the Indian textile designs are getting degraded. Traditional saree designs are vanishing along with the artists because no one takes an interest in sustaining the art form after them. Thus, the need has arisen to preserve it in order to safeguard the rich textile heritage and culture. According to UNESCO, lack of proper inventory and documentation are the major challenges in safeguarding of intangible cultural heritage especially in South-Asian countries. But now-a-days ICT plays a significant role in addressing the issues of preservation and access to cultural heritage by replacing the physical form of storage with the electronic form. In this respect, this paper is an attempt to highlight the significance of digital archive in preserving Sambalpuri saree designs and to make the Sambalpuri sari art globally accessible. Sambalpuri sarees are world famous handloom products that originated from the state of Odisha. These sarees are considered to be the conscious expression of Odia culture. Therefore, the main purpose of this paper is to describe the steps about the organization and management of Sambalpuri saree archive. It also presents overview of digitization practices of Sambalpuri sarees designs and how the archive could add value to the protection of Sambalpuri saree designs. The archive has the potential to be used as a platform that facilitates accessibility and preservation of cultural heritage associated with hand-woven Sambalpuri saree designs. Hence, all generation will get information and knowledge about Sambalpuri sarees designs easily.

Keywords: Cultural Heritage; Preservation; Digital Archive; Digitization; Metadata; Sambalpuri Saree Designs; Open-Source Software.

1. Introduction

Cultural heritage has a unique role to play in the overall development of each nation. It is a treasure of past human legacy and values which is transmitted from generation to generation. It represents the traditions, customs, and culture of a country that has had great importance to the country for a long time. It provides communities, groups, and individuals with a sense of identity and enhances social harmony. It depicts universal value from the historical, architectural, commemorative, aesthetic, ethnological or anthropological point of view. According to UNESCO, heritage is divided into two categories: tangible cultural heritage and intangible cultural heritage. The tangible cultural heritage encompasses works of art, buildings and monuments, and other

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**A COMPARATIVE STUDY ON SYSTEMATIC
LITERATURE REVIEW AND BIBLIOMETRIC
ANALYSIS OF WOMEN
ENTREPRENEURSHIP**

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Abstract

Purpose-The study aims to systematically critical review of existing works of literature on Women Entrepreneurship. The main motto of the study is to analyze the research pattern, development & further future scope of the research path in this field.

Design/Methodology/Approach-All the important documents relating to women entrepreneurship from 1992 to 2022 were collected from the Scopus database. These documents have been used in the bibliometric technique analysis.



An In-depth Analysis of the Relationship between Financial Inclusion, Women Empowerment, and Self-Help Groups in the Context of Odisha, India

Satyanarjan Garu and Srinibash Dash***

ABSTRACT

The study aims to measure the impact of financial inclusion on women empowerment through SHGs. Additionally, it examines the impact of SHGs on women's entrepreneurship. The study employs an empirical methodology, utilizing statistical techniques such as Exploratory Factor Analysis, Confirmatory Factor Analysis, Structural Equation Model, and Multiple Regression Analysis. The study focused on three constructs derived from the Exploratory Factor Analysis i.e., Financial Inclusion, Women's Empowerment, and Socio-economic Development. Each construct comprises several variables. From the measurement model, it checked the validity & reliability criteria in this study. Self-help Groups have a huge impact on the entrepreneurship of women. Women's entrepreneurship encompasses the generation of ideas, the production of goods and services, and commercialization to earn profits. Likewise, in Odisha, the combination of financial inclusion and socioeconomic development has a profound impact on women's empowerment through SHGs. The application of multivariate analysis further enhances the current understanding in the research domain of financial inclusion, women's empowerment, and women's entrepreneurship.

Keywords: *Financial Inclusion; SHG; Women Entrepreneurship; Women Empowerment.*

1.0 Introduction

Financial inclusion plays a pivotal role in enhancing women's economic empowerment by significantly increasing their income, purchasing power, quality of life, and position within the family.

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Institutional Finance for Agricultural Development: A Bibliometric Overview and Future Research Agenda

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Abstract: Agricultural finance is crucial for maintaining global food production, rural development, and economic growth. This study aims to review the already published research works on agricultural finance in the Scopus database. The main objective of this study is to analyze the research and development patterns in the field of agricultural finance. In this study, we have a bibliometric analysis of agricultural financing concepts to identify the pattern of research. For this study, data have been collected from the Scopus database. VOS viewer and R software are used for building and visualizing bibliometric networks. This bibliometric overview explores the context of agricultural finance research, to provide insights into its evolution, trends, and significant contributors. The study investigated a large corpus of scholarly publications from a specific period of 1985 to 2023 using bibliometric analysis approaches such as citation analysis, most relevant sources, most globally cited documents keyword analysis, etc. The study demonstrates the chronological progression of research issues, major journals, prolific writers, and influential organizations. It also identifies emergent themes and multidisciplinary collaborations. This study provides direction for future research in the agricultural finance field.

Keywords: Agricultural Finance, Bibliometric Analysis, Financing Concepts, Challenges, Citation.



JEL Codes: Q14, C88, G32 Q10, C81,

1. INTRODUCTION

Agriculture is a vital component that is intricately woven into the fabric of human subsistence and economic stability in the complex tapestry of global economies. Being the backbone of this industry, agricultural finance coordinates the flow of funds needed for investment, risk management, and agricultural output (Jin-xia *et al.*, 2014). Agricultural financing is crucial to the sustainability and advancement of agricultural systems around the world. It includes a wide range of financial services and processes meant to help farmers, agribusinesses, and



Polythiophene, polypyrrole-NiO ternary hybrid nanocomposites: structural, morphological, dielectric and electrical properties

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Abstract. Herein, we are reporting the synthesis of polythiophene, polypyrrole, and reinforced nickel oxide (NiO) hybrid nanocomposites by an in-situ chemical oxidative polymerization of thiophene and pyrrole in the presence of NiO nanoparticles. The polymerized nanocomposites were thoroughly characterized by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) studies, scanning electron microscopy (SEM), and thermogravimetric analysis (TGA). The concentration of polymer-NiO hybrids varied between different ratios of PTh, PPy and NiO contents. A maximum dielectric constant of $\approx 1 \times 10^6$ was observed at a higher ratio of polymer-filler contents. The PTh-PPy-NiO hybrid nanocomposite structure and crystallinity were verified by X-ray diffraction (XRD), and the FTIR approach demonstrated a robust interaction between PTh, PPy, and NiO particles. The surface morphology analysis revealed that NiO particles were successfully integrated with PTh, PPy during the polymerization process by forming a network. The dielectric constant values of the resultant nanocomposites were obtained from capacitance measurements. The dielectric constant for the higher concentration ratio of polymer-NiO hybrids was much higher than that of the pristine PTh, PPy matrix. A significant increase in dielectric loss and AC conductivity was observed for the higher concentration of PTh-PPy-NiO ternary nanocomposites. These PTh-PPy-NiO hybrid nanocomposites can potentially be useful in developing high-performance composite materials in the electronic field.

Keywords. Polythiophene; Polypyrrole; Nickel Oxide; Polymerization; Dielectric Properties.

1. Introduction

Recently, conducting polymers and their hybrid nanocomposites have garnered immense interest among academic researchers due to their interesting physiochemical properties (electrical, optical, electronic, and optoelectronic) and attractive potential applications in various fields such as solar cells, sensors, and optoelectronic devices.¹⁻⁵ There are several physical and chemical ways for synthesizing polymer nanocomposites (including in-situ chemical oxidation, electrochemical polymerization, and melt processing) with the study of dielectric and electrical properties.

Due to their innovative electrical, optical, electronic, and optoelectronic features, conjugated polymers are of tremendous scientific and technological relevance.⁶ It is expected that the inorganic components will rapidly modify the characteristics of the organic polymer matrix owing to their high surface-to-volume ratio. The primary goal in synthesizing organic-inorganic networks is to create novel hybrid composite materials with different characteristics that are the best for organic and inorganic substances. However, doping with metal oxides is one way to optimize the properties of these materials and achieve new, unobtainable effects by precisely controlling the introduction of the dopant into the polymer matrix.⁷ Since

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Short communication

Coordination driven self-assembled 18-component molecular octahedron

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ABSTRACT

Unsymmetric bidentate ligands offer multiple binding modes with respect to the orientations of the coordinating sites, the unsymmetric nature of ligand 3,5-bis(3-pyridyl)-1,2,4-oxadiazole, L1 arises because of orientations of 3-pyridyl groups with respect to central 1,2,4-oxadiazole ring. Ligand L1 forms a discrete molecular octahedron [Pd₆(L1)₁₂](NO₃)₁₂, **1** when combined with Pd(NO₃)₂ in DMSO where the bound ligands are in *cisoid-up* orientation. In cage **1**, Pd(II) ions are present at the vertices of the octahedron whereas twelve ligands are present at its edges, the opposite Pd-Pd distance in compound **1** is 17.501 Å. ¹H NMR and DLS study of compound **1** with different guests reveals that resorcinol has interaction with the cage.

1. Introduction

Coordination driven self-assembled discrete molecules have gained much interest among chemists because of their designed shape and cavity size which have been exploited for various applications such as recognition [1–5], sensing [6–10] and catalysis [11–16]. These discrete self-assembled compounds have been prepared from non-chelating multidentate ligands and four coordinated metal center like Pd(II) and Pt(II) [15–22], although six coordinated metal centers have also been used for preparation of such coordination cages [23–27]. The multidentate ligands used for coordination driven self-assembled cages are, mostly, of symmetric in nature; only few cages have been reported with unsymmetrical multidentate ligands [28]. Unsymmetric bidentate ligands offer a variety of plausible binding modes to metal center with respect to the binding sites of the ligand and the resulted assemblies from such ligands have been recently reviewed [29]. Since more than one binding modes are possible for these unsymmetric bidentate ligands, the prepared cage from them can accommodate guests, ions or recognize molecule with respect to the newly oriented forms of the ligands. Synthesis of lower symmetric discrete coordination cages from different ligands may be achieved by various methods such as preparation of heterometallic cages [30–34] and choosing heteroleptic ligands [35–37] or low symmetric ligands [38–42] for complexation. Low symmetric or unsymmetric bidentate ligands have been used for preparing M₂L₂ [43–46], M₃L₃ [47,48] and M₄L₄ [49,50] type coordination cages where metal centers are *cis*-protected. Similarly, unsymmetric bidentate

ligands form M₂L₄ [38,40,42,51] or M₃L₆ [48,52] type coordination cages when the four sites of metal are unprotected. Recently, Severin research group has reported formation of M₆L₁₂ and M₁₂L₂₄ type molecule from unsymmetric bidentate ligands [53,54]. The strategy to synthesize unsymmetric bidentate ligand may be achieved by choosing an unsymmetric backbone with same binding sites or symmetric backbone with different binding sites [29].

In this work we have demonstrated formation of a discrete molecular octahedron from unsymmetric ligand, 3,5-bis(3-pyridyl)-1,2,4-oxadiazole (L1) which is potentially bidentate in nature and Pd(NO₃)₂. Ligand L1, has been chosen to have same binding sites but unsymmetric backbone in the central oxadiazole ring which can have different orientations in solution state. To the best of our knowledge, this 1,2,4-oxadiazole based ligand L1 has not been reported for preparation of any coordination cages till date [55].

2. Experimental

2.1. Materials and methods

Palladium chloride and deuterated solvents have been acquired from Aldrich Chemicals. Silver nitrate, 3-cyano pyridine, nicotinic acid, thiourea, hydroxylamine and solvents have been purchased from CDH limited, India, The solvents are analytical grade and used as received.

NMR spectra of samples have been recorded in Bruker 400 MHz

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Deciphering the interaction of galactomannan polysaccharide guar gum and bile salt sodium deoxycholate

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Abstract

The interaction study of water-soluble galactomannan polysaccharide guar gum (GG) and biosurfactant bile salt may have implications in lipid digestion and food formulations. In this work, we have tried to bring almost all fundamental aspects of the interaction of guar gum and bile salt sodium deoxycholate (NaDC), and the physicochemical properties allied with their association. The critical aggregation concentration (CAC), aggregation number (N_{agg}), and critical micellar concentration (CMC) of GG/NaDC mixed system were calculated using fluorescence parameters of pyrene molecule and conventional conductivity data. The thermodynamic parameters of GG/NaDC system were calculated, and the association was found to be a spontaneous and feasible process. At various regions of their interaction, zeta potential and dynamic light scattering studies have been done to gain a better understanding of their interaction.

Keywords Guar gum · Bile salt · Pyrene · Thermodynamic parameters · Aggregation · Physicochemical properties

Introduction

Guar gum (GG) is a highly water-soluble dietary fiber that has been considered an important nutritive component of human health because of its efficacy in the treatment of hypercholesterolemia, hyperglycemia, and obesity (Butt et al. 2007; Leclere et al. 1994; Moundras et al. 1997; Saeed et al. 2012). Nowadays, dietary fibers are an essential part of a healthful diet, as it lowers cholesterol and blood sugar levels, normalizes bowel movement, keeps the gut healthy, and reduces the risk of chronic health condition. It alters the emulsification of dietary fat and helps in lipolysis (Pasquier et al. 1996; Maisonnier et al. 2003). The high solubility and non-toxicity of GG make it a good material to be used in food industries as a food additive, emulsifier, thickener, and stabilizer (Mudgil et al. 2014; Gupta and Variyar 2018;

Thombare et al. 2016). Apart from food industries, it is also used in textile, oil well drilling, paper, and cosmetic industry (Mudgil et al. 2014; Chudzikowski 1971). The structure of guar gum, a galactomannan polysaccharide obtained from the endosperm of *Cyamopsis tetragonoloba*, having linear chains of (1 → 4)- β -d-mannopyranosyl units attached with (1 → 6)- α -d-galactopyranosyl units in the ratio of 2:1 approximately is shown in Fig. 1A (Prabaharan 2011).

Dietary fibers are known to interact with bile acids and thereby preventing their reabsorption and promote transit to the colon (Naumann et al. 2019). Moriceau et al. (Moriceau et al. 2000) have reported that guar gum elicits marked changes in the intestinal pools of bile acid, which result in lowering cholesterol in rats. Bile salts are biological surfactants, synthesized in the hepatocytes from cholesterol in the liver. The most commonly known unconjugated secondary bile salt is sodium deoxycholate (NaDC) (Fig. 1B), that is synthesized from deconjugation and dehydration of primary bile salts by the human gut microbiota (Ridlon et al. 2006). Bile acids play an important role in hepatobiliary, intestinal homeostasis, and digestion (Buy et al. 2013). After the emulsification of dietary fats, the bile salt pool is reabsorbed by the enterohepatic circulation and transported back to the liver. In vivo studies have shown that the interaction of dietary fiber with bile acid results in more excretion of bile acid in the feces (Lia et al. 1995), and this leads to a

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PHYSICAL CHEMISTRY
OF SOLUTIONS

A Conductometric Study on the Solute-Solute and Solute-Solvent Interactions of Quercetin and 7-Hydroxy Flavone with NAM in Water-Ethanol Mixed Solvent

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Abstract—A natural polyphenolic substance generated from plant metabolites is called a bioflavonoid. By using a conductometric technique, various interactions between the polar, hydrophilic, and hydrophobic components of quercetin (QUE)/7-hydroxy flavone (7-HF), and nicotinamide (NAM) in a hydro-ethanolic medium were examined. Quercetin (3,3',4',5,7-pentahydroxyflavone) and 7-hydroxyflavone (7-hydroxy-2-phenylchromen-4-one) belongs to the class of bioflavonoids. In this present work, the interactions of these two bioflavonoids with nicotinamide (NAM), a hydrogen bond donor (HBD) have been studied by analyzing different parameters derived from experimental electrical conductivity data. The solutions of QUE/7-HF-NAM were prepared using mixed solvents of ethanol (30 and 40 wt %) in 0.5 and 1.0 of NAM. Using the specific conductance (K) values the limiting molar conductance (Λ_m^0) was evaluated at different temperatures ($T = 293.15\text{--}313.15\text{ K}$ with 5 K interval). The thermodynamic parameters (change in enthalpy (ΔH), entropy (ΔS), free energy (ΔG), and activation energy (E_A) associated with their interaction has also been determined. Each of these parameters were interpreted in the light of the existing molecular interactions between QUE/7-HF-NAM in water-ethanol mixed solvents.

Keywords: bioflavonoids, nicotinamide, conductivity, molecular interactions, thermodynamic parameters

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1. INTRODUCTION

Human beings have been utilizing plants for their medicine and food from a long time ago. In many countries natural alternative medicines are being the most acceptable option that made it easier for adopting herbal medicines. Exclusive of 6000 species, bioflavonoids stand the most multifarious phytochemicals endow in several vegetables and fruits [1, 2]. They are having anti-viral, anti-oxidant, anti-inflammatory, anti-tumor and anti-carcinogenic properties, which makes them a very good molecule to be used in various fields [3–6]. The molecular interactions and thermodynamic studies of such type of poor soluble drugs are generally been carried out to get information on their physicochemical properties [7–9]. This information further helps in deciding the quality and suitability of the drug molecule that to be developed into formulations.

As a part of our ongoing research program on the study of solute-solute, solute-solvent, ion-solvent interactions of drug molecules with hydrotropic agents [10–18], non-essential amino acids with food preser-

vatives [19–22] attempt has been made to investigate molecular interactions of heterocyclic scaffolds because of the important biological actions of polyhydroxylated flavones, which also exhibit anti-viral, anti-oxidant, anti-inflammatory, anti-tumor, anticancer and anti-microbial properties. An important property of liquid mixtures that helps in understanding the solute-solvent interactions, is electrical conductivity which is proved to interpret the degree of difficulty of charge transfer in a solution. The ionic conductivity gets influenced by mobility of ions and the mobility of ions is affected by the amount of charge carriers, which in turn influenced by molecular weight, density and ion sizes. Solute-solvent interactions are the fundamental principles which play their crucial role in the field of photochemistry and photophysics of biological and organic chromophores in solutions [23].

In view of this, the present work has been made to study the molecular level interaction using conductivity techniques of QUE and 7-HF with co-solute molecule, NAM which is the hydrogen bond donor

ORIGINAL ARTICLE

An Analysis of the Activities of Daily Living (ADL) among Aged People in Rural Areas of Western Odisha, India

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ABSTRACT

Background: A decline in fertility rate and expansion in life span has resulted in the growth in the percentage of aged populations in the whole world. India and Odisha are no exceptions. **Objectives:** The objective of the present paper is to find out the incidence of functional ability/inability among the aged people of the rural areas of western Odisha of India. **Materials and Methods:** Katz Scale of ADL was used to assess the functional ability of elderly people. Six activities of daily living such as (Bathing, Dressing, Toilet, Mobility, Continence, and Feeding) were analyzed as per age and sex of the samples. **Results:** Of all the samples (1992), 98.5 percent are physically independent and only 1.4 percent are physically dependent. Out of 945 female elderly people, 931 (98.1%) are independent and out of 1047 male elderly people 1033 (98.6%) are independent. The physical dependency of females is more with a χ^2 – value of 0.075 and p – value of 0.466. The age group wise χ^2 – value is 20.899 (3) and p – value of 0.001. **Conclusion:** Lesser physical dependency is found among the elderly people in rural areas. An increase in dependency is seen with the increase in age.

KEYWORDS

Aged; Male; Female; Activities of Daily Living; Longevity; Prevalence; India; Elderly; ADL;

INTRODUCTION

The number of elderly populations is increasing fast in whole world. By 2050, it is estimated to be double i.e., from around 11% to 22%. (1). James (2) mentions that the Indian elderly population is second largest in the world which is expected to be 19.5% in 2050. This means that every 1 in 5 Indians is likely to be a senior citizen (3). Elderly people in

developing countries who are not able to look after themselves any longer is estimated to increase fourfold by 2050 (4). Activities of daily living (ADL) should be assessed while evaluating the mental status and the functional abilities of elderly (5). Li et al (6) studied the time trends and potential risk factors for ADL disability among elderly (65+ years) in China. Zhang et al (7) studied



Influence of chloride ions on corrosion behaviour of zinc-alloy in the simulated body fluid solution

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ABSTRACT

The bio-corrosion behaviours of the Zn alloy in the simulated body fluid (SBF) at different chloride ion concentrations were investigated. The Potentiodynamic Polarisation Curve (PDP) and Electrochemical Impedance Spectroscopy (EIS) results indicate that the corrosion rate of Zn alloy decreases with higher chloride ion concentrations. The decrease in corrosion rate is due to the formation of a protective layer of ZnCl₂ nanofibres and agglomerates. The surface morphology and analytical studies of the Zn alloy were carried out by scanning electron microscopy (SEM), EDX, atomic force microscopy (AFM), and X-ray diffractometry. The SEM, EDX, and X-ray diffraction studies indicate the formation of nanofibres and agglomerates of ZnCl₂. The AFM measurements show the increase in surface roughness due to the in situ formation of nanofibres and agglomerates on the alloy surface. Therefore, these results are useful to tailor the design of Zn alloy-based biomedical materials being implanted for the living body.

On a étudié les comportements de biocorrosion de l'alliage de zinc dans le fluide corporel simulé (SBF) à différentes concentrations d'ions chlorure. Les résultats de la courbe de polarisation potentiodynamique (PDP) et de la spectroscopie d'impédance électrochimique (EIS) indiquent que le taux de corrosion de l'alliage de zinc diminue avec des concentrations d'ions chlorure plus élevées. Cette diminution du taux de corrosion est due à la formation d'une couche protectrice de nanofibres et d'agglomérats de ZnCl₂. On a effectué la morphologie de la surface et les études analytiques de l'alliage de zinc par microscopie électronique à balayage (MEB), EDX, microscopie à force atomique (AFM) et diffractométrie des rayons X. Les études de MEB, EDX et diffraction des rayons X indiquent la formation de nanofibres et d'agglomérats de ZnCl₂. Les mesures d'AFM montrent l'augmentation de la rugosité de la surface en raison de la formation in situ de nanofibres et d'agglomérats sur la surface de l'alliage. Par conséquent, ces résultats sont utiles pour adapter la conception de matériaux biomédicaux à base d'alliage de Zn implantés dans le corps vivant.

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KEYWORDS

Zn alloy; electrochemical corrosion; simulated body fluid; electrochemical impedance spectroscopy; atomic force microscope

1. Introduction

Biodegradable metals (BMs) have gained much-needed consideration in recent years, especially in the field of biomaterials and tissue engineering owing to their property of biodegradability and biocompatibility [1]. The high biocompatibility and biodegradability mark biodegradable biomaterials as more beneficial for the permanent implant materials [2–6]. In recent years Mg [7–13], Fe [14–18], and Zn [19–22] have been widely used as biodegradable implant materials. In the past few decades, researchers have mainly focussed on Mg and Fe-based materials which suffer certain limitations with their clinical aspects. The high degradation rate, high hydrogen evolution, low mechanical strength of Mg [23–25], and slow degradation rate of Fe [26,27] mark their failure as an implanted biomaterial in a

physiological environment. Recently, Zn-based alloys were used as a biocompatible material for surgical implants because the Zn alloy produces a non-toxic corrosion product on the surface [28–30]. In addition to this, Zn possesses various properties such as a moderate degradation rate, high corrosion resistance, a high Young's Modulus, and a high mechanical strength [29,31–34]. Additionally, Zn is an important trace element found in the living body, which plays an important role in enzymatic reactions [35–38]. Ambat et al. performed the electrochemical studies and the corrosion behaviour by varying Cl⁻ concentrations of die-cast and ingot-cast AZD91 alloys [39]. With the increase in the chloride ion concentration, the corrosion rate increases at pH 7.2. Altun and Sen [40] investigated the influence of Cl⁻ ion concentration on the AZ63 alloy where the

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Polymer-based Corrosion Inhibitors: A Comprehensive Review and Modification Strategies

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Abstract

The use of polymer-based corrosion inhibitors has garnered significant attention as an effective means to combat corrosion and prolong the durability of metallic materials. This review article provides a detailed examination of recent advancements in this field, with a specific focus on the strategies employed to enhance the performance of polymer-based corrosion inhibitors. The principles of corrosion inhibition and the advantages associated with polymer usage, the review explores diverse types of polymers utilized as corrosion inhibitors, encompassing synthetic, biopolymer, and conducting polymers. The discussion encompasses synthesis methods, corrosion inhibition mechanisms, and the relationships between polymer structure and properties. Furthermore, the article emphasizes the significance of comprehending the interplay between polymers and metal surfaces in achieving effective corrosion protection. Various modification techniques are also investigated, including chemical modification, copolymerization, the incorporation of functional groups, the formation of nanocomposites, and surface modification. The challenges and prospects in the field are addressed, underscoring the need for innovative approaches such as stimuli-responsive polymers, smart coatings, and self-healing systems. This comprehensive review serves as a valuable reference for researchers and professionals in the corrosion science and engineering domain, consolidating existing knowledge and providing directions for further research endeavors.

