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2

Chapter - 1

Influence of Hinduism in the Religious Life of Molsom Community of Tripura

Dr. Sipra Ray

Abstract

Indian tribes are mostly Hindus and Buddhists. A small percentage has embraced Christianity. Molsom is one of the community belongs to the Halam tribe of Tripura. This study is an attempt to observe socio-religious and cultural aspect of Molsom tribe. Alike Vedic worship to nature, the Molsom society fond to worship the natural forces. Rites and rituals of the Vedas are reflected in the rites and rituals of Molsom community in Tripura. It is seen in the rituals of birth, marriage, *Upanayan*, etc, of the people. This clearly shows the influence of Hinduism in particular and the Vedas in general. They perform these rites with the help of a tribal priest *Awchai*. Related to different stages of life of a Molsom individual, and various rites and ceremonies observed from birth to death of a Molsom person finds similarities of social custom observed by the Hindu community. Molsoms believe in law of Karma and rebirth which has clear commonality with Hindu metaphysics. Molsom believe in many Hindu God and Goddess and name them in their own term like, *Ninu Jhapa* (Sun and Moon), *Inkil Pathwn* (Manasa), *Likhi* (Laxmi Debi, Goddess of prosperity), and so on. Besides these God and Goddesses, ancestors, some other supernatural powers and spirits are also worshipped by the Molsoms.

Keywords: Molsom, Vedic Rites and Rituals, Awchai, Nirakara Upasana.

Tribal Religion is one of the many aboriginal forms of Religion. Tribe means any aggregate of people united by ties of descent from a common ancestor, community of customs and traditions, adherence to the same leaders or a local division of an aboriginal people. Tribes are exceedingly small and limited social groups of hills people and their original religion is tribal religion. Indian tribes are mostly Hindus and some are Buddhists. A small percentage has embraced Christianity owing to western Missionary work.

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प्रस्तावना

हिंदी दुनिया की सबसे बड़ी भाषा है। यह दुनिया की जनसंख्या के 17.5% से अधिक और विकास-शील देशों में रहने वाले लोगों की वृद्धि से बढ़ती है। हिंदी दुनिया की सबसे बड़ी भाषा है। दुनिया के कई हिस्सों में शिक्षण के माध्यम से इसे सिखाया जा रहा है और हिंदी को दुनिया के कई हिस्सों में सिखाया जा रहा है। दुनिया के कई हिस्सों में शिक्षण के माध्यम से इसे सिखाया जा रहा है और हिंदी को दुनिया के कई हिस्सों में सिखाया जा रहा है।


इस पुस्तक का उद्देश्य है कि यह पुस्तक हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी। इस पुस्तक में हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी। इस पुस्तक में हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी।

दो-भाषी शिक्षण में हिंदी में बड़े अंकित शिक्षण कार्यक्रम को शामिल करने में हिंदी का उपयोग किया जा रहा है। इस पुस्तक में हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी। इस पुस्तक में हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी।

हिंदी भाषा, समाज और संस्कृति के बदलते तरीकार में इस पुस्तक में इस परिचित होने के कि "संस्कृति" एक भाषा के माध्यम से शिक्षण में समाज और संस्कृति को समर्थन देना है। इस पुस्तक में हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी। इस पुस्तक में हिंदी भाषा के शिक्षण के विभिन्न आयामों को प्रदर्शित करेगी।

यहां और सजावट का हिंदी भाषा में एक और एक प्रकरण समाप्त हुआ है। एक शिक्षण का शिक्षण की महत्ता है कि भारतीय धर्म भाषाओं के संवर्धनात्मक शब्दों का भाषाशास्त्रिक अध्ययन है।


1 <https://www.ethnologue.com/area/asia/spoken-languages-05-01-2021>, 116) 2 <https://hclib.com/wordpress.com/05-01-2021,11610>


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দেশভাগের কথকতা

খণ্ড দেশ ভগ্ন মন
রক্তক্ষরণ

সম্পাদনা
নিরুপম আচার্য


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না। এই শর্ত লঙ্ঘিত হলে উপযুক্ত আইনি ব্যবস্থা গ্রহণ করা হবে।

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মলয় দেব

১

দেশভাগের শর্তকে স্বীকার করে নিয়ে কতিপয় দেশীয় নেতৃবৃন্দ, ঔপনিবেশিক শাসক প্রভুদের ক্ষমতা হস্তান্তরের চুক্তিপত্রে স্বাক্ষর করে, দেশকে স্বাধীনতার অমৃতফল দিতে চেয়েছিলেন এ-কথা সত্য। কিন্তু, যেভাবে দ্বি-জাতিতত্ত্বের যূপকাঠে ১৯৪৭ খ্রিস্টাব্দে 'ভারত' নামক দেশ দ্বিখণ্ডিত হয়েছিল— এ-থেকে একটা বিষয় আমাদের কাছে স্পষ্টরূপে প্রতীয়মান হয় যে, সুদীর্ঘকাল ভারতবর্ষে বিভিন্ন ধর্ম ও গোষ্ঠীর মানুষ পাশাপাশি সহাবস্থান করলেও পারস্পরিক বিশ্বাসের ভিত্তিতে কোথাও যেন ফাটল ছিল। এই ফাটল সৃষ্টির পেছনে রয়েছে শ্রেণিবৈষম্য, শ্রেণিশোষণ ও ভূমির অসম মালিকানা। আর এই ফাটলের সূত্র ধরেই কিছু সংখ্যক বিভেদকামী শক্তির চক্রান্তের কাছে গোটা দেশকে, দেশের আপামর জনতাকে মাথা নত করতে হয়েছিল, সে-দিনের মানবতা বিরোধী রাষ্ট্রীয় সিদ্ধান্তকে মেনে নিতে হয়েছিল। যার ফলে, অমৃতের সন্তানেরা নিজেদেরই অজান্তে ১৯৪৭ খ্রিস্টাব্দে 'পার্টিশান' নামক যে-বিষবৃক্ষ রোপণ করেছিলেন তার রক্তক্ষরণ এখনও বন্ধ হয়ে যায়নি; বংশ পরম্পরায়, ব্যক্তি তার সমগ্র সন্তায় আজও সেই দগদগে স্মৃতিকে, যন্ত্রণাকে বহন করে বেড়াচ্ছে।

৪৭'এর পার্টিশানকালীন সময়ে যারা দেশভাগের প্রত্যক্ষ শিকার হয়েছিলেন তাদের সে-দিনের ভয়াবহ অভিজ্ঞতা, উত্তর প্রজন্মের কাছে স্মৃতিবাহিত হয়ে সঞ্চারিত হয়েছে। কিন্তু তৃতীয় প্রজন্মের কাছে কিছু রাজনৈতিক ও রাষ্ট্রনৈতিক দৃষ্টিভঙ্গিজনিত কারণে এই পার্টিশানের বাস্তবতা আরও বেশি ভয়াবহ রূপ নিয়েছে 'ডি-ভোটার', 'ডিটেনশান ক্যাম্প', 'এন. আর. সি.'—এই নতুন নতুন শব্দগুলির দৌলতে। ফলত নিয়ত প্রবহমান পার্টিশান তার বহুমাত্রিক রূপ নিয়ে ব্যাপ্তি থেকে সমষ্টির মনকে আন্দোলিত করে এবং ব্যক্তিসত্তা ও তার মানবিকবোধকেও নাড়িয়ে তোলে। এর পাশাপাশি অস্তিত্বের সংকট তার চিন্তকে করছে প্রতিনিয়ত দলিত-মথিত। পার্টিশানের প্রত্যক্ষ বলি প্রথম প্রজন্ম নিজেদের পায়ের নিচের মাটি শক্ত করার মানসে নিরন্তর সংগ্রাম চালিয়ে যাবার ফলে তাদের মনে এই সামাজিক ও রাষ্ট্রীয় সংকট নান্দনিকতায় খুব কমই পর্যবসিত হয়েছে; তুলনায় দ্বিতীয় ও তৃতীয় প্রজন্মের সৃষ্টিশীল মানুষের কাছে প্রবহমান পার্টিশানের যন্ত্রণা সময়ের দাবিতেই একটি অন্যতম বিষয় হয়ে উঠেছে। এই বহুস্বরাধিত বাস্তবতার বহুমাত্রিক রূপকে আমরা খুঁজে পাই বাংলা সাহিত্যের নানা অঙ্গনে।

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Empowering Indian Economy

Volume III

**Ashish Kant Chaudhari
Chinmoy Kumar Roy
Amit Manglani**

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Impact of FDI on Indian Manufacturing: A Study Post-launch of Make in India Initiative

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ABSTRACT

The aim of the present study is to provide an analytical insight into the impact of FDI on Indian manufacturing after the launch of Make in India initiative. The study used monthly data on Index of Industrial Production and FDI for the period from October 2014 to June 2019. A number of statistical techniques were employed including regression analysis and granger causality test. The findings of the study indicated a positive impact of FDI inflow on Indian manufacturing but the impact is too low. The result of granger causality test showed a unidirectional causality exists between IIP and FDI which flows from FDI to IIP and *vice-versa*.

Keywords: Make in India, Manufacturing, Granger causality test, FDI

I. INTRODUCTION

Make in India is a flagship initiative which is launched on 25th September, 2014 to encourage companies and manufacturing firms to produce their products in India. The vision for the Make in India initiative is to increase the contribution of manufacturing to the National GDP. In the process, the government expects to attract FDI, generate employment and transform India into an important manufacturing hub

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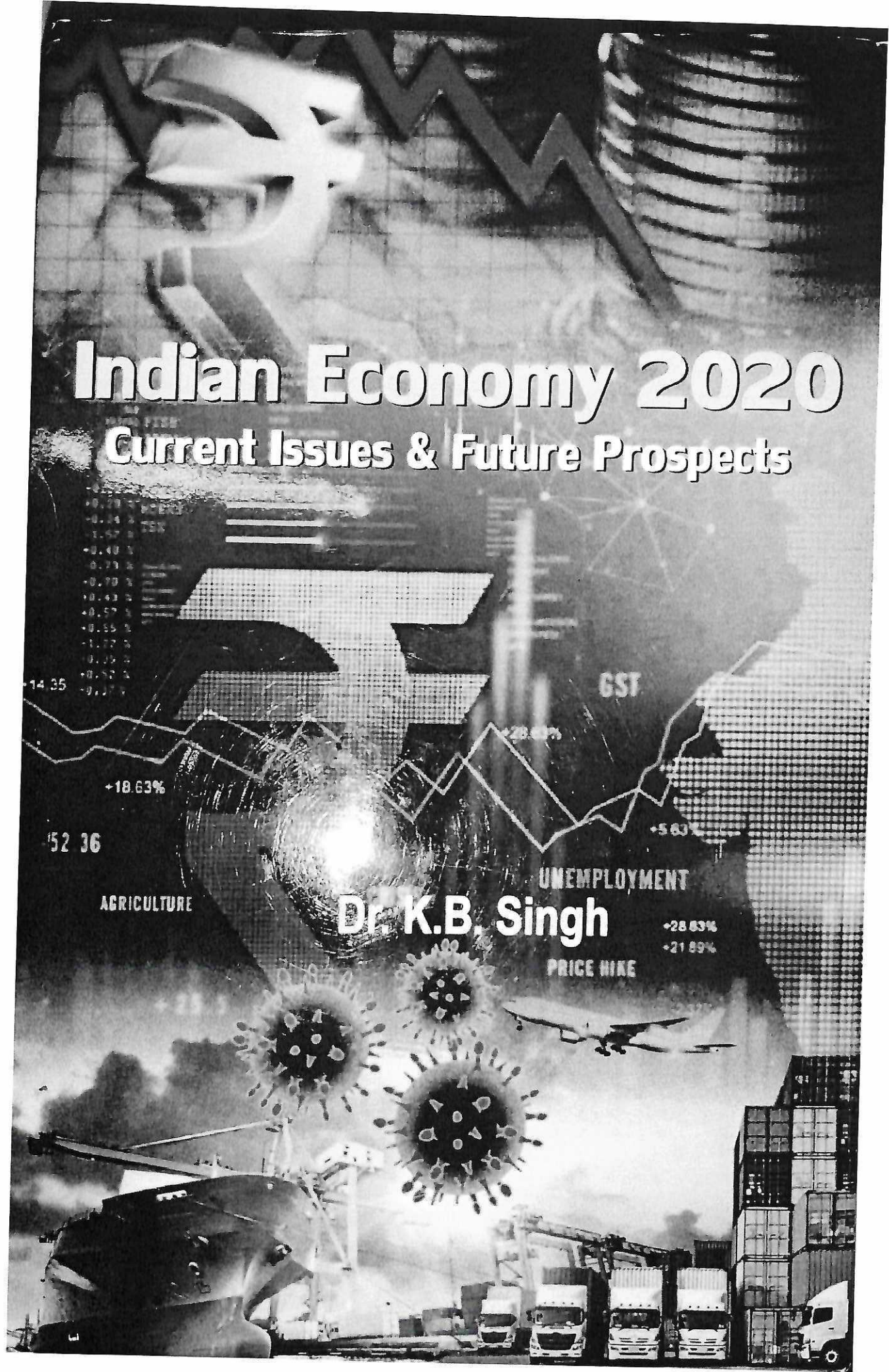
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CHAPTER

9

COVID-19 Outbreak and Its Impact on India

Dr. Joy Das¹, Animesh Bhattacharjee², Madhu Kumar³

Abstract

COVID-19 which emerged in Wuhan, China, has spread rapidly throughout the world. Till date, the virus has spread in over 200 countries and claimed over 2,00,000 lives. As a result of the deadly COVID-19 outbreak, Governments have imposed toughest restrictions on public life. Countries including India are going through full lockdowns and as a result, detrimental effects can be seen in the economies. On one hand, Governments are diverting financial resources to combat the health crisis and on the other hand, the economies are in ruins due to lockdowns and bloodshed in stock markets. However, the exact harm to the economy cannot be assessed so early, hence the present paper has attempted a rough estimate of the current and potential impact of covid-19 and specifically discusses some aspects of the effects on the Indian

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financial market. The analyses showed that the panic sell-off by FIIs led to massive liquidity outflow from Indian stock market. Since January 1, 2020 S&P BSE Finance index and S&P BSE Bankex have declined by 37.49 % and 39.38 % respectively. In addition, both public sector and private sector banks have witnessed sharp fall in their stock prices. Finally, the fiscal targets of India are unlikely to be achieved as there may be large fiscal deficit.

Keywords: COVID-19, Indian Financial Market, FIIs, lockdowns, fiscal deficits

Introduction

The outbreak of COVID-19 has created chaos in the world economy and with no clue of how to control the virus even the great economies of the world are facing the crisis. The virus got its ways to increase exponentially which forced the governments of affected countries to take severe steps of lockdowns and shut down all economic activities except the essential ones (Snooks, 2020). The closing down of economic activities has led to the situation where the business units may not be able to pay salaries to the employees. The liquidity crunch will be far superior in the informal sector. In addition the informal sector employs many migrant workers who already left the industrial cities for an unforeseeable period with no sources of income left. The supply and demand mechanism in Indian market has been affected severely and now with no income in hands, the demand side will again remain hampered even if production starts. With the devastating situation, the overall economy is drowned and the impact can be measured with the help of financial sector data. The exact harm to the economy cannot be assessed so early; hence the present paper has attempted a rough estimate of the current and potential impact of covid-19 and specifically discusses some aspects of the effects on the Indian financial market.

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CHAPTER

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Impact of Demonetization on Banking Sector Stock


Mahesh Dahal¹, Joy Das²

Abstracts

Indian economy is one of the fastest growing economy and an emerging market in the world. At the same time, the growing tax evasion, black money, increasing in terror funding and counterfeit currency led the growth of parallel economy. To curve the said threat and to boost digitalization i.e. a step towards to cashless economy, the Government of India, on November, 8th, 2016 announced the demonetization of currency note of INR 500 and INR 1000 which led to 86 percent of cash in circulation, illegal overnight. As a consequence of the announcement the BSE Sensex and NSE Nifty 50 crashed. This also leads to the occurrences of some infamous incident particularly in the banking sectors. As the banking sectors had the main role in the demonetization. On this background the researcher initiated to investigate into the impact of demonetization on stock of

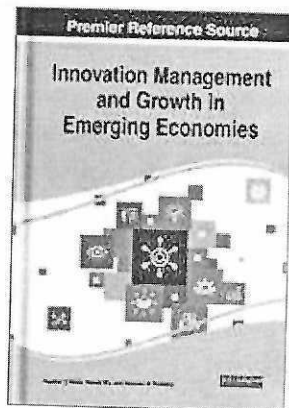
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Picturing the Indian Automotive Sector's Slowdown

Rajat Deb (Tripura University, India)

Source Title: Innovation Management and Growth in Emerging Economies (/book/innovation-management-growth-emerging-economies/244376)

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Abstract

The Indian automotive industry has remained a significant driver of the manufacturing sector and contributed to the GDP around 7% in 2018, but it is confronting its biggest slump in last 19 years with a double digit downfall in revenues across all segments. Such slowdown has caused job cuts of around 0.2 million workers, particularly contractual labourers, and shut down of around 300 dealers' shops in the last few months. A number of cyclical and structural contributing factors for the slowdown have been identified. Measures for turnaround are suggested, highlighting a recently announced stimulus package for reviving the industry.

Chapter Preview

Top

The Context

Indian business newspapers since July have been consistently reporting about the worst automotive slump emerged in the last quarter of a century leading to double-digit decline in top line, layoff of more than 0.2 million jobs, de-growth in the insurance premium collections and in the ancillary firms. The Society of Indian Automobile Manufacturers (SIAM) has empathically shown that vehicle wholesale across the categories have significantly dropped by 18.71 percent in July, 2019 vis-à-vis the corresponding period on year-on-year (y-o-y) comparison, a steepest downfall in last 19 years (Bhargava, 2019). Interestingly, the cascading effect of the slump has also adversely impacted the tyre, steel steering producers and the general insurance companies. The automobile industry has been contributing almost 8 percent in India's Gross Domestic Production (GDP) and around 49 percent of her manufacturing GDP. The Annual Survey of Industries (ASI) has reported the automotive industry has employed around 8


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Automatic Visual Gun Detection Carried by A Moving Person

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Abstract—Few works are reported in firearm detection, even though, it has an important application in both the field of video forensic analysis and surveillance. Security of different crowded areas such as around airport, marketplace, places of worships, shopping mall, ceremonies events such as marriage, parties etc. always have a requirement of automatic detection of moving person carrying illegal weapon. In the present scope of the work, we propose a gun detection technique based on template matching which is invariant to scale & rotation. Template matching is a simple and traditional method used for object recognition with a disadvantage of high time complexity. We propose an innovative yet simple way to reduce the time complexity by employing a background subtraction methodology. Background subtraction algorithm handles other challenges too, such as sudden change of illumination. Experimental results illustrate that the proposed method outperforms efficiently in gun detection in video sequences with lesser number of True negatives in comparison with state-of-the-art template matching algorithms.

Index Terms—Object Detection, Gun Detection, Database Creation, Crime Scene Analysis, Security & Surveillance.

I. INTRODUCTION

Automatic weapon detection recently gaining popularity to strengthening security system in sensitive areas [1], [2]. Therefore, several years CCTV cameras has been used for security purposes and it evolved to automatic surveillance system [3]–[5]. Recent automatic CCTV based surveillance system has the ability to detect suspicious intruder automatically. The automatic implementation of surveillance system could not reduce the manual intervention completely. In automatic implementation of surveillance system operators are required to confirm the suspicious intruder by observing activities of the object. one of the activity would be search for any weapons [5]. Concentrate on many monitoring screens is a challenging task for operators [6] [8] and often operators suffers from video blindness [7]. Hence, the implementation of automatic weapon detection has several applications.

Unlike object detection [9]–[12], weapon detection have several other challenges, such as:

- **High intra-class variability** is the most important challenge in detection of weapon. There are different types of weapons considering knife, firearms and they highly differ from each other regarding color, shape, size, etc.. Whereas, if only one class of weapon is considered than also a number of variants can be found. This high intra-class variability restricts the selection of key features from these weapons for automatic identification.

- **Illumination challenge** highly occurs in outdoor scenarios able to change the color of weapon, which in short increase difficulty in recognition of weapons based on color property.
- **Occlusion** is more important in weapon detection than the object detection because of its size. As the size of the weapons are small compared to the human handling the weapon, therefore, detection of fully occluded weapon is next to impossible. It is difficult but possible to detect partially occluded weapon by considering its key components.

Considering the sensitivity of automatic weapon detection several research works has been published, that proposed methodologies for automatic detection of weapons as shown in Table-I. Template matching based methods are mostly employed for weapon detection, such as [5], [14], [17]. Prime disadvantage of template based methods are high time complexity and template based methods are not scaling & rotation invariant. [13], [16] used classifier based methods to overcome the disadvantages of template based methods. In classifier based methods one important step is the segmentation of gun from the input images. Features from the segmented gun images are used to train the classifiers. Therefore, classifiers based methods are dependent on the correct segmentation of the gun from the input image. Template based methods are also employed k-means clustering for extraction of blob from the input image to be matched with saved templates. K-means clustering used color information for segmentation of gun, but guns are presented with various color. Therefore, color based methods would not be reliable. To handle these challenges, [13] used sliding window for feature learning. Using of small sized sliding windows and training procedure make the detection of weapon possible correctly.

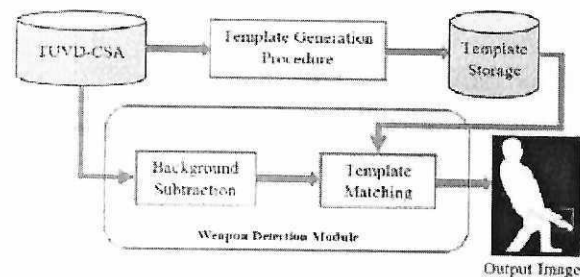


Fig. 1 Overall System Flow

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Side-Channel Attack in Internet of Things: A Survey



Mampi Devi and Abhishek Majumder

Abstract To ensure security for data exchange is a challenges task in Internet of Things (IoT). Thus, research on side-channel attack is a major issue in this domain. Side-channel attack is based on side-channel information. This attack is of either ciphertext only attack or plaintext only attack or chosen plaintext attack. Moreover, since this attack is cheap to perform, it requires little computing power and is relatively easy to perform. So, this attack is growing day by day. Therefore, security is not an easy task to establish in a given system. The motive behind this paper is to present a comprehensive survey on different types of IoT attack with special focus on side-channel attack. In addition, a list of research issues and open challenges are also highlighted in the paper.

