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FOREWORD

Dr. Sobhan Niyogi

Associate Professor and Officer in Charge
Krishnagar Government College

*It gives me immense pleasure to announce that volume XI of **Conscientia**, the academic journal of Krishnagar Government College is being published. Over the past 176 years- ever since the days of the East India Company rule to the present, this college has uninterruptedly carried forward the legacy of quality education in India. Today about 3,500 students enjoy the privilege of using and sharing the same abode of learning that greats such as D.L.Roy, Umesh Dutta, Jadunath Mukherjee, Jadunath Bhattacharjee, Lalit Kumar Banerjee, Satish Chandra Dey and a host of others have used in bygone decades. Teachers deliver lectures from the podium which had once been used by stalwarts like Pandit Madan Mohan Tarkalankar, Babu Ramtanu Lahiri, Suresh Chandra Sengupta and many other names remembered with reverence. I personally feel honoured at obtaining the opportunity to further promote the excellence of this heritage institution, which has witnessed more than 70 eminent Principals (like Roy Bahadur Jyoti Bhusan Bhaduri, Satish Chandra Dey, J.M. Sen and several others) over the course of its 176-year old history thus far. In less than the last ten years this College has secured “A” grade twice in NAAC evaluation and very recently the University of Kalyani has declared this College as the “Best Performing College” of Nadia District. The faculty members of the College have been contributing significantly in academic research through regular publications at various levels.*

***Conscientia**, the interdisciplinary journal of research findings launched by our College in 2011 strives to publish high quality articles, since the time of its inception. This journal is an interdisciplinary and multilingual publication and articles include scientific research findings, socially relevant issues as well as literary contributions from the various Humanities Departments. This volume is expected to evoke interest among myriad groups of readers, who will hopefully find the articles academically enriching and stimulants for intellectual discourse.*

I wish to thank all the contributors from various Higher Educational Institutions for their submissions, the Editorial Board Members from our College, the Advisory Board Members from various well known Universities and Institutes of West Bengal and India for their active role for the publication of this particular volume.

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Synthesis, X-ray Rietveld Analysis of Rare earth Double Perovskite Compound Ba_2NdSbO_6

Aksar Ali Biswas¹

ABSTRACT

The polycrystalline rare earth double perovskite compound Ba_2NdSbO_6 was synthesized using conventional solid state reaction method and characterized systematically through powder X-ray diffraction and its Rietveld refinement. The XRD profile was analyzed by Rietveld method using a FULLPROF software suite to determine the crystalline phase of the sample. From the analysis of Rietveld refinement, we could confirm that this compound is in single-phase and crystallized in perovskite type structure with cubic space group $O^5h-Fm\bar{3}m$. The lattice parameter obtained from this refinement is 8.54675 Å. From the X-ray diffraction peaks, the crystallite size was estimated using Scherrer's formula and was thus found to be 47.6nm. The average crystallite size is ~37.5nm.

Keywords: Rare earth, Perovskite, X-Ray diffraction, Rietveld Refinement

Introduction

The rare earth perovskite compounds with chemical formula ABO_3 have attracted a great deal of attention due to its wide variety of interesting and potentially fruitful physical properties, where 'A' typically represents a large electropositive cation, B represents a small transition metal or main group ion [1]. The ideal cubic perovskite can be described as an infinite number of corner sharing BO_6 octahedra with the twelve-coordinated 'A' cation site in the center of 8 such octahedra [2]. This compound has a great compositional flexibility so that it can accommodate almost all of the elements of the periodic table [3]. The ideal double perovskite structure with general formula $A_2BB'O_6$ is obtained when the 'B' cation is substituted by a B' cation in an ordered 1:1 fashion, doubling the unit cell. Now a days double perovskite system have been extensively studied for various thermo-physical properties, electrical properties etc. However, the investigations about the magnetic properties for this type of compound have been scarcely reported up to now. To get the information about the magnetic properties it is very necessary to know the structural information of the compound. Fu *et al.* [4] and Saines *et al.* [5] have reported the crystal structure of Ba_2NdSbO_6 with $R\bar{3}$ space group symmetry. Zhenget *al.* [6] and Wariaret *al.* [7] have reported the crystal structure of Ba_2NdSbO_6 with cubic $Fm\bar{3}m$ symmetry. But they have not mentioned the detailed structural information of the compound. So first of all our aim in this

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study is to synthesize the rare earth $\text{Ba}_2\text{NdSbO}_6$ compound and then analyse its structural formation through x-ray rietveld refinement method.

Sample preparation: The polycrystalline rare earth double perovskite compound $\text{Ba}_2\text{NdSbO}_6$ was synthesized from high purity (>99%) chemicals BaCO_3 , Nd_2O_3 , and Sb_2O_5 using conventional solid state reaction technique. The powders were mixed stoichiometrically according to the chemical equation $4\text{BaCO}_3 + \text{Nd}_2\text{O}_3 + \text{Sb}_2\text{O}_5 = 2\text{Ba}_2\text{NdSbO}_6 + 4\text{CO}_2$. The mixer was then intensely hand ground for 10 h with a few drops of acetone. It was pelletized and then taken in an alumina crucible and finally calcined in air for a total 48 h in a high temperature muffle furnace at 1400°C . After sintering, the furnace was turned off for natural cooling to room temperature. The sintered sample was re-ground with repeated intermittent grinding and pelletizing between the two sintering processes. Finally, we obtained the white powder for the sample.

X-ray Diffraction and Rietveld refinement: The X-ray diffraction (XRD) patterns of the sintered powder sample was carried out at room temperature to identify the crystalline phase of $\text{Ba}_2\text{NdSbO}_6$ using a Rigaku Miniflex 600 bench-top powder diffractometer which is operated at 40 KV and 15 mA with $\text{CuK}\alpha$ radiation of wavelength $\lambda = 1.5418 \text{ \AA}$. The powder x-ray diffraction data was collected by scanning in broad range of $2\theta = 10-90^\circ$ at 0.02° step intervals and also with a speed rate of $2^\circ/\text{min}$. The XRD obtained were analyzed by Rietveld refinement method using Fullprof software [8] introducing the atomic information setting the origin at Sb-site ($3m$) and the space group of the cubic perovskite structure model $Fm\bar{3}m$ with corresponding symmetry operators generated automatically. A Pseudo-Voigt function was introduced to produce the line shape of the diffraction peaks. The lattice parameter, scale factor, shape parameters, U , V , and W -factors, overall Debye-Waller B -factor, and oxygen positional x parameter etc. were varied consistently and simultaneously throughout the refinement to obtain the best profile matching.

Fig. 1 shows the X-ray diffraction patterns of the sintered compound $\text{Ba}_2\text{NdSbO}_6$. A quite narrow, sharp and symmetrical XRD peaks are found. This implies that the particle size is in the micro-region. Scherrer's formula $d = \frac{0.9\lambda}{\beta \cos\theta}$ [9], where λ = wave length of the X-ray, θ = Bragg angle, β = Full width at half maxima (in radians) of the most intense peak of XRD pattern, is used to estimate the crystallite size of the sample. β is related to σ , the standard deviation of the Gaussian distribution, given by $\beta = 2\sqrt{2\ln 2}\sigma$. Using the data for the (220) peak of the XRD pattern, the values of d are estimated to be 47.6 nm and was consistent with the compounds $\text{Ba}_2\text{DySbO}_6$ and $\text{Ba}_2\text{GdSbO}_6$ perovskites [10]. We have also estimated the particle size of this compound using (400), (422), (440) and (620) peaks of the XRD pattern and found to be 43.3 nm, 35.5 nm, 31.0 nm, 30.4 nm, respectively. Therefore, the average crystallite size is ~ 37.5 nm.

