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3.2.2.	Books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years



  
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সম্পাদনা

ড° মধুস্মৃতা বৰুৱা চাংকাকতি

অজিত কুমাৰ বৰা

  
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## অসমীয়া সাহিত্যলৈ ‘অৰুনোদই’ বদান এটি আলোচনা

মধুসূতা বৰুৱা চাংকোকটি

অসমীয়া জাতীয় জীৱনৰ বুৰঞ্জীত ১৮২৬ খ্ৰীষ্টাব্দতো অতি তাৎপৰ্যপূৰ্ণ বছৰ। কিয়নো এই বছৰতে অসমৰ সুদীৰ্ঘ আহোম তাৎপৰ্যপূৰ্ণ বছৰ। কিয়নো এই বছৰতে অসমৰ সুদীৰ্ঘ আহোম ৰাজবংশৰ ছশবছৰীয়া স্বাধীনতাৰ বেলি মাৰ যোৱাৰ লগে লগে অসমীয়া ভাষা সাহিত্যৰ উন্নতিৰ দিশত আহিছিল প্ৰবল বাধা। অসম ইংৰাজৰ শাসনধীন হোৱাৰ লগে লগে ৰাজ্যখন সুচাৰুৰূপে চলাবলৈ ইংৰাজী শিক্ষাৰে শিক্ষিত বঙলা ভাষী লোকক অসমৰ চাকৰিত নিয়োগ কৰিবলগীয়া হৈছিল। ইয়াৰ মূলতেই হ’ল, অস্পৃশ্য বুলি জ্ঞান কৰা ইংৰাজী ভাষা জনা অসমীয়া লোক সংখ্যা আছিল নিচেই তাকৰ। গতিকে ইংৰাজসকলে নিজৰ কাম-কাজৰ সুবিধাৰ বাবে ১৮৩৬ চনত অসমৰ স্কুল আৰু আদালতপৰা অসমীয়া ভাষা বহিস্কাৰ কৰি তাৰ ঠাইত বঙলা ভাষাৰ প্ৰচলন কৰে। ১৮৩৬ চনৰপৰা ১৮৩৭ চনলৈকে অৰ্থাৎ অসমীয়া ভাষাৰ পুনৰ প্ৰতিষ্ঠাৰ সময়লৈকে এই সাতত্ৰিশ বছৰ কাল অসমীয়া ভাষাৰ বিকাশৰ পথ ৰুদ্ধ হৈ পৰে।

অসমৰ বাবে ১৮৩৬ চনটো যিদৰে দুৰ্ভাগ্যৰ বছৰ, সেইদৰে সেই বছৰতেই আমেৰিকাৰ খৃষ্টান মিছনেৰীসকলে শুভক্ষণত খৃষ্টধৰ্ম প্ৰচাৰৰ উদ্দেশ্যে অসমত ভৰি দিয়েহি। এই মিছনেৰীসকলে চৰকাৰী ভাষাকে অসমৰ ভাষা বুলি ধৰি লৈ বঙলা ভাষাতেই ধৰ্ম প্ৰচাৰ কৰিবলৈ ধৰিলে। কিন্তু চতুৰ মিছনেৰীসকলে বুজি পালে যে বঙলা ভাষা অসমৰ মানুহেবুজি নাপায়, তেওঁলোকৰ নিজস্ব মাতৃভাষা আছে। তেওঁলোকে উপসলন্ধি কৰিব পাৰিছিল যে মাতৃভাষাৰ মাজেদিয়েই ব্যক্তি যা একোটা জাতিয়ে কোনো বিষয় যিমান সহজে হৃদয়ংগম কৰিব পাৰে, অন্য ভাষাৰ মাধ্যমত যিমান সহজে নোৱাৰে। সেয়েহে অসমীয়া ভাষাৰ পুনঃ ন্যায্য

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## Study of Optical Properties of Ag/ZnO Core/Shell Nanoparticles

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**Abstract**—In this research work, we report the synthesis of Ag/ZnO core/shell nanoparticles via a simple two step wet chemical method using zinc nitrate hexahydrate [ $Zn(NO_3)_2 \cdot 6H_2O$ ], Potassium hydroxide (KOH) and silver nitrate ( $AgNO_3$ ) as precursors, Polyvinylpyrrolidone (PVP) as capping agent and tri-sodium citrate ( $Na_3C_6H_5O_7$ ) as reducing agent. The structural and optical properties of Ag/ZnO core/shell structure are characterized by scanning electron microscopy (SEM), high-resolution transmission electron microscopy (HRTEM), X-ray diffraction (XRD), ultraviolet-visible spectroscopy (UV-Vis) and photoluminescence (PL) spectroscopy. SEM images reveal that all the Ag nanoparticles and Ag/ZnO core/shell nanoparticles are nearly spherical in shape and uniformly distributed. From HRTEM image, core diameter and shell thickness are found to be 15 nm and 3 nm respectively. XRD pattern of Ag/ZnO core/shell indicates formation of face centred cubic (fcc) structure of Ag NPs and hexagonal wurtzite structure of ZnO. The ZnO shell coating over Ag core results in red shifting of surface Plasmon resonance (SPR) peak of Ag core due to increased refractive index of the surrounding medium. The PL spectroscopy of Ag/ZnO core/shell nanoparticles shows quenching of near band edge emission of ZnO. This is due to the transfer of photogenerated electrons from ZnO shell to the Ag core

lowers its photocatalytic efficiency. To overcome this problem and to increase the photocatalytic efficiency of ZnO, Ag nanoparticles are loaded onto ZnO to form a composite like Ag/ZnO core/shell structure. As conduction band (CB) of ZnO is higher than the fermi-level of Ag, photogenerated electrons in the CB of ZnO get transferred to the Ag core. This enhances the charge separation and prolongs the lifetime of charge carriers. Ag/ZnO core/shell structures have been synthesized by a number of methods, such as Solvothermal methods [12], template-confined synthesis routes [13], low temperature methods [14], hydrothermal synthesis [2] and chemical precipitation methods [15].

In this work, we have synthesized Ag/ZnO core/shell nanoparticles via a simple two step wet chemical method. The Structural and morphological studies confirm the formation of core/shell structure. The optical properties including UV-Visible spectroscopy and Photoluminescence spectroscopy of the synthesized materials are studied and it is found that ZnO shell coating over Ag core results in red shifting of Surface Plasmon resonance (SPR) peak of Ag core due to increased refractive index of the surrounding medium. The PL spectroscopy of Ag/ZnO core/shell nanoparticles shows quenching of near band edge emission of ZnO. This is due to the transfer of photogenerated electrons from ZnO shell to the Ag core.

**Keywords:** Core/Shell, HRTEM, red shift, quenching.

### 1. INTRODUCTION

In recent years, metal/semiconductor core/shell structures have attracted much attention due to their unique optical and electrical properties which have potential applications in photo catalysis [1-4], antibacterial effects [5,6], gas sensors [7,8], fiber optic SPR sensors [9], solar cell and biological sensors [10,11] and so on. Among the semiconductors, ZnO is widely used due to its high (3.37 eV) and direct band gap properties, large binding energy (60 eV), high photocatalytic activity, high physical as well as chemical stability. However rapid recombination of photogenerated electrons and holes in ZnO

### 2. EXPERIMENTAL

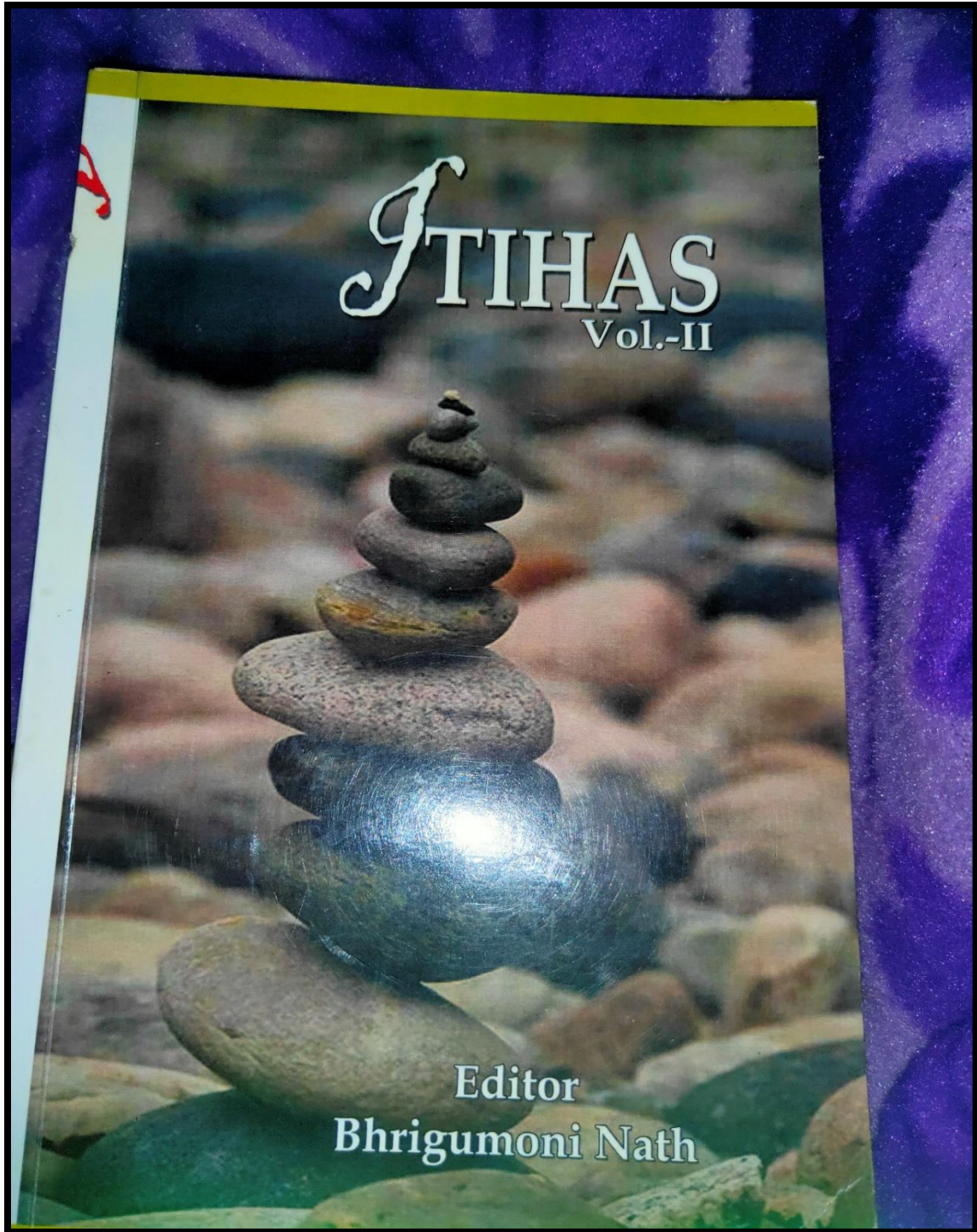
#### 2.1 Chemicals and Materials

All materials are purchased from Merck with highest purity (99.99%). Zinc nitrate hexa-hydrate [ $Zn(NO_3)_2 \cdot 6H_2O$ ], Potassium hydroxide (KOH), Polyvinylpyrrolidone (PVP), Silver Nitrate ( $AgNO_3$ ), Tri-sodium Citrate are used as chemical materials for synthesis of Ag nanoparticles and Ag/ZnO core/shell nanoparticles.

#### 2.2 Preparation of Ag nanoparticles



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## **Microalgae biofuels : Potentials and Challenges**


**Dilip Tamang**

**Abstract:**


*The practice of exploration for the alternative energy source is very old. The shrinkage of the fossil fuel reserves, their high cost and the increasing pollution are the main causes for the development and production of biofuels from the non-food feedstocks, mainly from the microalgae. This article reviews the present status of microalgae for the production of biofuels for the upcoming days with severe energy crisis. The interesting potentials of the microalgae and the challenges prevailing during the biofuel production process are analysed. Moreover, there are many more opportunities regarding the scope of biofuel productions not only in National and International backgrounds but in Assam also, very rich in biodiversity possesses many wetlands where the culture of Microalgae can be done and thereby playing a major role in contributing to the sustainable utilization of biofuels.*

**Keywords:** Alternative energy source, Fossil fuels, Microalgae, biofuel, sustainable utilization

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**SOME ASPECTS OF THE CIVIL DISOBEDIENCE  
MOVEMENT (1930-32) IN SOUTH ASIA: A CASE  
STUDY OF ASSAM**

*Fakrul Islam Laskar\**

The national enthusiasm and patriotic zeal which was manifested spontaneously during the Non-cooperation movement virtually ceased to exist in India in the post Chauri-Chaura (5 February 1922) period. But the development such as Bardoli Satyagraha (1928), the boycott of the Statutory Commission popularly known as the Simon Commission appointed in 1927 to examine the workings of the Act of 1919 and the refusal of the British Government to accept the demand of Dominion Status put India on the threshold of great struggle for freedom by the end of 1929 and gradually brought an active feeling of nationalism once again in the country which assumed subsequently a vigorous shape in the name of the Civil Disobedience Movement.

In this paper I have tried to explore the various aspects of the Civil Disobedience Movement in Assam. I have also focused on the mobilization of the people in the movement in both the valleys of the province and also the response of the common people to the call of Mahatma Gandhi.

This paper is primarily based on archival documents such as *Police Abstract of Intelligence, Memoirs, Fortnightly Reports* preserved in National Archives of India, New Delhi and Assam State Archives, Guwahati.

The Indian National Congress in its Madras session (1927) had declared independence as India's goal and that was later on reaffirmed by the provincial conferences such as Punjab, Delhi and Uttar Pradesh. The sentiment of independence became so strong that Mahatma Gandhi struck a middle path and proposed that the Dominion Status would be accepted provided the British Parliament accepted the Nehru Constitution in its entirety within a year. Again in the Calcutta Congress of December 1928, he moved a resolution which stated that the Congress would adopt the Nehru Constitution if it was accepted in its entirety by the British Parliament on or before the December 31, 1929, but in the event of its non-acceptance by the date or its earlier rejection, the Congress would organize a campaign of non-violent non-co-operation by advising the country to refuse taxation and in such other manner as may be decided upon.<sup>1</sup> Gandhi also appealed to the Congressmen to stick to the demand of Dominion Status as recommended by the Nehru Committee and approved by the Working Committee. But this compromising attitude created general dissent especially among the younger section that tried to bring amendment to Gandhi's resolution but remained unsuccessful.<sup>2</sup>

\* Senior Research Fellow, CAS, Department of History, AMU, Aligarh.

  
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# Recent trends in Material Science and Optoelectronics

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## **Wastewater treatment by metal- semiconductor Core-Shell Nanostructured Photocatalysts**

✉ Himanshu Rajbongshi\*


### **Introduction**

Metal-semiconductor core-shell nanostructured photocatalysts have been extensively employed for waste water purification and polluted air cleansing application. It is also a well-recognised scheme to decompose numerous hazardous materials in contaminated water and air. Recently, noble metals like Pt, Au, Ag have attained interest as a core material enclosed by semiconductor shells in core-shell nanostructural photocatalyst synthesis. The core-shell nanostructured materials can be fabricated with diverse shapes and sizes of varying core as well as shell widths by means of different structural morphologies. These nanoparticles could be of any shape like centric, eccentric, spherical, star-shaped, fibrous or tubular and so on<sup>[1]</sup>. The physicochemical properties of the core-shell nanostructures may be modified simply by adjusting their size and shape focusing on their particular applications<sup>[2-4]</sup>. Different core-shell nanostructures have many distinct characteristics which have been used in various fields of biomedical and nanomedicine, like drug delivery<sup>[5]</sup>, bioimaging<sup>[6]</sup>, cancer treatment<sup>[7]</sup>, so on and so forth<sup>[8]</sup>. There are various kinds of core-shell nanostructures such as metal core and semiconductor shell,

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## EDUCATION FOR NATIONAL INTEGRATION AND ROLE OF TEACHER

**Amar Jyoti Bharali**

Lecturer, Dept. of Education  
Bahona College, Jorhat

India is a land of more than a billion people who live an area of 12,69,640 sq. miles. Its boundaries extend from sublime height of Himalayas to the low depths of Indian Ocean. Her frontiers touch the borders of countries like China, Bhutan Pakistan, Bangladesh, Tibet and Myanmar (Barma).

The Indian society is composed of different races, cultures, customs, traditions, religions and faiths. It is a society with various diversities. One can notice the diversity anywhere, everywhere. One cannot say anything about Indian society by only superficially noticing her people speaking different languages advocating different faiths and practicing different customs. If some one wants to know the truth about Indian society he will have to probe into those regions which are hidden from the normal view. However, the main trait of this society is not diversity. Her diversity is superficial, the unit is integral.

It is worth noticing that diversity in this country has been often suppressed the forces of unity. Many a time the forces of unity have been pushed for back into national consciousness. Still today people, are living and caring for a particular region. Religion, community or caste but the forces of unity have never completely annihilated or destroyed. In this regard professor H.Kabir remarkd, " Throughout Indian History, we find on one hand a tendency

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## SELF-HELP GROUPS AS A TOOL OF SUSTAINABLE LIVELIHOOD TO PROMOTE SOCIAL ENTREPRENEURSHIP : A STUDY OF ASSAM

**Reema Rabha**, Assistant Professor,  
Department of Economics, Bahona College  
**Dibyajyoti Kalita**, Research Scholar,  
Dibrugarh University

The globalization era after the economic reforms, although uplifts the economic development of the country; it has, on the other hand, imposed constraints on the poor section of the society by increasing competitiveness in the market economy. The poor due to their poor performance in the globalized economy are unable to earn adequate income and excluded from the growth process of the country. To overcome the problem, Self Help Groups is regarded as an important tool. SHGs have been playing a major role in achieving a sustainable livelihood and in turn are helpful in lessening poverty. Nowadays, the majority of women are engaged with these groups and actively participating in the income generating activities. Village organizations are formed between the self help groups so that they can jointly perform various productive activities. The present paper tries to analyze the position of self-help groups in the state. Moreover, the paper seeks to analyze the achievement of village organizations in the state.

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## **HUMAN RIGHTS IN PAKISTAN WITH SPECIAL REFERENCE TO WOMEN: A STUDY OF THE CONSTITUTIONAL ARRANGEMENTS AND PRESENT STATUS**

**Pankaj Bora**

Assistant Professor,  
Bahona College

### **Introduction:**

Human rights are some basic rights. It implies those rights, to which an individual has a claim by virtue of birth. It implies rights relating the life, liberty, equality and dignity of individuals (Benjamin, 2010, p.11). These rights are international moral and legal norms that aspire to protect all people everywhere from severe political, legal and social abuses (Talukdar, 2009, p.98). These rights are the pillars of human welfare and prosperity. Basic Human Rights are so designed that they enhance the status of individuals in society. These rights are essential for all the individuals as they are consonant with their freedom and dignity and are conducive to physical, moral, social and spiritual welfare (Rathod, 2007, p.2). It protects individuals and the society against the arbitrary authorities. Human Rights are backed by some national and international laws. Both in the national and international spheres it is accepted that these are very essential for the development of individuals and society and so these need to be protected and promoted for the welfare of the human beings (Bora, Patiri, & Bora, 2012, pp. 437- 438). Understanding it, United Nations

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ডঃ বীৰেন্দ্ৰ কুমাৰ ভট্টাচাৰ্যৰ  
সাহিত্যৰ মহত্ব

অম্বিকাগিৰীৰ  
কবিতাত  
স্বদেশানুৰাগ

শ্ৰীৰেন ভট্টাচাৰ্যৰ কবিতাত স্বদেশপ্ৰেম

  
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**কবিতা**

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■ ডঃ উপেন ৰাভা হাৰাচাম

অহা সংখ্যাত  
জীৱনী বচনৰ বিকাশত 'জোনাকী'ৰ ভূমিকা,  
আৱহন যুগৰ অসমীয়া সাহিত্য, ডঃ ভবেন্দ্ৰ নাথ শইকীয়াৰ  
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।। আৰু নিয়মীয়া শিতানসমূহ আছেই ।।

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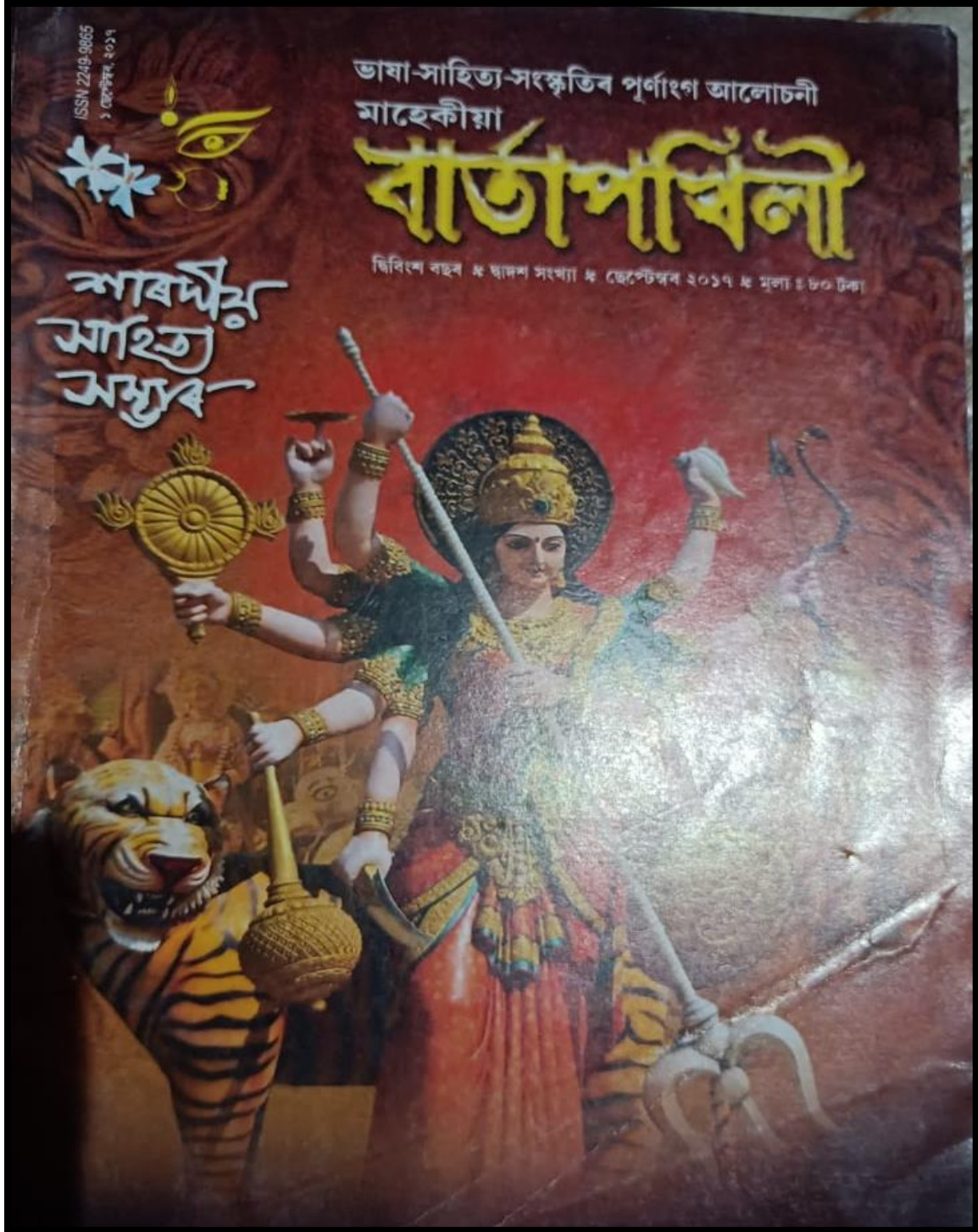
  
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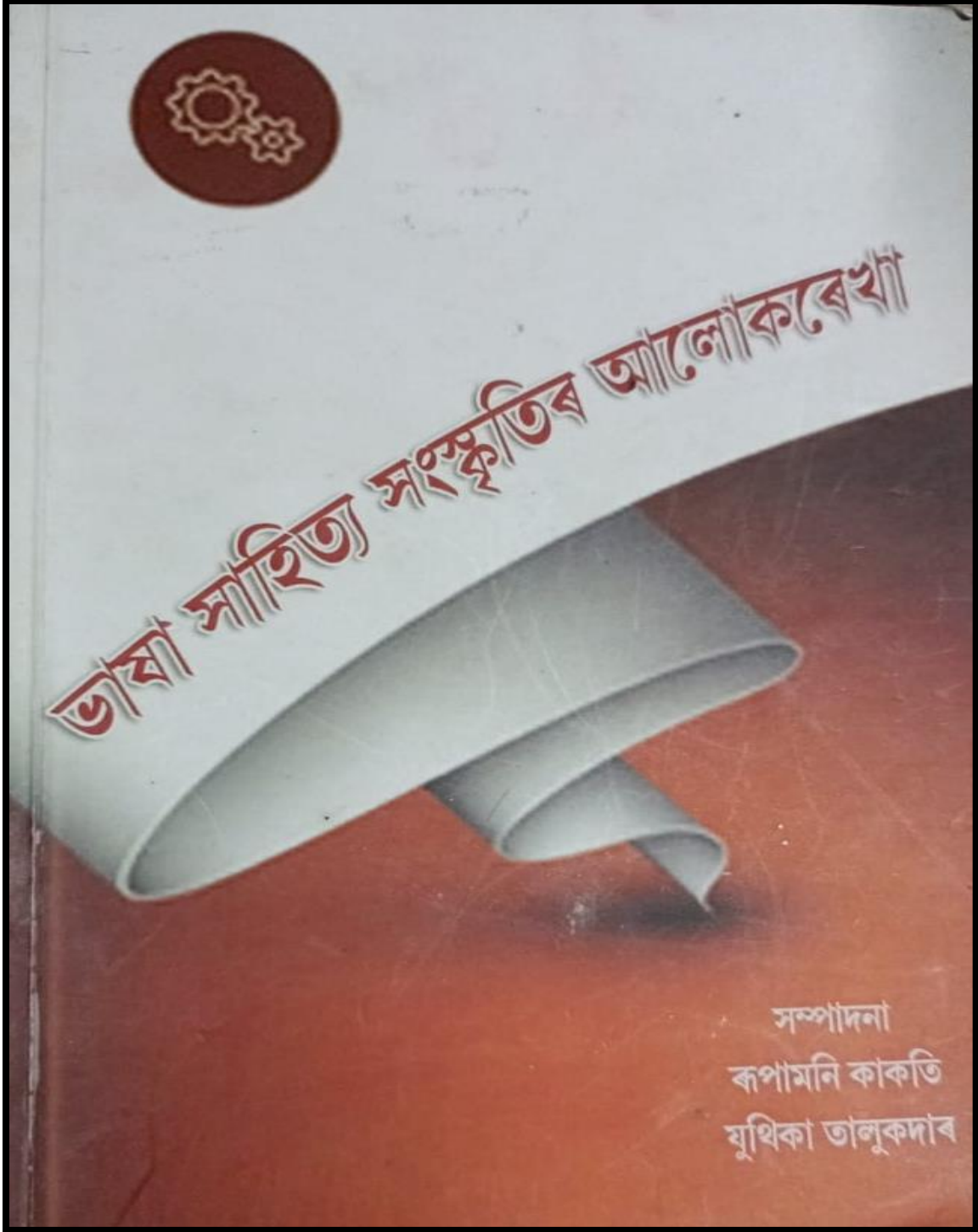
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# SPECTRUM

Multidisciplinary Thoughts

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## EMERGING TRENDS AND HUMAN RESOURCE MANAGEMENT IN LIBRARY AND INFORMATION CENTRES



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**TRANSFORMING LIBRARY SERVICES BY USING RFID TECHNOLOGY:  
A CASE STUDY ON IIT GUWAHATI AND RGU ITANAGAR**

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**Abstract**

This paper gives brief idea about the emerging Radio Frequency Identification (RFID) technology, its importance in the library management system and its working. The paper covers the advantages and issues related to use of RFID technology in libraries. A case study was conducted in two libraries to gain better understanding of how RFID based library management works. Then the survey was conducted to find out whether RFID technology offers any actual value for the library patrons. There is a lack of standards for RFID technology. The emerging standard for library RFID solutions is to employ a frequency of 13.56 MHz. However, no formal standards are currently in place. Another major problem in North-East India is power failure. Unless a library has any generator facility or any other backup system; it is bound to close its circulation operations in case of power failure. This may cause uneven functioning of the RFID system in the library and grounds for inconvenience to user

For the case study the researcher has chosen, IIT Guwahat Central Library and RGU Itanagar Central Library as a sample. Data were collected by the way of interview, documented data and observations, and then they were analyzed according to their intended purpose. It is thought to be useful and pioneer for library services to develop their service process with RFID technology. Besides, it outlines various issues and possible solutions involved in the process of implementing RFID applications in libraries.


RFID is a highly advantageous technology for a wide variety of inventory tracking situations for a library.

**Keywords:** *RFID technology, Library services, IIT Guwahati Central Library, RGU Itanagar Central Library, Library management.*

**1. Introduction:**

Technology has evolved at an incredible rate in the past decade. It totally changes the way how librarians serve their patrons and perform their works. The proliferation of RFID (Radio Frequency Identification) technology and its successful application across different industry and business sectors has provided new innovations in the technology.

The great usage of Radio- Frequency Identification (RFID) technology has moved during the past decade from labs and niche uses into a broader range of application and derives from the tremendous expansion

  
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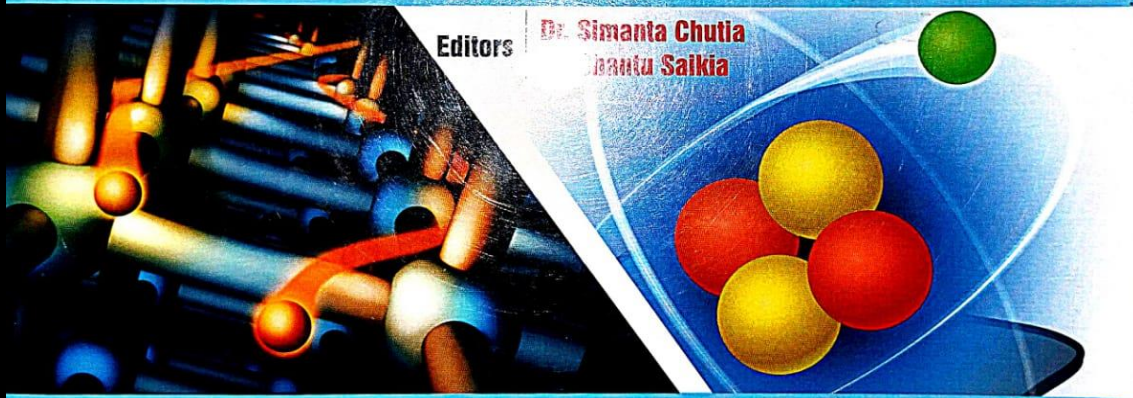


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## Effect of Morphology upon Photocatalytic Activity of Ag/ZnO Core/Shell Nanostructures under Sunlight Irradiation

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**Abstract**—In this work, we report synthesis of Ag/ZnO Core-Shell nanostructures via a simple two-step wet chemical method. The structural and optical properties of the as-synthesized samples are characterized by high-resolution transmission electron microscopy (HRTEM), UV-Visible absorption spectroscopy (UV-VIS) and photoluminescence spectroscopy (PL). ZnO coating over the Ag core enhances the charge separation process, whereas higher shell thickness and increased refractive index of surrounding medium cause red shifts of surface Plasmon resonance (SPR) peak of Ag. The photocatalytic activities of ZnO nanoparticle and Ag/ZnO core-shell nanostructures with variable shell thickness and morphologies are evaluated by the photocatalytic degradation of methylene blue (MB) dye under sunlight irradiation. Compared to pure ZnO nanoparticles, Ag/ZnO core-shell nanostructures exhibit efficient photocatalytic activity because of the presence of SPR in the Ag core. The photocatalytic activity of the Ag/ZnO core-shell NPs is found to be enhanced by the increasing shell thickness.