Keywords

Polymer, Corrosion, Corrosion inhibitor, Copolymerization, Nano composites

Introduction

Corrosion arises from a chemical process where metal undergoes a reaction with oxygen and water, resulting in the creation of stable metal oxides. The accumulation of these oxides poses a threat to the metal, leading to its gradual degradation. An observable sign of corrosion is the emergence of a reddish-brown coating on the metal's surface. Corrosion poses a significant challenge in marine settings, notably within the oil industry and navy. Unfortunately, a conclusive remedy for this problem remains elusive at present [1, 2]. The occurrence of corrosion results in a range of losses, encompassing economic consequences that directly affect key industries like thermal plants, nuclear plants, and the petroleum industry. These industries play a vital role in the nation's economy and corrosion poses significant challenges for their operations. Numerous mishaps related to corrosion failure that result in safety risks, financial losses and other factors have been reported. Some of the most well-known incidents include the Carlsbad pipeline explosion accident (New Mexico; 19 August 2000), the Aloha Boeing 737 airlines accident (US; 18 April 1988), the Guadalajara sewer explosion (New Mexico; 22 April 1992), the Gaylord Chemical Explosion (Louisiana;

A Simulation Study of Estimation of Finite Population Mean Using a Single Auxiliary Information in Double Sampling

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ABSTRACT

The goal of this work is to solve the conundrum of calculating the finite population mean in two-phase sampling from a single piece of auxiliary data. For the estimate of the finite population mean, we have here developed an estimator of the exponential ratio type. Up to the first level of approximation, the suggested estimator's mean square error has been expressed. The suggested estimator has been contrasted with various classic estimators that are already in use. It has been determined if the suggested estimate is preferable by taking into account both an empirical investigation and a simulation analysis. It has been found that in all circumstances, the suggested exponential ratio-type estimator is more practical than the current estimators.

Key words: Mean square error, Percent relative efficiency, Double sampling, Simulation.

Mathematics Subject Classification: 62D05

1. INTRODUCTION

In survey sampling studies, it is widely recognized that the proper use of auxiliary data that is highly associated with the research variable may boost the estimators accuracy during the estimation stage. In two-phase sampling, a sizeable sub sample is first selected from the preliminary sample to estimate the primary variable under investigation. The preliminary sample is used to gather data exclusively on the auxiliary information.

Sukhatme (1962) established a universal ratio-type estimator for the estimation of finite population mean under two phase sampling methods. Several authors have offered various estimate techniques employing the data on auxiliary variables. Singh et al. (2006, 2007, 2011), Dash and Mishra (2011), Singh and Choudhury (2012), Kiregyera (1980, 1984), Bahl and Tuteja (1991), Srivastava (1970), Cochran (1977), Singh et al. (2006, 2007, 2011), Dash and Mishra (2011), Singh and Choudhury (2012), Kiregyera et al. (2013), Khare et al. () and Sahoo and Jhankar (2023) etc.

Marketing Strategy using Markovian Model on Long Term Steady State Market Share

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Abstract

In this paper, there is the attempt of examining the long run steady state market shares of a variety of soap in Sambalpur, Odisha by applying the Markovian theory. The matrix consists of possibilities of transition of consumers who is switching different brand of bathing soap. The Markovian approach gives an insight of the reason of customer switching and try to identify the potential completion of a brand in the market and predicts the future condition of gaining and losing the customers of a particular brand. All the calculations done by primary data and using this data probability matrix has been designed.

Keywords: - Brand, Switching, Bath soap, share, Markov chain.

1. Introduction

In marketing, an entrepreneurial activity (An off, 1987), the practice of creating a name, symbol or design that identifies and differentiates a product from other product is known as branding. Basically, brand switching is the loss of own loyal customer to other brands and winning the loyal customers of other brands.

Out of the commonly used brands switching models of marketing, one extremely popular model is the Markovian brand switching model. A.A. Markov, Russian mathematician invented Markov chain in the early 1900's. It is a method based on mathematical model with the consideration of a random phenomenon. This method was constructed by imposing a crucial additional assumption on discrete time stochastic process. The concerned random phenomenon changes with time. Though the model was invented in early 1900's but the major applications of the model started in the second half of nineteenth century. The application were principally done on brand loyalty studies.

Sometimes consumers wish to try other brands for the same products but they are dissatisfied in choosing that as it does not fulfill their expectation. It is not that the preference of choosing the particular brands and products depends on the quality and durability of the product but also on the preference of consumer's conditions and situations. In other words, the consumer's reaction towards the product can be affected by the cost and price of that particular product. Price sensitivity or price elasticity means how much the sales of the product can be influenced by the price. The consumers are now easily choosing the other brand because of the price sensitivity. The company needs to be careful enough especially in maintaining the price sensitivity in bath soap and chocolates as consumers are quickly changing their minds for another brand. Even though a consumer has a habit of preferring a particular brand yet if he notice and realize that the price, he paid for the brand is not reasonable then at the very moment the brand will lose its customers.

Many people consider that when the product's Price is decreased the consumer will have a craze for the product. Getting decrease in the price is not the solution to attract consumers. The probability is that it may

Enhancement of Exponential Ratio-Type and Product-Type Estimators in Two-Phase Sampling

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ABSTRACT

In this study, we have proposed an exponential ratio-type and product-type estimators to estimate the mean of study variable Y by incorporating auxiliary variable under two-phase sampling scheme. The expression of mean square error has been obtained up to the first order of approximation and an empirical study carried out to show the superiority of our proposed estimators. It is observed that the estimators considered by various authors and usual unbiased estimator are less efficient than our proposed estimators. For the theoretical support a simulation study is also carried out.

KEYWORDS: Simple random sampling, mean square error, two-phase sampling and simulation study.

Mathematics Subject Classification: 62D05

1. Introduction

The concept of two-phase Sampling was given by Neyman (1938). Two-Phase sampling is more efficient and more reliable method for estimation. Several authors have proposed different estimation technique by incorporating the knowledge of auxiliary information. In this sampling a large sample is selected at first phase to estimate the auxiliary variable and the variable of interest is estimated at the second stage.

Consider a finite population $U = (U_1, U_2, \dots, \dots, \dots, U_N)$ of N units. Let \bar{X}, \bar{Y} and \bar{Z} denotes the population mean, C_x, C_y and C_z denotes the coefficient of variation, ρ_{yx}, ρ_{yz} and ρ_{xz} denotes the correlation coefficient. Let Y be the study variable and X and Z be the auxiliary variables with the corresponding values y_i, x_i, z_i ($i = 1, 2, \dots, \dots, N$). The problem is to estimate \bar{Y} in presence of two auxiliary variables x and z .

$$\text{Let } S_y^2 = \sum_{i=1}^n \frac{(y_i - \bar{Y})^2}{(N-1)}, S_x^2 = \sum_{i=1}^n \frac{(x_i - \bar{X})^2}{(N-1)} \text{ and } S_z^2 = \sum_{i=1}^n \frac{(z_i - \bar{Z})^2}{(N-1)}$$

Let $C_y = S_y / \bar{Y}$, $C_x = S_x / \bar{X}$ and $C_z = S_z / \bar{Z}$ be the coefficients of variation of y, x and z respectively. $f_1 = \left(\frac{1}{n} - \frac{1}{N}\right) = \left(\frac{(1-f)}{n}\right)$, $f_2 = \left(\frac{1}{n'} - \frac{1}{N}\right) = \left(\frac{(1-f')}{n'}\right)$, $f_3 = f_1 - f_2 = \left(\frac{(1-f'')}{n}\right)$,

An Enquiry into Divergence of Regional Inequalities in Agricultural Developments of Western Odisha: A Statistical Analysis

By

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Abstract

In the present study, an attempt has been made to determine regional inequalities in agricultural development among districts of Western Odisha at block levels. A sample of six districts of Western Odisha namely Nuapada, Jharsuguda, Boudh, Sundargarh, Sambalpur, and Baragarh out of ten districts of western Odisha was selected by the method of Simple random sampling. The "Statistical Abstract of various regions in Western Odisha: 2019-20", The Directorate of Economics and Statistics (DES) was the major source of data utilized for the purpose of the study. The method of Principal Component Analysis is employed and ten main components were extracted out of fifteen indicators which were tested as Normally distributed by Kolmogorov Smirnov tests. The three Quartiles Q 1, Q 2, and Q 3 of the Normal probability distributions have been used to divide fifty blocks into four homogeneous groups namely Meteoric, Progressive, Mediocre, and Laggard on the basis of their composite index scores. The above four mentioned groups are found to be significantly different with respect to Agricultural area in hectares, Yield rate in quintal/hectares and Production in quintals by one-way ANOVA test. A random sample of five blocks is selected from each group to compare the degree of inequality by computing the Gini concentration ratio (GCR) to take policy decisions at block levels.

Keywords: Principal Component Analysis, Kolmogorov Smirnov Test, Gini concentration ratio, Meteoric, Progressive, Mediocre and Laggard.

Introduction

Odisha is a state consisting 30 districts which ranks ninth in terms of area and eleventh in terms of population. The economy is based mainly on agriculture. Nevertheless, the state seems to have a lot of regional inequality development issues. Not all regions in Odisha expect equal benefits due to various substantial economic, agricultural, and social constraints. Likewise, due to various their connections with farmers, NGOs were able to set up decisions

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Exploring Agricultural Disparities in Western Odisha: A Comprehensive Study Based on Composite Index Scores

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Abstract

The research endeavor delves into the intricate agricultural disparities prevalent in Western Odisha, focusing on crucial metrics such as land area, yield rates, and production trends spanning the years 2020 to 2022. The study encompassed an extensive scope, encompassing 50 blocks distributed across six carefully selected districts: Nuapada, Jharsuguda, Boudh, Sundargarh, Sambalpur, and Baragarh. These districts were meticulously chosen through a process of simple random sampling from a pool of ten districts in the Western Odisha region. To distill meaningful insights, the research harnessed the power of composite indices, drawn from a comprehensive set of fifteen indicators, each illuminating distinct facets of agricultural development. Through the application of Principal Component Analysis (PCA), five key indicators were expertly extracted from this data set. Drawing upon secondary data sourced from the esteemed Statistical Abstracts of Western Odisha districts, and the Directorate of Economics and Statistics (DES), Government of Odisha (2019-2020), the study validated its assumptions by subjecting the extracted components to the rigors of the Kolmogorov-Smirnov test for normal distribution. Primary data was diligently collected from a cohort of 300 households via meticulously structured questionnaires, encompassing vital parameters such as land area (measured in acres), yield rates (measured in kilograms), and production figures (measured in quintals). It was discovered that the data exhibited deviations from normality, prompting the application of non-parametric methodologies. The ensuing Kruskal-Wallis tests unearthed significant disparities among the identified groups, emphasizing substantial distinctions between the Meteoric, Progressive, Mediocre, and Laggard classifications. To gauge the extent of these disparities, the Gini Coefficient (GC) was aptly employed. The findings underscored that the Meteoric group exhibited more



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Keywords

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Analysis (PCA).

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A statistical analysis of the effect of social networking sites on students' academic performance in the western Odisha universities

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Abstract

The purpose of this research is to investigate the core notion of social networking sites, as well as their relevance, use, and effect on the academic performance of students. The university students from western Odisha are the major source of information for this study. Primary data on demographic information, educational qualifications & achievements are collected through Google forms in online and offline methods that were utilized for the study. From the sample of size 277, gender-wise distribution [Female- 141 (50.9%) and Male- 136 (49.1%)] have been responded to and selected for our study. A five-point Likert Type Rating Scale Questionnaire, titled: Social Media and Academic Performance of Students Questionnaire was used to collect data from the participants. The data so collected are analyzed through IBM SPSS Statistics 26 under MS Excel environment and the results are analyzed. Statistical tools like Graphs, Pie- Charts, Diagrams, Chi-Square tests, and t-tests were used for the statistical data analysis to assess the various effects of social networking sites on the academic performance of students. The results reveal that the students who spend more time on SNSs are likely to demonstrate poor Academic achievement. Students can be able to boost their Academic achievement by collecting data and gathering important information.

Keywords: Social networking sites, academic achievements, chi-square test, t-test, statistical analysis

1. Introduction

Social networking sites are the most widely used mode of communication nowadays. It is utilized by people from all walks of life. Social media was broadly embraced by the public about a decade ago. Facebook, Twitter, Instagram, Whats App, YouTube, LinkedIn, Google+, Flickr, Snapchat, and Telegram are just a few of the many online networking platforms available. The purpose of this research is to investigate the core notion of social networking sites, as well as their relevance and use. The research also looked at how students' usage of social networking sites affects their academic achievements. University students from western Odisha are the major source of information for this study. The core goal of social networking sites is to provide customers and users with access. On the internet, they may converse with folks and form social relationships. They may also publish their thoughts and personal information on social media, such as daily events, speculations, images, videos, weblinks, etc. Social networking sites have influenced a variety of industries, but it has had the greatest impact on classrooms and the educational system as a whole. School after school has mastered a wide spectrum of interpersonal contact through some type of social media, whether it's through private social gatherings, Facebook Pages, classroom Twitter profiles, or web diaries. There is no doubt that social networking sites, particularly social media, have brought people closer together than ever before, but experts and academics around the world have been looking for the flaws that its users may have encountered. The use of internet networking has increased dramatically with the introduction of cell phones. With the rise in the use of long-distance interpersonal communication platforms, the face of traditional individual cooperation has altered and will become more unique in the future. Long-distance interpersonal communication has ramifications both inside and beyond society, such as specialized tactics, self-expression, disengagement, relationships, and a feeling of humanity. Another issue is social media's impact on society's general health. People choose to play online games that do not need any physical exercise.

A Study on Machine Learning Based Classification of Crystal Structures in ABO_3 Perovskites

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Abstract—This study focuses on the classification of ABO_3 materials using the XGBoost model. Out of 5329 perovskite compounds, 547 compounds are selected after the preprocessing phase of data mining. Some features are dropped due to a lack of relevance to the classification task. The correlated features are identified and redundant features are removed from the dataset. The proposed model successfully classified the structures into their appropriate classes with 90% accuracy. The augmentation technique is applied to deal with the imbalance in the dataset. The model is inexpensive and fast. The crystal structure classification finds application in material engineering.

Index Terms—Data Augmentation, Imbalanced Dataset, XG-Boost Model, Classification.

I. INTRODUCTION

Perovskite oxides have received a lot of attention in recent years due to their intriguing electrical, optical, magnetic, dielectric, and thermal properties etc. [1], [2]. ABO_3 is a straightforward chemical formula in which the 12-fold coordinated alkali, alkali earth, and rare earth metal cations with low valent and big sizes can occupy the A site, while transition metal cations with high valent and small sizes can occupy the B site coordinated with 6-fold oxygen anions. The physio-chemical properties of the Perovskite oxides mostly depend on the crystal structure [3]. In particular, the crystal arrangements of perovskite-type compositions have a significant impact on the electronic arrangements, which in turn affect carrier transport and energy band gaps. Determining the crystal structure is therefore necessary before creating candidate materials for next-generation applications. Consequently, before using ABO_3 perovskite oxides, it is essential to evaluate their formability and stability. Trial-and-error methods have been employed for this purpose. The oxides are first created using the corresponding stoichiometric precursors and then characterized to analyze their suitability for specific applications. However, those techniques are time- and labor-intensive and heavily rely on the expertise and understanding of the researchers. Hence, there is a hunt for computational prediction of crystal structure, which will reduce the time and cost of designing any emergent perovskite oxide. To examine the relationship between the structural, compositional, and performance of materials at various scales, density functional

theory (DFT), Monte Carlo simulation, and molecular dynamics are used [4]–[6]. However, most computational strategies only focus on a definite system, and a terrible amount of work is required for complex systems. Additionally, sophisticated computational methodologies and professional expertise are needed. This method is also very difficult to use for compounds that require huge unit cells and functional cells that are much larger than the primitive ones. Machine learning is found to be one of the effective and efficient approaches to identify the crystal structure of perovskite, which can cut down on the enormous amount of time needed to undertake large-scale screening experiments. Machine learning models (ML) have gained popularity in recent years as potential techniques for creating predictive models that actively solve prediction issues [7], [8]. The investigation of the various materials' properties and their associated applications has been accomplished with the help of one of the most well-liked statistical learning techniques based on machine learning. The current work focuses on the prediction of classifying ABO_3 compounds into cubic, tetragonal, orthorhombic, and rhombohedral systems by incorporating wide range of input parameters, such as vacancies, ionic radii, electronegativities, and oxidation states. The primary goal of this research is to examine the ABO_3 perovskite data that is currently accessible and to highlight the data's intrinsic properties. The paper experiments XGBoost model to categorize the crystal structures into four different classes. The rest of the paper includes six more sections. The objective of the paper is outlined in section 2. Section 3 details the data preprocessing. XGBoost model is explained with a diagram in section 4. The working structure of the proposed model is elaborated in section 5. Section 6 discusses the results obtained from the model experimentation. The concluding remark is summarised in section 7.

II. OBJECTIVES

- 1) The main objective of the study is to minimize the failure rate in decision-making in the class imbalance dataset.
- 2) In this work, an XGBoost model is presented to tackle the disproportionate class sample distribution problem.
- 3) The outcome of the proposed model may assist the material scientist in the classification of crystal structures.

IoT for Smart Healthcare: Opportunities, Challenges and Technology

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Abstract. Internet of Things (IoT) has drawn a lot of attention in recent years because of its potential to solve real world challenges observed in several application domains. Its expanding trans-disciplinary usages have changed the way we live. One of the IoT applications includes smart healthcare, which connects sensors, smart devices, machinery, patients, and doctors to the Internet. It can be utilized to minimize the load on healthcare systems brought on by an ageing population and an increase in chronic sickness. When it comes to health bills, resource requirements, availability, and personal care, healthcare have become a major socio-economic concern, particularly for the elderly persons. IoT has enabled doctors to do remote monitoring, chronic illness management, and senior care of secluded patients, and looking after indoor patients, in an effective and intelligent manner as well. Furthermore, due to remote monitoring of patients by physicians, the length of hospital stay can be reduced that reduces the expenses. This study examines some smart healthcare trends that have transformed the traditional healthcare system by improving health management efficiency through IoT implementation.

Keywords: Internet of Things (IoT), Smart Healthcare, Healthcare (HC), Challenges and Issues.

I. INTRODUCTION

The basic idea of IoT is the pervasive presence of different objects or things, such as radio-frequency identification (RFID) tags, actuators, mobile phones, sensors etc., around us. The objects are able to interact with each other and cooperate with their neighbours to reach common goals through unique addressing schemes. Key fields and applications for applying IoT solutions encompass smart cities, power networks, transport, healthcare, agriculture and buildings which is shown in Figure-1. This list also includes smart healthcare system based on IoT which is one of the major focuses of this research work. Health is an important aspect of every individual's life. Unfortunately, due to lack of technology and other factors recipients do not get satisfactory treatments. On the contrary,

continually ageing population along with the rise in chronic sickness, is putting enormous strain on modern healthcare systems due to high demand for hospital beds, doctors, and nurses. Clearly, a solution is needed to alleviate the strain on healthcare systems while maintaining high-quality care for at-risk individuals [1][17].

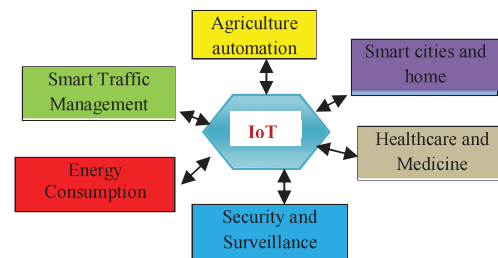


Figure 1. IoT application areas

IoT has been widely recognized as a viable solution to reduce the strains on healthcare systems, and as a result, recent research problems have focused on it. A significant portion of this study focuses on patient monitoring for specific illnesses like diabetes or high blood pressure. Further research is being conducted with the goal of serving specific goals, such as assisting rehabilitation by continuously monitoring a patient's development. Related efforts have also suggested emergency healthcare as a possibility, but it has not yet been thoroughly investigated. Several prior studies have looked into certain areas and technology connected to IoT in HC. An in-depth study is introduced, with an emphasis on economically available solutions, potential applications, and unsolved issues. This study contributes to the field by identifying the major components of IoT in HC and focusing on an advanced design that can be used to all IoT-based HC structures [2][18][19][20].

The remainder of the paper is laid out as follows. Section 2 delves deeper into the subject of IoT, with a focus on IoT-enabled healthcare delivery. Section 3 looks at the fundamental difficulties in IoT healthcare systems, while Section 4 discusses about cloud technologies and

Medical Datasets Classification using a Hybrid Genetic Algorithm for Feature Selection based on Pearson Correlation Coefficient

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Abstract—The method of selecting useful features to incorporate into the creation of a predictive model is known as feature selection. In order to select the best features from datasets, this article presents a hybrid feature selection approach that combines genetic algorithm with Pearson correlation coefficient. A classifier uses the extracted features as input to determine whether or not a person has a disease. The proposed technique for diagnosing heart disease and diabetes, which have greater rates of influence on lowering quality of life globally, is developed. Heart disease, diabetes, and hepatitis are some of the selected datasets that were retrieved from the UCI repository and evaluated using the proposed methods. The experiments are carried out to analyze the performance of the genetic algorithm using the k-nearest neighbor classifier and the Pearson correlation coefficient. Ten-fold cross validation is used to attain the classification accuracy. For the hepatitis, diabetes, and heart disease datasets, the accuracy of the proposed methods is 96.87%, 89.53%, and 97.03% respectively. The outcomes indicated our proposed algorithm's higher accuracy in comparison to other available techniques in the field of pattern recognition and classification.

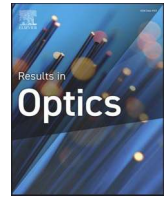
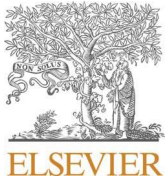
Index Terms—*k*-nearest neighbor (kNN), Pearson Correlation coefficient(PCC), Genetic Algorithm (GA)

I. INTRODUCTION

Heart disease is one of the leading causes of death internationally and the main contributors too to disease burden in developing countries. Several studies reveal that a larger number of individuals died every year from heart disease than from whatever other cause. An expected 12 million people died every year from heart disease [1]. On the other hand hepatitis results more than millions of the death worldwide, most of which occur indirectly from liver cancer [2]. In many cases hepatitis does not shows the sign and symptom which

letter turns into liver dysfunction and permanently damage of the liver. Globally, an estimated 415 million individuals had diabetes as of 2015, with type-2 diabetes contributing for around 90% of cases. Early detection of these diseases can bring better treatment to patients and also convenience in decision making for the medical professionals. Statistical methods are widely used to diagnose hepatitis, diabetes and heart disease based on the clinical data. However, dealing with the high dimensional data is difficult since uncertainty and noise in the datasets have a significant impact on the problem domain.

The hepatitis, diabetes and heart disease can be identified easily by help of pathological tests, but some of the tests are costly and difficult to achieve. There is another way to predict the disease based on few basic medical tests and patient's medical information. Clinical reports are the main source of information to analyze the occurrences of diseases and helpful in decision making. However an irrelevant and redundant feature of patient's datasets makes it difficult for decision making. In this regard relevant feature has vital role in disease diagnosis. Many researchers have attempted to work on feature selection methods and automatic diagnosis of hepatitis, diabetes and heart disease. In this study, we present a hybrid method for diagnosing hepatitis, diabetes, and heart disease. For solving feature selection problems, the proposed method combines a genetic algorithm (GA) based on the Pearson correlation coefficient (PCC). PCC-based methods are basically greedy-based techniques, which typically result in sub-optimal solutions. The PCC-based feature selection is improved in this work to transform into global optimization, where genetic searching is employed to choose the best



Computation of dimensionless propagation parameters of LP₁₁ mode of double clad fibers

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ABSTRACT

A scalar variational approximation is proposed to calculate the propagation constant and the normalised dispersion parameter of LP₁₁ mode of double clad fibers. Single and two parameter variational approximations have been proposed in this work. Also, a numerical method has been developed for the computation of these parameters. It has been demonstrated that the two parameter variational approximation calculates the propagation parameters more accurately than single parameter variational approximation over a wide range of fiber parameters. These values of the parameters, computed using variational approximations, have been verified with the exact results obtained numerically.

1. Introduction

Double-clad or W-type fiber, was first theoretically proposed by Kawakami and Nishida (Kawakami and Nishida, 1974) in 1974. Such type of fiber contains a core surrounded by two claddings. The inner cladding has a refractive index lower than that of the outer cladding. The refractive index of the core is greater than those of the claddings. This fiber acts as a better alternative to single-clad single-mode optical fiber due to its larger core diameter which makes splicing of two such fibers easier. As the field associated with the fundamental mode (LP₀₁ mode) is more tightly confined to the core, this reduces attenuation due to absorption in the cladding. These double-clad fibers find large applications in the wavelength division multiplexing systems because of the low value (<1ps/km nm) of chromatic dispersion over a wide range of wavelengths from 1.3 μm to 1.6 μm. W-type fibers are also used in dispersion compensating devices (Basu and Roy, 2006), in fiber laser devices (Filipov et al., 2010), in sensing devices (Liu et al., 2010), in medical applications (Yelin et al., 2004) and in supercontinuum generation (Xiao et al., 2020). An accurate description of the transverse field of the LP₀₁ mode propagating in such fibers is essential to compute various propagation characteristics (Monerie, 1982; Miyagi and Yip, 1979; Petermann and Storm, 1976) such as splice loss, bending loss and microbending loss etc. Further, the transverse field can also be obtained

numerically by solving the scalar wave equation and most of the above calculations can be done numerically. However, all the above calculations become simpler and more user friendly, if the modal fields are known analytically.

