

# Sammilani Mahavidyalaya



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## CRITERION - III RESEARCH, INNOVATIONS AND EXTENSION

**QnM: 3.3.2** - Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five years.

Sl. No.	Title of the Book/Chapters/Conference	Title of the paper	Documents Attached
<b>2018-19</b>			
1	Maulana Abul Kalam Azad an Inspiration for our Country.	Banerjee. M & Chakrabarti M (2018). Relevance of Maulana Abul Kalam Azad in Present Era. (pp 1-6)	1)Tile Page 2) Content page
2	Probahoman bangle charcha	MrinalHalder (2018)Tevagardutiuponnyasokichukotha(Page231)	1) Title Page 2)Content Page 3) First Page of The Paper
3	8th International Symposium on Embedded Computing and System Design (ISED) (pp. 80-84). IEEE.	Choudhury, A., Mondal, B., & Sikdar, B. K. (2018, December). ReMiT: Redundancy migration for latency aware fault tolerant cache design in multicore.(pp. 80-84). IEEE.	1) First Page of Conference article
4	Women in Ancient India: Myriad Voices, Edited by Mau Dasgupta	Bhattacharya, P S (2018). Glimpses of ethical values as introspected in the Sekasubhodayā..(pp. 261-270)	1) Tile Page 2)Back Title Page 3) Content Page 4) First Page of The Paper
5	Biochemical and Biophysical Roles of Cell Surface Molecules. Series Title- Advance in Experimental Medicine Biology 1112:	Chowdhury S, Bhattacharya K, Mandal C, Mondal S, Sarkar S, Chandra S, Banerjee S, Mandal C. (2018) A Glycomic Approach Towards Identification of Signature Molecules in CD34+ Haematopoietic Stem Cells from Umbilical Cord Blood.pp-309-318	1) Bibliographic Information Page 2) First Page of The Paper
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10	IEEE 28th Asian Test Symposium (ATS) (pp. 79). IEEE.	Choudhury, A., Mondal, B., & Sikdar, B. K. (2019, December). Latency Aware Fault Tolerant Cache in Multicore Using Dynamic Remapping Clusters.(pp. 79)	1) First Page of Conference article
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12	Prabahahman Bangla Charcha, Vol:3	Kasturi Kar(2019) Rabindranath o Bishnupur Gharana	1) Tile Page 2) First Page of The Paper
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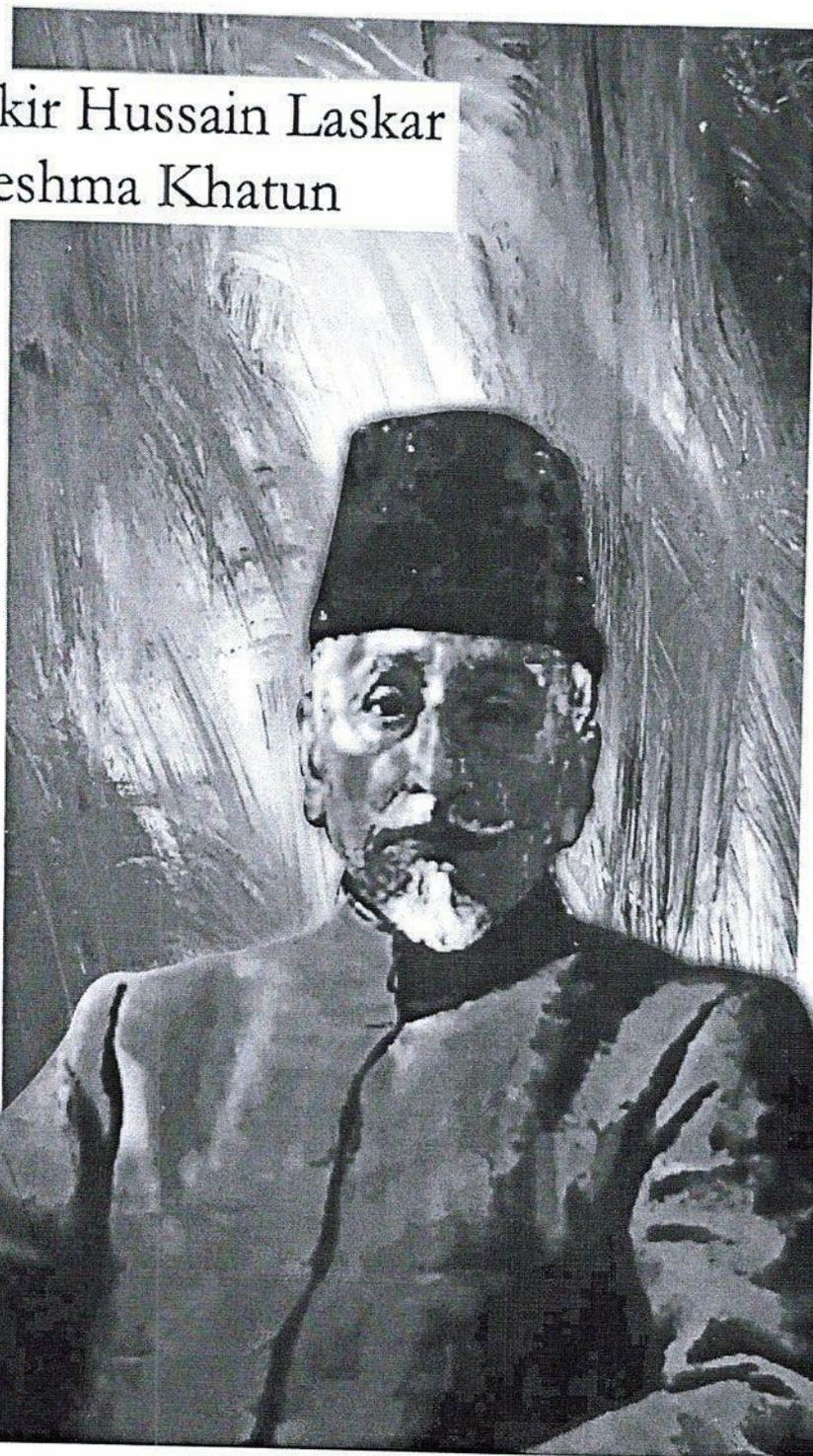
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# Relevance of Maulana Abul Kalam Azad in The Present Era

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# ReMiT: Redundancy Migration for Latency Aware Fault Tolerant Cache Design in Multicore

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**Abstract**—Power dissipation in Chip Multiprocessors (CMPs) has been addressed by Dynamic Voltage and Frequency Scaling (DVFS). But uncontrolled reduction of voltage supply results in failure of cache cells due to either external particle intervention as soft errors or wearout effects as permanent errors. Several fault protection strategies for CMP cache have been proposed in this regard. But, these techniques fail to ensure complete fault protection with minimum latency. On this outset, this work proposes a redundancy migration strategy that not only ensures complete fault protection without using any auxiliary storage but also incurs minimum latency. Complete fault protection is achieved by remapping to non-conflicting faulty as well as potential non-reusable healthy blocks. Latency is minimized by migrating the redundant blocks towards their home tiles as the healthy blocks nearer to the home tiles gradually become non-reusable. Reusability is calculated by analysing the reuse distance distribution of the cache blocks. Through cycle accurate simulation in Multi2Sim 5.0 simulation framework for CPU-GPU heterogeneous computing, the proposed work claims up to 36.23% improvement in hit ratio and 51.04% improvement in L2 latency compared to the existing techniques.

**Keywords**—Multicore, Cache, Fault Tolerance, Latency, CMPs

## I. INTRODUCTION

Chip Multiprocessors (CMPs) were introduced to deliver high processing power. But due to this massive density and high parallelism, power consumption raised exponentially [1] in CMPs. This became a real problem in the battery operated devices. To resolve this, Dynamic Voltage and Frequency Scaling (DVFS) has been broadly used. But unfortunately, uncontrolled voltage scaling results in cell failure in SRAM [2]. Also due to the faulty fabrication, these multicore chips became vulnerable to either transient or intermittent errors, due to external particle induced noises, or permanent errors due to wearout failures for aging. Cache, holding the most significant chip area, becomes susceptible to failure and restricts the threshold voltage supplied to the system [3]. Thus fault tolerance mechanisms, to ensure error free execution is extremely important as voltage scaling is indispensable.

Several fault resilient strategies have been proposed in the literature. A complete in-place fault remapping technique has

also been reported [16]. However, none of these techniques have considered the latency overhead due to fault remapping in remote cores. To ensure complete fault protection, faulty blocks must be remapped to remote cache banks. And as many blocks remapped to remote cache banks, their access latency from the requesting core increases, affecting the overall latency and performance of the system. Thus, if the degree of fault protection is increased, the latency is also increased due to remapping of large number of faulty blocks to remote banks. And if the degree of fault protection is lowered, latency is scaled down due to lesser number of faults remapped to remote banks. A simple optimization technique can be applied to balance the degree of fault protection and latency overhead for an optimum system performance. But in that case, the completeness of fault protection is harmed and the performance is bottlenecked at a local maxima. To overcome this issue, a technique is required that gives complete fault protection with minimum latency globally. This is what the proposed work concentrates in.

The main contributions of this work are: 1) Identification of the potential non-reusable blocks using the reusability prediction dynamically at run time by analysing their reuse distance distribution in regular intervals [14], 2) Remapping of the faulty blocks to the non-conflicting faulty blocks first and then in potential non-reusable blocks if no non-conflicting blocks are found, 3) Migrating the remapped blocks towards their home tiles, after certain intervals, on some new healthy blocks that become non-reusable in time.

Simulation of the proposed fault protection strategy and the existing ones is done on an Hexacore CMP architecture results in upto 36.23% improvement in hit ratio and upto 51.04% decrease in latency of the last level cache in ReMiT over existing fault tolerance strategies. The simulation is done in Multi2Sim 5.0 framework for CPU-GPU heterogeneous computing with plethora of fault maps. For evaluation, programs from the SPLASH-2 and PARSEC 3.0 benchmark suites have been considered.

## II. RELATED WORK

Different fault tolerance techniques have been proposed at different levels. Fault resilient approaches for the traditional 6T (6 transistors) SRAM cell as well as 8T, 10T, 11T [4]

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cells and the 10T SRAM cell based on Schmidt trigger are proposed at the circuit level. System level approaches include the Error Correcting Codes (ECC) [5]. Though, for large number of faults, multiple bit ECC are required incurring complex decoders with huge decoding and storage overhead.

There are also disability based fault tolerance techniques that disables the faulty cache parts (ways, sets, blocks or sub-blocks) are studied in [6, 7, 8]. But with increasing faulty cache parts, it incurs additional misses. The Redundancy based techniques reduce the number of misses by keeping redundant copies of the cache blocks or sub-blocks. Redundant strategies work by using redundant blocks in the cache [9], or a small fully associative spare cache [10] or by using a victim cache [11].

Another technique i.e. worth mentioning is REMEDIATE [12] which is a scalable fault resilient policy uses non-conflicting faulty blocks to hold data of faulty blocks and forms correct data if merged together. But, it fails to give complete protection as at most half of the faulty cache blocks can be used as targets in the best case.

Another fault resilient replacement strategy is proposed [13] based on a spatial footprint prediction mechanism but for only 2-way associative faulty caches. Another fault tolerant (re)mapping strategy is worth mentioning i.e. CIFR [16] that ensures a complete in-place fault remapping strategy.

### III. THE REMIT

The goal of proposed fault tolerance technique is the remapping of faulty cache blocks in such a way that the complete fault resiliency can be achieved with minimum latency. To lower the remapping overhead, the potential reusable faulty blocks are identified by analysing their reuse distance distribution. Only the potential reusable faulty blocks are probed to be remapped to either non-conflicting faulty blocks or non-reusable healthy blocks for ensuring complete fault protection. For latency minimization, redundant blocks are migrated towards their home tiles on some non-reusable healthy blocks as the reusable blocks close to their home tiles become non-reusable with time.

#### A. Fault detection

Both the hard and soft faults are identified in this work. Permanent faults are detected using BIST at boot time and fault map is generated accordingly. For soft error detection, ECC is used. Periodic checking of ECC is done to detect errors and to perform the remapping as well as update the access map accordingly.

#### B. Fault protection

Once the faults are detected, the following steps are followed to ensure fault protection to the potential reusable faulty blocks.

1) *Potential Dead Block detection*: The potential dead blocks are identified by analysing the reuse distance distribution of the cache blocks. For selection of the reusable faulty blocks, for protecting and non-reusable healthy blocks

as redundancies, reusabilities of both the faulty as well as healthy blocks are analysed.

The reusability is measured according to the study reported in [14] which estimates the future behavior by observing the reuse distance of the cache blocks. The number of accesses to a cache set between two accesses to the same cache line is called the Reuse Distance (RD). The distribution of these reuse distances, called the Reuse Distance Distribution (RDD), is observed i.e. an unique signature of any program for a specific cache configuration. The RDD is analysed to select a reuse distance that increases hit ratio of the cache with minimal cache pollution. This RD is called Protecting Distance (PD).

The reuse distance that covers most of the cache lines in terms of their reuse is called the protecting distance (PD). It is a single value used for all blocks but kept individually for all blocks. A block is protected for PD accesses.