### INTRODUCTION

Photocatalysts have the advantage of conversion of solar energy into chemical energy to produce solar fuels or to remove organic pollutants. Metal oxide semiconductors have been extensively used as photocatalysts. However, many metal oxide semiconductors face several problems including low photocatalytic activity and unsuitable light absorption region. The former is mainly caused by the high recombination rate of electron-hole pairs (ZnO) and the latter is due to the wide band gap (ZnO). These two disadvantages have limited metal oxide photocatalysts towards degradation of organic pollutants. To broaden the visible light absorption range or to increase electron-hole pairs separation, many efforts have been made by the researchers for the last several years. Amongst the reported syntheses, Liu and coworkers synthesized worm-like Ag-ZnO core-shell heterostructured composites having improved photocatalytic activity towards degradation of rhodamine B (RhB) compared to pure ZnO nanoparticles under UV light irradiation [1]. M.E. Aguirre and coworkers synthesized Ag-ZnO core-shell nanoparticles in N, N-dimethylformamide which also showed higher photocatalytic activity towards degradation of 9-phenyl-2,3,7-trihydroxy-6-fluorone (PF) as compared to pure ZnO under UV light irradiation [2]. S. Wang *et al.* synthesized hierarchical heteroassemblies made of interwoven Ag core nanowires covered by ZnO branched-structures under UV light excitation [3]. Moreover, Ag/ZnO nanorods and they also showed enhanced photocatalytic activity under UV light excitation [3]. More-over, Ag/ZnO core/shell structures have been synthesized by a number of methods, such as Solvothermal methods [4], template-confined synthesis routes [5], low temperature methods [6], hydrothermal synthesis [7, 8] and chemical precipitation methods [9]. But, in particular, the synthesis of these Ag-ZnO core-shell nanostructures involved the use of high temperature, ultrasonication, toxic solvents and much more complicated processes. In addition, the synthesized Ag-ZnO core-shell nanostructures showed enhanced photocatalytic activity towards UV light irradiation only. It is to be noted that solar UV intensity is only 4-5% of incoming solar light intensity, thus the major portion of solar light (i.e. visible light) was not efficiently used. Li *et al.* developed an efficient visible-light plasmonic photocatalyst Ag/Cu<sub>2</sub>O core/shell heterostructure, which allows for tunable light absorption over the entire visible-light region due to tailoring of the shell thickness [10]. As ZnO is of higher physical as well as chemical stability, Ag/ZnO core-shell nanostructures may be beneficial as photocatalyst provided their photocatalytic activities be extended towards visible region by tuning shell thickness. But so far, as our knowledge goes, such studies have not yet been reported.

In this work, we report a rapid and simple strategy for controlled synthesis of Ag-ZnO core-shell nanoparticles along with efficient photocatalytic activity towards MB degradation under sunlight irradiation. By controlling the concentration of Zn(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O in the reaction mixture, ZnO shells with different thicknesses and morphologies coated over the Ag cores are easily tailored. It is found that compared to pure ZnONPs, Ag/ZnO core/shell NPs

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## **Yield and Depth-wise Soil Properties through Survey in Some Selected Commercial Tea- gardens of Assam Under Organic and Conventional Production Systems**

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### **ABSTRACT**

Survey studies for tea yield and soil properties (soil profile) were conducted in the year 2010 in three commercial tea gardens located at Jorhat District of Assam, India. These were Deha tea estate under organic production system as well as Bokahola tea and Borbhetta tea estate under conventional production system. Data on soil physical properties revealed that bulk density of the organic commercial tea garden was lower compared to the other commercial tea gardens studied under the conventional production system. Similarly, percentage of soil aggregate size was also found to be lower in the soil from the organic tea garden as compared to the soil from the other two conventional gardens. Tea yield was also found to be lower in the tea garden under organic production system when compared with the yield from the tea gardens under the conventional production system. The present work has provided information on the tea yield and soil physical properties of soil under organic and conventional production systems in Assam, India. Considering the possible higher value of organically produced tea in the present global market without degrading the soil properties, these data may be helpful to the farmers of this region in managing their fertilizer addition to produce organic tea.

**Keywords:** Tea, yield, bulk density, soil aggregate.



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Chapter-9

## **Wearable Body Worn Antenna-the Beginning of New Era**

**Pragyan Jyoti Gogoi**

*Department of Physics, Tezpur University, 784028, Assam India*  
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Recent days with the fast growing of the wireless communication, antenna technology has taken a quantum leap towards the development of wearable antenna. The need of convenient in carrying the communication gadgets and devices, made researchers to think of about the wearable devices which is portable and user friendly. The need of achieving portability in terms of voice communication, data transfer, positioning, and entertainment leads to the development of wearable communication. With the requirement of the specific need in different application varying from medical, rescue and security services, sports, entertainment even in fashion applications, today's communication achieving highest level of portability.

### **1. AN INTRODUCTION TO WEARABLE ANTENNA**

In recent years the rapid growing of wireless communication technology achieving the significant goal of portability. With the increasing demands for the high data rates, voice and video transmission with miniaturized

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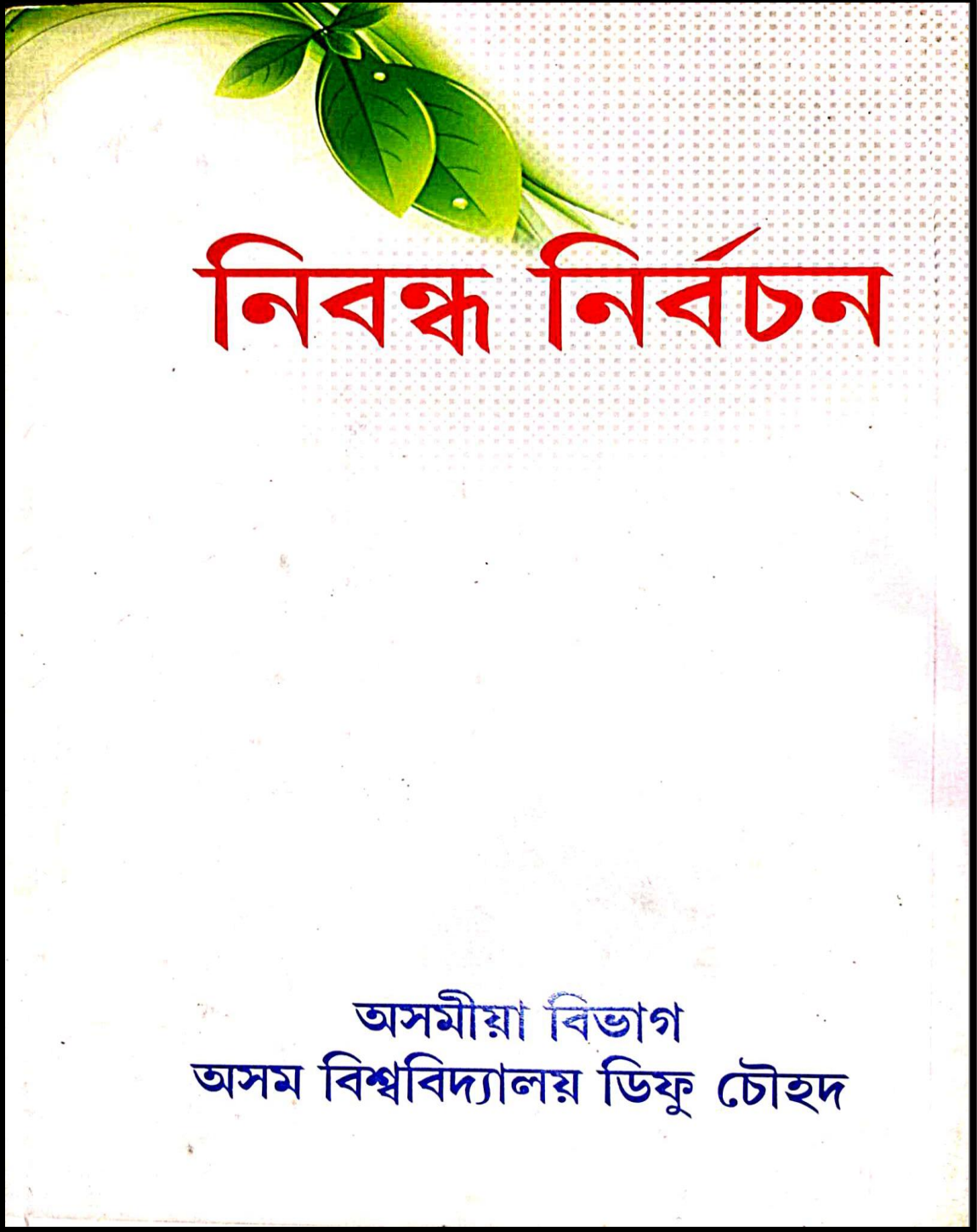
  
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INTRODUCTION TO CHALLENGES AND STRATEGIES TO IMPROVE CROP PRODUCTIVITY IN CHANGING ENVIRONMENT

## Introduction to challenges and strategies to improve crop productivity in changing environment



Mohammad Wahid Ansari, Savindra Kumar  
Babeeta C. Kaula, Ratnum K. Wattal

  
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## Mutation breeding for crop improvement

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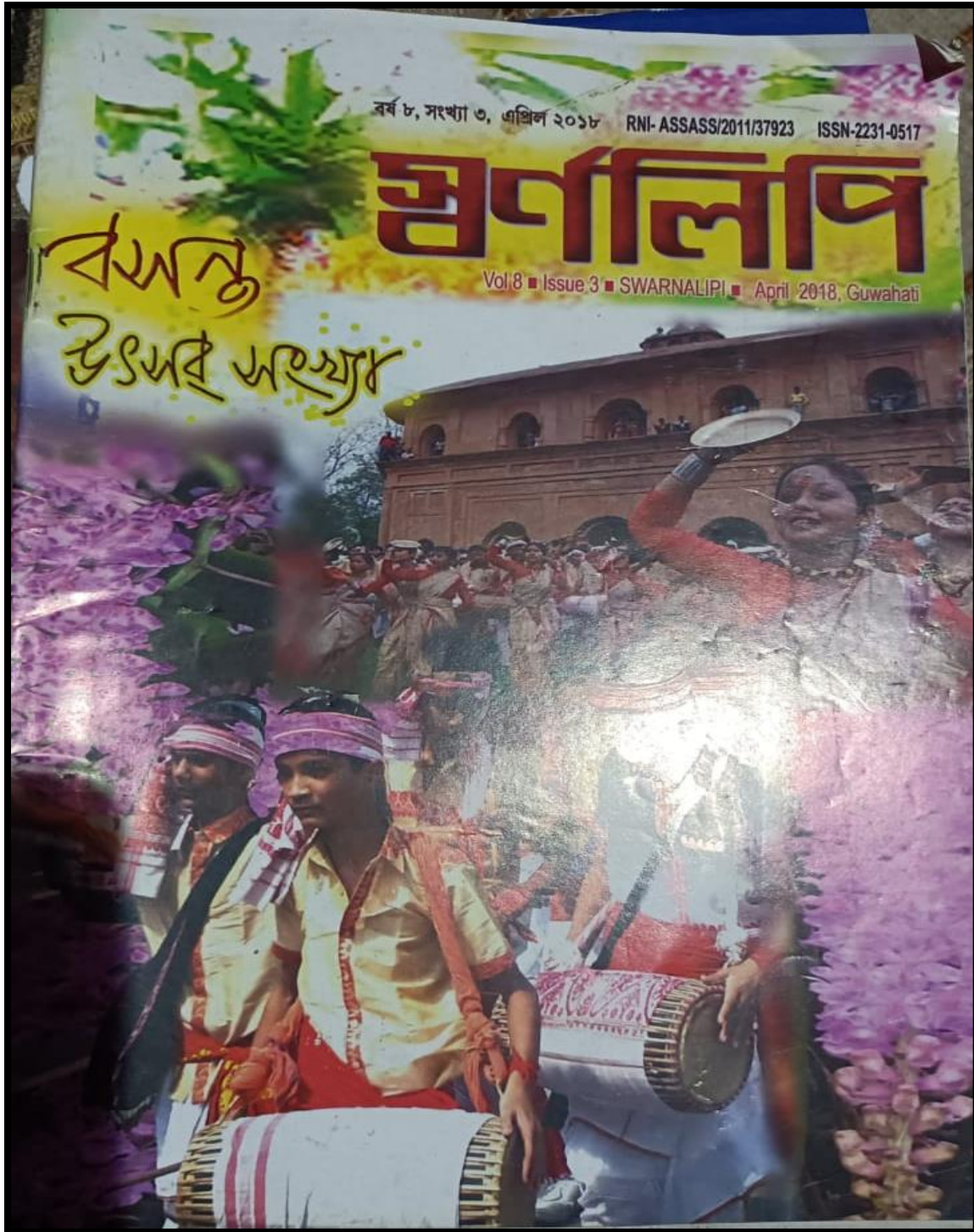
### Abstract

In the present scenario of sky high population, depleting arable land and water resource, erratic rainfalls global food insecurity is a major challenge to the human existence. The food insecurity is further facilitated by the major climatic change that plays a pivotal role in reducing the food production. The development of climate smart varieties may help in increasing the food productivity by their wider adaptability to range of ecosystems. The most viable approach to develop the climate smart varieties is the mutation breeding which creates the genetic variability by modifying a single gene without altering the entire genome. The development of crop varieties which can withstand the climatic change and other environmental fluctuations can play a vital role to combat global food insecurity This article highlights the role of mutation breeding in crop improvement and thus overcoming the challenges of food security due to rising population

**Key words:** mutation, climate smart varieties, food insecurity



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**স্বর্ণালিপি**  
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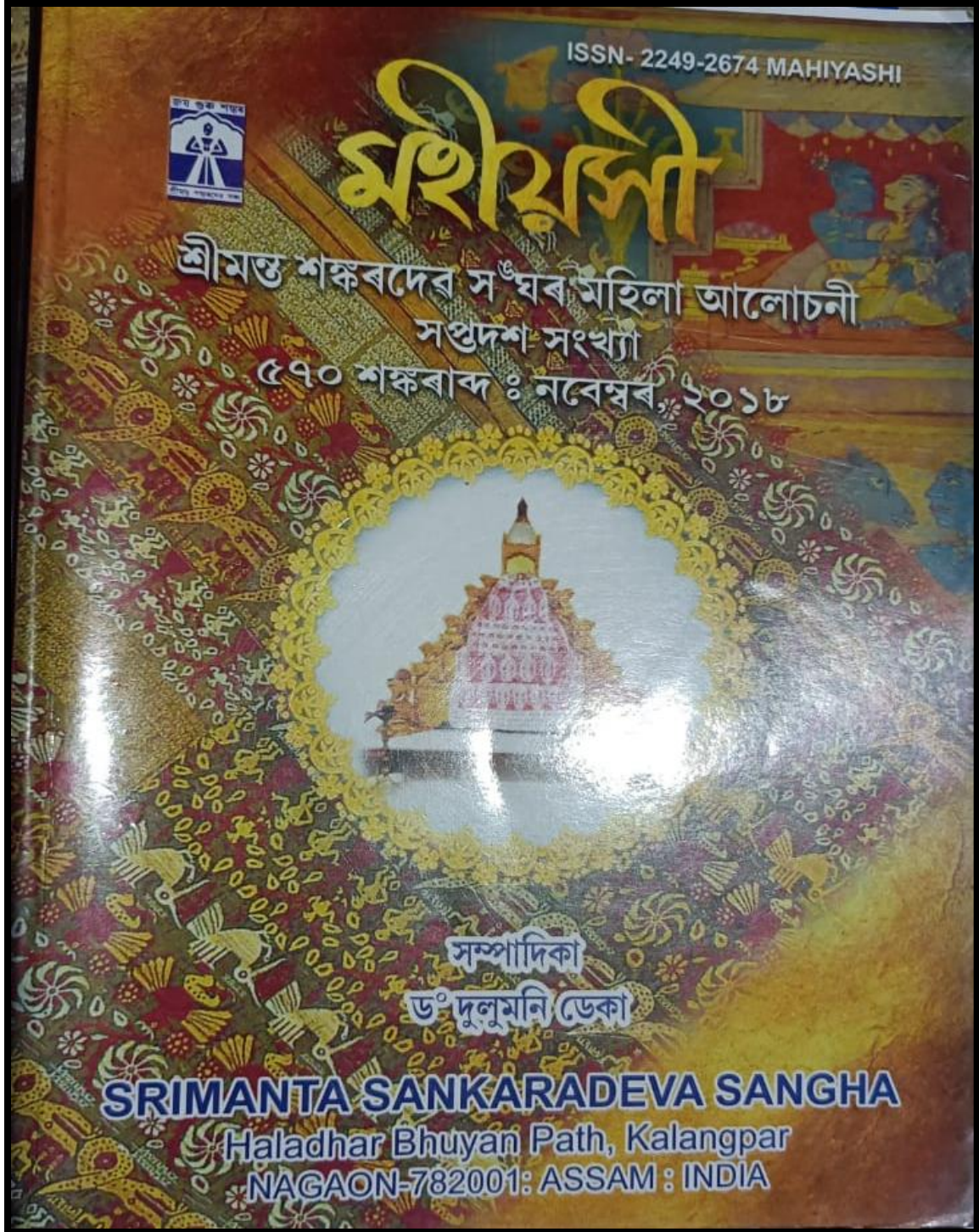
  
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Dr. Santana Dutta
- ◆ Role of Information and Communication Technology (ICT) ৫৬  
in Empowering of Rural Women: with Special Reference  
to Assam  
Dr. Nijumoni Changmai

চিন্তা-চয়ন / ৯

  
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# ভাষা-সাহিত্য-সংস্কৃতি



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**LIBRARY  
AND  
INFORMATION SERVICES  
IN  
DIGITAL ENVIRONMENT  
CHALLENGES & PROSPECTS**

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### *Chapter 3*

## **Automation Scenario of Libraries of NIELIT in Assam: A Case Study**

*Anupam Chanda*

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#### **Abstract**

National Institute of Electronics & Information Technology (NIELIT), (earlier DOEACC Society), an Autonomous Scientific Society under the administrative control of Ministry of Electronics & Information Technology (MeitY), Government of India. At present, NIELIT has thirty-five (35) offices. Over the last two decades, NIELIT has acquired very good expertise in IT training, through its wide repertoire of courses, ranging from 'O' Level (Foundation), 'A' Level (Advance Diploma), 'B' Level (MCA equivalent), 'C' Level (M-Tech level), IT literacy courses such as CCC (Course on Computer Concept), BCC (Basic Computer Course) and other such long term and short term course in the non-formal sector like courses on Information Security, ITeS-BPO (Customer Care/Banking), Computer Hardware Maintenance (CHM-O/A level), Bio-Informatics (BI-O/A/B level), ESDM etc, besides high end courses offered by NIELIT Centres at Post-Graduate level (M.Tech) in Electronics Design & Technology, Embedded Systems etc. This paper mainly discusses the automation scenario of libraries of NIELIT Guwahati and its extension centres. The introduction of Information & Communication Technology (ICT) has made a tremendous impact in every facet of life. NIELIT Assam has at present 7 (Seven) centers including the main center, among the 7 (Seven) centers 2 (Two) of them has automated their library system by using Koha Open Source Library Management Software, 1 (One) by e-Granthalaya 4.0 and rest 3 (Three) centers are planning to automate the library, it's a very good sign. The author himself automated 2

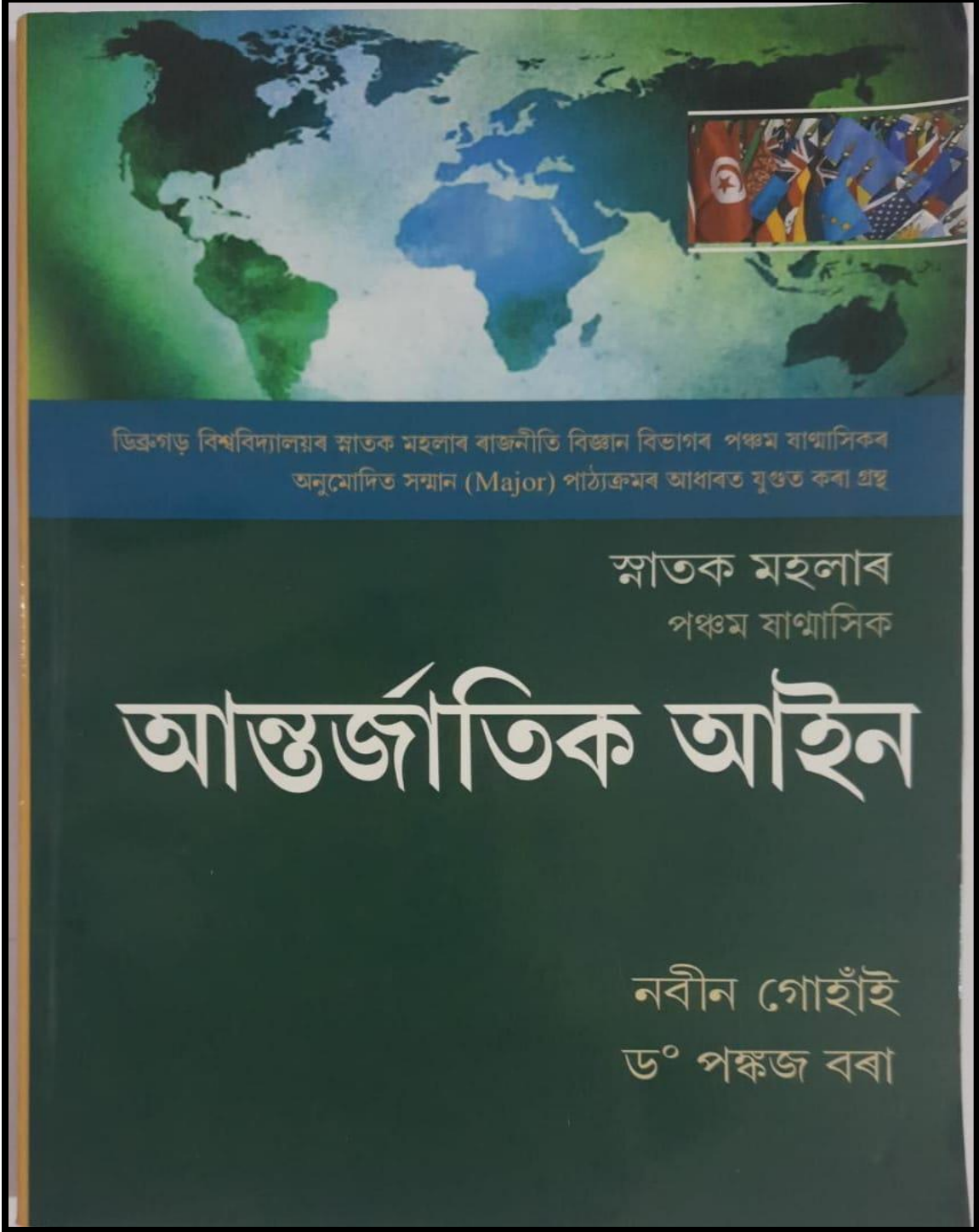
  
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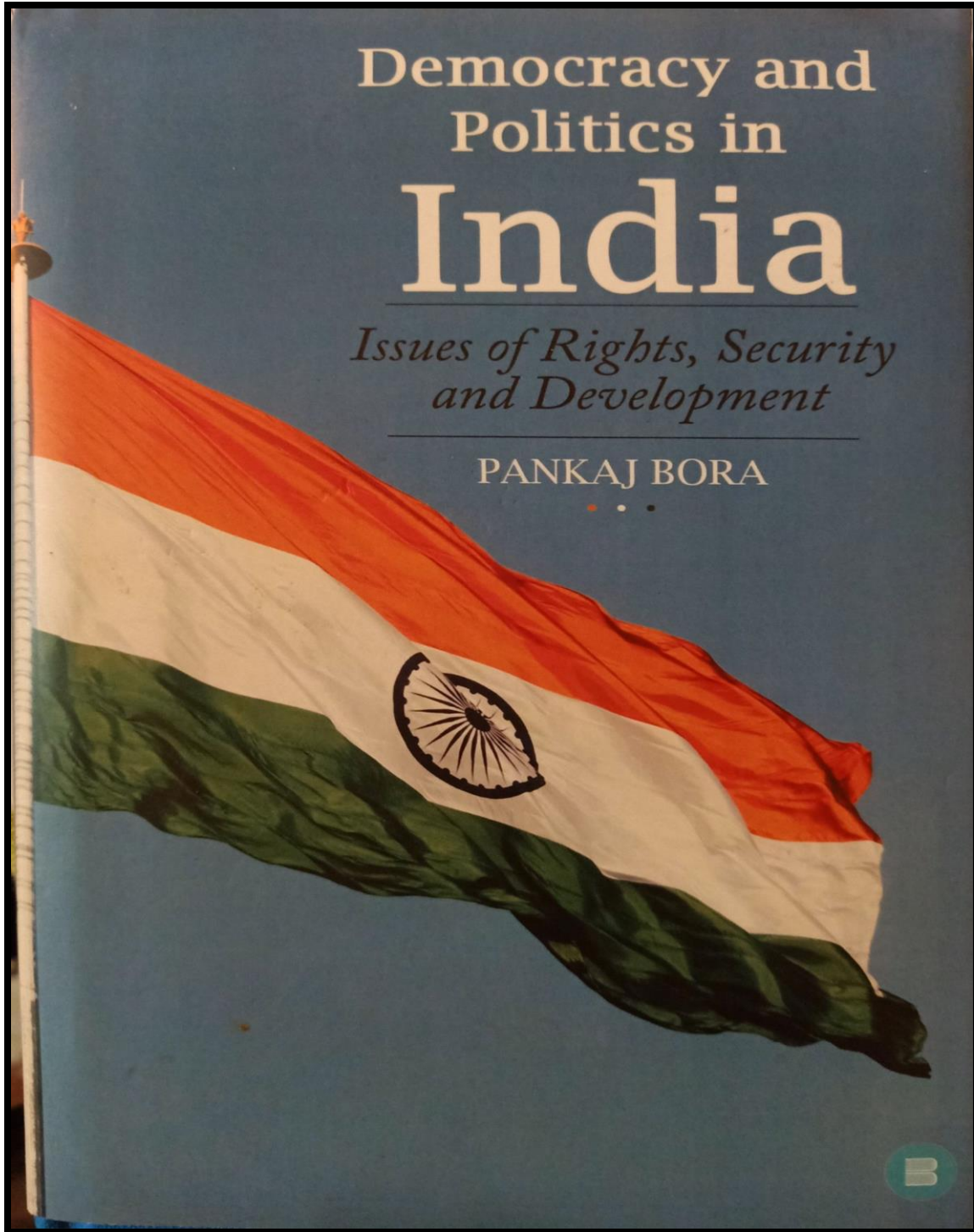
  
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Democracy and Politics in India:  
AN INTRODUCTION

-Pankaj Bora

Introduction

India, with more than 81.4 Crore voters, is the largest democracy of the world. It's been 71 years since independence and 68 years since the adoption of a constitution, which promotes democracy in India. But even after seven decades, India has not become a fully democratic country. As per the Economist Intelligence Unit's (EIU) Annual Democracy Index 2017, India is not a Fully Democratic Country but a country with a flawed democracy (EIU, 2018). In 2017 EIU Report, India slips from 32<sup>nd</sup> to 42<sup>nd</sup> position. This decline has raised questions on the credibility of India as a democratic country. What we have seen in the last seven decades is that India is a democratic country in terms of institutions. Constitution of India made provision for making India a democratic country. Parliamentary Supremacy, Independent Judiciary, Division, Separation and Decentralization of power, Fundamental Rights and Universal Adult Franchise, all these made India a democratic country. But politics in India has not adopted the democratic principles that the Indian Constitution has laid down. Conversion of democratic principles in the constitution in politics has failed to a great extent. This is a matter of concern and this book has tried to look at these issues. While exploring the democracy and politics in India, this book tries to look at issues like development, rights, security, environment etc.

  
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Livelihood Security in Assam:  
A STUDY ON IMPLEMENTATION AND  
OUTCOMES OF MGNREGS

-Pankaj Bora

Introduction

Indian economy is the world Sixth largest economy by nominal GDP and third largest by PPP. However, 2017 Global Hunger Index ranked India in 100<sup>th</sup> position with 31.4 GHI Score (Klaus von Grebmer and Team, 2017, p. 13). In 2012, the Reserve Bank of India mentioned that 21.92% people are poor in India (Kamat, 2015, p. 129). Asian Development Bank also stated that 21.9% of Indian populations are Below Poverty Line (Asian Development Bank, 2017). This underdeveloped Indian economy has a historical rationale. The British colonial rule in India ravaged the economy and did not allow growing the local economy. As a result, people lost their livelihood opportunities. Assam, a state of North Eastern part of India has also experienced underdevelopment and livelihood crisis. In post colonial period, Indian State tried to provide livelihood opportunities to the people by introducing and implementing several rural development policies. This paper tries to explore the implementation and outcome of one such rural livelihood policy of Indian Government in Assam.

Livelihood security

Livelihood security is an emerging area of study among the policy makers and scholars of development studies (Kaag, 2004, Pp. 49-74). The recognition of socio-economic rights by the United Nations in 1948 raised several issues related to

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## Open Defecation in India: HOW AN END IS POSSIBLE

-Pankaj Bora

-Bitapi Bora

### Introduction

Health is a basic human right obligatory for enjoying the rights. Access to proper drinking water and sanitation is considered as an integral part of health rights. The right to health means that everyone has the right to the highest attainable standard of physical and mental health, which includes sanitation also (Islam, 2017, p. 2628). Every individual, without discrimination, has the right to sanitation for personal use. However, UNICEF in 2014 reported that 2.5 billion individuals do not have proper sanitation facility across the globe (UNICEF, June 2014, p. 1). In 2015, as per UNICEF report, 2.3 billion people lack a basic sanitation service and among them, 892 million people practised open defecation (UNICEF). In India, almost 53% of the total population defecate in the open (Kara, 2015). Therefore, Open Defecation has become a significant problem for the nation and it has started working for making the country Open Defecation Free.


### What is Open Defecation

Open Defecation is basically linked with water, sanitation and hygiene. The term "Open Defecation" earned popularity almost a decade ago in 2008. The publication of Joint Monitoring Programme for Water Supply and Sanitation (JMP) and the UN International Year of Sanitation made the

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## THE ROLE OF ICT IN ACHIEVING FINANCIAL INCLUSION: THE INDIAN EXPERIENCE

-Reema Rabha


### INTRODUCTION

After the Millennium Development Goals (MDGs) on 25 September 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, along with a new set of development goals that are called as the Sustainable Development Goals (SDGs). The Agenda is a culmination of many years of negotiation and was endorsed by all 193 member-nations of the General Assembly, including both developed and developing and these goals are set up for all the countries. United Nations Secretary General Ban Ki-Moon noted that “the new agenda is a promise by leaders to all people everywhere. It is an agenda for people, to end poverty in all of its forms— an agenda for the planet, our common home.”