Analytical expressions for the modal fields are available for homogeneous core W-type fibers (Miyagi and Yip, 1979; Petermann and Storm, 1976). However, for an arbitrary graded-core, double-clad fiber, an exact expression for the mode field does not exist as analytical solution of the scalar wave equation for such fibers is not possible. So, one needs numerical methods (Kato et al., 1982; Paek et al., 1982) or requires approximate method, such as, variational method (Francois et al., 1982; Mishra et al., 1984). The variational method gives a closed form expression for the transverse mode field. However, to test the correctness of the results obtained by the variational method, one needs exact results which are obtained from the numerical solution of the scalar wave equation.

Exact expression for the LP₀₁ mode for the homogeneous core W-type fiber (Kawakami and Nishida, 1974; Monerie 1982) and approximate expression for this mode for graded core W-type fiber have already been proposed earlier (Mishra et al., 1984). Over the last few years, few mode fibers in which the first few modes propagate, are used largely in astronomical telescope (Horton and Bland-Hawthorn, 2007), sensors (Yuan et al., 2011). Recently, few mode single clad fibers associated

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Accu-Help: A Machine-Learning-Based Smart Healthcare Framework for Accurate Detection of Obsessive Compulsive Disorder

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


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Kabita Patel, Ajaya K. Tripathy , Laxmi N. Padhy, Sujita K. Kar, Susanta K. Padhy & Saraju P. Mohanty

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Abstract

Smart healthcare becomes one of the popular research areas in recent years. This research proposes to expand the state-of-art of smart healthcare by incorporating solutions for obsessive compulsive disorder (OCD). Classification of OCD by analyzing oxidative stress biomarkers (OSBs) through a machine-learning mechanism is a significant development in the study of OCD. However, this procedure requires the collection of OCD class labels from hospitals, collection of corresponding OSBs from biochemical laboratories, integrated and labeled dataset creation, use of suitable machine-learning algorithm for designing OCD

Machine Learning Approaches for Obsessive Compulsive Disorder Detection

Kabita Patel, Ajaya K. Tripathy

Abstract

Obsessive-Compulsive Disorder (OCD) is a psychiatric illness that produces significant psychological distress in patients. Individuals with OCD have recurring unwanted thoughts or sensations which make them obsessed with something and feel to do something repetitively as a compulsion. In general detection of OCD is performed by symptoms analysis. However, the symptoms are significantly visible at a later stage. Even individuals with OCD have less faith in the analysis of the symptoms as long as it is not affecting their life negatively. As a result, they start their treatment at a later stage and the treatment process becomes longer. However, it is observed that if the detection is performed through laboratory analysis through some biomarkers then the patients have more faith in the detection process and can start their treatment well in advance. Therefore laboratory detection of OCD can play a vital role in OCD treatment effectiveness. Most of the laboratory detection process proposed in the literature uses Machine Learning on related biomarkers. However, the prediction accuracy rate is not enough. This research aims to analyze the approaches to pediatric OCD based on machine learning using neuroimaging biomarkers and oxidative stress biomarkers. The challenges in OCD detection and prediction using neuroimaging biomarkers, oxidative stress biomarkers, and Machine Learning models have been described. Further, it analyzes the performance of different machine learning models that were used for OCD detection and highlights the research gap to improve prediction accuracy.

Keywords: Machine Learning, Obsessive Compulsive Disorder, Artificial Intelligence.

Introduction

Obsessive-Compulsive disorder (OCD) is one of the psychiatric disorders. Persons with OCD are having an unwanted and unpleasant feeling. Obsession turns a person anxious and fearful. As a protective measure against obsession, the individual with OCD involves in doing repeated activities called compulsion. In the latter stage OCD impact negatively individuals day to day life. As a treatment for OCD one can opt for Cognitive-Behavioral Therapy (CBT), repetitive Transcranial Magnetic Stimulation (rTMS), transcranial Direct Current Stimulation (tDCS), and Deep Brain Stimulation (DBS) [1].

The most commonly used method for OCD detection is behavioral symptoms analysis [2]. However, this method works well when the disease is already in an advanced stage. Mild symptoms are observable at an early stage. At the early stage, the individual feels normal and able to manage day-to-day activity smoothly, the individual with OCD (at the preliminary stage) is reluctant to believe the symptoms analysis detection result. As a result, they feel normal and not accepting the treatment at an early stage.

At a later stage when it affects negatively and the day-to-day activity gets affected negatively the OCD patient starts believing that they are mentally ill and start accepting treatment. In most cases, the patient becomes resistant to common OCD treatment and the treatment process becomes difficult and longer. However, laboratory detection brings more faith in the patient's mind and the probability of acceptance of treatment at an early stage may increase if laboratory detection is adopted. Therefore, early detection of OCD through laboratory tests can play a vital role in OCD treatment.

In the literature, several studies are performed on the prediction or detection of OCD

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**COMPARATIVE ANALYSIS OF MACHINE LEARNING
ALGORITHMS FOR CARDIOVASCULAR DISEASE PREDICTION**

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ABSTRACT

Today machine learning is playing an important role especially in the healthcare field. Heart disorders, generally referred to as cardiovascular diseases are the main cause of death in the world. The number of tests required for the detection of heart disease is decreasing due to machine learning techniques. This paper looks at heart failure survivors from a group of 299 individuals who were hospitalised to the hospital. The goal is to use of machine learning models that can enhance the predictability of cardiac patient survival. In this paper, we have evaluated the accuracy of seven machine learning methods for cardiac illness prediction, including Nave Bayes (NB), Decision Tree (DT), K Nearest Neighbour (KNN) and Logistic Regression (LR), Random Forest (RF), Extra Tree (ET) and Ridge Classifiers (RC). The comparative study has proven Random Forest (RF) with a maximum accuracy (87.77%) with the lowest error rate.

Keywords: Cardiovascular diseases, Nave Bayes, Decision Tree, K Nearest Neighbour, Logistic Regression, Random Forest, Extra Tree, Ridge Classifiers

1. INTRODUCTION

In the last few years, cardiovascular diseases have emerged as one of the most common causes of deaths worldwide. Heart disease diagnosis is the process of identifying or forecasting heart disease based on patient information. In particular,

if the patient has multiple diseases, doctors might not be able to accurately identify the patient in a short amount of time. Because of this, determining the presence of cardiac disease has been a challenging task that requires training and expertise. A wrong

PROLONGING THE LIFETIME OF WIRELESS SENSOR NETWORKS USING AMBIENT ENERGY

PRASANT KUMAR DASH AND MADHUMITA PANDA*

ABSTRACT

In recent years, wireless sensor networks (WSNs) have grown dramatically and made a great progress in many applications. But Lifetime of wireless sensor network (WSN) is hampered by the use of disposable battery. In order to make the WSNs prevalent in our lives, an alternative energy source is required. Presently research shows that use of ambient energy like solar, wind, water, Radio Frequency (RF) etc. concept adopted by WSN outperforms than battery-powered. In this paper, we propose a new protocol adopting slot concept in each layer of multi-based MAC protocol using solar ambient energy.

Keywords: MAC, MLMAC, MLMAC-HEAP, SMLMAC-HEAP, WSN

1. INTRODUCTION

A wireless sensor network [1, 2] is made up of large number of low power sensor. In recent years wireless sensor network has found its use in variety of applications such as radiation level control, battlefield, noise pollution control, biological detection, structural health monitoring etc. A wireless sensor network (WSN) is a collection of sensor nodes which are deployed in a given area of interest. The concept of wireless sensor network is based on a simple equation: Sensing+ CPU+ Radio= Thousands of potential applications [3]. The sensor nodes collect data from their surroundings and send the collected data to their neighbouring nodes in single hop. The neighbouring nodes in turn send the data to the nodes which are located in single hop distance. In this way data is transmitted to the sink node and it is responsible for deliver report messages to base station as shown in Fig.1.

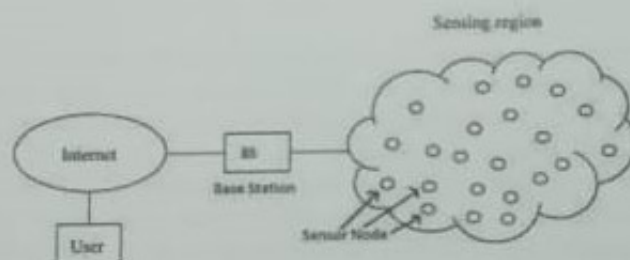


Figure 1: Typical WSN Architecture and Networking

Research on WSNs has been driven (and somewhat limited) by a common focus: Energy efficiency [4]. Nodes of a WSN are typically powered by batteries. Once their energy is depleted, the node is "dead." Only in very particular applications batteries can be replaced or recharged. However, even when this is possible, the replacement/recharging operation is slow and expensive, and decreases network performance. Different techniques have therefore been proposed to increase the network lifetime, one of which is using ambient energy like solar, wind, water, Radio Frequency (RF) etc. Energy Harvesting-based WSNs (EHWSNs) are the result of endowing WSN nodes with the capability of extracting energy from the surrounding environment [5].

The rest of the paper is organized as follows. Section 2 of the paper gives a survey on the recent work being carried out in WSN using ambient energy. Section 3 gives a brief introduction of our proposed method with a flowchart. Section 4 concludes the paper giving future work.

2. RELATED WORK

The sensor node lifetime is highly dependent on power consumption performed at each sensor node. A more efficient power management results in a longer network lifetime. Currently, the main sources of ambient energy considered suitable for uses with WSNs are solar, mechanical (vibration or strain), thermal and electromagnetic energy [6]. In this article[7], the authors have review the state-of-the-art in energy-harvesting WSNs for environmental monitoring applications, including Animal Tracking, Air Quality Monitoring, Water Quality Monitoring, and Disaster Monitoring to improve the ecosystem and human life. In addition to presenting the technologies for harvesting energy from ambient sources and the protocols that can take advantage of the

FSE2R: An Improved Collision-Avoidance-based Energy Efficient Route Selection Protocol in USN

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Abstract: The 3D Underwater Sensor Network (USNs) has become the most optimistic medium for tracking and monitoring underwater environment. Energy and collision are two most critical factors in USNs for both sparse and dense regions. Due to harsh ocean environment, it is a challenge to design a reliable energy efficient with collision free protocol. Diversity in link qualities may cause collision and frequent communication lead to energy loss; that effects the network performance. To overcome these challenges a novel protocol Forwarder Selection Energy Efficient Routing (FSE2R) is proposed. Our proposal's key idea is based on computation of node distance from the sink, Residual Energy (RE) of each node and Signal to Interference Noise Ratio (SINR). The node distance from sink and RE is computed for reliable forwarder node selection and SINR is used for analysis of collision. The novel proposal compares with existing protocols like H2AB, DEEP, and E2LR to achieve Quality of Service (QoS) in terms of throughput, packet delivery ratio and energy consumption. The comparative analysis shows that FSE2R gives on an average 30% less energy consumption, 24.62% better PDR and 48.31% less end-to-end delay compared to other protocols.

Keywords: USN; energy efficiency; collision avoidance; MAC; SINR

1 Introduction

The Ocean is the most captivating unexplored area that everyone is eager to discover. Underwater is like a huge forest that is fascinating and complex. Acoustic signals are used for transmission and communication [1]. The Underwater Sensor Networks (USNs) is a network infrastructure application in the deep ocean that detects, collects, and transmits data, providing information to an onshore location for remote data collection. USNs are viewed as a promising area of research because they can be applied in various applications such as monitoring, navigation, surveillance, and tracking in industrial, environmental, and military environments



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Determinants and Pattern of Saving Behaviour in Rural Households of Odisha: An Analytical Outline

Rajulata Kumar** & Dr. Manmohan Mishra**

Abstract

This paper is an attempt to identify the pattern and determinants of the saving and investment behavior, and scope for mobilization of saving in a backward state like Odisha. The main objectives in the study are to examine the determinants and the pattern of the saving behaviour in rural households of Odisha. Both primary and secondary data are used and multiple linear regression and binary logistic regression model has been indicated for analysis. It is ascertained that household sector saving provided the bulk of national savings. This also considers that the growth of income is not a very effective instrument to influence the saving rate. The results shows that education, primary occupation and land are highly significant with the monthly saving and one dependent variable that is formal saving (save or not save) with number of independent variables like age, marital status, education, primary occupation, family size, house type and land. The conclusion arises that there is significant impact of land on saving decision of the rural household in the study area. The research accredits that marginal propensity to save informally positive, less than one, but absolute income hypothesis exist in the informal financial sector.

Key Words: *MPC, Capital Formation, Household Saving, Potential Saving, Physical Asset.*

Introduction

Saving implies the cash or physical products set aside for future use. Saving occur mainly for three motives that are transaction motive, precautionary motive and speculative motive (Keynes, 1936). Keynes also stated as the marginal propensity to consume is less than one, the remaining of the income has been saved. People in rural area and other low-income communities also save when they are guided and encouraged by the Government and financial institutions like banks, micro finance institutions, SHGs and other local banks (Nayak, 2013). Some of the rural households though used their saving for limited livelihood, cultivation, and social need purpose, there may be arises idle saving, which might be a source of capital formation. Odisha is one of the major states of the India with a population of 1393409038 according to 2021 census. The decline in the growth rate for 2020- 21 (AE) is attributed to the devastating impact of Covid-19 on the state economy. But for

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NON-PERFORMING ASSETS MANAGEMENT OF COMMERCIAL BANKS IN INDIA – A LITERATURE REVIEW

Manoj Kumar Sahoo*, Muralidhar Majhi**

Abstract *The present study analyses existing studies on various issues of Indian commercial banks related to non-performing assets (NPA). The problem of NPA is not only precarious in India, but also across the globe. In other words, NPA is like a large red balloon, a red signal for the banking system in India. The reason for the investigation is to analyse the accessible literature, to place in a nutshell the various points of view of NPAs. The article divides the existing literature into different sections, for a detailed analysis of the identification, growth and composition, determinants, financial ratios, recovery channels, financial sustainability, and other aspects of NPA management of commercial banks. The papers which have been chosen for the literature reviews are based on a systematic literature review. The research papers and articles have been selected by searching keywords in the abstracts and concluding remarks of the whole database. The systematic review process conveys and assists in the selection of appropriate articles for the study. The scope of this research will be helpful to bankers in finding new directions to analyse the management of NPAs, and academicians and researchers in conducting exploratory research. The study presents the research gaps that occur in the management of NPAs, to explain research that can bring an insight into the literature. A wide-ranging review of NPA will not only help identify the issues, but also establish effective management of NPAs.*

Keywords: Banks, NPA, Recovery Channels, Sustainability

INTRODUCTION

The present global financial catastrophe that is drawing the consideration of academicians and policymakers is a result of the problems arising from non-performing assets (NPA) management. Today, NPA is a cancer in the Indian banking system; NPAs are a big problem for Indian banks. Even before Indian banks meet the Basel III standards, they must fight the scourge of the NPA that threatens to strike at its heart. The industrial health life of the bank is measured by NPAs. The mounting amount of gross NPAs are contributed by the public sector banks and private sector banks; this is accrued mainly due to the non-priority sectors. The profitability of banks is decreasing due to the increase in NPAs. Therefore, to improve the profitability and competency of banks, the reach of the NPAs should be reduced to the appropriate level and be regulated. The liquidity, profitability, and solvency performance of banks are affected by the high NPA rate, which means that banks can extend large amounts of credit. Thus, the financial sustainability of the Indian banking sector requires adequate maintenance of capital. On the contrary, to keep Indian banks in line with international standards,

the Basel principles should be applied with great care. Therefore, to achieve financial stability, banks must improve their recovery mechanism, the quality of assets, and have adequate provisions.

METHODOLOGY AND LITERATURE APPROACH TO THE STUDY

The basic objective of the literature review is to investigate the current piece of research, which includes articles, research papers, working papers, Ph.D. thesis, annual reports, and bulletins, for a detailed analysis of the definitions, growth and composition, determinants, financial ratios, recovery channels, financial sustainability, and other aspects of NPA management of commercial banks. The papers published from 1982 to 2019 have been selected for review. The reason behind this duration is that the concept of NPA came into force in the post-financial sector reforms introduced in 1991 with the recommendations of the Report of the Financial System Committee (Narasimham, 1991). This period has been divided into two phases – pre-financial reform and post-financial reform of 1991. Hence, studies were conducted

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A COMPARATIVE STUDY OF MOTIVATION AMONG THE LEARNERS OF INDIRA GANDHI NATIONAL OPEN UNIVERSITY AND ODISHA STATE OPEN UNIVERSITY

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ABSTRACT

The motivation of learners deals with the commitment of their goals, where the motivated students develop their willingness for accomplishing their desired goals in terms of assignment submission, courses completion, preparation for end term examinations etc., as a whole. Realising the crucial need of studying and increasing the motivation level among the learners an attempt has been taken by the researchers for investigating motivation of the distance learners towards ODL by developing a motivation scale. The study was conducted in two parts, in the first part efforts has been taken to develop, validate and standardise a motivation scale towards open and distance learning, and in the second part, efforts have been taken to compare the motivation level of distance learners of Indira Gandhi National Open University (IGNOU) and Odisha State Open University (OSOU). The findings of the study revealed that the final version of motivation scale towards open and distance learning was consisted of three dimensions i.e., academic motivation, non-academic motivation, and demotivation. The academic motivation dimension of the scale consisted of 17 items, non-academic motivation consisted of 12 items, and demotivation consisted of 07 items. So, in total 36 items were there in the MSODL. The Cronbach's alpha reliability of the motivation scale was found to be 0.88 and split-half reliability was found to be 0.87, which revealed that the motivation scale was highly reliable having high internal consistency. Further, the findings also revealed that the motivation scores of students studying in OSOU were found to be significantly more than their counter part IGNOU students. The academic motivation scores of students studying in OSOU were found to be significantly more than their counter part of IGNOU students. The non-academic motivation scores of students studying in OSOU were found to be significantly more than their counter part of IGNOU students. The demotivation scores of students studying in IGNOU were found to be significantly more than their counter part of OSOU students.

Keywords: Development & Standardisation; Validation; Motivation Scale towards ODL; Reliability & Validity; Comparative Analysis of Motivation.

INTRODUCTION

Education is a process of bringing about desirable changes in the behaviour of the students in a systematic way. It helps individuals to gain understanding about their potentialities and bring changes in life styles for all round balanced development. In Indian context, education is imparted in different levels with different forms. So far as the forms of education is concerned, distance education plays a vital role all over the country. The distance education is offered by National Institute of Open Schooling for matriculation and for higher education open universities plays vital role. The analysis of distance education in India makes it clear that it does not exist in vacuum, as it allows every individual to undertake learning activities without any discrimination of caste, creed, colour, sex, tribe, and locality. A comparative analysis of distance education and conventional system of education reveals that both of these are having wider scope, which provides much wider learning situations to the students. The distance education is also known as Open and Distance Learning (ODL). ODL is a term based on two important words i.e., 'Open' and 'Distance', where the term 'open' refers to meant for all without any restrictions, and 'distance' refers to the opposite of face-to-face mode of learning. So, in this context, ODL refers to a learning platform where equal opportunity is provided to each and every learner without any discrimination of caste, creed, colour, age, locality, socio-economic status etc., and provisions are made to learn anywhere. It refers to the use of telecommunication for enhancing learning by providing access, quality and equity, where are considered as the base of education system in India. In the present context, academic community is discovering and exploring through internet globally for promoting learning experiences. In ODL, the students acquire varied knowledge and skills with the help of mediated information and instruction through the massive use information and communication technologies. But it is a fact that in distance learning individual faces many issues and challenges



Exploring the nature of EKC hypothesis in Asia's top emitters: role of human capital, renewable and non-renewable energy consumption

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Abstract

The present study uses both carbon dioxide emission and ecological footprints as proxies for environmental degradation to examine the environmental Kuznets curve hypothesis for the top three emitters from Asia, i.e., China, India, and Japan. To this end, the autoregressive distributed lag model for time series and panel estimation is used for a period spanning over 1980–2016. For carbon dioxide emission, China presents an inverted-U shape of the environmental Kuznets curve, while a U-shape relationship is found for India and Japan. Similarly, when the hypothesis is tested with the ecological footprint, Japan offers an inverted U-shape and U-shaped association is detected for China and India. The panel analysis indicates the existence of the environmental Kuznets curve with both proxies of environmental degradation. Besides, human capital and renewable energy promote environmental sustainability, while non-renewable energy use hinders environmental quality. The findings of this study suggest that in order to meet the combined goals of economic growth and environmental protection, the three economies, i.e., China, India, and Japan, should employ renewable energy-enabled technology.

Keywords CO₂ emissions · Ecological footprint · Economic growth · Human capital · Environmental Kuznets curve

JEL Classification C50 · Q56

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Highlights

1. The study amalgamates both CO₂ emission (negative indicator) and ecological footprint (positive indicator) of environmental degradation to investigate the validity of the environmental Kuznets curve hypothesis for the top three Asian emitting economies, namely Japan, China, and India.
2. The environmental Kuznets curve holds for China when CO₂ emission represents environmental degradation. Japan confirms the validity of the environmental Kuznets curve hypothesis when ecological footprint depicts environmental degradation. However, the inverted U-shaped environmental Kuznets curve does not operate in India.
3. The panel analysis detects an inverted U-shaped environmental Kuznets curve for both the proxies of the environment for the panel of selected economies.
4. Human capital and renewable energy use promote environmental sustainability, while non-renewable energy is detrimental to the environment.
5. This study suggests China, India, and Japan are undisputable the three largest Asian economies producing high pollutant emissions; it becomes imperative for the three economies to adopt renewable energy-enabled technologies to achieve the dual purpose of economic growth and a clean environment.
6. Finally, this study recommends that combating climate change and ensuring a sustainable environment (SDG13) require de-carbonization measures be pursued to enable a healthy environment that will reduce health impacts due to energy-related air pollution (SDG3) by 2030.

Extended author information available on the last page of the article

Introduction

Studies to date have aspired to ascertain the association between economic growth and environmental quality (Razzaq et al. 2021a, 2021b; Murshed 2020; Mehmood and Tariq 2020; Ahmad et al. 2021; Adeel-Farooq et al. 2020; Mujtaba et al. (2022b); Verbič et al. 2021; Adeleye et al. 2021a; An et al. 2021; Usama et al. 2015; Zhuang et al. 2021; Eregha et al. 2021; Abul and Satrovic 2022; Li et al. 2022). The graphical illustration of such a relationship usually takes an inverted U-shape, popularly known as the environmental Kuznets curve (EKC). There have been considerable economic growth and improvement in the quality of life in the last few decades, which has boosted energy consumption (fossil fuels especially). Efforts of governments worldwide thrive on energy efficiency, energy conservation, and capacity building in renewable energy. Still, fossil fuels stand as the supreme energy source constituting 79.68% of the total energy use in 2015 (World Bank 2020).

The United Nations Framework Convention on Climate Change (UNFCCC) directed a protocol in Kyoto, Japan, in 1992 where 160 countries advised the developed countries to reduce emissions by 5.2% below the 1990 levels by 2008–2012. The primary goal of the convention was to stabilize greenhouse

Determining the Attributes of Short-Term Migration to Kashmir, India

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Abstract

The research uses data from a multi-stage survey performed in 2019 to evaluate short-term migrants' characteristics and sectoral transitions in Kashmir. After locating in-migrants in the selected clusters, we randomly selected 253 samples in a 70:30 urban–rural ratio. The IV-Probit is used to identify the features of short-term migration to the valley. Results reveal that short-term migrants are primarily absorbed in construction. In addition, most in-migrants are unskilled and come from marginalised communities. This study contributes to the knowledge on migration in a developing nation like India, particularly in Kashmir. In addition to temporarily increasing the urban inflow, short-term labour migration may assist the family left behind by remitting revenue. Hence, these results are critical for policymaking regarding mobility, urban development and the expanding construction sector.

JEL Codes: J6; C2

Keywords

Short-term migration, IV-Probit, caste, skill, construction

I. Introduction

Migration is a crucial risk-mitigating strategy for households in emerging economies (Zaveri et al., 2020). Today, the world is witnessing an increase in short-term or temporary labour migration against permanent migration for seeking employment (Panda & Mishra, 2018). The importance of short-term labour migration in India has been widely documented (Deshingkar & Farrington, 2009; Keshari & Bhagat, 2013). However, region-specific short-term migration survey, especially in-migration, is quite limited. Additionally, there are no studies on in-migration to the Kashmir region. Political volatility, terrorism and extreme weather conditions call for detailed research on in-migration to the area.

This article is based on a primary survey conducted in 2019 on short-term labour migration in the region to supplement the limited empirical evidence. We explore how caste, religion, marginal landholdings, low skill levels and age of workers play an extensive role in migration decisions in the region. Thus, the study attempts to address the endogeneity problem in determining the attributes of short-term migration.

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MEASURING TRIBAL WOMEN'S EMPOWERMENT THROUGH SELF HELP GROUPS (SHGs) -A CASE STUDY OF SAMBALPUR DISTRICT

Gita Devi Gupta ¹
Muralidhar Majhi ²

Abstract

The objective of the paper is to measure the social and economic empowerment of tribal women through SHGs in the Sambalpur district of Western Odisha. This paper attempts to cover the nine blocks of the entire district with a sample of four blocks having 120 tribal women respondents in total. The explorative study conducted during April 2020 to October 2020 through multistage sampling based on the primary source of data. In the study an attempt has been made to compare the social and economic status of pre and post joining of tribal women in SHGs by using social empowerment index and paired't' test respectively. Statistical parameters of monthly income, expenditure and savings are taken into account to compare their economic empowerment. Self confidence, skills, social awareness & recognition and access to facilities/services are measured in Liker's scale to compare their social empowerment. The study concluded that there has been significant increase in income and expenditure of the members after joining the SHGs but with an exception that there was no significant increase in savings of the members in pre SHGs and post SHGs period. Conclusively the social empowerment is in favour of post joining than pre joining of tribal women through SHGs.