2) *Fault Remapping*: Once the reuse distances of all the blocks are analysed and potential reusable faulty as well as non-reusable healthy blocks are identified, the following steps are followed for fault remapping.

a) *Map in same set on non-conflicting faulty blocks*: Faulty blocks that are detected as live are tried to be replicated to non-reusable faulty blocks in same set. Two blocks not containing faults in same positions are called non-conflicting. Data is remapped on both of them and they together form the correct data. On successful remapping, both the target bit of the target line and mapped bit of the faulty line are set. For a block, if the remapped bit is not set and the target bit of the target block is not set, then only the block is remapped.

b) *Map in different set of distant tile on non-conflicting faulty blocks*: Faulty blocks that are reusable are remapped to non-conflicting faulty blocks of different set in different bank if they could not be remapped in previous steps. Data recovery and bit modifications are same as (a).

c) *Map in same set on healthy blocks that are non-reusable*: Blocks that are faulty and not remapped in previous steps are remapped to non-reusable healthy blocks in the same set. An upper limit on the number of healthy remapped blocks is maintained to reserve sufficient space per set to keep data for normal execution. A block is only remapped when its remapped bit is not set. The faulty block can be remapped even if its target bit is set as the healthy block can itself deliver the correct data. For successful remapping, the mapped bit of the faulty block is set along with the target bit of the healthy line is set.

d) *Map in different set at distant tile on healthy blocks that are non-reusable*: Faulty blocks which are not remapped using any of the above steps are tried for remapping to blocks that are healthy and in different set of different bank. Constraint on threshold and bit modifications are same as (c).

#### C. Fault migration

The execution starts with the faulty blocks mapped on the faulty blocks that are not conflicting with each other. After the protecting distance, the faulty blocks that are yet to be mapped to the faulty blocks not conflicting with each other,

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# Women in Ancient India : Myriad Voices

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Published by :  
Sri Debasish Bhattacharya  
SANSKRIT PUSTAK BHANDAR  
38, Bidhan Sarani, Kolkata-700 006

First Published : 2018

Price : Rs. 400.00

ISBN : 978-93-87800-33-5

*Laser Print :*  
Binapani Laser Print  
Kolkata-700 114

*Cover artist :*  
Nabin Saha

*Printed by :*  
Orient Press  
Kolkata 700 006

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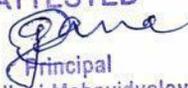
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India in 1990. He was elected to the prestigious Johns Hopkins Honor Society in 1995. He has been an elected fellow of the American Association for the Advancement of Sciences (FAAAS) since 1988. He received the "NRI-2015 Award" Trophy in the International Professional category from the respected *India Times* newspaper in April 2015.

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<b>Book Title</b>	<b>Editors</b>	<b>Series Title</b>
Biochemical and Biophysical Roles of Cell Surface Molecules	Kausik Chattopadhyay, Subhash C. Basu	<u>Advances in Experimental Medicine and Biology</u>
<b>DOI</b>	<b>Publisher</b>	<b>eBook Packages</b>
<a href="https://doi.org/10.1007/978-981-13-3065-0">https://doi.org/10.1007/978-981-13-3065-0</a>	Springer Singapore	<u>Biomedical and Life Sciences, Biomedical and Life Sciences (R0)</u>
<b>Copyright Information</b>	<b>Hardcover ISBN</b>	<b>eBook ISBN</b>
Springer Nature Singapore Pte Ltd. 2018	978-981-13-3064-3 Published: 25 January 2019	978-981-13-3065-0 Published: 12 January 2019
<b>Series ISSN</b>	<b>Series E-ISSN</b>	<b>Edition Number</b>
0065-2598	2214-8019	1
<b>Number of Pages</b>	<b>Number of Illustrations</b>	<b>Topics</b>
XI, 363	60 b/w illustrations, 85 illustrations in colour	<u>Membrane Biology, Cell Physiology, Regenerative Medicine/Tissue</u>

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# A Glycomic Approach Towards Identification of Signature Molecules in CD34<sup>+</sup> Haematopoietic Stem Cells from Umbilical Cord Blood

# 21

Suchandra Chowdhury, Kaushik Bhattacharya, Chandan Mandal, Susmita Mondal, Sayantani Sarkar, Sarmila Chandra, Subir Banerjee, and Chitra Mandal

## Abstract

Umbilical cord blood (UCB) is a powerful storehouse for normal CD34<sup>+</sup> haematopoietic stem cells (HSCs), often used for allogeneic bone marrow (BM) transplantation in malignant and non-malignant diseases. The glycomic especially the sialoglycomic aspect of these HSCs has been unravelled in this study. Cell surface expression of the glycans with the related enzymatic activities has been compared with the BM of childhood acute lymphoblastic leukaemia, a common BM-associated malignancy. An enhanced cell surface expression of  $\alpha$ 2,3-linked sialic acid, P- and E-selectins, and intercellular adhesion molecule along with reduced expression of L-selectin distinguishes CD34<sup>+</sup> HSCs of UCB from leukaemic samples. More importantly, high expression of *O*-acetylated sialoglycoproteins, a hallmark of lymphoblasts, is drastically reduced in the CD34<sup>+</sup> HSCs of UCB and is substantiated by

the low activity of sialylate-*O*-acetyltransferase and high sialidase activity. In contrast, a significant variation is evident in the expression of sialic acid,  $\alpha$ 2,6-linked sialic acids, and the sialyltransferase activity. Taken together, these studies indicate a few signature molecules, forming a unique glycomic template, which may be a potential indicator, reassuring the normal profile of these stem cells, to be used for future transplantation.

## Keywords

CD34<sup>+</sup> haematopoietic stem cell · Glycomics · Sialic acid · Cell adhesion molecules · Sialylate-*O*-acetyltransferase · Sialidase

## 21.1 Introduction

Allogeneic haematopoietic stem cell (HSC) transplantation has provided curative therapy for severe bone marrow (BM)-related malignant and non-malignant diseases in patients. However, only a few of them have the option of a human leukocyte antigen (HLA) identical sibling donor. Substantial advances in the use of alternative donors like unrelated volunteer donors and umbilical cord blood (UCB) donors enable almost all patients to benefit from this life-saving treatment. Nevertheless, each donor type has its own demerits (Chowdhury et al. 2014; Hough et al. 2009).

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K. Chattopadhyay, S. C. Basu (eds.), *Biochemical and Biophysical Roles of Cell Surface Molecules*, Advances in Experimental Medicine and Biology 1112, [https://doi.org/10.1007/978-981-13-3065-0\\_21](https://doi.org/10.1007/978-981-13-3065-0_21)

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# Cognizance The New Vistas of Education & Psychology

Vol. I

*Edited by  
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*Cognizance The New Vistas of Education & Psychology*  
*Vol. I*

First Published : 2019

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ISBN 978-93-88207-26-3

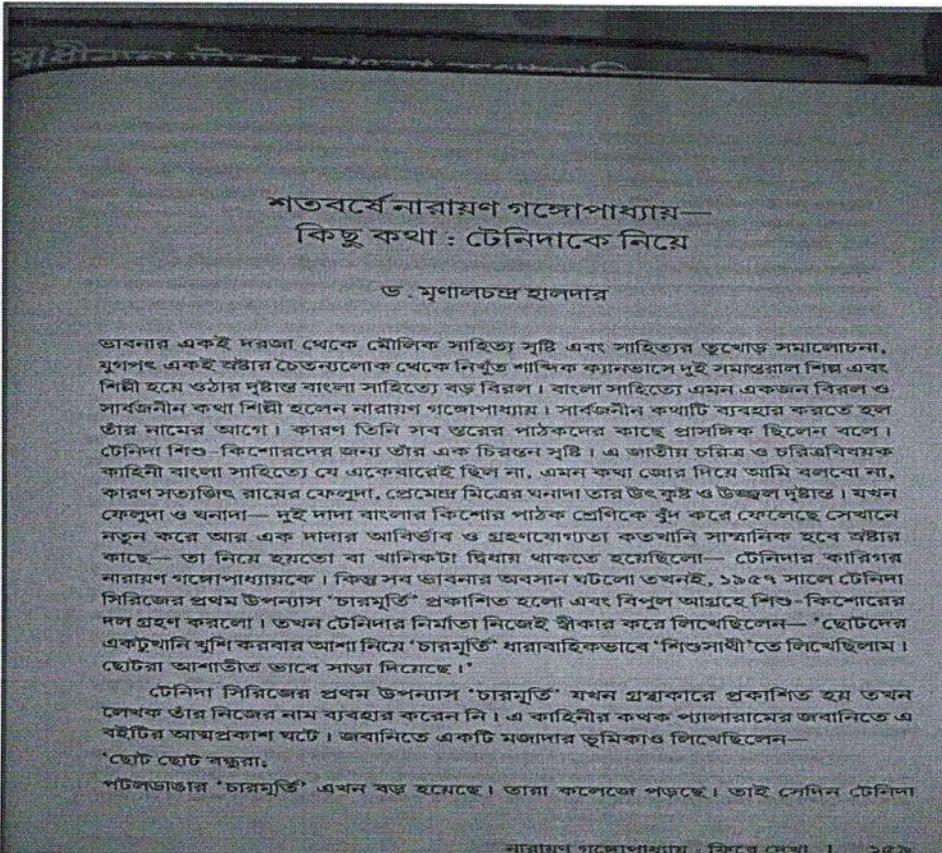
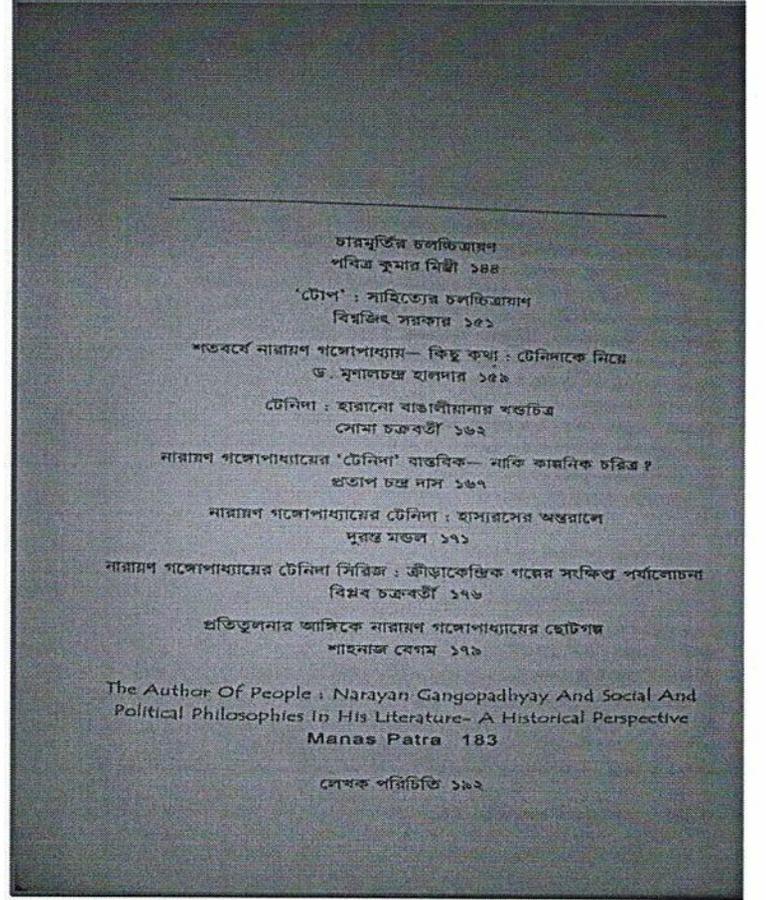
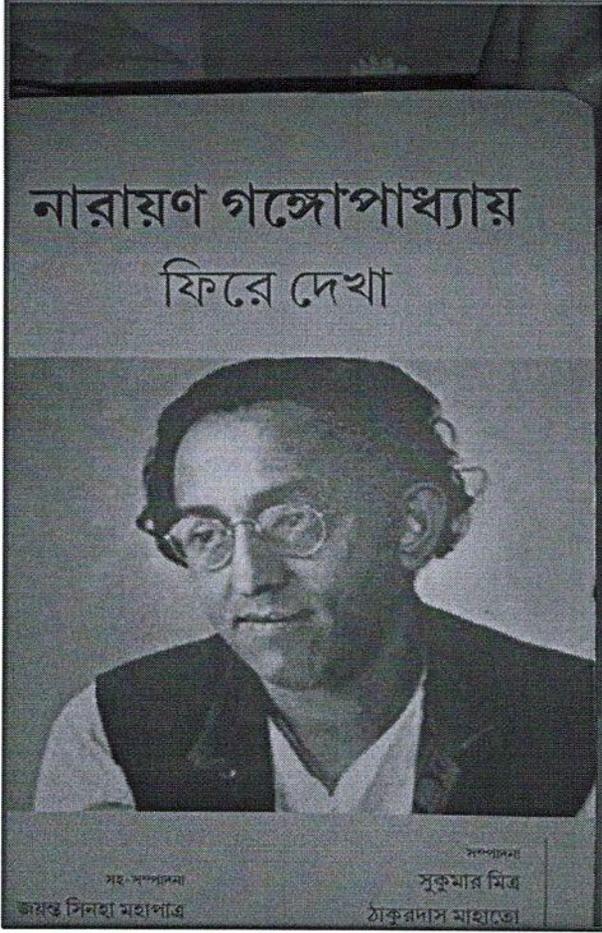
*Published by*  
Malay Das for  
P.A.I.O.L.C.K.,  
Baruipur, Kolkata - 700 144  
anchalikitihhas@gmail.com

*Printed at*  
S. P. Communications Pvt. Ltd,  
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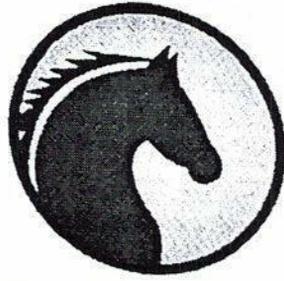
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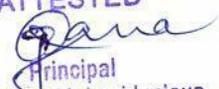
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ISBN: 978-81-941874-9-3

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**THE WARSAW PACT -ITS  
EVOLUTION AND ROLE IN HISTORY  
IN WORLD POLITICS  
Lupsy Mahanty Roy**

The Warsaw Pact is otherwise formally known as the **Treaty of Friendship, Co-operation and Mutual Assistance** was a collective defense treaty signed in Warsaw, Poland with a motto of **Union of Peace and Socialism**. It was signed by the Soviet Union and seven Soviet satellite states of Central and Eastern Europe during the Cold War. It was a program undertaken by Nikita Khrushchev and Nikolay Bulganin. It was a military complement to the **Council for Mutual Economic Assistance (Comecon)**, the regional economic organisation for the socialist states of Central and Eastern Europe. It was a reaction to the integration of West Germany into North Atlantic Treaty organisation (NATO)<sup>1</sup> in 1955 as per the London and Paris Conference held in 1954. Moreover the Soviet Union could have control over military forces in Central and Eastern Europe so that Western Europe cannot be taken and retained by America forcibly. The motive was to create a buffer zone.