With the set up of SDGS, there is an urgent need of greater access to financial services as it is a key enabler of many of the development goals under SDGS. Here comes the term “Financial Inclusion” which was first developed in Britain when it was found that 7.5 million did not have a bank account. Leyshon and Thrift (1995), define financial exclusion as referring to those processes that serve to prevent certain social groups and individuals from gaining access to the formal financial system. According to World Bank Report (2008), “Financial inclusion, or broad access to financial services, is defined as an absence of price or non price barriers in the use of financial services”. The report

  
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Sustainable environmental  
development in India:  
ISSUES AND CONCERNS

-Sangeeta Das

Understanding Sustainable environmental  
development

Sustainable development aims at meeting human needs while still preserving the environment for the future generations. According to the Brundtland Report released by the United States (1987), it is a development which meets the needs of the present without compromising the ability of the future generations to meet their own needs. During the last ten years, different organizations have tried to measure and monitor the proximity to what they consider sustainability by implementing what has been called sustainability metrics and indices (Singh and Islam, 2012).

Since the United Nations convened the conference on Human Environment in 1972 in Stockholm, there is growing concern over the continuous deterioration of the global environment. A few burning causes to earth and human population creating environmental degradation are pollution, degradation of soil, various harmful human activities, etc. (Ramakrishna, 2010).

According to the member states of the United Nations, economic and environmental degradations are interrelated and environmental protection in developing countries should be considered as an integral part of the development process. Whereas, consumption patterns and production in industrialized countries speed up environmental degradation. To overcome such problems, there was an urgent

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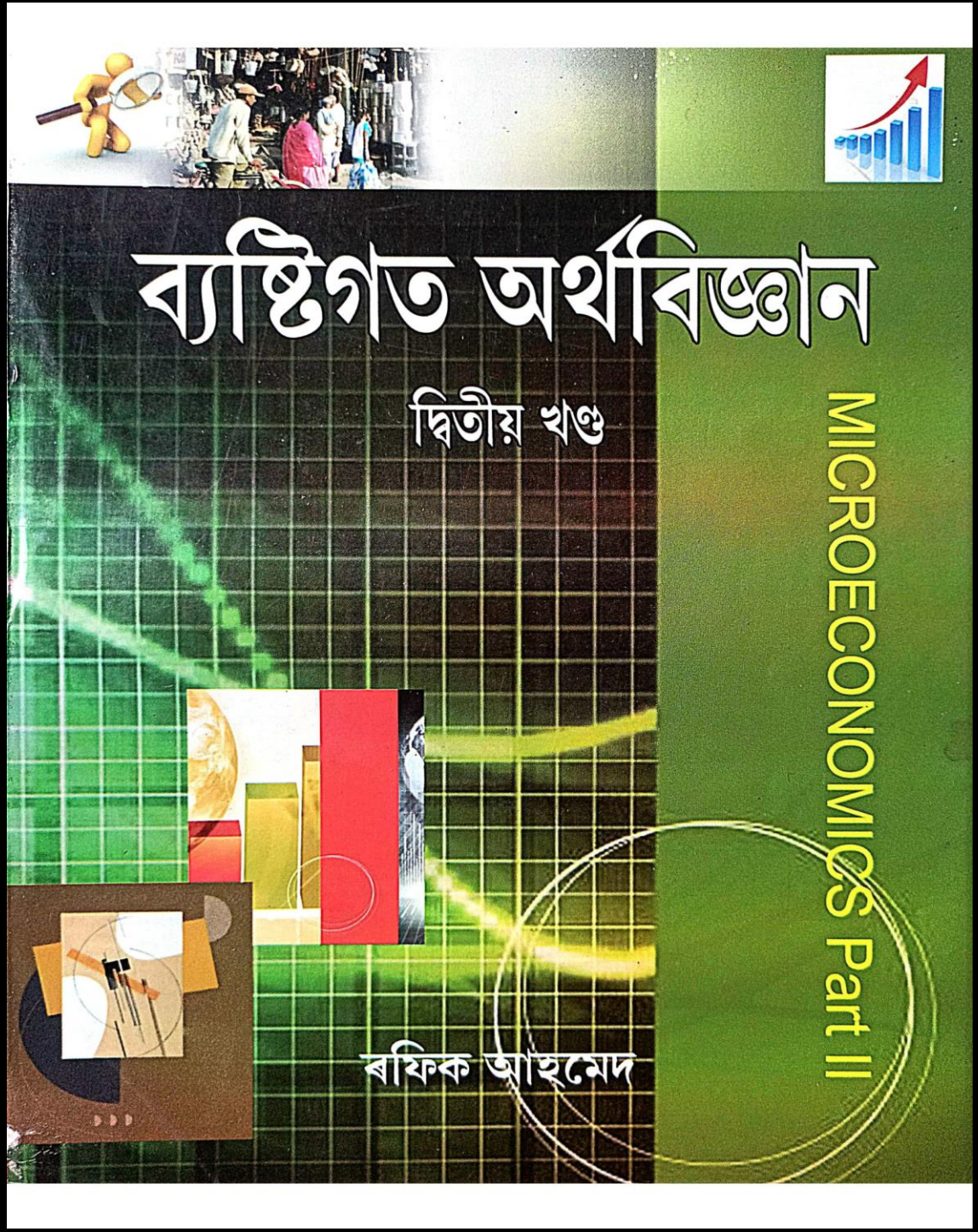
  
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# Organic Farming and Tea Cultivation in India with Special Emphasis to North East India: Status and Constraints

✉ Sangeeta Das\* and Sourabh Kumar Das\*\*

## Abstract

In recent years, there has been a significant increase in organic production all over the world due to consumers concern for healthy and chemical free food. This trend has emerged from the developing countries to different parts of the world including the developing countries like India also. India, despite of having ample opportunities and reasons for bringing more land under organic tea cultivation, is progressing at a very slow rate towards organic farming (0.03% of its total area under organic farming) and similar is the scenario for North East India. This review paper is

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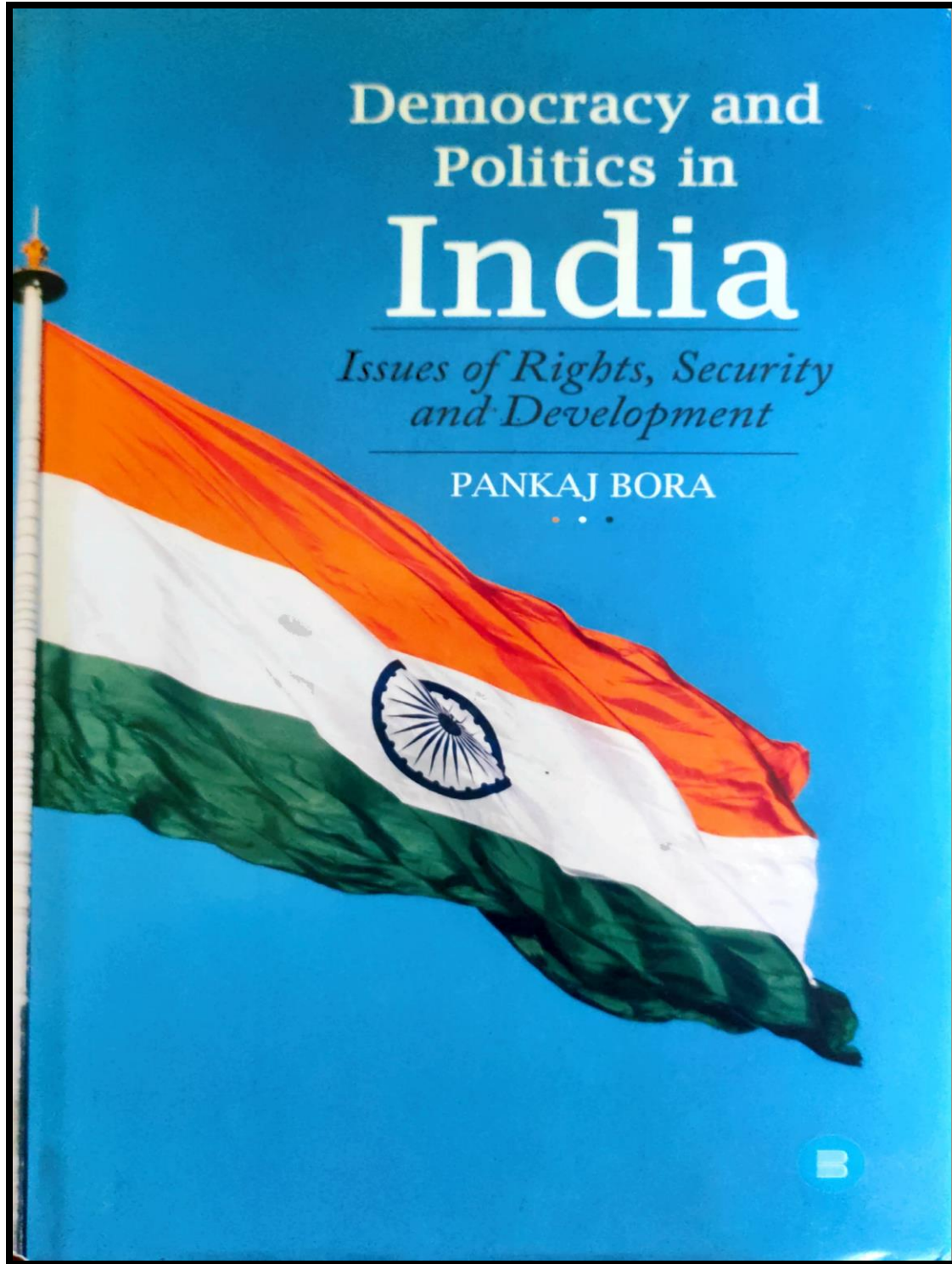
  
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politics and Assamese Fiction:  
(RE) READING DEBENDRA NATH ACHARYA'S  
*JANGAM*

-Ajit Kumar Borah

Introduction

The origin of Assamese fiction is traced back to the 18<sup>th</sup> century. Since inception this literary form enjoyed rousing welcome from an ever increasing reading public fed on the scrapes of translated fictions of Sanskrit and other Indian languages. 'Jangam' literally refers to the animated, living and moveable beings in general. It also means 'movement'. Debenranath Acharya's *Jangam* encapsulates an epic journey of hundreds of thousands of people of Indian origin who were made to flee Burma following the Japanese Invasion during the World War II. It is the story of those living on the last rung of the Burmese social ladder- landless farmers, sharecroppers, small businessmen and those who lived on the margin of the degenerated Burmese society. A catastrophic event like the World War II was bound to cause massive scale displacement of people from one country to another and that was more so the case with the Indian diaspora in Burma. Almost all Indians are reminded of the terrible displacement and concomitant human tragedy of the partition in 1947 that got represented in numerous literary pieces- novels, plays and films. English novels like *Train to Pakistan* by Khushwant Singh and *Azadiby* Chaman Nahal offered life- like portrayal of the ordeal of the millions of partition victims who had to make their journeys amidst unprecedented violence and inhuman communal riots.

The displacement or exodus of Indians from Burma had its past record way back in 1942, at the outbreak of the



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Jameel M. Al-Khayri · Shri Mohan Jain  
Dennis V. Johnson *Editors*

# Advances in Plant Breeding Strategies: Legumes

Volume 7

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### Chapter 3

## Chickpea (*Cicer arietinum* L.) Cytogenetics, Genetic Diversity and Breeding



Aamir Raina, Samiullah Khan, Mohammad Rafiq Wani, Rafiul Amin Laskar,  
and Waseem Mushtaq

**Abstract** Climate change, depleting natural resources, declining arable land and sky-high population represent the main obstacles to the attainment of global food security. Therefore, to make a significant breakthrough in the food production and to combat global food insecurity, sustainable intensification of the agricultural production through low-input agriculture and development of cultivar with improved yield and adaptability is required. By traditional and modern plant breeding methods, breeding of pulses, cereals, and other important food crops, especially chickpea, can be accomplished by exploiting available genetic diversity. Chickpea and other pulse crops are important foods in many nations and play a vital role in the diet of malnourished populations world wide. Globally, chickpea is mainly grown in developing countries, accounting for ~97% of world area and 96% of world production. At present the average global yield of chickpea is 0.9 mt/ha, very low compared to its estimated potential of 6 mt/ha under favorable growth conditions. The main constraints that limit desired goals of chick pea productivity include low genetic variability, low and unstable yield and low resistance to biotic and abiotic

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## Chapter 9 Lentil (*Lens culinaris* Medik.) Diversity, Cytogenetics and Breeding



Rafiul Amin Laskar, Samiullah Khan, Chitta Ranjan Deb, Nasya Tomlekova,  
Mohammad Rafiq Wani, Aamir Raina, and Ruhul Amin

**Abstract** Lentil (*Lens culinaris* Medik. ssp. *culinaris*) is one of the oldest cultivated plants that originated from *L. culinaris* Medik. ssp. *orientalis* in the Near East arc and Asia Minor. This cool season legume crop is an excellent food source to provide energy, proteins and iron in the human diet. Most lentil-growing countries have a shared objective of higher and more stable seed yield, which often entails breeding for adaptation to abiotic and biotic stresses, which otherwise cause a substantial reduction in crop yield and production. Lentil domestication and selection over thousands of years led to the low amount of genetic variation in the current cultivated species and this scarcity in genetic variability represents a major constraint for lentil breeding. Thus far, lentil breeders have been successful in improving some easily manageable monogenic traits using conventional breeding techniques of selection and recombination. However, these conventional techniques are insufficient to address economic traits like seed yield due to polygenic inheritance and genotype-environment interaction. Other species of the genus *Lens* are important sources of genetic variation for breeding key traits into new lentil varieties. Induced mutagenesis is a powerful breeding tool and can greatly supplement the availability of lentil genomic resources. Impressive progress in applications of biotechnological innova-

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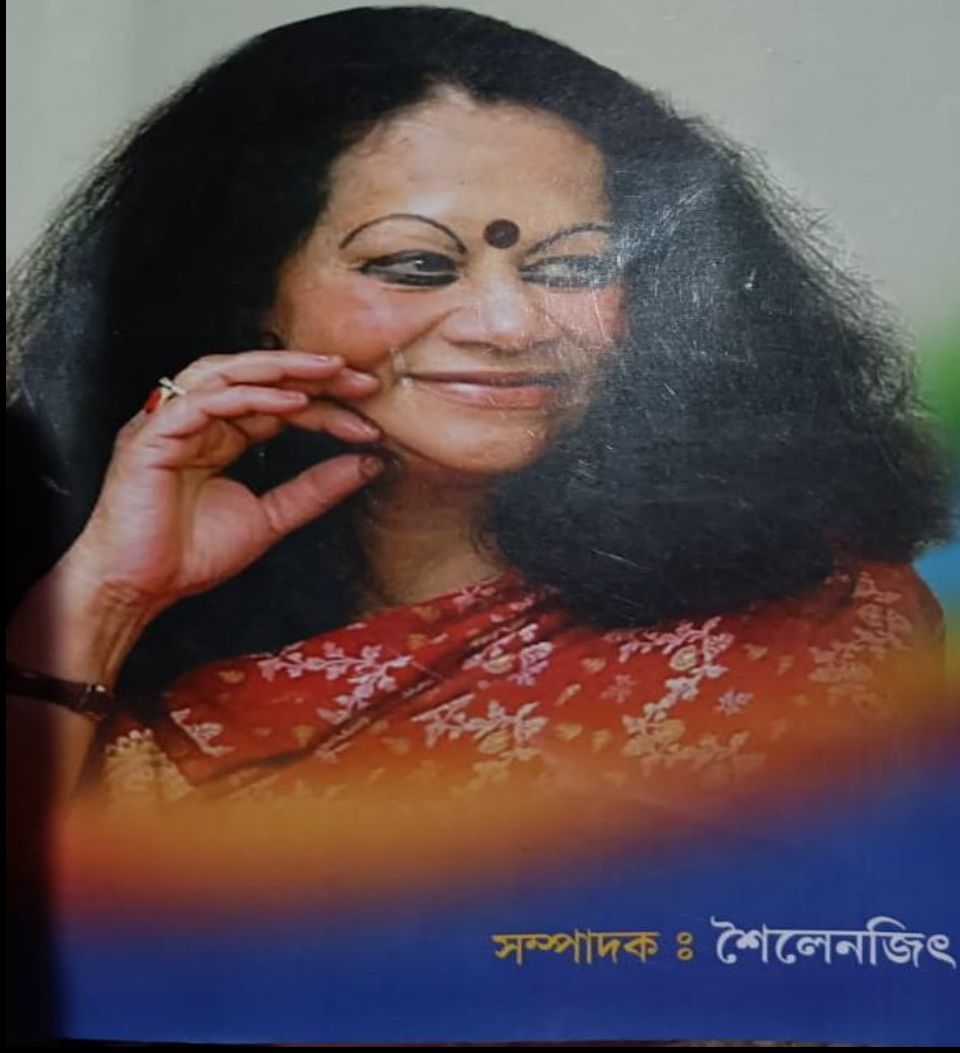


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**ABOUT THE BOOK**

The ICT applications in libraries has revolutionised the information processing techniques in all the type of libraries and provides variety of opportunities to library users' to satisfied their information needs as well as the library professionals to provide information services in more promptly and effective way. Definitely ICT provides a lot of opportunity to LIS professionals to handle the information resources for their users in present digital era and the strategy of library resource management has totally changed in last three decades and emerged new trend of information resource management like- Web-OPAC e-resources, consortium, digital library, institutional repository, RFID technology, cloud computing, Knowledge management, total quality management, data management, use of SNSs, open access movement, and many more areas. The book deals with the opportunity, strategy and trends of Information Resource Management scenario in India in digital environment.

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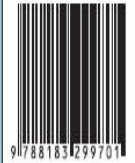
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## Importance of RFID Technology in Libraries: A Case Study of CIT, Kokrajhar Central Library

*Anupam Chanda\* and Manoj Kumar Sinha\*\**

*Abstract: Libraries are moving towards adopting latest technological environment. Libraries are regarded as the central agencies for the dissemination of knowledge in the form of books, journals, audio-video tapes, CD-ROMs, and via digital information services to one and all. Previously barcode technology was one such tool which has been used to enhance the efficiency of libraries all over the world. Now libraries and information centers have started using Radio Frequency Identification (RFID) systems to replace their electromagnetic and barcode systems in the late 1990's. RFID is one of the most technologies being adopted by both industry and academic world. This technology helps librarians reduce valuable staff time spent scanning barcodes while charging and discharging items. RFID consist of smart RFID labels, handheld reader, staff station, self issue/return kiosk and middleware software provides libraries with more effective way of managing their collections while providing greater customer service to their patrons. The researcher has gone through many literatures on RFID technology and its relative prospects and found some important information on it. On the basis of this*

\* Librarian, Assam Don Bosco University, School of Technology Guwahati.

\*\* Dean (Swami Vivekananda School of Library Sciences) & HOD, Dept. of Library and Information Science, Assam University, Silchar.

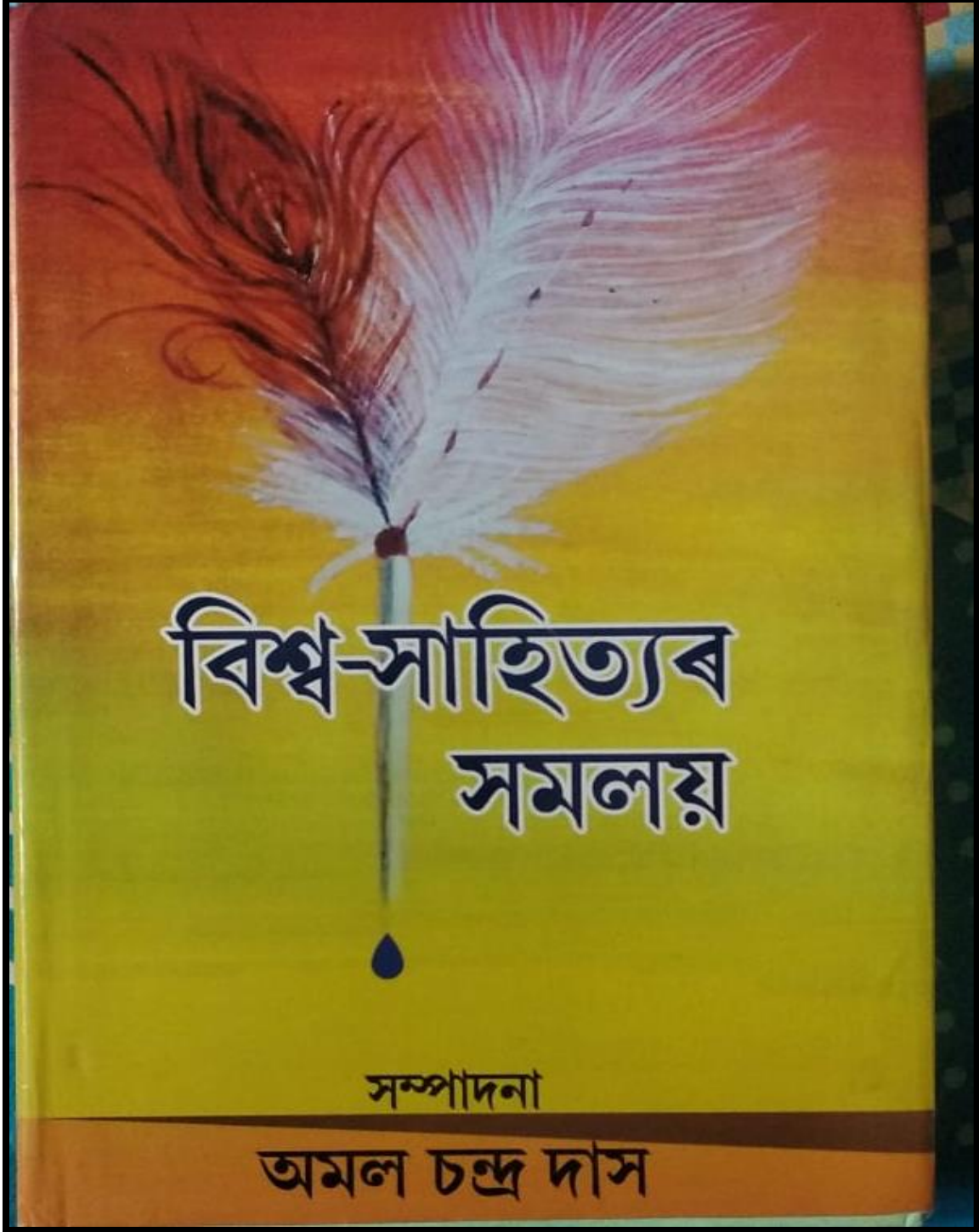
  
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# Redefining India

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## The Quit India Movement in Assam

*-Dr. Fakrul Islam Laskar*

The national movement in Assam constituted an integral part in the landmark of India's struggle for freedom. The province which went through the baptism of fire in 1921 and yet again in 1930-32 did not fall behind other Indian provinces and responded fully to the Quit India Movement, 1942. In terms of dimensions and intensity, the Quit India Movement surpassed all the previous movements including the Great Revolt of 1857. The inhabitants of Assam jumped into the vortex of struggle with the determination of 'do or die' in a way that would make every freedom loving people proud.

The All India Congress Committee met in Bombay under the presidency of Maulana Abul Kalam Azad on August 7, 1942. The resolution of 'Quit India' was adopted on August 8, 1942. It was moved by Jawaharlal Nehru and Vallabhbhai Patel seconded it. The resolution was carried by a big majority while a few Communist members opposed it. To dismiss British and American doubts, Maulana Azad clarified that the demand for 'Quit India' only stood for the transfer of power.



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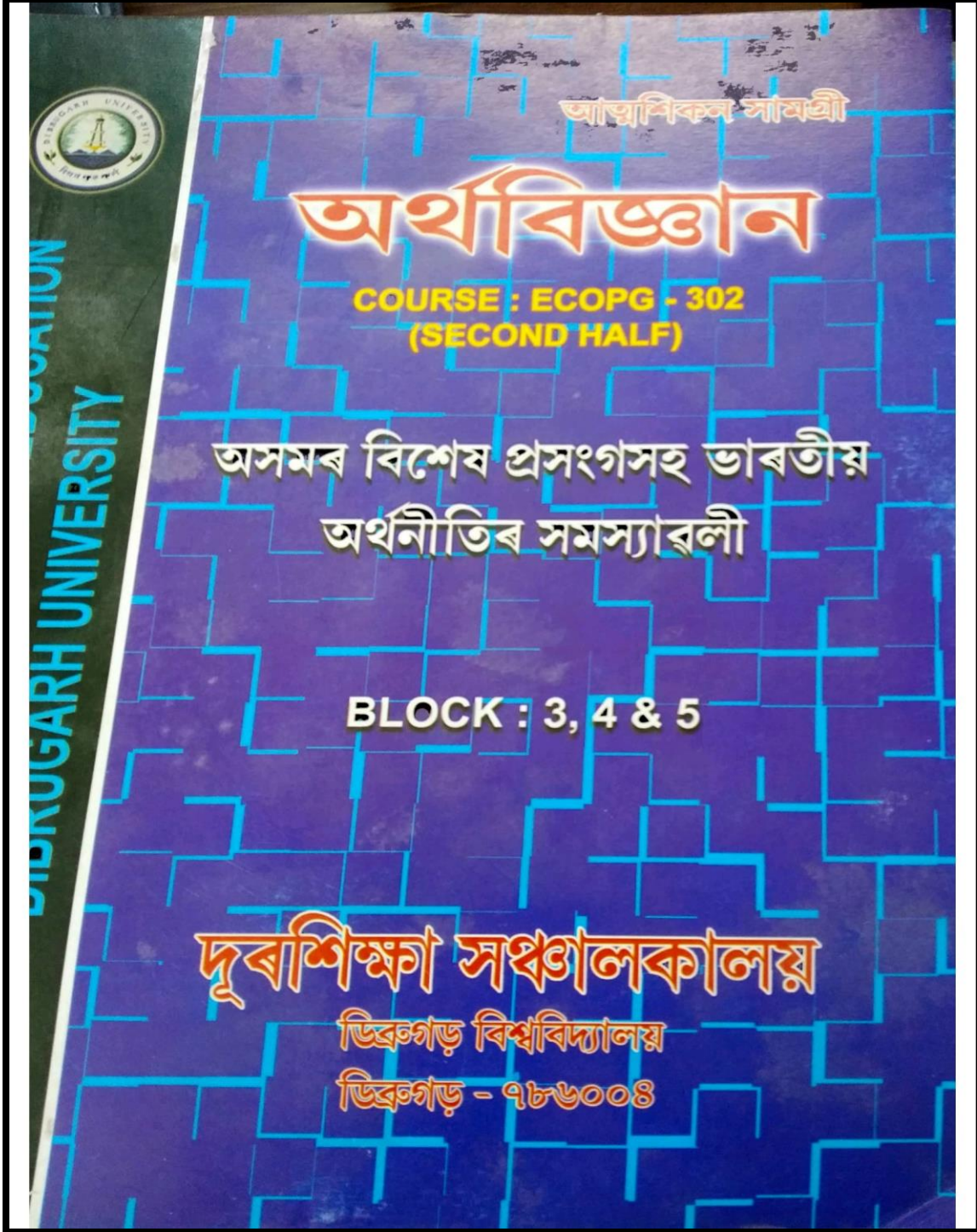
  
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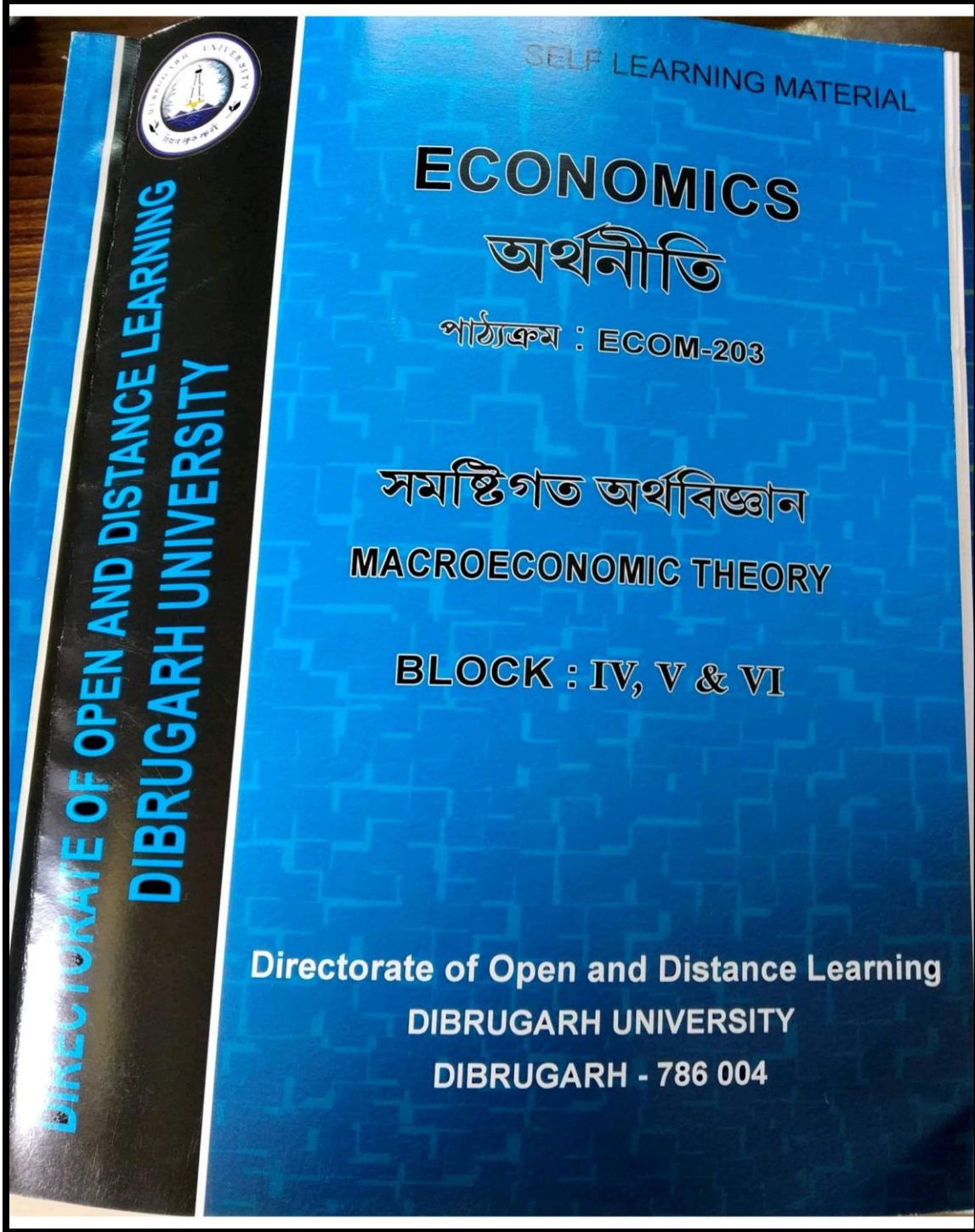
  