Keywords: Tribal Women, Empowerment, Self Help Group, Entrepreneur

JEL Classification, G21,G41,G51,L26

Introduction

Empowerment of tribal women is one of the major central issues in the process of development everywhere in the world (Das and Mahapatra 2017). They play vital role in their social, cultural, economic, and religious ways of life and considered as an economic asset in the society. But they are still lagging far behind in the different walks of life like education, employment, good health, economic empowerment etc. (Puttaraja and Heggade 2012). Though they are industrious, they have limited control over resources and economic activities; face the problems of food insecurity, malnutrition, lack of access to health care services, victim of domestic violence and

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A STUDY OF TECHNOLOGICAL PEDAGOGICAL CONTENT

KNOWLEDGE OF SCIENCE TEACHERS AT THE HIGHER SECONDARY STAGE

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Abstract

This study aimed to gather knowledge about the Technological Pedagogical Content Knowledge of Science Teachers at the Higher Secondary stage in the Covid Era. A descriptive survey method has been used to collect data from the sample comprised of 202 higher secondary stage Science teachers from the Cuttack district by employing random and incidental sampling techniques. The researcher used Likert Scale to collect data from 202 higher secondary-stage Science teachers by adopting the Likert scale. The objectives of the study were, 1)to study the Technological Pedagogical Content Knowledge of Science Teachers at Higher Secondary stage, 2)to find out the Technological Pedagogical Content Knowledge of science teachers at the higher secondary stage concerning their teaching experiences, and 3)to investigate the differences in higher secondary stage science teachers' Technological Pedagogical Content Knowledge regarding the type of institution. To draw out the result, two statistical techniques were used percentage and t-test. The researcher found that there is no significant difference in the TPACK means scores of novice and experienced teachers and government and private higher secondary school teachers.

Keywords: Teaching experiences, TPACK, Science Teachers, Covid Era...



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Introduction:

It takes a long time for society to transform but the Covid-19 has brought about a drastic change in every sector of society. The impact of the Covid-19 scenario has also affected the education sector as well. As a result, the education system has drastically shifted from face-to-face or offline mode to online mode overnight. Both teachers and learners were found to adapt to the new way of teaching and learning which was conducted online with the help of ICT. Before this, everyone used technology in their daily lives. However, because the



Tribal Education – Current Scenario with Future Prospects

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Abstract

This paper primarily focused on current issues and problems that tribal community face in their different phases of life as well as in their educational sphere. Access to education in current scenario for schedule tribes has become a challenge due to so many vibrant causes. As, education is the fundamental right of all individuals, we can't keep tribal education in an isolated form that is full of social and religious taboos. In the present context as per the need and demands of this highly competitive society where everybody wants to move forward with certain basic skills can be attained successfully through the system of education. Hence, tribal education should be given proper emphasis. Considering the importance of tribal education this paper outlined certain constructive and valuable means to provide equity and at the same time equal educational opportunity to tribal people to make them aware about education and to give them proper social identity to live a happy and successful life with proper dignity like non- tribal people in this society.

Keywords- Tribal education, Issues, challenges and solutions.

Back ground of the study

The National Education Policy, 2020, ensures equity, equal educational opportunity, quality, and national perspectives for tribal education while considering the importance of education for all. Tribal education has a number of challenges. A variety of things led to indigenous education's challenges. The origins of this problem can be separated into four categories: socioeconomic, psychological, and external; the former refers to policy, planning, execution, and administrative concerns and obstacles. Internal restrictions include concerns with the educational system, curriculum, teaching media, pedagogy, academic supervision, tracking, and teacher issues. The third set of challenges covers first-generation students' psychological issues, as well as tribal people's social, economic, and cultural origins.

Review related literature

Education is an extremely important human right and a necessary part of the country's development from the point of view of human growth. It is widely recognized that the development goals must be implemented

in order for the economically and socially disadvantaged to escape poverty and participate fully as citizens. (World Bank, 1990; Sen, 1999; Dreze, 2006). Many international human rights treaties have confirmed this, including the United Nations Educational, Scientific and Cultural Organization (UNESCO) Convention against Discrimination in Education (1960), the International Covenant on Economic, Social and Cultural Rights (1966) and the Convention on the Elimination of All Forms of Discrimination Against Women (1978). Since 2000, the United Nations has also set Millennium Development Goals (MDGs) to ensure free universal primary education for all people regardless of race. According to the various provisions of the constitution, the public and private sectors provide education across India at three levels including state, federal and local levels. Several vocational schools were developed for educational needs. Bhatti(1998). The level of education and literacy of tribal groups can be used as an important indicator of internal stability and social and economic growth.



Relationship between Techno Stress and Academic Performance of University Students

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

A modern adaption disorder called techno stress is described as being caused by inability to use modern computer technologies. The aim of the study is to determine the relationship between techno stress and academic achievement of university students of Gangadhar Meher University, Sambalpur. Descriptive correlation method was adopted for this study. The sample consists of 273 post-graduation students selected through stratified purposive sampling. The data was collected through techno stress scale developed by Upadhya & Vrinda (2021). The obtained data were analyzed through mean, standard deviation, t-test, & correlation. The results revealed that there is a negative relationship between techno stress & academic achievement of university students. It is also found that there is no significant difference between techno stress between boys & girls.

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ICT Competency and Academic Achievement of Integrated B. Ed. Students in relation to Gender, Stream and Locality

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ABSTRACT

Having sufficient knowledge and adequate skills about technology & networking is known as ICT Competency. The aim of the study is to know the relationship between ICT competency & Academic Achievement of integrated B. ED students of Gangadhar Meher University, Sambalpur. Descriptive correlational method was adopted for this study. The sample consists of 210 Integrated B. ED students selected through stratified purposive sampling technique. The data was collected through the ICT competency tool developed by Dr. Manmohan Gupta. The obtained data were analyzed through Mean, Standard Deviation, t- test & Pearson's correlation method. The result revealed that positive negligible correlation between ICT competency and academic achievement.

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Introduction

The present era is the age of information & communication technology. The development of ICT has made life simpler. The usage of ICT has increased dramatically over the past few decades in many spheres, including business, education & industry. Now the educational institution all over the world are integrating ICT with teaching learning process in order to provide knowledge and skills to the learners to meet the challenges of educational environment. ICT has changed how students read, write, compute & communicate. (Zhang, Zhang & Zhang, 2008). Jeelani (2011) found that "it is only through education & the integration of ICT in education that one can teach students to be participants in the growth process in this era of rapid change.

The use of ICT in all level of education is required because ICTs give both teacher & students more flexibility to adopt learning and teaching individually according to their needs, but the integration of ICTs at different levels & various types of education in a developing country like India is most challenging.

Information & communication technologies refers to all communicational technologies, including the internet, wireless networks, mobiles, computers, software's, video conferencing, social networks sites, wifi zone, world wide web, web2.0 and others media application and services enabling users to access, store, retrieve, transmit & manipulate information in a digital form.

Role of ICT in education

Presently there are four areas of education namely teaching, learning, curriculum & educational programme. ICT has been added essentially in the 21st century as the fifth potent area of education (Sampath, 2011). ICT make education system more productive, interesting, give more powerful instruction & also able to extent the educational opportunities to masses & creating information rich learning environment. ICT makes the things more realistic and thus helps the learners to understand the entire concept very clearly.

ICT can improve the quality of higher education by promoting experiment, researches and innovations, adopting the new strategies in the teaching-learning process and integrating the new information with the best practices (Sudipta, 2015). In 1998 UNESCO world education reports stressed the importance of ICTs in higher education to generate quality education. ICT stimulates the learners to acquire quality research through team work, time management, analytical thinking, global consciousness, basic communication, problem solving & guided instruction (Singaravelu & Muthu krisnan, 2007).

ICT enhanced learning environment facilities active collaborative, creative, integrative and evaluative

Mathematics Anxiety and Academic Achievement of Secondary School Students in relation to their Gender and Medium of school

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Abstract

Mathematics is an important subject for secondary school students. However, Mathematics as a subject becomes an obstacle to academic progress for secondary school students as some students are not capable of understanding the formulas and laws of mathematics. Therefore the main purpose of present study was to find out the relationship between Mathematics anxiety and Academic Achievement of secondary school students and the difference between Mathematics Anxiety and Academic achievement in relation to their Gender and Medium of School. Descriptive survey method was adopted for this study. The present study comprised of 140 students, out of which 70 boys and 70 girls have been selected as sample. The tool used for data collection was Mathematics Anxiety Scale (MAS) developed by Dr. Ayatollah Karimi and Prof. S. Venkatesan. The obtained data were analysed with the help of Mean, Standard Deviation, t-test and Pearson's Product Moment Correlation. The findings of the study revealed that Negative Correlation between Mathematics Anxiety and Academic Achievement of secondary school students. The study also revealed that girls have more Mathematics anxiety than the boys. The study findings also includes that boys have more academic achievement than the girls as they were having less mathematics anxiety. The study also revealed that the English medium students have better academic achievement than the Odia medium secondary school students.

Key Words: Mathematics Anxiety, Academic Achievement, Medium of School

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I. Introduction

Mathematics is essentially needed in every walk of life in many ways. It has always held a key position in the school curriculum. It has occupied its important role not only in mathematical areas but in non-mathematical areas also. Its knowledge is essential in home, business industry, sale and purchase, banking, agriculture, communication, transport, defense, science and technology, etc., yet mathematics is often considered as a difficult subject in schools. This Difficulty creates anxiety among the students. Mathematics is a core subject in secondary schools. The study of mathematics was established to produce competent person who will be able to apply the knowledge of mathematics in everyday life and responsibly in solving problems and making decisions. However mathematics as a subject is unique from other subjects due to its multiple applications like addition, subtraction, multiplication etc. and the mathematical formulas, which becomes a matter of concern for the students specifically at the secondary level. So the weakness among students in learning Mathematics in particular will affect the academic outcomes of the students.

Mathematics is an important subject with broad applicability but to its contrast Mathematics is generally considered as the most difficult Subject of all subjects. Students find lots of problems and difficulties in this subject in understanding the Concepts, remembering the formulas, solving the sums and applying In practical situations. It is seen that students are doing good in all other subjects but fail to do so in Mathematics. There can be many reasons behind this. One of the reason is fear and anxiety towards the subject. Students generally develop this anxiety in their school life and carry this Anxiety though out their life.

Mathematics is a compulsory subject at secondary stage. Access to quality mathematics education is the right of every child. The knowledge of mathematics merely not meant for computational arithmetic and geometrical measurements but also played an important role in the education of all people. Secondary school mathematics teachers' are trying to develop essential skills, thinking and problem solving abilities among their students related and important to this subject.

In Indian Education system, Mathematics is a core subject at secondary level. Learning of Mathematics at secondary level is supposed to establish fundamental base for the next level of mathematics education and for

A Comparative Study of the Development of Logical Thinking between Deprived and Non-Deprived Categories of Students in the Pre-Adolescent Stage

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ABSTRACT

This paper was designed to find out the development of logical thinking between the deprived and non-deprived categories of students in the pre-adolescent stage. For this study, the investigator selected 24 samples of elementary school students by using a purposive sampling technique. The descriptive method was used for this study and data were collected by self-developed cognitive tasks. The investigator used a simple percentage and "t" Test for analysis of the data. The result indicated that there was no significant difference between the non-deprived and deprived groups of students concerning their logical thinking.

Keywords: Logical thinking, Deprived and Non-Deprived children, pre-adolescent

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I. INTRODUCTION

Piagetian theory of cognitive development(logical thinking) is based on the active state of equilibrium and disequilibrium which moves the child from perceptual to formal operational (Sullivan,1967) Piagetian theory of cognitive development(logical thinking) is based on the active state of equilibrium and disequilibrium which moves the child from perceptual to formal operational (Sullivan,1967). logical thinking is a process where using our logical abilities, we can draw conclusions based on our pre-existing, incomplete knowledge. (Végh,2021) logical thinking is the active reflection of objective reality as a rational cognitive process through concepts, judgments, reasoning, and other forms of thinking. (Végh,2021) Thought comprises the mental functions of conceiving(formation and apprehension of ideas about an object), of judging (discrimination of the identity or diversity of two concepts) and of reasoning (completion from two or more related, previously known judgments)(Francisca, and et al,2022). Piaget describes the sequence of development of logical thinking in terms of conservation of mass weight and volume (BatHae and Hosseini,1971), conservation of identity of Mass was easier than the conservation of equal equivalence of quantity which was easier to conserve within most profound in young children (Elkind and Schoenfield,1972), the conservation of area developed was much better in the original subject than in European subject and in some cases, this concept did not develop. The researcher did not notice the invariant order of development of logical thinking among the original subject for conservation of quantity, weight, and volume (Delemos,1969), the development of conservations of urban and rural children aged between 6 to 11 years was individually notified and the development of logical thinking in terms of conservation of quantity started at an earlier in urban school children (Muhar and Jain,1969). The performance and conservation of logical thinking in terms of volume and area did not differ from those who ability to identify the subject in terms of length, conservations of logical thinking in terms of numbers mass weight, and volume (Rao,1976). Conservation of logical thinking in terms of volume was a poor performance by students on conservation of mass weight and volume of both male and female children's (Jain,1982)

TEACHER- STUDENT RELATIONSHIPS OF UNIVERSITY STUDENTS IN RELATION TO THEIR ACADEMIC ACHIEVEMENT

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ABSTRACT

The present correlational study makes an attempt to examine the interpersonal relationship between the university students and their teacher along with its effect on their academic achievement. One hundred twenty post-graduate students (60 girls & 60 boys) were selected by using stratified purposive sampling. The investigator collected data by using self-made questionnaire. The data were analysed by simple percentage, mean, standard deviation, t-test, product-moment correlation, and ANOVA (two-way). The researcher found that 40 % university students have very high relationship with their teachers and the teacher-students relationship have significantly positive effect on their academic achievement. This study also shown that no difference exists in teacher-students relationship by considering gender. Also, the result of two-way ANOVA highlighted that there is a significant difference exist in academic achievement in term of the categories of relationship, but no difference examines by considering the interaction of both gender and categories of relationship.

I. INTRODUCTION

Quality education enables a child to earn a livelihood and contribute something towards the welfare of the society as well as nation. Children's academic progress and their achievement define the quality of education taken from an educational institution. While thinking about academic achievement, has been influenced by many factors addressed by previous research studies. It has been reported that psychological attributes and contextual factors have a significant effect on the academic performance of students. Psychological attributes include study habits (Credé & Kuncel, 2008), intelligence (Naderi et al., 2010), academic motivation (Amrai et al., 2011), and academic self-efficacy (Richardson et al., 2012). The psychological aspects may relate to the psychology of students, teachers, and others who are directly and indirectly associated with it. The contextual factors include a wide range of aspects such as educational interventions (Donker et al., 2014), parental expectations (Sarier, 2016) and their involvement (Jeynes, 2003), socio-economic status (Sarier, 2016), teacher's judgment of students' academic achievement (Südkamp et al., 2012), teacher's openness (Poropat, 2014), teacher's support (Rolland, n.d.), school culture (Bektas et al., 2015), classroom activities (Watson et al., 2017), peer group (Kalalan & Kasim, 2014), etc.

The socialization process of the students begins with family. A positive home environment may lead to the positive development of the students such as language (Son & Morrison, 2010), and cognitive and emotional development (Orri et al., 2019). Similarly, a negative home environment may lead to the negative development of the students (Dev, 2016). It has been found that a family's culture and parental socio-economic status have a direct relationship with the academic achievement of their children. Previous literature also shows that parental involvement in education may increase the academic progress of their children (Bacete & Ramirez, 2001). In a family, parents' expectations of children's educational achievement may have a positive outcome on their academic achievement (Li et al., 2021). The attachment between parents and children is biological which develops academic self-efficacy. Academic self-efficacy is one of the predictors of academic achievement of children (Xu & Qi, 2019). Sometimes family harms children's behavior. The excessive love and care of mothers towards their children may lead to the development of aggressive behavior and negative predictor of attachment to their peers (Llorca et al., 2017).

Comparative Content Analysis On Panchayati Raj System As A Topic Of Class-Vi Political Science Text Book Between Ncert And Scert, Odisha

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Abstract –

In the present study an attempt is made to do the comparative content analysis on the Panchayati Raj System as a topic of class-VI political science text book between NCERT & SCERT, Odisha. To meet the objective of this study data were collected from the Political science text book of NCERT & SCERT, Odisha by adopting qualitative content analysis method. It was found that 55% contents of NCERT textbook is not given in the textbook of SCERT, Odisha. In SCERT (75%) and NCERT (66%) of the illustrations with examples indicate gender neutrality and rest parts are biased in nature. NCERT contents emphasized to inculcate the all domains of cognitions knowledge (57%), understandings (28%), applications (14%), skills (14%) whereas SCERT, Odisha contents mostly promote the 94% knowledge aspect of the learners.

Key Words - content analysis, Panchayati Raj System, NCERT, SCERT, Odisha.

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I. INTRODUCTION –

Text book is an essential guiding instructional tool for both teacher and students. It acts as informative as well as formative tool, it provide knowledge and simultaneously enable the development of competencies, skills and values. Textbook are good topical in structure using titles, sub titles, various task, questions, illustrations with examples and summaries of new concept. Content should be design in a way that encourage students to learn and complement burden of teacher's instructions. In class-VI students are at the age of 11 this age is called early adolescence, children start to feel & think in a more mature ways. In this stage political science is very necessary subject, it's the study of politics and the power of domestic, international and comparative perspective. It entails political ideas, ideologies, institutions politics, process and behavior as well as group, class, government, diplomacy, law and war.

II. RATIONALE OF THE STUDY-

Panchayati Raj institutions plays a vital role in the development of elementary education. It's an important tool which cultivates the sense of responsibility and care among students and people's towards rural development. How to develop the rural areas? & How to sustain the rural development? Sustainable development of rural areas can be done only through healthy environment and quality education. Without quality education and healthy environment the sustainable development of rural / village's area are impossible.

For quality education formations quality textbook is very essential. "Textbook is an basic teaching & learning materials which enables the students to acquire the necessary knowledge, develop critical, creative and critical thinking and develop their mental skill." (Poljak 1983) "Textbook is a textual teaching medium and part of educational tool that aids both efficiency of teaching as well as individual learning." (Kovac et al 2005 p. 20) .Textbook is an important educational tool that mediate knowledge to new generations (Pallo, 2006). HAM & HEINZ (2018) found that topic not included in textbook are rarely discuss in class, as teacher mostly use them as a guiding instructional tool. In the process of teaching textbook functions on both didactical as well as educational level (Jurman, 1999) .

As per the researcher literature review there is no study found about the analysis between NCERT & SCERT, Odisha on the context of Panchayati Raj System. So, it's a big research gap for the researcher and one of the core interest area to analysis between NCERT & SCERT, Odisha contents, cover on this topic, pattern of organizations, number of activity boxes and kinds of illustrations.

Techno-Pedagogical Skills For 21st Century Teacher's: Contextual Enabler

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School of Education

ABSTRACT-

"Education is a fundamental pillar of human rights, democracy, sustainable Development and peace."- UNESCO World Conference on Higher Education (1998). Education act as catalyst for the all-round development of an individual, it empower the pupils to meet the emerging needs ; especially Techno-pedagogical skills of teachers is vital importance to achieve the objectives of 21st century educational needs in different context. Acquiring this proficiency will make teaching learning environment pleasurable, lessen the pressure of teachers and enable the students plunge deeper into knowledge acquisition process. As the present education system revolves around technologically enhanced learning so, teachers need to understand the values of integration of technology with pedagogy in different context for coping with ever changing learning environment. Present paper author try to analysis the importance of techno-pedagogical skills in the process of education and its contextual enablers.

Key words: Techno-pedagogical Skill, ICT, TPACK model.

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I. INTRODUCTION

Good thinking skill cannot be develop on their own, they must be taught! (Beyer, 1987)

Education has become the basic needs for an individual just like food, shelter and clothes. Nelson Mandela has rightly said that "Education is the most powerful weapon you can use to change the world." Education without effective teaching is meaningless in nature. It's not a mere transactions of the content to the concern class but it's an art and science. Its highly logical, sequential, practical, experimental and systematic in nature.

The 21st century has introduce new imperatives in to education practices, simulated by increasing concern about global inequities and lack of fairness. As demonstrated first by Millennium development goal, and currently by the Sustainable Development Goals (United Nations 2016), the concern are about both access to education and quality of education. 21st centuries quality have consequences for how education system must cater to all children and youth. Education system need to provide educational experiences need to 21st century world that learners face like problems in critical thinking and problem solving, initiative, creativity and entrepreneurship, communication, team work, meta cognition, digital literature etc. Learner's creative mind depends on learner quality learning environment, transferable skills & competencies of the teachers. Now the questions arises about how will the teacher design his/her learning activities? What is the effective strategies that the teacher needs to apply to the class? How the teacher does prepared a skilled millennium generations to make 21st century education system ecologically sound, cognitively advanced, technologically superior and qualitative? In our transformative world to address the 21st century learning needs of the leaners Techno-pedagogical skills of teachers in demand.

II. CONCEPT OF TECHNO-PEDAGOGICAL SKILL:-

Techno-pedagogy decide whether or not the education news product is successful. Pedagogy Means 'science or art of teaching ', 'Techno' is derived from the Latin word 'texere' approach 'weave or merge'. Techno-pedagogy means tailoring teaching strategies in the learning environment itself. Educational Technology provide simulated learning, maintaining a focus on teaching and learning objectives with excellent instructional methods. Techno-pedagogy is an important area that determines



EDUCATIONAL PERSPECTIVE OF SOCIAL MEDIA FOR TECHNOLOGICAL TRANSFORMATION OF SOCIETY.

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ABSTRACT:

The present paper is based on the theme of technology, particularly social media (Facebook, WhatsApp, Twitter, YouTube, etc.). which is an integral part of the practical life of human beings, it regulates and influences every aspect of life, starting from the kitchen to the official work of the employees. Here the researcher emphasizes the conceptual part of social media and the role of social media in transforming the lifestyle and making life technologically sound. The author also emphasizes the role of social media in the technological transformation of society.

Keywords: Technological transformation, Role of social media, Education.

INTRODUCTION:

The present generation/age is called the age of technology. Today we believe knowledge is created from knowledge (constructivist approach). Knowledge is created and spread and evaluated by the individual. It is very easy to explore any information that would be evaluated and modified by others. This is helpful for the invention of new techniques and innovation to solve the practical problem of society. It can be possible through social media such as YouTube, WhatsApp, Facebook, Twitter etc. In this present era with the help of social media, knowledge can be easily shared with the people of the world and the idea of all people of the whole world become the resources/weapons for changing the living style of human society. A person can easily learn anything by using social media. If he/she wants to create some new ideas, knowledge, thoughts, and new innovative views, then the prior knowledge is easily available on YouTube and et. It means that social media are very helpful and useful for promoting any kind of new technological transformation of society.



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Inclusion of Disabled Children in Normal School: Institution Centric Challenges

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Abstract:

From broader perspective, Inclusive education is an educational model based on universal inclusion of all types of students irrespective of socio-cultural and physiological disadvantages in the same classroom setting. With reference to educational inclusion of physiologically and psychologically disadvantage children, though academic and research world have considered this model as appropriate one and accordingly policy framers have progressed much but It's successful implementation is not barriers free. In research literature though good number of studies have highlighted macro level problems like low funding, inappropriate curricular integration process etc but number of grass root level problems also negatively contribute for successful implementation of this design. In this review paper attempt has made to explore multiple types of problems associated with teachers, institutions and parents in the inclusive educational settings. Finally, a conceptual model has been proposed where broadly all these problems have been categories as structural and psychological.

Keyword: Inclusive education, Disability, institutional barrier

Introduction:

Inclusive education is a global agenda, which propose for educating all types of children irrespective of their socio-cultural and physiological background within the same classroom (Salamanca report-1994). This educational model provides opportunity for all students to enter access quality education and develop the skills they need to thrive. From human rights point of view and from educational implication point of view, inclusive education has positive academic and socialisation effect on students. Studying in classroom having multiple diversities and difference

A Study Habits Inventory for University Students

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Abstract- Though good number of standardized tools are available to collect data on study habits, but these tools have certain limitations like inappropriate way of measurement, non-comprehensiveness and bulkiness of items. Considering these limitations, the present study aims at developing a study habits inventory for university students. This inventory encompasses eight aspects of study related habits of university students, assessed by 13 items. The inventory was developed following proper procedure of tool development which can be further used by researchers to assess study habits of both university and college students.

Index Terms- Study Habits, Tool Development, Inventory

INTRODUCTION

In research process, valid data collection is a vital aspect. Good quality data collection depends upon appropriate selection and use of the tool. In this context, researchers either use any one from the available standardized tools or develop a tool for their own purpose. The decision for selection of appropriate one from available tools depends upon lots of consideration like how the variable has been operationalized, how score will be interpreted i.e., quantitatively or qualitatively etc.