Speculation about Khrushchev's ambition towards the power of the Communist party may explain the formation of the Warsaw pact - he wanted global domination for Communism. Khrushchev considered his plans of "de-Stalinization" to be completely justified and necessary for Soviet prosperity. Additionally, the Communist Soviet Union was finding it increasingly difficult to fulfill its monetary needs and thought that the Warsaw Pact would resolve this problem. One of Khrushchev's main goals was to stimulate the development of the involved Eastern European nations so that they may function on their own.\*

It was formed on the 14<sup>th</sup> of May 1955 at Warsaw, Poland and dissolved on the 1<sup>st</sup> of July 1991. The headquarter was at Moscow, Russian Soviet Federative Socialist Republic (SFSR), Soviet Union. The members were Albania (withdrew 1968), Bulgaria, Czechoslovakia, East Germany (withdrew in 1990), Hungary, Poland, Romania and Soviet Union. It derived its name from Warsaw, a place in Poland where the treaty was signed. The treaty was meant for the member states to come in defense of any member, which comes under the threat of external attack by any exterior forces. It was set up under the leadership of Marshal Ivan S. Konev of the Soviet Union. The name itself suggested the reason for its existence. It revolved around the issue of remilitarisation of Western Germany and its inclusion in the North Atlantic bloc thus leading to a war-like state and jeopardising the plight, with a threat to national security of the peace-loving states. It was the decision taken by the United States and other members of the North Atlantic Treaty Organisation (NATO) on the 9<sup>th</sup> of May, 1955, to incorporate West Germany as a member of North

<sup>1</sup>In 1949, the prospect of further Communist expansion prompted the United States and 11 other Western nations to form the North Atlantic Treaty Organization (NATO).

**\*Sources:**

"APPENDIX C: THE WARSAW PACT -- Soviet Union." Library of Congress. 12 May 2008.

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Atlantic Treaty Organisation (NATO) and thus remilitarising it in the due process. The Soviets saw it and took it as a direct threat and thus responded with the Warsaw Pact.

The eight members took pledge to protect each other and mutually defend against external attack. All the members agreed to refrain from mutual intervention in internal affairs, respect each other national sovereignty and political independence. (Conditions of the treaty included "total equality, mutual non-interference in internal affairs, and respect for national sovereignty and independence.") However, all the member states were indirectly controlled, by the Soviet Union. In July 1963, the Mongolian People's Republic was asked to join Warsaw Pact under Article 9<sup>2</sup> of the treaty. But the Sino-Soviet Split created such a plight that Mongolia had to maintain observer status. The Soviet Government agreed to station troops in Mongolia in 1966.

The Political Consultative Committee and the Unified Command of Pact Armed forces had strings in their hands of the actions performed by the Warsaw Pact and both were centered in Moscow. The latter was in charge of all military activities of the alliance, while the first controlled everything else. One of the presiding conditions was that the leader of both of these committees would be Soviet, so that Communist dominance would remain prevalent.

On the 20<sup>th</sup> of August 1968, the Operation Danube was carried out and Czechoslovakia was invaded by 250,000 Warsaw Pact troops. Around 108 civilians were killed and another 500 were wounded by the invading troops. Albania and Romania refused to participate in the invasion. East Germany did not send the troops as it was ordered to do so by Moscow. Albania left the Pact over the invasion. The Communist Party leader, Alexander Dubcek had plans to reform Czechoslovakia, which was not the wish of Soviet Union. The invasion was an attempt to overthrow the Communist leader out of power. He wanted to liberalise his economy and bring about necessary reformations but his arrest during invasion ended everything in fiasco. He urged his denizens, not to protest militarily, as it will lead to violence and bloodbath. Thus there were many non-violent protests, which took place throughout the country.

On the 26<sup>th</sup> of April 1985, Mikhail Gorbachev and leaders of the six Eastern European members of the Warsaw Pact signed a protocol to renew the alliance for further 30 years. A unitary military command was provided and also the maintenance of Soviet military units on the territories of the other participating states was made possible. A communist government continued in Soviet Union. Bulgaria in the first half of 1990 had a reform government based on Socialist Party. In mid June multiparty elections were scheduled to be carried out. None of the leaders realised or expected

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<sup>2</sup>Article 9. The present treaty is open to be acceded to by other states-irrespective of their social and state systems-which may express their readiness to assist through participation in the present treaty, in continuing the efforts of the peace loving states for the purpose of safeguarding the peace and security, of nations. This act of acceding to the treaty shall become effective, with the consent of the states that are parties to this treaty, after the instrument of accedence has been deposited with the government of the Polish People's Republic.

# Latency Aware Fault Tolerant Cache in Multicore using Dynamic Remapping Clusters

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**Abstract**—This work proposes a re-usability aware fault remapping scheme for multicore NUCA cache. It replicates data in non-reusable blocks to ensure full error coverage and minimum latency, by forming dynamic remapping clusters around the home tiles. Simulations in Multi2Sim 5.0 claim up to 18.64% increase in hit ratio and 20.79% decrease in latency in last-level cache over the existing techniques with 3.17% area, 5.35% leakage power and 3.34% dynamic power overheads.

**Keywords**—Multicore, Cache, Fault, Remapping, Latency

## I. INTRODUCTION

Aggressive voltage scaling causes exponential cell failures in SRAM. Error resilience schemes are proposed in multiple levels. SRAM cells [1], error correcting codes (ECC) [2], disabling faulty sub-blocks [3] and redundancy based techniques [4] have been reported. But none of them ensures full error coverage with minimum latency where this work concentrates in.

## II. PROPOSED FAULT REMAPPING SCHEME

The proposed work detects hard errors using BIST in low power and a fault map is generated. Blocks addressed on faulty lines are remapped on non-conflicting faulty or non-reusable healthy blocks in the same set or in the nearest neighbour tile with lowest manhattan distance, forming remapping clusters that expand and shrink dynamically depending on the cache pressure. An access map is then generated to track the replications. Re-usability is measured as defined in [5].

The simulation is done with Multi2Sim 5.0 using SPLASH-2 and PARSEC 3.0 suites. Overheads are calculated using CACTI 6.5 and power components are calculated using McPAT. A fault model has been followed as in [6]. The hit ratio and latency of the proposed scheme for fft benchmark are shown in Figure 1 and 2 respectively showing consistently higher hit ratio and lower latency achieved by the proposed scheme.

## III. CONCLUSION

This work proposes a latency aware complete in-place fault remapping policy with 18.64% improvement of hit ratio and 20.79% improvement in latency in  $L_2$  cache with 3.17% area, 5.35% leakage power and 3.34% dynamic power overheads.

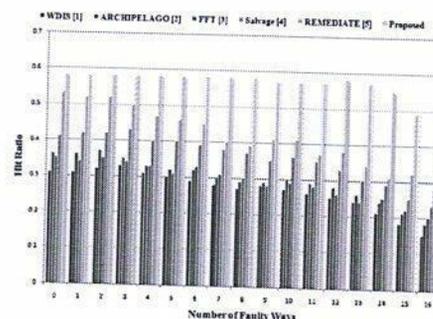


Fig. 1. Comparison of  $L_2$  hit ratio of the proposed work with others

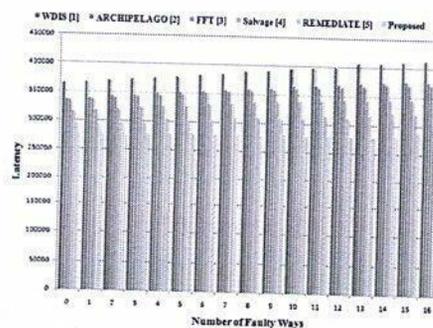


Fig. 2. Comparison of  $L_2$  latency of the proposed work with others

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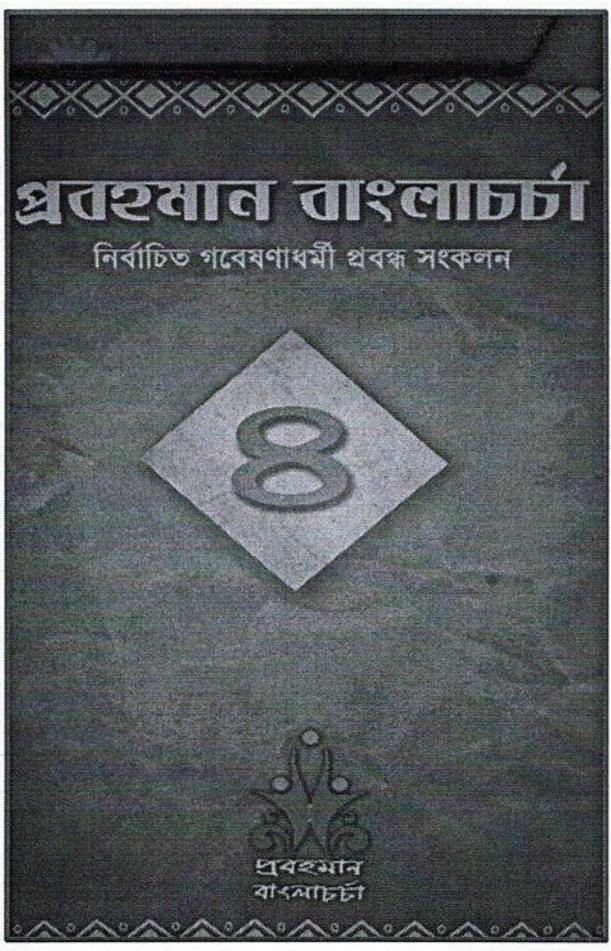
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লেখকক বিত্ততিভূষণের ব্যক্তিগত জীবনের অভিজ্ঞতা কমবেশি ছায়া পাত্র করেছে তাঁর পথের পাঁচালী (১৯২৯), অপরাজিত (১৯৩২), আরণ্যক (১৯৩৯), অনুবর্তন (১৯৪২), ইছামতী (১৯৫০) - আরও কমবেশি নানা রচনায়। আরণ্যকে যেন সেই অনুভূতি অনন্দের মত সবুজ গ্রাণবস্ত আরও ঘন হয়ে দেখা দিল। বিত্তত ভাগলপুর অঞ্চলের আরণ্যক প্রকৃতি এবং সেই ছায়া-খন প্রকৃতির কোলে বসবাসকারী দেহাতি আটপৌরে মানুষতলো হল এ উপন্যাসের উপজীব্য। ভাগলপুরের আজসাবাদ, ইসমাইলপুর, লবটুলিয়া, সোহনপুরা রিজার্ভ ফরেস্টের প্রান্তসীমা এ উপন্যাসের ভৌগোলিক মানচিত্র।