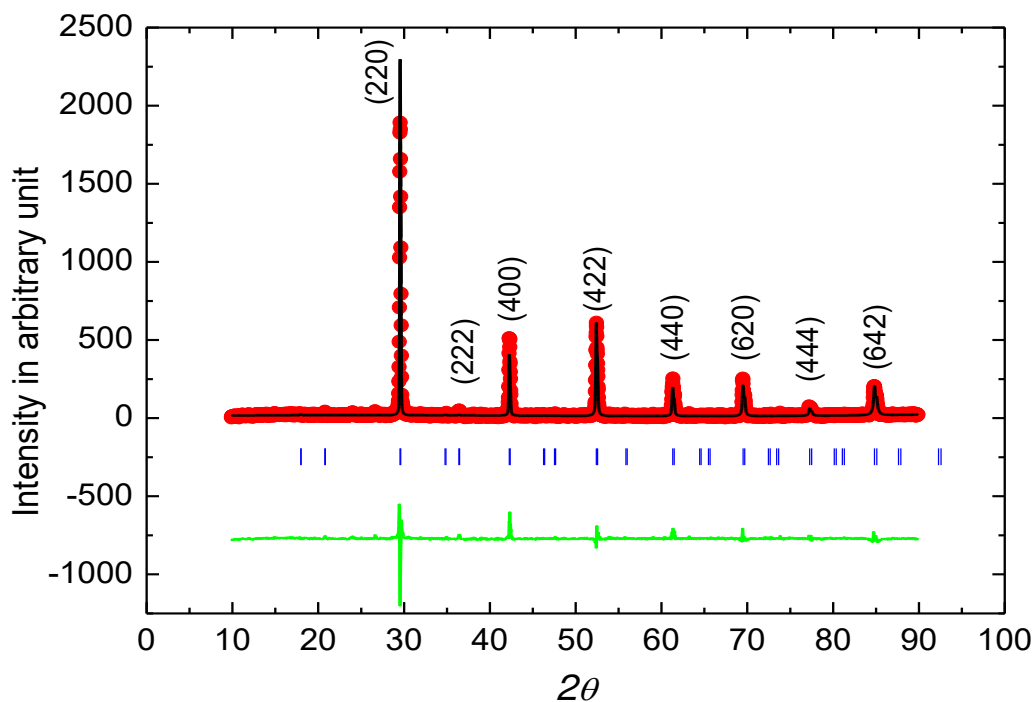


Figure1. X-ray diffraction profiles of $\text{Ba}_2\text{NdSbO}_6$: observed (red circular points), calculated (black solid line) using FullProf, and the difference (green line). Vertical marks (in green) correspond to the allowed Bragg reflections of $Fm\bar{3}m$ cubic space group symmetry. The most significant and intense reflections are mentioned only.

The conventional Rietveld refinement particulars, the structural parameters, bond length etc. for $\text{Ba}_2\text{DySbO}_6$ compound are summarized in Table 1. The difference between the observed and refined profiles are shown in Fig. 1 for this compound. Theoretical Bragg positions appropriate to the $Fm\bar{3}m$ space group symmetry are also indicated for comparison. The agreement between the observed and calculated profiles is excellent and the final structural particulars (Table.1) are satisfactorily well and in good agreement with other double perovskites reported so far [10]. The impurity, if any, is very nominal. Hence from this analysis, we could confirm that all these samples are in single-phase and crystallized in $\text{A}_2\text{BB}'\text{O}_6$ double perovskite type structure with $Fm\bar{3}m$ cubic space group symmetry. The perovskite structure was constructed and presented in Fig. 2 using the atomic coordinates which are mentioned in Table 1. The obtained lattice parameter for $\text{Ba}_2\text{DySbO}_6$ is 8.54675 Å which is consistent with the previous reports [6,7,10].

From Table 1, it is clear that the lattice parameter increases with six coordinated Nd^{3+} ionic radius [11]. It is also found in the literatures [12,13,14,15,16,17] that lattice parameter increases linearly with ionic radius for the series of cubic Ba_2RSbO_6 ($\text{R}=\text{Sm, Gd, Dy, Ho, Er, and Y}$) compounds. The effective bond lengths $\text{Nd}-\text{O}$, $\text{Ba}-\text{O}$ and $\text{Sb}-\text{O}$ of $\text{Ba}_2\text{NdSbO}_6$ compound can be determined assuming compact packing of the atoms and using the ionic radii [11] of Nd^{3+} ($r_{\text{Nd}^{3+}}=0.983$ Å), Ba^{2+} ($r_{\text{Ba}^{2+}}=1.61$ Å), Sb^{5+} ($r_{\text{Sb}^{5+}}=0.6$ Å) and O^{2-} ($r_{\text{O}^{2-}}=1.4$ Å) ions and they are found to be 2.383 Å, 3.01 Å and 2.0 Å,

respectively and they are also quite consistent with corresponding reitveld refined values (Table 1). The systematic variations of bond lengths and bond angles between constituent ions of $\text{Ba}_2\text{NdSbO}_6$ are also compiled and compared with other perovskite compounds $\text{Ba}_2\text{DySbO}_6$ and $\text{Ba}_2\text{GdSbO}_6$ in Table 1.

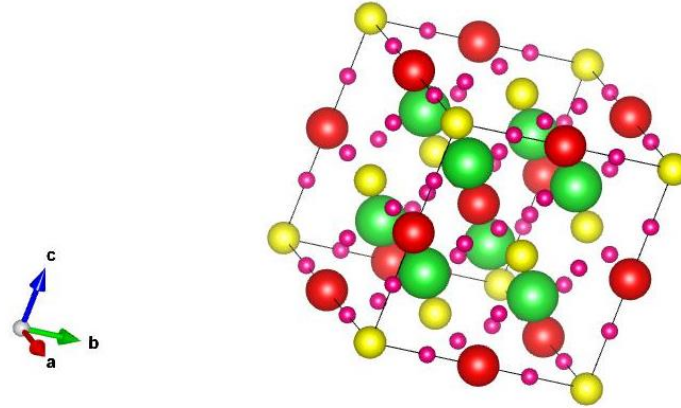


Figure 2. Conventional unit cell of $\text{Ba}_2\text{NdSbO}_6$ with $Fm\bar{3}m$ cubic space group symmetry. Green, yellow and pink colours represent Ba ($8c$), Nd ($4a$), Sb ($4b$) and O ($24e$) ions, respectively.

Table 1: Atomic positions, ionic radius of R-site ions, lattice constant, density, oxygen x -parameter, refined structural parameters, inter-ionic bond distances and bond angles of the Ba_2RSbO_6 double perovskites (R=Nd, Dy, Gd)

	$\text{Ba}_2\text{NdSbO}_6$ (this work)	$\text{Ba}_2\text{DySbO}_6$ [10]	$\text{Ba}_2\text{GdSbO}_6$ [10]
Atomic positions			
Ba($8c$)	(0.25, 0.25, 0.25)		
R($4a$)	(0, 0, 0)		
Sb($4b$)	(0.5, 0.5, 0.5)		
O($24e$)	($x, 0, 0$)		
$r(R^{3+})$ [\AA][11]	0.983	0.912	0.938
a_0 [\AA]	8.5467	8.4289	8.4727
ρ_x [gm/cm^3]	6.093	7.265	7.09
x -parameter	0.2633	0.2642	0.2677
R_{Braggs}	11.35	14.6	16.8
R_F	22.45	22.5	20.8

χ^2	1.51	1.08	1.02
Bond-distance (Å)			
Sb-O	2.25051	1.9875	1.9682
R-O	2.02283	2.2269	2.2681
Ba-O	3.02385	2.9824	2.9993
R-R	6.04341	5.96	5.991
Bond-angle [°]			
R-O-O	45	45	45
Ba-O-R	92.1	87.7	87.1

Conclusions: The rare earth double perovskite $\text{Ba}_2\text{NdSbO}_6$ compound was synthesized using the solid state reaction technique. This compound was characterized systematically through powder X-ray diffraction and its Rietveld analysis. The rietveld refinement of XRD pattern showed a good agreement with observed results. From the analysis of refinement, we could confirm that this compound is in single-phase and crystallized in perovskite type structure with cubic space group $O^5h-Fm\bar{3}m$. The lattice parameter obtained from this refinement is 8.54675 Å. From the X-ray diffraction peaks, the crystallite size was estimated using Scherrer's formula and was thus found to be 47.6nm. The average crystallite size is ~37.5nm.