Keywords Internet of things · Side-channel attack · Internet security · Cryptography

1 Introduction

Recently, the world is more connected through the electronic devices specially known as Internet of things (IoT) technology. Ashton [1] is the pioneer of the term IoT. Internet of things is instance technological changes which represent the future of computing and communications. To develop this technology is a dynamic invention, which is spread from wireless sensors network field to the nanotechnology-based architecture [2–4]. Nowadays, this IoT has potential applications spreading from smart city, control actuation and maintenance of complex systems in industry field to health transport. In simple, we can say that IoT becomes a important part of our lives.

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A Study of Micro-ring Resonator-Based Optical Sensor



Papiya Debbarma, Srikanta Das, and Bishanka Brata Bhowmik

Abstract Optical ring resonator evolved as a latest technology in recent years for various sensing applications. This paper focused refractive index-based sensing capabilities of ring resonator in optical light detection explained the ring resonator sensors designs and reviews the present state of the field. Several factors have been taken into account during simulation, including the effect of ring radius, gap spacing, input wavelength, refractive index, and waveguide width and height.

Keywords Ring resonator · Optical sensor · Refractive index-based sensor

1 Introduction

Optical ring resonator consists of waveguides; among these minimum one is a closed loop which is attached to some kind of light input and output [1]. To understand how optical ring resonator work, we must understand the optical path length (L_{optical}) of a ring resonator. This is given for a single-ring resonator.

$$\text{OPD} = 2 * \pi * r * n_{\text{eff}} \quad (1)$$

Here, r = Radius of the ring.

n_{eff} = effective index of refractive in waveguide material.

A sensor may be defined as a device, component, or subsystem whose function is to detect actions or changes in its environment and send the information to other electronics, frequently a computer processor. Optical sensor has long been popular


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Design of a Low-Cost Li-Fi System Using Table Lamp



Suman Debnath and Bishanka Brata Bhowmik

Abstract This paper presents a designing of a Li-Fi working model to send information in a unidirectional path via visible light to a receiving device across free space. The communication link will be set up between a mobile device and a PC using a modified table lamp to transmit data serially via USB COM port.

Keywords Light fidelity (Li-Fi) · Visible light communication (VLC) · Radiofrequency (RF) · Universal asynchronous receiver/transmitter (UART) · COM (communication) port

1 Introduction

A rapid evolution in technology is not only helping the society to progress, but it also opens the door of a new era of creative thinking for future innovations. Li-Fi is one such emerging technology in the subset of visible light communication (VLC) where the data communication is done wirelessly by modulating the output intensity of the light-emitting diodes (LEDs) with respect to the binary information, whereas a photo-detector is used at the receiver end to recover the transmitted signal.


Li-Fi was coined by a German professor Harald Hass that stands for *Light Fidelity*. He demonstrated this concept of optical wireless communication (OWC) at the TED Global Talk in Edinburgh in 2011 [1]. The concept of using light as medium of transmission dates back to the ancient times when light is being used in various forms like smoke signals or beacon fires to convey messages [2]. Over the years, optical communication has been evolved to a more advanced form where data nowadays is being sent wirelessly via optical medium that proved to be a complementary technology to the existing radio-frequency (RF) communication [3]. Li-Fi uses license-free visible

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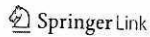
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Modeling and Implementation of Advanced Electronic Circuit Breaker Technique for Protection

Applications of Internet of Things pp 15-26 | Cite as

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Abstract

The following paper narrates a microcontroller-based system which is an advanced electronic circuit breaker that designed for voltage fluctuation, frequency fluctuation, short circuit, overload, and residual leakage current. The advanced circuit breaker announces various watchful parameters that users get information other than any smart energy device during any electrical fault-based accident. During twenty-first century, many IoT-based energy monitoring and control projects are done. This project has also on features of smart energy monitoring system in coordination with web server-based IoT model. However, this project can be initiated for the protection scheme of household service as well as protective model of smart power system [1], [2]. Nowadays, power system is dealing with high-voltage alternating current (HVAC) and extra high-voltage current (EHVC). For making high-voltage circuit breaker and protective devices, special attention should be taken for designing such equipment. The circuit breaker technique is used in this paper and can be installed in the protection scheme to make a fault-free power system and also IoT-enabled smart power system. A hardware prototype model is designed using Arduino microcontroller to make this project a successful one.

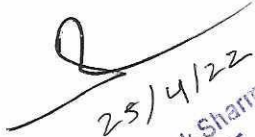
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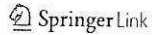
Advanced circuit breaker Residual current leakage Energy monitoring Arduino Internet of things

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Design of an Industrial Internet of Things-Enabled Energy Management System of a Grid-Connected Solar–Wind Hybrid System-Based Battery Swapping Charging Station for Electric Vehicle

Applications of Internet of Things pp 1-14 | Cite as

Conference paper

First Online: 04 August 2020



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415

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Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 137)

Abstract

Increasing greenhouse gases imposes severe concern over the environment since it results in rising dangerous calamities of climate change in the form of flood, cyclone, the rise of sea level, and so on. By promoting renewable power generation and electric vehicles, greenhouse gas emissions can be reduced to a very low level. But both the solutions have some major disadvantages like the intermittency of renewable sources is very high and also electric vehicles need to be charged after traveling a fixed distance. This paper mainly provides a remedy for these disadvantages. In this study, a grid-connected solar–wind hybrid system-based battery swapping charging station for the electric vehicle is designed, which includes an IIoT (Industrial Internet of Things)-enabled energy management system to efficiently utilize and control the flow of energy of different sources. This study includes a twenty-four-hour case study analysis on Meghalaya, India, by utilizing the real-time data of solar radiation and wind speed of January month to check the feasibility and power generation capacity. The results of this analysis simply indicate that the IIoT-enabled energy management system is efficiently managing the energy from different renewable energy sources in the proposed hybrid system for supplying the load and for storing a fixed amount of energy in the battery for electric vehicle charging which shows that the overall hybrid system is feasible, profitable, and environmentally friendly.


Keywords

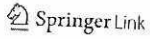
Hybrid energy system Climate change Renewable energy Industrial internet of things Electric vehicle Battery swapping charging station

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Angle-Based Feature Extraction Method for Fingers of Hand Gesture Recognition

Applications of Internet of Things pp 187-192 | Cite as
Conference paper
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Abstract

In this paper, two types of features 'angle' feature and *Finger_Tips* distance feature extraction methods for gestures of finger recognition are proposed. The entire image is segmented into several spatial modules and the task of feature extraction is carried out on finger of the hand images. Application of this method is extended to medical systems, sign languages for hearing-impaired people, crisis management and disaster relief, entertainment and human-robot interaction. This method is tested on medial axis transformation (MAT) image and it does not require any gloves for recognition. This feature extraction algorithm has an advantage of very low feature dimension.

Keywords

Feature extraction Classification MAT image Hand gestures recognition

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Smart Irrigation System Using Internet of Things

Applications of Internet of Things pp 119-129 | Cite as

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Abstract

As agriculture is the backbone of Indian economy, it deserves to be modernized. To overcome backwardness of traditional methods of agriculture and to enhance the crop production, to avoid the risk of damaging crops, and to do efficient use of water resources, the latest technology of Internet of things (IoT) is playing a crucial role nowadays. So, this paper "smart irrigation system" is proposed where the soil sensor is used to collect large number of real-time data from the agricultural fields. The sensors interact with each other through Internet connection. The data collected from the sensors sent to the Web server using wireless sensor network. IoT framework analyzes and processes the sensed data. Then, notifications are sent to the farmer's smartphone application periodically. The farmer can track changes in soil moisture. In this way, unnecessary wastage of water can be avoided. This paper discusses the various experiments done in this context and a comparatively low cost system module with sensors and wireless networks for modernized irrigation is represented.

Keywords

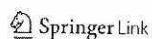
Smart irrigation Internet of things Arduino Wireless sensor network Sensors

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Fingerprint Authentication System for BaaS Protocol

Applications of Internet of Things pp 39-48 | Cite as

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Abstract

Over the past many years, several corporations have benefited from the implementation of cloud solutions among the organization. Due to the advantages such as flexibility, mobility, and cost saving, the number of cloud users is expected to grow rapidly. Consequently, organizations want a secure system, credit to manifest its users so as to make sure the practicality of their services and information hold on within the cloud storages are managed in a private environment. In the current approaches, the user authentication in cloud computing is predicated on the credentials submitted by the user like secret, token and digital certificate. Unfortunately, these credentials can often be stolen, accidentally revealed, or hard to remember. In view of this, we propose a fingerprint-based authentication system to support the user authentication for the cloud environment. We take into account a distributed state of affairs wherever the biometric templates are hold on within the cloud storage, whereas the user authentication is performed without the leak of any sensitive information.


Keywords

Biometric authentication Fingerprint recognition BaaS protocol Minutiae

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A Sustainability Perspective

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Chapter 6

Role of Hybrid Energy System in Reducing Effects of Climate Change



Somudeep Bhattacharjee, Uttara Das, Moumita Chowdhury,
and Champa Nandi

Abstract Climate change is a very rising topic nowadays since the climate of this world is changing rapidly day by day. In the technical field, it is seen that so many things or techniques used here, which have a very bad impact on our environment like use of non-renewable energy source, emission of greenhouse gases and so on. At present electric power generation is mainly dependent upon non-renewable sources. Due to rapid uses of non-renewable energy sources, its storage reserves are decreasing rapidly. So an alternate source is required and that is the renewable energy source, nowadays renewable sources are utilized but in small amount. Renewable sources are environmentally friendly, so using of renewable energy sources are more preferable than non-renewable sources for the betterment of our environment. Due to rising environmental concerns day by day, the utilization of renewable energy need to be increased as much as possible. There are so many remote or island places in this world where huge numbers of renewable sources are available which can be used for power generation. And the most important thing is that they have no effect (or very less effect) in this environment. So our goal is to model and simulate a grid connected solar-wind hybrid energy system which is used to solve the problems regarding the power generation. In this chapter a 24 h case study analysis is done by taking the real time data of solar radiation and wind speed of a selected location. The results of this analysis indicate that the hybrid system is profitable and environmentally friendly. This analysis simply gives an idea about to what extent there will be the generation of power and how much it will be helpful to this environment. In addition, it includes detailed discussion on climate change, harmful effects of non-renewable energy sources on the environment and the need of renewable energy based hybrid energy system to combat climate change. By this explanation we will get to know more about how renewable energy sources mitigate two problems – climate change & power demand.

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Lung Cancer Detection Using Deep Learning Network: A Comparative Analysis

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Abstract— Deep learning is an emergent and influential method which is used for feature learning and pattern recognition. We provide a comparison between Computer Aided Diagnosis scheme using Deep Learning Technique and traditional Computer Aided Diagnosis scheme in our paper. In this paper, we have compared several deep neural networks for recognition of pulmonary cancer. In our study, we find that Convolutional neural networks are used for pulmonary cancer detection in most of the cases, as compared to other algorithms in deep learning techniques. In conclusion, we address the few difficulties in the implementation of the systems for pulmonary cancer, then we summarise the advantages and disadvantages of the existing algorithms for diagnosis of pulmonary cancer.

Keywords- Pulmonary Cancer Detection, Lung Nodule, Deep Learning Network, Computer Aided Diagnosis scheme, Convolutional neural network.

I. INTRODUCTION

Nowadays, pulmonary cancer is considered as one of the fatal ailment [1]. Every year we have new records of over and above 1.6 million patients with pulmonary cancer. The early detection of lung nodules with Computer-Aided-Diagnosis (CAD) [3] schemes is especially significant for the analysis and recovery of lung cancer patients [2]. Though, classifying huge numbers of CT images is very hard and time consuming for radiologists. Therefore, the automatic recognition of lung nodules is important field for research and significantly enhances the effectiveness of pulmonary nodule detection frameworks.

In order to improve the clinical diagnostic systems for lung cancer, automated detection algorithm is a research domain that is related with representation of computable assessments. Automatic diagnosis of malignant/benign character of pulmonary nodules is typically the most important goals of CAD schemes and it is done on feature extraction in order to decide every time there is analytical indecision and disparity. Conventional CAD systems usually involve a number of image processing steps and then perform categorization job for detection of tumor or abrasion. Performance of traditional CAD systems depends a lot on the intermediary outcomes of the image processing steps for consistent features. In many CAD schemes, additional issues may be integration and selection of extracted features. The malignant/benign character of the training CT images can be simply identified by the annotator without the need for particular drawing of the tumor margins on the training dataset. There are many automatic diagnosis systems based on traditional systems, as research area based on deep learning techniques are less explored, so we are presenting our study which concentrates on CAD Schemes based on deep learning techniques.

From our study, we can see that from the perspective of CAD for lung cancer detection, Deep learning techniques have not been that much explored. In this paper, automated detection systems dependent on different types of deep learning architectures are analysed. Lung nodules can be classified as benign or malignant pulmonary nodules with the application of these networks to the CT images with some modification.

In the review paper, our contributions are as written below:

- In this paper, we compare the conventional CAD systems with the CAD methods established on Deep Learning technique.
- We have addressed several the advantages and disadvantages of the existing algorithms for pulmonary cancer detection.
- Several automated detection systems for pulmonary nodules with deep learning architectures are compared for in the paper.

II. TRADITIONAL COMPUTER AIDED DIAGNOSIS SYSTEMS

A CAD method is a research domain for study of the detection of pulmonary nodule and identification of pulmonary cancer, and it incorporates Computed Tomography images as input and based on an algorithm assists radiologists to perform an image analysis and malignant/benign tumor classification. Five important steps of Diagnosis of pulmonary nodules in CAD systems are: Database Acquisition, Preprocessing of Image, Segmentation Operation, Analysis and Classification. In Figure 1, we can see the important steps of a traditional CAD system; the first step is acquisition of CT images from accessible databases like LIDC, LIDC-IDRI, ELCAP [1]. Second step is preprocessing of Lung CT image in order to enhance the image and to remove unnecessary noises. Some of the commonly used preprocessing techniques are Adaptive Median Filter, Alpha-Trimmed Mean Filter, Gaussian Filter [19]. Third step is segmentation of the preprocessed CT image using a standard segmentation technique like thresholding technique, Markov random field, region growing, watershed and histogram based segmentation [22]. The fourth step is analysis, in which during feature extraction, some of the extracted features are for example area, perimeter, eccentricity, centroid, diameter [16]. The fifth

Smart Border Security System using Internet of Things

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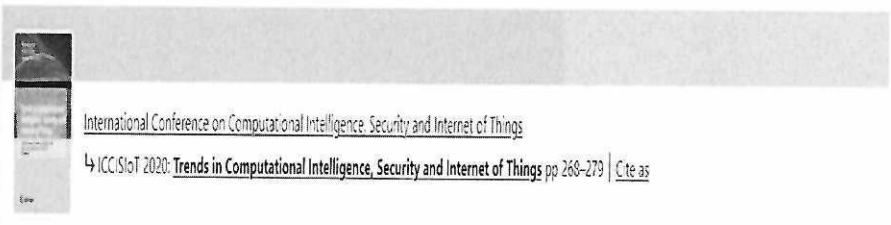
Abstract. National security and defence is incredibly important for a country and its people. For increasing tension in the border areas due to unresolved conflicts, currently national security systems emphasize more on border security to protect the country from terrorist attacks, illegal border crossing and infiltration from the neighbouring countries. To make security system more efficient, a real time border security system is needed which can provide 24 hours surveillance in the border areas with high accuracy and that can minimize the need of human involvement by utilizing the most advanced sensors and actuators. Indian Border Guarding forces are already installing and adopting newer technologies in terms of cameras, night vision devices, radars etc. But for the efficient and intelligent use of collected data, involvement of modern and innovative technology like Internet of Things (IoT) is very necessary, which already has been adopted but in very small scale and in limited areas. Whereas, it is the reliable source of accurate data and renowned for smart and fast decision making as it is one of the major fields of implementing Big Data and Analytics. So, a smart IoT based solution has been introduced for securing hazardous border areas with extreme climatic conditions, diverse land forms, river terrains, inaccessible dense forest areas which is very tough to monitor for the individual. This paper "Smart Border Security System using Internet of Things" proposes a low-cost system that uses various sensors like Passive Infrared (PIR) sensor and OV7670 camera module to sense movement of any object within a range and capture images of intruder respectively. The system can upload the sensed data into a cloud server which can be retrieved in a base station by using web and desktop application as well. The system can also send alert to the base station by processing the sensed data. Also, it allows user i.e. the trained security personnel to control the camera and retrieve data from it from a distant. Through the proposed system it is possible to detect the intruder crossing the border area instantly.

Keywords: Internet of things, Border security system, Passive infrared sensor

1 Introduction

Border security is incredibly important to guard vulnerable and valuable assets like an individual, dwelling, community and nation from any harmful activities


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Smart Border Security System Using Internet of Things

Machurima Bhattacharya & Alak Roy

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Abstract

National security and defence is incredibly important for a country and its people. For increasing tension in the border areas due to unresolved conflicts, currently national security systems emphasize more on border security to protect the country from terrorist attacks, illegal border crossing and infiltration from the neighbouring countries. To make security system more efficient, a real time border security system is needed which can provide 24 h surveillance in the border areas with high accuracy and that can minimize the need of human involvement by utilizing the most advanced sensors and actuators. Indian Border Guarding

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Recognition of Indian Classical Dance Single-Hand Gestures Using Moment Invariant Features

Mammi Devi & Alak Roy

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Abstract

Recognition of single-hand gestures of classical dance is a challenging task due to its variation of age group of dancer. It is also a difficult task to find out the invariant features specially when same images are captured from different angle of view. The main objective of this paper

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Abstract

Recognition of single-hand gestures of classical dance is a challenging task due to its variation of age group of dancer. It is also a difficult task to find out the invariant features specially when same images are captured from different angle of view. The main objective of this paper is to recognize single-hand gestures of Indian Classical dance using *Huś* invariant features. In this paper, three different types of image dataset namely boundary image, gray image and binary image dataset used. The seven *Huś* invariant features were extracted from all the three image dataset. This paper also presents performance of accuracy for twenty eight different classes of hand gesture based on the extracted features set.

Keywords

Huś moment feature Hand gesture recognition Mudra Indian Classical dance

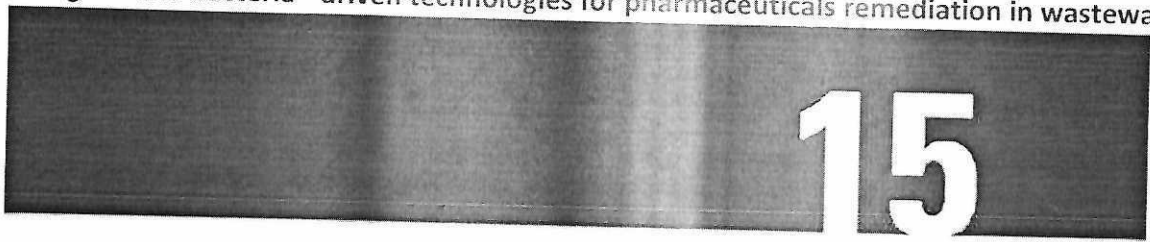
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3. Algae - and bacteria - driven technologies for pharmaceuticals remediation in wastewater.



Algae- and bacteria-driven technologies for pharmaceutical remediation in wastewater

Mamta^{a,*}, Shashi Bhushan^{a,b,*}, Mohit Singh Rana^c, Shaon Roychaudhuri^c, Halis Simsek^b, and Sanjeev Kumar Prajapati^b

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1 Introduction

Pharmaceuticals are drugs used to treat, diagnose, and help in preventing animal and human diseases. Various new and more effective pharmaceuticals are being developed in order to meet the ever-increasing demand worldwide. In a study conducted by the IMS Institute for Healthcare Informatics, global medicine consumption is predicted to be 4.5 trillion by 2020 (Viken & Klemmick, 2013). With the excessive production and subsequent usage of pharmaceuticals, these compounds are inevitably being released into waste streams. Pharmaceutical compounds enter the environment through hospital effluents, industrial discharges, agricultural runoff, and human as well as animal excreta (Zhang et al., 2016). Additionally, unused and discarded drugs eventually get into the ecosystem due to mishandling (Rogowska, Zimmermann, Mises, Farnosz, & Wolski, 2010). The fate of the pharmaceutical compound is illustrated in Fig. 1.1. Hospitals are one of the leading sources of pharmaceutical contaminants. Hospital effluents include active drugs, their metabolites, expired pharmaceuticals, hazardous chemicals, solvents, disinfectants, and heavy metals (Ewari et al., 2017). These contaminants have an inherent property to interact with living systems. They can remain in nature for a long time without any deterioration and have high toxicity in the

* These authors contributed equally to this work.

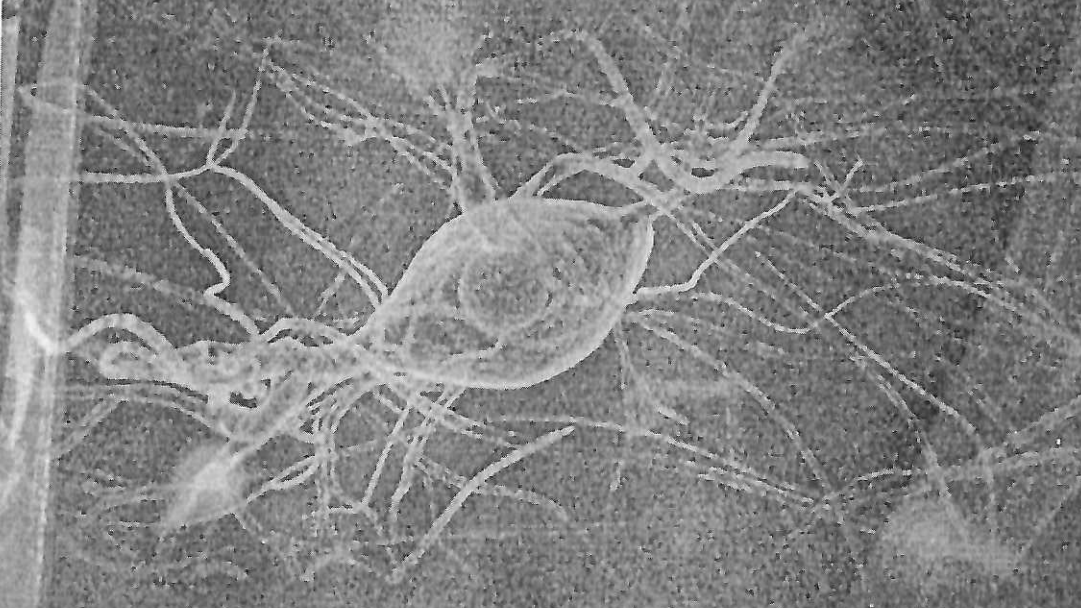

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Chapter - 16

JL. A Traditional Alcoholic Beverage of Halam Tribe of Tripura

Nandita Nath and Bipin Kumar Sharma


Abstract

Halam, a major tribe of Tripura having deeply rooted tradition associated with preparation and consumption of local rice beer socially and culturally. Survey and sampling of rice beer were done to study the process, faith believe and tradition of beer making by the Halam tribe. The survey reveals 11 medicinal plants used by the tribe in preparation of starter culture cake. The rice beers prepared with this cake are believed to have ameliorating health effects with the improved gastrointestinal condition. The process and product of traditional preparation of rice beer are properly documented in this manuscript. As per the literature survey, this study might be the first scientific report on making traditional rice beer by the Halam tribe of Tripura.