বাংলা কথাসাহিত্যের ধারায় আরণ্যক একটি ভিন্ন বাদের উপন্যাস। 'ভিন্নবাদের' বলার অর্থ হল, ইতিপূর্বে বাংলা উপন্যাস এমন বিষয় ও রচনাশৈলী নিয়ে নির্মিত হয়নি। এই বোধ হয় প্রথম। অনন্য এখানে শুধুমাত্র পটভূমি নয়। কোনো কোনো যায় এই অরণ্য সজীব চরিত্র হয়ে ধরা পড়েছে লেখকের কাছে। শৈলীগত দিক থেকে মাঝে মাঝে মনে হতে পারে, এ উপন্যাস না দিনলিপি? এ সংশয়ের অবসান বিত্ততিভূষণ নিজেই নিরসন করেছেন গ্রন্থারম্ভে। তিনি নিজেই বলেছেন, আরণ্যক উপন্যাস। তাঁর নিজের কথাটি এই রকম "মানুষের বসতির পাশে কোথাও নিবিড় অরণ্য নাই। অরণ্য আছে দূর দেশে, যেখানে পতিত-পক জন্তুদলের গঞ্জে গোদাবরী তীরের বাতাস ভারাক্রান্ত হইয়া উঠে। আরণ্যক সেই কল্পনা-লোকের বিবরণ। ইহা ভ্রমণ বৃত্তান্ত বা ডায়েরী নহে-উপন্যাস।" তাহলে আমরা লেখকের সুরে সুর মিলিয়ে আরণ্যকের উপন্যাস হয়ে ওঠা নিয়ে নিশ্চিত হলাম। এবার আমাদের বিচার্য বা ফিরে দেখা, এ উপন্যাস চিত্রাচরিত উপন্যাসের মত কি কল্পনার ভাষাচিত্র অথবা লেখকের আপন চোখে দেখা মানুষ ও প্রকৃতির নিবিড় বসবাসের ধারাপাত। এখানেও লেখকের নিজের কথায় আসা যাক। গ্রন্থারম্ভে বলছেন "...আরণ্যক পটভূমি সম্পূর্ণ কাল্পনিক নয়। কুশী নদীর ওপর পারে এমন দিপ্ত দ্বিতীর্ণ অরন্যপ্রান্তর পূর্বে ছিলো, এখনও আছে।" তা হলে আমরা নিশ্চিত হলাম এ উপন্যাসের কথা নিছক বানানো নয়, এ কাহিনির অস্তিত্ব বাস্তবে রয়েছে।"

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by

**Authorspress**

Q-2A Hauz Khas Enclave, New Delhi-110 016 (India)

Phone: (0) 9818049852

E-mail: authorspressgroup@gmail.com

Website: www.authorspressbooks.com

**Working of Democracy in India: Major Issues**  
ISBN 978-93-90155-91-0

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# Covid-19 Pandemic and its Impact

Lupsy Mohanty Roy

## Corona: The Open Secret

It's quite interesting, also known to all that, there was a fable on a child from village who visited an urban area, anxiously asked his father, "Where are all the people of this town going?" To utter surprise of father, the child was worried, it will become empty. Yes it's true indeed we all were suffering from 'hurry or rush syndrome', suddenly the outbreak of Corona has made everything go topsy-turvy, a sudden halt from the cut throat rat race competition. The virus that came from Wuhan Laboratory IV was thought to be brought under control in China but gradually it spread in such a manner that everything got upside down. It was realised that with absence of intervention, the major health crisis can lead to 7.0 billion infections with 40 million deaths globally in 2020. The immediate mitigation measure adopted is social distancing, special care for elderly and the most vulnerable. Social distancing and Lockdown will lower the transmission rate. There are flexible working arrangements, lop sided division of labour in household chores and child care.

In the aftermath of Second World War, it is one of the greatest predicaments that have jeopardised the entire race of *Homo sapiens*. It is a calamity and hazard of the worst kind faced in this century. It is in the later part of 2019; a new infectious respiratory disease emerged in Wuhan, Hubei province, China and was called coronavirus disease 2019 or Covid-19 by the World Health

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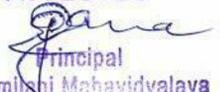
**ISBN 978-93-90459-62-9**

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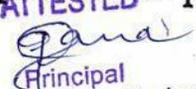
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## Quest for Better Life through Sustainable Development Goals

LUPSY MOHANTY ROY

### Development as Sustainable Process

Development per se is quite encompassing and pervasive. It is be-all and end-all of any socio-economic structure of the society. It is a process that brings in major metamorphosis in multi-dimensional sectors leading towards growth, progress and amelioration. The main purport is to provide and enhance the quality of human life without compromising on the limited resources of the environment. It is tangible and not necessarily immediate as it might bear fruits after prolonged effort. It was only in the second half of the twentieth century that 'development' gained weightage in the International Fora. There was urgency to formulate policies to channelise the resources towards better life. It has multifarious connotations but Amartya Sen's "capability approach" stated it is a tool to attain the highest level of ability through liberty of action. The Human Development Index (HDI) which was coined by the United Nations Development Program (UNDP) in 1990 was prioritised by the approach and thus became the basis for the measurement of development. Even Martha Nussbaum emphasised the empowerment of women as a development tool by introducing the abilities approach in the ambit of 'Gender'. Jeffrey Sachs and Paul Collier grappled with various poverty traps then Sachs promoted 'Sustainable Development'. Development has to cater to the needs of present generation without compromising on the demands of the posterity. The Bretton Woods organisations and the International Monetary Fund (IMF) in the aftermath of World War II were basically established to provide International aid and fiscal assistance to countries shattered due to war. It was during the 1980s developing countries faced budgetary deficit and the aforementioned organisations provided credit under alternative terms i.e. opened the path towards development.

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# Connecting Asia

Understanding Foreign Relations, Organizations and Contemporary Issues

*Edited By:*  
**Debasish Nandy**

*Foreword by:*  
**Professor Sharad K. Soni**



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# Marine Pollution and The Role of IMO in The 21st Century: Focus On Indian Ocean

*Dr. Sukanya Mukherjee*

## Introduction

Maritime security is one of the latest additions to the vocabulary of international security. In the phase of globalization, the concept has received growing attention due to the increasing significance in recent years of the so-called 'blue economy' and issues relating to maritime environmental protection and resource management (Bueger & Edmunds, 2017). Since the 1970s, world seaborne trade has grown due to market globalization. Generally speaking, from ancient times up to the present day, the transportation of goods by sea has remained one of the cheapest ways of shipping and the world seaborne trade has been growing steadily, particularly after the Second World War. The number and size of merchant ships have increased due to major technological breakthroughs, yet the maritime industry has remained a dangerous workplace (Galic, Lusic, & Skoko, 2014). As a result, the environmental impacts from ocean shipping are several, and they can be summarized in different contexts. Some pollution related to ocean shipping is not directly from the ships but from efforts to serve the ocean shipping sector through port infrastructure maintenance and fleet modernization (Corbett & Winebrake, 2008: 20). Added with this, the rapid population growth and enormous urban and coastal development in many of the world's coastal regions have also responsible for the degradation of the marine ecosystem. In this context, if we focus on the study of the Indian Ocean Region we can see the effects of pollution in the marine environment began to be felt recently, although these activities are continuing for a long time. It had always been felt to establish an international body which would promote maritime safety (from all perspective) more effectively. The role of IMO (International Maritime Organization) in this regard is needed to be mentioned here.

In this context, the present paper attempts to focus on two major areas - firstly, to study the role of the International Maritime Organization (IMO)

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গোলপার্ক, কলকাতা - ৭০০ ০২৯

প্রথম সংস্করণ :  
কল্পতরু উৎসব ১৪২৬ (১ জানুয়ারি ২০২০)

© সর্বস্বত্ব সংরক্ষিত

*RMIC Cataloguing-in-Publication Data*

বেদ

বেদগ্রন্থমালা। কলকাতা : রামকৃষ্ণ মিশন ইনস্টিটিউট অব  
কালচার, ২০২০ খ্রিঃ।

খণ্ড। সেমি।

টীকা : বেদ বদানুবাদ

১০শ খণ্ড, শুক্রযজুর্বেদ : শতপথ-ব্রাহ্মণ, সপ্তম ভাগ

পূর্ব সারথি ভট্টাচার্য ও সীতানাথ দে অনূদিত এবং শান্তি ব্যানার্জী সম্পাদিত।

ISBN 978-93-88542-20-3 (VOL. XIII, PART-VII)

ISBN 978-93-81325-67-4 (SET)

১। বেদ ২। শতপথ-ব্রাহ্মণ, সপ্তম ভাগ

294.5921 — dc 23

মূল্য : তিনশো টাকা

*This book is being published with  
financial assistance from the Department of Higher Education,  
Government of West Bengal.*

মুদ্রক

পদ্মা প্রিন্টিং ওয়ার্কস প্রাইভেট লিমিটেড  
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হত্যাাদি পূজা উপলক্ষে যে জগৎব নৃত্যের আয়োজন তারা করে যার ফলে তারা মনে করে যে উৎসাদনশীলতা বাড়ে। সে জন্য রাজা যুবকরা বর্ষার শুরুতে তাদের শস্য ক্ষেতে নানা প্রকার নৃত্যানুষ্ঠান করে থাকেন। রাজারা পশু বলি দেয়। জমিতে ধান বোনার সময় ও নবাবের সময় তারা প্রকৃতি ও বিভিন্ন দেব-দেবীর তুষ্টিবিধানের জন্য মোরগ বলি দিয়ে পূজা করে। তাদের বিশ্বাস যে ফসলের জমিতে রক্তপাত হলে অধিক ফলন পাওয়া যায়। প্রকৃতির ধীলা সম্পর্কেও তাদের কিছু লোক বিশ্বাস রয়েছে যেমন তারা বিশ্বাস করে যদি অনেক ব্যাঙ একসঙ্গে ডাকে কিংবা গর্তের কেঁচো বেঁটিয়ে আসে বা উইপোকা কাঁক বেঁধে উঠতে থাকে তাহলে প্রবল বর্ষণ হওয়ার সম্ভাবনা দেখা দেয়। আবার যদি অসময়ে শেয়াল ডাকে যদি কাঁকড়া তার গর্তের মূল মাটি দিয়ে বন্ধ করে দেয় তাহলে বর্ষার সম্ভাবনা দেখা দেয়। ফড়িং আকাশে উড়তে থাকে তাহলে দেশে দূর্ভিক্ষ দেখা দেয়, তেমনি বাঁশ গাছে যদি ফুল দেখা দেয় তাহলে দেশে দূর্ভিক্ষ দুর্দশা দেখা দেয়।

যাত্রা শুভ অভ্যুত :

যাত্রা কথাটি ব্যাপক অর্থে উত্তর-পূর্বাঞ্চলে বা উত্তরবঙ্গের ব্যবহৃত হয়। এক স্থান থেকে অন্যত্র শুভ কাজে যাওয়াকে সাধারণভাবে যাত্রা বলে। এছাড়া এই অঞ্চলে হাতি ধরার মাহুতফান্দি, শিকার ও মৎস্য শিকারে যাওয়া যাত্রা হিসাবে প্রচলিত। এই ধরনের জীবিকা সম্পর্কিত যাত্রাতে কেউ কেউ পৃথকভাবে বিশেষ বিশেষ দেবতার পূজা দিয়ে থাকেন এই পূজাকে বলা হয় যাত্রা পূজা। তাদের বিশ্বাস যে যাত্রা পূজা প্রদানের ফলে তারা যে ঝুঁকিপূর্ণ অভিযানে যাচ্ছে সেখানে ওই দেবী তাদের রক্ষা করবেন। কিছু ক্ষেত্রে পশু বা পাখি বলি দেবার প্রথাও আছে। এছাড়া যাত্রা বলতে বোঝায় হাল যাত্রা, বিদেশ যাত্রা, বিবাহ বা অন্য কোন পুণ্য কাজের উদ্দেশ্যে যাত্রা। এধরনের যাত্রা পথে যতদেহ শ্মশানে নিম্নে যেতে দেখা, বিয়ের পাত্রীর বাড়িতে ধান শুকোতে দেখা, সেই বাড়িতে কাপড় বুনতে, পান নারকেল বা কলার কাঁদি পড়ে আছে দেখলে যাত্রা শুভ হয় বলে রাতাদের লোকবিশ্বাস। অন্যদিকে বিবাহের কাজে যাবার পথে যদি শ্মশানে যতদেহ দেখা যায়, কন্যার ঘর কাঁদাঘাটি দিয়ে নিকোতে দেখা যায়, পথে যদি কোন বক্ষা নারী বা মাকুন্দ পুরুষের দেখা পাওয়া যায় তবে তা অতীব অশুভ লক্ষণ বলে মনে করা হয়।