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Is Governor Indispensable for Indian Federal System? An analysis

Animesh Mandal¹

ABSTRACT

According to Indian Constitution, the head of the State is called the Governor, who is the constitutional head of the state as the President is for the whole of India. The role played by governor is very important in Indian federal system because he serves as a bridge between central government and state government. But the office of the Governor during 1950-2023, we find that it was the involvement of the governor in active state politics of the states which made of the office subject to considerable public criticism. The Governor of a State is not elected but is appointed by the President and hold his office at the pleasure of the President. The functions and power of the Governor may be conveniently discussed under five heads. But There are numerous examples of the Governor's being abused, usually at the behest of the ruling party at the Centre. In this regard, the post loses its dignity rather in course of time the role of governors faces questions. So, discussion is needed whether there is any relevance of the post of governor appointed by central government because the Governor had become a party appointment, serving the party rather than the interest of the nation. In this paper, an attempt is made to examine Is Governor Indispensable for in Indian Federal System.

Keywords: Constitution, active, pleasure, dignity, nation

Introduction

The Governor is the 'Linchpin of the constitutional apparatus of the state'.... His role 'has emerged as one of the key issues in union-state relation'.... he has been criticized for want of 'impartiality and sagacity' and for being used by the central Government 'for its own political ends' [1].

---Sarkaria Commission Report

The Governor (Rajyapal) is the constitutional head of state Government in a formal sense, in a real sense he is an agent or a representative of the Centre. He plays a two-fold role set in two capacities- as the constitutional Head of State Government and as a link between the Centre and State Government. In normal times, he acts like an effective instrument of the Centre, in abnormal times, he he dealing with the problems of State Government he does, as far as possible, according to the wishes of his real masters sitting in New Delhi [2]. In this regard, the function of the Governor shall be to lubricate the

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machine of the Government, to see that its wheels are going on well by reason not of his interference, but of friendly, co-operation. But the study of the operational aspect of the office of the Governor during 1950-2023, we find that it was the involvement of the governor in active state politics of the states which made of the office subject to considerable public criticism [3].

According to Indian Constitution, The Governor of a State is not elected but is appointed by the President. He holds his office for five years unless he resigns or is removed by the President at whose 'pleasure' he holds the office. However, article 361 in Constitution of India, no criminal proceedings whatsoever shall be instituted or continued against the Governor of a State, in any court during his term of office. Further, no process for the arrest or imprisonment of the Governor of a State, shall issue from any court during his term of office. Similarly, no civil proceedings in which relief is claimed against the Governor of a State shall be instituted during his term of office in court. However, every Governor and every person discharging the functions of Governor has to take an oath to faithfully execute the office and to preserve, protect and defend the Constitution and the law (article 159).

The functions and power of the Governor may be conveniently discussed under five heads: executive, legislative, financial, judicial and discretionary. A comprehensive survey of the functions and powers of the Governor shows that he is more or less a nominal head like the President. On the other hand, the Constitution vests some 'discretionary power' to the Governor. The discretionary powers of the Governor refers to the special type of powers in exercising which the Governor is not required to consult the Council of Ministers or the Chief Minister. Article 163(1) of the Constitution says, there shall be a Council of Minister with the Chief Minister at the head to aid and advice the Governor in the exercise of his function, except in so far as he is by or under this Constitution required to exercise his functions or any of them in his discretion.

Discretionary Power of the Governor: According to the Constitution the Governor enjoy four types of normal functions and powers, but the Governor has some powers in his discretion in the exercise of which he is not required to act on the advice of his ministers. These may be reckoned s under e.g. in (a) appointing a new Chief Minister in a situation where no single party or leader commands majority support; (b) dismissing a Ministry where it refuses to resign even after losing majority support in the house or after being defeated on a no confidence motion; (c) dissolution of the Assembly on the advice of a Chief Minister who has lost majority support; (d) determining the royalty for mineral licenses to District Council in case of tribal areas of Assam, under the Sixth Schedule; (e) advising the President of the failure of the constitutional machinery and to impose President's rule; and (f) giving or withholding assent to Bills, returning a Bill for reconsideration of the House/s or reserving it for the consideration of the President [4].

Examples of Misuse: There are numerous examples of the Governor's is abused, usually at the behest of the ruling party at the Centre.

Firstly, after the 4th General Elections S.V.D. (Sanyukt Vidhayak Dal) Government was formed under the leadership of Mr. Mahamaya Prasad Sinha, but due to defection, the S.V.D. lost majority. The Governor did not recommend the President rule and gave an opportunity to the Congress to form the Government. Opposition parties criticized this action of the Governor [5]. Secondly; one of the more famous examples was the dismissal of the SR Bommai (Janata Dal) government in Karnataka in 1989. Then The Governor refused to allow the democratically elected chief minister to prove his majority on the floor of the Assembly. Thirdly, Andhra Pradesh and Goa's governors, who dismissed the governments led by NT Rama Rao and Wilfred D'Souza, respectively, showed the same partisan attitude. Fourthly, Uttar Pradesh Governor Romesh Bhandari's actions were so blatantly partisan that he had to endure the Supreme Court's disgrace of being censured [6]. Finally, the most recent one (2018) is action taken by the governor while forming a government in Karnataka.

The Governor called a party to form the government, though it was not having a simple majority and gave some time to prove majority. But the Governor did not give the first preference to the other two parties with a post-poll alliance. Later this was solved with the intervention of the court. The office of the Governor will be less controversial and less politicised if conventions are established that persons appointed to the post should be acceptable to the state government and should be continued in office for their full term except for incompetence or proven in capacity to function [7]. Now a days a Controversy has been created over the new representatives nominated by centre to the states elected government. Today's the Raj Bhavans are turned into a centre of political asylum. The constitutional status and biasness are in the face of question, particularly when almost all opposition ruled states whereas the Governor is being used in the hands of the centre. This proneness is not shaped overnight. Just after the independence there was no active role of Governor as long as there are prevailed dominant party rule of Congress.

At the end of 50s the role of Governors becomes meaningful gradually at the time of forming non congress government. Its first step in to break the communist Government of Karala led by E.M.S Nambudripad. In an effort to break the united front Government Dharma Vira the then Governor of Bengal play a controversial role in the late 60s. This was an incident of limelight in the politics of the state. It is known to all, that how the governor is being used today. In course of the time the aggressive attitude of the ruling class is increasing. It has not the end it arise question and controversy over the selection of governor. It is supposed that the elect in the past of Governorship as it were a political award. But today the role of governors has created Controversy. It the Governors always threaten openly the elected Government on the basis of opposition complaints, criticises to the press against the elected Government daily and become centre of interest of the opposition that is not acceptable. In fact, the tenure of the Governor the agent of centre is in the hands of the Centre [8].

Indispensable or Not: In independence India, the post of Governor in a state is the British inheritance but after two decades of independence no problem or question did arise because both the central and

state government were under the governance of same party. But now a days the Raj Bhawans had been turned in to political place. Specially, in case of states governed by opposition parties, the constitutional dignity and impartiality of the governors had been compelled to face serious questions as they are being used by the central government. Not only in West Bengal, in similar other states, the governors marked themselves as the agent of ruling party of the central government. This system is being continued under the period of any government. In this regard the post loses its dignity rather in course of time the role of governors faces questions, So discussion is needed whether there is any relevance of the post of governor appointed by central government,

In independent India, no active role is apparent from the part of the governors how long in both state and central government Congress was in ruling position. Mahatma Gandhi met British governor Fredrick Rajor on 30th October, 1946. There was the government of Sohorawardi in state and the situation was in turmoil. The governor asked the question to Gandhi, "What do you ask me to do?" And the answer was "nothing your excellency." Actually, when the government was in power, there was nothing to do by the governor. In the post-independence period, after taking the charge of Madhya Pradesh, Pattavi Sitaramaiya said that his role was to host the invitees in Raj Bhawan. Sarojini Naidu described her post of governor of Uttar Pradesh as a "bird in golden cage." Vijoy Laxmi Pandit of Maharastra didn't find any relevance of the post of governor. Basically, there was smooth relationship between the Chief Minister of a state and the governor after two decades of independence [9].