Keywords: Rice beer; Starter cake; Medicinal plant; Halam; Tripura.

Introduction

Tripura is a small hilly state of north-east India with a geographical area of 10,491 sq. Kilometres. The location of Tripura is between Latitude of 23° 45' N and Longitude of 91° 30' E. The geographic location and abundant forest resources support the survival of many ethnic communities in the hilly terrains and mountains of Tripura. It is inhabited by twelve major ethnic tribes viz. Tripuri (Debbarma), Reang, Jamatia, Noatia, Lusai, Molsom, Chaimal, Halam, Kukis, Koloj, Mog and Chakma. The climatic condition and forest resources favour the practice of brewing traditionally, which is an indispensable part of their culture and livelihood. The Halams is one of the ancient tribe of Tripura. They belong to the Indo-Mongoloid racial family, and linguistically they are close to Kuki sub-family of the Sino-Tibetan family². Practising and consuming rice beer is an age-old tradition among this tribe. It is essential in every festival, marriages and birth ceremony and even condolences. This study is focused on the primary source of


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Role of Extremophiles and Extremophilic Proteins in Industrial Waste Treatment

Sharmistha Tapadar, Deeksha Tripathi, Saurabh Pandey, Khyati Goswami, Arunima Bhattacharjee, Kunwali Das, Espita Palwan, Mamta Rani, and Ashutosh Kumar

Abstract

Majority of the industrial products are made in variety of extreme environments. These industrial processes generate by-products that are difficult to degrade, harmful for environment, and toxic to animals and humans. These industrial by-products are present in extreme conditions such as high salt and high or low temperature. It is an unfavorable condition for most of the waste-degrading enzymes as they work at ambient condition. The harmful industrial by-products, therefore, needed to shift at ambient condition for their degradation. Extremophiles grow at extreme conditions, and so their enzymes too work optimally under these extreme conditions. Extremophiles have enormous potential in biotechnological industry and waste remediation/management. Some halophilic microorganisms have great efficiency to remove petroleum, heavy metals, and dyes from the water polluted by industries. The chapter details the protein

Sharmistha Tapadar, Deeksha Tripathi, and Saurabh Pandey contributed equally to this work.

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Chapter 7

Control of Bacterial Biofilms for Mitigating Antimicrobial Resistance



Brij Pal Singh, Sougata Ghosh, and Ashwini Chauhan

Abstract Antimicrobial resistance is a significant global issue across countries irrespective of the level of income and imposes a significant health and financial burden. Naturally, microorganisms become resistant when exposed to antimicrobial drugs, and overuse of antibiotics is a primary driver contributing to their increased prevalence. But when bacteria are attached to a surface and expand as a biofilm, they become more resistant to antimicrobials as they are embedded in a slimy extracellular polymeric substance as a single or multiple bacterial species. Thus, bacteria within a biofilm are protected from killing by antibiotics, biocides, and other chemical or physical challenges. Biofilms often contaminate the medical devices and food industrial equipment leading to associated infections and food spoilage, respectively. Therefore, warranting a need for novel agents and effective approach against drug resistant biofilms.

Here we present innovative strategies to control and eradicate bacterial biofilms unlike the conventional antibiotic therapies. The review introduces the basics of biofilm development from a planktonic bacterium, the role of bacterial motility, structural components, and exopolysaccharides. Furthermore, signaling in biofilm, its association with antimicrobial resistance and how inhibition of biofilm signaling, using quorum sensing inhibitors molecules such as phytochemicals, signaling molecule analogues and RNA III - inhibiting peptide, can be exploited are discussed. Present review also deliberated the role of ultrasound and acidic electrolyzed water to disrupt biofilms from medical devices and food industry equipment. Besides we also reviewed the enzymatic and combination killing approaches used to remove biofilms. In the end, some emerging approaches like bacteriophage mediated disruption of biofilms and the role of nanomedicine to control bacterial biofilms are discussed.

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Pharmacology of Angiotensin and Its Receptors

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Abstract

Angiotensin is a peptide hormone produced by the proteolytic cascade initiated by the enzyme renin. The physiological effects of angiotensin are articulated by a particular receptor subtype, and it allows the cells to respond to extracellular signals. In earlier days, receptors were used to be identified using *in vitro* radioimmuno assay methods similar to the method used to identify receptor-binding properties of antibodies. However, nowadays the validation of receptors is done by doing the molecular or gene grafting into an unresponsive cell and then by observing the changes in chemical messengers. These innovative methods of identifying receptors have led to the discovery of two major angiotensin receptors, angiotensin type 1 receptor (AT₁ receptor) and type 2 receptor (AT₂ receptor), which produce cellular signals. Angiotensin has various physiological functions in different places such as juxtaglomerular cells, aldosterone, heart and kidney. The pharmacological intervention of renin-angiotensin system can be done by using beta blockers which create the inhibitory effect on renin secretion from juxtaglomerular (JG) cells. There is another method which involves the use of the renin inhibitory peptide. However, this method is not yet proved to be a successful approach for controlling the renin-angiotensin system. By far the most appropriate method of controlling the renin-angiotensin system is by using orally active angiotensin-converting enzyme (ACE) inhibitors, which interrupt the whole system. However, due to the associated adverse effects of ACE inhibitors, angiotensin receptor blockers (ARBs) are chosen over them. This chapter describes the history and origin of angiotensin, its biosynthesis, its mechanism of action and its physiological role. Further, the chapter also narrates the role of angiotensin as drug target and the use of ARBs for the pharmacotherapeutic intervention of hypertension.

Keywords

Angiotensin Angiotensin receptor blockers Renin-angiotensin systems Ang II AT₁ AT₂ Sartans Hypertension

Abbreviations

ACE	Angiotensin-converting enzyme
Ang II	Angiotensin II
ARBs	Angiotensin receptor blockers
AT ₁	Angiotensin type 1 receptor
AT ₂	Angiotensin type 2 receptor
AT ₃	Angiotensin type 3 receptor
AT ₄	Angiotensin type 4 receptor
CHF	Congestive heart failure
CKD	Chronic kidney disease
GPCR	

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Hormones and Steroids as Neurotransmitters

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Abstract

Neurotransmitters are chemical messengers synthesized by neurons, which enable interconnection of nerve fibers within their vicinity. Neurotransmitters traditionally consist of amino acids and their derivatives, chains of amino acids, peptides or proteins. However, several studies report that steroids and hormones also exert an acute effect on the physiology of neuronal activity and the expression of behavior that can happen within minutes. Those steroids that can bind to the neurotransmitter receptors and modulate the neurotransmission signal are included together within the term neurosteroids or neuroactive steroids. The examples of neuroactive steroids include progesterone, estradiol, testosterone, DHEA, glucocorticoid, allotetrahydrodeoxycorticosterone (THDOC), androstenediol (AD), ganaxoxone, androsterone, pregnenolone and their sulfate esters. Additionally, several synthetic steroids such as alphaxalone and 3 α -hydroxy-5 β -pregnan-20-one hemisuccinate possess similar characteristics of modulating neuronal activities to the endogenous steroids. These hormonal steroids exert their neuronal excitability functions through various receptors and ion channels such as the estrogen receptor, progesterone receptor, androgen receptor, GABA_A, AMPA and NMDA receptors. These neuroactive steroids are also involved in the pathology and physiology of various neurological disorders such as epilepsy, schizophrenia and traumatic brain injury. Additionally, these neuroactive steroids have agonistic or antagonistic effects toward the neurotransmission action of various other neurotransmitters some of which have undergone clinical trials for the treatment of various neurological disorders. Thus, these steroids and hormones can act as neurotransmitters, exert either agonistic or antagonistic effects on receptors and have potential benefits in the treatment of neurological disorders.

Keywords

Neurotransmitter Neuroactive steroids DHEA Estradiol Ganaxoxone Neurological disorders

Abbreviations

AD	Androstenediol
AMPA	α -Amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid
ANT	Adenine nucleotide transporter protein
ARH	Arcuate nucleus of the hypothalamus
BLSA	Baltimore Longitudinal Study of Aging
CB1	Type-1 cannabinoid
CNS	Central nervous system
CREB	cAMP response element binding protein
D1	Dopamine 1
D2	Dopamine 2
DHEA	

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Pharmacology of Calcium Channel

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Abstract

Calcium channel plays a very crucial role in the regulation of various vital functions of the body. The effects and modes of action of various drugs on calcium channels have been outlined with every detail. The pharmacology of various subunits and subtypes of this channel has been discussed in view of drug development in the near future. The role of Ca_v1 channel in health problems such as Parkinson's disease, cardiovascular diseases, subtypes of Ca_v2 channels in terms of G-protein inhibition and synaptic vesicle release, Ca_v3 channels for peptide toxins, and $\alpha_2\delta$ ligands in amino acid transportation and synaptic transmission has been highlighted in the literature. Diseases like obesity, epilepsy, and anxiety can be treated easily by targeting the T-type calcium channel which is one of the best potential therapeutic targets for the aforesaid diseases. In epilepsy and neuropathic pain, $\alpha_2\delta$ subunit is the most prominent area of therapeutic target by the gabapentinoid drugs. Thus, scientific research on calcium channel pharmacology may become revolutionary in the management of various chronic diseases. In this chapter, all possible attention has been given to describe the super selectivity of different subtypes of calcium channels by focusing on isoforms of channels and biophysical properties in various target tissues.

Keywords

Calcium channel Voltage-gated calcium channel Ca_v1.2 Ca_v1.3 Ca_v2.3 Ca_vβ L-type calcium channel
Drug selectivity $\alpha_2\delta$ ligand Splice variants

Abbreviations

<i>AID</i>	α -Interaction domain
<i>CRMP-2</i>	Collapsin response mediator protein-2
<i>CYP450 3A4</i>	Cytochrome P ₄₅₀ 3A ₄
<i>DUB</i>	Deubiquitinating enzyme
<i>GABA</i>	γ -Aminobutyric acid
<i>GPCR</i>	G-protein-coupled receptors
<i>IP₃</i>	Inositol 1,4,5-trisphosphate
<i>NAGly</i>	N-Arachidonylglycine
<i>pS</i>	Picosiemens
<i>TAT</i>	Transactivator of transcription
<i>US-FDA</i>	United States Food and Drug Administration
<i>USP5</i>	Ubiquitin-specific peptidase 5
<i>ω-TRTX-Hg1a</i>	

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Lightning Detection and Warning



Anirban Guha, Yakun Liu, Earle Williams, Carina Schumann,
and Hugh Hunt

Abstract This chapter is concerned with the remote detection and analysis of thunderstorms and lightning flashes by electrostatic, electromagnetic and photographic means, and the use of these methods for public warning of hazardous conditions. Section 1 addresses the measurement of electrostatic fields in fair weather and in response to the stronger fields of electrified shower clouds and thunderstorms. Section 2 reviews various methods in place worldwide for the detection of the electromagnetic radiation from lightning. The observation of the evolution of lightning flashes with video-camera observations is the subject of Sect. 3. The final Sect. 4 addresses the dissemination of the multitude of available observations for purposes of improving lightning safety.

Keywords Electrostatic fields · Video-camera observations · Electromagnetic radiation · Nowcasting · Detection

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INDIAN FOREIGN POLICY

and Contemporary
Security Challenges

Edited by
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Ajay Kumar

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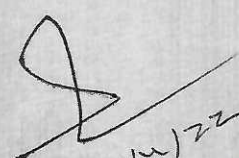
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The Security Dimensions of India's Foreign Policy Towards Myanmar

Biplab Debnath*


Introduction

India's immediate eastern neighbour and the only country in South East Asia which shares a land border, Myanmar is of vital strategic significance in India's foreign policymaking. The geo-strategic location of Myanmar, almost at a point of intersection between South Asia, Southeast Asia and East Asia, creates an array of linkages for India in engaging with the broader Indo-Pacific region. Myanmar is consistently projected as a gateway to India's engagement policy with Southeast Asia in India's Look East/Act East Policy, as well as a vital component of India's Neighborhood First Policy – both foreign policy objectives pursued more rigorously since BJP's ascendance to power in 2014. India shares over 1600 km long land border with Myanmar and a maritime boundary in the strategically crucial Bay of Bengal, with its pits and falls as the benefits of land and maritime connectivity accompanies the perils of security threats. Myanmar also shares borders with four Indian states of Northeast – Mizoram, Manipur, Nagaland and Arunachal Pradesh – a region often inflicted with security threats mainly of a non-traditional nature with the involvement of an external dimension. The China factor also factors in India's Myanmar policy, as the rise of the Asian giant in the global power hierarchy and its corresponding exertion of influence, in what is regarded as India's traditional sphere of influence, necessitates a constructive approach from New Delhi towards Myanmar.

Historical Overview

Even though India and Myanmar shared significant cultural, social and people-to-people links throughout a long period of history, political relations between the two nations were inconsistent at best. For a long time, Myanmar was an underrated neighbour of India

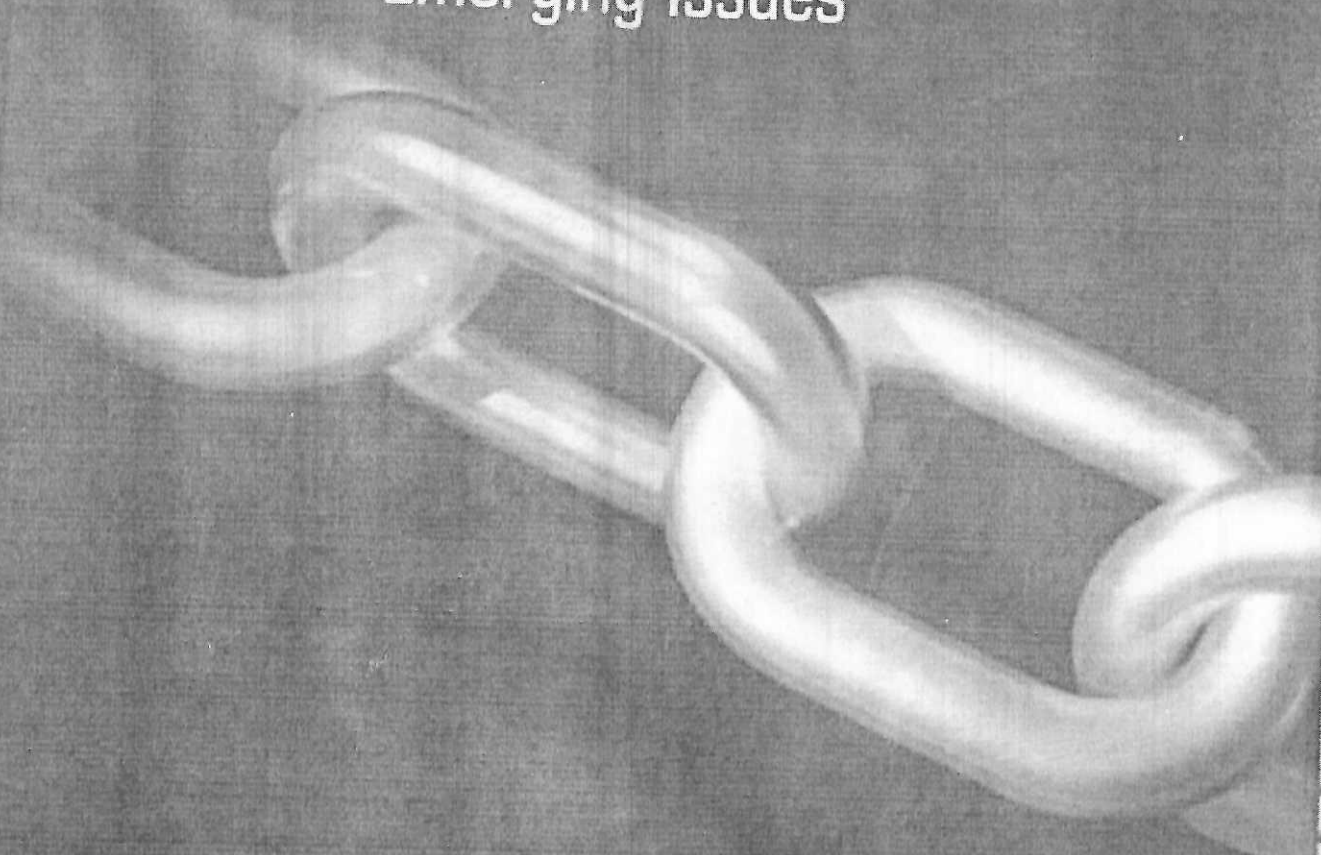
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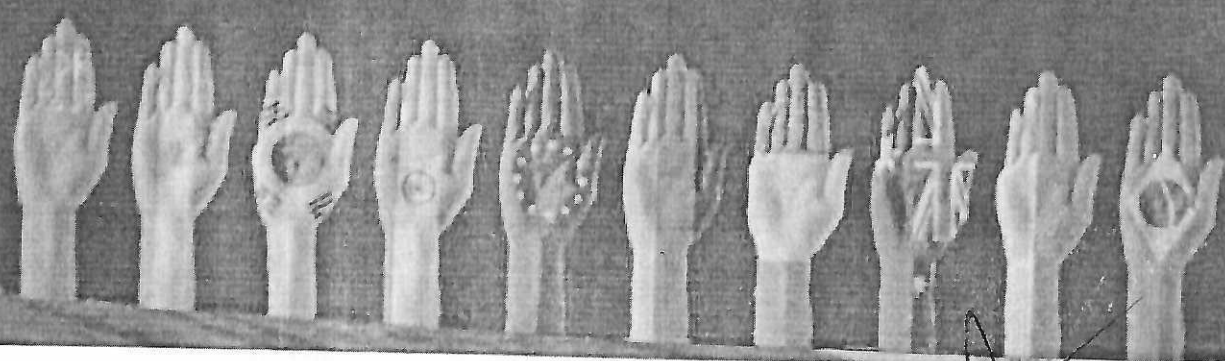


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Emerging Issues



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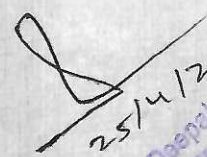
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About the Book

Federalism is a concept in which central and state governments cooperate with each other for good governance and for making efforts to sort out all the problems arising in its way in cordial manner. This system is different from the system in which programmes and policies of central government are imposed on states without any consultation with them and also without any agreement and coordination between them.

In a vast country like India with so many diversities, flexibility and rigidity both are essential within constitutional provisions for smooth functioning of our federal system, but conflicts arising not due to ideological issues but due to political reasons mostly have always created hindrances. In recent years, though emergence and success of a political party at the national horizon has provided political stability, but on the other hand several contentious issues due to lack of consensus between centre and opposition ruling states have become home of contention between them thereby threatening the sound base of our entire constitutional system including constitutional institutions also.

In this edited book eminent scholars having their expertise in federal studies have discussed different functional dimensions of cooperative federalism in India to know whether this concept is a myth or reality in different stages of its functioning.

About the Editor

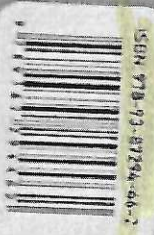


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Cooperative Federalism in India:
Myth or Reality

Foreword by Prof. Mahendra Prasad Singh

Cooperative Federalism in India: Myth or Reality

Editor

Prof. Saroj Kumar Verma

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Towards Cooperative and Conflicting Federalism: An Analysis with Reference to the Recent Trends and Dimensions of Centre-State Equations in India

Dr. Pankaj Chakraborty and Prof. K.N. Jena

Introduction

In August 1947, India became an independent democratic nation and in January 1950 we became a constitutional republic. The Indian Constitution incorporated a federal structure, with a strong union bias. However Indian states were not considered as independent sovereigns voluntarily joining a federation. India's now comprised of 28 states and 09 "Union Territories" (UTs). In general, the constitution was structured to give the central government residual authority and considerable sovereign discretion over the states, creating a relatively centralized federation. India is the world's largest democracy; Indian democracy is designed in a federal structure. While democracy represents the majority opinion, federalism accommodates and links it to the voice of the minority, lending a favour of social justice. The federal structure has given the India's political system great flexibility to sustain the cultural pluralism of the country through the constitutional means.

Federalism means the constitutionally allocated distribution of powers between two or more levels of government – one, at the national level and the other, at the state or local level.¹ The word Federation is derived from the Latin word *foedus*, which means treaty or agreement. A federation, therefore, is a political system that is formed through a treaty or agreement between its various constituent units.² When few contiguous provincial or state units voluntarily come together to form a strong union, a federation is formed. The USA is a perfect example of a federation of states. There is another model where the Geographically vast and culturally diverse state gives

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autonomy to its provinces or states for administrative convenience and for representing the regional interests. This model of federation is called the "holding together" federation. Indian federalism has been broadly designed based on the second model. In India there are two types of governments, one at the central level and the others are at the state level. However, the Indian Constitution has structurally made the Union government more powerful than the states. The objective of this paper is to have an understanding of federalism in India from a historical and analytical perspective. This article also focuses on the various dimensions of centre state relations in India and attempts to analyse the phase wise development of Indian federalism. This paper also aims at understanding federalism in India from the present context with a reference to the centre state relations during the present one party dominance system and during the COVID-19 pandemic.