## রাজা জনজীবনে লোকবিশ্বাস ও লোকাচারের ভূমিকা

কস্তুরী কব

ব্রহ্ম লোকবিশ্বাসের ক্ষেত্রে রোপসম্মি বা সামাজিক পারিবারিক অন্যান্য বিপদ বিপর্ক্যের জন্য কোনো না কোনো অশুভ শক্তিকে চিহ্নিত করা হয় এবং তার তুষ্টি বিধানের জন্য পূজা বা প্রায়শ্চিত্তের মাধ্যমে বিশেষ বাধি বা বিপদ থেকে নিস্তার পাওয়ার চেষ্টা করা হয়। রাজা জনগোষ্ঠীর অন্যান্য গোষ্ঠীর মতো বিশ্বাস করে যে মঙ্গলকারী দেবতার বাস করেন দেবতাদের বাসভূমি দেবলোককে যাকে তারা রাং কাং বলে কিন্তু অগদেবতা বা অশুভ শক্তির মানুষের বাসভূমিতে, নদী, নালা, বৃক্ষ বা প্রস্তর খণ্ডে যেকোনো ভাবে বসবাস করে এবং সামান্য কারণেই কুপিত হয়ে মানুষের ক্ষতি করার জন্য উন্মুখ হয়ে থাকে। রাজা জনগোষ্ঠী বিচ্ছিন্নভাবে বসবাস করার কারণে তাদের বিশ্বাস লোকাচার লোকচক্ষুর অন্তরালে থেকে গেছে। পরবর্তীকালে চা বাগান পল্টন, বনাঞ্চলকে সংরক্ষিত এলাকা হিসেবে ঘোষণা করা প্রচলিত কারণে শান্তিপ্রিয় রাজাগোষ্ঠী অন্যান্য প্রতিবেশী গোষ্ঠীর সঙ্গে মিলেমিশে পাশাপাশি বসবাস করতে অভ্যস্ত হয়ে পড়ে। এর ফলে তাদের জীবিকার যেমন পরিবর্তন ঘটে তেমনি তাদের চিরায়ত লোকবিশ্বাস ও লোকাচারের ক্ষেত্রেও শুরু হয় গ্রহণ-বর্জনের প্রক্রিয়া। তারা একদিকে যেমন নিজেদের শোকবিশ্বাস ও লোকাচারের কোনো কোনো বিষয়কে পরিত্যাগ করেছে তেমনি প্রতিবেশী লোকবিশ্বাসের দ্বারা নানাতাবে প্রভাবিত হয়েছে। রাজাদের লোকবিশ্বাসগুলোকে কয়েকটা ভাগে ভাগ করে আলাচনা করা যেতে পারে।

বৃদ্ধবয়স সম্পর্কিত লোকবিশ্বাস :

রাজাদের কিংবদন্তি অনুসারে দুঃসহস্রী পূর্বপুরুষ জংশনারেং তিনি প্রথম বাঁশের তৈরি সুরেলা বাদ্যযন্ত্র বাঁধি বা বাঁমিছ পুথিবীতে স্বর্গ থেকে আনেন আর কাঠ থেকে তৈরি রাজাদের সবচেয়ে প্রিয় যন্ত্র হেম বা ঢোলের প্রচলন করেন।

কৃষিকেন্দ্রিক লোকবিশ্বাস :

এরা কৃষিজীবী হওয়ার ফলে এদের সমাজে কৃষিকে কেন্দ্র করে নানা রকম লোকবিশ্বাস গড়ে উঠেছে। রাজাদের বিশ্বাস অনুসারে তাদের খোকছি বা বায়খো পূজা, লাংমারা পূজা

Samir  
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নজরুল চর্চা নজরুল চর্চা  
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নজরুল চর্চা নজরুল চর্চা

নজরুল চর্চা: একালের ভাবনায়

সম্পাদনা

নিরুপম আচার্য

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Saini  
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## ‘মৃত্যুক্ষুধা’ ও ঔপন্যাসিক নজরুল

কল্পরী কর

সম্মিলনী মহাবিদ্যালয় ইতিহাস বিভাগ

সারাংশ : কবি নজরুল ঔপন্যাসিক হিসাবে বড়ই কম চর্চিত। যদিও তিনি খুব বেশি উপন্যাস লেখেননি তবু তার মধ্যে ‘মৃত্যুক্ষুধা’ উপন্যাসটি বাংলা আধুনিক সাহিত্যের অঙ্গনে তাঁর একটি বিশিষ্ট শৈল্পিক প্রকাশ। এই উপন্যাসের প্রতি ছত্রে ছত্রে তিনি কঠিন বাস্তব কে তুলে ধরেছেন। প্রথম মহাযুদ্ধের পর আর্থিক সংকট, বেকারত্ব, পরাধীনতার শৃংখলে আবদ্ধ ও সাম্প্রদায়িকতার বিষবাপ্পে জর্জরিত মাতৃভূমি এই উপন্যাসের প্রেক্ষাপট। এবং সেই সঙ্গে কোথাও যেন এই উপন্যাসটিতে লেখকের আত্ম প্রতিফলন ঘটেছে এবং এখানেই উপন্যাসটির অনন্যতা।]

নির্ধাতিত মানবাত্মার মুক্তি সাধক নজরুল তার সাহিত্য চর্চার বিভিন্ন ধারাতে কবিতা গল্প নাটক প্রবন্ধ ইত্যাদির পাশাপাশি ঔপন্যাসিক হিসাবে অপেক্ষাকৃত কম চর্চিত। বিংশ শতাব্দীর দ্বিতীয় দশকে বাংলাদেশে নজরুল ফিরলেন প্রথম মহাযুদ্ধের অভিজ্ঞতা নিয়ে। সাম্রাজ্যবাদের ভ্রুকুটি, জালিয়ানওয়ালাবাগের গণহত্যা, বিশ্বজোড়া আর্থিক সংকট, বেকার সমস্যার কারণে মধ্যবিত্ত সমাজে তখন তীব্র সংকট। অন্যদিকে বিপ্লব, ব্যক্তিস্বাতন্ত্র্যবাদের উত্থান। এই প্রেক্ষাপটটিই মৃত্যুক্ষুধা উপন্যাসটি রচিত। এই উপন্যাসটি বেছে নেওয়ার বিশেষ কারণ হল একজন ইতিহাসের অনুসন্ধিৎসু হিসেবে যে সময়টাকে উনি এই উপন্যাসে ধরতে চেয়েছেন সেই সময়টা বড় উত্তাল সময় ছিল। আসলে এই উপন্যাসের চরিত্রগুলো লেখকের খুব চেনা এবং এর প্রেক্ষাপটটিও বিংশ শতাব্দীর দ্বিতীয় দশকের কৃষ্ণনগর এবং ওই সময়টায় কবি ওইখানে বেশ কিছু বছর কাটিয়েছিলেন। ১৯৩০ সালে সওগাত পত্রিকায় ধারাবাহিকভাবে উপন্যাসটি ছাপা হতে থাকে। আমরা জানি নজরুলের বিশেষ একটি রাজনৈতিক আদর্শ ছিল এবং বারে বারে তার লেখায়

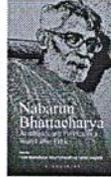
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**Product details**

Published	30 Sep 2020
Format	Ebook (Epub & Mobi)
Edition	1st
Extent	314
ISBN	9789388630511
Imprint	Bloomsbury India
Publisher	Bloomsbury Publishing

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## Nabarun Bhattacharya and his world: an introduction

Authors	Sourit Bhattacharya, Arka Chattopadhyay, Samrat Sengupta
Publication date	2020/10/6
Book	Nabarun Bhattacharya: Aesthetics and Politics in a World after Ethics
Pages	xvii-xxviii
Publisher	Bloomsbury
Description	<p>Nabarun Bhattacharya and his world: An introduction — University of Edinburgh Research Explorer Skip to main navigation Skip to search Skip to main content University of Edinburgh Research Explorer Home University of Edinburgh Research Explorer Logo Help &amp; FAQ Home Research output Profiles Research Units Projects Datasets Prizes Activities Press / Media Equipment Search by expertise, name or affiliation Nabarun Bhattacharya and his world: An introduction Sourit Bhattacharya, Arka Chattopadhyay, Samrat Sengupta School of Literatures, Languages and Cultures Research output: Chapter in Book/Report/Conference proceeding &gt; Chapter Overview Research output (2) Original language English Title of host publication Nabarun Bhattacharya Subtitle of host publication Aesthetics and Politics in a World after Ethics Editors Sourit Bhattacharya, Arka Chattopadhyay, Samrat Sengupta Publisher ...</p>
Scholar articles	<p>Nabarun Bhattacharya and his world: an introduction            S Bhattacharya, A Chattopadhyay, S Sengupta - Nabarun Bhattacharya: Aesthetics and Politics in a ..., 2020            All 3 versions</p>

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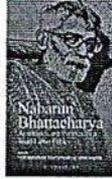
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**Nabarun Bhattacharya**

Aesthetics and Politics in a World after Ethics

Sourit Bhattacharya (Volume Editor), Arka Chattopadhyay (Volume Editor), Samrat Sengupta (Volume Editor)

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**Description**

The book aims to introduce the Bengali writer (1948-2014) to a global audience through some of his short stories and poems in English translation and a series of critical essays on his works. A political commitment to literature frames Nabarun Bhattacharya's aesthetic project and the volume wishes to tease out the various perspectives on this complex meeting of politics and aesthetics. Be it the novel on dogs or those on petro-pollution and the machine, the political question in Nabarun echoes significant contemporary issues, such as animal rights, global warming and techno-capitalism. This opens up the possibility of questioning the traditional paradigm of humanist values in a world of catastrophic and violent encounters such as nuclear war or holocaust, which keeps returning in Nabarun's works.

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Published	30 Sep 2020
Format	Ebook (Epub & Mobi)
Edition	1st
Extent	314
ISBN	9789388630511
Imprint	Bloomsbury India
Publisher	Bloomsbury Publishing

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Dr. Samrat Sengupta

## 'The Unknown Something': Objects beyond the Economy of Use in Nabarun's Short Stories

Authors Samrat Sengupta

Publication date 2020/9/30

Journal Nabarun Bhattacharya: Aesthetics and Politics in a World after Ethics

Pages 237

Publisher Bloomsbury Publishing

**Description** Nabarun Bhattacharya, a Bengali writer from India coming from Marxist lineage, wrote in a style that deviates majorly from traditional concepts of realism. In this chapter, I delineate his departure from conventional realist depictions of difference and alienation in society through his use of objects in short stories. In the modern realist form of thinking, objects generally appear either as background of the human world or as a part of man's own economy of use, his phenomenological experience of being and belonging. Objects are no longer enchanted or magical or carry some deep inexplicable meaning in modernity. They are understood only in terms of human experience and ways of looking. The word 'object' also leads to the word 'objectivity', where man can measure his relationship with his non-self dispassionately and in terms of what value they carry to man's experience and knowledge. Looking from a western enlightenment tradition objective, knowledge can lead us towards progress and a better form of existence. Marxist thought follows the same trajectory of understanding the real relationship of man with other things to move towards a more just society. Both socialist and critical realism appear to affirm the role of human mind in understanding reality as objective artefacts. My point is to show how Nabarun's stories employ objects not in terms of human use and understanding, but as wasted things inexplicable to human understanding. They effect the form of his writing as well as content. The shifting importance of things as they become more than a setting

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BINSHA SATAKER BANGLA CHOTO GALPA :  
NIRMANE-BINIRMANE  
(A Reference Book on Bengali Short Stories)  
Edited by Dr. Mrinal Chandra Halder

ISBN : 978-81-949432-3-5

প্রথম পাড়ি প্রকাশ : ১ জানুয়ারি, ২০২১  
First Imprint : 1<sup>st</sup> January, 2021

গ্রন্থস্বত্ব : ড. মৃগালচন্দ্র হালদার

মূল্য : ২০০ টাকা

প্রকাশক : পাড়ি

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'জলের আয়না' গল্পটি পূর্ণতা পেয়েছে চারটি চরিত্রের অসাধারণ চিত্র কর্ণায়।  
আতুর ওরফে আতুরি, বিফুপদ সর্দার, লিজবাবু ওরফে হাবান নন্দর ও পলাশ।  
এই চার চরিত্রের প্রত্যেকে গল্পকার ঝড়েখুর এ গল্পে এক বিশেষ সময়ের  
রাজনৈতিক ইতিহাস ও ইতিহাসে উঠে আসা অসহায় মানুষদেরকে ধরার চেষ্টা  
করেছেন। ১৯৬৭ সালের কিছু আগের সময় থেকে শুরু করে ১৯৮০-৮১ সাল  
পর্যন্ত এই দীর্ঘ সময় এ গল্পে কাশপর্ব চিত্রিত করেছে। দীর্ঘ ১৩-১৪ বছরের এই  
কালিক ইতিহাসে উঠে এসেছে প্রান্ত দক্ষিণ বঙ্গের কৃষি আন্দোলন— যার মধ্যে  
রয়েছে বর্গদারদের বর্গ প্রতিষ্ঠার জন্য লড়াই, 'বেগার' না খাটার জন্য প্রতিবাদ  
সবশেষে নশাল আন্দোলনের পরাজয়ের স্বপ্ন থেকে উঠে আসা কিছু আশপোড়া  
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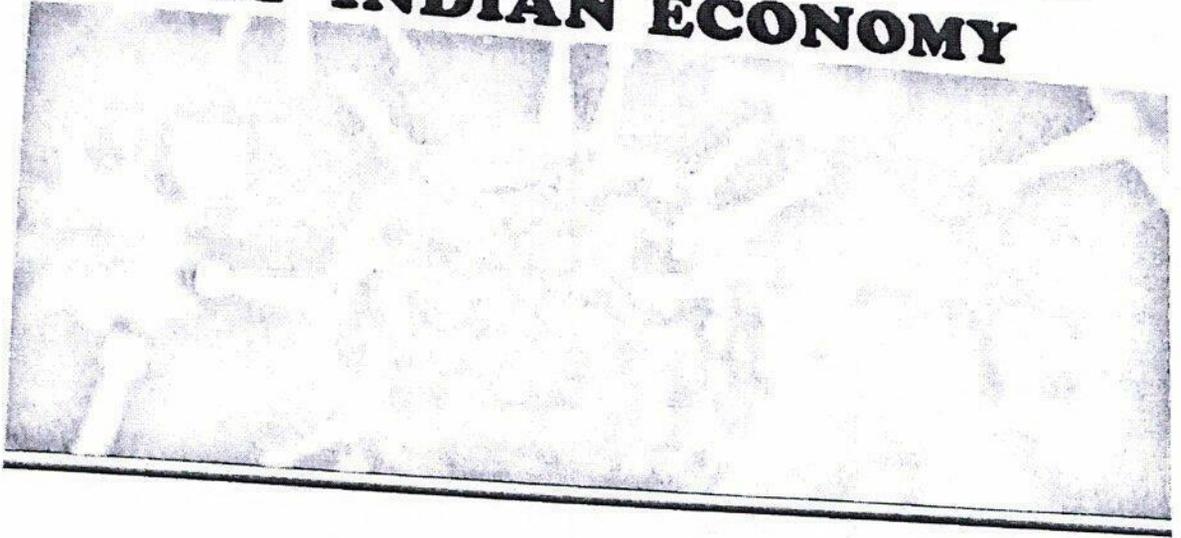
গল্পের মধ্যে দস্তর প্রবেশ করার আগে পিছনের ফেলে আসা সময়ে  
দিকে একটু তাকানো যেতে পারে। বৃটিশ শাসনাধীন ভারতবর্ষের মাঠ-ঘাট-নদ  
নদী, খাল-বিল-নালা-ডোবা, আকাশ-বাতাস, বন-জঙ্গল, পত্র-পাখি, সেই সব  
এদেশের আপাদমস্তক শ্রমজীবীরাও তাদের অধীন, তাদের গোলায় বৃটিশ  
এদেশ থেকে পাততাড়ি গোটালে (১৯৪৭) বৃটিশ প্রভুদের ঐ পদে বহাল পড়েন  
এদেশের জমিদার, জোদ্ধার, মহাজনেরা। এ গল্পে তারই একটি চিত্র  
এদেশের চেষ্টা রয়েছে।