Study habits denotes consistent pattern of study behaviours, skills and approach for study etc (Singh, 2009; Fanai & Lalringgheti, 2016). It is an individualised process of study (Jafari et al. 2019; Siahni & Maiyo, 2015) which varies from person to person in terms of quality rather than quantity. Study habits also includes decisions about how to learn, what to learn, where to learn, what strategies to be followed whether self-testing after study etc (Zhou & Wang, 2020).

In researches literature, during operationalization of study habits as a variable, two common features are seen. For example, researchers from Indian, African and Middle East countries have used some standardized tools which included maximum dimensions of study related behaviours like approaches, skills, techniques, time, examination preparation mechanism within umbrella variable of study habits (Iaisan & Kumar, 2011; Ossai, 2012; Naqvi et al., 2018). On the other hand, researchers from western countries have used some standardized tools which

measure specific study related habits which are not comprehensive in nature.

Standardized Study Habits Scale/ Inventory

Globally, multiple standardized tools in the form of inventory, questionnaire, scale are available to measure study habits and researchers have collected study habits data by using these. These are "Approaches and study skills inventory" of Entwistle (1986) which was further culturally adapted by Byrne et al. (2007) for the students of USA and by Diseth (2015) for Norway population; "Study process questionnaires" of Biggs (2001) which was also further culturally adapted by Immekus and Imbrie (2010) for USA population; "Motivated strategy for learning questionnaire" of Duncan & Mckeachie (2010); "Learning and study strategies inventory" of Weinstein et al. (1987) which was culturally adapted by Yip (2013) for Hong Kong population.

Similarly, good number of standardized tools are used by researchers from India, Africa and Asian countries to measure study habits. These are "study habits inventory" of Palsane & Sharma (1989); "study habits inventory" of Mukhopadhyaya & Sansanwal (1985); "study habits inventory" of B.V. Patel (1976); "test of study habits and attitudes" of C.P. Mathur (2005); "study habits scale" of Rani and Jaidka (2015).

Critical Analysis of the Existing Tools

Before using these available standardized tools, it requires brief idea about both technical and non-technical quality of the tool. Though there are lots of feature of a standardized tool, that a researcher requires to know before use but the quality of existing standardized tools have been analysed from three feature i.e., comprehensiveness, bulkiness of the items and operationalization process.

Firstly, comprehensiveness as a quality of tool means whether the tools measure or covers maximum attributes which is supposed to be measured. It is found that maximum researchers from western world have used study habits tools like "approaches and study skills inventory of Entwistle (1986) and "study process questionnaire" of Biggs (2001) measure limited aspects of study habits like approaches to study (deep, strategic and surface approach) which only measure how the information are processing

Socio-Economic Condition and Insecurity of Handloom Weavers of India: A Systematic Literature Review

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Abstract

In recent years the socio-economic condition of weavers has been degraded in terms of loss of jobs, loss of income, high production costs, several health issues. Thus, this paper aims to conduct a systematic literature review (SLR) based on a survey of 30 papers published between 2015 and 2021 on the subject of socio-economic issues, health hazards and business problems of handloom weavers to acquire an updated picture of these domains. The Google Scholar search engine was used, and SLR produced intriguing results documented in this review paper. The government has adopted several welfare laws and projects. Despite several plans, the handloom business has numerous challenges, including worldwide marketing rivalry, low income, and low market pricing. As a result, weaver's social and economic situations have been deteriorating. Weak organizational structure, low pay, inadequate infrastructure, dispersed looms, poor marketing, and other factors made them more vulnerable.

Keywords: Socio-economic condition, health hazards, business problems, handloom weavers, poor marketing

1. Introduction

The handloom industry is playing a pivotal role in the sustenance of the culture and heritage. This sector is also providing employment to the rural mass. Handlooms form the

highest employment generating, labor-intensive and export-oriented industry, especially in rural and semi-urban areas in India (Kaushik and Jain 2015). In reality, together with agriculture, the handloom sector is the backbone of the

Exploring Consumer Loyalty towards Sambalpuri Handloom: A Structural Equation Modeling Approach

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Keywords

Sambalpuri handloom, Consumer behavior, Market reach, User experience

JEL Classification

M21, M31, O14, Z11

Abstract: The purpose of this study is to explore the inclination of consumers towards Sambalpuri handloom. An attempt has been made to assess the consumers' loyalty through analysis of the factors influencing buying decisions towards these products. The data were collected from 550 selected respondents from the Sambalpur District of Odisha through random sampling. Exploratory Factor Analysis, Confirmatory Factor Analysis, Structural Equation Modeling, Garrett Ranking Technique and ANOVA have been applied to the data as per the objective. This study reveals that most consumers are highly familiar with Sambalpuri Handloom. Sambalpuri Bastralaya is the most preferred destination for the respondents and the usage of Sambalpuri Handloom is influenced by product specifications as well as market reach. Therefore, the focus of the policymakers should be on bringing handloom products within consumers' reach in terms of product, price, promotion and physical distribution.

1. Introduction

The splendour and cultural diversity of Sambalpuri handloom industries have long been a source of debate. Handloom weaving is a centuries-old cottage industry. Next to agriculture, the handloom sector is the largest employment provider in the country. The richest handcraft and weaving traditions in the nation are found in Odisha, and sambalpuri sarees pay a substantial tribute to these traditions. This provides round-the-year means of livelihood for the weaving families. The Sambalpuri handloom products play an important role in up keeping the rich tie and dye weaving tradition of western Odisha. Because of their texture, pattern and colour durability, these handlooms have a distinct identity and market demand. Due to competition from power loom products, and a shift in consumer taste towards contemporary clothes, handloom marketers are facing serious marketing challenges (Ramanna *et al.*, 2019). As a result, marketing tactics are becoming increasingly important, and customer purchasing pattern, as well as attitude research, is required (Vaishnavi and Suja, 2017). Marketers are still unsure of

TRAINING INITIATIVES FOR WEAVERS' SKILL ENHANCEMENT: AN IMPACT ASSESSMENT STUDY

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-Prof (Dr.) Shyama Charan Acharya, Professor (Retd.), Gangadhar Meher University, Odisha

ABSTRACT

The study's goal is to examine how a training program affects the development of a weaver's skills. Handloom training programs are necessary for the advancement and upgradation of weaving techniques (Balakrishnan & Nadu, 2019). Handloom is the traditional cottage industry of Orissa and is performed by weavers for generations to earn a livelihood with self-employment. Skill has a multilevel role to play in the handloom industry, whether it's learning to weave or utilising technology to boost weaving output. Due to the present advancement in technology, this industry is facing stiff competition in the market for substances. To overcome the situation, market-oriented products with colour fastness are required which can be done with skills training for the weavers. For this, data have been collected from 110 trained weavers who have undergone handloom training in Bargarh District. Paired Sample t-test was used to analyse the collected data, and Cohen's D Test was used to calculate the effect size. The study discovered that after completing the training programme, the weavers' skills significantly improved.

Keywords: *Training, Weaving, Skill, Handloom.*

INTRODUCTION

One of India's cultural legacies is the handloom textile industry, which is the second-largest economic activity after agriculture. Close to 43 lakh people are engaged in hand weaving and allied activities in India (msde.gov.in). Even though the handloom sector provides thousands of talented weavers with abundant employment prospects, it has recently been plagued by challenges and is now in the decline stage of the product life cycle (Kumudha & Rizwana, 2013). Handloom fabric attracts huge consumer interest due to its unique designs and exquisite artistic value. To be updated with the latest trend with regards to the market as well as fashion, skill up-gradation training and exposure should be given to weavers and allied workers for learning new weaving techniques, development of new designs, eco-friendly dyes, exposure management practices, familiarisation with e-commerce, etc. The key problems in this sector are due to a lack of training opportunities for upgrading skills. (Rao & Kumar, 2018). Due to the non-availability of skilled and trained labour, more handloom skill development training programmes should be organised. The goal is to enhance the traditional

AN ANALYSIS OF SOCIO-OCCUPATIONAL CONDITION OF SAMBALPURI
HANDLOOM WEAVERS OF ODISHA

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Abstract:

The handloom sector of India is the largest employment generating sector after agriculture. But the deteriorating socio-economic condition raises a major concern. In this context, the paper aims at dissecting the socio-demographic factors of handloom weavers of Sambalpur District of Odisha province of India. A total of 185 weavers are taken for the study purpose. Demographic factors like level of education, social groups, nature of employment, etc. are associated with the help of the Chi-square test. It is found that level of education has no impact on nature employment but has a significant impact of on card holding patterns. Similarly, social group has a significant impact on card holding and level of education and it has no impact on the nature of engagement. The finding of the paper will help the policymakers in designing and revamping the policies for the growth and development of such weavers.

Keywords: Social Condition, Nature of Employment, Social Groups, Handloom Weavers, Card Holding

1. Introduction

The handloom industry is one of the most important cottage industries in India. In today's scenario, the handloom sector is the second largest employment-generating sector after agriculture as it provides direct and indirect employment to 43 lakh weavers and associated employees (Anumala & Acharyula, 2015). For more than 50 years, this industry has offered a self-sustaining traditional means of subsistence (Anand, 2019). This sector has many advantages like less capital intensive, requiring minimal use of power, being eco-friendly and adaptability to market requirements (Jain & Gera, 2017). Despite being a green industry, it is facing major issues like a declining number of weavers, crisis of raw materials, low wages for workers, competition with the power loom sector, small domestic market, and collapse of primary weaving cooperative societies, etc. (Paul, 2019). The handloom sector is precious because of its uniqueness and versatility. The handloom weavers are getting more innovative day by day in their creativity and weaving styles and are getting appreciation from both national and international consumers. But the conditions of weavers are getting vulnerable with each passing day due to which they start losing their interest in this field as well as they are earning meagre income which is not sufficient to meet their requirements and are not getting an organised market where they can sell their produce. As per the handloom census of 1995, the total number of weavers was 65 lakh which declined to 43.32 lakh in 2010. In the year 1995, the number of full-time workers is more or less than 28.6 lakh whereas it was 28.16 lakh in 2010. There is also an increase in the days of work per weaver household from 197-person days per year in 1995 to 234-person days per year in 2010. This shows that despite of facing various issues this sector is not dying and still there is scope for its revival. Similar observations are also drawn in the handloom census report of 2020.

This sector involves several activities like the acquisition of raw material (yarn), winding, warping, sizing, drawing-in and finally sitting in a static posture to weave fabric. The process of weaving comprehends a multitude of activities that involves repeating movement of upper and lower limbs to operate pedals and shuttles as a result of which handloom activities become a high-risk occupation and cause musculoskeletal disorders (Ahmed et al., 2021). About 70% of workers do not have any insurance so they can be compensated in case of occupational diseases and injuries (Koiri, 2020). The declining number of weavers' population and no increase in the youth population in this sector has become a concern. So, the study focuses on the analysis of demographic factors of Sambalpuri

Mapping the Research Landscape of Indian Handloom: A Bibliometric Analysis

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Abstract: This study aims to conduct a bibliometric analysis of research publications related to the Indian handloom industry. Indian handloom is an essential part of the country's cultural heritage, and the handloom sector has been a significant contributor to the Indian economy (Meher & Bhattacharya, 2016). In recent years, there has been an increase in research interest on this topic. The study uses data from the Scopus Database and analyzes research output, citations, and co-citation patterns to provide insights into the research landscape of Indian handloom. The R software programme Biblioshiny was used for the data analysis. The study also identifies the top authors, institutions, and countries contributing to research on Indian handloom. The findings of this study will be useful for researchers, policymakers, and practitioners interested in Indian handloom research.

Keywords: Bibliometric Analysis, Indian Handloom, Citations, Authors, Institutions, Countries.

JEL Codes: D23, L2, M1

1. INTRODUCTION

An industry with a long history reaching back to ancient times, the Indian Handloom Industry is one of the largest and oldest in the country. The cultural and economic identity of India is strongly influenced by the handloom textile industry, which is noted for its fine craftsmanship, elaborate designs, and brilliant colours. Handloom fabrics are created using age-old methods totally by hand, without the aid of any machinery or automated procedures (Islam et al., 2021). But nowadays this industry is facing lots of challenges and obstacles, especially regarding product imitation and high prices (Mishra & Das, 2020). Despite these difficulties, the business has thrived as a result of the numerous artists and weavers who are committed to maintaining traditional methods and producing handloom fabrics that are highly valued by consumers all over the world (Ghosh & Jena, 2018). Bibliometric analysis was introduced by (Pritchard, 1969) and it significantly facilitates understanding of a research area. Bibliometric analysis can offer insightful information into the research landscape of the Indian handloom sector and assist in supporting evidence-based policy and practice in light of the increased

Corporate Social Responsibility Practices in India: A Bibliometric Analysis

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Abstract: Corporate social responsibility has become crucial to any company's strategic decision-making and has attained a level of significance. Government cannot succeed in its mission to improve society on its own. As a result of globalization, Liberalism, and outsourcing as well as due to the changing environment, corporates have established separate CSR wings to promote sustainable development. This paper explains regarding the corporate social responsibility practices framework in India. Bibliometric analysis has been applied for such purposes. Defining terms, choosing the database, collecting research papers, improving search results with acceptance and rejection standards, and compiling and analysing data are all steps that were involved in conducting such an analysis. The research database Dimension has been to compile articles from 2013 to 2023. Keywords like "Corporate Social Responsibility", "Practices" and "India", etc. are used for searching papers. The analysis of data is done using the R software tool Biblioshiny. The study will help in encouraging and promoting corporate social responsibility activity more in the Future.

Keywords: Corporate Social Responsibility, Sustainable Development, CSR Activity, Companies, Changing Environment.

JEL Codes: M140, G22, F64

1. INTRODUCTION

In an amendment to the Companies Act, 2013 in April 2014, India became the first nation in the world to mandate corporate social responsibility (CSR). As part of any CSR compliance, businesses can allocate a portion of their earnings to causes like hunger, gender equality, poverty, and education. Corporate Social Responsibility (CSR) and Sustainable Development (SD) are currently becoming more widely known. As a result, all kinds of organizations are working together to guarantee that sustainable development is not overlooked as they



Evolution of Sambalpuri Handloom in Odisha: Retrospects and Prospects

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Abstract:

Sambalpuri Handloom has seen numerous ups and downs with cultural forces as it has travelled through Odisha's and India's socio-political history. We have seen how the product has evolved in response to these social shifts and patronage over history. Thanks to this ingenious invention, art and talent have lasted the ages. The Sambalpuri handloom is so exquisite and distinctive that, it has overcome the test of time and is in high demand all over the world. If we look forward, then there will be a need for brand promotion, strategic marketing network to ensure its global availability, contemporary design and look improvisation. However, the products of sambalpuri handloom are yet to be in the position they deserve due to lack of adequate promotional initiatives. When it comes to business, many of the weavers are unaware of what is required to be competitive in the national or global market. Poor infrastructure and, insufficient marketing put them in competition with more businesses (Sahoo & Mishra, 2018). The present study is an attempt to examine the constraints and opportunities of Sambalpuri handloom since its origin and also offer suggestions to overcome the impediments in its journey to the global market.

Keywords: Sambalpuri Handloom, Genesis, Globalization

1. Introduction

Sambalpuri handloom is a traditional weaving style that originates from the Indian state of Odisha. It is known for its unique designs and patterns that are created using a special type of handloom called the Sambalpuri Ikat. The fabrics produced by this technique are characterized by their vibrant colours, intricate designs, and geometric patterns. The technique of Sambalpuri handloom is passed down from generation to generation and is an important part of the cultural heritage of Odisha. Due to its distinctive pattern and design, which cannot be found in any other State or country in the world, the "Sambalpuri Handloom Sarees" has exhibited remarkable growth despite enormous difficulties and hurdles, resilience, and competition from power looms and mill sectors (Mishra & Das, 2020). However, it is facing some challenges in the present context. One of the main challenges is the competition from mass-produced, machine-made textiles. The handloom industry is often seen as less efficient and less profitable compared to mass production, which has led to a decline in the number of handloom weavers. The handloom sector has been steadily diminishing over the years, and handloom weavers are experiencing considerable difficulties due to a high cost of yarns, high cost of production, an unorganised market, loss of jobs and income etc. (Panda & Bhuwaria, 2022). The handloom industry has steadily declined over the past ten years due to the increased competition posed by the contemporary textile industry (Mohapatra, 2014). Additionally, the lack of government support and the absence of a strong marketing strategy for handloom products have also contributed to the decline of the industry. Despite these challenges, there are efforts to revive and promote the sambalpuri handloom in the present context. There are government initiatives and non-government organizations that are working to support handloom weavers and promote handloom products. Sambalpuri handloom continues to be an important part of the cultural heritage of Odisha and is still widely used today. Handloom plays a significant role in the Indian economy owing to their rural employment potential by contributing to 23 % of cloth production in the country (Mishra & Mohapatra, 2019).

**CUSTOMERS' ATTITUDE TOWARDS ONLINE SHOPPING OF SAMBALPURI
HANDLOOM: A STUDY ON SAMBALPUR DISTRICT****Khired Chandra Maharana^{*1}, Prof (Dr.) Shyama Charan Acharya^{**2}**^{*1}Research Scholar, School of Commerce, Gangadhar Meher University, Amruta Vihar,
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Sambalpur, Odisha, India.DOI : <https://www.doi.org/10.56726/IRJETS33001>

ABSTRACT

The present study attempts to assess the attitude of consumers towards the online purchase of sambalpuri handloom. Orissa has one of India's oldest and biggest Handloom weaving industries, it helps thousands of weavers, craftsmen and artisans. The power loom dominates textile production in India & has encroached upon the handloom sector's traditional market because of a lack of proper marketing. (Vinayagamoorthy & Baskaran, 2018). Primary Data has been collected from 280 respondents and analyzed through Garrett Ranking Technique. The demand for Sambalpuri Handloom will always be consistent because of the rising popularity for Sambalpuri Handloom as a brand (Ghosh & Jena, 2018). For this reason, the current study intends to assess the consumer's attitude towards online shopping of Sambalpuri handloom. This study will undoubtedly assist marketers in understanding the motivations behind sambalpuri handloom purchases made online.

Keywords: Sambalpuri Handloom, Online Shopping, Consumer Behaviour.**JEL Classification:** M21, M31, M37

I. INTRODUCTION

Online shopping has revolutionized the way we shop for handloom products. With the convenience of browsing and purchasing from the comfort of our own homes, more and more people are turning to the internet to find unique and handmade handloom items. Online shopping allows customers to easily compare prices, designs, and quality of handloom products from different sellers and manufacturers. Additionally, online marketplaces often offer a wider variety of handloom products than brick-and-mortar stores, making it easier to find one-of-a-kind pieces. Shopping for handloom products online also supports artisans and small businesses who may not have the resources to open a physical store. Overall, online shopping for handloom products offers customers a convenient and diverse shopping experience.

The splendour and cultural diversity of the Sambalpuri Handloom industry has long been the source of debate. Due to the advancement of information technology in India, this sector is becoming increasingly popular in the current scenario. Sambalpuri handloom has a strong chance of becoming a major player in the global handloom industry. In this sense, Sambalpuri Handloom's online presence is a must-have to attract customers. The trend of e-commerce has increased rapidly in recent years with the development of the internet and due to the easy accessibility of internet usage. Making sambalpuri handloom digitized is a marketing technique that can help increase handloom product sales. It is essential to have better marketing practices in the handloom industry due to a lack of innovation (Venkata et al., 2020). The psychological condition of consumers when it comes to making purchases over the internet is referred to as their attitude toward online shopping. E-market has a significant role in the marketing of handloom products. (Patra, 2021). Because of the rapid growth in the area of buying and selling, companies now have a better understanding of what drives people to shop online. If sambalpuri Handloom gets a digital platform to showcase its products, it can attract and cater to a large number of customers worldwide. The majority of marketers felt that handloom products are costly to pay for and was lacking good visual merchandising and timely home delivery facilities, lacking discount/rebate sales, publicity and advertisements. (Vyshnavi & Nair, 2020). Besides that, there is an absence of a market value chain along with poor front-end marketing (Boruah et al., 2021). Since online shopping has become a popular and widely accepted practice and to address these issues, it is important to understand customers' attitudes towards the online shopping of sambalpuri handloom.

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RE-LOCATING MAYURBHANJ (ODISHA) CHHAU-NĀCHA: AN ICONIC REPRESENTATION FROM INDIGENOUS TO METROPOLITAN CONTEXT

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Abstract: This paper aims at enriching the debate on aesthetics properties on the *Chhau-Nācha* (dance) of Odisha. This traditional *Chhau-Nācha* mostly based on the *Rāsa* theory i.e., *Vira* (Heroic); and its old age tradition belonging to canons of *Nāṭyaśāstra* in rhythmic way. Man requires artistic skill to express his thought but proper modulation of artistic representation is necessary to make expressed thought precise and distinct. One performer could represent him/her in the way of demonstrate in the form of art i.e., dance or *Nācha/Nāta*. Dance consists of certain movements, certain prescribed gestures and postures of the body which are more capable of giving expression to human thought, than even language. Communication of thought through dance is even a better guide of human thought than through language. In Odisha the performance dance its related music, dramatic thought, is as old like its history. Numerous forms of histrionic arts which are deeply and intimately associated with the life of the people were evolved, natured and put into practice and then left to the posterity either to retain or forget. Through the passage of time many terms are must have perished away. All the form of art can survive only proper patronage but these are not possible every time and space. *Chhau* dance is basically a virile dance which demonstrates vim and vigour. It reflects a culture of strength with aesthetics.

Keywords: region, trend, practises, ritual, folk dance, anthropological methods, theory of *Rasa*

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Introduction

This paper aims at enriching the debate on aesthetics properties on the *Chhau-Nācha* (dance) of Odisha. This traditional *Chhau-Nācha* mostly based on the

Implementing Blockchain Technology for Fraud Detection in Financial Management

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Abstract

This review paper explores the use of blockchain technology for fraud detection in financial management. The paper begins with an introduction to the topic, highlighting the need for fraud detection in financial management. The advantages and limitations of blockchain technology are then discussed, followed by an overview of the different types of blockchain technology, including public, private, consortium, and hybrid blockchains. The paper then delves into the use of blockchain technology for fraud detection in financial management, highlighting how it can be used to create more secure and transparent systems that are resistant to tampering and manipulation. The potential advancements and innovations in blockchain technology for fraud detection are also explored, including the integration of machine learning and AI, the use of smart contracts, cross-chain interoperability, privacy-preserving techniques, and the use of decentralized autonomous organizations. Overall, the paper highlights the potential of blockchain technology to revolutionize fraud detection in financial management, creating more secure and transparent systems that can quickly respond to potentially fraudulent activity. It concludes with a call for continued research and development in this area to fully realize the potential of blockchain technology for fraud detection in financial management.

Keywords: *fraud detection, financial management, blockchain, hybrid, implementing, innovations, machine learning, AI integration, smart contracts*

I. Introduction

Implementing blockchain technology for fraud detection in financial management involves the use of blockchain technology to detect and prevent fraudulent activities in financial management. Blockchain technology is a decentralized and secure ledger system that allows for the recording and sharing of data without the need for intermediaries. It provides a transparent and immutable system that can help prevent fraudulent activities in financial management. Financial fraud is a serious

IOT BASED VISIBLE LIGHT COMMUNICATION SYSTEM FOR BIOMEDICAL APPLICATION

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Abstract

As VLC might provide a real and highly efficient alternative to radio-based wireless, it is now receiving a lot of attention. This thesis argues that VLC is ideal for solving problems brought up by radio frequency and providing high-density wireless data coverage in an area around the size of a light bulb. With VLC technology, any light bulb may function as a Wi-Fi hotspot, allowing for the simultaneous transmission of large amounts of data to a large number of users while simultaneously reducing energy consumption and protecting the natural world. As the connections between things, their surroundings, and people get stronger, the Internet of Things (IoT) holds the potential of delivering a new, completely linked "smart" world. If the advantages to people's lives, communities, and the economy are to be realised, however, the problems and obstacles that come with the Internet of Things must be taken into account and addressed. A heated discussion that contrasts the promises of IoT against its potential hazards will not lead to solutions for maximising the advantages of the IoT while reducing the risks. Instead, the most productive next steps can only be determined via the thoughtful participation, conversation, and cooperation of many different parties. In the not-too-distant future, the groundbreaking idea of the IoT will enable wireless communication for billions of devices. This technology enables the development of ambient intelligence and autonomous control, both of which have the potential to shape people's surroundings to better suit their needs and preferences. In this study, we choose to tackle these issues using low-cost hardware, expanding the use cases for VLC connections while drawing attention to their inherent performance constraints. In conclusion, this project aims to develop a



Enhanced Internet of Things Security Integration Framework with an Emphasis on Virtual Health Monitoring

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Abstract

Humans spend a lot of money on healthcare services. The healthcare business is growing more sophisticated and technologically advanced. It also required patients to expend time, effort, and money to get care. When a patient is in a distant location (particularly for the elderly), it takes time to go to the healthcare facility, make an appointment, and wait for his/her turn to meet with the doctor. Many individuals have perished as a result of heart attacks. If there is technology that can be utilised to remotely monitor a patient's vital signs, it might save lives and offer better treatment. Such QoS is attainable with remote health monitoring using technologies such as cloud computing, sensors, and IoT. When remote health monitoring using IoT technology is realised, particularly for rural people, it will revolutionise the way healthcare services are delivered and ordinary people will survive from a variety of life-threatening illnesses. This paper investigates current IoT-based remote health monitoring systems, as well as their benefits and limits. It also contains a suggestion for a revolutionary remote patient monitoring system that merges PHC in a community with smart beds linked to IoT technology for real-time patient health monitoring. The scope also includes security upgrades to the planned remote health monitoring system, such as support for secure end-to-end connections and the preservation of healthcare data privacy.