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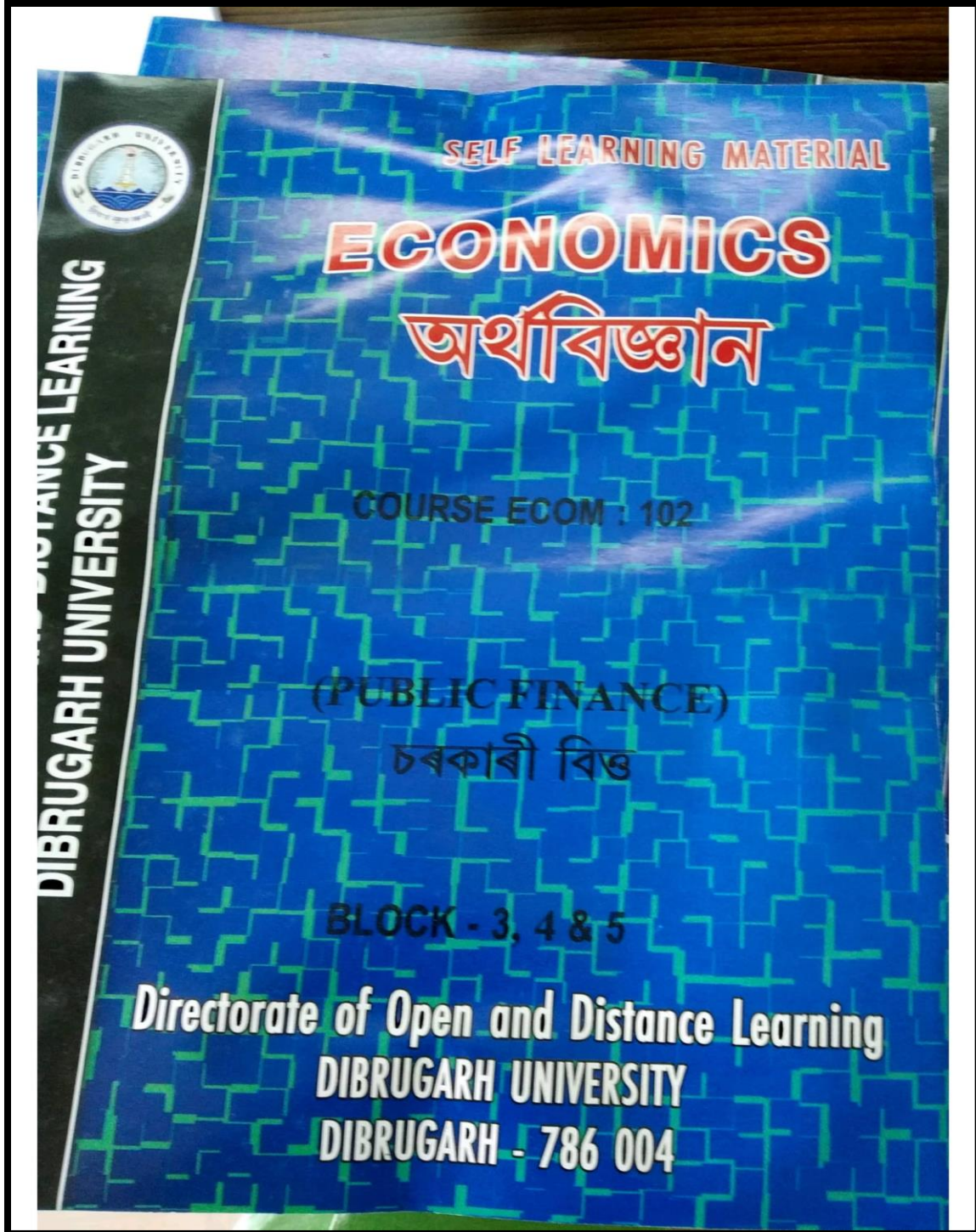
  
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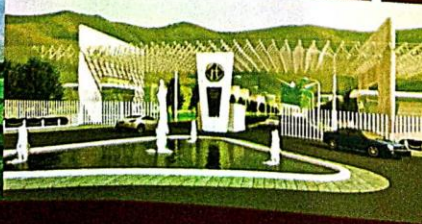
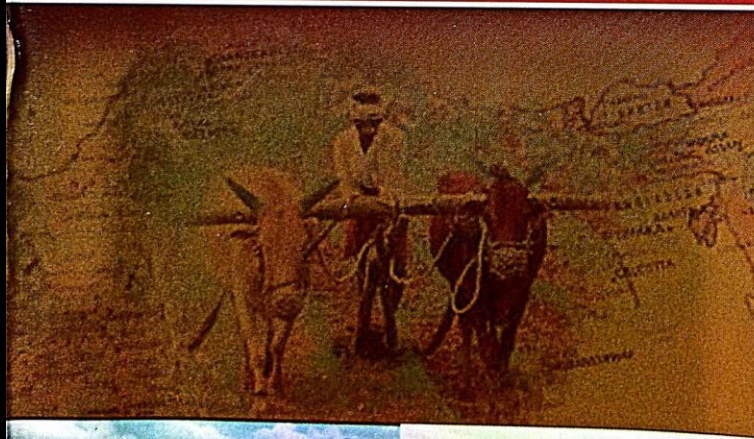
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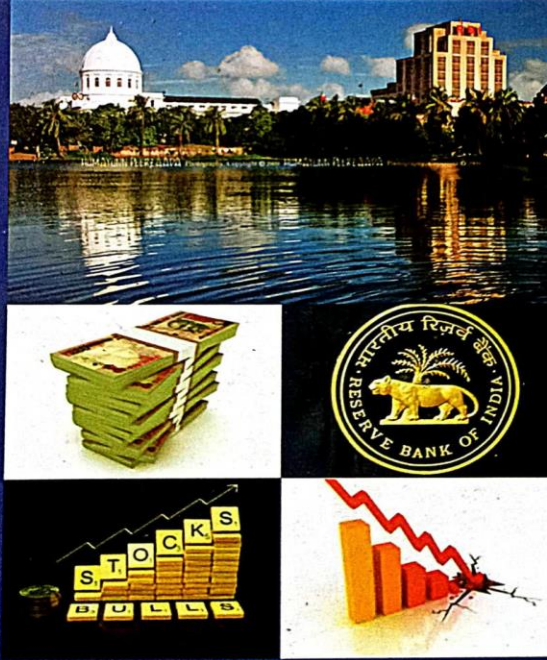


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Monetary Theory and Financial Market

ড° বফিক আহমেদ



  
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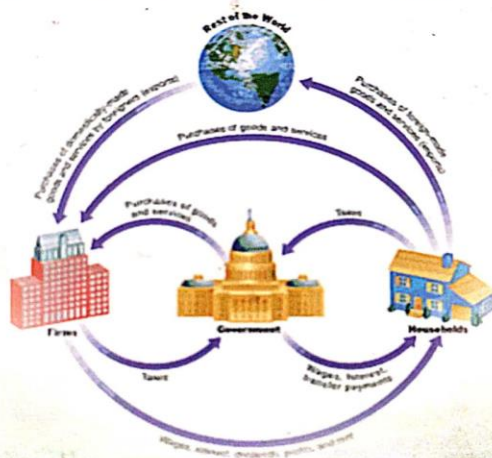


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**STUDIES ON COMPARATIVE EFFICACY OF  
ORGANIC AND CONVENTIONAL  
AGRICULTURAL PRACTICES IN RELATION  
TO SOIL HEALTH AND TEA YIELD**

Dr. Sangeeta Das



**Dr. Sangeeta Das**  
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Professor, Department of Life  
Sciences, Dibrugarh University,  
Dibrugarh, Assam, India.  
Year - 2015

Tea [*Camellia sinensis* (L.) O. KUNTZE] is a plantation crop and when grown organically is of great demand in the present global market due to health benefits. Organic farming system (OFS) is considered more sustainable than chemical based agricultural systems, as it avoids the use of synthetic chemicals. The transition from conventional to organic and low-input farming is often accompanied by significant changes in an array of soil chemical properties and processes that affect soil fertility and eventually crop yield. These changes also influence the leaf biochemical constituents of plants. In the present investigation, a comparative study was undertaken to evaluate the effect of organic and conventional farming systems on soil health and

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## **Rural Livelihood Security and India's employment generation Schemes: A study of MGNREGS in Assam**

**Dr. Pankaj Bora**  
Assistant Professor  
Department of Political Science  
Bahona College, Jorhat

### **Introduction**

Livelihood, the concept, has recently gained popularity among policymakers as well as among the scholars of poverty and development studies (Kaag, 2004, pp. 49-74). Underdevelopment, never-ending poverty, insecure sources of income that the present world has been witnessing has popularized the concept of livelihood among the researchers. In 2005, as per the World Bank report, 2.6 billion people had to live in less than US\$2 per day across the globe (World Bank, 2011, p. xi). The picture is more pathetic in the rural areas. The International Fund for Agricultural Development reported that 70% of the world's poor live in rural areas (IFAD, 2010, p. 47). They are in a vulnerable situation, in terms of livelihood opportunities. Therefore, countries like India have adopted several policies for the development of the rural people. MGNREGS is one of such policies which aim at securing livelihood by ensuring employment to the rural people. This paper has tried to examine the outcomes of this MGNREGS in Assam as a livelihood security scheme.

### **Meaning of Livelihood Security:**

Livelihood security implies having a secured means of living. Livelihood security of an individual or family is their command over income or bundles of resources that can be used to meet their needs. It ensures the basic necessities of life like food, water, shelter, clothing etc. Kamaljit Das, in his book *Livelihood Security and Governance* (2009) figured out five elements of livelihood system- creation of on farm and off-farm gainful employment, poverty reduction and enhancement of income with change in the consumption pattern, ensuring well being and the capabilities of individuals and communities, livelihood adoption vulnerability and resistance which include self esteem, happiness, reduction of stress, empowerment of women and sustainability of natural resource system (Das, 2009, p. 3). Frank Ellis, an Emeritus



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# ৰাজনৈতিক তত্ত্ববোধ

UNDERSTANDING POLITICAL THEORY



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# CONSTITUTIONAL GOVERNMENT AND DEMOCRACY IN INDIA

As Per CBCS Syllabus of Dibrugarh University  
For BA Political Science (Honours) First Semester Students  
Paper: C-II

Dr. Pankaj Bora  
Dr. Gautam Chandra Roy  
Dr. Aniruddha Kumar Baro  
Pallab Ghose

  
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## **UNIT: I**

### **The Constituent Assembly and the Constitution**

- a. Framing of the Constitution- Acts of 1909, 1919, 1935 and 1947; the Preamble and the major features of the Constitution
- b. Fundamental Rights and Directive Principles

**Dr. Pankaj Bora**

#### **Introduction**

Indian democracy is the largest democracy in the world. The Constitution of India ensures a democratic government in India with regular election and universal participation of citizens of India. It is very important to look at the nature and working of the Indian Constitution to understand the democratic politics of India. But before looking deep into the nature and working of the Constitution of India, it is important to know the meaning of the constitution as well as importance of a constitution. Therefore, let's begin with the meaning of the constitution.

#### **Meaning of Constitution**

In a modern nation state, constitution is the most important document. A constitution of a country guides the functioning of the country. Constitution is regarded as the supreme embodiment of the law of a country. Constitution is the supreme authority. The term constitution originated from the Latin word 'Constitutio'. The word constitution was used in French for regulation and orders.

A constitution is a set of fundamental rules and principles or

  
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**UNIT: III**

**Organs of Government: Judiciary**

- a. The Judiciary: High Court and Supreme Court, Juridical Review
- b. Relation between Executive and Judiciary, Juridical Activism, Public Interest Litigation (PIL)

**Dr. Pankaj Bora**

**Introduction**

The Judiciary is the organ of government which is responsible for interpretation of the Constitution and settling of disputes. Independence of judiciary from the control of legislature and executive is very crucial for delivering justice. In India, we have an integrated system of judiciary with the Supreme Court at the apex, followed by the High Courts, District Courts and Subordinate Courts. Unlike the other federal states of the world, India does not have separate state courts but all the High Courts and other lower courts come under the Supreme Court. The Judiciary is considered as custodian of the rights of the people and a balancing wheel between the Executive and Legislature. Not only this but Judiciary also decides all disputes which may arise between and the federal unites, so that federal structure is not put under heavy strains.

**History of Indian Judiciary**

Judiciary in India is a colonial legacy. British colonial administration had introduced the Indian Judicial System based



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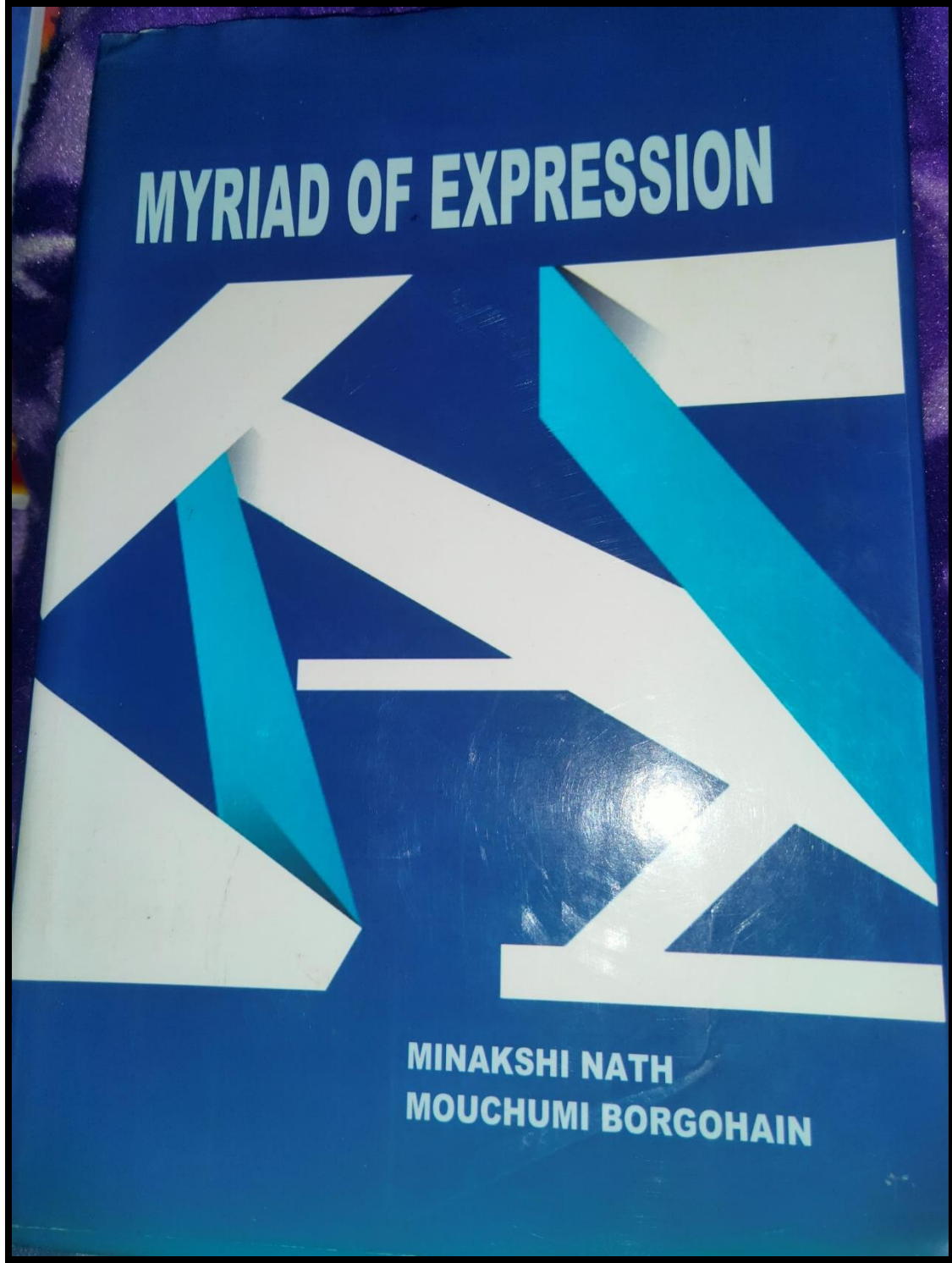
  
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# **PERSPECTIVES ON MATERIAL CULTURES IN NORTHEAST INDIA**

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## Weapons of Subsistence and Resistance: Social Life of Poisoned Arrows in Colonial Northeast India

*Bikram Bora*

*Looking up that rocky gorge, one could well imagine the scenes... the filthy villages where every man's hand is against his neighbour; the poverty, the hunger, the cross-bows, and the poisoned arrows, the single-rope bridges across the torrent, and the diet of wild honey that proved at last so nauseating to the weary travellers.*

In 1912, while writing about the mountainous borderlands between British India and China, the British consul of Yunnan province Archibald Rose thus paints a vivid picture of the region.<sup>1</sup> His depiction of the region reiterates the imageries that colonial travellers conventionally associated with these ungoverned highlands in the 19th and early 20th century. The fact that poisoned arrow have found mention within this description is not uncharacteristic. Because object being was fairly ubiquitous among the communities inhabiting the region, presently cutting across the territorial borders of China, Burma and India's north-east.

This paper traces the trajectory of the spatial and discursive mobility of the poisoned arrows in the upland tracts between Tibet and colonial Assam. At present this region encompasses the eastern parts of Arunachal Pradesh.

  
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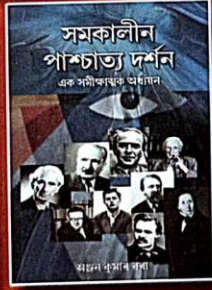
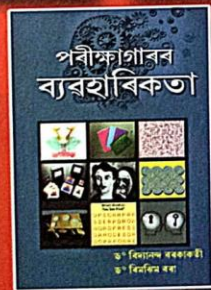
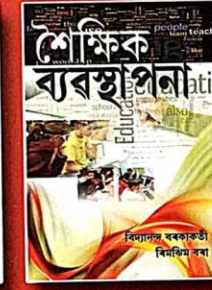
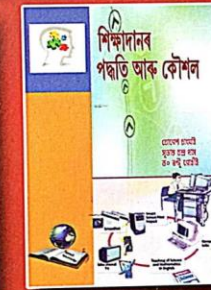
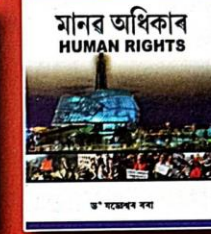
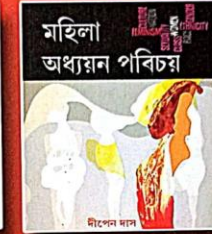
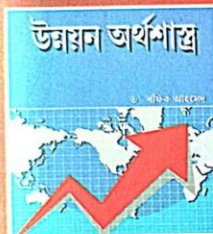
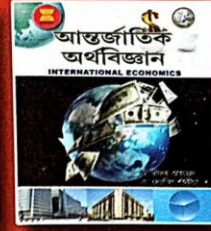
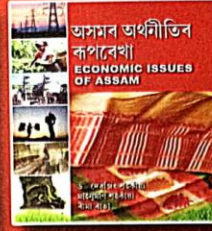
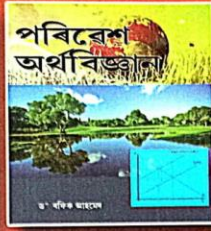
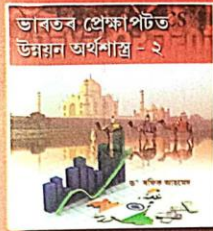
  
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## Chapter 4

### **ASSAM'S RESPONSE TO THE SIMON COMMISSION: A STUDY**

*Fakrul Islam Laskar*

The genesis of the Indian Statutory Commission may be traced to the Government of India Act, 1919. The Act contained a provision that at the end of ten years, a Commission would inquire the working of the Reforms with a view to determine what further action, if any, should be taken to extend, modify or restrict the degree of “responsible” Government<sup>1</sup>. On November 8, 1927, the appointment of the Statutory Commission on Constitutional Reforms was announced by the Secretary of State in England and the Viceroy in India<sup>2</sup>. The proposed Commission would be headed by the celebrated constitutional lawyer Sir John Simon and he would be assisted by six other members of the British Parliament<sup>3</sup>. The Commission was well known as the ‘Simon Commission’ after the name of its chairman Sir John Simon. The announcement of the appointment of the Commission created “profound disappointment” and raised a veritable political storm in India because the Commission which was to prepare the future constitution of India had no Indian members. The exclusion of Indians was deemed as the direct insult to the intelligence of India<sup>4</sup>.

  
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**ABOUT THE AUTHORS**

**Dr Sumbit Chaliha:** He is working as Associate Professor in Physics at Bahona College, Jorhat (India). He has been teaching Physics and Electronics science for the last 27 years. He has done the PhD works on thinfilm devices from Gauhati University and successfully completed one Major and three Minor Research Projects. He has published more than 20 numbers of research papers in International Journals as corresponding and co-author. He is the author of a book on popular science "Jugantorkari Avishkar" and a research level book "Thinfilm Schottky Barriers and Heterojunctions". He is also the co-author of a School level Science text book "Amar Vigyan", and other two undergraduate level text books on Environmental Science and Electricity an Magnetism. He writes several popular science articles/ talks for different Magazines and All India Radio. He is the life member of Indian Association of Physics Teachers, Indian Science Congress Association, Assam Science Society and Physics Academy of the North East.



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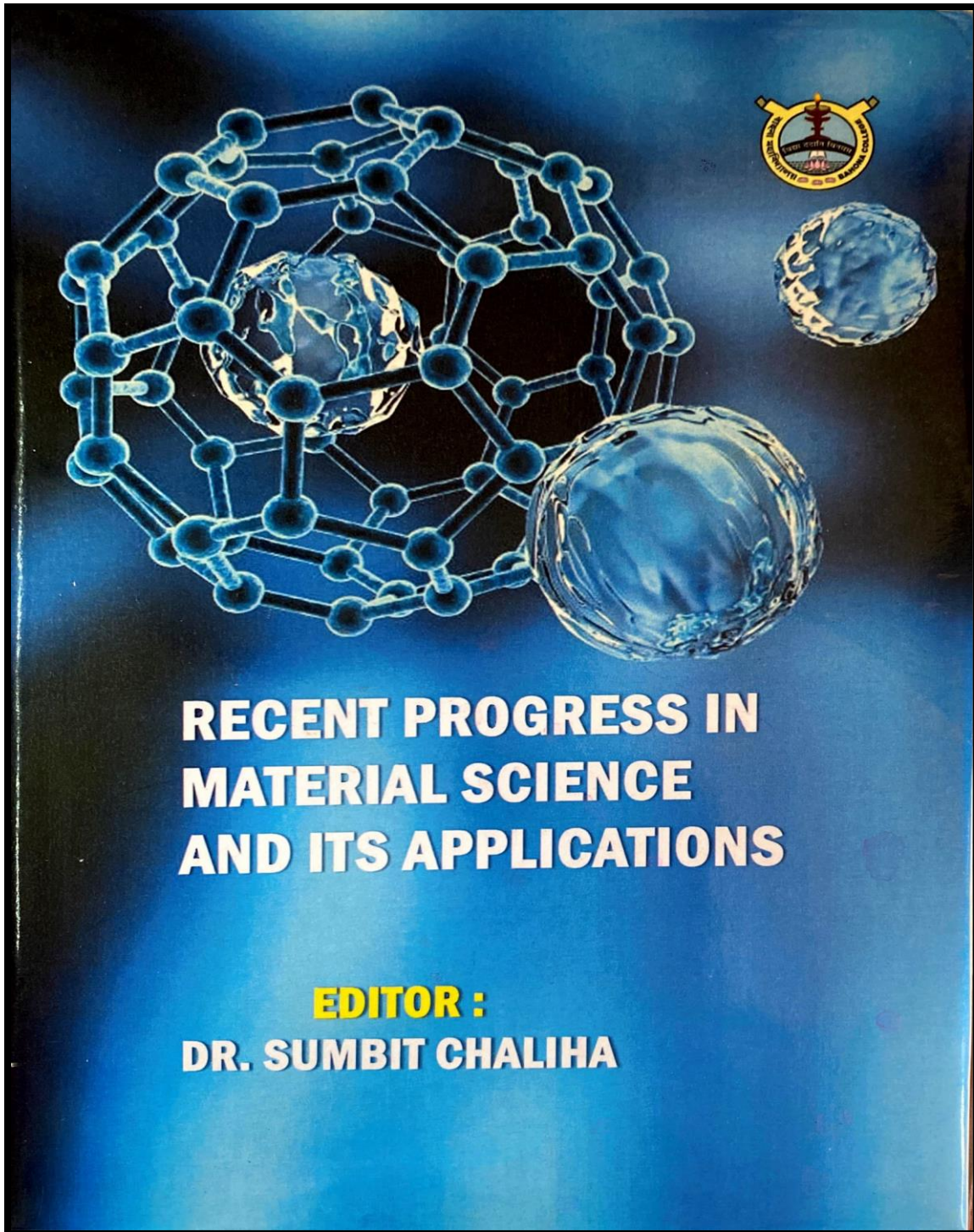
  
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# **RECENT PROGRESS IN MATERIAL SCIENCE AND ITS APPLICATIONS**

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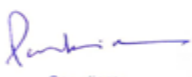
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## Recent Advances in Heavy Metal Ions Sensing in Aqueous Media Using Different Fluorescent Probes


Himanshu Rajbongshi

### 1. Introduction

Monitoring the presence of contaminants in water is of general interest in order to ensure the quality of surface, ground, and drinking water [1, 2]. Among the several water pollutants, such as plastic or waste [3], chemical fertilizers or pesticides [4], and pathogens [5], heavy metal ions are known for their high toxicity [6]. Although some of them are essential nutrients (for instance, iron, zinc, or cobalt), they can be toxic at higher concentrations [7]. For their part, cadmium, lead, and mercury are highly poisonous even at trace levels [8, 9], showing a close association to cancer or neurodegenerative diseases [10, 11]. Furthermore, heavy metal ions are non-biodegradable substances [12] and they have an accumulative effect in human body [13], where they enter, typically, through the air [14], beverages [15], and the food chain [16], in which water plays a key role. Metal ions

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## **Chemical Bath Deposition - A Novel Technique for the Preparation of Semiconductor Thin Films for Photovoltaic Applications**

Dr Sumbit Chaliha

### **1. Introduction**


Thin film, the two dimensional form of materials are important because of their potential low cost processing with minimal material usage while fulfilling application requirements. A number of studies verified that their physical and chemical properties are highly dependable on the deposition methods. Thin films can be synthesized by varieties of physical and chemical deposition techniques. Among these techniques chemical bath deposition (CBD) is one of the most suitable routes to get uniform, well adherent and good reproducibility thin films of different materials on substrates or on previously deposited layers. Chemical bath deposition of compound semiconductor thin films currently receives a great deal of attention not only for its effectiveness in the reduction of cost and

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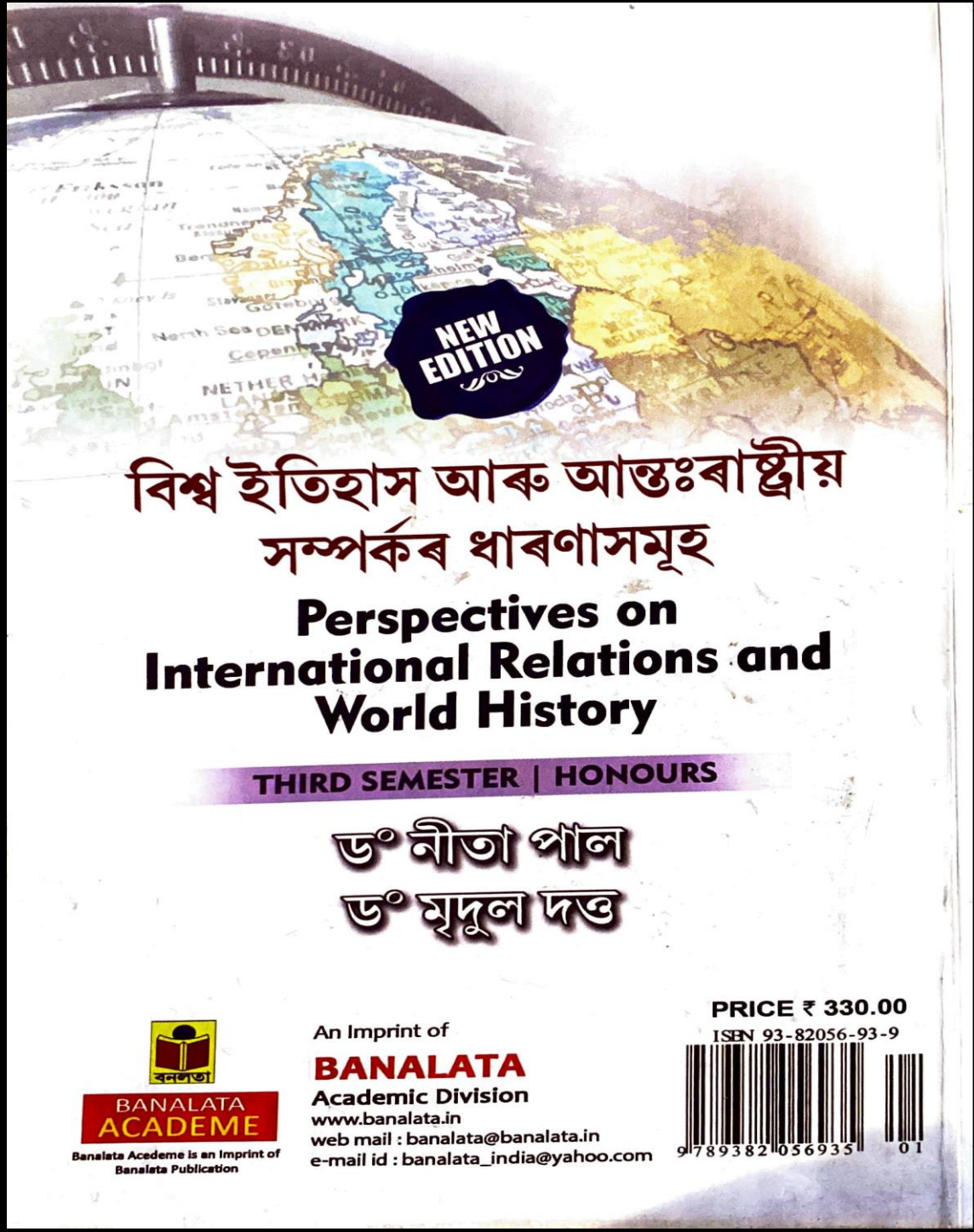
  
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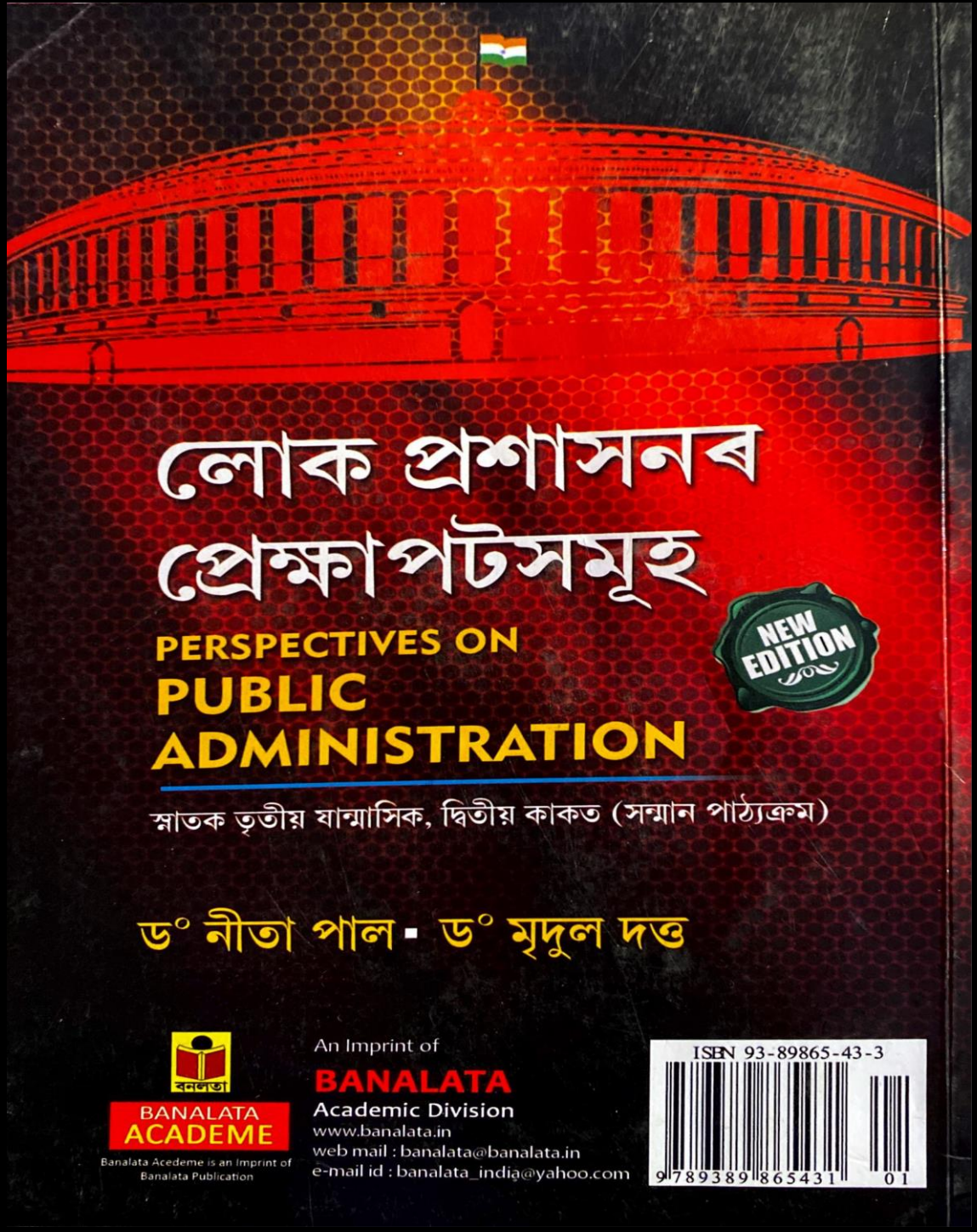
  
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Dr. Anupam Chanda is currently working as a Librarian at Assam Don Bosco University, Guwahati, Assam, India. He has completed his PhD from Assam University, Silchar under Prof. M.K. Sinha. He has few publications on Scopus Indexed Journal, UGC Approved Journals. He has attended a few International Conferences and presented paper at the conference.