বৃটিশ প্রভুদের ফেলে যাওয়া শাসন দণ্ডের অধিকার নিলে এদেশে  
রাজা, মহাজন, জমিদার, জোদ্ধারেরা। বৃটিশ প্রবর্তিত দশশালা, পাঁচশালা  
বন্দোবস্তের পথ ধরেই স্বাধীনতার পরে এদেশের হাজার হাজার বিধা  
জমিদার গভিয়ে উঠলো দেশের নানা প্রান্তে। জলের আয়না' তারই ট  
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# **IMPACT OF COVID-19 ON DIFFERENT SECTORS OF INDIAN ECONOMY**



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**Published by**

**ACADEMIC PUBLICATION**

B-578, Street No-8,

Near Shanti Palace, 1st Pusta,

Sonia Vihar, Delhi- 110090

Tel.: 9811966475, 9811966603

E-mali : academicpublicationsdelhi@gmail.com

E-mali : academic2014@gmail.com

www : academicpublication.in

**Ghaziabad office**

C-21 Nishant Colony Pavi Loni

Sadak Pur Ghaziabad-201002

First Edition Published 2021

**ISBN : 978-93-83931-19-4**

**Laser Typesetting by : Tamalika Computers**

**Printed at : Nagri Printers, Delhi**

**PUBLISHED IN INDIA**

**Published by Academic Publication, Delhi-110090**

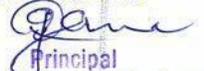
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## FIGHTING OUT COVID-19 AND ITS MULTIDIMENSIONAL IMPACT

### ABSTRACT

*Lypsy Mohanty Roy*

The end of 2019 saw the outbreak of flu like disease called COVID-19 caused by corona virus which is suspected to have come from the wet market of a Chinese province or caused from animals like bat or pangolin etc. The chapter on "Fighting out Covid-19 and its Multidimensional Impact" is an academic exercise in order to make people realize that COVID-19, the viral disease is going to stay for couple of years with post recovery complications till mid 2021 as stated by the World Health Organization (WHO) in early September 2020. It's an attempt to probe the impact on socio-economic trajectory of the international order. Basically the first part will focus on its genesis and how it impinged mankind with an optimistic conclusion about new normal and vaccination.

The multi dimensional impact denotes the havoc created in different sectors of the economy with repercussion and paradigmatic shift in international relations and world politics. The chapter tries to dissuade the think tank towards critical examination of peril jeopardizing the human life and initiated a debate on life vis-a-vis livelihood. Still the new normal has equipped, the adaptive men to combat the invisible enemy. Life is not easy but it's possible amidst the predicament.

### INTRODUCTION

No wonder people never realized that COVID-19 which started in late 2019 as an epidemic will become a global pandemic by the 11th of March as declared by the World Health Organization (WHO). The deadly virus which started its journey from the Laboratory IV of Wuhan Institute of Virology, Chinese Academy of Sciences (CAS) is subject to myriad conspiracy theories but there is absence of proof against any kind of scientific discrepancy. It is not clear whether the attempt was deliberate to release the micro-organism or accidental leak during various experiments being carried out for medicinal

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Worldwide Circulation through Authorspress Global Network

**First Published in 2021**

by

**Authorspress**

Q-2A Hauz Khas Enclave, New Delhi-110 016 (India)

Phone: (0) 9818049852

E-mail: [authorspressgroup@gmail.com](mailto:authorspressgroup@gmail.com)

Website: [www.authorspressbooks.com](http://www.authorspressbooks.com)

**Indian Administration: Institutions and Issues**

**ISBN 978-93-90891-81-8**

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Printed in India at Thomson Press (India) Limited

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## Ethics in Governance

Lupsy Mohanty

**Divorced from Ethics, Leadership is reduced to Management and Politics to Mere Technique. – James MacGregor Burns**

Ethics has to be the guiding light to attain the goal of 'Good Governance'. This polemic piece will explore – 'what is ethics' and 'how ethics in governance' acts as a catalyst to bring about effective public administration and public management. The nexus between governance and ethics will be examined trying to comprehend the fiasco it will be led to if at all the authority is not abided by science of morality.

### *Ethics Per se*

Public Administration broadly deals with implementation of governmental policies and efficacious management of public affairs. The optimum utilisation of scarce resources is also dealt with effectively. No doubt this sub field of 'Political Science' stresses upon policy analysis and evaluation research. Ethics is one of the six pillars of Public Administration namely human resources, organisational theory, policy analysis and statistics and budgeting.

'Ethics' is interchangeably used with 'morality'. It is basically derived from Greek word '*ethikos*' which means associated with '*ones character*' or '*arising from habit*'. Some thinkers opine it has its genesis from Latin word '*ethicus*' means '*character*'. It is essentially part of philosophy, normative studies, utilitarianism, hedonism, consequentialism, deontology etc. Utilitarianism is essentially a strand of consequentialist ethics emphasising on "greatest good of greatest number". Utility being one of the determining factors in case of Utilitarianism. Consequentialism is all about moral theories, consequences of any particular action which acts as a basis of valid moral judgement made about the said action. Duty or obligation based ethics is called Deontological ethics. The rightness or wrongness of actions is seen than rightness or wrongness of the consequences of those actions.

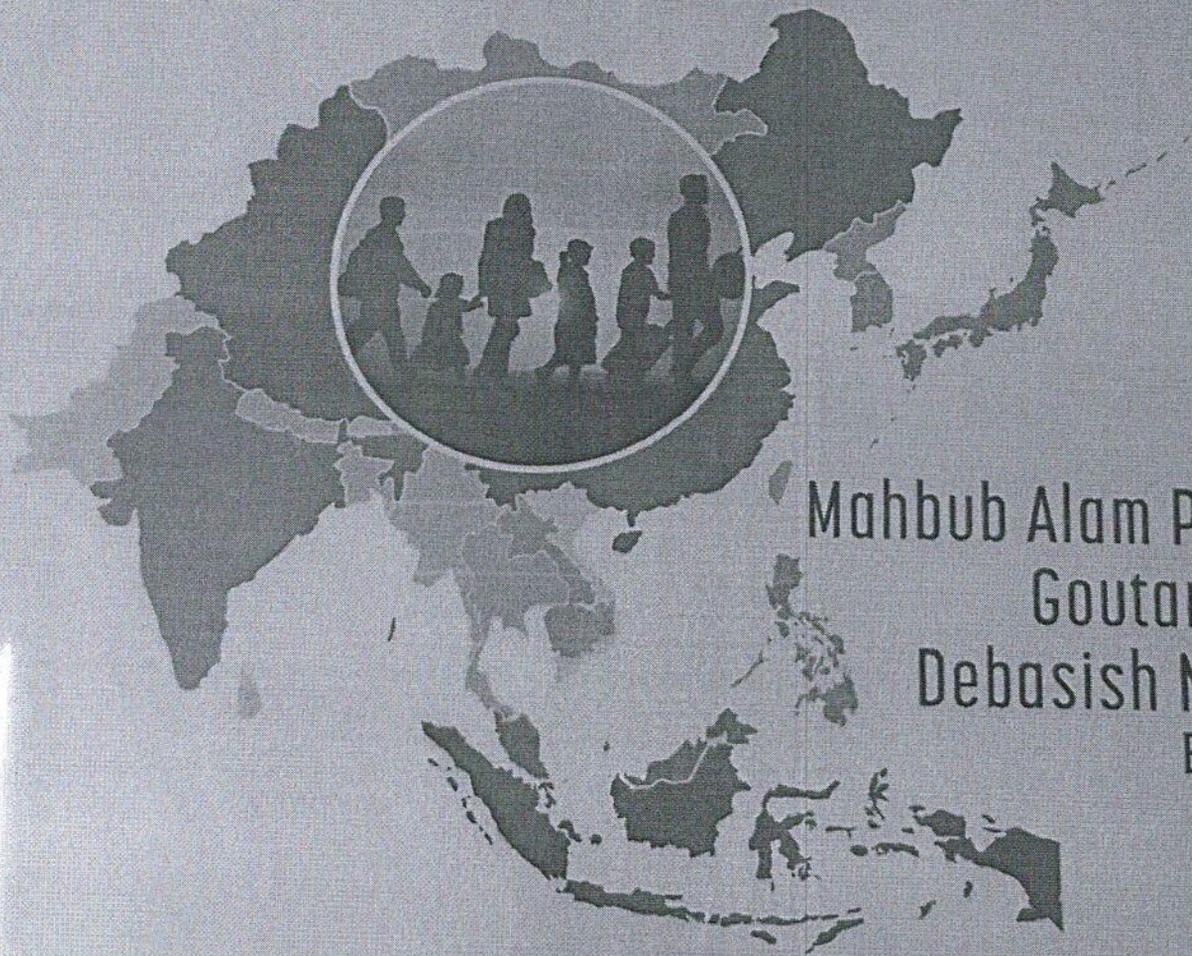
It is an interdisciplinary topic and also inter-related with various other disciplines in post-modern epoch. Philosophers, great thinkers, political scientist, intellectuals, statesman of different ages have been critically analysing and contemplating on the

EDUCATION IN A COMPETITIVE AND GLOBALIZING WORLD

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# REFUGEE EDUCATION IN SOUTH ASIA

policies, Practices, and Implications



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Chapter 6

**UNDERSTANDING REFUGEE EDUCATION:  
AN ASSESSMENT OF AFGHAN REFUGEES  
IN PAKISTAN AND INDIA THROUGH  
POLICY ANALYSIS**

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**ABSTRACT**

Education for Refugee children is one of the most sensitive issues in the world today. Due to conflict and persecution, Refugee children usually drop out of schools as they are forced to seek refuge in other countries. Refugees in some countries face numerous restrictions on their entrance in national schools and have access solely to unregistered, non-formal and informal schools. As a result, they are deprived of receiving the formal secondary and tertiary level of education. The emerging issues related to Afghan refugee education are also no exception in this regard. There are

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Rastratattwa : Drishtibhangi O Bitarka,  
Edited by Joyprokash Mondal & Subir Gayen

প্রথম সংস্করণ : অক্টোবর, ২০২১

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প্রকাশক এবং স্বত্বাধিকারীর লিখিত অনুমতি ছাড়া এই বইয়ের কোনও অংশেরই কোনও পুনরুৎপাদন বা প্রতিলিপি করা যাবে না। কোনও যান্ত্রিক উপায়ের (গ্রাফিক, ইলেকট্রনিক বা অন্য কোনও মাধ্যম যেমন ফোটোকপি, টেপ বা পুনরুদ্ধারের সুযোগ সম্বলিত তথ্য সংরক্ষণ করে রাখার কোনও পদ্ধতি) মাধ্যমে প্রতিলিপি করা যাবে না। কোনও ডিস্ক, প্লেট, পারফোরেটেড বা কোনও তথ্য সংরক্ষণের যান্ত্রিক পদ্ধতিতে পুনরুৎপাদন করা যাবে না। এই শর্ত লঙ্ঘিত হলে আইনি ব্যবস্থা গ্রহণ করা যাবে।