An Intelligent Internet of Medical Things based Smart Healthcare Monitoring Equipment for Patients

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Abstract

In today's fast-paced world, a new technology paradigm known as the Internet of Things (IoT) is advancing every business. It allows for communication across the virtual and physical worlds, which will drastically alter how business is conducted in the near future. It paves the way for a plethora of novel, exciting prospects across all sectors of the economy and is stimulating creativity in every sphere of human activity. The Internet of Things (IoT) has had a profound impact on the delivery of healthcare services in recent years. Easy measurement of medical indicators by smart devices implanted in the body yields a massive quantity of individually identifiable medical data for each patient. There are a number of security risks associated with this data collection. It is challenging to implement a complicated data encryption method to improve security on IoT devices because of their limited resources. Existing cryptographic security techniques also have a significant computational cost, which must be reduced. However, these algorithms must be secure against a wide range of assaults, including differential attacks, linear attacks, algebraic attacks, and others. As a result of these assaults, there is a pressing need to design foolproof, highly effective, and relatively lightweight security algorithms for use in the healthcare IoT sector. Due to the inability of the doctor to assess the patient's vitals via video chat alone, this kind of telemedicine falls short. To get around this, there has to be a system in place with very precise sensors for monitoring the patient's vitals.

Keywords: Healthcare, IoTM, Patient's, Sensor, Connectivity and Medical parameters.



Keshab Chandra
Ratha

Post-COVID-19 World and Trajectories of a Crumbling World Order

Authors Keshab Chandra Ratha, Sushanta Kumar Mahapatra

Publication date 2023

Book Changing World Economic Order in the Post-Pandemic Period

Pages 63-76

Publisher IGI Global

Description The pandemic poses the severest jolt to the US-led international order, including the retraction of the United States from previously held global leadership. The extraordinary economic and medical response in the developed and opulent countries is simply not at hand for many developing countries. With COVID-19, international and multilateral bodies are not anywhere on the scene. Regional institutions such as the AU (African Union) and South Asian Association for Regional Cooperation (SAARC) are often treated as weak, lacking the habit of cooperation and under-resourced to address the pandemic. Globally, societies could turn into more self-seeking and inward-looking eventuating in further pushback against liberal policies in respect of migration and refugees. Absence of basic resources, lack of well-functioning and efficient healthcare systems, and the dearth of well-organised communication channels ...

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Keshab Chandra Ratha

Potential Implications of Covid-19 on Tourism Industry: Charting A Road Map for Future

Authors Keshab Chandra Ratha

Publication date 2023/6

Journal Indian Journal of Public Administration

Volume 69

Issue 2

Pages 372-384

Publisher SAGE Publications

Description Covid-19 has transformed the world for days ahead in every conceivable respect impacting massively the international travel, tourism demand and hospitality industry. The major thrust of the present article is to map out the implication of the Covid-19 outbreak on the global tourism industry in all countries and finds out the challenges they encountered in tourism and the plan of action to overthrow those challenges in the short and long periods of time. The study is an intellectual endeavour to examine the impact of the other supporting sectors, such as hospitality, air travel, transport and communication in the global context. The governments need to outline a master plan to keep workers in the tourism industry safe, without neglecting to render financial contributions supported with low-interest loans or grants to revive the industry. An exploration into how the industry will recover after Covid-19 and how the industry can ...

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A Pandemic within a Pandemic: Viewing through a Gender Lens

A Pandemic within a Pandemic: Viewing through a Gender Lens

—K.C. Ratha

Abstract—The main objective of this paper is to understand gender-based violence during the COVID-19 lockdown. It aims to do so by assessing the pattern of rise in such forms of violence and related psychological and social issues. The study draws attention to the risk of domestic violence, which is likely to increase as social distancing measures are put in place and people are encouraged to stay home. It contends that gender violence, despite being a global phenomenon, remains under-reported because of stigma and social pressures. The paper stresses on the necessity to create awareness by initiating dialogue and appealing for change in the response towards victims of gender-based violence.

My research, therefore, attempts to suggest measures to curb the menace of gender violence during periods of confinements at

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Keshab Chandra
Ratha

Implication of Covid 19 on International Migration: Emerging Scenario in Post-Covid World Order

Authors [Rajesh Kumar Karna](#), [Sushanta Kumar Mahapatra](#), [Keshab Chandra Ratha](#)

Publication date 2023

Journal [IASSI-Quarterly](#)

Volume 42

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Pages 834-857

Publisher [Indian Association of Social Science Institutions](#)

Description The paper trying to understand the connection between the pandemic and migration holds tremendous academic significance. The main objective of this paper is to examine the interlinked relationship between the pandemic and migration by correlating covid-19 with other similar incidents that happened in the past and exploring emerging scenarios of the current pandemic in order to draw a picture of international migration in the post-covid world order. The central question of exploration is; How far this global health security crisis impact state sovereignty and global integration and how it will influence the trends of global migration in days to come? In other words what implications and emerging scenarios are on rise of global migration in the post-covid world order? It is a normative historical analytical, and descriptive article that attempted a comprehensive, critical analysis of international migration and Covid-19 ...

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[RK Karna](#), [SK Mahapatra](#), [KC Ratha](#) - [IASSI-Quarterly](#), 2023
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Inclusion of African Union in G20: India's Strategic Move?

DOI: <https://doi.org/10.5281/zenodo.10804415>

Banita Mahanandia*
Singh Subhalaxmi Baidhar*

Abstract

South-South Cooperation and ant-colonialism served as the cornerstones of India's relations with Africa so far. The inclusion of the African Union (AU) in the G20 is another milestone in India's bonhomie with Africa. The G20 is no longer dominated by western developed countries, rather it has widened its structure by including many emerging and developing countries. India's support for the inclusion of the AU is viewed as a strategic move as it will benefit New Delhi in many ways, not the least of which is by increasing the likelihood that Africa will back India's bid to the United Nations Security Council (UNSC). Furthermore, Prime Minister Modi's action is the correct start toward a just, equitable, and democratic international infrastructure and governance. This paper throws light on the different aspects of India's G20 presidency, focusing primarily on the inclusion of the AU in the Group of 20. The strategic move of India to achieve its goal through the G20 Presidency, the benefits of inclusion of the African Union, and finally suggests how India should deal with complex issues and problems.

Keywords: G20, India, African Union, UNSC, South-South Cooperation

Introduction

India has longstanding relations with Africa and remained a strong supporter of Africa's development. However, the trade relation was limited

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**THE ROOTS OF INDIA'S NATIONALISM: A HISTORICAL NARRATIVE OF EARLY
IDENTITY FORMATION**

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University, Sambalpur, Odisha, India

Priyanka Priyadarsani Mallick, Research Scholar, Gangadhar Meher University, Sambalpur,
Odisha, India

Abstract:

This paper seeks to understand the origin and development of Indian Nationalism by comparing western Nationalism. India has its historical facts to contextualize the roots and development of national identity. In this paper, we consider the development of national identity as an essential element of Nationalism in India. However, scholars of political science often refer to Indian Nationalism as a byproduct of western Nationalism. Is western Nationalism a chief source of Indian Nationalism and the sense of national identity in India? The question of national identity and Nationalism has attracted scholarly attention in the last few decades. The voluminous literature on the topic has been overemphasized without referring to the indigenous factor of Indian Nationalism. We argue in this paper that Indian Nationalism is different from western Nationalism. Indian Nationalism has its indigenous historical facts. In this paper, we focus on two aspects of the origin and development of Indian Nationalism. We argue that ancient Indian political tradition and the colonial era are the chief sources of developing the idea of national identity and Nationalism in India. This study applies the historical narrative method and multi-method. This study relies on the recorded document and events and the ancient Indian text to contextualize the indigenous nature of Indian Nationalism.

Key Words: *Nationalism; Identity, Nationhood, Political thought, Hindu Rashtra, Bhakti*

Introduction

Historical narratives often set our identities. Historical records always tell the story of our origin and development. It also guides us in the direction of the future course of action. Last few decades, various movements have emerged, and they fostered to realize a sense of national identity. These days' national identity has emerged as a powerful tool for social change worldwide. Similar phenomena have occurred in India, and the Indian case remains unique. In this paper, we are trying to narrate the Indian sense of Nationalism and national identity; we consider India a multi-nation state with deep diversity based on ethnicity, language, culture, and tradition. Each component has its historical narrative, identity, and myths of origin. Still, India sustains and prevails as a nation-state and can accommodate everything in the name of national identity and Nationalism. In a broader sense, we can call it a political unification. In this paper, we argue the political coalition of different regions into the entity of India originated much before the development of western Nationalism. Indian Nationalism is an old phenomenon resulting from the ancient Indian political tradition and the strenuous activities of British rule.

Britishers have dominated the country for a more extended period. However, a sense of national identity has emerged in people's minds due to malicious activities. Among many others, Gandhian Nationalism remains a powerful tool. The idea got legitimacy, and it can confront and communicate effectively both in the realm of public and in the inner spiritual realm. A central concept of Gandhi strengthened and influenced the mass. Gandhi's central methodology was a protest, and nonviolent got greater legitimacy. However, it was beyond the control of the Indian National Congress.

India which comprises various intersecting imagined communities. Multiple groups and different aspects of common identification have emerged in society. The most potent and prominent elements create the community based on the linguistic lines, "within which is implied countless local and regional variations in religion, culture, and custom" (Chatterjee 1993). Gradually these communities

ABSTRACT

Assessment involves a laborious process, especially when it comes to living human beings as in social sciences. Pandemic makes it even more difficult. This paper aims to explore the challenges and opportunities in assessing moral reasoning during pandemics. Assessing moral reasoning is itself quite complex. The most conventional method for this is presenting moral dilemma stories developed by Kohlberg. Standardized tools, in this regard, are limited. Moreover, these methods involve face-to-face interaction with the participants and recording their responses accordingly. But, a pandemic does not allow us either to opt for household surveys or to apply direct methods of data collection from several sectors. Here comes the role of digital platforms. There is a paradigm shift in research methodology due to pandemics and researchers can take it as a great opportunity to use digital platforms to assess and accumulate relevant data.

KEYWORDS: assessment, digital platform, moral reasoning, pandemic

Introduction

Research methodology is one of the most vital parts, if not, the most vital parts of any scientific research. Of which, assessment and data collection involve a laborious process, especially when it comes to living human beings as in behavioural and social sciences. Data collection has several aspects, right from sampling to gathering data itself. Be it qualitative or quantitative data, pandemic makes it even more difficult. Though there are many distant methods used for data gathering in developed countries, especially with the high-income groups, face-to-face interview prevails in Southeast Asia. This paper aims to explore the challenges and opportunities in assessing moral judgment and moral reasoning during pandemics.

Assessing moral reasoning is itself quite complex. Standardized tools, in this regard, are limited in number. Most of them are applied in face-to-face interaction with the participants, particularly in developing and under-developed countries and in middle and low socioeconomic strata. But pandemic does not allow us either to opt for household surveys or to apply direct methods of data col-

lection from several sectors. We discuss the pros and cons of different aspects of data collection procedures that could be implemented by researchers to measure moral reasoning during the pandemic and in the post-pandemic era. We divide our discussion into five segments: a) tools to assess moral reasoning b) sampling techniques c) modes of data collection d) rapport, informed consent, data protection, and privacy and e) research funding.

Tools to assess Moral reasoning

Moral judgment and moral reasoning are the parts of moral cognition. Moral judgment is a judgment of value, judgment of what ought to be, what is right or wrong, with reference to the moral ideal. Moral reasoning is the cognitive process through which individuals try to think what is right or what is wrong by using logical operations. It applies critical analysis to specific events or situations or dilemmas to judge what is right or what is wrong.

As it is evident, there are not many standardized assessment tools for moral reasoning. The available tools for this are of two types: response production and response re-

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Women Entrepreneurs: Balancing Work and Life

¹Lipsita Dash

²Dr. Sanjukta Padhi

Abstract

The entry of women is relatively a new phenomenon in business. Because of the introduction of nuclear family system and the necessity for extra income for maintaining the living standards women have started entering into the world of business. As women play a vital role in the family, so women entrepreneurs have to play dual role in business as well as at home. So, it is quite challenging for them to maintain a work life balance. Therefore, the study aims to find out how the women entrepreneurs manage their work life balance. For these purpose 200 women entrepreneurs were randomly selected from different organizations. Hayman's work life balance questionnaire and a validated questionnaire by Lovely Professional University for women entrepreneurs are used for data collection. Statistical techniques like t-test, multiple regression, correlation have used for analysis of the data. And the result suggests that there is a negative correlation between stress and work life balance. It also states that work environment and family support have a positive impact on work life balance. And the study suggests some strategies to the women entrepreneurs for managing the work life balance.

Keywords: *Women entrepreneur, work life balance, family support, Dual Role, work environment*

INTRODUCTION

In the 21st century due to economic conditions and social demands the role of women has changed all over the world. So, in the present scenario working women have a lot of pressure to make a career while sustaining active engagement in their own private life. Today women are entering into different kinds of professions for their self-dependence and entrepreneurship. By their potency and skills and with the support of different organizations, more and more women are joining

in entrepreneurship. However, due to the increasing work pressure in the existing familial setup, entrepreneurial women are finding it very difficult to balance their work and life and they have limited time for themselves. The advancement of technology which keeps work life integrated with personal life creates stress among job holders. And this has an impact on the individual's overall well-being. And this is why achieving work life balance is important for working women to lead a quality life.

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Morality in Education as reflected in NEP 2020

*Anwasha Banerjee, **Dr. Sanjukta Padhi

Abstract

Morality lies at the core of a just society. Good human beings with sound moral systems are the components of such a society. Developing good human beings with 'ethical moorings' is the spirit of the National Education Policy, 2020. NEP 2020 believes that teachers are the most important part of our society as they shape the next generation. Teachers are to provide quality education for achieving full human potential. So are the teacher educators. As they are the creators of schoolteachers. To restore the lost integrity and credibility, education must develop not only cognitive abilities but also moral and ethical dispositions. Traditional Indian values are embedded in the recommendations of NEP 2020. Right from the Vedic values to the Constitutional values are at the root of NEP 2020. The transformation of society into an equitable and just one is the aim of this policy. And this transformation is possible through the transformation of the educational system. High-quality education grounded in morals is the key to such reformation. This paper is an attempt to discuss the importance and necessity of the presence of morality in quality education in light of NEP 2020.

Introduction

At the micro-level, it is the individual. At the macro-level, it is the country. It is the society. An individual without ethical grounding leads to a society, a country, without moral moorings. A corrupt nation regresses its citizens into corruption in every nook and corner of life. It is a cyclical process. Life without morality is life without justice, life without fairness. Humans make (im) moral decisions in almost every step of life. They believe in the concept of right and wrong. Morality is the core of almost every decision made in day-to-day human life. It is the guiding principle based on which people act and live their lives. Humans are the only species in this world whose brains are evolved in such a way that they are capable of moral judgment and moral reasoning. The root of morality thus lies in the process of evolution.

This paper is an attempt to discuss the importance and necessity of the presence of morality in quality education as reflected in NEP 2020. To understand the necessity of the presence of morals in education and promote an ethical base in students and teachers, understanding human morality is essential. To improve the moral foundation it is needed to have conceptual clarity about the origins of morality, and to have a theoretical understanding of different aspects of morality as well.

Origins of Morality

Etymologically, the term morality has come from

the Latin *Moralitus* which means manner or character or proper behaviour. Some of the most popular notions regarding the origins of morality are morality comes from religion, morality is a genetically predisposing factor, morality has its origin in socio-cultural setup, and/or our rational choices make us moral. However, Churchland (2013) denies accepting any of these simplistic explanations about the origin of morality. Instead, she stresses the socio-neurological basis of morality. The different perspectives about the roots of morality are:

1. **Biological:** Ayala (1987) opines that human beings show ethical behaviour not because of sociological factors but because of their biological construction. According to the author, the biology of the human brain determines the presence of the three necessary, and jointly sufficient, conditions for moral behaviour: the ability to anticipate the consequences of one's actions; the ability to make moral judgments; and the ability to choose among various alternative courses of action. Ayala argued that moral behaviour has arisen and developed in evolution not because it is adaptive in itself, but as an inevitable consequence of man's intellectual abilities. And intellectual abilities of the human species are directly promoted by Darwin's natural selection. Neuro-imaging studies in the recent past have linked several regions of the human brain to moral cognition. Disruptions to the right temporoparietal junction,

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The Impact of Psychological Capital on Transitional Readiness of Employees

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Abstract

The purpose of this study is to determine how employees' psychological capital affects their preparedness for change. This study used quantitative correlational approaches with transitional readiness and psychological capital scales as measuring tools. Incidental sampling and snowball sampling are the sample methods employed. Data were collected via a Google form, and 132 subjects were assessed. Simple regression analysis was employed in the hypothesis testing. The correlation value $R = 0.788$ with a significance value of 0.000 ($p < 0.01$) indicates a substantial association between psychological capital and employee readiness, according to the analysis's findings. The study's findings suggest a somewhat strong link between the two factors. R square is equal to 0.573, which suggests that psychological capital is responsible for 48.3% of the workforce's preparation for changes. The analysis's findings indicate that the optimism dimension and readiness for change are related, with the optimism dimension having a significance value of 0.010 ($p < 0.05$) and the hope dimension having a significance value of 0.000 ($p < 0.01$), respectively. The self-efficacy dimension, on the other hand, has a significance value of 0.864 ($p > 0.05$), and the resilience dimension has a significance value of 0.554 ($p > 0.05$), indicating that it does not directly relate to preparedness for change.

Keywords: *psychological capital, transitional readiness, employee, resilience*

1. INTRODUCTION

To assist people in adapting to environmental alteration and behavior, organizations made several modifications to improve organizational work effectiveness. During the economic crisis brought on by the COVID-19 epidemic, the majority of enterprises in Odisha, whether they were state/government owned or privately held, adjusted in order for their organization to remain the same and recover. Employees were

Examining the Elements Impacting the Entrepreneurial Intention

Nazia Arif, Dr. Rupashree Goswami

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Abstract

The growth of the market economy, global rivalry, and technical advancement, has all contributed to the importance of entrepreneurship. As a result, it has inspired academics to conduct research into its precursors. Entrepreneurship used to be a method by which individuals started their own business enterprise with their own money. This view of entrepreneurship has indeed shifted, though. Why do some people, but not others, favour starting their own business? Since the essential predictor of entrepreneurial activity and a critical aspect in understanding the process of launching new businesses, this topic prompted us to look at the elements that spark EI. Many elements, such as, environmental, psychological, demographic and cognitive ones, can stimulate an individual's desire to initiate a venture. The internal-psychological and external-environmental elements were the main topics of research in the past, but lately, factors related to cognition have also become more significant. The purpose of the current study is to investigate the association between EI, inclination towards risk-taking, self-efficacy of entrepreneurs, and emotional intelligence. Also, the study took into account personal attitude as a cognitive element. PA is one among the various motivation precursors in the Theory of Planned Behavior Ajzen's (1991). This makes it possible to comprehend the causes of EI better. A sample of aspiring entrepreneurs is only rarely included in studies on EI; the majority of the study participants are students coming from college. Conversely, by examining the replies of genuine entrepreneurs rather than students, this work seeks to develop a more precise understanding of the characteristics that contribute to entrepreneurial ambition.

Keyword: *Entrepreneurial Attitude, Entrepreneurial Intention, Theory of Planned Behaviour, Emotional Intelligence*

1. Introduction

J.B. Say is the first to use and describe entrepreneurship in a scientific context. Cantillon used the term "entrepreneurship" after J.B. Say. According to Cantillon, entrepreneurship can be defined as "buying and producing production input for an unspecified price." Cantillon and Say claimed that as entrepreneurs invest their own money, they accept risks. Conversely, Schumpeter states "entrepreneurship as product and process development; finding of new export markets; production of new raw material and a demand for semi-finished



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Examining the Influence of Entertainment Technology on Employees' Behaviour during the COVID-19 Pandemic: A Study on Odisha

Susmita Mandal^{1*}, Dr. Rupashree Goswami²

ABSTRACT

During COVID-19, several organizational activities, as well as human resource management, are increasingly utilizing the social technology. The benefits and drawbacks of entertainment and social interaction are examined from a variety of angles. The abstract content

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Research Paper

The Effect of Psychological Wellbeing on Employee Job Performance and the Role of Gender

Susmita Mandal¹, Dr. Rupashree Goswami^{2*}

ABSTRACT

The goal of this study is to examine the effects of the level of psychological wellbeing

Organizational Behaviour and Sustainable Development: A Study

Rupashree Goswami¹

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Abstract: This article focuses the "organisational sustainability", which we refer as the sustainability in an organisational setting. It would be an overstatement to say that the concept of sustainability has not yet been clearly defined in literature. The uncertainty may result from the fact that the sustainability discussion is still in its early stages. In this paper, we seek to reduce the conceptual ambiguity in this area of application and forward the discussion of strategies that can be effective in enhancing the "organisational sustainability". Such sustainability depends on many factors like good governance, ethical practice, style of management, etc. It is a challenge for the organisation to implement and continue such sustainable practices which can help the organisation to attain growth in long run.

Keywords: Sustainability, organisational behaviour, Sustainable development, Ecological development

JEL Codes: Q01, Q56, D23

1. INTRODUCTION

Sustainability is the power to survive and grow devoid of exhausting natural resources for the coming time. "Sustainable development" was well-defined by the 'United Nations' in the Brundtland Report as the progress where present requirements are fulfilled, deprived of negotiating the capacity of upcoming groups to fulfil the personal requirements. It presumes that, the reserves are limited. Hence, the resources must be used conventionally and meticulously. So that, it will be ensured that there is an adequate amount for upcoming groups without diminishing the current condition of living. A workable culture should be communally sensible, concentrating on the ecological security, vigorous steadiness in human beings and natural practices (Alcaraz & Thiruvattal, 2010). So today in each sphere, "sustainability" is most important.



The Impact of Psychological Capital on Transitional Readiness of Employees

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Keywords: *psychological capital, transitional readiness, employee, resilience*

1. INTRODUCTION

To assist people in adapting to environmental alteration and behavior, organizations made several modifications to improve organizational work effectiveness. During the economic crisis brought on by the COVID-19 epidemic, the majority of enterprises in Odisha, whether they were state/government owned or privately held, adjusted in order for their organization to remain the same and recover. Employees were



Research Article

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A Relationship between Resilience and Mindfulness Practices: A Correlational Study among the Adolescents of Odisha, India

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Maharana, N., & Goswami, R. (2023). A Relationship between Resilience and Mindfulness Practices: A Correlational Study

Abstract: Resilience is a character quality that enables people to successfully navigate difficult situations, change, and grow. Mindfulness is defined as paying attention to a state of consciousness that shows the mind is present and has a heightened and purposeful awareness of internal and external sensations occurring at a specific time. The aim of the present study was to investigate the association between resilience and mindfulness among the adolescent students of Central and Northern Odisha. It was also proposed to find out the moderate role of resilience in predicting mindfulness among Central and Northern Odisha adolescents. A convenience sample (N = 385) of adolescent (n = 233, 60.3%), private and public sector, Odisha was collected. The sample was evaluated using Facet Mindfulness Questionnaire (Raar et al., 2012). Results indicated that resilience and mindfulness were positively correlated. There is a positive and



Identifying the relationship between social support, stress, and mental health among University Student-athletes in Odisha

¹Nilamani Maharana

²Rupashree Goswami

Abstract

The study's goal is to ascertain the connection involving social support, stress, and the mental health of student athletes in Odisha, India. Context: There is a dearth of literature examining the precise relationship between social support and its predictive influence on mental health among athletic training students, despite the fact that social support has been reported to be a factor that increases the retention of athletic students in their profession. Sample: The sample comprises of 232 student athletes of different age groups. Mainly the students are in adolescent age group. Design: A cross-sectional design is used. The subjects were randomly selected after obtaining their informed consent to participate in this study. Instruments: The Multidimensional Scale of Social Support (MSSS), the Perceived Stress Scale (PSS), and the Mental Health Continuum Short Form (MHC-SF) were used to collect data from the participants. Result: Social support and perceived stress were associated with the mental health of student athletes. Positive and significant relationships were found between social support and the mental health of student athletes, and a negative and significant relationship was found between stress and the mental health of student athletes. Conclusion: The study concluded that the student athletes' perceived stress and social support significantly influenced their mental health.