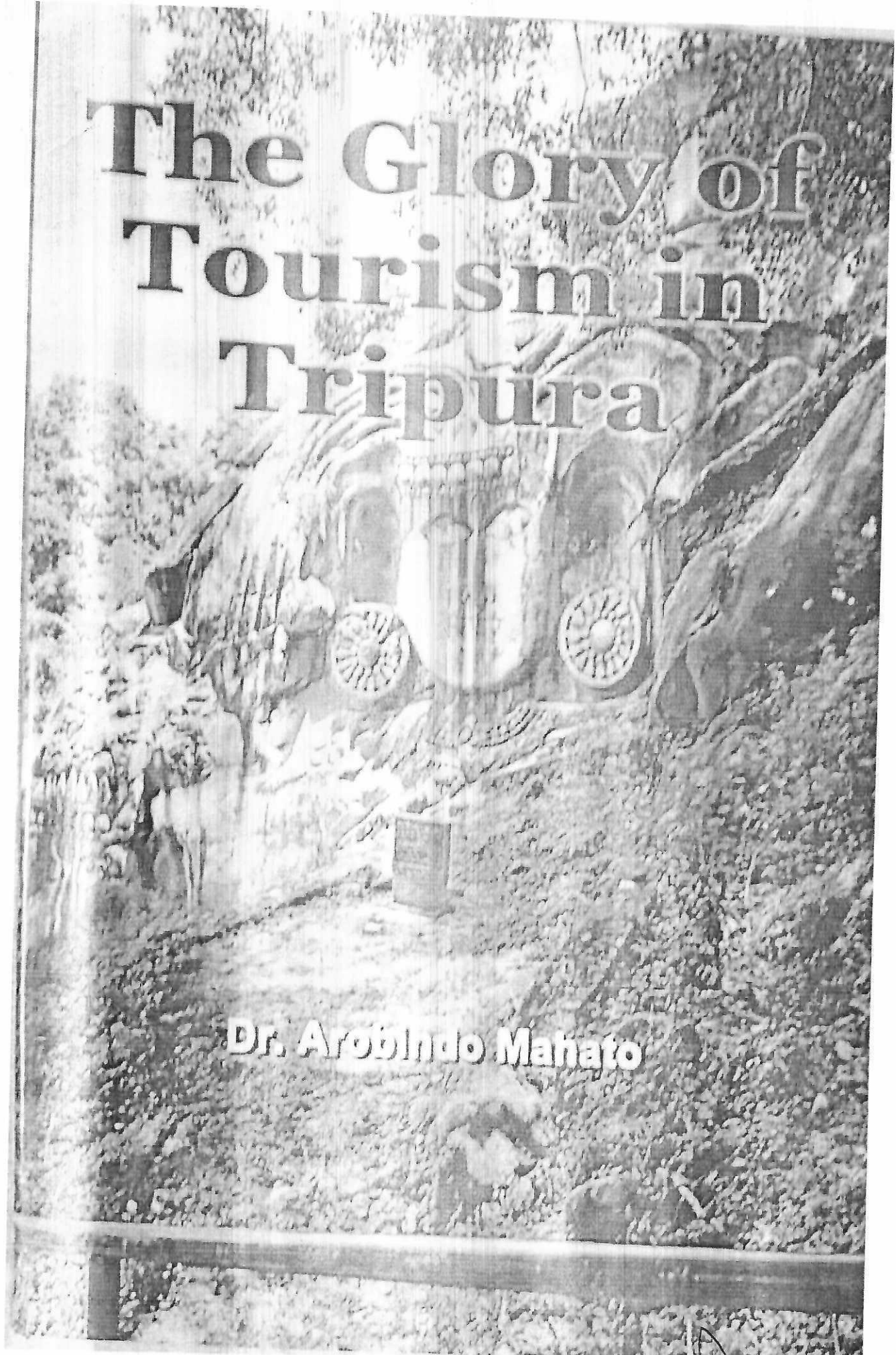
Federalism in India: Pre-Independence Experience

The federal policies and principles were practiced in India since ancient time in various kingdoms and by different rulers. In most of the places there was no intervention in local affairs by the rulers. It was known to the rulers that the policy of non-intervention in the local happenings was needed as the subcontinent had a huge diversity. If these diversities weren't respected and if they try to impose common set of norms and conditions then it would have been difficult for them to continue to rule. Looking at these cultural and various other diversities the ancient rulers followed the principle of federalism by allowing the locals to manage their affairs as per the norms set at the community or cultural level. History tells us that any ruler who tried to impose common codes in all parts of their kingdom in this region have failed to keep the rule get going and had to face disintegration. For example we can talk about Mughal rulers like Jahangir and Aurangzeb. Later on British Government tried to follow the pattern and policies of federal government in India to a good extent. At first after the independence India became a nation and became a union of states. Article 1 of the Constitution of India reads, "India, that is Bharat, shall be a union of states". If we search through British rule in India then the roots of cooperative federalism can be found in the Regulating Act of 1773.

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The Glory of Tourism in Tripura

Dr. Arvind Mahato



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At present he is working on various aspects of livelihood such as tourism, trade between India and Bangladesh, Impact of migration from Bangladesh to India on rural livelihood, women entrepreneurship etc..



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बौद्धों को बुद्ध के जन्मदिन और मृत्युदिन पर एक वर्षा की वर्षा

डॉ. देवराज पाण्डेय

भूमिका: - श्रीनीलाचलधाम में अधिष्ठित त्रिमूर्ति श्रीजगन्नाथ, बलभद्र तथा सुप्रदा अदि देवों में से श्रीजगन्नाथ हिन्दू धर्म का या बौद्ध धर्म के प्रमुख आराध्य देव माने जाते हैं। आजादक संन्ये के पत्र में है य, परन्तु कुछ शास्त्रीय प्रत्यक्षिक, पुराणिक तथा काविक प्रमाण होने इस विषय में सौम्य के विभिन्न यथासंभव प्रेरित करता है। इन सब बातों को लेकर यहाँ एक संक्षिप्त चर्चा निम्न प्रकार है।

शास्त्रीय प्रमाण - श्रीजगन्नाथ जी के अनुसार 'श्रीजगन्नाथ' शब्द का अर्थ है नवम अवतार भक्त जगन्नाथ और जगन्नाथ बुद्ध भी माना जाता है। श्रीजगन्नाथ शब्द के अन्वय में उद्भव बुद्ध इन्द्रभूति स्वर्चित ज्ञानसिद्धि मन्थ में आदि बुद्ध को सर्वप्रथम श्रीजगन्नाथ जी के नाम से अभिहित कर के प्राणपात कर रहे हैं। जैसे -

प्रधिपत्य जगन्नाथ सर्वजीनवरर्चिषतम्

सर्वबुद्धमयसिद्धिवापीनं गमनोपमम्।

सगुणं शिष्यमद्ग्राहो सर्वं बुद्धानुकारकम्,

इत्युक्त्वा जगन्नाथो नान्यं वै गुरुवः स्मृताः ॥

प्राचीन बौद्ध जालिद्रम्य एवं श्रीमन्दिर गात्र से मिली भगवान विष्णु की प्रतिमूर्ति प्रमाणित करती है कि, बुद्ध एवं विष्णु, दोनों ने २४ बार अवतार लिया था। इस के अतिरिक्त श्रीमन्दिर के पश्चिम पार्श्वस्थ चूड़ों में विदित आसीन बुद्ध, विष्णु के २१ तम अवतार के रूप में विद्वान् हैं।

प्रलतात्त्विक प्रमाण: - पुरी में श्रीजगन्नाथ जी स्वयं अवस्थापित होने से पहले वे नीलमाधव के रूप में शबरों के द्वारा पूजित होते थे। उनका मूल अवस्थान महानदी के किनारे पर अत्यन्त दूर्गम स्थान पर होता था। सोनपुर, बौद्ध आदि स्थान से लेकर चौद्वार तक महानदी के किनारे पर जो बौद्ध स्थापत्य मिलता है, वह सब भञ्जवंशीय राजाओं की पृष्ठपोषकता के द्वारा हुआ है, ऐसा अनुमान लगाया जा सकता है। हुएस्तों

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के द्वारा वर्णित पुष्पगिरि विश्वर में भी इन सब इलाकों का वर्णन है। यह स्थान महाकान तथा हीनयान आदि बौद्धानुयायियों का समन्वयक्षेत्र था। कर्ण युवर्ष के राजा श्री शशाङ्क राज के समय जिस बौद्ध विद्वेषी कार्य का सूत्रपात हुआ था, उस के भय से तत्कालीन राजा श्रीजगन्नाथजी को सोनपुर के कोटमभलाइ में जमीन के नीचे दफना कर रखा था। बाद में चौबीसवीं शताब्दी में यथाकिञ्चिती प्रयत्न में पुनः प्रकट होने पर बुद्ध के स्थान का पता लगाया गया।

ओडिशा के गजपति महाराज रामचन्द्रदेव द्वितीय (१७२७-१७३६)

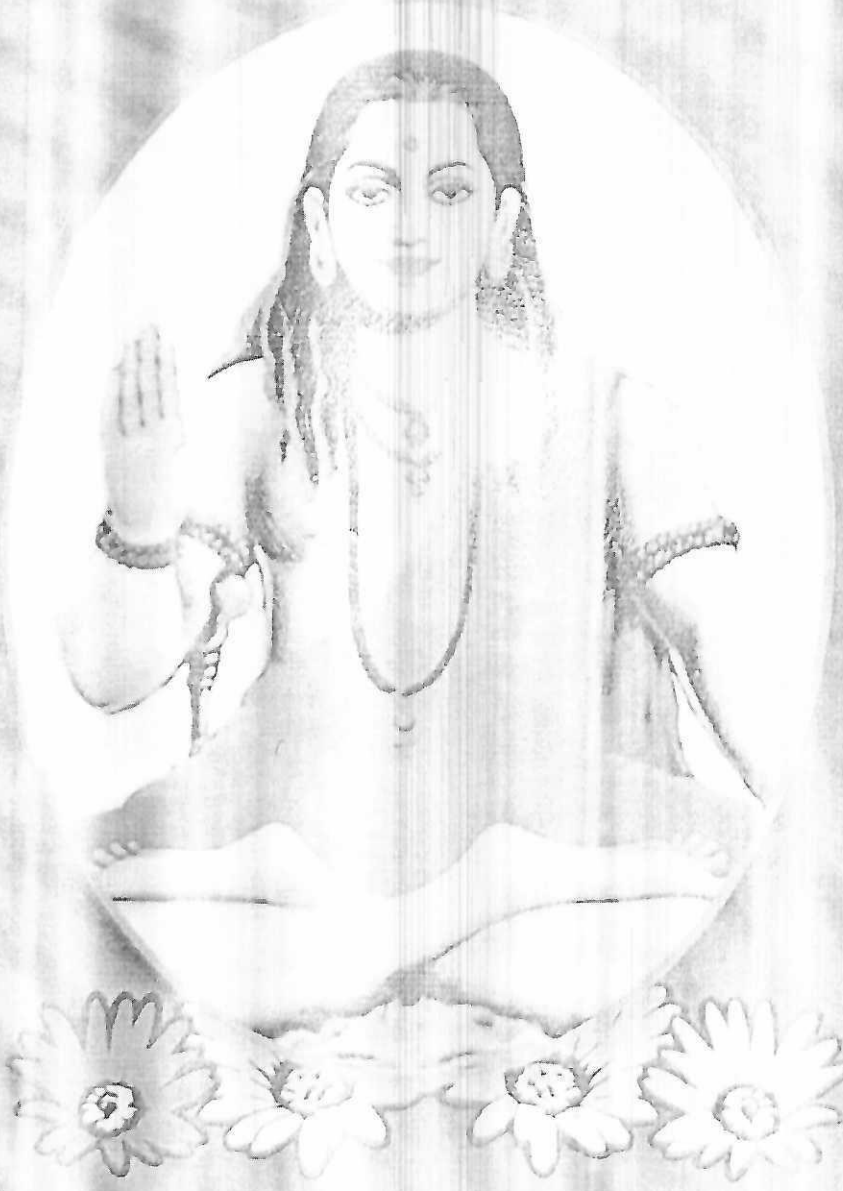
गुल्लामगंज का एक हिन्दू राजा होने के कारण ही जगन्नाथ जी के दर्शन में रुचि लेते हैं। उस समय उन्होंने नये रूप में श्रीजगन्नाथ धर्म की सृष्टि करने के लिए बौद्धधर्म नरसिंहपुर में आकर जौहर की वाकिक समस्त व्यक्तित्व किया था। उन दिनों महाकान के अन्वयिकार्यों में इन सब स्थलों पर 'खम्बा (स्तम्भ) / जगन्नाथ (pillar) / जगन्नाथ की स्तम्भ' का नाम देकर उन स्थानों को भी 'जगन्नाथ' कहा गया।

नागवंशी बौद्धमार्गवाली विषय में एवं प्रथम आधिकारिकियों के द्वारा पूजित खम्बा (स्तम्भ) - धम्बा (pillar) तथा स्यासतस्यो द्वारा जगन्नाथ स्यासतस्यो को भी श्रीजगन्नाथजी की प्रतिमा की कल्पना की थी। प्रत्यक्ष उस समय बङ्गाल के प्रकटी इन्द्रभूति ने 'नवम' शब्द के साथ 'नव' शब्दको जोड़कर 'नवमनव' जगन्नाथ शब्द का उच्चारण करने में मुख्य भूमिका अदा की थी। उन्होंने जगन्नाथ शब्द की परिष्कारण कर 'ओडिशा के जगन्नाथ' शब्द को 'जगन्नाथ' शब्द में परिवर्तित कर दिया है।

पुनश्च ऐसा भी प्रमाण मिलता है कि किम्बदन्ती के अनुसार महाकान का अपरनाम भी इन्द्रभूति है। 'इन्द्रभूति' नाम क्रमशः अपभ्रंश के कारण 'इन्द्रभूति' में भी परिवर्तित हो सकता है। महाकान इन्द्रभूति जो न श्रीजगन्नाथ जी मन्दिर का विश्व तयार कर के प्रतिष्ठा की थी। सभवतः धर्म नष्ट होने की आशका से अपना नाम किन्सा भी शिलालेख में उत्कीर्ण न कर के गुप्त रखा था इस बात में समीक्षकों का भी मत है, जब जगन्नाथ जी से राजाको वर मिल रहा था, तब राजा ने निर्वशा होने के लीये वर मांगा था। उस बात का वर्णन भक्त कृष्णदास के द्वारा रचित 'देउल तोला' ग्रन्थ में कुछ इस प्रकार से उपलब्ध होता है -

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नाथपंथ : साधना और साहित्य



उत्तर प्रदेश हिन्दी संस्थान, लखनऊ

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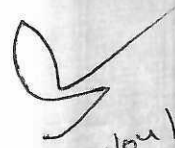
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त्रिपुरा में नाथपंथ का प्रभाव तथा स्थानीय साहित्य में उसकी झलक

ॐ पार्थसारथि शील

'शक्त्या तु सृजते विश्वं शिवेन परिपाल्यते।
कालेन च संह्रियते मुक्तिर्नाथेन दीयते।'

अर्थात् सृष्टि-स्थिति और लय की प्रक्रिया में शक्ति विश्व का सृजन करती है, शिव इस सृष्टि का परिपालन करते हैं और काल उसका संसार बन्दे हैं सर्वतः नाथ मुक्ति प्रदान करते हैं। नाथ शब्द की व्युत्पत्ति अल्प-अल्प प्राप्ति होती है। इसमें 'ना' दर्श अर्थात् स्वयं का प्रतिनिधित्व करना है जबकि 'थ' अल्पत्व के स्थापित होने को प्रकृतता है। शिव-शक्ति का सम्बन्ध अनादि है। इस शिव शक्ति नाथ को आश्रय उसके चिह्न दर्शन का निदान्त स्थापित हुआ है। शिव शक्ति सम्बन्ध के विषय में नाथ आचार्यों ने भी यही मन् व्यक्त किया है।

'शिवस्याभ्यन्तरे शक्तिः शक्तयेरभ्यन्तरे शिवः।
अन्तरं नैव पश्यामि चन्द्रचन्द्रकयोरिव।'

डॉ. कल्याणी शर्मा ने अपने शोध प्रबन्ध में बतलाया है कि गोरक्ष का दर्शन प्राचीनकाल के शैवमत के अद्वैतवाद पर आधारित है। किन्तु उसका नाथ तत्त्व द्वैत-अद्वैत, साकार-निराकार से अर्थात् है। शिव नृप चिह्न है और शक्ति उसका परिवर्तन एवं विकास का पक्ष है। नाथ लोक जगत्पतन के अद्वैतवादी परम कारण को शिव या शिवनाथ के नाम से अभिहित करते हैं।¹ इस नाथ परम्परा के सबसे प्रसिद्ध आचार्य हैं गोरक्षनाथ। जिन्होंने नाथ सम्प्रदाय के विकास और प्रचार में सर्वापेक्षा ज्यादा महत्वपूर्ण भूमिका निभायी है। नाथ परम्परा में जिन आचार्यों की श्रुति प्राप्त होती है उनके साथ निवृत्ती बौद्ध परम्परा का सादृश्य मिलता है। सर्वोच्च नाथना पद्धति, नाथ तथा शैववाद के साथ भी इस सम्प्रदाय का सादृश्य पाया जाता है। डॉ. मन्मद शर्माद्वारा से अपने 'बंगाल साहित्य का इतिहास' पुस्तक में कहा है कि बंगलादेश में शैवपरम्परा के पुनरुत्थान से पहले नाथिया बौद्ध नाथिक सम्प्रदाय ने अपने मत के प्रचार किया था। चैम प्रदेज में तीर्थिक तथा बौद्ध सम्प्रदायों में धर्मोत्थान हुआ और दोनों में मेलनाय करने के लिये अथवा दोनों के समिश्रण से परिचय बंगाल में तादर्थ और पूर्णत्व में नाथपंथ का उद्भव हुआ।² पूर्ववत् अर्थात् अद्यतन बांग्लादेश, नेपाल और पूर्ववत् अर्थात् पश्चिम बंगाल और त्रिपुरा और जर्मन के कुछ प्रदेशों (सिलोन) के

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Professor Sukanta Banik did his BSc, MSc and PhD in Zoology from University of Calcutta. He visited University of Dhaka in 1991, Institute of Ecology, Mikolajki, Poland in 1994 and Leibniz Institute of Limnology, Germany in 2009. He visited Climate Research Institute, Germany and also the Laboratory of Albert Einstein, Potsdam, Germany in 2009.

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Chapter - 1
**Biology of *Ompok pabda* of Feni River Ecosystem
of Tripura, India: A Step for Conservation**

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Chapter - 2
Population Density of *Wallago attu* (Bloch & Schneider 1801) Related to Physico-chemical Characters of Feni River of Tripura, India: Multivariate Regression Analysis

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Chapter - 3
Length-weight Relationship of *Wallago attu*
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Queries in the Structure of Language

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Morphosyntactic Aspects of Kokborok Numeral System

S. INDRAKUMAR SINGH

Abstract

The paper describes morphosyntactic aspects of numerals in Kokborok. The language belongs to the Bodo-Garo branch of the Tibeto-Burman sub-family of languages and is mainly spoken in Tripura. The study also compares old and new numeral systems in the language. As far as new numeral system is concerned, Kokborok is of the decimal type like many other Tibeto-Burman languages. However, the old numeral system is of the vigesimal type. Majority of the numeral roots are monomorphemic and few are bimorphemic.

Keywords: classifier, compound, endangered, numerals, tibeto burman.

Introduction

Numeral occupies a core position in the communication system of the languages of the world. Apparently it acts as an indispensable role in the morphosyntactic structure of the majority of natural languages in the world. The studies in the numeral system of a language is relevant, particularly the Tibeto-Burman languages of North-East India, as there is a lack of scientific study. Comrie (2005), rightly points out that an indigenous numeral system becomes more endangered even if the language itself is not endangered. It is due to the neighbouring politically and economically predominant languages.

This paper describes the morpho-syntactic aspects of Kokborok numeral system. Kokborok, the second official language of Tripura, a northeast Indian state belongs to Bodo-Garo branch of Tibeto-Burman sub-family of languages (Benedict 1972). According to Burling (2003), Kokborok is classified under Bodo group of languages, now called Bodo-Koch branch of Bodo-Konyak-Jinghpaw sub-group of Tibeto-Burman sub-family of languages. The language is mainly spoken in the northeast Indian state of Tripura. It is also spoken in small groups in Karimganj district of Assam. Besides, a handful of speakers are also found in Dhaka and Chittagong hill tracts of the Bangladesh.

The paper focus on the system of the numeral structure of Kokborok, the formation of cardinal and ordinal numerals, and the preservation of Kokborok numerals. Kokborok numeral system, as in many other Tibeto-Burman languages, is mainly of the decimal type. However, the vigesimal system is also found in old numeral system. Numerals in this language usually take classifiers. Kokborok has predominantly agglutinative structure. It is a word final structure.


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Chapter PDF Available

Growth and Reproductive Biology of Earthworms in Organic Waste Breakdown Under the Indian Condition

July 2020

DOI: 10.1007/978-981-15-4522-1_11

In book: Earthworm Assisted Remediation of Effluents and Wastes (pp 179-193)

Project: Survey on earthworm resource in organic wastes forest agro-ecosystem and their role in waste management and nutrient dynamics in Northeast India (Tripura Nagaland) and Uttarakhand

Authors



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References (54) Citations (2)

Abstract and Figures

Environmental improvement is an accepted national goal. Under the present condition of the acute energy crisis and environmental degradation with rise in population, it has become essential to develop an appropriate technology for the recovery of energy from non-conventional sources like organic wastes. India produces 350 million tonnes of organic wastes from different agricultural sources. Out of these, several million tonnes of plant nutrients are produced. Earthworm (vermin) is known to be a good biological source for the recovery of vermifertilizer and vermiprotein from the organic wastes to be used in agro-ecosystem and aquaculture and poultry, respectively. Vermicomposting is a process of conversion of organic waste through the synergistic actions of epigeic earthworm and bacteria. When earthworms (endogeic or anecic) are applied for breakdown and stabilization of municipal solid wastes, the process is termed 'vermistabilization'. The ultimate goal of both the processes is the production of plant-available nutrients and earthworm biomass (vermiprotein). Earthworm species to be selected for the process (1) should have great adaptability with respect to environmental factors, (2) should be capable of inhabiting high percentage of organic matter, (3) should be a prolific breeder (high fecundity) with high hatching success, and (4) should have short life cycle. Recent studies indicated that under Indian conditions epigeic species such as *Perionyx excavatus*, *Perionyx ceylanensis*, *Eudrilus eugeniae*, *Eisenia fetida*, *Eisenia andrei*, can complete their life cycle in organic waste and produce vermicompost. *Lampito mauritii*, *Polypheretima elongata*, *Drawida nepalensis*, *Drawida willsi*, *Metaphire posthuma*, *Metaphire houlleti* can degrade organic matter in municipal sewage sludge which contains considerable amounts of sand particles. This chapter deals with the growth and reproduction of these organic waste degrading earthworms. Based on the study, suitable species for organic waste degradation are being suggested.