ISBN : 978-93-90873-68-5

এভেনেল প্রেসের পক্ষে সুভাষনগর, মেমারী, পূর্ব বর্ধমান থেকে অঞ্জন সাহা কর্তৃক প্রকাশিত এবং শরৎ ইম্প্রেশন প্রাইভেট লিমিটেড, ১৮ বি শ্যামাচরণ দে স্ট্রিট, কলকাতা-৭৩ থেকে মুদ্রিত।

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পার্টি সম্পর্কে মার্কসীয় দৃষ্টিভঙ্গি :  
লেনিন-লুক্সেমবুর্গ বিতর্ক

ড. সুকন্যা মুখার্জী

১৯৯১ সালে পূর্বতন সোভিয়েত ইউনিয়নের পতন ও তদানুকালীন বিশ্বরাজনৈতিক পরিস্থিতি মার্কসবাদী চিন্তাধারার অনুকল্পিত চিন্তাধারাগুলিকে রাজনৈতিক আলোচনার মূলস্রোতে আসতে সাহায্য করেছিল। আর সে কারণেই রাষ্ট্রবিজ্ঞান পাঠের জগতে মার্কসবাদ আলোচনা প্রসঙ্গে যে সকল উত্তর-মার্কসবাদীদের নাম উঠে আসে, তাদের মধ্যে রোজা লুক্সেমবুর্গ (১৮৭১-১৯১৯) অন্যতম।

জন্মসূত্রে পোলিশ রোজা লুক্সেমবুর্গ-র রাজনৈতিক জীবনের প্রাথমিক পর্যায়টি পোল্যান্ডের শ্রমিক আন্দোলনকে ঘিরেই আবর্তিত হয়েছিল। আর তারই ফলশ্রুতি ছিল ১৮৯৩ সালের মার্কসীয় চিন্তাধারাপুঙ্ক SDKP বা Social Democracy of the Kingdom of Poland রাজনৈতিক দলটির প্রতিষ্ঠা, যা পরবর্তীকালে পোল্যান্ডের কমিউনিস্ট শ্রমিক দলের সঙ্গে যুক্ত হয়। বলা বাহুল্য, রোজা লুক্সেমবুর্গ-র রাজনৈতিক চিন্তাধারার মূল বা প্রধান সত্ত্ব (essence) টি জার্মান সোশ্যাল ডেমোক্রেটিক পার্টি (এস.ডি.পি)-র বৈপ্লবিক সমাজতন্ত্র ও পরবর্তীকালে ১৯১৯ সালে রোজা ও তাঁর সহযোগী কার্ল লীবখেনশট (Karl Liebknecht)-এর সহায়তায় প্রতিষ্ঠিত জার্মান কমিউনিস্ট পার্টির কার্যকলাপকে কেন্দ্র করে আবর্তিত হয়েছিল।

রোজা লুক্সেমবুর্গ-র দার্শনিক দৃষ্টিভঙ্গির অন্তর্গত যে বিষয়গুলি বর্তমানকালেও অত্যন্ত গুরুত্বতার সাথেও আলোচিত হয়ে থাকে, তার মধ্যে উল্লেখযোগ্য হল, সমাজবাদ এবং গণতন্ত্র সম্পর্কে তাঁর স্বচ্ছ ধারণা এবং বিপ্লবের সাথে এই দুইয়ের সম্পর্ক। উল্লেখ্য, বিপ্লব, সমাজতন্ত্র, গণতন্ত্র, সাংগঠনিক কার্যকলাপের আদর্শবাদী চিন্তা রোজা লুক্সেমবুর্গ-কে যেমন এস.পি.ডি থেকে বেরিয়ে এসে স্বতন্ত্র জার্মান কমিউনিস্ট পার্টি গঠনে সহায়তা করেছিল, তেমনই তা লেনিন-রোজা বিতর্ককেও পুষ্ট করেছিল।

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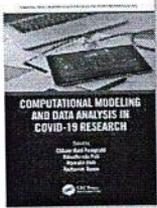


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Chapter

## Analysis of COVID-19 Data Using Consensus Clustering Technique

By *Arko Banerjee, Sunandana Mukherjee, Chhabi Rani Panigrahi, Bibudhendu Pati, Rajib Mall*

Book [Computational Modeling and Data Analysis in COVID-19 Research](#)

Edition 1st Edition  
First Published 2021  
Imprint CRC Press  
Pages 12  
eBook ISBN 9781003137481



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### ABSTRACT

On 11 March 2020, the World Health Organization (WHO) declared the Coronavirus disease (COVID-19) outbreak as a pandemic around the globe and advised all countries to step up their medical response to treat, detect, and reduce transmission of the disease to save people's lives. At present, nearly all countries in the world have been affected by COVID-19. However, so far no specific treatment, vaccine, or drug has been reported to cure COVID-19. To assist health management departments in containing the disease, data science and related technologies have been playing a crucial role in working out the best possible arrangements and responses to the pandemic. In this chapter, we report the use of a data mining technique called Consensus Clustering to analyze the COVID-19 data of India. The key purpose of this study is to design an unsupervised and robust method to measure the relative performances in containing the pandemic of all states and union territories of India hit by COVID-19. This analysis will help the health management departments to optimize government policies, decisions, medical facilities, treatment, etc., to reduce the spread of COVID-19 cases.

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# বিশ্ব শতকের বাংলা ছোটগল্প নির্মাণে - বিনির্মাণে

ড. মৃগালচন্দ্র হালদার

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# শরদিন্দু বন্দ্যোপাধ্যায়ের গল্প : আদিম; ঐতিহাস মিশরের দাম্পত্য সম্পর্ক ও সমাজ সাহিত্যে ইতিহাস অব্ধষণ

কল্পনা কর

ঐতিহাস মিশরীয় সমাজ সংস্কৃতির প্রেক্ষাপটে শরদিন্দু বন্দ্যোপাধ্যায়ের আদিম গল্প যেন আজ থেকে পাঁচ হাজার বছর আগের মিশরীয় সমাজের এক টুকরো জীবন্ত দলিল। আজকের মত সেই সমাজে বিবাহ নামক ঐতিহ্যটি অতীব গুরুত্বপূর্ণ ছিল। যেটি পারম্পরিক বিশ্বাস ও শাস্ত্রের ভিত্তিতে গড়ে ওঠে। আবার আজন্ম শালিত সেই পুরুষতত্ত্ব, যৌনতার ধ্যান-ধারণা, দাম্পত্য, অলৌকিক শক্তির ব্যবহার এই বিষয়গুলি ও চমৎকারভাবে উঠে এসেছে এই গল্পে। ঐতিহাসিক গুরুত্ব বিচারে এই গল্পটি লেখকের সার্থক প্রয়াস।

ঐতিহাসিক গল্পে মূলত বিশেষ কোন সময়ের বা ঘটনার পটভূমিতে চরিত্র গুলির কথোপকথনের মাধ্যমে কাহিনীর বিন্যাস ঘটানো হয়। লেখক ভাষা ও শব্দপ্রয়োগকে যুগোপযোগী করে সেই বাস্তবতাকে প্রাঞ্জল করে তোলেন। শরদিন্দু বন্দ্যোপাধ্যায়ের আদিম এরকমই একটি ঐতিহাসিক গল্প। গল্পটির কেন্দ্রভূমি আজ থেকে পাঁচ হাজার বছর আগেকার মিশর। গল্পটির বিষয়বস্তু মরুভূমির পরপ্যায় মহারাজা সূর্যেশ্বরের শত্রু রাজ্য জয় করে ধনরত্ন ও সহস্র বন্দী বন্দিনী নিয়ে নিজ রাজ্যে ফিরছেন। যার মধ্যে একশত বন্দি ও বন্দিনী তিনি নিজে বেছে নেন এবং বাকি যারা থাকবে তাদের প্রধান সেনাপতি থেকে নিম্নতম নায়ক পর্যন্ত সকলে পদমর্যাদা অনুযায়ী ভাগ করে নেবে, ধনরত্ন ও ভাগ বাটোয়ারা হবে। ঐতীন মিশরের ইতিহাসে বিশেষ করে নিউ কিংডম এর সময় অধিশিত্তির একটি গুরুত্বপূর্ণ বৈশিষ্ট্য ছিল এই দাস ব্যবস্থা। সাধারণত যুদ্ধবন্দীরাই দাস হিসেবে ব্যবহৃত হতো। তাদের সম্পত্তি বা পণ্য হিসাবে কেনাবেচা চলত। আবার কখনও কখনও মহাজনের ঋণের জালে আবদ্ধ হয়েও দাস হিসেবে তারা জীবন কাটাতে। এবং এরা প্রতুর বাড়িতে কাজ করতো। আবার কোন দাসের যদি বিশেষ কোনো দক্ষতা থাকত তাহলে সে আনাদা করে ওরুত পেত। তারা কখনো কারিগর হিসেবে, লেখাপড়া জানা থাকলে প্রতুর এগ্রেস্টের ম্যাগেজকে হিসেবে আনার সন্দেহে নিরীক

স্বাধীন জীবন ছিল না।

এই কাহিনীর মুখ্য চরিত্র সোমভদ্র নামে এক কনিষ্ঠ সেনানী, যার “বয়স একশ বাইশ, বলিষ্ঠ দেহ, ত্রা ফলকের ন্যায় দেহবর্ণ : সুন্দর আকৃতি।” রাজার সাথে এই প্রথমবার সেও যুদ্ধযাত্রা করেছিল। যুদ্ধে তাঁর অসীম পরাক্রমে সে রাজা সহ প্রধান সেনানায়কদের যথেষ্ট প্রশংসা পেয়েছ। পরদিন তারা কৃষ্টিত দ্রব্যের অংশ এবং দু-একটি দাস-দাসী পেয়ে মহানন্দে গৃহে ফিরবে। কিন্তু আমরা দেখি সোমভদ্রের মনের অবস্থা অন্যরকম। তার মন চঞ্চল। “সম্মুখে নীয়মান পতাকার ন্যায় তাহার মন পিছন দিকে তাকাইয়া আছে।” তার অন্যতম কারণ ই বন্দিনী দের মধ্যে মেরুকা নামে এক বন্দিনী আছে, যাকে সোমভদ্রের ভালো লেগেছে। যদিও সে কথা পরিষ্কার করে তাকে বলা হয়নি তার। এরকম অবস্থায় সোমভদ্র মেরুকার সাথে দেখা করে, নির্ভর নিয়তির পরিণতিতে নিমজ্জিত অসহায় হতাশাগ্রস্ত মেরুকাকে ভগিনী সম্বোধন করে, তাকে বিয়ের প্রস্তাব দেয় এবং জানায় নিয়ম অনুযায়ী বিজয়ী সেনানীর একটি বন্দিনী প্রাপ্য, সেই মতো সে মেরুকাকেই বেছে নেবে, তারপর বাড়ি নিয়ে গিয়ে তাকে বিয়ে করবে। এখানে বলে রাখা প্রয়োজন বিবাহ নামক ঐতিহ্যটি সমাজে খুবই গুরুত্বপূর্ণ ছিল। মিশরীয় সমাজ ছিল স্তরবিভক্ত। যার ওপরে ছিল রাজা ও অভিজাত পরিবারে সাধারণ মানুষ। এক বিবাহ সমাজে গুরুত্ব পেলেও রাজা ও অভিজাত পরিবারে বহু বিবাহে কোন বাধা ছিল না বরং সেটাই ছিল স্বাভাবিক দস্তুর। যৌনতা সম্পর্কে ঐতীন মিশরীয়দের ধারণা বেশ আকর্ষণীয়। তাদের মধ্যে কুমারীত্বের ধারণা কিন্তু দেখা যায় না এবং নারী বা পুরুষ উভয়ই বিবাহ পূর্ব সম্পর্কে লিঙ থাকতে পারতো। এ নিয়ে সমাজে কোনো বাধা-নিষেধ ছিল না। যদিও বিবাহ পরবর্তী বিবাহ বহির্ভূত সম্পর্ক সমাজে নিষিদ্ধ ছিল।

ঐতীন মিশরে নারীকে ভগিনী হিসেবে সম্বোধন করার প্রথা ছিল এবং বিশেষ করে রাজকীয় পরিবারে ও অভিজাত পরিবারের সহোদর সহোদরার বিবাহ রীতি প্রচলিত ছিল। এর একটা কারণ সম্পত্তি যাতে নিজেদের মধ্যেই থাকে এবং দ্বিতীয়ত যে কারণটি সেটি হল, তারা মনে করত বিয়ের ফলে ভূমিষ্ঠ লিঙ জননীর রক্তধারা পায়, তাই সে কারণে তারা পরিবারের বাইরে অন্যত্র বিবাহে উৎসাহী ছিল না। যদিও সাধারণের ক্ষেত্রে এই নিয়মটা সব সময় খাটতো না।

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ISBN: 978-93-91345-86-0

Published by : Satyam Law International, 2/13, Ansari Road, Daryaganj,  
New Delhi-110002, India

Phones : 0091-11-40391920, 23242686, 23245698

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First Published April 2022

ISBN: 978-93-91908-97-3

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Chapter

## Availing Engineered and Biosynthesized Metal-Based Nanoparticles to Alleviate Abiotic Stress

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Edition	1st Edition
First Published	2022
Imprint	CRC Press
Pages	19
eBook ISBN	9781003258063

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## ABSTRACT

Anthropic climate change factors lock the global agri-food sector into a 'vicious cycle' of crop yield penalty, food insecurity, increased crop production, environmental deterioration, and intensifying public health issues. Drought, submergence, temperature extremes, salinity, and heavy metal toxicity are major abiotic stresses that are detrimental to the growth and productivity of economically important crop plants. Contextually, integrating nanotechnology with agricultural practices offers an immediate, climate-smart solution for sustainable agriculture and breaking the crop yield barrier. The present chapter reviews how engineered and biosynthesized metal/metal oxide nanoparticles (NPs) have been employed as nanobiosensors, foliar sprays, nutritional supplements, or stimulants and in seed priming, to ameliorate diverse abiotic stresses. Contrary to their bulk counterparts, the unique physiochemical attributes of NPs like size, shape, surface properties, and solubility, augment their bioavailability, bioactivity, and, particularly, radical scavenging potential, which is crucial for containing stress-induced oxidative damage. NP application positively impacts plant biomass, photosynthetic performance, and nutrient acquisition, enhances antioxidant potential, affects sugar and amino acid metabolism, and orchestrates hormonal signalling. Owing to the versatile multilevel and multimodal control over stress signalling responses, coupled with the prospects of developing into a durable technology, metal-based NPs can be exploited as agrochemical alternatives for ensuring multistress tolerance in plants.