Key words: Social support, Stress, Mental health, University students, Student Athletes, Odisha

INTRODUCTION

Athletes are those who participate in

in sports where endurance is more important than strength typically consume fewer calories than other athletes do (Thompson et

Relationship between Social Media Usage and Nomophobia during the Covid-19 Pandemic

Snehaprava Sahoo¹, Dr. Rupashree Brahma Kumari^{2*}

ABSTRACT

People worldwide are largely engaged with mobile phones, especially Smartphones. It is the communicative tool used by people of all ages, but specifically by young generations. Many students engage in social media activities by using Smartphones. The main aim of this research is to investigate the role of gender in the correlation between social media usage and nomophobia during the COVID-19 pandemic. The samples are randomly selected from western Odisha through the purposive sampling method. The researcher collected data from 80 samples by using the "Nomophobia Questionnaire (NMP-Q)" and the "Social media addiction scale (SMAS)". The researcher examined the data with the help of "descriptive statistics", "Pearson product moment correlation coefficient analysis" and "uncorrelated t-test" through SPSS version 20 software. This study concluded that there is a positive correlation between social media usage and nomophobia. This study also revealed that there is no significant difference between male respondents and female respondents based on their level of nomophobia and social media usage.

Keywords: Covid-19, Pandemic, Smartphone, Social Media Addiction (SMA), Nomophobia, Gender

The COVID-19 pandemic has had a major impact on human lives and their everyday functioning. Educational institutions and Social Avenue have been positioned on prolonged lockdowns, with people continuing to maintain physical and social distance. Adolescents and young people have had to undergo significant stress, loneliness along with dealing with developmental characteristics. Studies showed that adolescents were utilizing social media and the internet more than adults before the government enacted the COVID-19 lockdown to stop the virus from spreading (Kirkaburun & Griffiths, 2018). When peoples particularly students depend too much on their smartphones, it results in many discomforts, unnecessarily worrying about the outcomes in situations when they don't have their phones and they habitually become less productive and start to procrastinate a lot. Students are using smartphones more, which increases the risk of smartphone addiction or nomophobia. Using internet-based technology on smartphones, schools, colleges and universities have turned to e-classes as a means of teaching during the lockdown. As a

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The Effect of Nomophobia on Academic Performance: A Literature Review

¹Snehaprava Sahoo

²Dr. Rupashree Brahma Kumari

Abstract

Mobile phones have become an essential component of individuals' daily lives. Smartphones facilitate the user to have internet access, communicate, social network and even able to examine their health and lifestyle. Nomophobia is a syndrome brought on by excessive smartphone use, which refers to "NO Mobile Phone PhoBIA". This research takes into account how students' academic performance is impacted by the nomophobic behaviours that appear as signs of smartphone addiction (Durak, 2019). The major goal of this research is to comprehensively review and analyse the most recent studies that have been undertaken on the connected topics of nomophobia, social media, and academic performance. This study can assist in determining how social media use and nomophobia affect academic performance and can look at the connections between the three. This article collected an overview of more than 350 qualitative and quantitative studies through a systematic literature review process from the year 2000 onward. A total of 350 articles were gathered, read, and categorised as relevant or irrelevant for the literature review from the original search. In the end, 60 articles that fit this requirement were discovered. Nomophobia have a negative impact on academic performance, and Social media have a positive relationship with nomophobia. Students' academic performance is impacted by social media in both positive and negative ways. Additionally, some research findings suggested that excessive social media use may be a factor in students' poor academic performance. Nomophobia will significantly mediate between Social Media use and Academic Performance.

Keywords: *Nomophobia, Smartphone, Addiction, SocialMedia, Students, Academic Performance.*

INTRODUCTION

The novel coronavirus (COVID-19) originating from China has rapidly spread all over the world and challenging globally. Lockdown is among one of the option suggested by World Health Organisation (WHO) to control spread of the virus. The Protection Motivation Theory (PMT)

describes how individuals are motivated to act in health threatening situations. According to this theory, the more hazardous a life events appears to be to an individual, and the more competent they perceive themselves to be in dealing with it, the more they will engage in adaptive behaviours to protect their health. This timid situation enforced

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मोहन राकेश के कथा-साहित्य में नारी-चित्रण

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* सहायक अध्यापिका (हिन्दी विभाग) गंगाधर मेहर विश्वविद्यालय अमृत बिहार, सम्बलपुर (ओड़िशा) भारत

शोध सारांश - मोहन राकेश अपनी साहित्यिक विशिष्टताओं के कारण साहित्य जगत् में चर्चित रहे हैं। उन्होंने अपने कुशल सृजन शिल्प से हिंदी साहित्य को विविध बहुमूल्य स्वरूपी साहित्य कृतियाँ प्रदान करने वाले प्रवीण शिल्पकार मोहन राकेश ने गद्य साहित्य की विविध-विधाओं को नव आयाम दिया है। मोहन राकेश अपनी साहित्यिक व्यक्तित्व लेखन की उत्कृष्टता के कारण पाठक के मन पर अमीट छाप छोड़ने में समर्थ हैं। द्वितीय विश्वयुद्धोपरांत भारतीय सामाजिक परिवेश में आए बदलावों को उनकी साहित्यिक कृतियाँ रेखांकित करती हैं। मोहन राकेश हिन्दी कथा-साहित्य में एक विलक्षण व्यक्तित्व को लेकर आये। मोहन राकेश जितना बाह्य व्यक्तित्व प्रभावी था, उतना ही विचित्र और विलक्षण भी साथ ही अंतर्विरोधों से भी परिपूर्ण था। उन्होंने कम लिखा है, लेकिन जितना लिखा है बहुत गहरा लिखा है। मोहन राकेश ने अपने कथा-साहित्य में नारी अधिक प्रभावशाली और आधुनिक रूप में चित्रित है। प्रस्तुत शोध पत्र में नारी-चित्रण पर विचार किया गया है।

प्रस्तावना - स्वतंत्रता के उपरान्त नारी जीवन में व्यापक परिवर्तन हुए और उसका कार्य क्षेत्र घर और बाहर दोनों दिशाओं में विस्तृत हो गया है। आज नारी अनेक समाजिक संस्थाओं में कार्यरत है। कुछ नारी लेखन के क्षेत्र में अपनी क्षमताओं को प्रमाणित कर चुकी है। वे सार्वजनिक जीवन में पुरुषों के निकट आ गई हैं। बढ़ते स्त्री-पुरुष संपर्क के कारण प्रेम, स्वतंत्रता और यौन संबंधी नैतिकता में अनेक परिवर्तन आए हैं। विधवा विवाह, बाल विवाह, अनमेल विवाह, बड़े प्रथा, वेश्या गमन आदि कुरीतियों का नारी समाज ने विरोध किया है। मोहन राकेश ने अपने कथा साहित्य में नई अधिक प्रभावशाली और आधुनिक रूप में चित्रित है। उनके कथा-साहित्य में महानगरीय स्वर विद्यमान होने के कारण गहरे मानवीय सम्बन्धों की प्रस्तुति है। इसी मानवीय संबंधों में स्त्री पुरुष संबंधों को अहम् भूमिका के रूप में प्रस्तुत किया है। स्त्री-पुरुष सम्बन्ध समाज के दो महत्वपूर्ण अंग हैं। महानगरों में अनेक समस्याओं के कारण उनके सम्बन्धों में भी परिवर्तन आ गया है।

नारी समाज में स्वतंत्रता के नाम पर बंधनहीन नैतिकता नजर आती है। आज नारी पुरुषों के समान यौन व्यापार की स्वतंत्रता चाहती है। वे कलवों तथा रेस्तरां जाती हैं। शराब, सिगरेट आदि पीती हैं और यौन श्रुतिता को भी महत्व नहीं देती। आज प्रेम के बाद विवाह आवश्यक नहीं माना जाता। आज के अर्थ केन्द्रित समाज में स्वार्थ के लिए सम्बन्ध बनते और टूटते हैं। खुले आम प्रेम का प्रदर्शन करना एक साधारण सी बात बन कर रह गई है। पति और पत्नी के रहन-सहन, आचार-विचार, रीति-रिवाजों में, शिक्षा और अभिरुचि में अन्तर के कारण वैवाहिक सुख में व्यवधान पड़ता है। इन अन्तरों के कारण पति-पत्नी में अहं भाव जागृत हो जाता है। फलस्वरूप ये एक-दूसरे को परित्याग करने के लिए तैयार हो जाते हैं। विवाह के पश्चात विलासिता की प्रवृत्ति के कारण पति अथवा पत्नी दूसरे स्त्री और पुरुष से सम्बन्ध बना लेते हैं। इस कारण गृह कलह शुरू होता है तथा यह दुःख परिस्थिति का अंत हत्या या आत्महत्या के रूप में होता है। कभी-कभी पत्नी के संतान न होने के कारण या केवल कन्या संतान होने के

कारण पति मन ही मन घुटता है। यह समझता है कि पत्नी के कारण उसके वंश की वृद्धि नहीं हो सकती। इस कारण प्रायः पति अपनी प्रथम पत्नी का परित्याग कर दूसरा विवाह करता है। इस कारण उनका दाम्पत्य जीवन नष्ट हो जाता है।

स्त्री-पुरुष सम्बन्ध की महत्वपूर्ण कड़ी है उनके मध्य प्रेम और आपसी समझ। भारतीय समाज में दाम्पत्य सम्बन्ध केवल वासना पूर्ण का साधन न होकर त्याग, समर्पणता सहयोग का प्रतीक है। पारिवारिक जीवन की सफलता, राष्ट्रीय जीवन की उत्पत्ति एवं सांस्कृतिक चेतना के विकास में सहायता करती है। आज का वैवाहिक जीवन नाम मात्र की सुविधा के लिए प्रयोग किया जाने वाला उपकरण बन गया है। आज का विवाह एक समझौता बन कर रह गया है। स्त्री एवं पुरुष दोनों की इच्छाएँ और आकांक्षाएँ अलग होने के कारण उनके सम्बन्धों में विखराय आता जा रहा है। वे एक घर में रहते हुए भी इस सम्बन्ध को संभालते हुए भी अकेले हैं। आज के महानगरीय जीवन में जब कोई दाम्पत्य सुख से वंचित होता है तो वह इस सुख को पाने के लिए दूसरा आश्रय ढूँढ़ने लगता है। इस कारण विवाह सम्बन्ध में विच्छेद उत्पन्न होता है।

नारी के विविध रूप - साहित्य में नारी के रूपों का चित्रण पुरातन समय से होता आ रहा है। संस्कृत साहित्य से लेकर आधुनिक युग तक कथा-साहित्य में नारी का वर्णन प्रत्यक्ष प्रमाण है। समाज में आ रहे बदलाव के साथ-साथ नारी के रूपों में भी परिवर्तन हुआ है। स्वतंत्रता प्राप्ति के उपरान्त सामाजिक परिस्थिति तथा जीवन जीने के आधार में बदलाव हुए हैं। आज भी पारिवारिक संबंध नारी के लिए मूलाधार बना हुआ है। उन्हें परिवार में ही रहकर जीवन जीना पड़ता है। स्वातंत्र्योत्तर हिन्दी कहानीकारों ने नारी के विविध रूपों को प्राचीन और नवीन मूल्यों, परम्परागत और परिवर्तित संवेदनाओं, अनुभूतियों और प्रवृत्तियों के माध्यम से अभिव्यक्त किया है। इन अभिव्यक्तियों के द्वारा नारी के विविध रूपों का विकास और बदलाव परिलक्षित होते हैं।

आधुनिक महानगरीय समाज में नारी जीवन संबंधी पुरातन आदर्शों

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आम्नायिकी



चतुर्विंशोऽङ्कः, जुलाई-दिसम्बर, २०२३
षण्मासिकी अन्तराष्ट्रिया मूल्याङ्कितशोधपत्रिका
(विश्वविद्यालयानुदानायोग-नईदिल्लीद्वाराअनुमोदिता)

प्रधानसम्पादकः

प्रोफेसरहरीश्वरदीक्षितः

सहसम्पादकाः

प्रोफेसरपतञ्जलिमिश्रः डॉ० उदयप्रतापभारती, डॉ० पुष्पादीक्षितः,
डॉ० शान्तिलाल सालवी, प्रो० (डॉ.) देवेन्द्रनाथपाण्डेयः,
डॉ० राकेशकुमारमिश्रः, डॉ० आलोकप्रतापसिंहविसेनः

प्रकाशकः

प्रोफेसरहरीश्वरदीक्षितः

वेदविभागः

संस्कृतविद्याधर्मविज्ञानसङ्घायः

काशीहिन्दूविश्वविद्यालयः, वाराणसी- २२१००५

सिद्धान्तकौमुद्यां स्वादिसन्धिविमर्शः

डॉ. सुनेली देई*

१.० उपक्रमः

भट्टोजिदीक्षितेन (सप्तदशशताब्दी) विरचिता सिद्धान्तकौमुदी महर्षिपाणिनिना (ख्री.पू.पञ्चमशतकम्) सूत्रात्मकशैल्या विरचितस्य अष्टाध्यायी नाम व्याकरणग्रन्थस्य प्रक्रियाग्रन्थोऽस्ति । अष्टाध्याय्यारूपरि विरचितेषु प्रक्रियाग्रन्थेषु सिद्धान्तकौमुदी सर्वश्रेष्ठा अस्ति । संस्कृतभाषाशिक्षाप्रदाने सिद्धान्तकौमुद्याः गुरुत्वपूर्णा भूमिका वर्तते । सिद्धान्तकौमुद्यां त्रयोदशप्रकरणानि सन्ति । तानि भवन्ति- १. संज्ञाप्रकरणम्, २. परिभाषाप्रकरणम्, ३. सन्धिप्रकरणम्, ४. सुबन्तप्रकरणम्, ५. अव्ययप्रकरणम्, ६. स्त्रीप्रत्ययप्रकरणम्, ७. कारकप्रकरणम्, ८. समासप्रकरणम्, ९. तद्धितप्रकरणम्, १०. तिङन्तप्रकरणम्, ११. कृदन्तप्रकरणम्, १२. वैदिकप्रकरणम्, १३. स्वरप्रकरणम्। अन्ते परिशिष्टरूपेण पाणिनीयशिक्षा, गणपाठः, धातुपाठः, लिङ्गानुशासनञ्च सन्ति । सिद्धान्तकौमुद्याः सन्धिप्रकरणे सन्धिपदानां व्युत्पत्तिः प्रदर्शिता अस्ति । सिद्धान्तकौमुद्याः सन्धिप्रकरणं

पञ्च उपप्रकरणैः विभक्तमस्ति । तानि भवन्ति- १. अच्-सन्धिप्रकरणम् २. प्रकृतिभावसन्धिप्रकरणम्, ३. हल्-सन्धिप्रकरणम्, ४. विसर्गसन्धिप्रकरणम्, ५. स्वादिसन्धिप्रकरणम् ।

महर्षिः पाणिनिः सन्धिशब्दस्य कृते संहिताशब्दस्य प्रयोगं करोति । संहितायाः (सन्धेः) लक्षणं कृत्वा पाणिनिना उक्तम्- परः सन्निर्कषः संहिता (अ.-१.४.१०९) इति । अर्थात्, वर्णानामतिशयितः सन्निधिः संहितासंज्ञः स्यात् ।^१ सु आदिः - स्वादिः । स्वादिपदेन सु औ जस् अम् औट् शस् टा भ्याम् भिस् डे भ्याम् भ्यस् डसि भ्याम् भ्यस् डस् ओस् आम् डि ओस् सुप् चेति एकविंशतिः विभक्तिप्रत्ययाः गृह्यन्ते । भट्टोजिदीक्षितेन सिद्धान्तकौमुद्याः स्वादिसन्धिप्रकरणे षोडशसूत्रैः वार्त्तिकद्वयेन च एतेषां सु-औ-जस्-प्रभृतीनां लोपागमवर्णविकारादिभिः सुप्रत्ययसम्बन्धानां सन्धिपदानां साधुत्वं प्रदर्शितम् । अधः सिद्धान्तकौमुदीक्रमेण सूत्रार्थनिर्देशपूर्वकं साधुसन्धिपदानां व्युत्पत्तिः प्रदर्शिता अस्ति ।

१.१ ससजुषो रुः (सि.कौ.-१६२, अ.-८.२.६६) विधिसूत्रम्

पदान्ते विद्यमानस्य स् कारस्य सजुष् शब्दस्य ष् कारस्य च स्थाने रुकारादेशः स्यात् । यथा- देवः, सजूः ।

देवः देव सु (इयाप्प्रातिपदिकात् (अ.- ४.१.१), सौजसमौट्-छष्टाभ्यांभिस्डेभ्याम्भ्यस्डसिभ्यांभ्यस्डसो-साम्ङ्योस्सुप् (अ.- ४.१.२) इति सूत्रद्वयेन देवशब्दात् सुप्रत्ययः ।

देव स् (उपदेशेऽजनुनासिक इत् (अ.- १.३.२) इति सूत्रेण उकारस्य इत् संज्ञा, तस्य लोपः (अ.- १.३.९) इति सूत्रेण उकारस्य लोपः ।

देव रु (ससजुषो रुः (अ.- ८.२.६६) इति सूत्रेण स् कारस्य स्थाने रुकारादेशः ।

* सहायिका आचार्या, संस्कृतविभागः, गङ्गाधरमेहेरविश्वविद्यालयः, सम्बलपुरम्

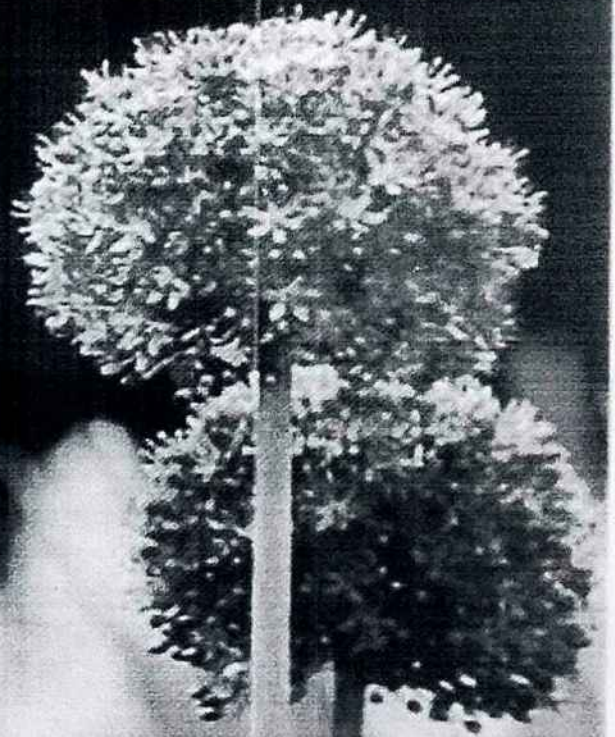
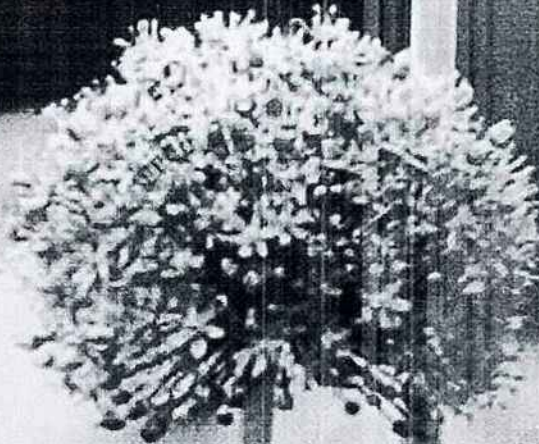
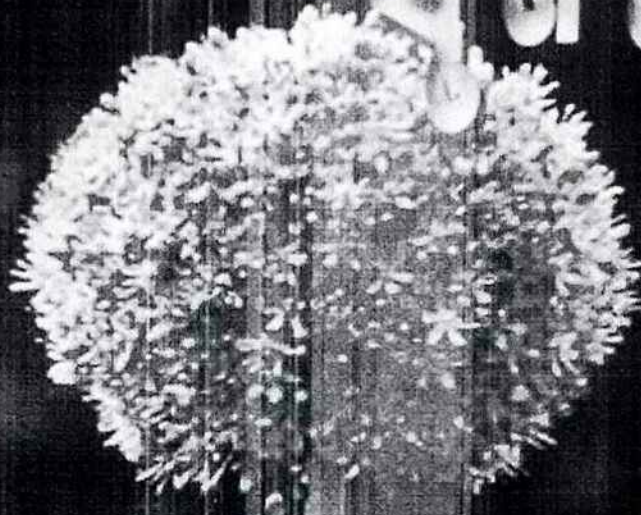
^१ अ.-१.४.१०९ इति सूत्रस्योपरि सिद्धान्तकौमुदीवृत्तिः ।

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ଭାରତୀୟ ଭାଷାଗତ ଓ ଆବୃତ୍ତ ଚେତନାର ସ୍ୱାକ୍ଷର, ସମାଜୀୟ ସମୃଦ୍ଧି ତୁଙ୍ଗମାଧିକ

ସୂକ୍ଷ୍ମ ସୂକ୍ଷ୍ମ



ମୁଖ୍ୟ ସଂପାଦକ
ଦେଶବନ୍ଧୁ ସ୍ୱାଇଁ

ସମ୍ପାଦକ
ଶ୍ରୀମତୀ ଦେବଶ୍ରୀ ରେଣୁ (ଧର)

ସ୍ୱଳ୍ପ ବୟସ୍କ

ଅଷ୍ଟାଧ୍ୟାୟୀ

ତତ୍ତ୍ୱର ସୁନେଇ ଦେଇ

ଇପତ୍ରମ:

ସଂସ୍କୃତଭାଷା ଭାରତର ସର୍ବପ୍ରାଚୀନ ଭାଷା । ସଂସ୍କୃତଭାଷାର ସର୍ବପ୍ରାଚୀନ ଗ୍ରନ୍ଥ ଦେଇଛି ବେଦ । ଯେଉଁ ବେଦ ଭାରତୀୟ ସାମ୍ପ୍ରଦାୟିକମାନଙ୍କ ମୂଳ ଲକ୍ଷ୍ୟ ଅଟେ । ଋଗ୍ ବେଦ, ଯଜୁର୍ବେଦ, ସାମବେଦ, ଅଥର୍ବବେଦ, ଶିକ୍ଷା, ନଳ, ଛନ୍ଦଃ, ଜ୍ୟୋତିଷ, ନିରୁକ୍ତ, ବ୍ୟାକରଣ ପ୍ରଭୃତି ଷଡ଼ ବେଦାଙ୍ଗ, ଗମାୟଣ, ମହାଭାରତ, ଅଷ୍ଟାଦଶ ପୁରାଣ, ଅଷ୍ଟାଦଶ ଉପପୁରାଣ, ସାଂଖ୍ୟ, ଯୋଗ, ନ୍ୟାୟ, ବୈଶିଷ୍ଟିକ, ବୈଶାଖ୍ୟ, ମାମାଂସା ପ୍ରଭୃତି ଷଡ଼ ନର୍ତ୍ତନ, କୁମାରସମ୍ଭବ, ଗୟାତ୍ରୀ, ବିରାଟାକ୍ଟିନାୟ ପ୍ରଭୃତି ମହାଭାରତ, କାବ୍ୟରା, ଦର୍ଶନଗିତ, ଦଶକୁମାରଗୀତ, ବାସବତୀ ପ୍ରଭୃତି ଋଷ୍ୟବ୍ୟାସ, ମେଘଦୂତ, ଉଦ୍‌ଯୋଗ ପ୍ରଭୃତି କାବ୍ୟାଳଙ୍କାର, ନବନୃ, ରାମାୟଣଚକ୍ର ପ୍ରଭୃତି ଚକ୍ରାଳଙ୍କାର, ଅଭିଜ୍ଞାନଶାକୁନ୍ତଳ, ସୁପ୍ତସାହସବେଦୀ ପ୍ରଭୃତି ନାଟକ ସଂସ୍କୃତଭାଷାରେ ହିଁ ରଚିତ ହୋଇଛି । ସଂସ୍କୃତସାହିତ୍ୟର ଇତିହାସଗ୍ରନ୍ଥ ଅଧ୍ୟୟନ କଲେ ଜାଣିପାରିବ ଯେ ବୈଦିକକାଳଠାରୁ ଆରମ୍ଭ କରି ଏପର୍ଯ୍ୟନ୍ତ ସଂସ୍କୃତଭାଷାରେ ଅସଂଖ୍ୟ ଗ୍ରନ୍ଥ ରଚନା ହୋଇସାରିଛି । ପୃଥିବୀର ଅନେକ ପ୍ରାଚୀନଭାଷା ତାହାର କରାକରଣରେ ଗୁପ୍ତ ହୋଇଯାଇଛି । କିନ୍ତୁ ସଂସ୍କୃତଭାଷା ଅତିପ୍ରାଚୀନଭାଷା ହେଲେ ମଧ୍ୟ ଆଜି ମଧ୍ୟ ଜୀବିତ ରହିଛି । ତାହାର କାରଣ ହେଉଛି, ସଂସ୍କୃତଭାଷାର ଅନେକ ନିଖିତ ବ୍ୟାକରଣଗ୍ରନ୍ଥ ରହିଅଛି । ପାଠ୍ୟ ପଦରେ ସଂସ୍କୃତ ଭାଷା ଏବଂ ସଂସ୍କୃତ ଗାଣ୍ୟରେ ରଚିତ ଗ୍ରନ୍ଥଗୁଡ଼ିକ ସମୃଦ୍ଧ ସୁରକ୍ଷିତ ହୋଇ ରହିଛି, ଯେଉଁଥିରେ ଭାରତର ଆତ୍ମା ତଥା ଭାରତୀୟ ସଂସ୍କୃତି ନିହିତ ହୋଇ ରହିଅଛି । ସଂସ୍କୃତଭାଷାରେ ଲିଖିତ ବ୍ୟାକରଣ ଗ୍ରନ୍ଥ ମଧ୍ୟରୁ ମହର୍ଷି ପାଣିନିଙ୍କ ଦ୍ୱାରା ରଚିତ ଅଷ୍ଟାଧ୍ୟାୟୀ ସର୍ବଶ୍ରେଷ୍ଠ ଅଟେ । ମହର୍ଷି ପାଣିନିଙ୍କଦ୍ୱାରା ରଚିତ ଅଷ୍ଟାଧ୍ୟାୟୀ ନାମକ ବ୍ୟାକରଣ ଗ୍ରନ୍ଥ ସଂସ୍କୃତବାକ୍ୟର ଏକ ଅନୁଲ୍ୟ ନିଧି । ଅଷ୍ଟାଧ୍ୟାୟୀ, ଅଷ୍ଟ, ପାଣିନୀୟ ବ୍ୟାକରଣ, ତ୍ରିମୁନି ବ୍ୟାକରଣ ଏବଂ ପରାଶର ବ୍ୟାକରଣ ରୂପରେ ପ୍ରସିଦ୍ଧ ଅଟେ ।