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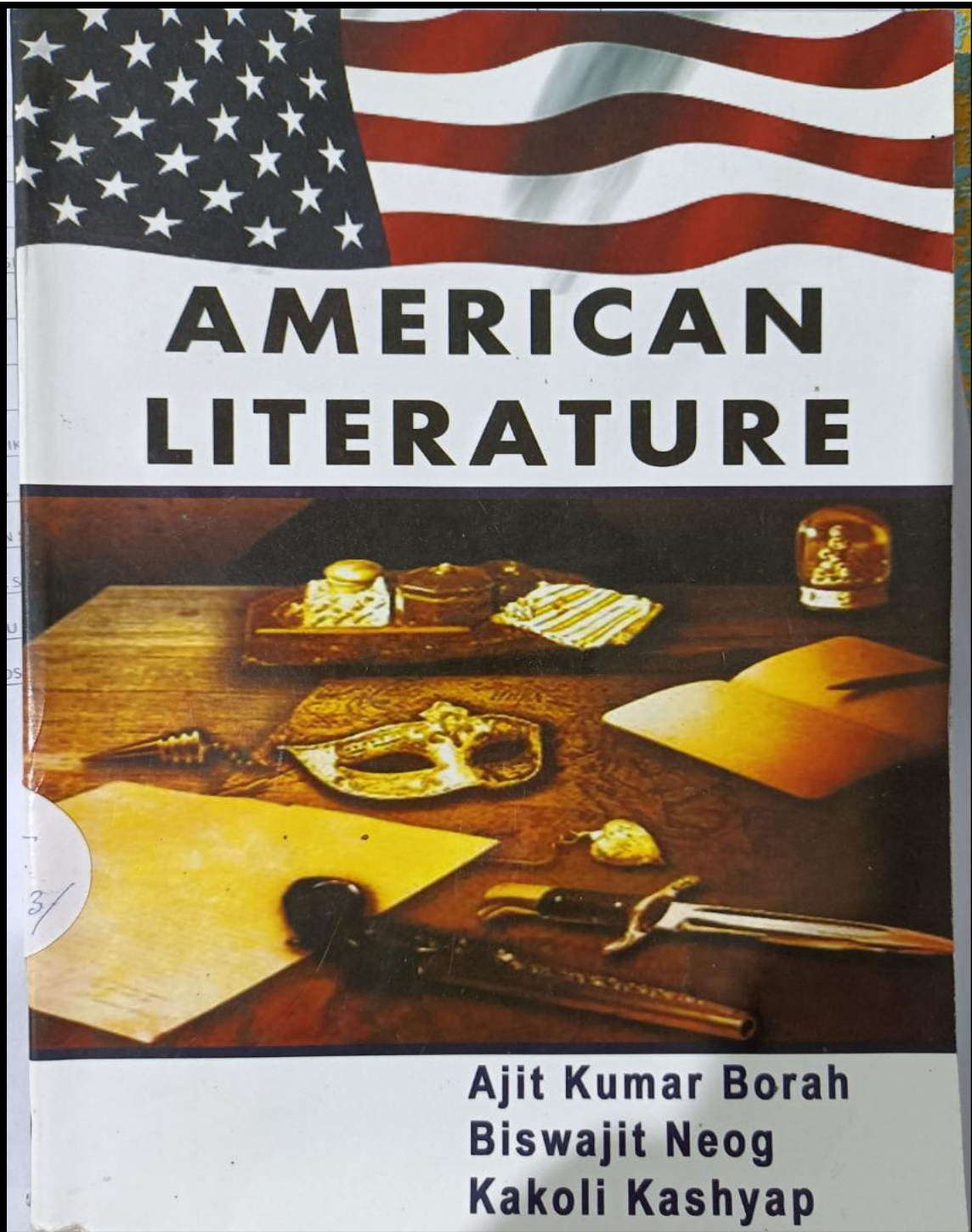
  
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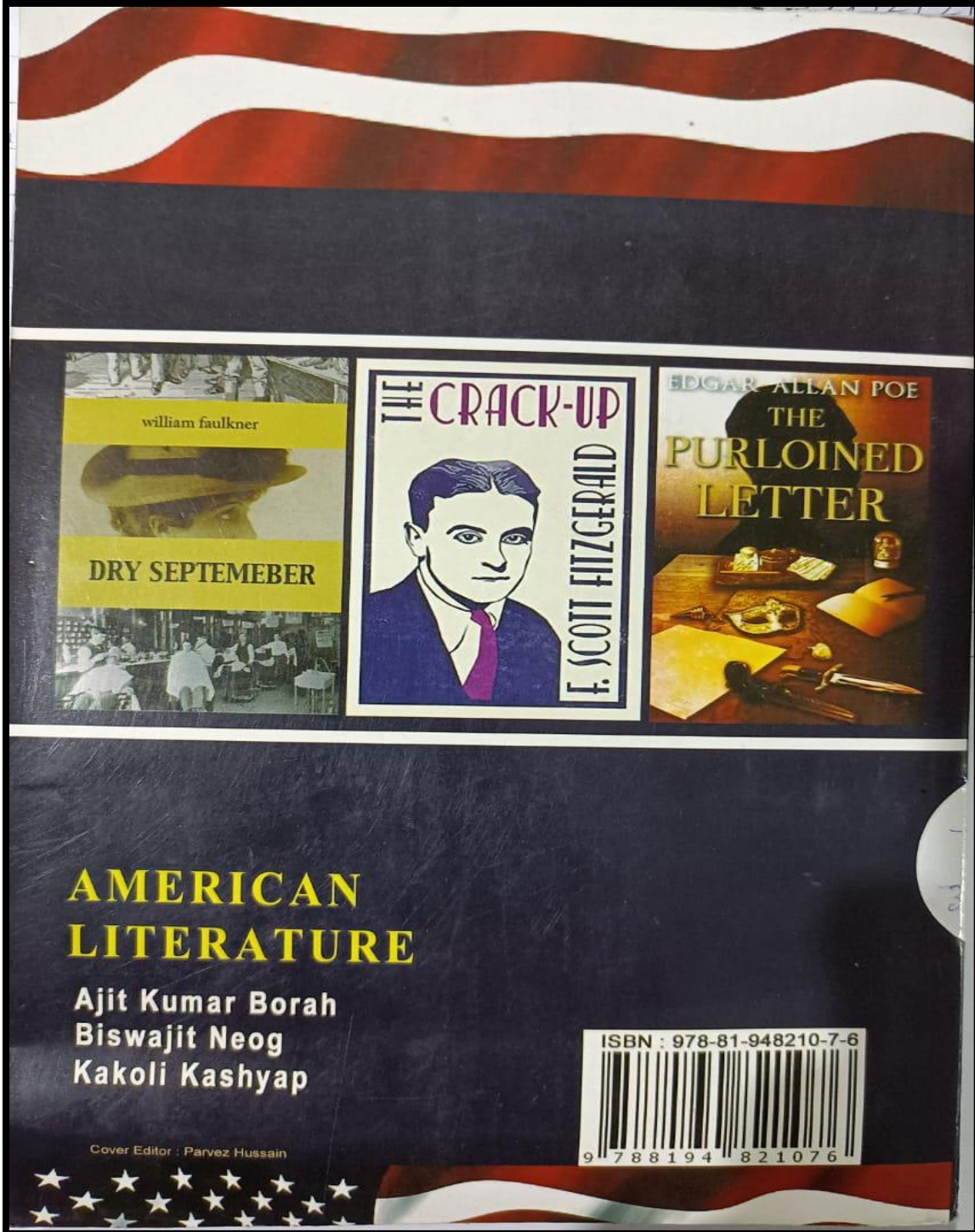
  
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Contemporary issues in Assam Economy II 193

## Exploring Relationship between Financial Inclusion and Economic Growth: Indian Scenario

Dr. Reema Rabha  
Assistant Professor, Bahona College, Jorhat, Assam

### Abstract

The concept of inclusive growth demands for equitable opportunities for each and every participant from every sections of the society. The concept of inclusive growth basically implies the participation of every individual in the process of economic growth irrespective of their economic class, gender, disability or religion. The participation from all sections of the society calls for a well equipped financial system with well maintained financial intermediaries which will meet the financial demands of all section of the population. In this context, the paper examines the significance of financial inclusion in attaining economic growth in India using Cointegration and Vector Error Correction Model (VECM) over 23 year period ranging from 1991 to 2014.

In the cointegrating equation, the beta coefficients for increase in the ratio of broad money to GDP and the increase in credit amount per 100 persons are both significant indicating cointegration of these two variables with increase in gross domestic product. In addition to it, the sign of the coefficient of the increase in the ratio of broad money to GDP is positive indicating that increase in the ratio lead to increase in the gross domestic product and vice versa. However, the coefficient of the increase in credit amount per 100 persons is negative and significant.

Although the financial deepening variables do not have long run causality with the increase in gross domestic product; the cointegration of these two variables exists with the increase in gross domestic product. The significance of the chi-square value of the cointegration equation has established the fact.

Keywords: Equitable, Exploring, Inclusion, Inclusive

### I. Introduction

Since classical period, economists have divergent views regarding the importance of the financial system in attaining economic growth. The

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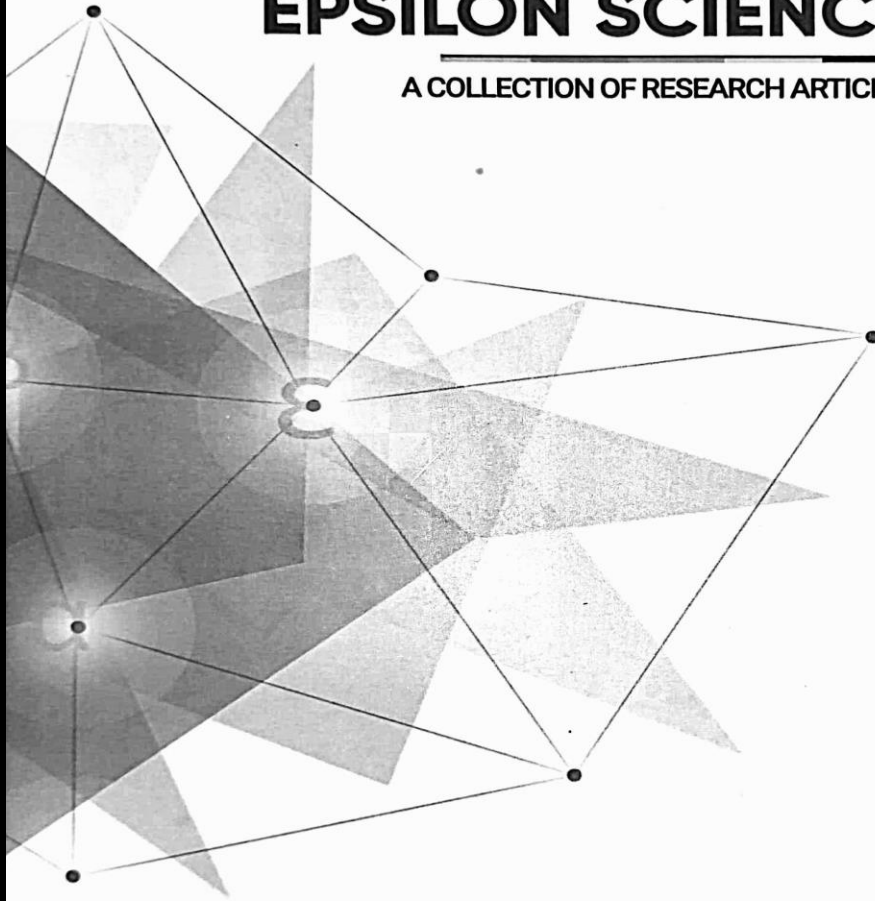
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Dr. Deepak Sarma is currently working as an Assistant Professor of Mathematics in the Department of Agricultural Statistics in Assam Agricultural University, Jorhat. Prior to this, he served as an Assistant Professor of Mathematics at Tezpur University. He currently teaches undergraduate, graduate and Ph.D. courses in Mathematical Analysis, Mathematical Statistics, Probability Theory and Structural Equation Modelling. Besides these, his other areas of interest includes Matrix Analysis, Graph Theory, Abstract Algebra and Topology. All his research works so far have been published in different international journals with high impact factors.

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## On Sunspot Waves in the Solar Atmosphere

Aishwarya Sharma

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**Abstract:** The aim of this chapter is to provide a brief overview of the recent observation of sunspot waves and oscillations in the solar atmosphere. The chapter reviews the multi-wavelength observation of sunspot waves observed in an active region [Sharma et al. 2017] by Atmospheric Imaging Assembly (AIA, Lemen et al. 2012) onboard the Solar Dynamics Observatory (SDO, Pesnell et al. 2012). High spatio-temporal resolution by AIA shows clear propagation of sunspot waves in different layers of the solar atmosphere. The study provides the first direct observational evidence of coupling of different sunspot waves in different layers of the solar atmosphere.

**Key words:** Sun, Sunspot, Waves, Corona.

### Introduction:

One of the dynamic features observed in the solar photosphere is sunspot. The photosphere is the lowermost region (550 km thick) of the solar atmosphere that differentiates the solar interior from the solar atmosphere. The photosphere has an effective temperature of  $\approx 5785$  K, and it appears to the naked eye from Earth as a plain yellow surface. But in reality, it is a region of complex dynamic activities with different features such as granules, plage regions, sunspots etc.

Sunspots are observed in the solar photosphere as some dark spots. They have a darker core called the umbra and an outer less dark region called the penumbra. The sunspots are regions of strong magnetic fields with a flux density of  $\approx 2000$ – $3000$  G at the center. The strong magnetic fields associated with sunspots inhibit convection that occurs below the photosphere and transfers heat and energy. This causes the sunspots to have a lower temperature than the surrounding region and make them darker as compared to the solar surface. The umbral magnetic fields are oriented vertically up, whereas the penumbral fields are inclined. Figure 1 shows an image of a sunspot in the solar photosphere with surrounding granular patterns.

Recent advancement of technologies and increase of spatial and temporal resolution of the ground and space-based telescopes have revealed the presence of different waves and oscillations in the sunspot atmosphere. They are observed at various features associated with sunspots at different layers of the solar atmosphere (Solar atmosphere: the photosphere, chromosphere, transition region and the corona), and characterised by different periods, frequencies, phase speeds etc. The phenomenon of sunspot oscillation was first discovered by Beckers & Tallant (Beckers & Tallant 1969) as sudden brightenings in the intensity of Ca II lines in the chromosphere. Over the years, after this discovery, many shorter (3.5 minutes) and longer (>10 minutes) period oscillations associated with sunspots have been observed. Different sunspot waves and oscillations can mainly be



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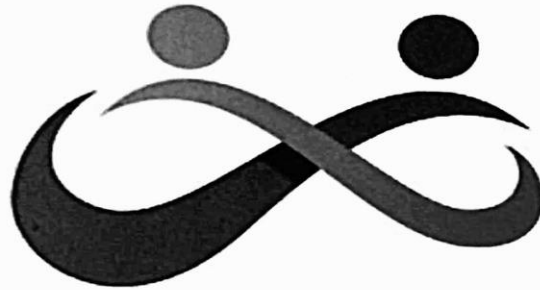
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যোৰহাট বিজ্ঞান আৰু প্ৰযুক্তি বিদ্যা প্ৰতিষ্ঠান



**INFINITY**

A collection of research articles  
in Mathematical and Physical Science

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## **Observation of Waves in the Solar Atmosphere**

**Aishawnnya Sharma**

Department of Physics, Tezpur University, Tezpur 784028,  
India

*Email: sharmaaishawnnya@gmail.com*

**Abstract:** In the solar environment, MHD waves are omnipresent. They are seen as an important candidate for causing the upper solar atmosphere to heat up. To explain the existence of MHD waves in the solar atmosphere, which can be used as a limitation in the wave heating model of the solar atmosphere, this chapter discusses recent empirical studies [Sharma et al., 2017, 2020].

### **1 Introduction**

The direct observations of waves and oscillations in the solar atmosphere have been increased dramatically in recent years,

  
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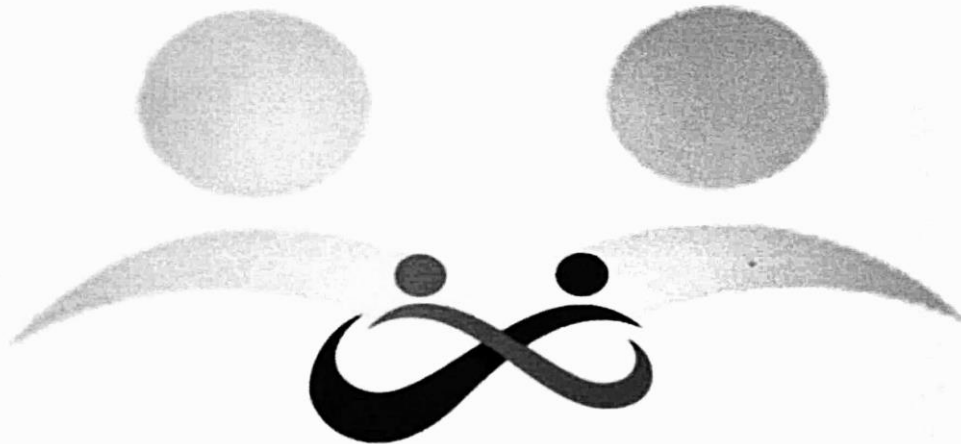
  
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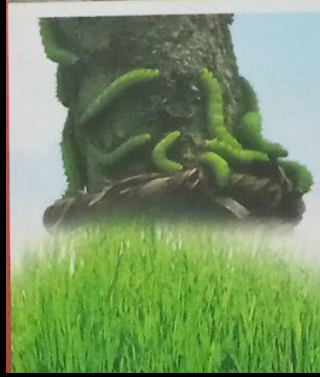
  
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Four<sup>th</sup> Edition - January, 2020

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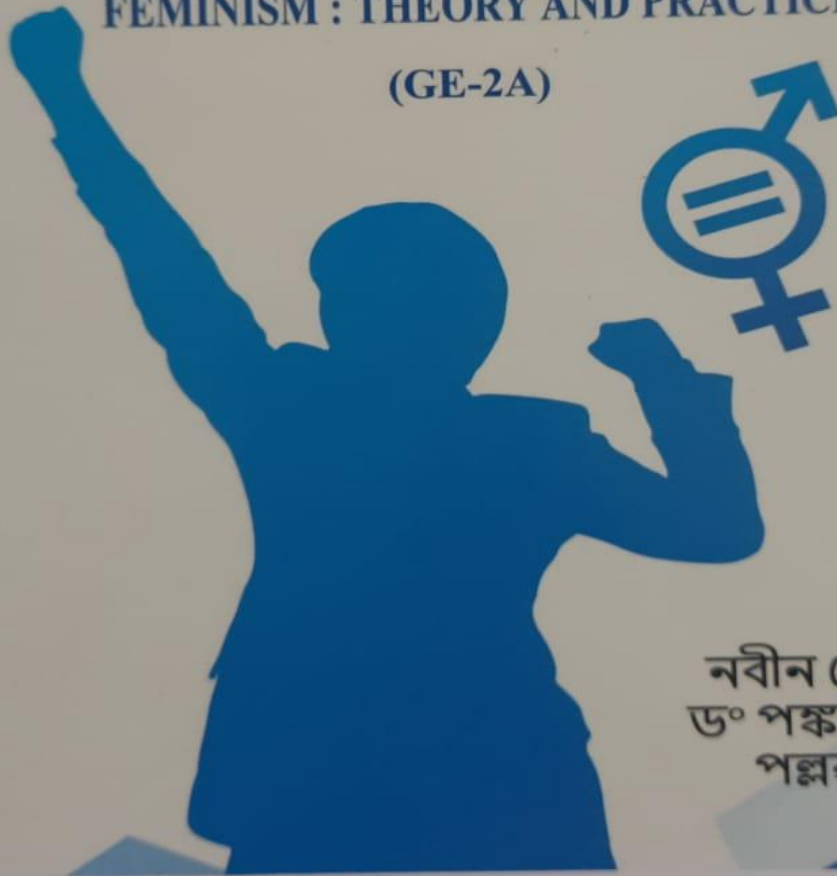
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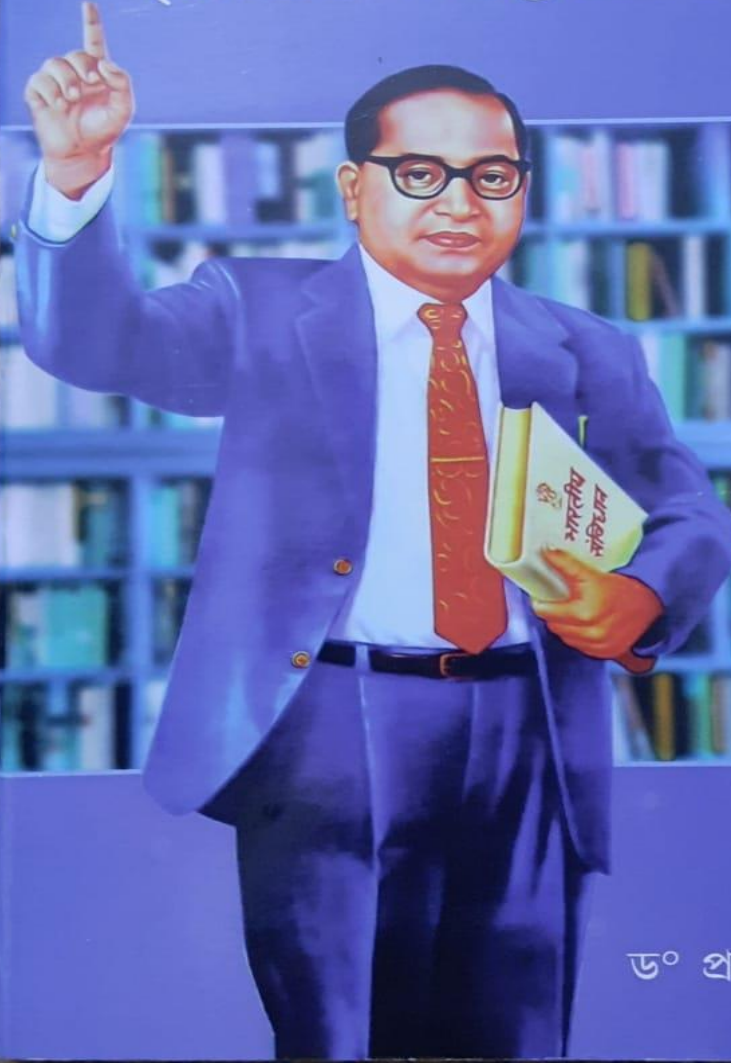


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(Understanding Ambedkar)



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# ভাৰতবৰ্ষত ৰাজনৈতিক প্ৰক্ৰিয়া

(Political Process in India)



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**Peace & Development in the North-East:  
Prospects and Constraints**

*A collection of the research papers submitted at the ICSSR sponsored National Seminar on "Peace and Development in the North-East: Prospects and Constraints", organised by Department of Political Science, Jorhat College on 22nd and 23rd February 2019, edited by Bidyut Bora, Assistant Professor, Department of Political Science, Jorhat College.*

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## **Question of Identity and Political Unrest in Assam: A Theoretical Understanding**

**Mridul Dutta**

### **Introduction**

The word 'identity' has not only found wide usage but has political and social situations. It is a word which is not only used by academics but is perhaps more commonly used today by various political groups and other organizational bodies<sup>1</sup>. The politics of identity became more pronounced in the post independence period. The reorganization of States on ethnic lines further strengthened the ethnic mobilization and this was marked as a signal for ethnic conflict on the basis of language<sup>2</sup>. Importantly, the government of Assam passed the Assam State Language Bill 1960 which ensures the safeguards of Assamese identity based on Assamese language. It made adverse effects on the tribal communities as they afraid of dominating and losing their distinctive linguistic identity because of Assamese language and cultural identity<sup>3</sup>. So, the emerging educated elite of the ethnic groups began to feel that in order to establish their community into a rightful place, they must be politically powerful and assertive. As a result, the expansion of ethnic identity has captured political institutions and social movements. Moreover, the socio-political assertion is based on demographic power in order to maintain ethnic hegemony.

The ethnic elite and people feel that their hopes and aspiration are dominant by the greater Assamese community. This can be observed

  
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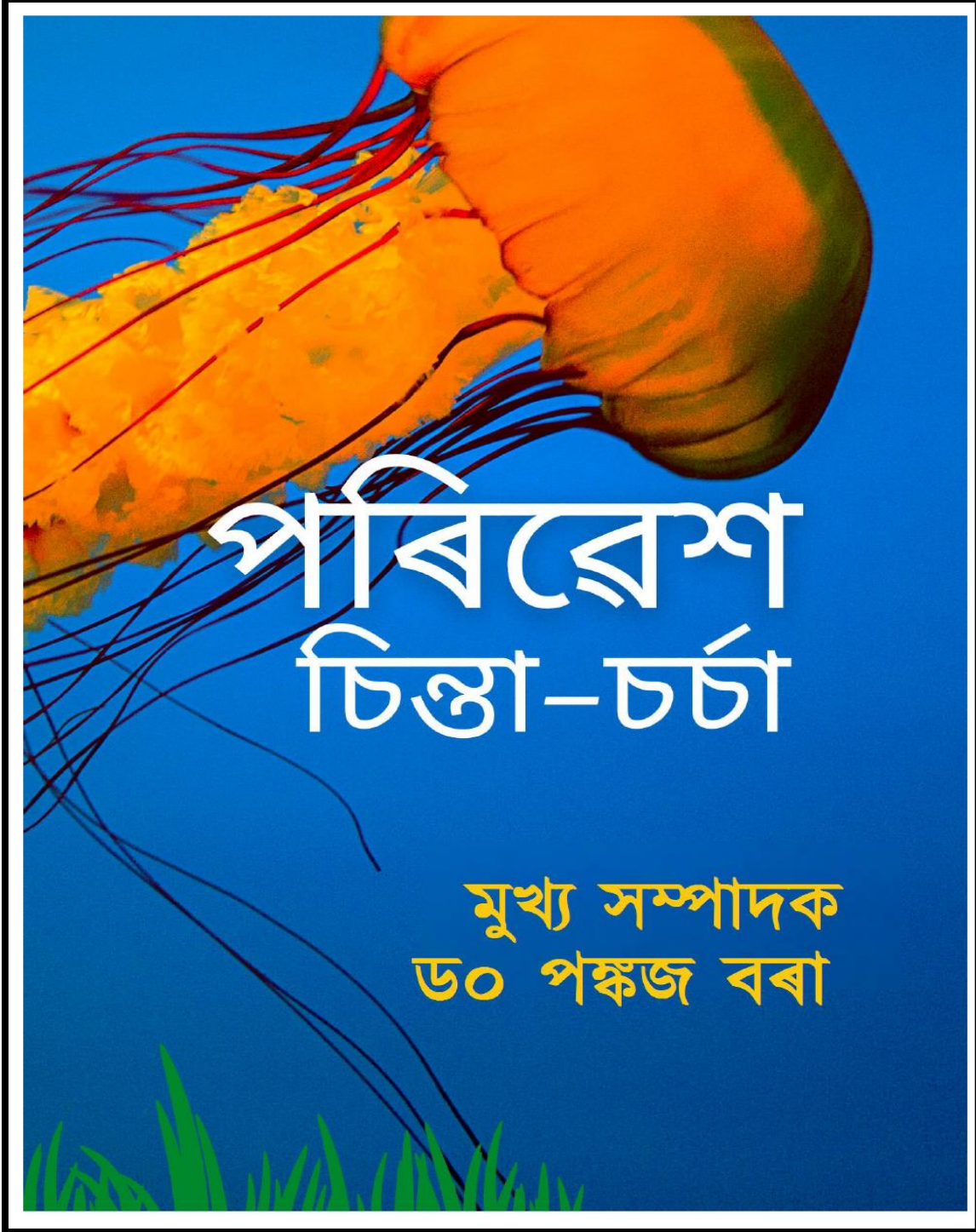
  
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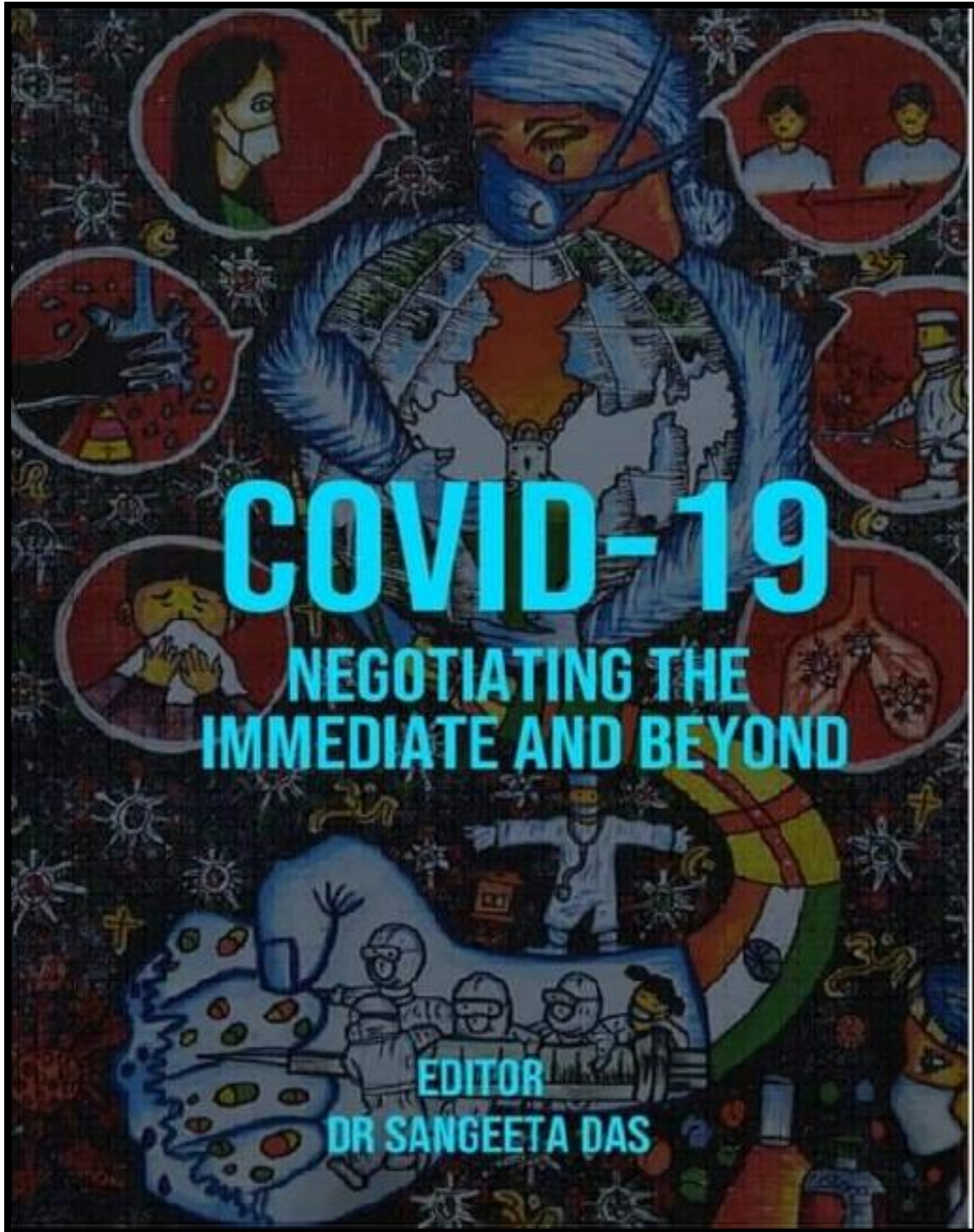
  
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Women are the backbone of any society and contribute significantly to the betterment of any society. Without them, no society exists. But still, during this pandemic situation due to COVID-19 they were the worst sufferers in almost all sectors in society. Therefore, the aim of this Book entitled **“COVID-19: Negotiating the Immediate and Beyond”** was to understand and mitigate the various issues faced by women during this pandemic period on the basis of effective wisdom, learning and findings of the large resource pool available across the country.