However, the governors had started to be significant after the formation of state governments by the opposition parties of the central. Along with the germination of the power of regional parties, it became a trick of the ruling party of central government to use the post of governor. Though there was no active role of the governors in governance of the state government, but they became highly significance when there was problem of majority in state assemblies. There are several instances in this regard regarding the role of the governors as per the whim of central government. Many governors are criticized for their actions. Recently, in Bihar, after twelve hours of resignation Nitish Kumar was sworn in again as the Chief Minister. But the governor was late in offering the opportunity of taking oath to the Chief Minister of Jharkhand. When the President has to maintain the decision of ministers of central government, the governors are not inactive in formation or saving a state government. Constitutional question arises in every step of the Raj Bhawan and consequently there is constant conflict between the governor and state government.

However, the office of the Governor during 1950-2020 we find that it was the involvement of the Governor in active politics of the state which made the office subject to considerable public criticism [10]. There are numerous examples of the Governor's activities. In West Bengal, in 1967, Governor Dharma Vira, being of the view that the United Front Ministry, led by Ajoy Mukherjee, had lost majority in the Legislative Assembly, owing to defections from the party, asked the Chief Minister to call a meeting of Assembly at a short notice, and, on the letter's refusal to do so, dismissed the Chief

Minister with his Ministry [11]. In the Indian constitution, it is not clearly mentioned how to remove the governors. If the President removes any governor, this person can go to court for knowing the actual cause of the removal. So, without exceptional cases it is not easy to remove a governor. The governors attempt to hold control on the state government using this safe guard. It is relevant and common that the opposition parties will go to the governors against the state governments. But it is not ethical if the governor threatens the government based on the allegations of the oppositions, condemns the elected government on the media and becomes the source of inspiration of the oppositions.

Recommendation of various Committees: In the federal system, for such actions of the governors, several state governments demanded to abolish the post of governor. There are opinions on removal of governors by three commissions constituted for the relationship between central and state government. Sarkaria commission constituted in the time of prime ministership of Indira Gandhi opined that without exceptional cause it is not right to remove the governors. Venkat Chaliaya Commission said in 2002 that the opinion of the Chief Minister of a state is to be taken while removing the governor of the state. The Government of India constituted The Panchhi Commission in 2010 for the relationship between centre and state. This commission opined that by the wish of the President of central government the governor cannot be removed. The proposal of removing the governor should be passed in the concerned state assembly. Basically, the three commissions are on the opinion to continue the post of governors on the same current position. But several commissions criticized the misuse of power by the governors. However, the proposal of none of these three commissions had been produced in the parliament yet [12].

The basic question that had arises based on the background of history and experiences of the parliamentary system in India are whether is there any argument of keeping the post of governor by the public (government) fund. If swearing in the government is the main role of the governor it can be executed by the Chief Justice of High Court. Probably, this proposal didn't get significance for the political ground of controlling a state government. It is thought by many that the post of governor is created in the constitution for holding the control of central government upon the state. So, the governors being the agent of the Centre became highly honorable and the politics of Raj Bhawan became the constitutional right. But it is to be remembered that India is a country of federal structure. The centre is to be strengthening for the interest of national unity and integrity. The relationship between the governor as the representative of the Centre and the President, Head of the state is highly significant for the unity, solidarity and integrity of India.

Conclusion: The office of the Governor is considered as one of the major constitutional offices in India. Jawahar Lal Nehru, former Prime Minister of India thought that the Governor should be a dignified, eminent person without any political connection as the Governor is the preserver and protector of the constitution and law. However, it is considered by some politically conscious persons that Governor is not a useful post and also the post creates financial burden upon the state governments. Even an

argument is created that the appointment of governors had become party oriented for the sake of party's interest rather than the nation. However, it is to be remembered that in the federal system of India, the role of the governor is significant. His services act as the connecting medium between the central and state governments. It is the function of the governor to look after the formation of stable government in the states and also to keep a look on the legal validity of any law initiated by the concerned legislature of a state. Even the governor may recommend for President Rule in any state if breakdown of constitutional system is apparent in the concerned state. It is certain that the post of governor is highly significant for the conduction of democratic system in India, but it is also a fact that the post has been used to create a package for the politicians in their post-retirement period.

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(অনন্তশয়ন মূর্তি/ ১)

প্রাচীন ভারতীয় ভাস্কর্য: একটি মূর্তিতাত্ত্বিক পরিক্রমা

অনিরুদ্ধ বাগচী¹

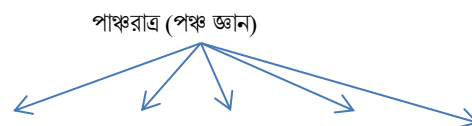
সারাংশ

মূর্তিতত্ত্ব বা Iconography ভারতীয় শিল্পকলাসম্বন্ধীয় একটি প্রাচীন ও সমৃদ্ধশালী শাস্ত্র। মূর্তিনির্মাণের বিবিধ কৌশল, মূর্তির নানাবিধ শ্রেণীবিভাগ, দেববিগ্রহ ও দেবভিন্ন অন্যান্য বিগ্রহসমূহের চেনার উপায় প্রভৃতি যাবতীয় বিষয়ের কলা ও বিজ্ঞানসম্মত আলোচনা- পর্যালোচনা, বিচার-বিশ্লেষণ এই শাস্ত্রে আলোচিত হয়েছে। *বিষ্ণুধর্মোত্তরপুরাণ*, *প্রতিমালক্ষণ*, *রূপমণ্ডন*, *শিল্পরত্ন*, *অংশুমল্লোদাগম*, *কামিকাগম*, *শারদাতিলকতন্ত্র* প্রভৃতি গুরুত্বপূর্ণ মূর্তিতত্ত্বসম্বন্ধীয় গ্রন্থগুলি প্রাচীন ভারতীয় ভাস্কর্য ও শিল্পকলার মূল ভিত্তিস্বরূপ। ‘ষড়ঙ্গ’ বা যে ছয়টি বিষয় মূর্তিকলা, চিত্রকলা প্রভৃতি কলাসমূহের প্রাণস্বরূপ, তাদের প্রকৃত বন্দনা, অনুশীলন ও প্রয়োগের মধ্যে দিয়েই কোন মূর্তি জীবন্ত হয়ে ওঠে। ষড়ঙ্গের প্রভাবেই ব্যক্ত-অব্যক্ত-ব্যক্তব্যক্ত, চল-অচল-চলাচল, চিত্র-চিত্রার্থ-চিত্রাভাস, আসন-স্থানক-শয়ন’ভেদে বিপুল মূর্তিসম্ভার আমাদের সামনে পরিদৃশ্যমান। মূর্তিতত্ত্ব বা Iconography প্রকৃতপক্ষে আমাদের এই দেখার চোখ তৈরী করতে সহায়তা করে থাকে।

সূচক শব্দ: মূর্তিতত্ত্ব- শিল্পকলা- দেববিগ্রহ- ষড়ঙ্গ- আগম- তন্ত্র

মূল আলোচনা

ভারতবর্ষের সাপেক্ষে যদি আমরা বিচার-বিশ্লেষণে প্রবৃত্ত হই, তাহলে লক্ষ্য করবো যে, এদেশে মূর্তি বা বিগ্রহের ব্যাপক সম্প্রসারণের জনকরূপে আবির্ভূত হয়েছে ‘পাঞ্চরাত্র দর্শন’। পাঞ্চরাত্র অর্থাৎ পঞ্চজ্ঞান -পাঁচপ্রকার জ্ঞান এখানে আলোচিত হয়েছে, তাই ‘পাঞ্চরাত্র’ এইরূপ অভিধায় অভিহিত হয়েছে দর্শনটি। সেই পাঁচটি জ্ঞান হল’:



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তত্ত্ব মুক্তিপ্রদ ভক্তিপ্রদ যৌগিক বৈশেষিক

প্রসঙ্গক্রমে উল্লেখ্য যে, পাঞ্চরাত্র সম্প্রদায়ভুক্তগণ তাঁদের একমাত্র উপাস্য দেবতার পঞ্চরূপ কল্পনা করতেন এবং সেইগুলি হল:

“তৎ পর-বৃহ-বিভব-স্বভাবাদি নিরূপণম্।

পাঞ্চরাত্রাহবয়ং তত্রং মোক্ষকফললক্ষণম্।।” [ব্যানার্জী, ১৯৯৪: ৬৭]

অর্থাৎ পর, বৃহ, বিভব, অন্তর্যামী ও অর্চা। পর অর্থাৎ সর্বোচ্চ রূপ, বৃহ অর্থাৎ ক্রমবিকাশমান রূপ, বিভব অর্থাৎ অবতার রূপ, অন্তর্যামী অর্থাৎ যে রূপ সকলের মধ্যে আভ্যন্তরীণ নিয়ন্ত্রক হিসেবে বিরাজমান এবং অর্চা বা বিগ্রহ রূপ। এই অর্চার ভূমিকা মূর্তিতত্ত্বে প্রশাসিত। উপাসনায়োগ্য মূর্তিকে 'অর্চা বলা হয়, পাঞ্চরাত্র দর্শনানুযায়ী এরূপ মূর্তিকে শ্রীবিগ্রহ হিসেবেও অভিহিত করা হয়েছে।



(শ্রীবিগ্রহ। স্থানক মূর্তি ২)



(শ্রীবিগ্রহ। আসন মূর্তি ৩)



(শ্রীবিগ্রহ। আসন মূর্তি/ ৪)



(শ্রীবিগ্রহ। শয়ন মূর্তি/ ৫)

উপাসনায়োগ্য মূর্তির ব্যাপক বিকাশের কারণ সম্পর্কে অবহিত হওয়ার পর, স্বভাবতঃই যে বিষয়টি এরপর আলোচনার দাবী রাখবে সেটি হল 'মূর্তিতত্ত্ব'।

মূর্তিতত্ত্বের ইংরেজী প্রতিশব্দ আমরা পাচ্ছি Iconography; যেটি দুটি গ্রীকশব্দের সমন্বয়ের ফলে সৃষ্ট হয়েছে, যথা- eikon (image) এবং graphein

(to write)[*ব্যানার্জী*, ২০০২: ১] অর্থাৎ যুগপৎ কলা ও বিজ্ঞানবিদ্যার অন্তর্গত; পুরাণ, তন্ত্র, আগম, শিল্পশাস্ত্র প্রভৃতি গ্রন্থে বর্ণিত মন্দির-নির্মাণশৈলী, ভাস্কর্য ও বিবিধ ধর্মীয় তাৎপর্যসমূহের আলঙ্কারিক রূপ প্রকাশক শাস্ত্রই হল' Iconography বা মূর্তিতত্ত্ব।

মূর্তিকলা তথা চিত্রকলা নির্মাণের ভিত্তি হল' ষড়ঙ্গ; অর্থাৎ ছয়টি গুরুত্বপূর্ণ বিষয় এর সাথে সংযুক্ত এবং প্রত্যেকটি, প্রত্যেকের পরিপূরক। বাৎস্যায়নকৃত কামসূত্রের প্রথমাধিকরণের তৃতীয় অধ্যায়ের টীকা রচনাকালে যশোধরপণ্ডিত খুব সুন্দরভাবে ষড়ঙ্গকে বর্ণনা করেছেন:

“রূপভেদাঃ প্রমাণানি ভাবলাবণ্যয়োজনম্।

সাদৃশ্যং বর্ণিকাভঙ্গ ইতি চিত্রং ষড়ঙ্গকম্।।” [ঠাকুর, বৈশাখ ১৩৫৪: ১]

সামান্যভাবে বলতে গেলে 'রূপভেদাঃ' অর্থাৎ রূপসমূহ সম্পর্কে গভীর ধারণা; 'প্রমাণানি' অর্থাৎ রূপসমূহের নিখুঁত গঠন, গণনা ও উপলব্ধি; 'ভাবঃ' অর্থাৎ রূপসমূহের বিকার-বিধায়ক ও ব্যঞ্জনা প্রকাশক; 'লাবণ্যয়োজনম্' অর্থাৎ লালিত্যের সংযোজন তথা শৈল্পিক রূপায়ণ; 'সাদৃশ্যম্' অর্থাৎ সমরূপতা এবং 'বর্ণিকাভঙ্গঃ' অর্থাৎ সাধনী ও বর্ণের শৈল্পিক প্রয়োগ। এরপর বিশেষভাবে ষড়ঙ্গকে ব্যাখ্যা করার প্রচেষ্টা করা হল-

(১) **রূপভেদাঃ** - প্রথম এই অঙ্গটিতে রূপের বিভিন্নতা বা রূপের মর্মভেদ আলোচিত হয়েছে। আমাদের চতুর্দিকে যত মূর্তি আমরা নিয়ত প্রত্যক্ষ করি তার মধ্যে কোনটি দীর্ঘ মূর্তি, কোনটি হ্রস্ব মূর্তি আবার একেক মূর্তির একেক রকমের কেশবিন্যাস তথা আবরণ ও আভরণবিন্যাস, যা প্রকৃতপক্ষে রূপের বহুমাত্রিক উপস্থিতিকেই প্রতিষ্ঠা করে। নিম্নের চিত্রগুলি মূর্তির রূপভেদকে সুন্দরভাবে উপস্থাপিত করছে:



(দীর্ঘ মূর্তি / ৬)



(হ্রস্ব মূর্তি / ৭)



(বেণীবন্ধন চিত্র / ৮)



(কেশবিন্যাস চিত্র / ৯)

(২) **প্রমাণানি** - দ্বিতীয় অঙ্গটিতে বস্তুরূপটির সাথে নির্ভুল জ্ঞানলাভ; বস্তুর নৈকট্য, দূরত্ব ও তার দৈর্ঘ্য-প্রস্থ প্রভৃতির মানের ধারণালাভ হয়। প্রসঙ্গক্রমে উল্লেখ্য যে, মূর্তির নির্মাণের সময়ে তার মান নির্ধারক একটি গুরুত্বপূর্ণ পারিভাষিক শব্দ হল 'অঙ্গুল'। মূর্তি-শরীরের সম্পূর্ণ যা দৈর্ঘ্য, তার ১২৪ অথবা ১২০ অথবা ১১৬ সম অংশে ভাগ করলে, প্রতিটি ভাগকে 'দেহাঙ্গুল' নামে অভিহিত করা হয় যা মূর্তিতত্ত্বের নিরিখে খুবই গুরুত্বপূর্ণ একটি বিষয়। অংশুমন্ডেদাগম, কামিকাগম, শিল্পরত্ন প্রভৃতি মূর্তিতত্ত্ব-সম্বন্ধীয় আগম-গ্রন্থগুলিতে আরেকটি গুরুত্বপূর্ণ পারিভাষিক শব্দ উপলব্ধ হচ্ছে, যার নাম 'তাল' এবং ১২৪দেহাঙ্গুল বিশিষ্ট মূর্তি-শরীর 'উত্তম-দশ-তাল' হিসেবে, ১২০দেহাঙ্গুল বিশিষ্ট মূর্তি-শরীর 'মধ্যম-দশ-তাল' হিসেবে এবং ১১৬দেহাঙ্গুল বিশিষ্ট মূর্তি-শরীর 'অধম-দশ-তাল' হিসেবে ঐ গ্রন্থগুলিতে বর্ণিত হয়েছে [রাও, ১৯৯৭: ৬(পরিশিষ্ট – খ)]। [উত্তম-মধ্যম-অধমভেদে দশ-তাল পরিমিত মূর্তিগুলি নিম্নরূপ:

- উত্তম-দশ-তাল > ত্রিদেব মূর্তি [ব্রহ্মা, বিষ্ণু, শিব]
- মধ্যম-দশ-তাল > উমা, দুর্গা, সরস্বতী, সপ্তমাতৃকা শ্রীদেবী, ভূদেবী প্রমুখ দেবীমূর্তি
- অধম-দশ-তাল > ইন্দ্রাদি-দিকপাল, চন্দ্র, সূর্য, দ্বাদশাদিত্য, একাদশরুদ্র, অশ্বিনীকুমারদ্বয়, সপ্তর্ষি, অষ্টবসু প্রমুখ দেবমূর্তি