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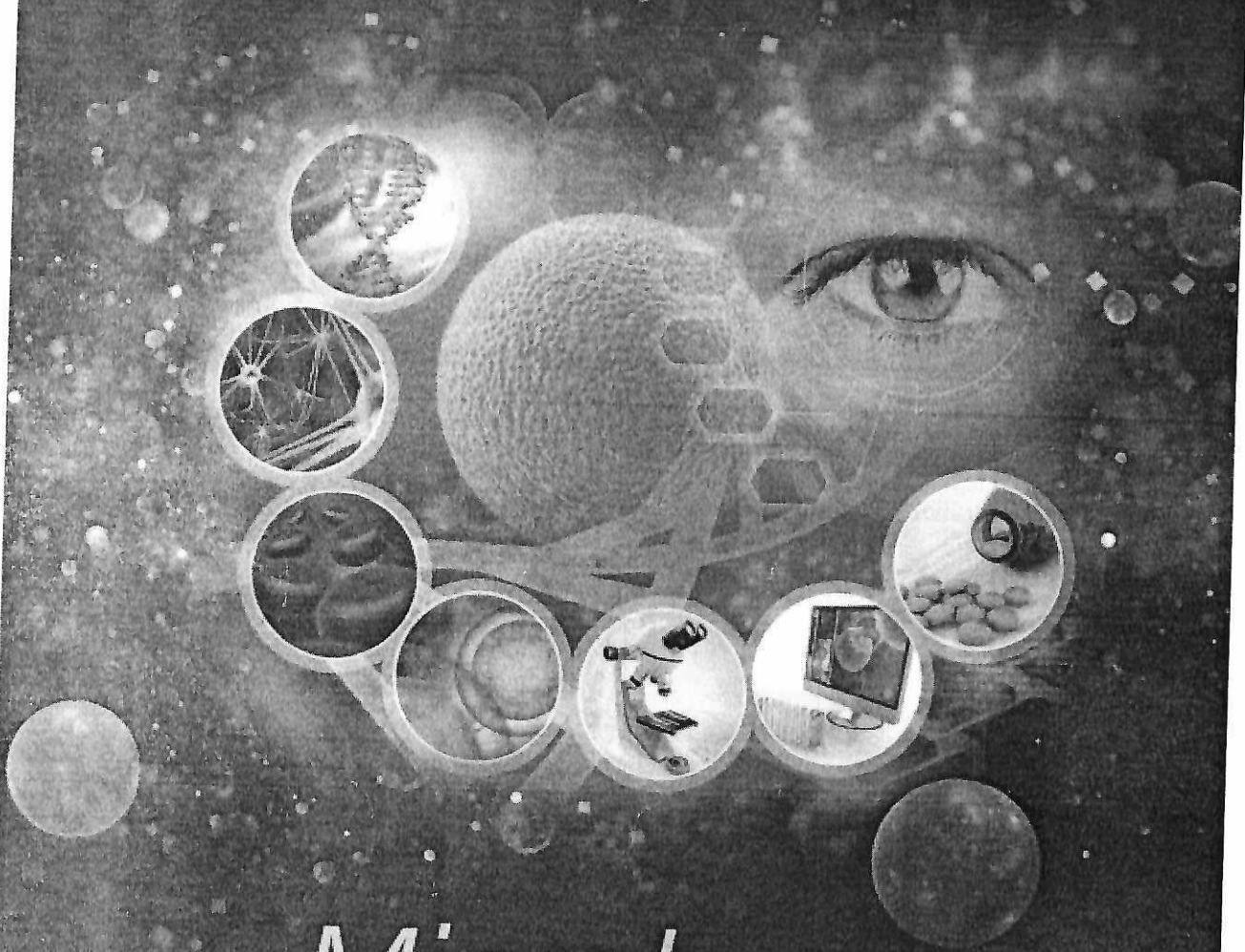
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Microbes, Environment and Human Welfare

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(Sandipan Mukherjee, Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai, India)

Chapter 2. Microbe-Mediated Remediation of Heavy Metal Contamination
(Palas Samanta, PhD, Apurba R. Ghosh, PhD, and Jinho Jung, PhD, Department of Environmental Science, Sukanta Mahavidyalaya, University of North Bengal, Dhupguri, West Bengal, India, and others)




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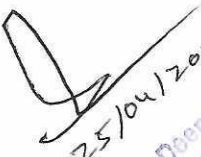
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The book entitled "Microbes, Environment and Human Welfare" is divided into fifteen chapters that cover various aspects of microorganism-based biotechnology, including recent methodologies such as advanced molecular techniques, as well developments in classical microbiological techniques. The authors also explain how the latest and classical techniques are being used in modern-day microbial biotechnology. All chapters were written by experts from prominent universities, research laboratories, and institutes around the globe. Above all, they focus on recent advances in microbial technology that promote the welfare of living beings and the environment.

Microbes in human welfare from different angles starting from source of antibiotics to fermented food to production of biofuel have been discussed with environmental relevance. Separate chapters discussing the use of microbes for remedy of environmental problems help the book to stand with the motto of sustainable development and protection of nature. Global problem in clinical microbiology is discussed with plausible novel remedial approaches. Further, it explains how and why microbes play an important role in preserving the welfare of living beings and the environment. Many bacteria play a significant part in cleaning our environment by detoxifying various xenobiotic compounds, while several microbes produce secondary metabolites that are useful to human beings. (Imprint: Nova)

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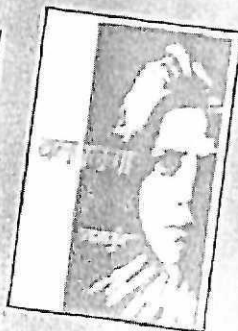



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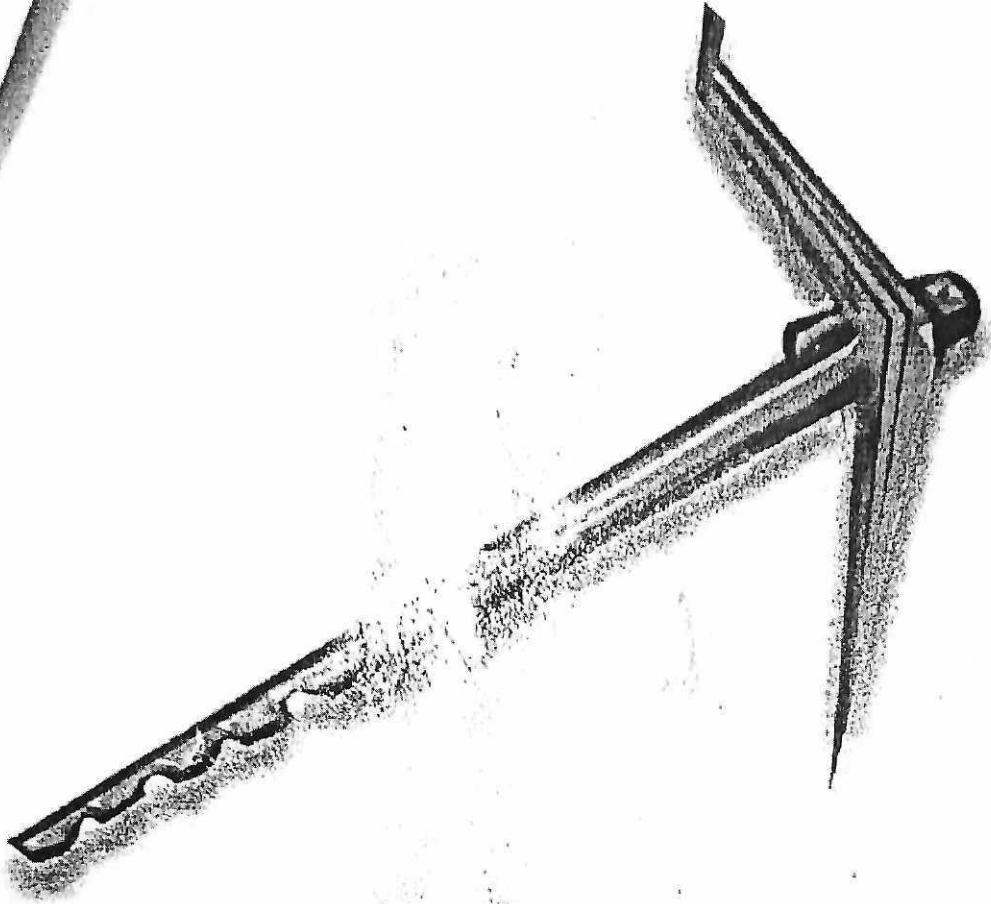
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ত্রিপুরার বাংলা ছোটগল্পে ভূমি ও ভূমিপুত্র : একটি সংক্ষিপ্ত পর্যালোচনা
ড. মলয় দেব, সহকারী অধ্যাপক, বাংলা বিভাগ, ত্রিপুরা বিশ্ববিদ্যালয়

একটি ভৌগোলিক সীমারেখায় নির্দিষ্ট পরিমাণ মানুষকে নিয়ে গড়ে ওঠে 'দেশ' বা 'প্রদেশ'। ১৯৪৯ খ্রিস্টাব্দের ১৫ অক্টোবর ভারত যুক্তরাষ্ট্রের সঙ্গে ত্রিপুরা যোগদান করে। এই রাজ্যের দক্ষিণ-পূর্ব ও পশ্চিম দিক বেষ্টিত করে রয়েছে বাংলাদেশ। শুধুমাত্র উত্তর দিকেই রয়েছে মূল ভারত ভূখণ্ড। রাজ্যটি "আসামের দক্ষিণ-পশ্চিমে ২২° ৫৬" — ২২° ৩৩" উত্তর অক্ষাংশ ও ৯১° ১০" — ৯২° ২২" পূর্ব দ্রাঘিমাংশে অবস্থিত।"১ ত্রিপুরার মোট আয়তন ১০,৪৭৭ বর্গ কিলোমিটার। রাজ্যটিতে বর্তমানে আটটি জেলা রয়েছে। ভূ-প্রকৃতির গঠন অনুসারে রাজ্যটিকে সাধারণত দু'ভাগে ভাগ করা যায়। যথা পার্বত্যভূমি ও সমতলভূমি। ত্রিপুরায় সমতলভূমির পরিমাণ পার্বত্যভূমির তুলনায় অনেক কম। প্রায় সমান্তরালভাবে পাঁচটি পর্বতমালা এই রাজ্যের উত্তর-দক্ষিণে বিস্তৃত। যথা- আঠারমুড়া, বড়মুড়া, লংতরাই, শাখাংটাং ও জম্পুই। তাছাড়া রয়েছে পূর্ব-পশ্চিমে আরো একাধিক ছোট পাহাড় যা উক্ত পর্বতমালাগুলিকে সংযুক্ত করেছে।

ত্রিপুরার মাণিক্য বংশীয় রাজাদের ঐতিহাসিক পর্বের সূচনা পঞ্চদশ শতাব্দীতে। মাণিক্য রাজাদের জারি করা তাষশাসন ও মন্দিরগাত্রের একাধিক শিলালিপি থেকে জানা যায় -- তাঁরা দেবালয়, ব্রাহ্মণ, পির-ফকির ও ধর্মপ্রাণ ব্যক্তিদের নিষ্করভূমি দান করতেন। ২ এই নিষ্করভূমির অধিকাংশই ছিল ত্রিপুরার রাজার জমিদারির অন্তর্ভুক্ত। এই নিষ্কর দান বিষয়ক তাষশাসন থেকে ত্রিপুরার জমির পরিমাণবাচক একক, জমির চৌহদ্দি বিষয়ক একাধিক গুরুত্বপূর্ণ তথ্য পাওয়া গেলেও ভূমি ব্যবস্থা সম্পর্কে কোন স্পষ্ট ধারণা পাওয়া যায় না। তবে এ থেকে একটা বিষয় স্পষ্ট হয়, মধ্যযুগে ত্রিপুরায় নিষ্কর ভূমি যেমন তেমনি করযুক্ত ভূমিও প্রজাদের বন্দোবস্ত দেওয়া হত। লর্ড কর্ণওয়ালিস চিরস্থায়ী বন্দোবস্ত চালু করার পর জেলা ত্রিপুরায় জমিদারি ব্যবস্থা দৃঢ় হয়। মোগল আমলে 'চাকলা রোশনাবাদ' নামে যে বিস্তৃত সমতল ভূভাগকে কেন্দ্র করে কখনও মোগলদের সঙ্গে আবার কখনও বাংলার নবাবদের সঙ্গে ত্রিপুরার রাজাদের বিরোধ বাঁধলেও ভূমির উপর রাজারা তাদের অধিকার হারান নি। অথচ এক বক্শীর বিশ্বাসঘাতকতায় ব্রিটিশ আমলে ত্রিপুরার এই ভূভাগের উপর রাজারা কর্তৃত্ব হারিয়ে বসেন। মহারাজ কৃষ্ণমাণিক্যের সময়ে ১৭৬১ খ্রিস্টাব্দের ফেব্রুয়ারি মাসে চট্টগ্রামের ইংরেজ সেনাপতি ম্যাথিযু ত্রিপুরা আক্রমণ করে ত্রিপুরার সমতল ভূভাগে ইংরেজ অধিকার প্রতিষ্ঠা করেন। ১৭৮৬ খ্রিস্টাব্দ নাগাদ 'চাকলা রোশনাবাদ' নামে একটি পৃথক জমিদারির পত্তন ঘটে। ইস্ট ইণ্ডিয়া কোম্পানি এই এলাকার জন্য একজন কালেক্টর নিযুক্ত করলেও জমিদারি স্বত্ব ত্রিপুরার রাজাদেরই থেকে যায়। ৩ নির্দিষ্ট পরিমাণ কর প্রদানের শর্তে মহারাজারা

কালিপদ চক্রবর্তীর নির্বাচিত গল্প : ভূমির উপর অধিকার প্রতিষ্ঠার লড়াই
ড. পদ্মকুমারী চাকমা

প্রথম বিশ্বযুদ্ধের ভয়ঙ্কর অভিঘাত, আর্থিক মন্দা, বেকারত্ব এই বিষয়গুলি ত্রিপুরার নিস্তরঙ্গ, শান্ত কৃষিনির্ভর জনজীবনকে এবং তার সৃষ্টিলোককে তেমনভাবে নাড়া দিতে সক্ষম না হলেও মূল ভূখণ্ডের জনজীবনকে, বাংলা সাহিত্যকে গভীরভাবে আন্দোলিত করেছিল। বাংলা সাহিত্যে সে সময় কমল, কালিকলম, প্রগতি পত্রিকায় লেখকরা গল্পের প্রসঙ্গ, বিষয় এবং প্রকরণে নতুন নতুন আনার প্রচেষ্টায় রত। সে জায়গায় দাঁড়িয়ে সামন্ততান্ত্রিক স্বাধীন রাজ্য ত্রিপুরা নিরুত্তাপ, আপন খোঁলে চলমান। ঔপনিবেশিক শাসনের শৃঙ্খল মুক্তির স্বপ্নে গত শতকের চমিশের দশকে ভারতবর্ষে ব্রিটিশ বিরোধী গণআন্দোলন, দ্বিতীয় বিশ্বযুদ্ধ, পঞ্চাশের মধ্যসূত্র, ব্রিটিশের কূটক্রান্ত প্রভৃতির ফলে জনজীবনে যখন নাতিশ্বাস উঠছিল তখন ত্রিপুরার রাষ্ট্রীয় জীবনে এবং জনজীবনে বিক্ষিপ্তভাবে এর কিছু প্রভাব পড়লেও নান্দনিক জীবনে এর প্রভাব চোখে পড়ে না বললেই চলে। কিন্তু ১৫ অক্টোবর, ১৯৪৯ খ্রিষ্টাব্দে ত্রিপুরা ভারত যুক্তরাষ্ট্রের সঙ্গে যোগদানের সঙ্গে সঙ্গে এই রাজ্যটির রাজতন্ত্র থেকে গণতন্ত্রের উত্তরণ ঘটে। এই পর্বে দেশভাগজনিত কারণে বিপুল উদ্বাস্তু স্রোতে ক্ষুদ্র এই পাহাড়ি রাজ্যের জনবিন্যাসের চরিত্র বদলে যাবার পর ত্রিপুরার জনজীবন আর স্থির রইল না। বিশাল জমিদারির চাকলা রোশনাবাদ যা ত্রিপুরার রাজাদের প্রধান আয়ের উৎস ছিল তা থেকে গেল ওপারেই। কাতারে কাতারে কৃষিজীবী থেকে শুরু করে নানা জীবিকার মানুষ ত্রিপুরায় এসে ভিড় করতে থাকে। ধীরে ধীরে গড়ে ওঠে মিশ্র সংস্কৃতি।

এই অস্থির সময় পরিসরে শিক্ষিত বুদ্ধিজীবীদের মনেও তৈরি হয়েছিল এক গভীর ক্ষত ও জিজ্ঞাসা। সংকটের গভীরতা বিবেকবান চিন্তাশীল মানুষকে আলোড়িত করেছিল সে সময়। এই সূত্রেই ত্রিপুরার ছোটগল্পে ঘটে যায় বিষয় ও চরিত্রগত পরিবর্তন। তারপর থেকে ত্রিপুরায় বাংলা ছোটগল্পের নির্মাণে বিষয়গত, চরিত্রগত ও শৈলীগত পরীক্ষা-নিরীক্ষার শুরু হয়। কথাকার বিমল চৌধুরী, সুবিমল রায়, সুখময় ঘোষ, মানস দেববর্মণ, কালিপদ চক্রবর্তী, ঋতেন চক্রবর্তী, ভীষ্মদেব ভট্টাচার্য, কল্যাণব্রত চক্রবর্তী, বিশ্বজিৎ চৌধুরী, বিমল সিংহ, মানিক চক্রবর্তী প্রমুখেরা এই কাজে হাত দেন। বলা যায় তারাই ত্রিপুরার ছোটগল্পকে সময় ও জীবন সংলগ্ন করে তোলেন।

ত্রিপুরার গল্পকারদের মধ্যে এক বলিষ্ঠ ও বিশিষ্ট লেখক কালিপদ চক্রবর্তী (১৯৪৩-২০০১)। তাঁর গল্পগুলির বিষয় বৈচিত্র্য লক্ষণীয়। তাছাড়া গল্পগুলির ভাষা চরিত্রগুলির শ্রেণি অনুযায়ী বদলে গেছে। তাঁর গল্পগুলিতে আঙ্গিকের দিক থেকে তেমন অভিনবত্ব নেই। তবে লেখকের গল্প

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সৌমিত্র শেখর সম্পাদিত



25/4/22
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Registrar
Tripura University

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মধ্যযুগীয় সামাজিক জড়তা ও কুসংস্কারের মূলে কুঠারাঘাত করতে হলে নারী পুরুষ নির্বিশেষে সকলের মধ্যে শিক্ষার আলো ছড়িয়ে দিতে হবে- এই ভাবনা বিদ্যাগারকে শিক্ষাসংস্কারে উদ্যোগী করে তুলেছিল। ভবিষ্যৎ প্রজন্মের মধ্যে যুক্তিবাদী মন ও বিজ্ঞানভাবনার প্রসার ঘটানোর মধ্যে যে সামাজিক প্রগতি লুকিয়ে রয়েছে সেটা তিনি উপলব্ধি করেছিলেন। আর তাই বালকবালিকাদের বিজ্ঞানভাবনায় উদ্বুদ্ধ করার জন্য তিনি বন্ধপরিষ্কার হন। এ বিষয়ে তাঁর বিস্ময়কর অবদান জীবনচরিত ও বোধোদয়। বিজ্ঞান সচেতনতা বিদ্যাগারের চরিত্রের একটি বিশেষ দিক ছিল। তিনি নিজের প্রতিষ্ঠিত বিদ্যালয়গুলির জন্য যে পাঠ্যসূচি তৈরি করেছিলেন সেখানে সাহিত্য, ইতিহাস, ভূগোল, অর্থনীতি ছাড়াও তার অন্তর্ভুক্ত ছিল বিজ্ঞানীদের জীবনী, গণিত, জ্যোতির্বিদ্যা, প্রাকৃতিক বিজ্ঞান,

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উনিশ শতকের বাংলায় নারী শিক্ষা ও নারী প্রগতি

সম্পাদক
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বিদ্যুৎ মণ্ডল
দেবশিস মণ্ডল

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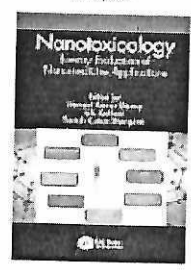
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Chapter



Current Guidelines and Regulatory Challenges, Insight into the Legal, Societal, and Ethical Issues of Nanomaterials

By Harjeet Nath, S. S. Subhranshu, S. R. Manohara


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Entrepreneurial Challenges during COVID-19

Recent Trends and Innovations

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LINKAGE BETWEEN COMMUNITY-BASED HOMESTAY AND RURAL DEVELOPMENT: ITS APPLICABILITY IN TRIPURA