This book is the outcome of all the collaborative efforts of all the contributors. We sincerely hope that this book will be of great value and a research guide for all of us especially to the women in any society.

**Dr. Sangeeta Das**



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She has edited books and published research papers and articles in reputed journals and books. She has presented a number of research papers in different National and International Seminars all over the country and delivered lectures as resource person both inside and outside the country.

Dr. Das has also organized the National Webinar/Training Program/Workshops as Coordinator/Convener/Host. She is also a member of the International Journal of Integrated Research & Development (IJIRD), Indian Journal of Genetics & Plant Breeding and has reviewed many research papers for National and International Journals.

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## **Mental Health problems of Women during Pandemic situation: Issues and Concerns**

**Amarjyoti Bharali**

Assistant Professor, Department of Education, Bahona College,  
Bahona Jorhat

Email. ID: - amarjyotib20@gmail.com

### **Abstract: -**

Depression, Tension, Stress, Anxiety, Emotional Disturbance, Frustration, Anger, Restlessness, Rudeness, Loss of Control, Mental Pressure, Family burden, Unable to fulfil Ambitions, Future expectation, What to do or not to do, Financial problems, Economic conditions, Difficulties in home management, Difficulties to manage children and others members of the families are the common causes of mental health problems of women of our country during this pandemic situation. In this article it will be tried to focus on those challenges and problems which are more serious, rendering them into genuine mental health concerns. It will cover a range of problems which are encountered the women in general and specially the women of middle class family. This paper will try to find out the stress that impinge on the lives of women, recognize the manner of responses that occur as a result of stress, the mental health problems which women folk faced and genesis of these problems. An attempt will be made at discussing and explaining general symptoms of mental health problems, ways to manage mental health problems and techniques to express and reduce mental stress.

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# RFID Technology and its Importance in the Library

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Dr. Anoop Chandra is presently working as a librarian at Bahona College, Jorhat, Assam. He studied M. Phil in Dept. of Library and Information Science, Assam University, Jorhat and also obtained PhD degree from Dept. of Library and Information Science, Assam University. Doctor on Implementation of ICT Technology in Libraries of Higher Educational Institutions of North East India: A Study in 2018. He has published 15 research articles and 7 books. He has attended 5 International Conference and presented seminar papers. He has also attended many workshops, training program etc. He has conducted a 2 state level workshop as a resource person. He has also delivered many talks on library resources. He has attended many prog on info. at IIT Bombay under HR/ICT Project. He is the coordinator of IIT Bombay for collection of book workshop. He has installed some library automation software in 51 libraries in Assam as well as Meghalaya.



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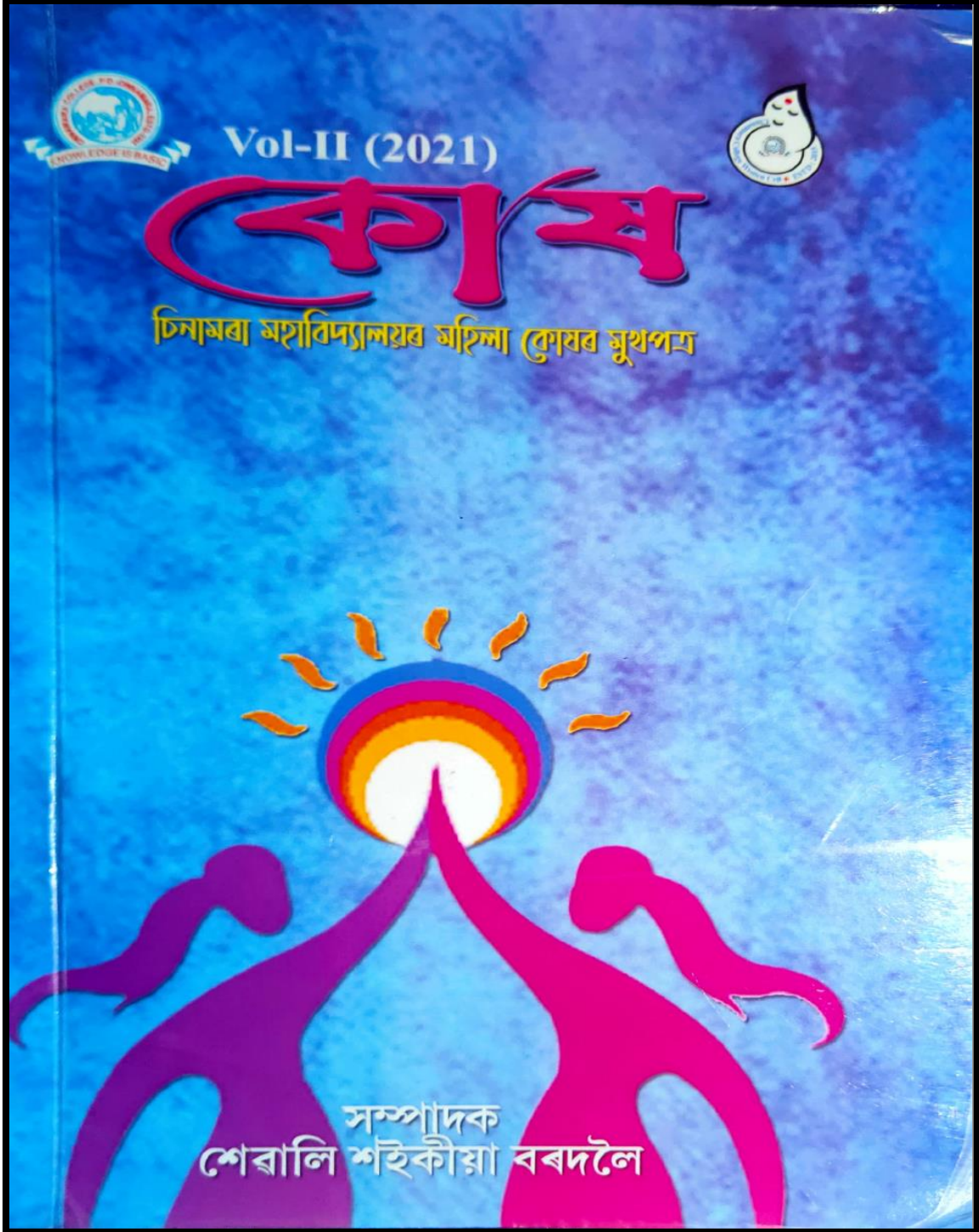
  
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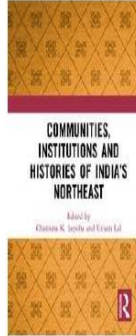


  
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Borderlands, Waterscapes and Geographies in Colonial Northeast India

By *Bikram Bora*

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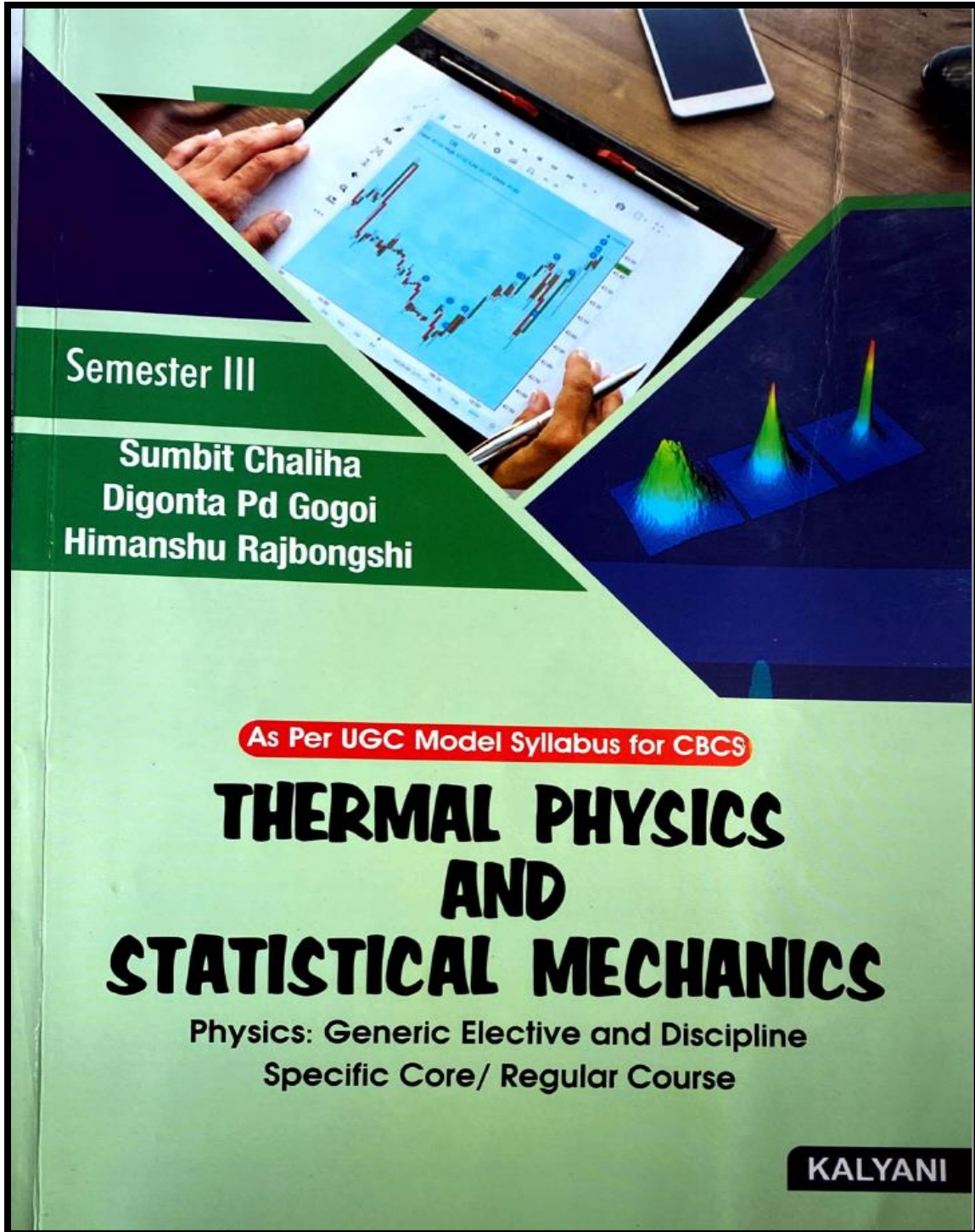
  
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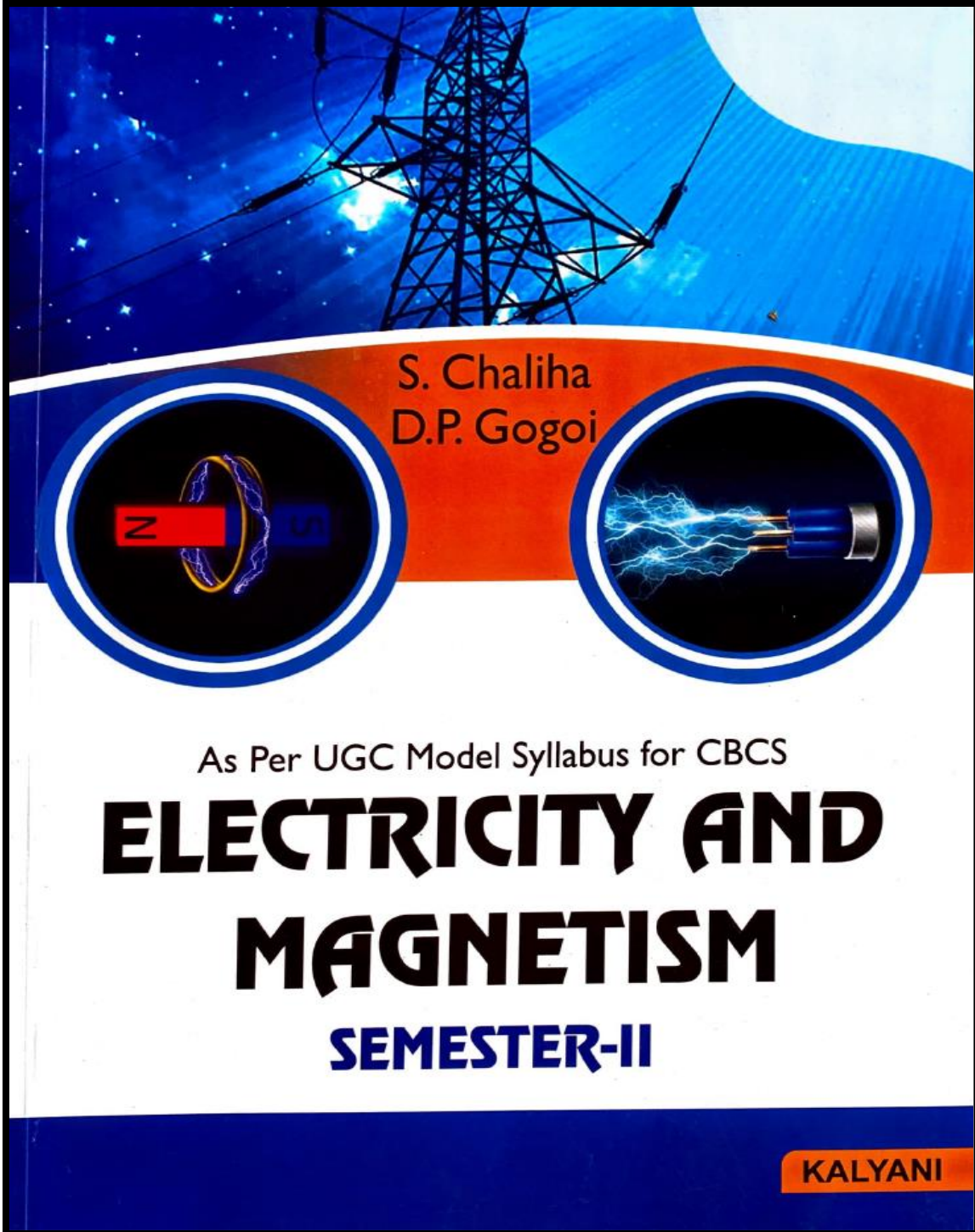
  
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**Diganta Proasad Gogoi** is working as Assistant Professor in Physics at Bahona College, Jorhat (India) since 1995. He has completed the M. Phil. degree from Madurai Kamraj University and successfully completed two Minor Research Projects. He has published several science articles in different magazines and All India Radio, Jorhat broadcasted several popular science talks. He is the life member of Indian Association of Physics Teachers and Indian Science Congress Association.



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**Dr. P. K. Dutta** started his career as Lecturer in the department of Zoology at Bahona College, affiliated to Dibrugarh University, Assam. He became Associate Professor in the said college and served that post until 2012. He was appointed Principal in Bahona College in the year 2012. As many as 7 scholars got M. Phil degree under his guide-ship. He also completed one minor research project and one major research project funded by UGC and DST respectively. He published a number of research papers and two books.

**Dr. G. A. Bora** joined Bahona College in the year 1998 as Assistant Professor. She became Associate professor in the said College and has been serving the college as Head of the Department in the Zoology Department. She conducted three minor research projects and published a number of research papers and three books up till now.



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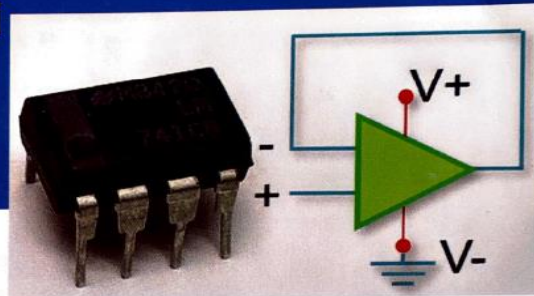
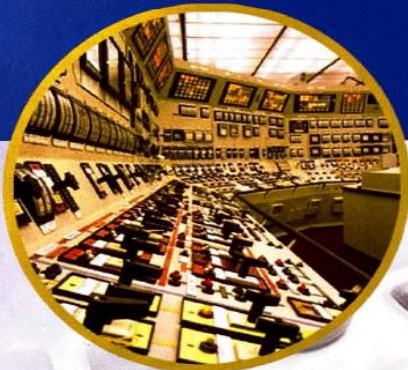
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# পুস্তক ঐতিহ্যিকা



যোৰহাট লেখিকা সমাৰোহ সমিতি

  
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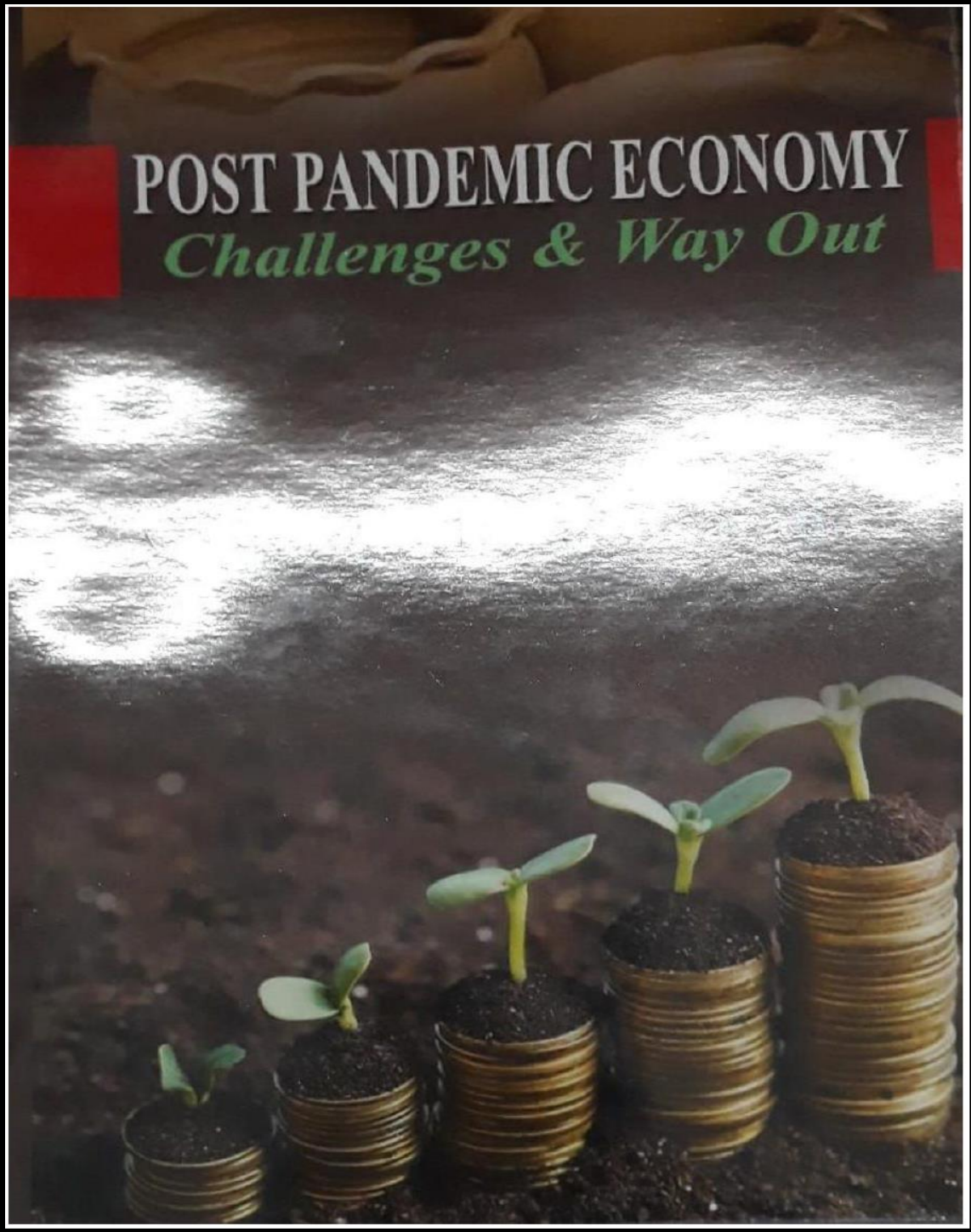
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# POST PANDEMIC ECONOMY

## *Challenges & Way Out*



  
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## Post Covid-19 :Challenges in Higher Education of India

■ Mainu Moni Saikia ■

Covid-19 pandemic impacted higher education will be different mainly in the mode of teaching, learning, and evaluation. Nationally there was a call for a de facto switch over to virtual teaching, learning and education, pushing a huge number of teachers into an unfamiliar mode. Online mode, formally allowed only in Open Universities and Varsities graded 3.5 onwards, is now licensed for all Universities to run their UG and PG programmes accordingly.

Covid-19 pandemic has forced the Universities and higher education Institution(HEIs) in India to shift to online teaching. But there has been a lot of debate on its effectiveness and “reach “to students. Many questions have been raised by experts on whether true evaluation of students’ performance is possible and terminal examinations can be conducted online. In these unprecedented difficult times the stake holders have to seriously think on how to effectively employ the digital technology to teaching, learning, continue academic activities and impart a holistic education without sacrificing the quality. To ensure continuity in teaching, learning process, institutions have resorted to the use of online modes such as Google class room, Google Hang out, Cisco webex meeting, you tube streaming, Zoom, Microsoft team,SWAYAM,NPTEL etc.Faculties have been using several tools like whatsapp groups, other social media tools and emails to enhance the learning capabilities of students.

But in Indian higher education there are many challenges to the online mode of teaching. According to many experts in the field of

❖Post Pandemic Economy: Challenges and Way Out❖ 57

  
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# Analysis of Infectious Disease Problems (Covid-19) and Their Global Impact



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## Similarity Measure of $q$ -Rung Orthopair Fuzzy Soft Sets and Its Application in Covid-19 Problem



Manash Jyoti Borah and Bipan Hazarika

**Abstract** In this chapter, we introduce  $q$ -rung orthopair fuzzy soft sets ( $q$ -ROFSSs) and some basic properties. Also we define a similarity measure of  $q$ -ROFSSs and their properties are studied. Finally, we provide an application of  $q$ -ROFSSs in Covid-19.

**Keywords** 34-XX Ordinary differential equations · 37N25 Dynamical systems in biology · 92D25 Population dynamics (general) · 92D30 Epidemiology · 93A30 Mathematical modeling

### 1 Introduction

Zadeh [35], in 1965 was the first to come up theory of fuzzy set for dealing with uncertainties problems in our daily life, where conventional mathematical tools fail. In 1986, Atanassov [2] extended the fuzzy set to intuitionistic fuzzy set (IFS) by adding the non-membership degree. Yager [30] generalized the IFS and introduced the Pythagorean fuzzy set (PFS)  $P = \langle x_i, (\mu_P(x_i), \nu_P(x_i)); x_i \in X \rangle$ , where  $0 \leq \mu_P^2(x_i) + \nu_P^2(x_i) \leq 1$ . The PFS has been widely studied and applied in many fields, one can see [8, 28, 31] related to PFS. Yager [32, 33] introduced a new form of fuzzy set known as  $q$ -rung orthopair fuzzy set ( $q$ -ROFS), which can be described as  $Q = \langle x_i, (\mu_Q(x_i), \nu_Q(x_i))_q; x_i \in X \rangle$ , where  $0 \leq \mu_Q^q(x_i) + \nu_Q^q(x_i) \leq 1$ . When  $q = 1$  and 2, we can see that the IFS and PFS are special cases of  $q$ -ROFS, respectively. The cosine similarity measures and distance measures between  $q$ -rung orthopair fuzzy sets was studied by Liu et al. [14] in 2019.

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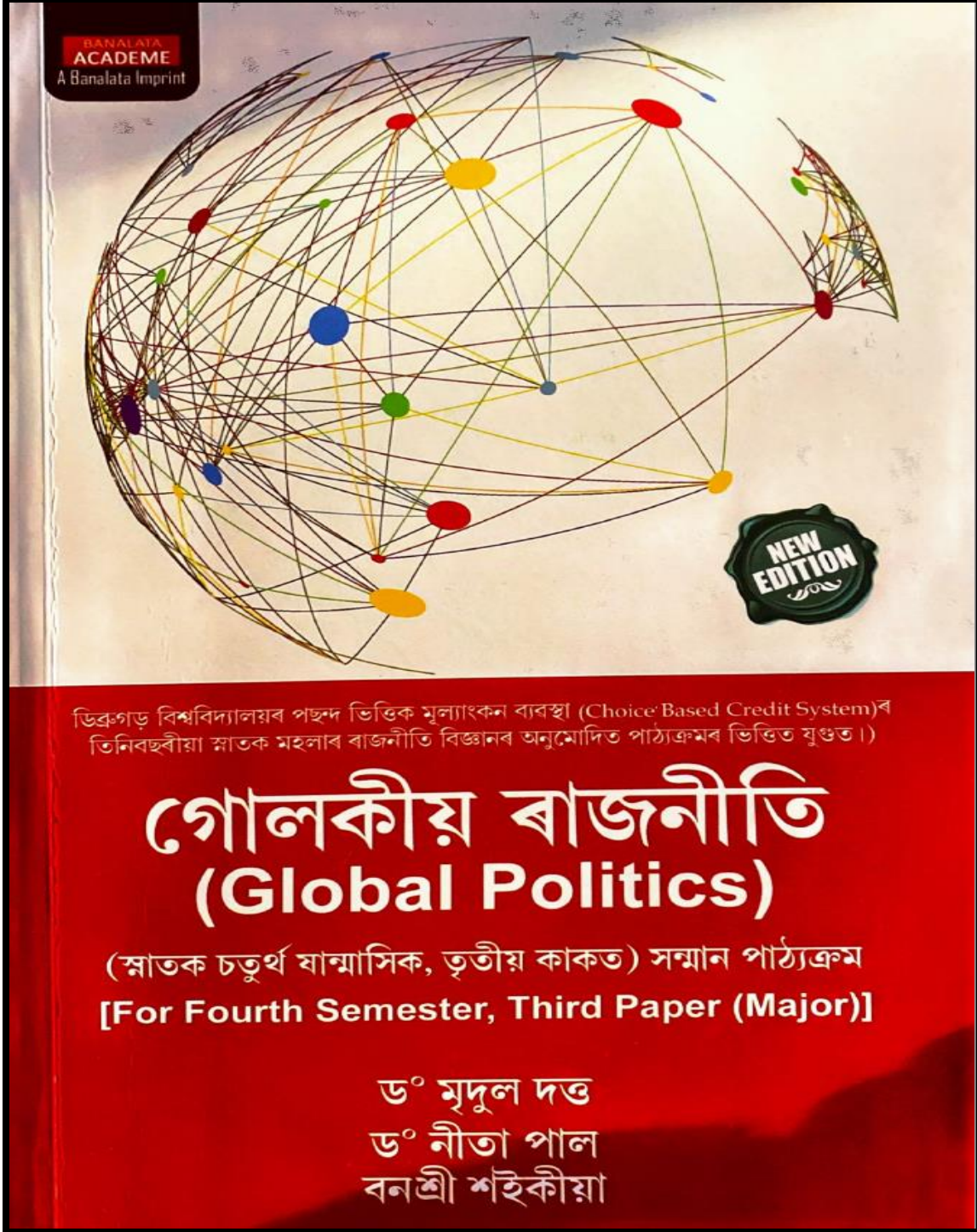
  
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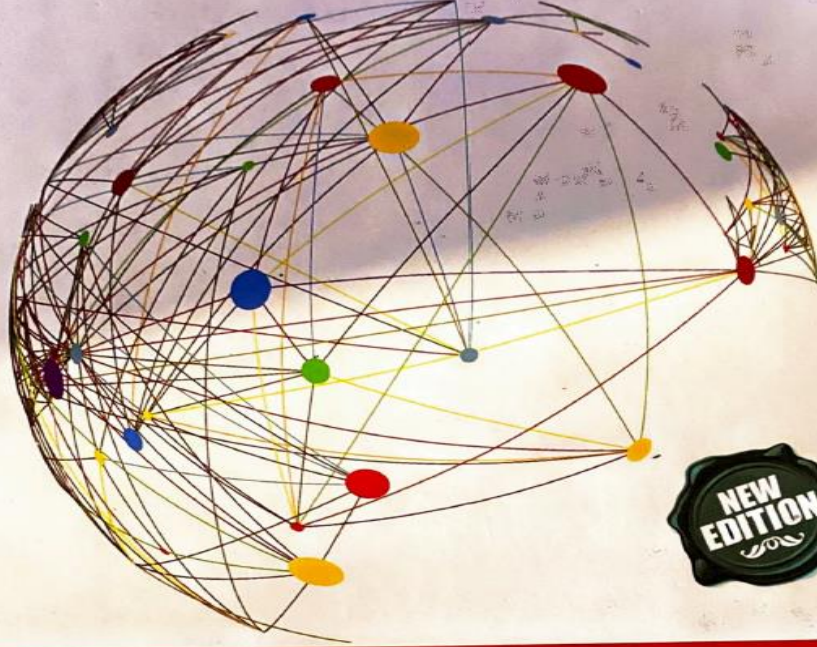
  