(উত্তম-দশ-তাল / বিষ্ণুমূর্তি / ১০)



(মধ্যম-দশ-তাল / সরস্বতীমূর্তি / ১১)



(অধম-দশ-তাল / সূর্যমূর্তি / ১২)

(৩) **ভাবঃ** – ‘ভাবঃ’ হলা দেহ ও ইন্দ্রিয় সমূহের বিকার-বিধায়ক এবং ব্যঞ্জনা প্রকাশক তৃতীয় অঙ্গ। ‘ভাব’ বিষয়টি আমরা চক্ষুর দ্বারা অনুধাবন করে থাকি; অর্থাৎ ভাবকে লক্ষ্য করি চক্ষুর সহায়তায় এবং প্রকাশকরি ভঙ্গীর সাহায্যে। এই ভঙ্গীর মধ্যে কিছু শিল্পশাস্ত্রসম্মত যেমন, আভঙ্গ, সমভঙ্গ, দ্বিভঙ্গ, ত্রিভঙ্গ, অতিভঙ্গ প্রভৃতি এবং অজস্র ভঙ্গী শাস্ত্রবর্জিতও বটে:



আভঙ্গ

সমভঙ্গ

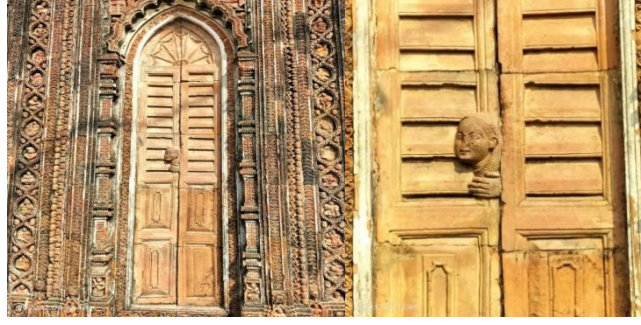
সমভঙ্গ

অতিভঙ্গ

ত্রিভঙ্গ

(ভাবোৎপন্ন বিবিধ ভঙ্গী / ১৩)

কিন্তু এটি স্মরণে রাখতেই হবে যে, ভাবের একটি দিক হলা দেখা এবং দেখার মধ্যদিয়ে উপলব্ধিপূর্বক বিবিধ ভঙ্গীর মাধ্যমে তার প্রকাশ এবং অন্যটি হলা সুগভীর ব্যঞ্জনা। অতএব শিল্পকার্যের সময় কতখানি প্রকাশ করতে হবে আর কতখানি অপকাশিত থাকবে, উভয়ই সমরূপে বিচার্য। উদাহরণস্বরূপ বলা যায় যে, কোন মন্দিরের গায়ে অলঙ্করণরূপে একটি দরজা অঙ্কিত হয়েছে এবং তা আসল দরজার মতনই বোধ হচ্ছে। সেই দরজার মধ্যস্থলে এক নারীমুখ, যেন দরজা খুলে কাউকে দেখার অপেক্ষায়-- দর্শক তখন সেই নারীর আড়ালে থাকা ঘরের ভেতরের নানা দৃশ্যপট কল্পনা করতে থাকেন। এই যে কিছুটা প্রকাশ্য ও অনেকটা প্রচ্ছন্ন-এটিই প্রকৃতপক্ষে ভাবের ব্যঞ্জনার দিকটি:



(ভাবের ব্যঞ্জনা / ১৪)

(৪) **লাবণ্যযোজনম্** - ভাবের কাজ বা ভঙ্গীকে পরিমিতি প্রদানকারী সুকুমার বন্ধনরূপ চতুর্থ অঙ্গ। ভাবের ভঙ্গীকে শৃঙ্খলিতকরে একটি যথোপযুক্ত পরিমিতি প্রদানকরে লাবণ্য। লাবণ্যের বন্ধন সৌকুমার্যগুণে পরিপূর্ণ। লাবণ্য সংযোজিত না হলে কোন শিল্পকর্মের রসাস্বাদ সম্পূর্ণ হয়না। লাবণ্য এক নৈসর্গিক শোভনতা ও স্নিগ্ধতা প্রদানের মধ্যদিয়ে শিল্পকর্মটিকে রমণীয়করে তোলে:



(লাবণ্যসংযুক্ত মূর্তি / ১৫)

(৫) **সাদৃশ্যম্** - সদৃশের ভাব প্রকাশক পঞ্চম অঙ্গ। একের ভাব যখন অন্যে উপস্থাপিত করে, তাই সাদৃশ্য। সাদৃশ্যে প্রকৃতপক্ষে দুইটি বিষয়ের আকৃতির ভিন্নতা থাকা সত্ত্বেও একটি বিষয়, দ্বিতীয় বিষয়টির ভাবকে সৃষ্টি করে। সাদৃশ্য উপস্থাপনের সময় কোন বিষয়ের আকৃতির থেকেও তার প্রকৃতির উপর গুরুত্বারোপই করা হয়ে থাকে:



(সাদৃশ্য প্রকাশক মূর্তি / ১৬)

উপস্থাপিত চিত্রে একটি মন্দিরগায়ে গ্রথিত টেরাকোটা ফলকে মাঝির দ্বারা নিয়ন্ত্রিত একটি প্রমোদতরী জলে ভেসে চলেছে, তা দৃশ্যমান। এখানে পূর্বেল্লিখিত আকৃতির থেকে প্রকৃতিকে গুরুত্ব দিয়ে সদৃশের ভাবকে প্রতিষ্ঠিত করা হয়েছে।

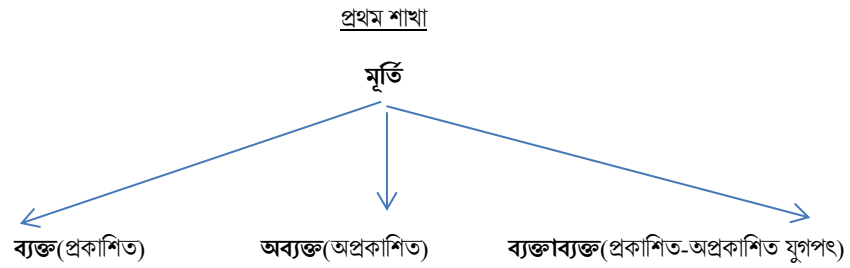
(৬) বর্ণিকাভঙ্গঃ - আনুষঙ্গিক কার্যসাধনী এবং বিবিধ বর্ণ-সংমিশ্রণের জ্ঞানরূপ ষষ্ঠ ও অন্তিম অঙ্গ।



(বর্ণিকাভঙ্গ-সংযুক্ত মূর্তি / ১৭)

ষড়ঙ্গের অন্তিম অঙ্গটি সর্বাপেক্ষা গুরুত্বপূর্ণ। এটি প্রায়োগিক দিক। বাকী পাঁচটি অঙ্গ তাত্ত্বিক বিষয়; সেখানে পারদর্শিতা উৎপন্ন হতেই পারে কোনরকম বর্ণজ্ঞান বা কার্যসাধনীর প্রয়োগ ছাড়াই। কিন্তু সামগ্রিকভাবে ষড়ঙ্গের স্বার্থকতা তখনই সম্ভব, যতক্ষণ না বর্ণিকাভঙ্গের যথার্থ প্রায়োগিক অনুশীলন হচ্ছে। বর্ণিকাভঙ্গের মূলকথাই হল 'দক্ষতাপূর্ণ প্রয়োগ'।

‘ষড়ঙ্গ’ অর্থাৎ মূর্তি তথা চিত্রকলার ভিত্তি সম্পর্কে আলোচনার পর প্রসঙ্গতঃ যে বিষয়টি উঠে আসে তা হল মূর্তি এবং তার বিবিধ শ্রেণীবিভাগ, যথা-



(ব্যক্ত মূর্তি / ১৮)



(অব্যক্ত মূর্তি / ১৯)