Paulami Ray and Joy Das***

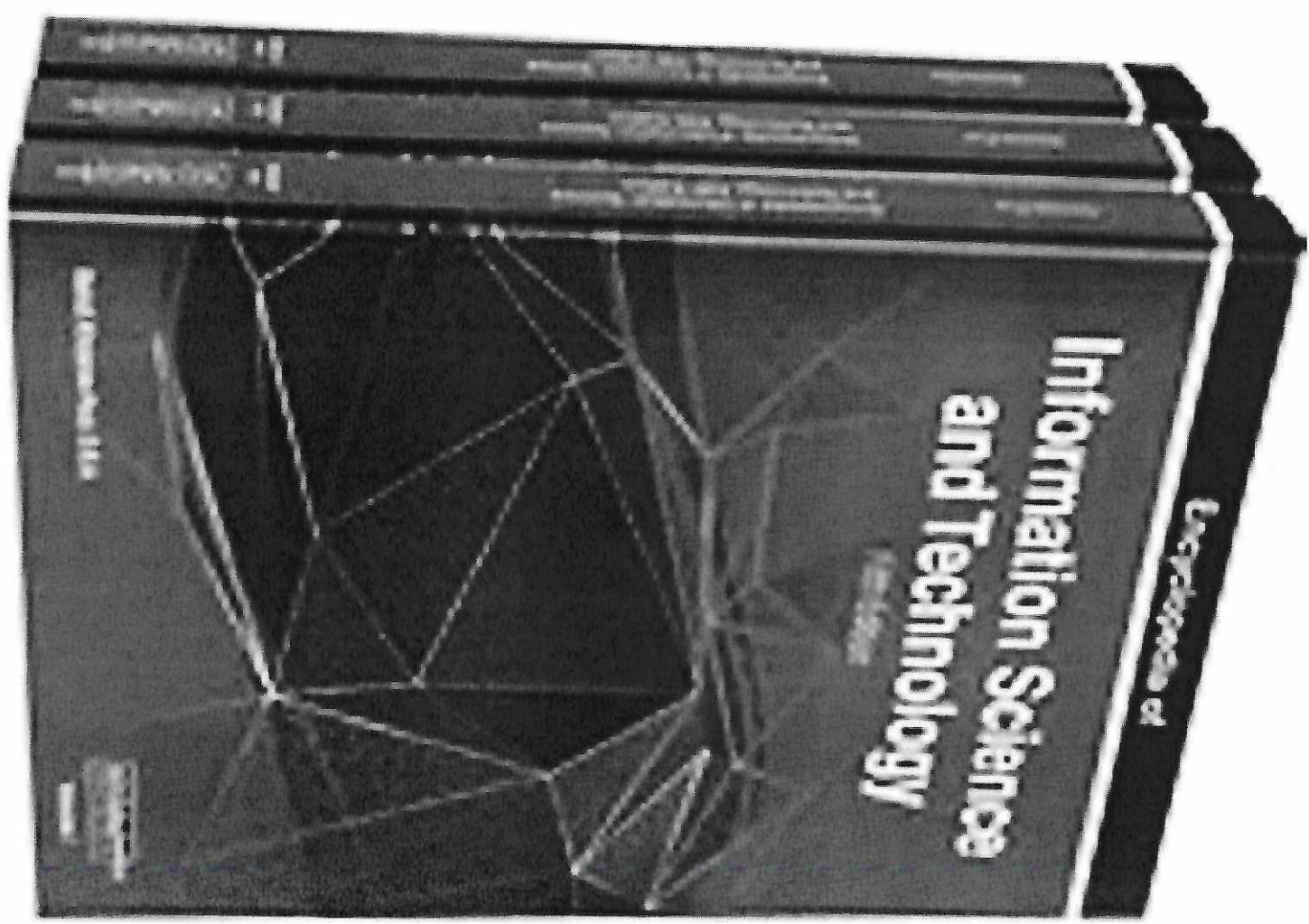
ABSTRACT

The present study focuses on knowing the linkage between community-based homestay and economic development of a region. Tourism is considered as an important source of employment in certain regions as it can act as a medium of rural development. In order to develop tourism in a sustainable way the approach of community-based tourism has been popularised. Homestays have been acknowledged as a product of community-based tourism that enables the tourist to experience the local heritage and culture. The study employs review of literature method to identify the linkage between homestay and rural development and also tries to identify the factors essential for the success of community-based homestay as an entrepreneurial technique. The study reveals that if the community-based homestay programme is

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QoS Provisioning for Multicast Routing and Channel Assignment in Wireless Mesh Network

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INTRODUCTION

Wireless mesh networks (WMN) is defined by a group of nodes which uses a wireless mode of channel and form a mesh topology, where each individual node is connected to the other with a dedicated line of communication. The few distinguished features of WMN's are self-organization, spatial reuse, and fault tolerance. The ad-hoc connectivity enables the WMNs to be of low cost, ease of maintenance, reliability and robustness [Akyildiz et al., 2005]. The scope of development and research in the fields of wireless mesh network is wide open and the focus has been also widened from only effective channel assignment to channel assignment and multicast routing. An effective channel assignment algorithm in WMN maximizes the utilization of network bandwidth. The efficiency of the network performance is generally termed as quality of service (QoS). The main term QoS defines the performance level of a service by the network to the end users. It generally is associated with the behaviour of wireless node or service, throughput sensitiveness and delay sensitiveness in multimedia applications. The QoS provisioning can be simply stated as satisfying a set of network related parameters like jitter, battery life, latency, packet loss ratio and bandwidth. The QoS imparting parameters depends upon the scenario in which it is implemented. In the context of channel assignment the QoS parameters can be signal power, bandwidth, power, etc. on the other hand the QoS parameters for multicast routing are bandwidth, delay, jitter etc. As for voice communication the parameters are battery life, for video communications buffer space, jitter delay, packet loss ratio, for military applications the parameters are strict security parameters. The various real time applications of the day to day life use multicasting such as audio/video conferencing, online gaming, remote learning, webcasting, distance learning, distribution of financial data, billing records, software, newspapers and lots more. WMNs are very much suitable for supporting such type of multicasting application. But provisioning of QoS in multicast routing as well as efficient assignment of channels is a challenging issue. For solving this problem, many techniques have been developed. This chapter presents a detailed study of the QoS provisioning in the channel assignment, multicast routing and both in a network scenario. It also classifies the techniques based on whether it is applied during channel assignment, multicast routing or during both phases. Comparison of the techniques is also presented in a tabular format.

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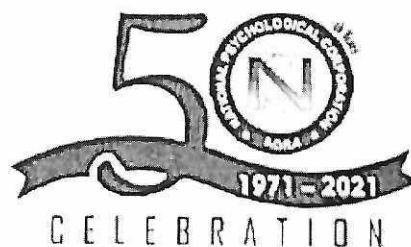
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Chapter



Solar Energy Generation and Internet of Energy (IoE)

Challenges and Purview

By Sanghita Baidya, Champa Nandi

Book [Internet of Energy Handbook \(https://www.taylorfrancis.com/books/mono/10.1201/9781003048343/internet-energy-handbook?refId=687747b7-a73b-4e5a-a93c-907bdb501110&context=ubx\)](https://www.taylorfrancis.com/books/mono/10.1201/9781003048343/internet-energy-handbook?refId=687747b7-a73b-4e5a-a93c-907bdb501110&context=ubx)

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প্রচ্ছদচিত্র স্বরূপ দত্ত

রূপায়ণ সন্তোষ দত্ত

ISBN 978-93-90621-64-4

দাম ৪৫০ টাকা

আমি এই শব্দের গভর্মতা মুখে দিচ্ছে মাই,
কুমি ছবি একে দিচ্ছে বৃষ্টির.

মুসলখাবাব —

মানুষ ভিছুক.

বাড়িখব

রাস্তা নালা ভিজ়ে একসারা মোক।

এই শব্দের মুখে বৃষ্টি মোক দিব

হাঁপ তিজ়িয়ে চার য়াওয়া :

আগিলোর শব্দ হলে তাঁর তপস্কণ্ড বহুয়ে সেই উল্লস উৎসবে কান্না
জন্মাত স্বাইন-স্পুর অবিতক গিপুবা মফিসাঁলের গুমিমা, প্রাকগবক্রিঃ
সিলেট বা লেখখালি থেকে আগবতলক জনালাস যাত্বেগত বিষ্টিঃ ও
কেশভাণের ফলে এক আগবতলক বীরের হাঁপের তার স্বহস্ত ইচ্ছিয়া ও কুপ্তিতে
বুজ়ে পায় বিকল্প নাপনিক পবিত্র বজ্ঞ-অমলের আগবতলক ও তাঁরই
সাপাতদিঃ ইতো এজবের গধব আগবতলয় এক গ্রিপুতর বজ্ঞকল
পূর্বাণেতর হেঃ পায়ক আসা ও মকর্দি ক্রিপল গো আগবতলয় অসল কান্ন
কলস আগব এই কলক ও বহুতর পয়সঃ পায়ক আগবতলক উজ্জয়ঃ ও
ও লকর্দি উল্লসিক অকর্বে তের দিন এই কলকলের পূর্বকলকর্টি ও
এই ক্রি উপকর্দি সিতল একা কলকনালা কিঃ হেঃ অগুতর গলকলকর্টি হেঃ
সক গ্রবিক সিভব হাঁতহস লঃ। সাইঃ ও অলকণ ইতিতকৈ শেভঃ আগুঃ
অকৈ গজীব সাইঃ ও অনুভবেই অকমাত এর অনুসরণ সচিব উল্লস্ক হাঁক
মাটে বাঞ্জহাত হেঃ ও একটি সিম প্রেক্ষিতে আগব মোজর কেকার মাঃ। ন-
যে অম্যাতে প্রাক্ষিতই সেই ফেলে অন্য কেশের ছয়া কঃঃ কৈল কঃঃ
নিজের প্রতিচ্ছবি ও জায়গা সকে মফিলে কঃঃ। কৈ তেঃ পূর্বকলকরে হেঃ।
গটেই ফলে ফেল মাঃ। কঃঃ। কৈল ও একটি হোদনটি মাঃ। অম্যাৎ কঃঃ
শাস্ত্র প্রাঃ-তার কঃঃ।

একইভাবে শীতের সৈন্স গজমাখা এক দর্ভীপ পাঃ ও ইবিবেরে ন ষিঃ
আলোয় পুনরাব্র হয মো ইচ্ছিয়াস, তা সৃষ্টিতর (Mineronic) কঃঃ-এক
লোককর্ম বৃষ্টি। মোত একটি সাদা কিশোর ওয়ঃ ওয়ঃ এই যে কইয়াঃ পূর্বাণ
কঃঃ যা বহুত, শরীরা ও স্পৃষ্ণ। মোতঃ। অম্যকক করে কঃঃ পঃঃ।
আমাদের কঃঃ। এই তিন প্রজন্মের সমাপনে একটি মাঃ সতঃ-তঃ। উয়ঃ-

ত্রিপুরার বাংলা কবিতা :
পটভূমিকায় দেশ ও দেশাতুর

অংশে গুপ্ত

আমি কবিতার মতো লোকের মতো লোকের মতো
আমি কবিতার মতো লোকের মতো লোকের মতো
ছবি হাঁস হাঁসে পলাক কিলকর মতো অমর

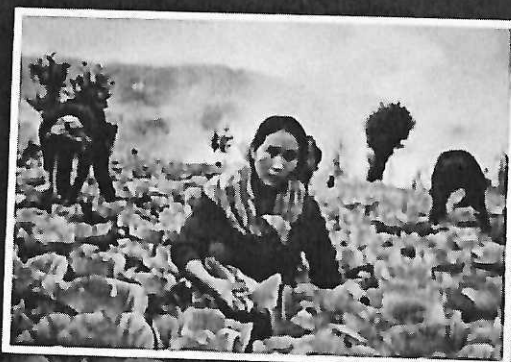
শিউকির আংলক নয় লক্ষ জোহলের কুচি চতুরা কাত, মন্দিগপু বিষ্টিঃ
গঃপঃ একেইকৈ বহু জক একটী কিলকর্টি প্রাঃ। কই এই মূলে দিকঃপ্রবলে
সির্সান বর্বিঃ প্রাঃের সীঃ। গীঃ। নতর দিবিলার বাকা গলক আকঃপঃ।
এক অঃঃ তিজকর নীঃ হাঁস ধরে যে অঃসেলল গাঃ। এই কটি নাইন
বঃবঃ পঃঃ। গলাঃ গাইঃ পাইঃ হেঃ। গাঃ। এর মাঃ। যঃ।
আমার মনঃ। আঃ। আমি কঃঃ। কঃঃ। আমাঃ। কঃঃ।
গতে কিলকরের লক গঃঃ ওয়ঃ ওয়ঃ। কঃঃ। কঃঃ।
কঃঃ। কঃঃ। গুপ্ত। গুপ্ত। গুপ্ত। গুপ্ত। গুপ্ত। গুপ্ত। গুপ্ত। গুপ্ত।
প্রাক্ষণকঃ। বাঃ। কঃঃ। কিলকলের সিবঃ।

জন্মকর্টি আগবতলক-টিঃের মূলে কুয়াশার পঃপঃ। বৃষ্টির ওয়ঃ
কঃঃ। এঃ। উয়ঃ এই শঃঃের প্রতি স্বকন সৈলঃগুঃ কঃঃ।
আমাকে একটা মঃঃ রাস এঃঃ।

(Dr. Deepak Sharma)
Registrar
Tripura University

A MITTAL PUBLICATION

BIORESOURCES AND SUSTAINABLE LIVELIHOOD OF RURAL INDIA



CHITTA RANJAN DEB
ASOSII PAUL

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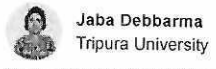
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Tree diversity and sociocultural significance of homegardens in the Baramura range, Tripura, North-east India

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Abstract and Figures

Baramura forest range is one of the largest forest ranges in Tripura. It is mainly inhabited by people from the Halam scheduled tribe, who have established permanent settlements in and around the forest. The forest harbours a rich biodiversity and it supports local people in contributing to their daily needs. Local people have also established and are managing forest-like, species-rich homegardens. These homegardens have never been studied. In this short note, we report results of the first study on the Halam homegardens of the Baramura range, combining an ecological assessment of the tree component with an assessment of their livelihood importance.

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Map of the study area. Note:... Distribution of trees per... Scattered plot between CS an...

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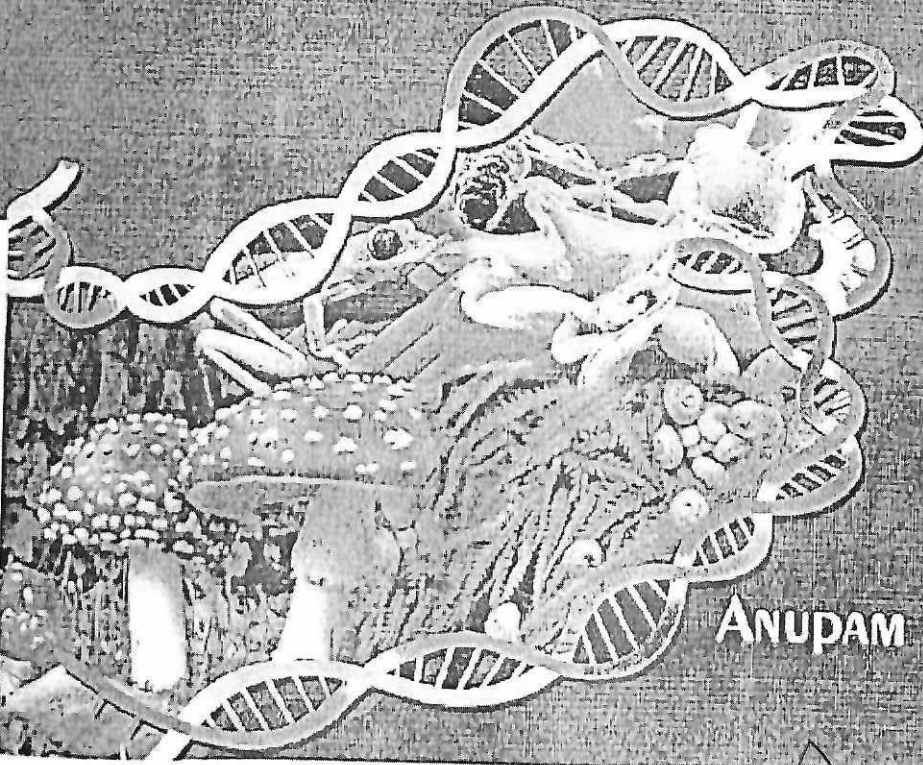


BIOLOGICAL SCIENCES

IMPACTS ON MODERN CIVILIZATION,
CURRENT AND FUTURE CHALLENGES

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CURRENT AND FUTURE CHALLENGES



ANUPAM GUHA

ANUPAM GUHA

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Biodiversity status, threats and conservational measures in Rudrasagar lake, a Ramsar site of Northeast India In : *Biological Sciences: Impacts on Modern Civilization, Current and Future Challenges* by Anupam Guha © New Delhi Publishers, New Delhi: 2020, 71-84. ISBN: 978-81-947417-9-4, DOI: 10.30954/ndp.bio.2020.6



Biodiversity status, threats and conservational measures in Rudrasagar lake, a Ramsar site of Northeast India

Moitree Taran, Prabir Barman, Yapri Jamatia, Sajib Das and Sourabh Deb*

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Abstract: Rudrasagar lake, a Ramsar site situated in Tripura, Northeast India offers a range of ecosystem services. The contribution of Rudrasagar lake to the humanity has not been estimated so far. The preliminary study aims to assess the biodiversity status and ecosystem services of Rudrasagar lake. The main provisional services provided by the lake are food (aquatic plants and fishes), fuel wood and timber whereas, the cultural services provided are boat raiding, tourism and recreational activities due to its historical importance. The main intimidations to the wetland are increasing silt loads due to deforestation, expansion of agricultural land and land conversion due to population pressure. To reduce stress on the lake, better monitoring, planning, restoration and management are essential. Different restoration activities like awareness programme, consultation and capacity building activities were conducted in the area. Restoration activities like *Hydrilla* based fish feed was introduced in the waterbody which becomes a good alternate source of food for many edible fishes. The water hyacinth based craft preparation was conducted for improving the livelihood of the common people. Proper conservation by restoration and sustainable management will help to enjoy the various services of the lake in a sustainable way.

Keywords: Biodiversity, Ecosystem services, Threats Management, Restoration.

Rudrasagar is a natural wetland located in Melaghar block, Sonamura subdivision under Sepahijala district of Tripura. Rudrasagar Lake is productive because of its ecological diversity and socio-economic importance^[1]. It is designated as a Ramsar site in the year 2005 as the lake complies with the criteria's of the wetland and considered as a national as well as of international importance. Criteria 2, 3 and 8 suggest that the wetland should support endangered, threatened species, animal and plant species which maintains biological diversity and important source of food for fishes respectively^[2]. It

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Flood Simulation Modelling and Disaster Risk Reduction of West Tripura District, Tripura, North-East India

15

Moujuri Bhowmik and Nibedita Das (Pan)

Abstract

Flood is a common fluvial hazard in the plain areas of West Tripura District during almost every monsoon season, where the gradient is very gentle (1:1461) and is drained by numerous drainage systems. About 40 percent area and 41 percent population of this district are flood affected which also includes Agartala, the capital of Tripura. This hazard causes tremendous loss in terms of property, standing crops, roads and houses. The objective of this study is to assess flood risk and disaster risk reduction using flood simulation model for 50 and 100 years return period. A study of 46 years' water level of the Haora River indicates 11 m a.m.s.l as the highest water level and 8 m a.m.s.l for the Lohar Nala. For this modelling, contour at 1 m interval has been generated on DEM which was downloaded from Bhuvan Cartosat, the flood inundation data have been entered in Animation Manager Table in ArcMap and the layer thus generated has been overlaid on 3D map of West Tripura District in ArcScene. From

this model, it has been estimated that during 50 and 100 years return period, the flood inundation depth was found to be 1–4 and 1–5 m, respectively; about 180 and 300 km² area of this district, respectively, will be affected; about 1,99,530 and 4,51,263 people will be affected, respectively. It means flood can be disastrous in the district when water level of the Haora River and Lohar Nala will be equal to or exceed 1.5–2 and 1–1.4 m above the river bank, respectively. Therefore, it is necessary to reduce the flood risk through proper flood plain land use planning and changing the cropping system.