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কল্পিত কর

সারাংশ :

ব্রিটিশ বিরোধী আন্দোলন এদেশে নানান ধারায় যেমন প্রবাহিত হয়েছে তেমনি পুরুষদের পাশাপাশি নারীরাও বিভিন্ন সময় বিভিন্নভাবে আন্দোলনকে শক্তিশালী করেছেন। কখনও বা অন্তরের স্বতঃস্ফূর্ত তাগিদে হাতে রিভলভার তুলে নিয়ে সামনাসামনি মোকাবিলা করেছেন। কখন বা আড়ালে থেকে বিপ্লবী কর্মকাণ্ডকে প্রেরণা যুগিয়ে গেছেন। এরকমই সশস্ত্র আন্দোলনের নির্ভীক যোদ্ধা ছিলেন সুনীতি চৌধুরী। মাত্র চোদ্দো বছর বয়সে যিনি প্রত্যক্ষ সংগ্রামে যোগ দিয়ে কুমিল্লার ম্যাজিস্ট্রেটকে হত্যা করেন, যা তাকে সর্ব কনিষ্ঠ সশস্ত্র মহিলা বিপ্লবী হিসাবে জাতীয় সংগ্রামের ইতিহাসে চিরস্মরণীয় করে রাখবে। এই নিবন্ধ তার প্রতি শ্রদ্ধার্ঘ্য।

ভারতের জাতীয় সংগ্রামের ইতিহাস সশস্ত্র বিপ্লবী আন্দোলন ছাড়া কখনই সম্পূর্ণ হতে পারে না। যে সব বিপ্লবী নারী, পুরুষদের সাথে একযোগে অস্ত্র ধারণ করে ছিলেন দুঃখের কথা ইতিহাসের পাতায় তারা আজ তেমন ভাবে চর্চিত নন। যে অদৃশ্য বেড়ি তাদের পায়ে আবহমান কাল ধরে পরিয়ে আসা হচ্ছে যখনই সে বেড়ি ভেঙ্গে তারা বেরিয়ে এসেছে সমাজ তাদের উপযুক্ত প্রাপ্য থেকে বঞ্চিত করেছে। আজও আমরা কজন মহিলা বিপ্লবীর নাম জানি অথবা তাদের নিঃস্বার্থ ত্যাগের কথা মনে করি। মুক্তি সংগ্রামে যে মহিলারা ঝাঁপ দিয়েছিলেন, ভারত স্বাধীন হওয়ার পর যারা বেঁচে ছিলেন তাদের কি হল? যা দিয়েছিল কতটুকু তারা ফিরে পেল?

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ISBN : 978-93-94806-10-8

প্রকাশক :

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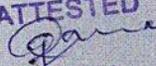
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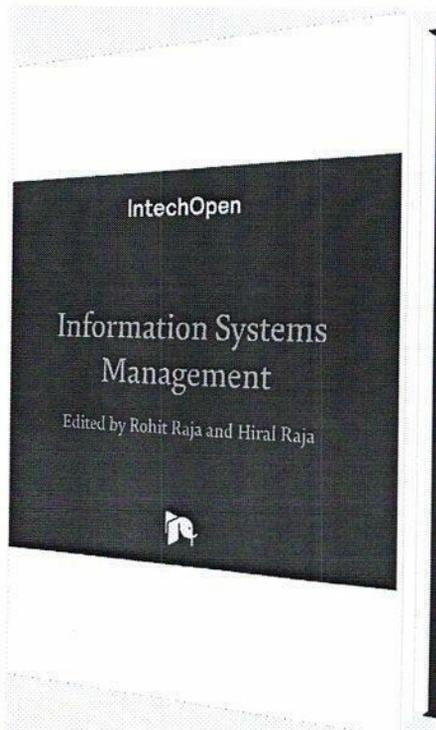
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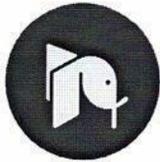
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India**PUBLISHED**

18 October 2023

**DOI**

10.5772/intechopen.100784

**ISBN**

978-1-80355-652-9

**PRINT ISBN**

978-1-80355-651-2

**EBOOK (PDF) ISBN**

978-1-80355-653-6

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2023

**NUMBER OF PAGES**

198

This book is intended for the technical reader who works with large volumes of data. Written by experts in information systems management, the book includes chapters on software development, cloud implementation, networking, and handling large datasets, among other topics. Blockchain and artificial intelligence (AI) are the foundations of automated systems and the authors provide their viewpoints ...

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# Research Trends in Library and Information Science in India during 2011 to 2018

*Sutapa Paul and Bapan Kumar Maity*

## Abstract

Bibliometric analysis analyzes the research activity based on the doctoral theses that were submitted to the Shodhganga repository from 2011 to 2018 to determine the research trends in library and information science (LIS) in India. The findings demonstrate a shift in academic attention from fundamental LIS subjects to computer applications. Based on the data from Shodhganga, the INDCAT database, Vidyanidhi, and University News, this paper examined 612 PhD theses that were submitted at various universities in India during the course of these eight years.

**Keywords:** LIS research, research in LIS, PhD theses, research trend, LIS research-India

## 1. Introduction

The development of LIS as a field of study began with the basic skills of classification, cataloging, indexing, reference, bibliographical search, and professional values. Dr. S.R. Ranganathan played a vital role in the development of library education, libraries, and the library profession in India. Formal LIS education in India is nearly 100 years old.

In this study, an attempt has been made to assess the year-wise and subject-wise growth of new conceptual research in LIS, particularly during the period 2011–2018. This is a bibliometric study, which identifies the recent trend in LIS education in India by analyzing the doctoral thesis uploaded in the Shodhganga repository during the year 2011 to 2018.

Shodhganga is a reservoir of electronic theses, and dissertations are primary sources of research materials that originate from doctoral theses/dissertations submitted to the universities for the award of a PhD degree. It is mandatory to submit an electronic version of theses and dissertations by the researchers in universities to a national repository with an aim to facilitate open access to Indian theses and dissertations to the academic community worldwide.

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## Tools and Approaches for Assessing Stress-Responsive Secondary Metabolites to Design Climate-Smart Crops

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Edition	1st Edition
First Published	2023
Imprint	Apple Academic Press
Pages	66
eBook ISBN	9781003346173



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## ABSTRACT

Agricultural environments are constantly jeopardized by abiotic stresses, including periodical droughts, temperature extremes, water deficit, flooding, salinity, and changes in atmospheric CO<sub>2</sub> levels. These agro-climatic factors severely affect crop quality, productivity, and yield. Crop plants' responses to such drastic climatic stresses involve alterations in gene expression and extensive metabolic reprogramming, impacting their proteome and metabolome. Thereby, the plants ensure metabolic homeostasis and improved stress tolerance. Among multiple adaptive responses, the production and accumulation of low molecular weight, chemically diverse, bioactive, 306exogenous, and endogenous secondary metabolites (SMs) are noteworthy. Metabolites are spatio-temporal chemical footprints of the cellular state under particular physiological or developmental conditions that reflect the complex crosstalk between genotype and the environment. Consequently, it is imperative to conduct a qualitative and quantitative assessment of the multi-parametric metabolic responses, analyze reconfigured metabolic networks under diverse stress conditions, and identify the underlying candidate genes in various metabolic biosynthetic pathways. Herein, we discuss the advances in analytical methods and sequencing technologies which offer high-throughput, cutting-edge, and cost-effective techniques for systematic identification of SMs and genetic dissection of commercially important agronomic traits. Integration of metabolomics with transcriptomics allows large-scale metabolite profiling with desirable accuracy and coverage, and mapping of trait-specific markers with high confidence levels, respectively. Inferring from large volumes of multi-omics data facilitates the identification of metabolic biomarkers and enables informed decision-making for crop breeding programs, which aim to develop climate-smart future crops with enhanced fitness, improved productivity, and increased stress tolerance.

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# Sustainable Industrial Wastewater Treatment and Pollution Control

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Includes theoretical and applied technologies

Emphasizes the potentiality and economic achievability

Bridges knowledge gaps between academia and industry

991 Accesses | 1 Citations

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## About this book

This book summarizes the advanced sustainable trends in removing toxic pollutants by environmental and biotechnological processes from both industrial wastewater and sewage wastewater. The book also provides an assessment of the potential application of several existing wastewater bioremediation techniques and introduces new cutting-edge technologies. Among other valuable information covered, here are the methods, procedures, materials (especially low-cost materials originating

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from industrial and agricultural waste), management of wastewater containing toxic pollutants, and valorization possibilities of waste resulting from the removal of toxic pollutants from wastewater.

Tonnes of hazardous waste pollutants released by industries are a challenge worldwide. With the ever-growing population and shrinking landfill areas, managing the disposal of pollutants is a matter of severe concern. Industrial wastewater treatment, recycling, and reuse are serious issues in today's context, not just to protect the environment from pollution, but also to conserve water resources so that water stress is reduced.

This book is designed for engineers, scientists, and other professionals and serves as a good summary of the current state-of-the-art and innovative research challenges to control pollution for coming generations.

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## Keywords

**Wastewater treatment**   **Bioremediation**   **Biodegradation**  
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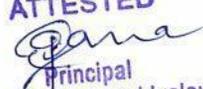
## About the editor

Dr. Maulin P. Shah is interested in genetic adaptation processes in bacteria. He has more than 350 research publications in highly reputable national and international journals. He directs the research program at Enviro Technology Ltd., Ankleshwar, India. He has guided more than 100 post-graduate students in various disciplines of life science. He is an active editorial board member in more than 150 renowned journals in the field of environmental and biological sciences. He was the founder and the editor-in-chief of the International Journal of Environmental Bioremediation and Biodegradation (2012–2014) and the Journal of Applied & Environmental Microbiology (2012–2014) [Science and Education publishing (SciEP), USA]. He is also serving as a reviewer for various journals of national and international repute. He has edited 225 books in the area of wastewater microbiology and industrial wastewater treatment.

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<b>Book Title</b>	<b>Editors</b>	<b>DOI</b>
Sustainable Industrial Wastewater Treatment and Pollution Control	Maulin P. Shah	<a href="https://doi.org/10.1007/978-981-99-2560-5">https://doi.org/10.1007/978-981-99-2560-5</a>
<b>Publisher</b>	<b>eBook Packages</b>	<b>Copyright Information</b>
Springer Singapore		

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 E.M. Bypass, Baghajatin  
 Kolkata-700094

Earth and Environmental Science, Earth and Environmental Science (R0) The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2023

**Hardcover ISBN**

978-981-99-2559-9

Published: 28 June 2023

**Softcover ISBN**

978-981-99-2562-9

Due: 12 July 2024

**eBook ISBN**

978-981-99-2560-5

Published: 27 June 2023

**Edition Number**

1

**Number of Pages**

VI, 255

**Number of Illustrations**

12 b/w illustrations, 18 illustrations in colour

**Topics**

Waste Management/Waste Technology, Water, general, Applied Microbiology, Nanotechnology, Pollution, general, Sustainable Development

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# A Beginner's Companion of SageMath

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E.M. Bypass, Baghajatin  
Kolkata-700094



**ACADEMIC PUBLISHERS**

5A Bhawani Dutta Lane, Kolkata-700073

E-mail : [contact@academicpublishers.in](mailto:contact@academicpublishers.in)

Website : [www.academicpublishers.in](http://www.academicpublishers.in)

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First edition : June 2023

ISBN : 978-93-93662-24-8

Price : Rupees three hundred and fifty only

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Principal  
Sammilani Mahavidyalaya  
E.M. Bypass, Baghajatin  
Kolkata-700094

Published by Bimal Kumar Dhur of Academic Publishers, 5A Bhawani Dutta Lane, Kolkata-700073.  
Laser type setting by Studio Michaelangelo, 5A Bhawani Dutta Lane, Kolkata-700073 and printed  
at Rajendra Offset & Graphics, 11 Panchanan Ghosh Lane, Kolkata-700009.