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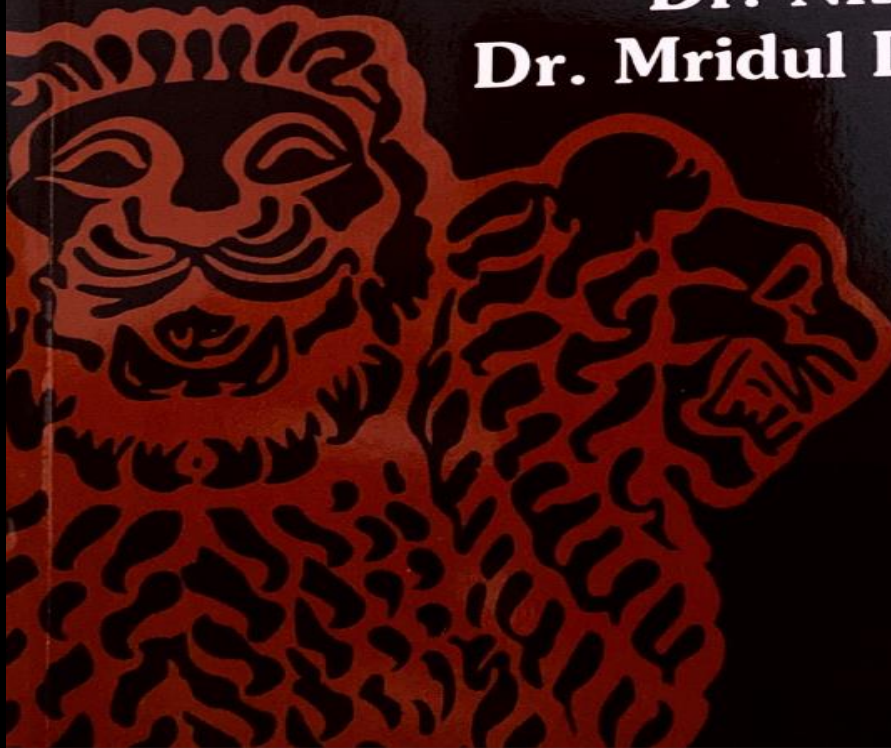
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# Political Theory

Concepts and Debates

**Paper III**  
**[For Second Semester]**

**Dr. Nita Pal**  
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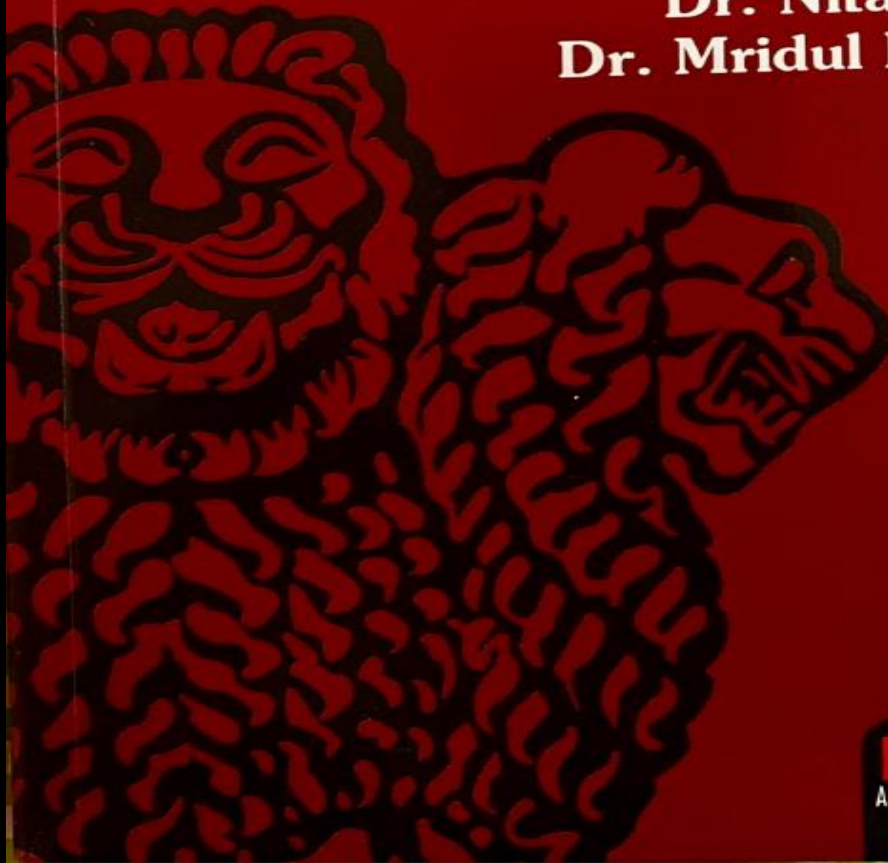
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# Political Process in India

[2.2 Paper-IV]  
Semester-II



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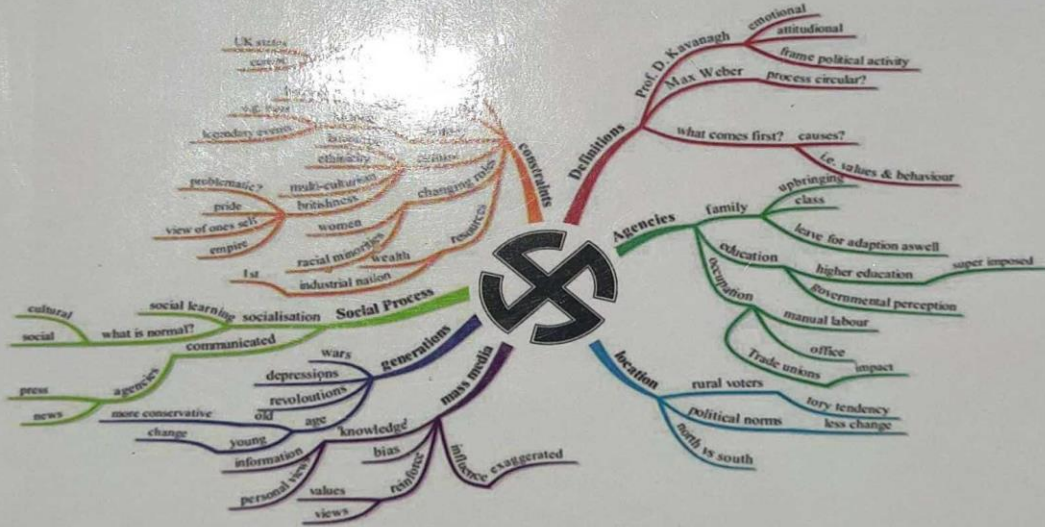
  
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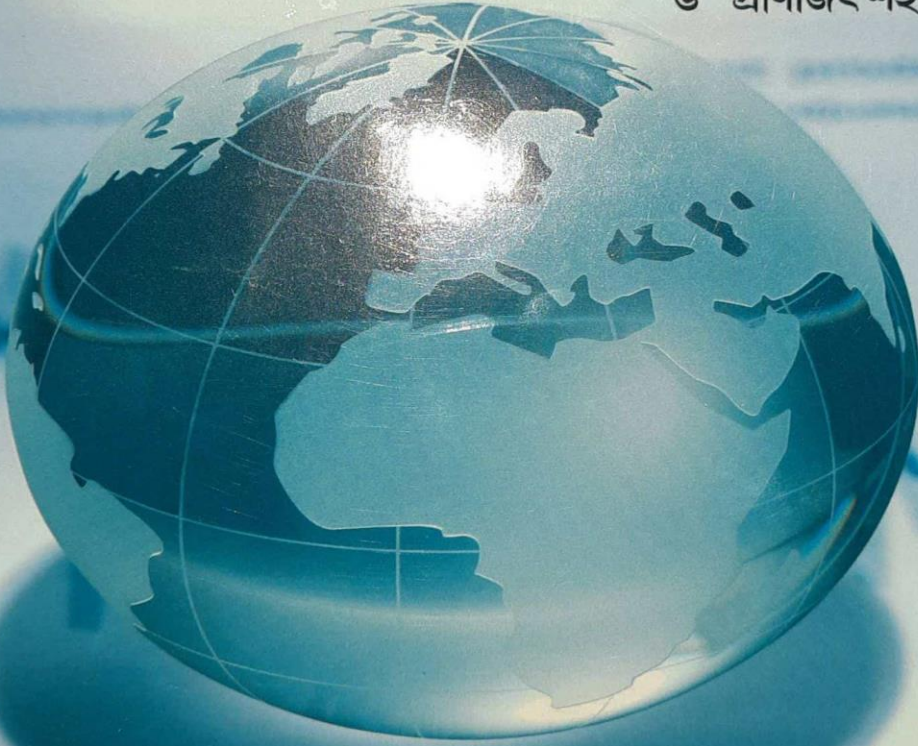
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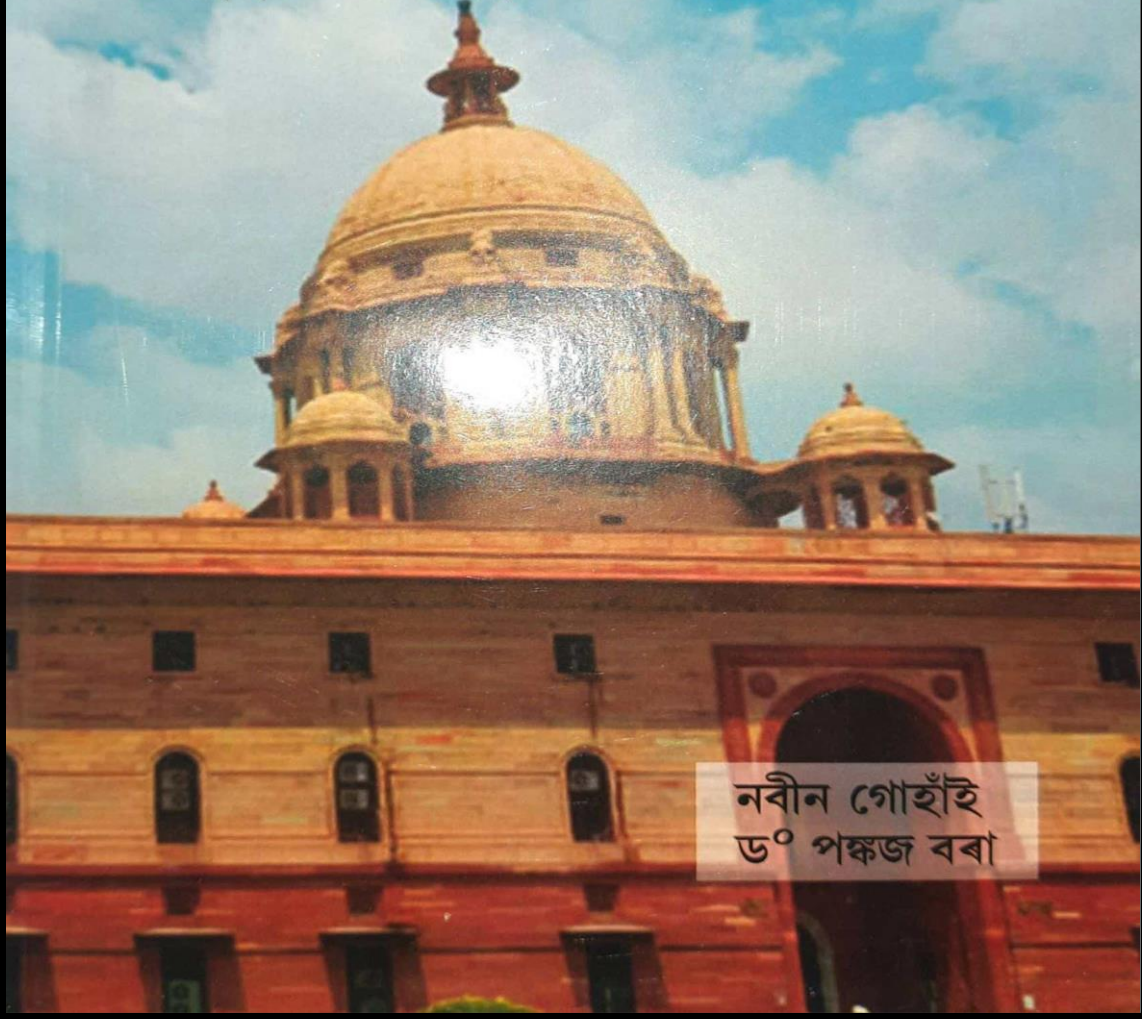
  
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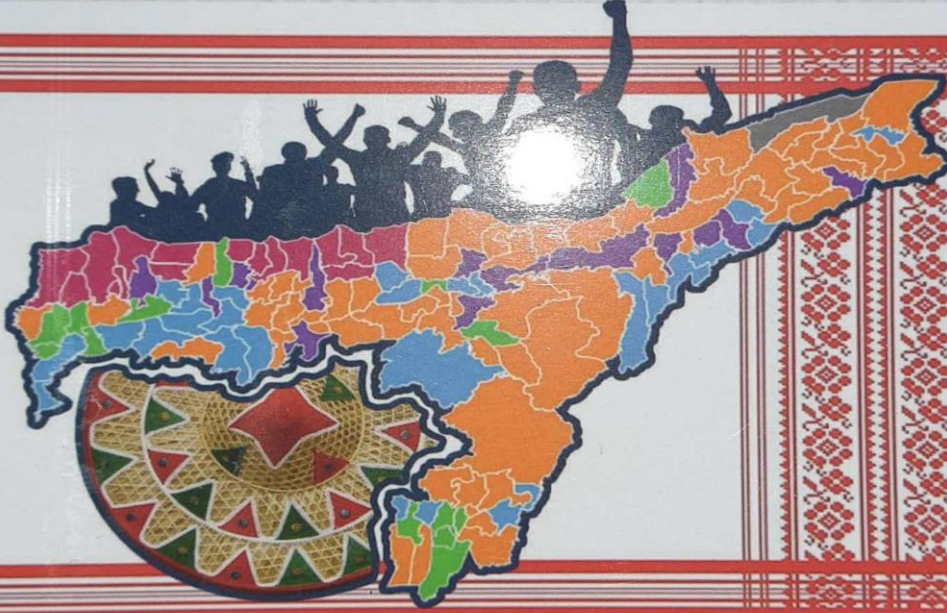


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Classical Political Philosophy



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*Revolutionizing Food Science*

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## CHAPTER 2

### PLANT MUTAGENESIS: PRINCIPLE AND APPLICATION IN CROP IMPROVEMENT

<sup>1,2</sup>AAMIR RAINA\*, <sup>3</sup>RAFTUL AMIN LASKAR,  
<sup>1</sup>SAIMA MALIK, <sup>4</sup>MOHAMMAD RAFIQ WANI,  
<sup>5</sup>TARIQ AHMAD BHAT AND <sup>1</sup>SAMIULLAH KHAN

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**Abstract:** A mutation is a sudden occurrence of a heritable alteration in the genomic makeup of an organism, which acts as an indispensable evolutionary force in nature. Induced mutagenesis plays a vital role in creating crop varieties with improved traits. Spontaneous mutation occurs due to replication errors, tautomeric shifts, exposure of an organism to certain radiations and chemicals, however, the frequency of these mutations is very low and hence insufficient to fulfil the demands of the present situation. This low frequency of spontaneous mutations necessitates the use of artificial mutagenic agents to enhance the frequency of mutations. A wide range of mutagenic agents has been employed for the development and release of mutant varieties. In the world, more than 3278 mutant varieties in 261 plant species have been developed, with improved traits such as yield, adaptability, disease resistance, quality and tolerance to abiotic stresses. Mutation breeding has played a key role in improving one or two traits without altering the entire genetic constitution of the crop

  
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## CHAPTER 6

### INDIVIDUAL AND SIMULTANEOUS TREATMENTS OF GAMMA RAYS AND ETHYL METHANE SULFONATE INDUCED GENETIC VARIABILITY FOR PLANT HEIGHT IN URDBEAN (*VIGNA MUNGO* (L.) HEPPER)

SONU GOYAL<sup>1</sup>, MOHAMMAD RAFIQ WANI<sup>2\*</sup>,  
RAFIUL AMIN LASKAR<sup>3</sup>, SAMIULLAH KHAN<sup>1</sup>  
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**Abstract:** Genetic variability is a pre-condition for every successful breeding program. The present study was designed to determine the extent of induced genetic variability for plant height in M<sub>2</sub> and M<sub>3</sub> generations of urdbean following mutagenesis with individual and combination treatments of gamma rays and EMS. Mean plant height diverted in a negative direction with most of the mutagenic treatments in both T-9 and Pant U-30 varieties. The genetic parameters were recorded to be higher in M<sub>2</sub> as compared to M<sub>3</sub> generations, indicating that prospective gain could be realized in an early generation.

**Keywords:** Mutagenesis, Gamma rays, EMS, Genetic variability, Plant height, Urdbean.

  
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## CHAPTER 8

### MUTATION BREEDING TECHNIQUE FOR THE IMPROVEMENT OF PULSE CROPS WITH SPECIAL REFERENCE TO FABA BEAN (*VICIA FABA* L.)

MOHAMMAD RAFIQ WANI<sup>1\*</sup>,  
NASYA TOMLEKOVA<sup>2</sup>, AAMIR RAINA<sup>3,4</sup>,  
RAFIUL AMIN LASKAR<sup>5</sup>,  
SHAHNAWAZ KHURSHEED<sup>3</sup>,  
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**Abstract:** Genetic variability is an essential prerequisite for crop improvement programs. Lack of required genetic variability limits the scope of selection for better genotypes in crop plants. Induced mutations

  
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## CHAPTER 9

### INDUCED CHROMOSOMAL ABERRATIONS IN GRAIN LEGUMES: *LENS CULINARIS* MEDIK.

RAFTUL AMIN LASKAR<sup>1\*</sup>, MOHAMMAD RAFIQ  
WANJ<sup>3</sup>,  
SAMIULLAH KHAN<sup>2</sup>, CHITTA RANJAN DEB<sup>4</sup>,  
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**Abstract:** Mutation is an evolutionary force that occurs at random in nature and creates a necessary contrast to the wild-type condition. Although mutations occur spontaneously in every organism the induced mutagenesis technique offers a way to accelerate the rate of mutations in desirable directions for controlled selection. Induced mutagenesis has been a powerful technique to generate desirable mutations in the trait(s) of interest for genetic improvement of economically important crops. Optimization of the mutagen doses/concentrations employed is a key prerequisite to achieve the maximum frequency of mutation with minimum hazards, as mutagenic potency and genotypic sensitivity are directly correlated, along with other treatment conditions such as temperature, pH, etc. In this context, cytological study (mitotic and

  
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## **Indian Economy: Exploring New Economic Opportunities in Post- Pandemic World**



**Editor**

**Dr. Reema Rabha**

Assistant Professor, Department of Economics,  
Bahona College, Jorhat, Assam.

**Kripa Drishti Publications, Pune.**

  
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## **8. A Study on the Impact of COVID 19 and Educational Challenges of School Aged Children Especially in the Rural Areas of Assam**

**Ilaxi Bora**

Asst. Prof. Dept. of Education  
Bahona College, Assam.

### **Abstract:**

Corona Virus Disease (COVID-19) is an infectious disease caused by a newly discovered corona virus. The outbreak of COVID-19 was first identified in Wuhan city of China in December 2019 and on 11<sup>th</sup> March 2020 it was declared as a pandemic by the World Health Organization. Due to the COVID, the worldwide education system has been severely affected, following the shutdown of schools and colleges/universities in order to prevent the spread of the virus.

Assam is one of the worst Covid-19 affected states in India. It is also the most Corona affected state among all northeastern states of India. The first Corona positive case was reported in Assam on 31<sup>st</sup> March 2020. Prior to that, Assam was totally free from Covid-19 pandemic (Barak Bulletin, 31<sup>st</sup> March, 2020).

After the end of March, the cases of Covid-19 started to grow rapidly in Assam. At present the situation of Assam is very critical and the people of each and every corner of the state are suffering from this pandemic.

The Community transmission has been started in all the districts of Assam which has created an atmosphere of panic among the people of Assam.

One of the most affected victims of the Covid19 pandemic is children who now have no access to schools. While a lot of children have the means for online classes, underprivileged children basically in the rural areas are still deprived of learning as they have few accesses to computers or smart phones. For lakhs of such children, education has come to a big restrain.

They can't afford smart phones, can't count on support of parents for home learning. It has been observed that because of the outbreak of COVID-19, the entire human society is facing lots of different challenges in their socio-political life. The education sector of most of the countries has been badly affected. Therefore, this study is an attempt to highlight the major impacts of the Covid-19 on education and educational challenges of children especially in the rural areas of Assam and suggest some remedial measures of the problem.

**Keywords:** Pandemic covid-19, Education, Rural Assam

  
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**Edited by**  
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## **The Status of Financial Inclusion in Assam: Evidence From Secondary Data**

**Dr. Reema Rabha**, Asst. Professor,  
Bahona College, Jorhat.  
Email: reemarabha@gmail.com

### **ABSTRACT**

Economic growth is harmonious and sustainable when it is inclusive in nature. By the beginning of the new millennium, concerns have been raised about the inclusiveness of the growth process. In this context, it is imperative to usher in an acceptable degree of financial inclusion, especially in rural areas so that the large mass of the population that are deprived of the basic banking facilities, can be brought within the ambit of the financial system. This would enhance rural investment, enterprise, and income, which ultimately will lead to higher growth for the state. Keeping in mind the urgent need of the term "financial inclusion", it has become a major agenda in government policy which aim to provide basic banking facilities to the rural people at an affordable cost. The objective of financial inclusion is to extend the scope of activities of the organised financial system to include the poor and excluded sections of people within its circle. In this context, the paper mainly focuses on the services provided by the banking sector, while explaining the status of financial inclusion in the state.

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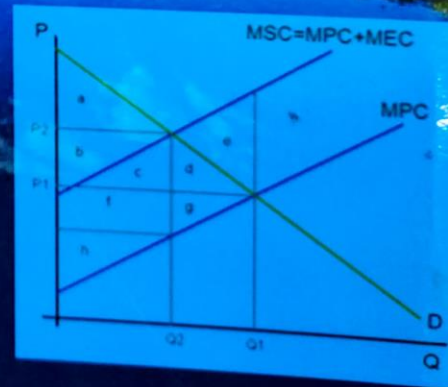


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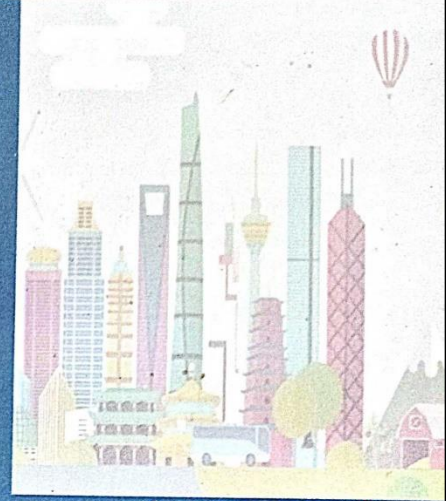
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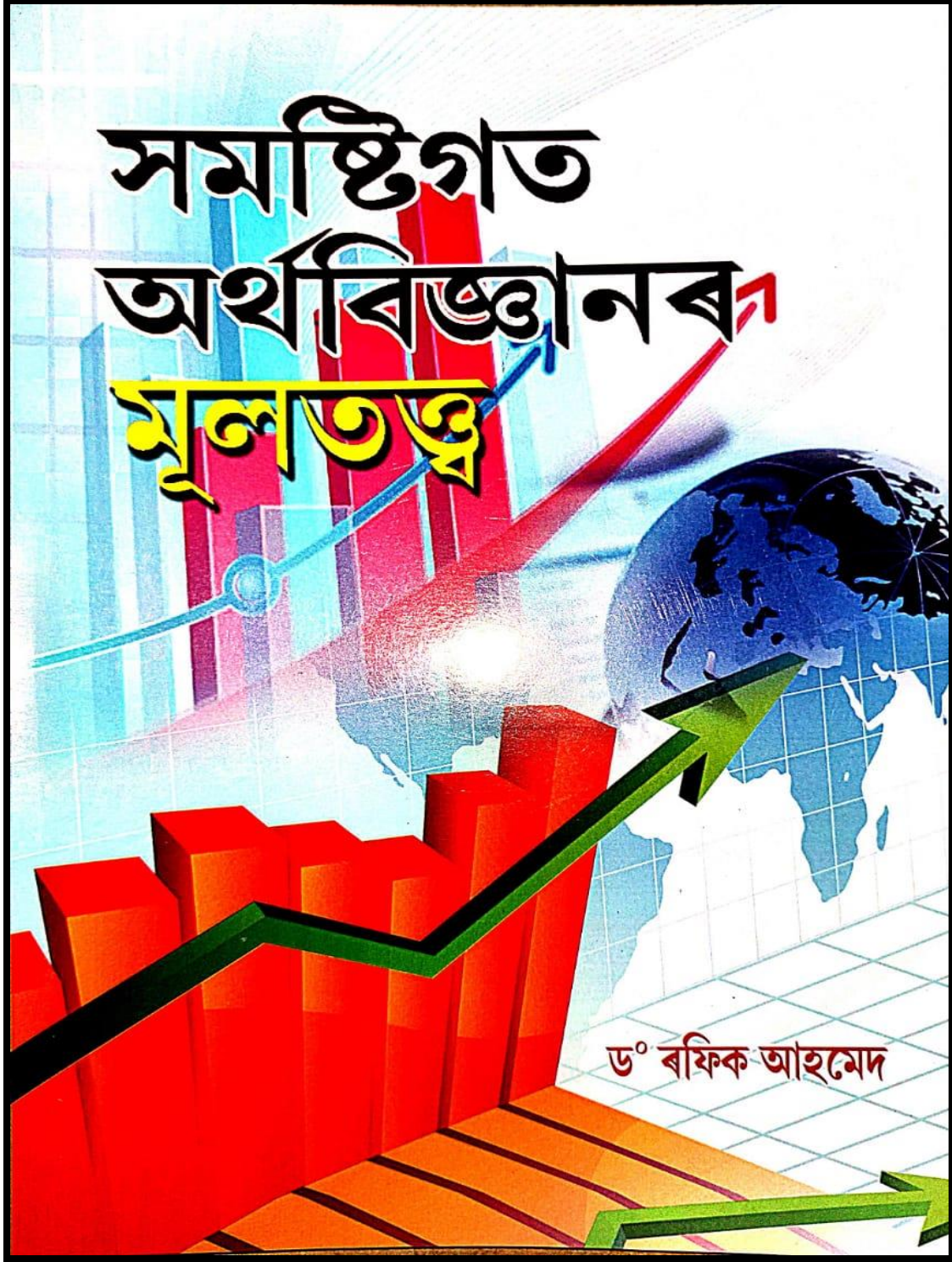


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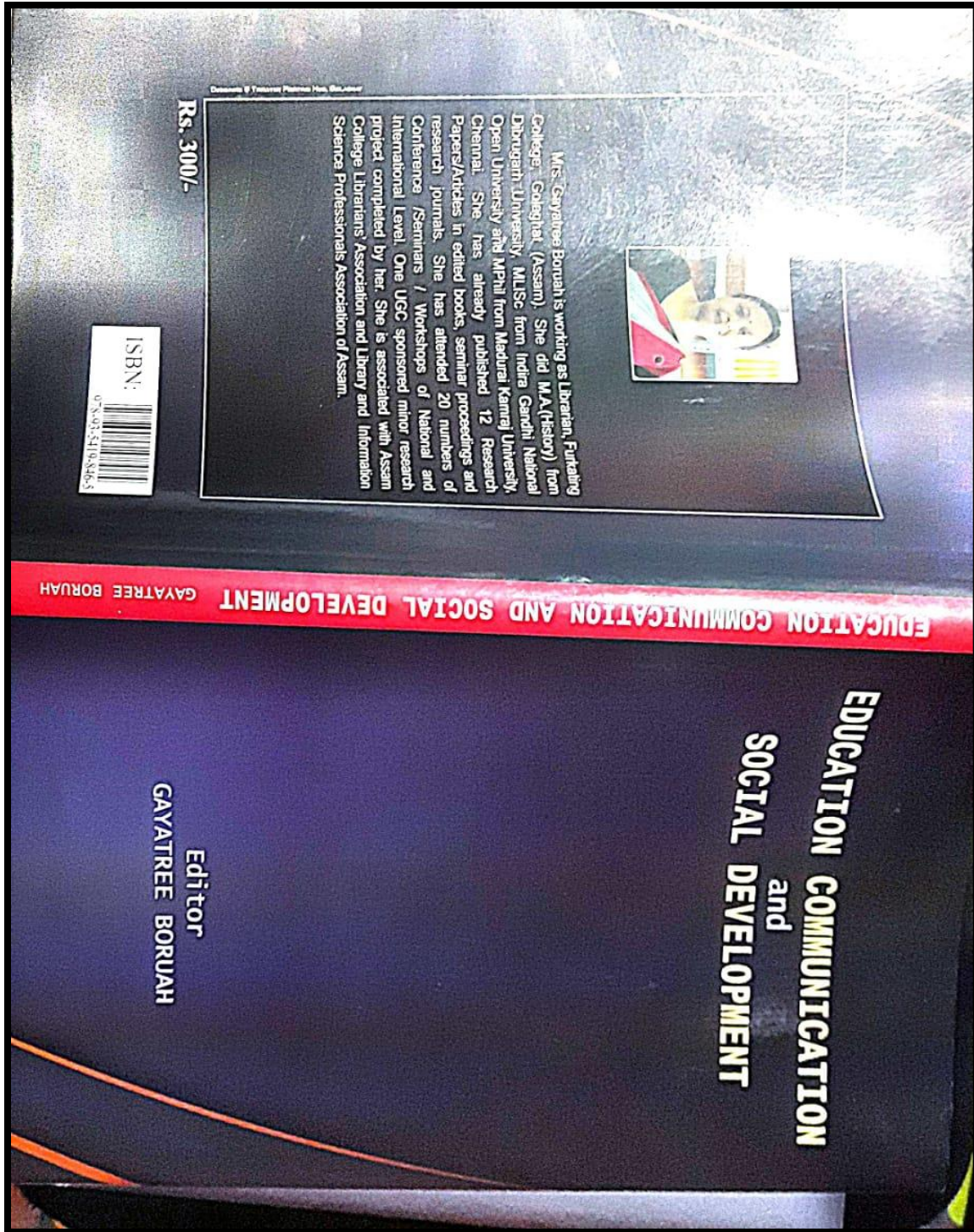
  
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**National education policy 2020 and  
Reform in higher education of India:  
A study**

**Ilaxi Bora**

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Lewis*

**INTRODUCTION:**

Education plays a significant role in the life of a nation. The character and quality of the people greatly depend on the education system of the society. Higher education plays an extremely important role in promoting human as well as societal well-being and in developing India as envisioned in its constitution - a democratic, socially- conscious, a cultured and humane nation upholding liberty, equality, fraternity, and justice for all. Higher education significantly contributes towards sustainable livelihoods and economic development of the nation. As India moves towards becoming a knowledge economy and society, more and more young Indians are likely to aspire for higher education. India has the largest higher education system in the world. It has more than 1000 universities and 33000 colleges with more than 20 million students. As per the latest 2011 Census, about 8.15 % of Indians are graduates.