Keywords

Flood simulation model · Flood hazard · Haora river · West tripura district

15.1 Introduction

Generally, after a spell of heavy rain (due to depression) which may last for a period of several hours to several days, a large volume of runoff is generated in the upper catchment and the river experiences floods (Kale 2003). Flood hazard is the probability of occurrence of a potentially damaging flood event of a certain magnitude within a given time period and area (Brooks 2003). Efficient flood protection measures require a good

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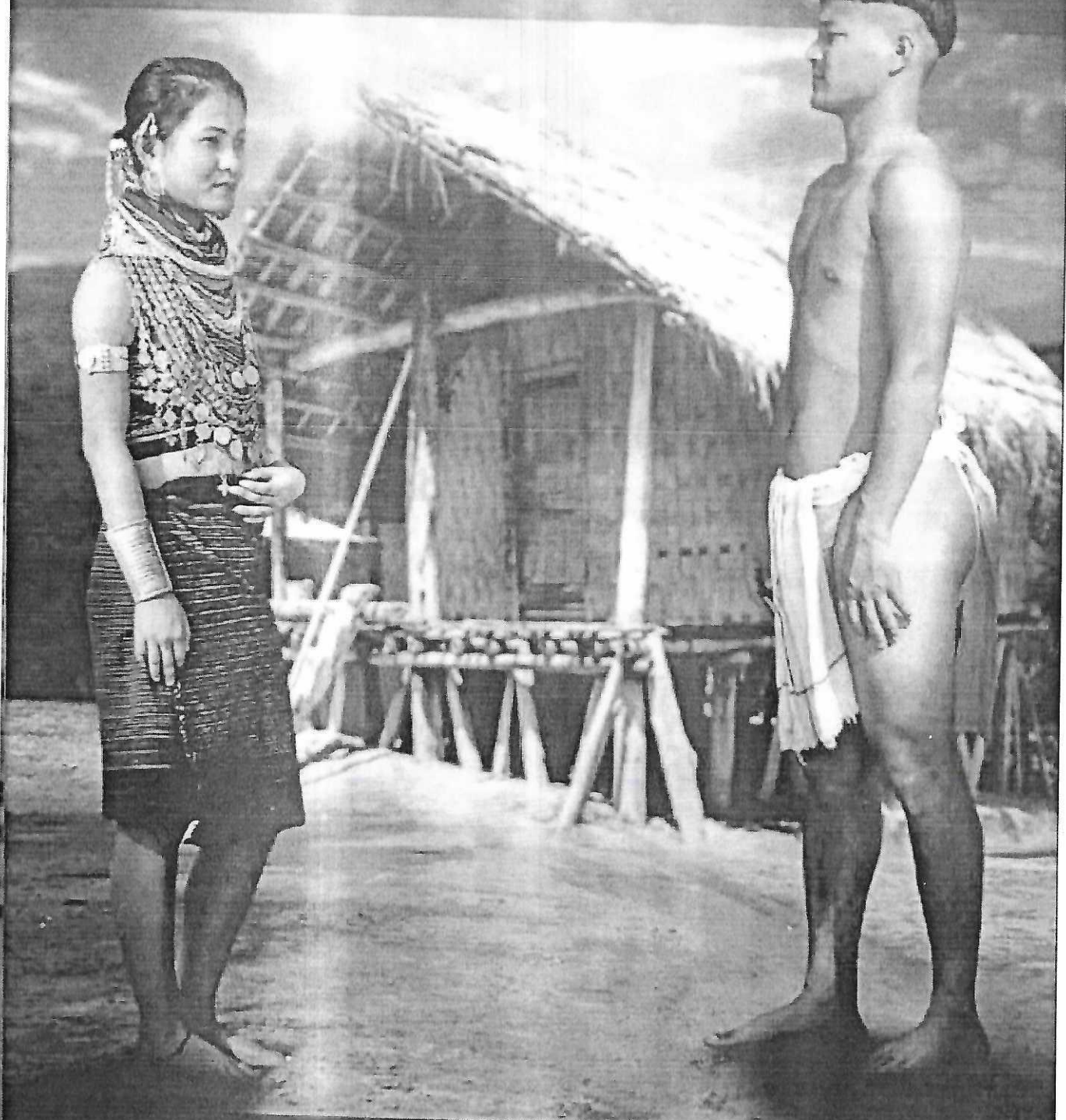
B. W. Pandey and S. Anand (eds.), *Water Science and Sustainability*, Sustainable Development Goals Series,
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REDMI NOTE 9
AI QUAD CAMERA

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HISTORY OF THE REANG (BRU)



LINCOLN REANG

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University

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Dr. Lincoln Reang

History of The Reang (Bru)

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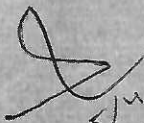
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The Book

The Reangs (Bru) are predominantly the inhabitants of Tripura. However, they are also found in the states of Mizoram and in some parts of Assam. The Reangs (Bru) in terms of appearance basically belong to the mongoloid groups and speak the Tibeto-Burman language Kau Bru. The Reangs (Bru) are a well-knit ethnic group having a rigid, well-ordained and well-structured self-governing system.

An important aspect of this book 'History of the Reang (Bru)' is to trace the historical background, socio-cultural tradition, political institution and religion of the Reang (Bru) Community based on primary and secondary sources.

The book throws new lights on the theme concerned and thereby fills the gaps which have not found sufficient attention by any scholars and researchers.



The Author

Dr. Lincoln Reang (b.1981) at Hanurampara, Tuisama, North Tripura. He studied in St. Paul's School, Agartala upto his Matriculation (1998). He did his Higher Secondary and Graduate Degree in History (2003) from Union Christian College, Barapani, Meghalaya and completed his Masters in Modern India History (2005) from North Eastern Hill University (NEHU), Shillong. Thereafter, he did his B.Ed (2005-06) from Bhavan's Tripura College of Teacher's Education, Agartala. He joined Tripura University as a Lecturer in the Department of History in the later half of 2006. He had done his Ph.D (2016) from Tripura University on 'The Reangs of Tripura: A Historical Study (1942-1985)'.



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Concomitant administration of selenium and vitamin B12 ameliorates arsenic-induced oxidative stress in male wistar rats In : *Biological Sciences: Impacts on Modern Civilization, Current and Future Challenges* by Anupam Guha © New Delhi Publishers, New Delhi: 2021, 138-153. ISBN: 978-81-947417-9-4, DOI: 10.30954/ndp.bio.2020.13



Concomitant administration of selenium and vitamin B12 ameliorates arsenic-induced oxidative stress in male wistar rats

Sudipta Pal¹ and Ajay Kumar Chatterjee²

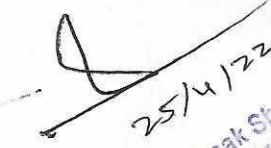
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Abstract: Arsenic toxicity is a serious environmental issue globally. Both chronic and acute exposure cause adverse health effects affecting almost all organ systems. It is a challenge to combat against arsenic toxicity to keep healthy life. Various natural and synthetic compounds have been tried to ameliorate arsenic induced organ toxicity. In the present study protective effect of selenium and vitamin B₁₂ co-administration was assessed against arsenic-induced oxidative stress in liver tissue of male Wistar rats. Intraperitoneal administration of sodium arsenite at a dose of 5.55 mg/kg body weight/day (equivalent to 35% of LD₅₀) produced depletion of reduced glutathione (GSH) content of liver, associated with enhanced lipid peroxidation (LPO) level and free hydroxyl radical (OH) formation. Activities of antioxidant enzymes like glutathione reductase (GR), superoxide dismutase (SOD), catalase were inhibited after arsenic exposure, indicating disturbed pro-oxidant-antioxidant equilibrium in rat liver tissue. Liver NADPH oxidase activity increased significantly following arsenic treatment, and thus enhances superoxide radical production. The same treatment of arsenic also cause liver injury as reflected by the elevated activities of serum γ -glutamyl transpeptidase (γ -GT), glutamate-oxaloacetate transaminase (SGOT), and reduced serum glutamate-pyruvate transaminase (SGPT) activity. Concomitant administration of selenium and vitamin B₁₂ with arsenic appreciably restored almost all of these parameters to their control levels. Combination of selenium with vitamin B₁₂ restored liver NADPH oxidase and serum GPT activities to their respective control values. In addition, they exhibited better efficacy to restore liver LPO level, SOD and catalase activities, serum γ -GT activity and carbonylated protein content. These results suggest that co-administration of selenium and vitamin B₁₂ is capable of reducing arsenic-induced oxidative and degenerative changes in rat liver.

Keywords: Arsenic, oxidative stress, free radical, selenium, vitamin B₁₂, antioxidant


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Computing Mortality for ICU Patients Using Cloud Based Data



Sucheta Ningombam, Swararina Lodh, and Swanirbhar Majumder

Abstract Computing Mortality for ICU patients, who are in critical conditions and in need of extra intensive care has been a major problem. The focus of this work is to predict patient's health mortality through health record data from ICU Mortality Prediction Challenged. Data are taken from the first 24 h to figure out the in-hospital death by using few models from machine learning. Here, in this health record-based work, personal health information particularly for ICU patients are recorded and observed by the physicians. These methods are cost-effective, reliable, easily accessible, and are maintained in a Cloud platform to increase the quality of service. We have taken 6 general descriptors recorded at the time of admission to a particular unit ward and other different time-series measurements collected during the first 24 h. This chapter focuses on predicting the mortality of ICU patients by checking their health-care data. We have used online mode that can be access by the physicians, patients, and other staff members easily. Therefore, it has the considerable potential to provide an accurate result with a simple and easily accessible mode. As there is less available research works on ICU patients with Cloud Computing. That's why, our approach has the potential to reach the prediction of mortality for in-hospital ICU patients using machine learning.

Keywords Machine learning · Cloud computing · Health-care · Mortality prediction · ICU patients

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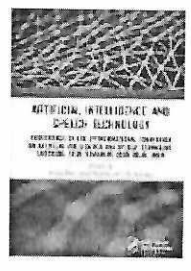
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Chapter



Identification of two tribal languages of India: An experimental study

By Joyanta Basu, Theodore Raphael Hrangkhawl, Tapan Kumar Basu, Swanirbhar Majumder

Book: Artificial Intelligence and Speech Technology (https://www.taylorfrancis.com/books/mono/10.1201/9781003150664/artificial-intelligence-speech-technology?refid=f523bec5-3749-4e4f-aad6-b5ef0e4aad6c&context=ubx)

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ABSTRACT

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X



Chapter 7 - A study on sleep stage classification based on a single-channel EEG signal

Sinam Ajitkumar Singh¹, Sinam Ashinikumar Singh², Ningthoujam Dinitha Devi³, Swanirbhar Majumder¹

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Abstract


Automated sleep stage scoring can deliver a clinical report for analyzing patients with sleep abnormalities. Traditional polysomnography or visual scoring is unfit for observing the large populations since visual scoring is extremely conservative and depends on skillful knowledge based on Rechtschaffen and Kales score and American Academy of Sleep Medicine rules. This chapter presents a study on single-channel EEG (electroencephalogram) signals for finding the fittest approach in terms of preprocessing, extraction of features, and classification for sleep abnormalities analysis. It focuses on the various applications regarding the importance of the prediction of sleep stage scoring. Analysis of the sleep stage based on the qualitative method along with traditional quantitative methods is presented. The datasets for sleep abnormality analysis based on EEG signals are introduced in this chapter. Also, the employed expert rules and relevant character of the EEG signal dataset play significant roles in the study as well. In this work, various state-of-the-art methods are comprehensively reviewed based on all of the significant features discussed here. Each step in the sleep stage scoring is briefly explained, and the relevant investigations are presented.

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Keywords

EEG; HMM; Machine learning; PSG; Time-frequency domain features

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Speaker Identification in Spoken Language Mismatch Condition: An Experimental Study



Joyanta Basu and Swanirbhar Majumder

Abstract This paper describes the impact of spoken language variation in a multi-lingual speaker identification (SID) system. The development of speech technology applications in low resource languages (LRL) is challenging due to the unavailability of proper speech corpus. This paper illustrates an experimental study of SID on Eastern and Northeastern (E&NE) Indian languages in language mismatch conditions. For this purpose, several experiments are carried out using the LRL data to build speaker identification models. Here, spectral features are explored for investigating the presence of speaker-specific information. Mel frequency cepstral coefficients (MFCCs) and shifted delta cepstral (SDC) are used for representing the spectral information. Gaussian mixture model (GMM) and support vector machine (SVM)-based models are developed to represent the speaker-specific information captured through the spectral features. Apart from that, to build the modern SID i-vectors, time delay neural networks (TDNN), and recurrent neural network with long short-term memory (LSTM-RNN) have been considered. For the evaluation, equal error rate (EER) has been used as a performance matrix of the SID system. Performances of the developed systems are analyzed with native and non-native corpus in terms of speaker identification (SID) accuracy. The best SID performances are observed to be EER 10.52% after the corpus fusion mechanism.

Keywords Low resource language (LRL) · Speaker identification (SID) · Mel frequency cepstral coefficients (MFCCs) · Shifted delta cepstra (SDC) · i-vectors · Linear discriminant analysis (LDA) · Probabilistic linear discriminant analysis (PLDA) · Deep neural network (DNN) · Time delay neural networks (TDNN) · Recurrent neural network (RNN) · Long short-term memory (LSTM)

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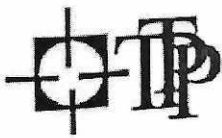
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Role of Public Libraries of the Tripura in Preservation and Conservation of Indigenous Knowledge: An Empirical Study

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Abstract

Indigenous knowledge is the basic ideas and practices that have passed on from the ancestors to one generation to the other. The indigenous people relies on the indigenous knowledge for their day-to-day life. The libraries play an important role in preserving and conserving the indigenous knowledge and disseminating it to the people. Preservation of Indigenous knowledge is important in order to preserve our identity and culture of the indigenous people. The study gives an overview on the preservation and conservation of indigenous knowledge of the people of Tripura by the public libraries of the state of Tripura. An attempt have taken to find out the role of the public libraries of the state of Tripura in preservation and conservation of Indigenous Knowledge (IK). The main objective of the study is to find out the existence of the IK and types of documents in the library, the methods and measures taken to preserve IK along with the challenges faced in the process. The data were collected from five different public libraries of the state of Tripura, the libraries are State Central Library, District Public Library, Town) Library, Kokborok Library and Tripura State Museum Reference Library. The government governs all the libraries. The study also stated that all the libraries has IK collection in the libraries and types of IK collections present in the library are Text


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COVID-19 Impact on Libraries and the Role of E-Resources

Jayanti Chakravorty* and Dr. R. K. Mahapatra**

*Research Scholar, Dept. of Library and Information Science,
Tripura University

**Associate Professor, Dept. of Library and Information Science,
Tripura University

Abstract

This paper aims to dwell upon the impact of Covid 19 pandemic on libraries and the role played by e-books, e-journals and other e-literature in maintaining and supporting library services during and after such impact.

Key words: Covid Impact, Challenges on libraries, Role of e-Literature

1. Introduction:

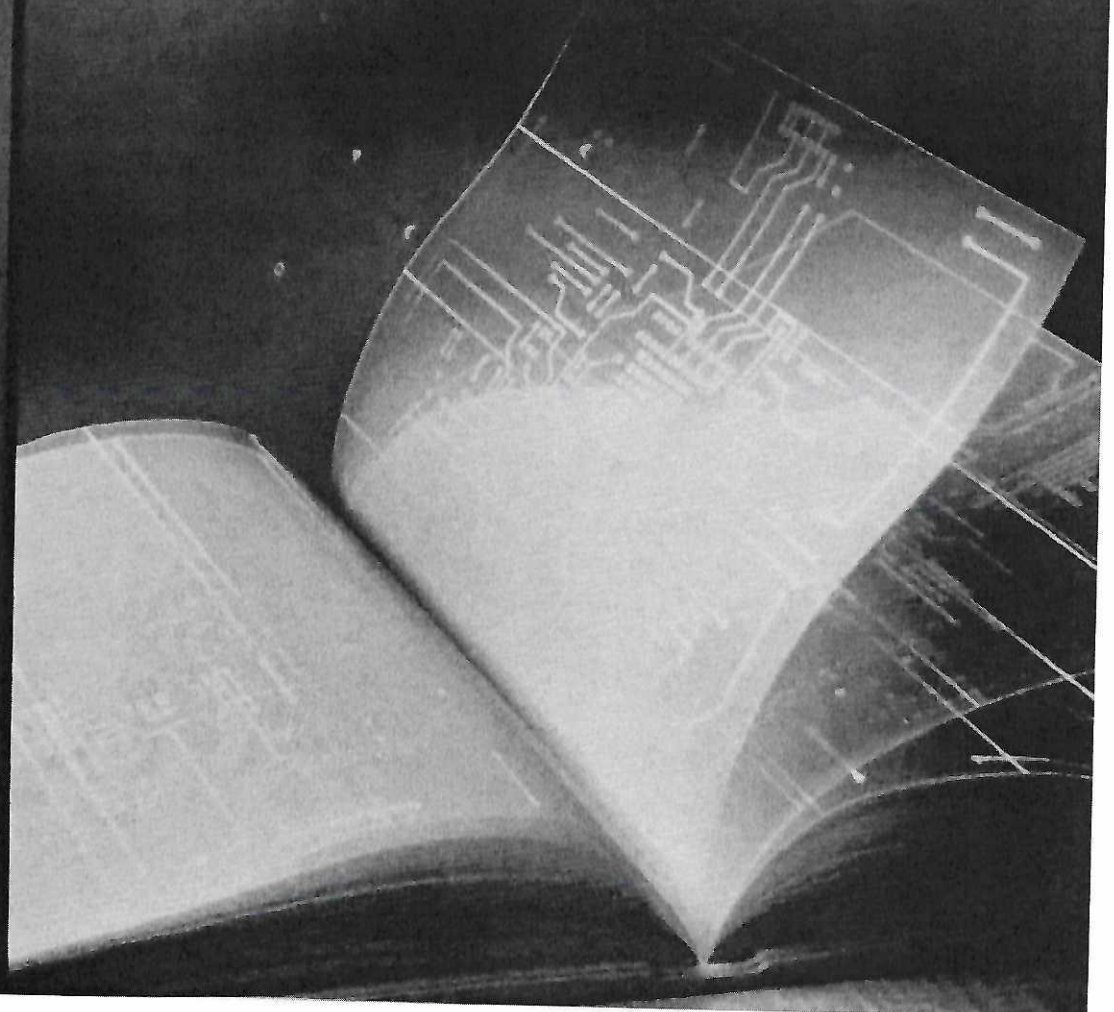
Covid 19 pandemic has emerged to be one of the major pandemics, the world has witnessed. It has left a lesson that the human race is not fallible and the health sector in many a country, both developed and developing or underdeveloped needs a thorough revamp. The disease has infected millions of people across the world. The World Health Organization declared its outbreak as a Public Health Emergency of International Concern on 30th of January, 2020 and a pandemic on 11th March, 2020. [Mayo Clinic]

Various countries have responded to combat the pandemic in various manners. Some were late in adopting effective measures; while some other nations have put in place effective strategies to contain the infection and have recorded a very low number of cases since the pandemic onset. Restrictive measures like social distancing, lockdown, case detection, isolation, contact tracing and quarantine of exposed had revealed the most efficient actions to control the disease spreading. India responded to the pandemic in a comprehensive manner. Only time will tell how well India has faced the outbreak.


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Quality Library Services in New Era

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Sanjay Kumar Singh
Kishor Sarma

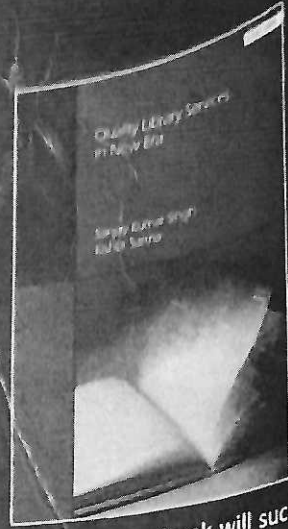


Quality Library Services in New Era

About the Book

Quality library service means resources and services which satisfy users' expectations and needs. The library services have been changing rapidly in the last few years. The primary objective of this book is to delineate the various issues to gear up the quality library services, so that the user community can meet their expectations through library. The book basically deals with the "Quality Library Services in New Era" which highlights concept of quality library service, role of library professionals for quality library service, implementing quality library services through mobile apps, space design and quality library service etc.

This book contains seventeen research oriented articles pertaining to relevance of the title. Hope these will throw some light for library professionals, faculty members and the students of Library and Information Science who are pursuing MLISc and Ph.D courses. Our industrious undertaking would bear fruits if the book will succeed in harbouring positive responds from our esteemed readers.



The Editors



Dr. Sanjay Kumar Singh is presently Professor and Head in the Department of Library and Information Science Gauhati University, Guwahati, Assam. He is life member of several professional organizations viz. IASLIC, IATLIS, ILA, ALA, GLA, NBT, IDEA etc. He is Vice President of IASLIC, Vice President of DLIS Gauhati University Alumni Association and Vice President of Assam Library Association (ALA). He has published a good number of articles in national and international journals and proceedings. Under his supervision 10 scholars have been awarded PhD degree in Library & Information Science.



Dr. Kishor Sarma is now working as Librarian in Dakshin Kamrup Girls' College, Mirza (Assam). He completed his Post Graduation in Psychology and B.Ed from Gauhati University. In addition, he obtained Master degree in Library and Information Science (M.L.I.Sc) with first class first position and Ph.D from Gauhati University. Dr. Sarma worked as Librarian in B.H. College, Howly before joining Dakshin Kamrup Girls' College, Mirza. For a short period he also worked in Indian Institute of Bank Management (IIBM- Guwahati) and L.C.B College, Maligaon. He has attended a number of national and regional conferences, seminars and workshops and presented and contributed several papers.



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Quality Library Services in New Era


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12

Use and Awareness of Social Networking Sites among the Students of Tripura Institute of Technology, Agartala, Tripura

*Mithu Anjali Gayan
Priya Datta*

Abstract

Social Networking Sites (SNS) are the new avatar of e-communication to the mass people for the two-way communication of exchange, interactions and sharing all kinds of information seamlessly. The current study is an attempt find out the use and awareness of SNSs among the students of Tripura Institute of Technology, Agartala, Tripura. The institute is one of the premier technical education institutes of the state of Tripura, India. A questionnaire having 20 questions was administered to 300 under graduate students of different departments from Tripura Institute of Technology. Out of 300 students, 280 have responded with a response rate 93.33%. The results showed that 41.43% of respondents spend 2 to 4 hours per day on social networking; 88.57% respondents use YouTube; 41.43% respondents use SNSs for keeping in touch with friends; 74.29% prefer content related to entertainment; 72.86% use SNS for communicating with their teachers; 92.86% respondents use smart phones for using social networking sites.

Keywords: SNS, Tripura Institute of Technology, Tripura, Awareness, Web 2.0.

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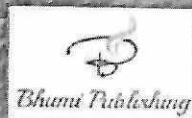
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INDUSTRIAL SOLID WASTES AND THEIR RESOURCES

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Abstract:

The wastes which are generating due to the manufacturing process or industrial process or any kind of mill as well are called Industrial waste. The disposal of these industrial solid wastes is a serious problem in various developed and developing countries. These industrial solid waste management must be financially sustainable, technically feasible, socially, legally acceptable and environmentally friendly. These waste materials can be used for various applications in several industries. In this present chapter, various industrial solid waste and their resources are discussed. Furthermore, the waste management policies implemented in India are also briefly discussed.

Keywords: Industrial solid wastes; Fly ash; GGBS; Nickel slag; Silica fume; Copper slag; Red mud; Rice husk.

1. Introduction:

The population of the world is increasing every day and the consumption of various materials is also increasing due to their developed lifestyle and purchasing power. Thus million tons of waste is generating every day and it is one of the major concerns for today's world. Waste can be defined as substances which are worthless after use or defective, unwanted, or discarded[1]. It is important to define waste and manage the waste to save the environment with respect to the health aspects. The wastes which are generated from the industrial or manufacturing processes any kinds of mill as well are called industrial solid waste. It is required to control the pollution caused by waste disposal and utilize these waste materials in various value added products for various applications in different sectors. There is needed to develop a proper infrastructure facility, appropriate safeguards, and guidelines to dispose of the industrial waste. Various industries which are generating waste need to manage such waste by following the government rules and regulations. Further, it is also required to assess the nature of waste generated for various applications. The major industrial solid wastes generators are the coal-based electricity generating plants, iron and steel industries, aluminum, zinc, and copper



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Bioresource Utilization and Management: Applications in Therapeutics, Botany, Agriculture, and Environmental Science

Editors: Pradyumn Kumar Thakur, H.N. Nagaraj Kumar, Dr. Pooja Saini

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The need for sustainable, cost-effective and safe drugs is a major challenge in the pharmaceutical industry. The use of natural products as drug leads has been a major focus in the search for new drugs. The use of natural products as drug leads has been a major focus in the search for new drugs. The use of natural products as drug leads has been a major focus in the search for new drugs.