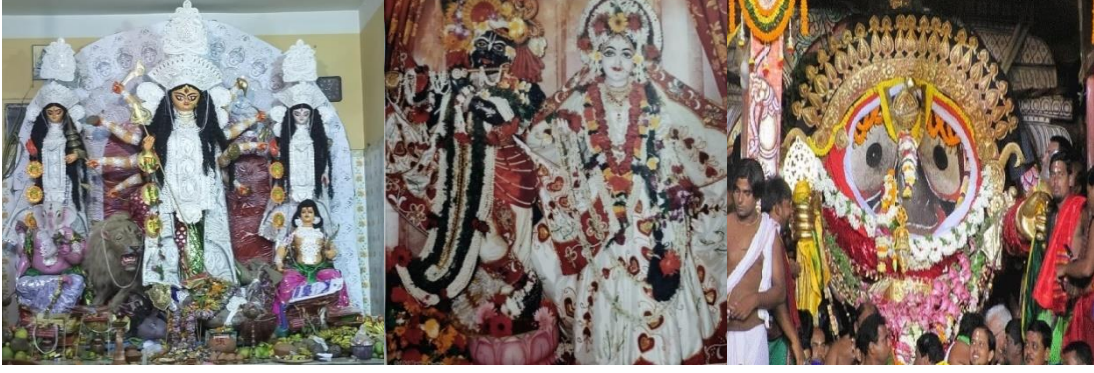


(ব্যক্তব্যক্ত মূর্তি / ২০)

দ্বিতীয় শাখা

মূর্তি

চল(স্থানান্তরযোগ্য বিগ্রহ) অচল(স্থির মূলবিগ্রহ) চলাচল(স্থানান্তরযোগ্য মূলবিগ্রহ)



(চল মূর্তি / ২১)

(অচল মূর্তি / ২২)

(চলাচল মূর্তি / ২৩)

তৃতীয় শাখা

মূর্তি

চিত্র চিত্রার্থ চিত্রাভাস

(শক্ত ভিত্তির গায়ে নতেন্তাবস্থায় সম্পূর্ণ প্রকাশিত)(ভিত্তির গায়ে নতেন্তাবস্থায় অর্ধ প্রকাশিত)(দেওয়াল, বস্ত্র উপর প্রকাশিত)



(চিত্র মূর্তি / ২৪)

(চিত্রার্থ মূর্তি / ২৫)

(চিত্রাভাস মূর্তি / ২৬)

চতুর্থ শাখা

মূর্তি

স্থানক(দণ্ডায়মান) আসন(উপবেশনরত) শয়ন(শায়িত)



(স্থানক মূর্তি / ২৭)

(আসন মূর্তি / ২৮)

(শয়ন মূর্তি / ২৯)

অতএব এটি বলতেই হবে যে, ষড়ঙ্গের উপর ভিত্তি করে ভারতীয় মূর্তিতত্ত্বের বিপুল বিস্তৃতি অত্যন্ত চমকপ্রদ এবং একই সাথে গুরুত্বপূর্ণ। শিল্পশাস্ত্রসম্মত মূর্তির মধ্যে দিয়ে যে ঐতিহ্য, নান্দনিকতা, চারুত্ব, লাভণ্য প্রকাশিত হয় তা এককথায় অনবদ্য। ভাস্কর তাঁর নৈসর্গিকী প্রতিভার স্পর্শে বিবিধ কঠিনপদার্থের মধ্যে প্রচ্ছন্ন যে বিবিধ রূপ, তাকেই বিবিধ মূর্তির মাধ্যমে জগতের সামনে উপস্থাপনা করে থাকেন এবং যা দেখে আমরা বিস্মিত হই, আক্লিত হই। এখানেই প্রকৃতপক্ষে মূর্তির বা সামগ্রিকভাবে মূর্তিতত্ত্বের সার্থকতা।

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Sororal bond versus class allegiance in Khadija Mastur's novel *A Promised Land*

Bisriti Parveen¹

ABSTRACT

Literary works interrogating the gender roles and patriarchal structure of society often prop up sororal bond among its female characters as a tool for resisting patriarchal oppression. Often the women form a support system that leads to their collective emancipation. Khadija Mastur's *A Promised Land* explores the interrelationship among the various female characters as they respond to the challenges of the patriarchal society. Discussion on the feminist stance of the novel omits the role of class hierarchy that governs this interrelationship among the female characters and ultimately leads to the futility of camaraderie among them. The tentacles of patriarchy that seem inescapable in the novel are allowed to assume its extensive presence precisely due to the exhaustion of feminist sisterhood when confronted with the class loyalties of the respective female characters.

Keywords: feminism, patriarchy, sororal bond, Marxism, class hierarchy, class allegiance

Introduction

An oft recurring motif in feminist fiction is the bond of sisterhood that helps women survive in the harsh patriarchal world. Women form alliances among themselves to provide strength and support for each other and to shield their peers from the onslaught of various expressions of patriarchy. In the novel *Kindred*, Octavia Butler revises the theme of kinship and envisions sororal alliance between Black women as a deterrent to their racial and sexual subjugation. In Alice Walker's iconic feminist novel *The Color Purple*, the female protagonist is offered solidarity and refuge by those very women whom her imbibed patriarchal worldview had pitted her against. Unlike the Western world where the feminist movement developed independently as a result of their society's progress, feminist ideas and practices in South Asia emerged as a response to the colonial accusation of Oriental backwardness. Consequently, feminist literature of the Western world that celebrates the theme of female camaraderie as a redeeming force toward women's emancipation- a theme that is more aspirational than realistic, an expression of gendered agency that was historically more a radical solution than a practical feasibility - did not find

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itself mirrored in South Asian female-centered fiction with similar unquestioned loyalty. The feminist utopia of Begum Rokeya's *Sultana's Dream* produced during the colonial period failed to acquire thematic seminality in later day's feminist fiction. Instead, in post-colonial South Asia, literary works explored the failure of the sororal bond in a patriarchal society ravaged by further divisions of religion, caste, and class. In Bapsi Sidhwa's *Water*, the young widow Kalyani is pimped out by Madhumati, another older widow who is as much a social reject as Kalyani and other widows of the ashram. Although Shakuntala later tries to give Kalyani a fresh start at life, her attempts are too feeble to dent the stranglehold of patriarchy in her life. Again, in Tehmina Durrani's *Blasphemy* the protagonist Heer, in a desperate attempt to save her own daughter from being assaulted by Pir Sain, pushes forward the helpless orphan girl towards that same terrible fate. So unforgiving is the world of women inside Pir Sain's household that the women, not only are unable to help each other escape this hell, but are forced to collude in other women's destruction as well. Sororal bonds fail to emerge in this patriarchal hellhole. Likewise, in Khadija Mastur's novel *A Promised Land*, although the female characters endure the stifling patriarchy within the household through assistance and empathy they receive from each other, yet, the particular kind of sororal bond that develops in the novel is not of an emancipatory kind. On the contrary, it inadvertently colludes in keeping the women within the bounds that the patriarchal household and society has thrust upon them. Although the female characters in the novel try in earnest to help other women, they fail to take any assertive step towards bringing actual positive change in the lives of their female compatriots. What mellows the efforts of these women and prevents them from making undaunted decisions that might save the life of their sisters is their inability to discard their class allegiance. The women, although staying in the same household, belong to very different positions in the class hierarchy and it is specifically the interests of their own class and its outlook towards other social classes that prevents them from offering any substantive assistance to other women. Owing to their class outlook that renders them incapable of viewing other women of different classes as their true compatriots, the sororal allegiance these women adhere to takes on the perverse role of perpetuating injustice on women.

In her novel *A Promised Land*, Khadija Mastur gives us a peek into the political and social upheavals taking place in the newly formed country of Pakistan just after the partition. Revolving around a rather uneasily adjusted household, the narrative takes place exclusively within the domestic sphere. Mastur's novel filters political and social changes taking place in the outside world through the prism of domestic life as it reflects upon the lives of the female characters navigating their way through the old societal structure in the new country. Besides being a critique of the disappointing turns that the political scenario of the Promised Land takes just a few years after its formation, the novel also reflects upon the deeply patriarchal structure of the newly formed society that it carries as a legacy and which continues to dictate the lives of women. Patriarchy and the injustices that are a part of it is not merely thrust upon women, but they too take part in perpetuating it. The women are not only victims of this patriarchal

system but active colluders in it. Much like the case of Aliya in *The Women's Courtyard*, in this novel as well, for women, freedom is won only through economic independence but at the cost of emotional exhaustion and rejection of family ties. But the path to freedom, however hard a bargain it may be, is not available to all. Whether the female characters are able to acquire agency in this society or not and to what extent is largely determined by their class position. The fate that awaits each of the female characters follows a neat adjunctive pattern with their respective class position and their class sympathies determine whether they will collude with the patriarchal system to perpetuate oppression of other women. The destiny of each of the female characters is determined not primarily by patriarchy but by the capitalist social structure of which patriarchy is but one symptom.