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Impact of Covid-19 On Economy, Business,  
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## **2. Covid-19, Atma Nirbhar Bharat Abhiyan and the Role of Entrepreneurship and Startups with Special Reference to Women**

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### **Abstract:**

In any society, women are the backbone and always play a vital role. However, during this pandemic situation caused by COVID-19, women have become the silent sufferers. To fulfil the dream of Prime Minister Modiji's in making India atma nirbhar, each and every citizen of India should have the capacity to be self-reliant including women. For 'Atma nirhar Bharat', it is very important to take women along. It is therefore has become the utmost priority to work towards the sustainable livelihoods and economic empowerment of women especially in rural areas. This review article focuses on the various schemes under "Atma Nirbhar Bharat Abhiyan" and the role of society, culture, education and technology along with Entrepreneurship and Start Ups in making India self-reliant with special reference to women.

**Keywords:** Atma nirbhar Bharat, COVID-19, Self-reliant, Women.

### **2.1 Introduction:**

Prime Minister Narendra Modiji has announced a special economic and comprehensive package of Rs 20 lakh crores under "Atma Nirbhar Bharat Abhiyan" with a vision to make India self-reliant on its own power and resources in every aspect. It includes packages for various sections including cottage industry, MSMEs (Ministry of Micro, Small & Medium Enterprises), labourers, middle class, industries, etc. All these efforts were made though the beginning of these new ventures to reform India's self-reliance by promoting our local market products into the global market.

This mission includes various objectives like to modify the infrastructure of India into a more digital one which suits the current developments towards 'Digital India' making India more self-reliant towards digital revolution and the one that represents 'Modern India' among the world; strives for a technology driven India where everything will be based on high-technology starting from one to all, etc. However, achieving all these objectives under this 'Atma Nirbhar Bharat Abhiyan' does not seem to be easy. There are major barriers that has to be crossed in order to actually achieve the objective so as to make India an actual 'self-reliant Bharat'. Some of the challenges that are to be overcome could be discussed under the following heads.

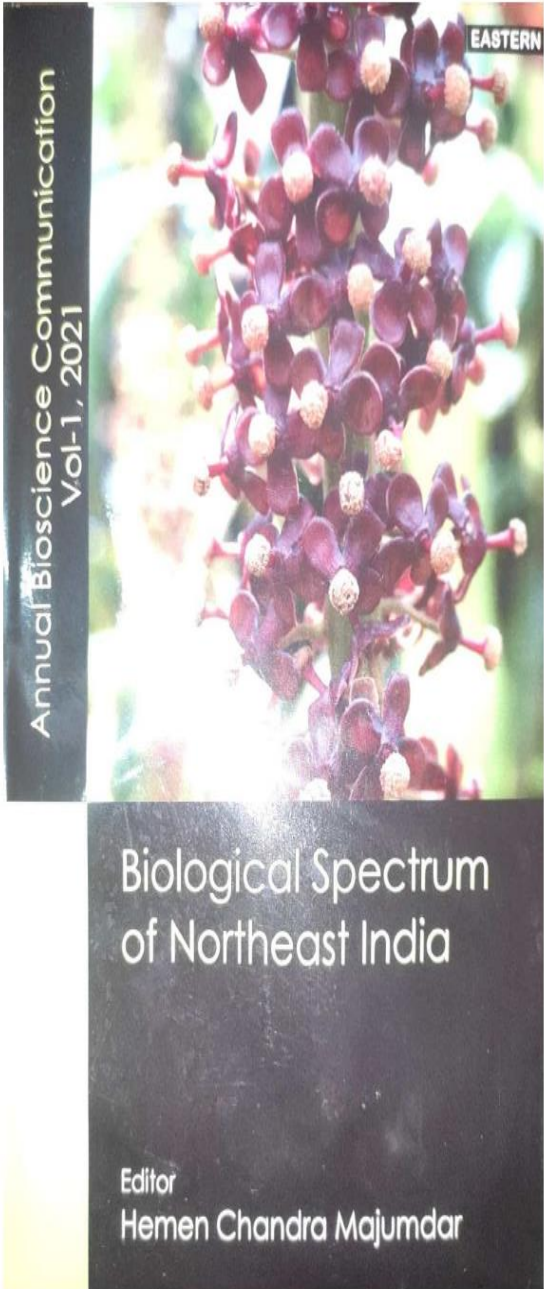
  
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Hemen Chandra Majumdar

Biological Spectrum of Northeast India (Annual Bioscience Communication)

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# ENVIRONMENT

in 21st Century

(Volume 1)



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## **7. Use of Nanotechnology in Remediation of Environmental Pollutants**

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Jorhat, Assam, India.

### **7.1 Introduction:**

Environmental pollution is one of the highly concerned global issues as affected the whole planet. Although numerous laws are made to control environmental pollution, but there is no improvement has been seen in recent years. The quality of air degraded day by day and it became toxic several part of the earth. Specifically air pollution causes severe illness, even snatch away the lives of people. Environmental pollution not only destroyed our environment but also cause serious health problems in humans. Heavy metals, particulate matter, pesticides, herbicides, fertilizers, oil spills, toxic gases, industrial effluents, sewage and organic compounds are some of the contaminants that polluted our environment. Intensive agriculture, industrialization and various land activities contaminate water, soil and air as well as with toxic pollutant. Waste discharge from pulp, dyeing, petrochemical and textile industries and the partial degradation of phenoxy contaminants in various remediation processes produce phenolic components. These may have deleterious consequences on the health and well-being of plant and animal biota. So there is an urgent need to control environmental pollution to restore the health of the environment. During recent years various technologies have been used to eliminate pollutants from the environment. New technologies are constantly explored for the remediation of the air, water and soil contaminants. Salvaging basic resources, along with remediating toxic pollutants and contaminants, by adopting latest technologies is a challenging priority. So nanotechnology is emerging to provide a state of art solution to these problems.

Nanotechnology involves the creation and manipulation of materials at the nanometer scale, either by scaling up from single groups of atoms or by refining or reducing bulk materials. This technology has gained a lot of attention in the past decades due to the unique physical properties of nanoscale materials or nanoparticles. Nanoparticles are wide the class of materials that include particulate substances, which have one dimension less than 100 nm at least. Nanoparticles possess unique physical and chemical properties due to their high surface area and nanoscale size. Their size, shape and structure determine their reactivity, toughness and other properties. Due to these properties nanoparticles can be used in various domestic and commercial applications that include catalysis, imaging, and medical application as well as environmental applications. It was found that nanomaterials have enhanced reactivity and better effectiveness than their bulkier counterparts.

Various types of materials can be employed in environmental remediation. Since environmental pollutants are the mixture of different compounds of high volatility, and low reactivity, it is challenging to the capture and degrades these pollutants.

  
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## **9. Covid-19: It's Positive and Negative Impacts on the Environment**

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Assistant Professor,  
Department of Zoology,  
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### **9.1 Introduction:**

The world has changed in the last few months due to the rare disaster known as COVID-19 pandemic. This is an ongoing global pandemic of corona virus disease 2019 (COVID-19), caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The virus was first identified in December 2019 in Wuhan, China. The World Health Organization declared a Public Health Emergency of International Concern regarding COVID-19 on 30 January 2020, and later declared a pandemic on 11 March 2020. So far, COVID-19 has caused the deaths of more than 3 million people worldwide. As of 13 June 2021, more than 175 million cases have been confirmed, with more than 3.79 million confirmed deaths attributed to COVID-19, making it one of the deadliest pandemics in the history.

COVID-19 is affecting people's health in different ways. Most infected people develop mild to moderate illness and recover without hospitalization. Most common symptoms of this disease include fever, dry cough and tiredness. Among less common symptoms include aches and pains, sore throat, diarrhea, conjunctivitis, headache, loss of taste or smell, a rash on skin or discoloration of fingers or toes. Severe cases can lead to cardiac injury, respiratory failure, acute respiratory distress syndrome and even death.

The pandemic has resulted in significant global, social and economic disruption. It has led to widespread supply shortages exacerbated by panic buying, agricultural disruption and food shortages. However, there have also been decreased emissions of pollutants and greenhouse gases. Numerous educational institutions and public areas have been partially or fully closed and many events have been cancelled or postponed. Misinformation has circulated through social media and mass media, and political tensions have been exacerbated. The pandemic has raised issues of racial and geographic discrimination, health equity and the balance between public health imperatives and individual rights.

India is one of the most affected countries from corona virus pandemic in all sectors. Healthcare is the epicenter during this unprecedented global pandemic. In the first quarter of the fiscal year 2021, India's Gross Domestic Product collapsed by 23.9% amid the corona virus lockdown. The pandemic has led to an unprecedented shutdown of business, industries and services. This has wreaked havoc on the job landscape in India. According to the Centre for Monitoring Indian Economy (CMIE) about 21 million salaries employees lost their jobs during April-August. According to an analysis by Scroll, during the first two months of the lockdown, India's vulnerable section lost incomes amounting to as much as Rs 4 lakh crores, or nearly 2% of the country's annual GDP.



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**1. COVID 19 Outbreak: Emerging Views on  
Observed and Potential Impacts on Environment**

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**1.1 Introduction:**

Globally, one of the serious issue is the change in the environment and its deleterious effects on us. A French word “environner” which means “surround” is the root word from where the word “environment” originated. In ecological terms, it includes everything that surrounds us. All the biotic and abiotic factors and their interconnection and interdependence which also includes us constitutes our surroundings. Thus, environment is the totality of all the external conditions affecting the life, development and survival of an organism (UN, 1997). In past few decades the constant deterioration of the environment at an alarming rate has been the matter of concern worldwide.

This deterioration due to many natural and anthropogenic factors and the long term ecological effects have contributed to various acute and chronic ill effects. Also, all significant events have some impacts on the environment. Presently the most talked about issue globally is the outbreak caused by the pandemic COVID 19. This pandemic has significantly altered many customary ways in which different things and machinery work in the world drastically in a very short span of time. Many human activities and movements have been limited. Therefore, a proper understanding and estimation of the impact on environment in light of the COVID 19 outbreak becomes significant. COVID-19 is an acute respiratory disease caused by Corona virus Sars-Cov-2 (World Health Organization, 2020a). Since WHO declared COVID-19 as pandemic disease (World Health Organization, 2020b), many countries worldwide have responded seriously to this pandemic.

  
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**About the Book:**

Human activities are deteriorating the environment to a great extent. Water and all other valuable resources are depleting day by day which is a great threat for the entire world. Time has come to aware people about those problems related to our environment and also to let them know about the various pros and cons. To sustain the global health, we need to work together; we need to live in harmony with nature so that we can leave the earth as it is for our future generations. Therefore, the objective of this book was to enumerate the various present day problems caused by our environment and also how to mitigate with those issues on the basis of the knowledge and research done by the learned academicians across the globe. We sincerely believe that this book will be of great value and a research guide for all of us especially to the environmentalists. I hereby offer my sincere thanks to all the learned academicians, researchers across the country who contributed to this book and enriched it with their valuable inputs.

**POLLUTION AND ENVIRONMENT**



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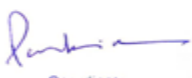


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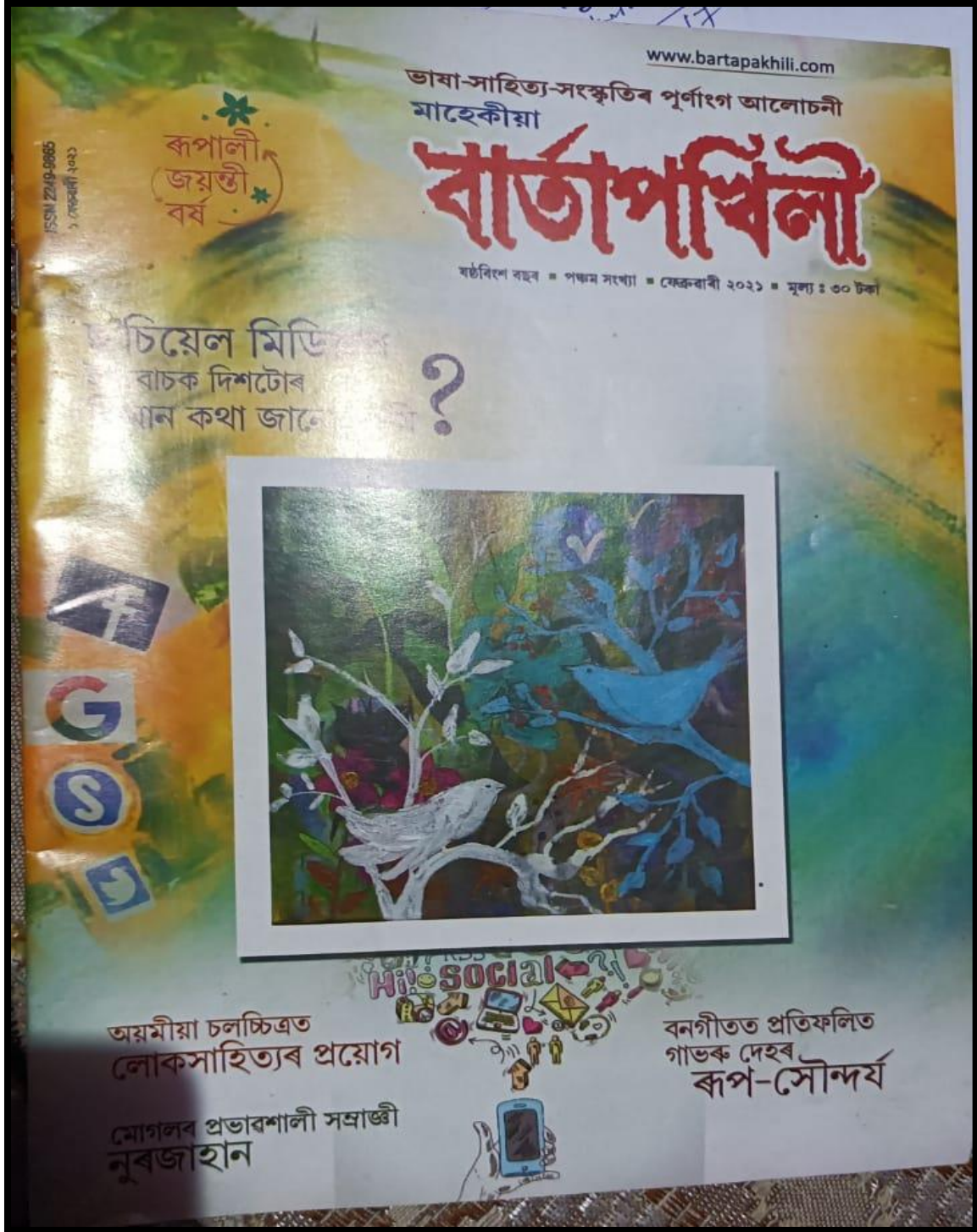
  
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- ▶ ওক-শিখাৰ মিলন প্ৰতিখন শিক্ষানুষ্ঠানতেই  
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#### কবিতা

শান্তনু পাতৰ, ইপুল হুছেইন, কিশোৰ কুমাৰ দাস, এলিজা বাণী দাস, ৰবিমা দাস, অনুপম হাতীমুৰীয়া, অৰুণ গগৈ, চয়নিকা চেতিয়া, অংকিতা ভবধাজ, ড° তিত্তবৰুৱা দাস, আবমান কাশ্যপ, দীপাঞ্জলি কাকতি হাজৰিকা, ড° ভাস্কৰজ্যোতি গগৈ, প্ৰদীপ দাস ঠাকুৰ, জ্যোতীশ চন্দ্ৰ গোস্বামী, কিৰণ বৰা, অমৰজ্যোতি বৰুৱা, নৰজ্যোতি শইকীয়া, তীৰ্থনাথ বৰুৱা, জয়জ্যোতি শইকীয়া, নিলীমা ডেকা কলিতা, প্ৰবৰ কুমাৰ গগৈ, পৰমাকাণ্ঠ দাস, কন্দৰ্প কুমাৰ কলিতা, ৰুণ শৰ্মা, ভূমিধৰ কৌৰৱ, প্ৰাণপ্ৰতিমা বৰা দাস, ড° ৰঘুনাথ কাগপুথ, জয়ন্ত দাস, লক্ষীপ্ৰসাদ বেগম, পিন্ধু ৰাজবংশী, ৰাখেল চৌধুৰী

উপদেষ্টা : নিৰুপমা বৰগোহাঁই, ড° অমৰজ্যোতি চৌধুৰী, কুল শইকীয়া, মৃণালিনী দেৱী, ববেন্দ্ৰ কুমাৰ দাস, ড° মুকুল চক্ৰৱৰ্তী, দেৱজিৎ হাজৰিকা, ধানেশ্বৰ মালাকৰ, ধনীৰাম তালুকদাৰ, লেখো বড়ো

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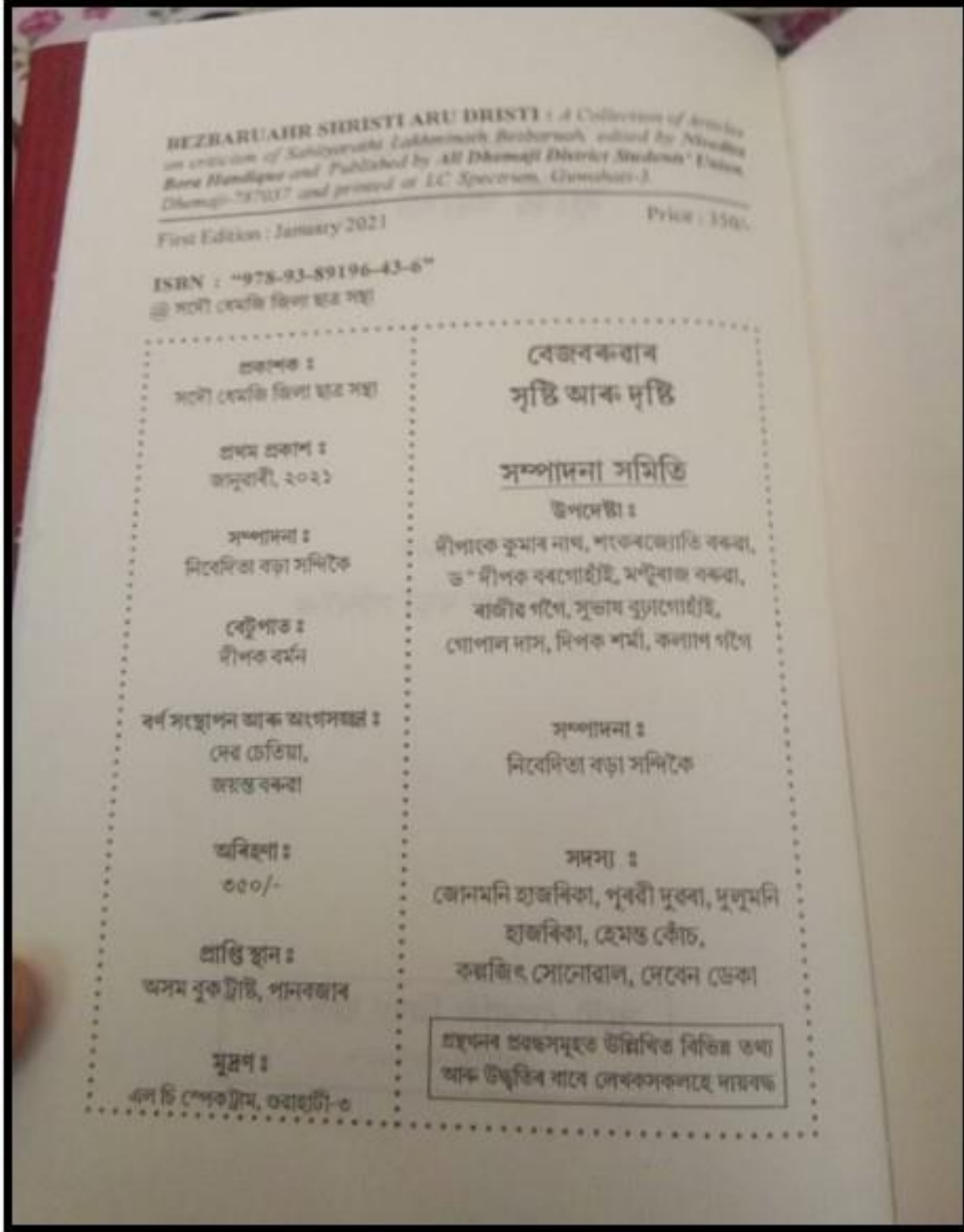
  
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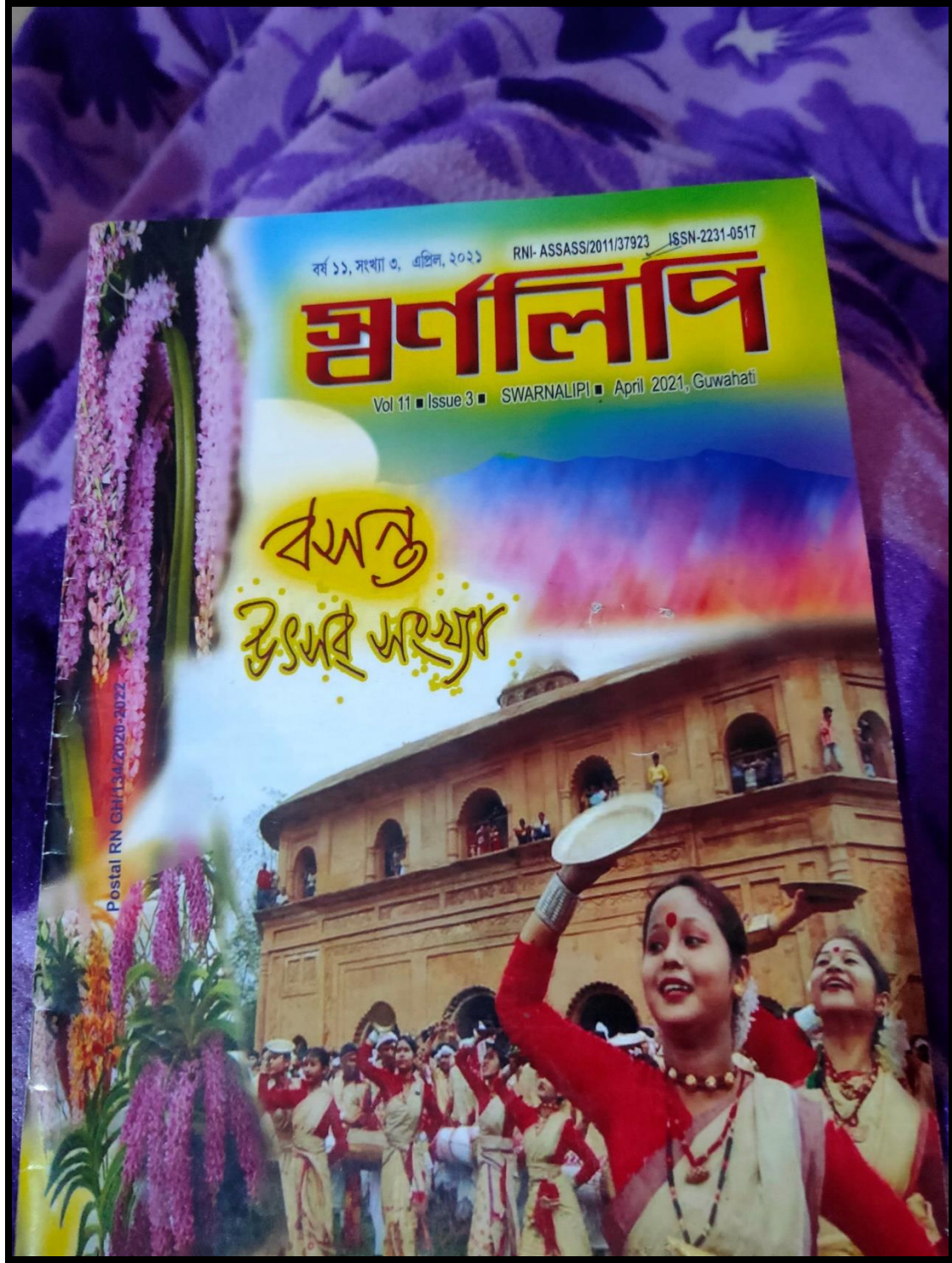
  
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জোনমণি দাস, প্ৰণৱ কুমাৰ বৰ্মন, শৰৎ হাজৰিকা,  
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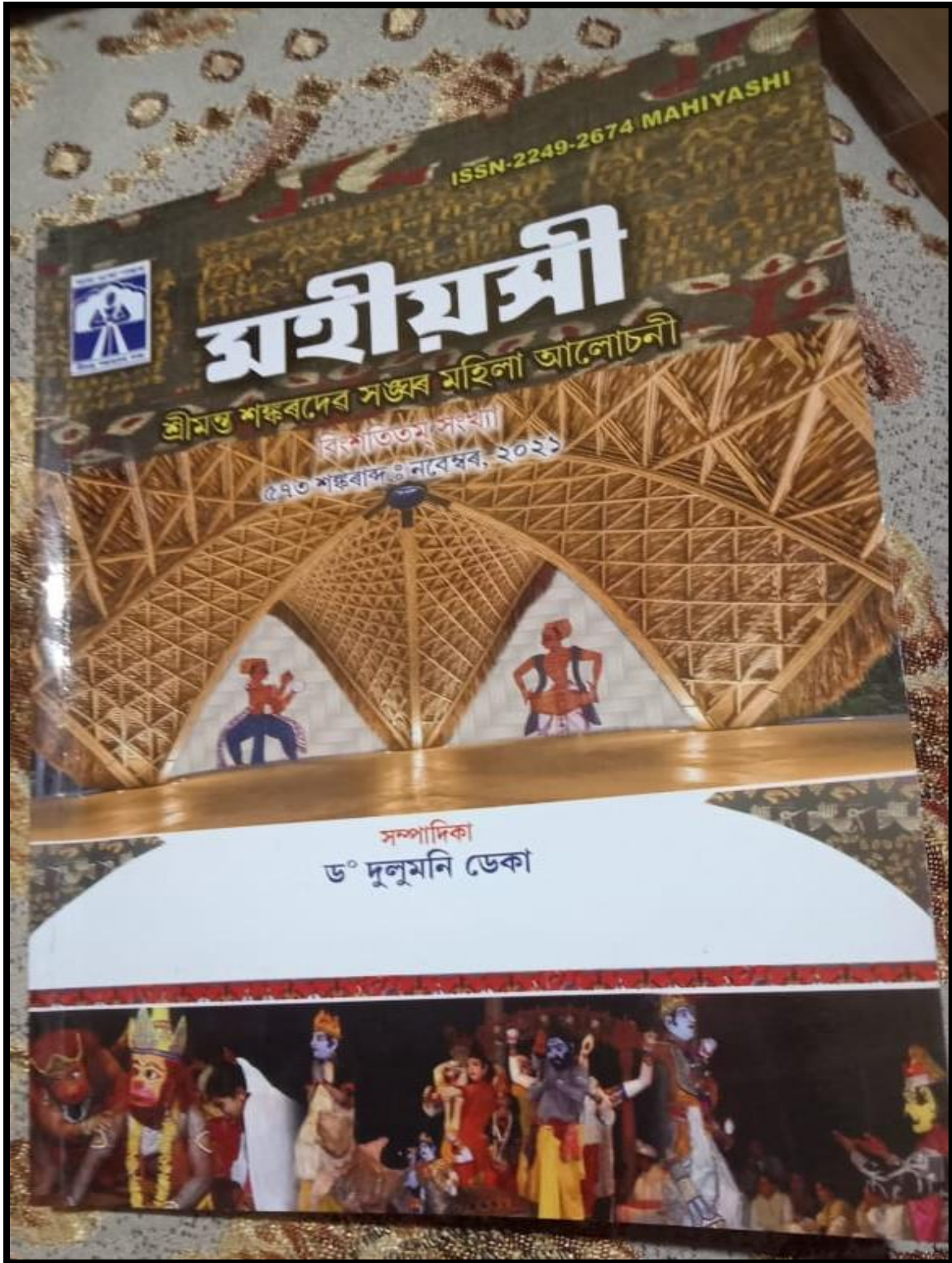
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**PHYSICS: GENERIC ELECTIVE AND  
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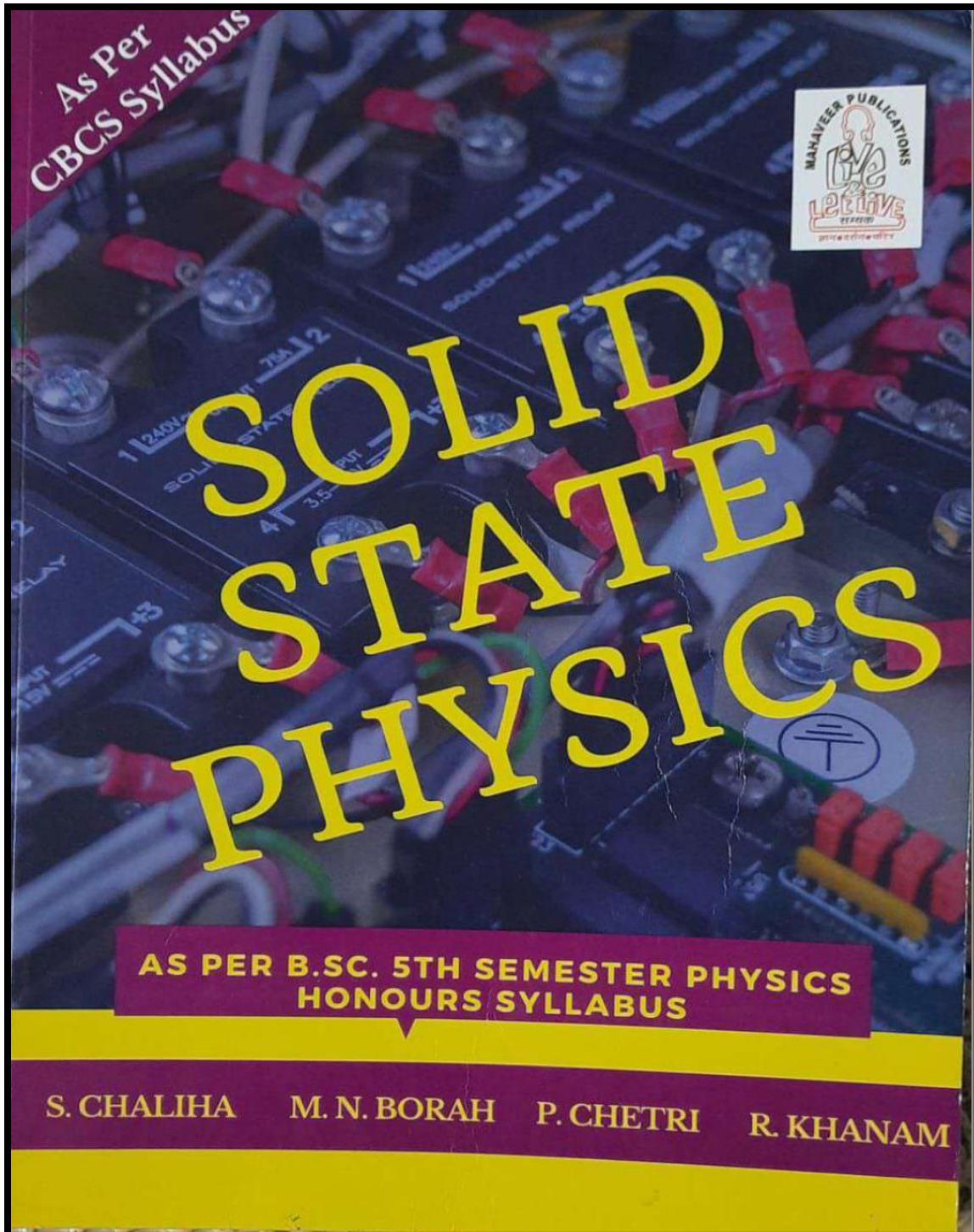
  
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