୧.୧ ଅଷ୍ଟାଧ୍ୟାୟୀ, ଅଷ୍ଟ

ଅଷ୍ଟାଧ୍ୟାୟୀରେ ଆଠଟି ଅଧ୍ୟାୟ ଥିବାରୁ ଏହାକୁ ଅଷ୍ଟ ଏବଂ ଅଷ୍ଟାଧ୍ୟାୟୀ କୁହାଯାଏ । ଅଷ୍ଟାଧ୍ୟାୟୀରେ ଆଠଟି ଅଧ୍ୟାୟ ରହିଅଛି । ପ୍ରତ୍ୟେକ ଅଧ୍ୟାୟରେ ୪ଟି ପାଦ ରହିଅଛି । ପ୍ରତ୍ୟେକ ପାଦରେ ଥିବା ସୂତ୍ରଗୁଡ଼ିକର ସଂଖ୍ୟା ନିମ୍ନରେ ସାରଣୀ ମଧ୍ୟମରେ ଦର୍ଶାଯାଇଛି ।

ଅଧ୍ୟାୟ	ପ୍ରଥମପାଦ	ଦ୍ୱିତୀୟପାଦ	ତୃତୀୟପାଦ	ଚତୁର୍ଥପାଦ	ପାଦସଂଖ୍ୟା
ପ୍ରଥମ ଅଧ୍ୟାୟ	୭୫	୭୩	୯୩	୧୧୦	୩୫୧
ଦ୍ୱିତୀୟ ଅଧ୍ୟାୟ	୭୨	୩୮	୭୩	୮୫	୨୬୮
ତୃତୀୟ ଅଧ୍ୟାୟ	୧୫୦	୧୮୮	୧୭୬	୧୧୭	୬୩୧
ଚତୁର୍ଥ ଅଧ୍ୟାୟ	୧୭୮	୧୫୫	୧୬୮	୧୫୫	୬୩୫
ପଞ୍ଚମ ଅଧ୍ୟାୟ	୧୩୬	୧୫୦	୧୧୯	୧୬୦	୫୫୫
ଷଷ୍ଠ ଅଧ୍ୟାୟ	୨୨୩	୧୯୯	୧୩୯	୧୭୫	୬୩୬
ସପ୍ତମ ଅଧ୍ୟାୟ	୧୦୩	୧୧୮	୧୨୦	୯୭	୪୩୮
ଅଷ୍ଟମ ଅଧ୍ୟାୟ	୭୫	୧୦୫	୧୧୯	୬୮	୩୬୯

ଅଧ୍ୟାୟ ସମ୍ପର୍କ - ୩୯୮୩

ମହର୍ଷି ପାଣିନି ଅଷ୍ଟାଧ୍ୟାୟୀଗ୍ରନ୍ଥର ପ୍ରାରମ୍ଭରେ ୧୫ଟି ସୂତ୍ରଦ୍ୱାରା ସଂସ୍କୃତବର୍ଣ୍ଣବିଷୟରେ ଶିକ୍ଷାପ୍ରଦାନ କରିଛନ୍ତି । ସେହି ୧୫ଟି ସୂତ୍ର ହେଉଛି- ୧) ଅଜରଣ୍ଡ ୨) ଗନ୍ଧୃ ୩) ଏଷତ୍ ୪) ଏଷିତ୍ ୫) ହସବଚତ୍ ୬) ଭସ୍ ୭) ଜମଚଣନମ୍ ୮) ଭେଷ୍ ୯) ଇତ୍ୟଧ୍ ୧୦) ଭବଗଚତ୍ ୧୧) ଖଂ ଛଂ ଛଂ ଛଂ ଛଂ ୧୨) କପୟ ୧୩) ଶକ୍ଷୟ ୧୪) ଜୟ । ଏହି ୧୫ଟି ସୂତ୍ରକୁ ବହୁବର୍ଣ୍ଣ ମାତ୍ରେଶ୍ୱରୀସୂତ୍ର କୁହାଯାଏ । କଥିତ ଅଛି ଯେ ପାଣିନି ଏବଂ ତାତ୍ପର୍ଯ୍ୟାୟନ ଗୋଟିଏ ଗୁରୁଜନ ଦୁଇଟି ଶିଷ୍ୟ ଥିଲେ । ତାତ୍ପର୍ଯ୍ୟାୟନ ସର୍ବବେଦ ସୁଗୁଣର ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାଦେଉଥିଲେ, ତିକୁ ପାଣିନି ତାତ୍ପର୍ଯ୍ୟାୟନଙ୍କ ଭବି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବା ନ ପାରୁଥିବା ହେତୁ ଗୁରୁଜନ ନିତ୍ୟାଗ୍ରାହଣନୀୟ ପାତ୍ର ହେଉଥିଲେ । ପାଠକେ ପାଣିନି ଜ୍ଞାନ ଭାଗଦେବାନିମନ୍ତେ ମତ୍ରେଶ୍ୱରୀଙ୍କର ଆରାଧନା କଲେ । ଭଗବାନ ମତ୍ରେଶ୍ୱର ଶିବ ପାଣିନିଙ୍କର ଉପରେ ସର୍ବତ୍ର ମୋହ ଡାକର ତମ୍ଭରୁ ୧୫ ଅକ୍ଷରକ୍ରମରେ ଏବଂ ସେଥିରୁ ୧୫ଟି ସୂତ୍ରର ଉତ୍ତର ଦେବା । ସେହି ୧୫ଟି ସୂତ୍ରକୁ ଆଧାର କରି ମହର୍ଷି ପାଣିନି ସମଗ୍ର ଅଷ୍ଟାଧ୍ୟାୟୀ ରଚନା କରିଥିଲେ । ଭଗବାନ ମତ୍ରେଶ୍ୱରଙ୍କର ଠାରୁ ଏହି ୧୫ଟି ସୂତ୍ର ଭାବ କରିଥିବାବେଳେ ଏହାକୁ ବହୁବର୍ଣ୍ଣ ମାତ୍ରେଶ୍ୱରୀ ସୂତ୍ର କୁହାଯାଏ । ଏହି ୧୫ଟି ସୂତ୍ରମଧ୍ୟମରେ ମହର୍ଷି ପାଣିନି ସଂସ୍କୃତବର୍ଣ୍ଣ ବିଷୟରେ ଶିକ୍ଷାପ୍ରଦାନ କରିଥିବାହେତୁ ଏହାକୁ ବର୍ଣ୍ଣଦୀପ୍ତି ବା ଅକ୍ଷରସମାପ୍ତି କୁହାଯାଏ । ଏଣୁ ୩୯୮୩ ସୂତ୍ର ଘଟିତ ୧୫ଟି ମାତ୍ରେଶ୍ୱରୀସୂତ୍ର ନିଶ୍ଚୟ ଅଷ୍ଟାଧ୍ୟାୟୀରେ ସର୍ବମୋଟ ୩୯୯୭ଟି ସୂତ୍ର ରହିଅଛି । ଅଷ୍ଟାଧ୍ୟାୟୀର ସୂତ୍ର ଆକରଣ କାଳିଦାସଙ୍କୁ ଅନୁପାୟୀ ହୋଇଥିଲା । କାଳିଦାସେ ଅଷ୍ଟାଧ୍ୟାୟୀର ଗଣନା କି (ଅ. ୧. ୧. ୧୭) ସୂତ୍ରକୁ ଦୁଇଭାଗରେ ବିଭକ୍ତ କରାଯାଇ ଦୁଇଟି ସୂତ୍ରରେ (ଉଷ୍ଠ-ଅ. ୧. ୧. ୧୭, କି-ଅ. ୧. ୧. ୧୭) ପରିଣତ କରାଯାଇଥିବାରୁ ଅଷ୍ଟାଧ୍ୟାୟୀର ସୂତ୍ର ସଂଖ୍ୟା ୩୯୯୭ ଅଟେ । ନଚେତ ଅଷ୍ଟାଧ୍ୟାୟୀର ସୂତ୍ରସଂଖ୍ୟା ୩୯୯୭ ଅଟେ । ତଥା ବି-ତ୍ରାଣିସୂତ୍ରସଂପ୍ରାପ୍ତି ତଥା ନବଶତାବ୍ଦୀ ଚ । ଷଷ୍ଠତ୍ଵ ଚ ସୂତ୍ରାଂ ପାଣିନିଃ କୃତବନ୍ ସ୍ତୟମ୍ । ।'



ଅର୍ଥାତ୍, ପାଣିନି ସ୍ତୟମ୍ ଚିନି ହଜାର ନଅ ଷଷ୍ଠ ଶତାବ୍ଦୀରେ (୩୯୯୭) ସୂତ୍ର ପ୍ରଣୟନ କରିଥିଲେ ।

୧.୨ ପାଣିନିବ୍ୟାକରଣ, ପାଣିନୀୟବ୍ୟାକରଣ

ମହର୍ଷି ପାଣିନିଙ୍କଦ୍ୱାରା ରଚିତ ହୋଇଥିବାହେତୁ ଏହାକୁ ପାଣିନିବ୍ୟାକରଣ ଏବଂ ପାଣିନୀୟବ୍ୟାକରଣ ମଧ୍ୟ କୁହାଯାଏ ।

ମହର୍ଷି ପାଣିନିଙ୍କର ଆଦିଭାବ ବୈଦିକସୂତ୍ର ଶ୍ରେଣୀରେ ଏବଂ ଶୈବିକସୂତ୍ରର ଆରମ୍ଭରେ ଖ୍ରୀ:ପୂ: ପଞ୍ଚମଶତକରେ ହୋଇଥିଲା । ପାଣିନି ଯେଉଁ ସମୟରେ ଅଷ୍ଟାଧ୍ୟାୟୀ ରଚନା କରିଥିଲେ, ଖେଚକେବେଦ କ୍ରମେ ସଂସ୍କୃତରେ ତଥା ହେଉଥିଲେ, ପାଣିନିଙ୍କ କ୍ରମରେ ସଂସ୍କୃତଭାଷା ତତ୍ତ୍ୱରଭାଷା ଥିଲା । ମହର୍ଷି ପାଣିନି ସଂସ୍କୃତଭାଷାକୁ ଅପଣରୁ ମୂଳ ଭବିତବ୍ୟାସୀ ତଥା ସଂସ୍କୃତ ଭାଷାକୁ ସୁରକ୍ଷିତ ଏବଂ ବିକଳତା ଭବିତା ନିମନ୍ତେ ସୁରକ୍ଷିତ ଶୈବୀକର ଅଷ୍ଟାଧ୍ୟାୟୀ ରଚନା କରିଥିଲେ । ସୂତ୍ରର ଲକ୍ଷଣ ହେଉଛି-



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Utilization of the idea of self-reflection and self- realization in the modern world

Dr. Srikanta Parida and Dr. Sala Besra

Abstract

People nowadays have become less reliant on themselves and their surroundings and more connected to the materialistic world. Instead of caring for themselves and maintaining a healthy lifestyle, they spend more time aiming to establish a good reputation in society. Therefore, the vast majority of people have poor mental health. In the current world, self-reflection and self-realization are of the utmost importance because they can promote personal development, endurance, mental health and improved connection with others. These techniques provide people the skills they need to create attainable objectives, better understand their thoughts and emotions, and make the required adjustments in their life in the highly stressful world of today. People may better handle hardship, seek a life that is in harmony with their themselves, and cultivate more rewarding and peaceful relationships with others by gaining more self-awareness and inner strength. This study emphasizes the importance of self-reflection and self-realization in cultivating resilience, empathy, and total fulfilment in oneself in today's fast-paced and complicated modern world.

Keyword: Self-reflection, self-realization, atman, brahman, personal growth, meditation, modern world

Introduction

In the modern world, where life moves at a fast pace and technology dominates our daily routines, the utilization of self-reflection and self-realization has become increasingly important. However, these practices find their roots in ancient philosophical traditions such as the Upanishads and Vedanta. In these profound teachings, self-realization and self-reflection are fundamental concepts that delve into the nature of the self (Atman) and its connection to the ultimate reality (Brahman). According to Vedanta, self-realization is the direct experience and realization of one's actual essence as the timeless, boundless, and pure self. It is the realization that one's intrinsic nature, Atman, has an unbreakable connection to the ultimate truth of the universe, Brahman. Drawing from the wisdom of the vedanta, self-realization is the process of directly experiencing and realizing the true nature of the self, transcending the limitations of the ego, and recognizing the eternal and interconnected aspect of oneself. It goes beyond intellectual understanding to encompass a profound experiential realization of the self's infinite and divine essence. Self-reflection, as taught in the Upanishads and Vedanta, is a practice known as "Swadhyaya." It involves introspection, contemplation, and inquiry into the nature of the self. By engaging in deep self-examination, individuals gain insight into their thoughts, emotions, desires, and actions, ultimately leading to a recognition of the underlying eternal reality. These ancient teachings emphasize that self-realization and self-reflection are transformative practices that lead to liberation (Moksha) from the cycle of birth and death. Through the guidance of a qualified spiritual teacher (Guru), the study of scriptures, contemplative practices, and the grace of the Guru, seekers are encouraged to question the nature of reality, seek the truth beyond the apparent world, and realize the oneness of the individual self with the ultimate reality. The guidance of a qualified spiritual teacher or guru was considered essential in ancient times. The guru would provide guidance, impart teachings, and help the disciple navigate the challenges and pitfalls on the path to self-realization. To achieve intellectual clarity and an understanding of the very core of the Self and reality, the ancient sages would read and reflect on the Upanishads, Vedanta sutras, and other spiritual works. Meditation is essential in the process of self-realization.

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Historical Background of Hydrology in Ancient Text

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Abstract: Water the building block of life, a clean source of energy, a philosophical powerhouse, teaches us to be flexible and a potential mode of transport, the role of hydraulic structures including waterways management becomes more important. In the 21st century this management seems to be a cakewalk. But it has deep roots in our ancient knowledge system and literature. Ancient people were proficient in inland navigation thus proving that reverse played an important part in the sustenance development and growth of mankind. To facilitate trade and transportation many ancient cities and industrial towns were established along rivers and their tributaries. Although most of the forgone hydrologic knowledge is unexplored to the world. So, this paper will try to bring very interesting classic facts on hydraulic structures including waterways management system in ancient India.

Key Words: Rig Veda, Yajur Veda, Atharva Veda, Mahabharata, Ramayana, Noria, Asmacakra, Udghatna, Varshamana, Varahamihira.

1. INTRODUCTION:

We have a rich history of managing water. The various ancient civilizations which were developed at places where water was required for agricultural and where whatever is readily available at that time mainly in the vicinity of springs, lakes, rivers, seas, etc. This extends from civilization to the Vedas and the references can be related to the current system. Our ancient history is full of advanced development in the field of water resources, or we can say water science Indus valley civilizations was contemporary to the Egyptian civilization to the Mesopotamian civilization to the Chinese civilization. But if we look at the developments in terms of the water science then this our Indus valley civilization was at the apex. Agriculture was the main source of this socio-economic activity at that time. And we know that the Mohenjo-Daro and dholavira were the two major cities at that time. The people of Indus valley civilizations were familiar with the advanced water management and drainage systems in that time. Everybody knows this great bath of Mohenjo-Daro. So that great bath is an excellent example that the Harappans peoples were knowing about the water management system. At the same time the Harapan peoples were aware about the seasonal rainfall and flooding of the Indus valley. Ancient agriculture was practiced at large in that and the irrigation was being done by the canals they were able to develop these water storage systems and low-cost water harvesting its structures such as small check dams burn and using the locally available material. We can take one example of dholavira city which is located between the femoral historians mansar and Manohar. There we can have a series of check dams and storage reservoirs. The purpose was to basically see runoff is coming taking lot of sediments with it so by constructing small check dams they were able to reduce the velocity of the flow so that the segments will get deposited and finally clean water will be stored in the reservoir. So now we can imagine what the knowledge about the hydraulics they were having at that time. It is more than you can say 4000 to 5000 years just type of knowledge was available there.

2. Knowledge of hydrology in Indus Vally Civilization :

This Indus valley civilization was having uniqueness particularly in terms of the water. The citizens of the Harappan civilization were known for their obsession with water. They pray to the reverse every day and accorded the rivers a divine status and carrying that is spirit. Even today, if we compare the development in the water sciences to all the contemporary civilizations. Then I think we will keep our Indus valley civilization at the top. We know that in Indus valley civilizations most of the houses were equipped with the private wells. Almost all the houses had private wells with bath and toilet area, line with the Indian standardise size burnt bricks and draining into the soak water into the street

शोधप्रज्ञा

Śodha-prajñā

अर्द्धवार्षिकी, अन्ताराष्ट्रिया, मूल्याङ्किता, समीक्षिता च शोधपत्रिका
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प्रो. दिनेशचन्द्रशास्त्री

कुलपतिः

सम्पादकः

डॉ. अरुणकुमारमिश्रः

सहसम्पादकः

श्रीमतिमीनाक्षीसिंहरावतः



प्रकाशकः

उत्तराखण्डसंस्कृतविश्वविद्यालयः, हरिद्वारम्

उत्तराखण्डम्

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THEORIES OF DĀNA IN VYĀSA SMṚTI

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Abstract-

Ancient knowledge systems included every single aspect of human life. Vedas, the foundation of the Indian knowledge system, advise humans to live a balanced life in society. Smṛiti Sastra reflects on assimilating the advisories of the Vedas to prepare humanity to live a peaceful life without any disputes. One of the many disputes in society, the most common dispute in human life, is related to property. Humans inherit wealth and properties from their families and ancestors. This inheritance and property rights have complex rules to understand and follow—Smṛiti sastras like Manusmṛiti, Yajñavalkya smṛiti, and Arthashastra detail human inheritance and property rights.

Vyasa smṛiti is one of the rarest smṛitis, which talks about the behavioural guidelines of human life. It discusses all the theories of the data and their importance within the society. Vyasa Smṛiti has explored various rituals associated with Dāna and the impact of performing the Dāna. This research paper has rediscovered the theories of Dāna reflected in smṛiti sastras and the concept of Dāna in Vyasa smṛiti.

(Keywords- Smṛiti, Dāna, Dharmashastra, Impact, Nitya, Doner, Receiver, Arthashastra)

Introduction-

Smṛiti literature is considered as one of the literatures discussing the guidelines, rules, etc. followed by society as well as humans. Manusmṛiti, Yajñavalkya smṛiti etc. few of the earliest smṛitis, have shed some light on the types of Dāna and the rituals to perform of the Dāna, the various reasons which make Dāna a social activity.

Vyasa smṛiti is one of popular yet unexplored smṛiti among all. Maharshi Vyasa who is the author 18 puranas and Mahabharata considers as the author of Vyasa smṛiti. There is no evidence regarding the date, time or the genealogy of his family. Currently total four edition of Vyasa smṛiti is available. Two editions are edited and published by Jivananda and Anandashrama, Puna consisting four chapters and 150 verses. Another one is published in Smṛitisandarbhā book having 241 verses. The last one is published in "Astadasasmṛiti" book having 241 verses.

The verses of Vyasa smṛiti has also been quoted by the commentators such as Medhatithi and Vishwarupa have seen quoting Vyasa smṛiti in the context of proof regarding various topics. There verses have been found in Mahabharata as well. Smṛiti Chandrika, Apararka and Mitakshara have also quoting the verses of the smṛiti.

Concept of Dāna in Dharmashastra-

The word Dāna has so much importance as it is attached with the practice of religious ceremonies. When a person gives something to another that is considered as Dāna. Sanskrit Sastras describe the act of Dāna as one of the Nitya karmas of a human being. According to Skanda Purana, a person shall give Dāna of 10% of his income as a part of Dharma.¹ Historical texts such as Mahabharata, Ramayana do throw some light on the

¹न्यायोपार्जितवित्तस्य दशमांशेन धीमतः।



Combined Legendre Spectral-Finite Element Methods for Two-Dimensional Fredholm Integral Equations of the Second Kind

Bijaya Laxmi Panigrahi 

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ABSTRACT

In this paper, we will discuss on the Combined Legendre spectral-Finite element methods (CLSFEM) for the two-dimensional Fredholm integral equations with smooth kernel on the Banach spaces and the corresponding eigenvalue problem. In these methods, the approximated finite dimensional space is the cartesian product of spline space and Legendre polynomial space. The problem is approximated by the CLSFEM using orthogonal projection, which projects from the Banach space into the finite dimensional space. The convergence analysis for both Fredholm integral equations and the corresponding eigenvalue problem will be discussed in both L^2 and L^∞ norms. The numerical results will be shown to validate the theoretical estimate.

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Combined Legendre spectral-finite element methods; eigenvalue problem; finite element method; Fredholm integral equations; Legendre spectral method

1. Introduction

Denote $\Omega = [-1, 1] \times [-1, 1] \subset \mathbb{R}^2$. Then the space $\mathbb{X} = L^2(\Omega)$ is defined by

$$L^2(\Omega) = \{u \mid u : \Omega \rightarrow \mathbb{R} \text{ and } \|u\|_{L^2(\Omega)} < \infty\}$$

equipped with the norm

$$\|u\|_{L^2(\Omega)} = \left(\int_{-1}^1 \int_{-1}^1 |u(x, y)|^2 dx dy \right)^{\frac{1}{2}}.$$

Consider the following integral operator \mathcal{K} defined on \mathbb{X} by

$$\mathcal{K}u(s, t) = \int_{-1}^1 \int_{-1}^1 k(s, t, x, y)u(x, y) dx dy, \quad (s, t) \in ([-1, 1] \times [-1, 1]), \quad (1.1)$$

where the kernel $k(., ., ., .) \in \mathcal{C}(\Omega) \times \mathcal{C}(\Omega)$, Ω is a given rectangular domain and $\mathcal{C}(\Omega)$ is the set of all continuous functions on the domain Ω . Then \mathcal{K} is a compact linear operator on \mathbb{X} .



Multi-projection methods for Fredholm integral equations of the first kind

Subhashree Patel^a, Bijaya Laxmi Panigrahi^b and Gnaneshwar Nelakanti^c

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ABSTRACT

We use piecewise polynomial basis functions to obtain the stable approximation solution of the Tikhonov regularized equation of the Fredholm integral equation of the first kind by utilizing multi-projection (multi-Galerkin and multi-collocation) methods. We evaluate the error bounds for the approximate solution with the exact solution in infinity norm. We provide an a priori parameter choice strategy under infinity norm. In addition to determining the regularization parameter, we discuss Arcangeli's discrepancy principle and calculate the convergence rates in infinity norm. We give test examples to validate the theoretical results.

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Ill-posed problems; Fredholm integral equation of the first kind; multi-projection methods; Tikhonov regularization method; piecewise polynomials

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1. Introduction

Many inverse problems in the the field of engineering and science (geophysics, radiography, electromagnetic field, signal processing etc.) can be converted into Fredholm integral equation of the first kind (see [6,10,12]). We consider the following general form of the first kind Fredholm integral equation

$$\int_0^1 k(s, t)u(t) dt = f(s), \quad 0 \leq s \leq 1, \quad (1)$$

where $k(.,.)$ and f are known functions and u is the unknown function to be determined in the Banach space $\mathbb{X} = L^2[0, 1]$.

It is widely known that the Fredholm integral equations of the first kind (1) is ill-posed. That means the major difficulty in the numerical computation of the first kind Fredholm integral equation is the instability of the solution w.r.t. the observation data f , i.e. small changes in the observation data may lead to a large error in the solution. Therefore, some regularization methods are needed to obtain the stable approximate solution. Since the effectiveness of the regularization method depends on the regularization parameter, it is important to select a good regularization parameter and the study on the regularization parameters are well documented in ([3–5,11,20] and reference therein). Tikhonov regularization method is one of the most commonly used regularization method in the literature.

Several numerical methods, such as projection methods (Galerkin and collocation) [6,15], wavelet method [14], degenerate kernel method [9], multiscale methods [5,13,14] have been developed to



Multi-projection methods for Fredholm integral equations of the first kind

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1. Introduction

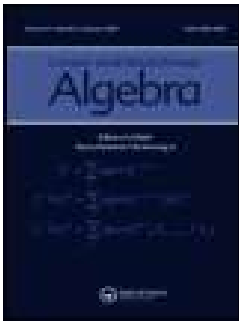
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A remark on the spectrum of fractional difference operator

A. Patra, P. Baliarsingh & L. Nayak

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