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- 1) Self-Sustained Farm Colonization in Tropical Islands of Western Colombia: One for Adoption and Alternative Livelihoods
- 2) Application of Bioremediation in Sustainable Development of Farming Community
- 3) Bioremediation of Heavy-Metals Contaminated Environment Using Bacteria, An Actinobacteria
- 4) Bioremediation of Heavy-Metals Contaminated Environment Using Bacteria, An Actinobacteria
- 5) Bioremediation of Heavy-Metals Contaminated Environment Using Bacteria, An Actinobacteria
- 6) Bioremediation of Heavy-Metals Contaminated Environment Using Bacteria, An Actinobacteria
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CHAPTER 21

Spent Coffee Waste Conversion to Value-Added Products for the Pharmaceutical and Horticulture Industry

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ABSTRACT

Coffee, a valuable product of world trade, is a popular beverage globally. After petroleum, it is the highest traded commodity. The International Coffee Organization reports that approximately 6 million tons of the solid waste is generated annually, of which spent coffee ground (SCG) forms a major portion. Currently, SCG has a little commercial value being mostly disposed


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2. Self-sustained ramie cultivation: an alternative livelihood option.

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The need for bioresource utilization and management is increasing rapidly in the agricultural sector. The authors have provided a comprehensive overview of the subject, covering the various aspects of bioresource utilization and management in the agricultural sector. The book is a valuable resource for researchers, students, and practitioners in the field of bioresource utilization and management.

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1.2. Application of Bio-Fertilizer and Smartest Feed for Sustainable Development of Farming Community

2. Remediation of Polluted Environment Using Microbes, Plants and Nanoparticles

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2.8. Remediation of Polluted Environment Using Microbes, Plants and Nanoparticles

2.9. Remediation of Polluted Environment Using Microbes, Plants and Nanoparticles

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The pages of my new book, 'Remediation of Polluted Environment Using Microbes, Plants and Nanoparticles', have been published. I am very grateful to AAP for making it possible to publish my book. I am also grateful to AAP for making it possible to publish my book. I am also grateful to AAP for making it possible to publish my book.

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CHAPTER 16

Self-Sustained Ramie Cultivation in Tripura: A Source of Multiple Commercial Uses for Adoption as an Alternative Livelihood

SHAON RAY CHAUDHURI^{1*}, BASANT KUMAR AGARWALA^{2,3},
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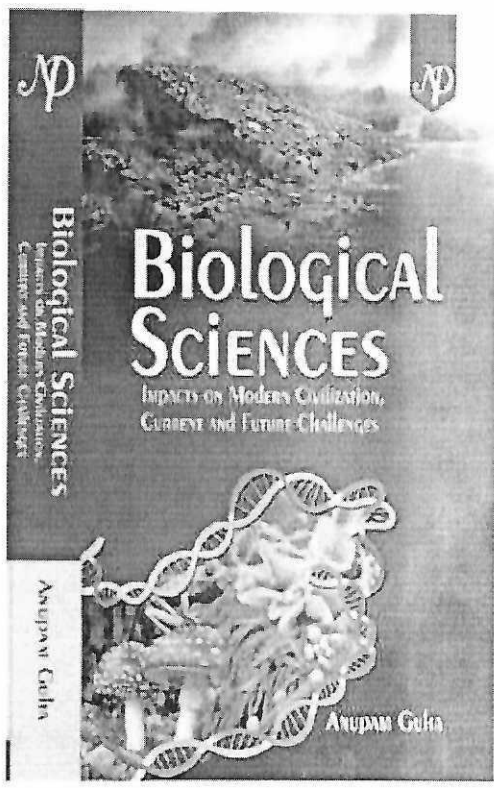
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4. White blood cell diameter as a biomarker for rapid diagnosis of septicemia and antibiotic sensitivity screening



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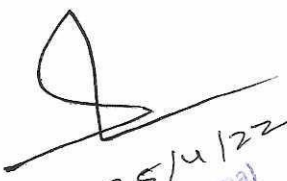
White blood cell diameter as a biomarker for rapid diagnosis of septicemia and antibiotic sensitivity screening

Shabana Islam¹, Anupam Guha², Manjira Gupta³, Smitay Ghose⁴, Anurag Das⁵, Madhusmita Sengupta⁶, Debashree Gupta⁷, Kripasankar Das⁸, Sharmistha Dasgupta⁹

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Abstract: This study was aimed at testing the effect of increasing diameter of WBCs in septicemia. Anupam Guha was involved in testing the work with Candidate Manjira Gupta. Anupam Guha was involved in the study design of the disease. Anupam Guha was involved in phytochemical extracts that was further used for conducting the experiment. Anupam Guha was involved in the editing of the paper. Anupam Guha and Smitay Ghose provided clinical samples for the experiment. Debashree Gupta also provided the corresponding VITEEE 2021. Sharmistha Dasgupta had designed the entire study carried out by the students including the entire study carried out from the ongoing research obtained for funding for the work.


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Plant litter decomposition –An overview In: *Biological Sciences: Impacts on Modern Civilization –Current and Future Challenges* by Anupam Gaha * New Delhi Publishers, New Delhi, 2021, 229-237 ISBN: 978-81-947417-9-4.
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Plant litter decomposition –An overview

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Abstract: Decomposition of plant litter refers to the breakdown of dead organic matter to simple inorganic form through the action of soil flora and fauna by a series of events like development of microbial flora on the plant surface followed by colonization of different microbes in a successive manner alongwith the action of soil fauna. The process of decomposition is controlled by various factors like qualitative features of the litter, edaphic and climatological factors etc. among which climate and biomass quality influences the most. Soil enzymes also play major role in decomposition as well as mineralization. The pattern of nutrient dynamics also varies for different litter types. The fungal succession on the decomposing organic matter is a vital aspect of litter decomposition. They explore the nutrients in a sequential mode and perform a key role in litter decomposition. Regardless of the type of soil ecosystem the process of litter decomposition confirms it's growth, development and sustainability.

Keywords: Litter decomposition; Litter quality; Nutrient dynamics; Climatic factors; Fungal succession

Litter decomposition is described as the biological disintegration of dead bio-organic matter into simple inorganic forms by the process of mineralization of complex organic compounds^[1]. It may be any ecosystem; the decomposition of litter has crucial influence upon the growth and development of vegetation. Other than plant remains, fungal and bacterial components and dead residues of various fauna, both micro and macro forms are present along with litter. The functioning of an ecosystem depends upon three distinct subsystems, i.e., producers, consumers and decomposers and more importantly transfer of matter and energy among these subsystems to maintain the structural and functional integrity of an ecosystem.

The sequence of events leading to the decomposition can be summed up along these lines: - development of microbes on the phylloplane, microorganisms colonize thereafter, combination and injection by invertebrates result in inclusion of organic


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CHAPTER 10

Molecular Biology Techniques for the Detection of Contaminants in Wastewater

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10.1 Introduction

Ecological calamities are complex events where water contamination domain directly impacts ecological balance, aquatic life, and human health. Detection technologies to assay these water-borne contaminants measure the status of contamination and help policymakers to plan corrective measures to restore ecological balance. Various molecular strategies are employed to screen contaminated samples for the presence of viral, bacterial, protozoa, and other pathogens. The presence of fecal coliforms, *Escherichia coli* and *Enterococci*, serves as microbiological markers to indicate the degree of quality loss due to pollutants. Additionally, they are used to evaluate the success of decontamination procedures (Lipp et al., 2001; Tree et al., 2003; Wéry et al., 2008). However, no bacterial indicators till now meet the criteria of a being water quality indicator for every source (Girones et al., 2010). Routine microbiological methods such as isolation of pure culture and morphological, biochemical, and genetic tests have shown huge microbial biodiversity in water bodies and nature in general (Bitton, 2005). Nonetheless, the complex interaction web among the bacterial population is plentiful but is difficult to capture as growing pure culture of most microorganisms from natural habitats is not possible. This little culturable fraction does not represent microbial biodiversity available at any niche. Molecular biology approaches can resolve this issue. The 16S rRNA can serve as a molecular indicator for the recognition of unculturable

* PB, DT, and SP contributed equally to this chapter.

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Chapter 1

Biofilm Formation and Pathogenesis

Ankurita Bhowmik, Akshit Malhotra, Sangita Jana, and Ashwini Chauhan

Abstract

Microbial biofilms are compact surface attached communities that are usually formed of mixed species wherein microbes thrive together and compete for limited resources. Bacteria growing in biofilms are highly tolerant to antibiotics and recalcitrant to host immune system thus act as an important virulence factor playing a crucial role in infection persistence and pathogenesis. Bacterial biofilms have long been perceived as cause of chronic infections and diseases in humans. However, host–biofilm interactions are not well understood and thus, limiting our knowledge on how biofilms participate in disease pathogenesis. In this chapter, we will discuss underlying molecular mechanisms of biofilm formation and different interactions taking place during establishment of biofilms. Moreover, we will highlight in detail the role of biofilms as a virulence component and its contribution to the disease pathogenesis, focusing on important human infectious diseases and relevant animal models studying the fundamentals of pathogenesis.

Keywords Biofilms, Adhesion, Host–biofilm interactions, Animal models, Competitive interactions, Infectious diseases

Abbreviations

EPS	Exopolysaccharides
ECM	Extracellular matrix
MSCRAMMs	Microbial surface components recognizing adhesive matrix molecule
PIA	Polysaccharide intercellular adhesin
AHL	Acyl-homoserine lactone
AI-2	Autoinducer-2
HSL	Homoserine lactone

Ashwini Chauhan

1 Introduction

Bacteria can grow in two different lifestyles: the free-floating planktonic or the surface-attached sessile mode within biofilms, which are highly organized communities wrapped in a self-produced polymeric matrix [1–3].

Moupriya Nag and Dibyajit Lahiri (eds.), *Analytical Methodologies for Biofilm Research*, Springer Protocols Handbooks, https://doi.org/10.1007/978-1-0716-1378-8_1, © The Author(s), under exclusive license to Springer Science+Business Media, LLC, part of Springer Nature 2021

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Chapter 19

Lee-Wave Clouds in Martian Atmosphere: A Study Based on the Images Captured by Mars Color Camera (MCC)



Jyotirmoy Kalita, Manoj Kumar Mishra, and Anirban Guha

Abstract Atmospheric internal gravity wave cloud, commonly known as lee-wave cloud, used to form over the north-eastern slope of Ascraeus Mons and the eastern slope of Tharsis Tholus in Mars. Mars Color Camera (MCC) captured ~ 30 images of such cloud structure during Martian years 33 and 34. In the present analysis, we objectify our focus on the atmospheric parameter related to the captured lee-wave events, and we interpret our results physically with other instrument data viz. MCS-MRO, MARCI. We estimated the reflectance at TOA, cloud's wavelength, wind velocity, formation height, formation temperature, nature of the cloud particle, the effective radius of the particle, and other atmospheric parameters related to the lee-wave events. Estimated maximum reflectance of 0.75 in the blue channel implies water ice particles in the cloud portion. The wavelength of the lee-wave cloud varies from 27 ± 2 to 39 ± 3 km implying a wind speed range from 32 ± 3 to 54 ± 7 m/sec at the height of 25 ± 2 to 37 ± 5 km from the surface of Mars. We used the Global Circulation Model (GCM) model to validate our initial findings. Further, the estimated AOD value variations from 0.8 to 2.4 for the blue channel implies the contribution of water ice particles in the increment of AOD over the Martian volcano. The effective radius of the water ice particle is found to be $3.2 \mu\text{m}$ based on the MCS-MRO analyzed data. The scale height of AOD varies from 3 to 6.5 km over Ascraeus Mons, and Tharsis Tholus indicates the presence of a non-homogeneous mixture of air and airborne particle near the lee side of Ascraeus Mons. The present study illustrates a Spatio-Temporal distribution of lee-wave cloud during solar longitude 70 to 140° with variation in 160 to 190 K formation temperature.

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EXTERNAL DIMENSIONS OF SECURITY OF THE NORTH EAST REGION

Edited by

HEM JENMEREN AO


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Dr. Deenak Shaha
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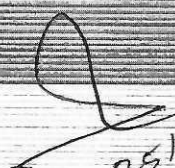


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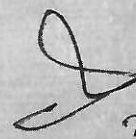
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7. Maritime Connectivity and North East India: Issues and Challenges

Biplab Debnath

Introduction

Maritime connectivity is a vital factor for the development and prosperity of nation-states, the obvious reasons being that a large chunk of global trade across the world is carried out through the sea. Since ancient times, water bodies were the primary medium of mobility among people and goods, even as maritime trade witnessed an exponential rise with the advent of globalisation and the resultant increase in global trade. According to the data of the United Nations Conference on Trade and Development (UNCTAD), the volume of sea trade in 2018 was at an all-time high of 11 billion tonnes—more than 90 per cent of the global trade (UNCTAD, 2020: x). Sea trade is the most cost-effective mode of transfer of goods. It plays a crucial role towards sustainable development—especially of the developing nations whose share of seaborne trade imports rose to 64 per cent in 2018 (UNCTAD, 2019)—and forms, in the words of the former Secretary-General of the United Nations (UN) Ban Ki-Moon, ‘the backbone of global trade and global economy’ (United Nations, 2016). It is for this reason that nations with coastlines have a natural geo-economic advantage in terms of direct access to the sea as compared to landlocked states that are dependent on political relationships with neighbouring countries to take advantage of maritime trade.

India, ironically, experiences the advantages as well as the pitfalls of its geographic location vis-à-vis maritime connectivity and trade. India is the 16th largest maritime country in the world with a coastline of 7,517 km, having 12 major and 187 minor or intermediate ports, which accounts for 95 per cent of India’s merchandise trade by

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Future of E-Waste Management covers various aspects of e-waste management and discusses remedies to protect the environment. The intricacies of law related to e-waste management have been discussed in detail. The contributors, in their respective chapters, have delved into the core of their chosen topics and provided suggestions at the end. Teachers, students, scholars, lawyers, judges and those interested in the subject will find the book useful. The editors of the book have great passion for environment protection and closely watch all national and international developments in e-waste management.

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FUTURE OF E-WASTE MANAGEMENT

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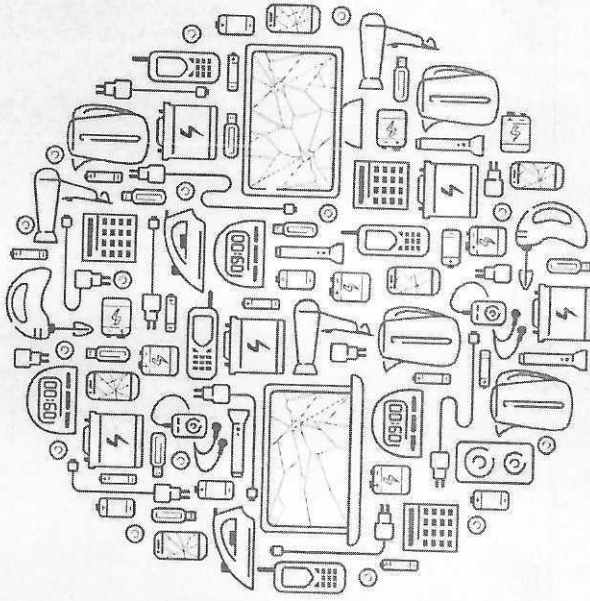
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Challenges and Opportunities

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CHAPTER 9

E-WASTE MANAGEMENT IN INDIA – A REVIEW

DIPANKAR DAS* AND PRASANTA KUMAR ROUT†

ABSTRACT

E-waste can be defined as waste from electrical and electronic equipment (EEE) discarded after their intended use by the end-user. It is one of the secondary resources of precious and valuable materials and is gaining more importance day by day due to it being a profitable business and a livelihood opportunity. The presence of toxic elements such as lead (Pb), nickel (Ni), zinc (Zn), barium (Ba), beryllium (Be), chromium (Cr), mercury (Hg), cadmium (Cd), and so on is very dangerous for the environment and health of human beings. India is the third-largest e-waste generator in the world and it is a matter of concern today. The e-waste collection in India is mostly done in informal ways, which is about 95% and formal ways do 5%. This chapter deals with the hazardous substance scenario of e-waste, its generations globally and in India, its treatments and processing in India, various policies implemented in the country and the challenges and opportunities for e-waste management. E-waste contains various valuable precious materials and has the potential to become a lucrative business opportunity in India.

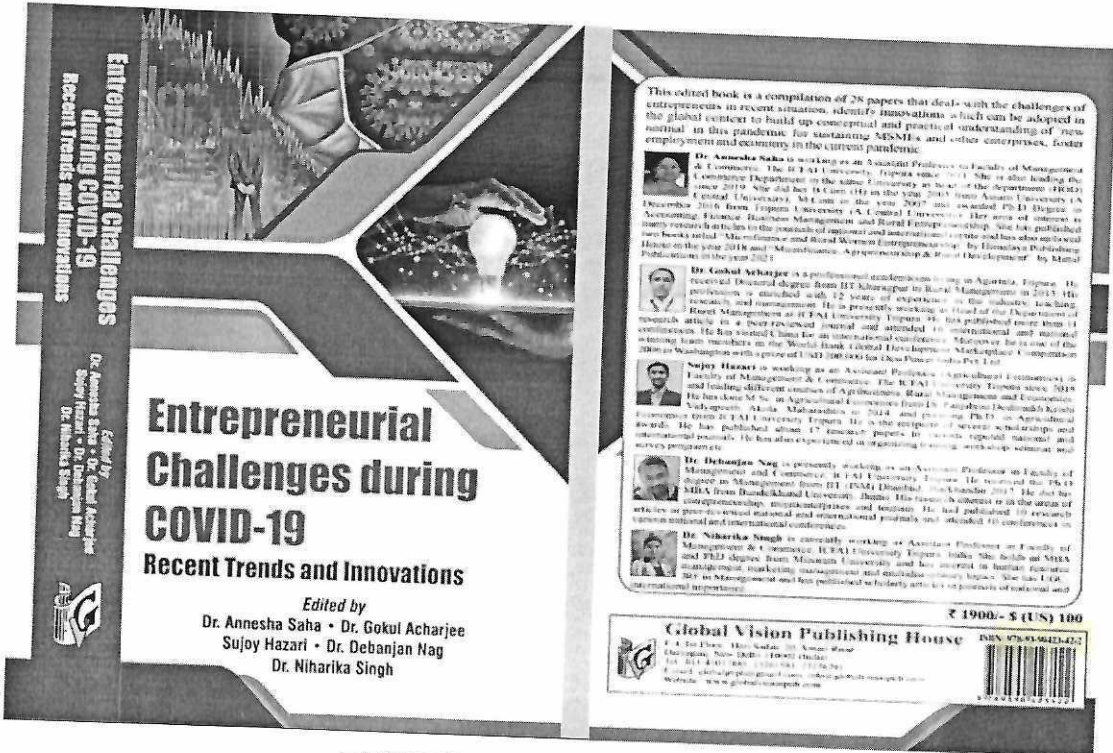
Keywords: E-waste, Environment, Recycling, EEE, Business, Toxic elements.

1. INTRODUCTION

Technology is developing every day at a faster rate. The lifestyle of human beings is also changing with these technological developments, and the vast community of humans depends on the EEE. Due to advancements of the EEE along with the lower price of the product, consumers are changing product within a short span of time. The discarded product by the user and the obsolete product is the reason for the increase of e-waste or electronic waste every day. The EEE which are discarded as whole or in part by the bulk customer or consumer, rejected from the manufacturing industry or during refurbishment and repair process is called e-waste, a term given by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India (MOEFCC, 2016). The

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Types of Topological Spaces Based on Notions of Sets

Binod Chandra Tripathy

Abstract

In the last century the notion of set introduced by G. Cantor has been expanded by the introduction of different notions of sets, such as Fuzzy set, Soft set, Multi set etc. The new notions of sets have been introduced looking at the requirements of the situations. The notion of topology has been defined on sets. Then it is natural to think about the introduction of topological spaces based on the introduced notions of sets. This has expanded the scope for the study in topological spaces. Thus topological spaces corresponding to each of these notions of sets have been introduced. In this talk, the basics of most of these topological spaces will be discussed. Suitable examples will be discussed on the motivation behind the introduction of the notions of sets as well as the emerged topologies on them.

Keywords: *Topology; Bitopology; Fuzzy set; Soft set; Multi set.*


AMS Subject Classification no. 03E72; 54A05; 54A05; 54E55.

1. Introduction

We start with the well known definition of metric space.

Definition 1.1. A function $f: A \times A \rightarrow R_+ \cup \{0\}$ is called a **metric** if

- (i) $f(a, a) = 0$ and $f(a, b) = 0$ if and only if $a = b$.
- (ii) $f(a, b) = f(b, a)$.
- (iii) $f(a, b) \leq f(a, c) + f(c, b)$ for some $c \in A$.


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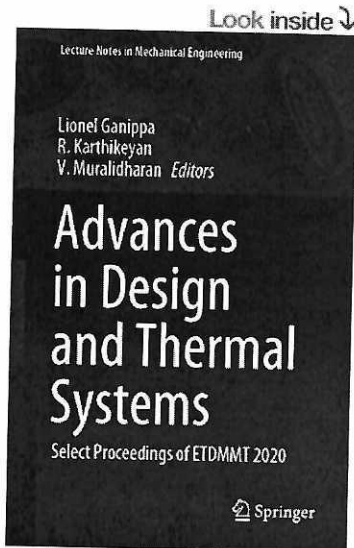
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About the Author

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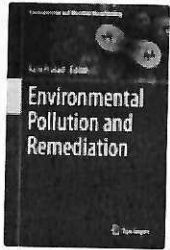
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Abstract

Extensive allocation of synthetic microfiber (SMF) particles in the environment has harmful ecological impacts. These are tiny threads of synthetic fabrics having diameter less than 10 μm and are categorized under secondary microplastics, which are mainly composed of polyester, nylon, acrylic, polyethylene terephthalate, and polypropylene. These micropollutants are of increasing concern, especially due to their release into aquatic environments, including rivers and ocean. Primary sources of these