For the purpose of illuminating the discussed hypothesis, a thorough comparison of the course of life of the three major female characters Sajidah, Saleema, and Taji in *A Promised Land* will be attempted, each of whom belong to three separate classes and who navigate through the patriarchal social structure from their respective class positions. The protagonist Sajidah, is the daughter of a middle class bookkeeper. She migrates to Pakistan as a refugee with her father. Upon her father's death she is made to move in with Nazim's family. Saleema, Nazim's sister and the daughter of the family that owns the mansion welcomes her into her new home like a sister. It is she who goes to the refugee camp herself to fetch Sajidah from there. When Saleema's mother tries to drag Sajidah down to the status of a servant girl upon learning about her poor family, Saleema comes forward to protect Sajidah. However her various gestures of kindness are not devoid of ulterior motives. She has rescued Sajidah from the refugee camp prompted by Nazim who is in love with her. When questioned by Sajidah why she was rescued Saleema replies

You've come here to protect your future. Nazim Bhai said that you're free to do whatever you want. He'll help you in every way to become what you wish. [...] Nazim Bhai told me you were very intelligent [...] He said that people were nothing if they were alone. Every person's joys and sorrows are connected with everyone else's.(39)

Although she has been brought under the pretense of being rescued as a compatriot and with the promise of securing her future, when she insists on being given a chance to complete her education in order to gain her independence the request is tactfully avoided. Saleema tries to placate her with platitudes.

'And what will happen to my studies, Baji?' Sajidah asked suddenly. She was sure no one in that house cared about her education.

'I've spoken to Malik. He said to be patient for a while. Right now, he's barely managing to cover the expenses of Kazim's and my education.' The shame on Saleema's face deepened.(56)

Her kindness is thus turned into an elaborate act of manipulation that limits the independent natured Sajidah from becoming self-sufficient. Saleema, who prizes her own independence and uses it to reject patriarchal heteronormative ties, does not consider similar modes of gaining independence essential for

Sajidah. Her attitude towards Sajidah, especially in relation to the kind and extent of freedom that she seems fit for the refugee girl is apparent when she pushes her to marry Nazim to escape Kazim's sexual harassment. Instead of confronting her brother Kazim for his misdeeds or setting Sajidah up in a path of self-reliance where she is able to save herself by distancing herself from the family, merely engaging Nazim in the role of her protector is deemed enough and appropriate by her. To Saleema as well as to the other members of the family Sajida is merely 'an educated Taji when she came from the camp.' She had received the precise amount of favour that was deemed appropriate for the poor but educated 'munshi-spawn' girl. Her further aspirations were not paid heed to.

Whatever paltry patronage Sajidah had received was not meted out to Taji, the servant girl. Taji is a working class woman, without wealth or the guidance of her family. She works in the household as a domestic help. Like Sajidah, she too is brought from the refugee camp deceitfully with the false promise of providing her security as a daughter. But unlike Sajidah she has to slave away in the household as she lacks education- the quality that would have made her eligible for upward mobility. Inside the household she is made to work as the sole househelp, receiving only food and shelter but no wage for her labour since she is in a situation vulnerable enough for such exploitation. Saleema, in spite of her otherwise progressive ideas and despite being a highly educated person does not protest this exploitation of her labour. Nor does she ever give any hint of finding such exploitation repulsive. Sajidah too is content with saving herself from the same fate as Taji's but does not protest against the injustice done against the destitute girl. Taji's exploitation does not remain limited to the realm of domestic labour. Taji is continuously sexually exploited by Kazim as a result of which she suffers from repeated abortions. It takes a toll on her health and she ultimately loses her life as a result. The immunity from sexual assault that Saleema grants to Sajidah is not offered to Taji. Sajidah too, despite her characteristic bravado and boldness, does not bring out Kazim's crime in the open. Instead she schools Taji to stay away from Kazim thus unjustly transferring to the servant girl's shoulder the onus of refusing her master's advances. Although both Saleema and Sajidah had promised to take her away once they found their own financial freedom, none of them fulfill their promise in the end. When Saleema actually gets a job she makes no effort to save Taji from Kazim or to remove her to a safe place. By shutting herself off from her family Saleema virtually washes her hands of Taji as well. Sajida too makes only a feeble effort to take away Taji from Kazim's clutches but quickly abandons that plan once she is met with a little resistance. At the end, by repeatedly helping Taji go through abortions she too becomes complicit in hushing up Kazim's crime. As Kazim puts it "If I hadn't made use of Taji, then someone else would have. She was born into the world for just that purpose". This same sense of Taji's worthlessness as a human drives the other women who do not belong to her social class to remain mostly apathetic to her plight. Apart from the course their life takes, how these women treat each other is also governed by class. Despite their sympathy towards Taji, Saleema and Sajidah are unable to help her in any

meaningful way since they fail to overcome the innate sympathies and biases bestowed upon them by their position in the class hierarchy.

The inability of the female characters to forge meaningful alliances based on gender and go against their class compatriots can be explained through Marxist analysis of gendered oppression. Marxist thought locates patriarchy in the formation of class based society during the early days of human civilization as it slowly shifted towards agriculture and in the relegation of women's labour into the domestic sphere. In *The Origin of the Family, Private Property, and the State* Friedrich Engels explains that the maintenance of private ownership of property that resulted from society's adoption of agriculture necessitated forced monogamy for women and their subjugation by men. Thus the gender hierarchy was established. Engels suggests that since subjugation of women is interlinked with the preservation of private property in a class-based society, women, therefore, should revolt against class division to achieve freedom from patriarchy. Although patriarchy subjugates women of all classes, yet it is not possible for women to act as one unified community to rise up against all expressions of patriarchy. As the early Marxist-feminist Alexandra Kollontai argues,

women however do not form a single uniform class although women of all social classes are oppressed in some form within a patriarchal society. First of all we must ask ourselves whether a single united women's movement is possible in a society based on class contradictions. The fact that the women who take part in the liberation movement do not represent one homogeneous mass is clear, to every unbiased observer.

The women's world is divided, just as is the world of men, into two camps; the interests and aspirations of one group of women bring it close to the bourgeois class, while the other group has close connections with the proletariat. (Kollontai 59)

Evelyn Reed elaborates this position:

In Marxist sociology a class is defined in two interrelated ways: by the role it plays in the processes of production and by the stake it has in the ownership of property. Thus the capitalists are the major power in our society because they own the means of production and thereby control the state and direct the economy. The wage workers who create the wealth own nothing but their labor power which they have to sell to the bosses to stay alive.

Where do women stand in relation to these polar class forces? They belong to all strata of the social pyramid. The few at the top are part of the plutocratic class; more among us belong to the middle class; most of us belong to the proletarian layers of the population. (Reed)

As women are themselves divided by class, the privileged among them are guided by their self-interest in preserving those aspects of patriarchy that benefit their class-interest. In *The Social Basis of the*

Woman Question Kollontai argues against an alliance between the bourgeois feminists and the proletariat women as she sees bourgeois feminism as incapable of improving the conditions of the working class women.

Class instinct – whatever the feminists say – always shows itself to be more powerful than the noble enthusiasms of “above-class” politics. So long as the bourgeois women and their “younger sisters” are equal in their inequality, the former can, with complete sincerity, make great efforts to defend the general interests of women. But once the barrier is down and the bourgeois women have received access to political activity, the recent defenders of the “rights of all women” become enthusiastic defenders of the privileges of their class, content to leave the younger sisters with no rights at all. (Kollontai 73)

The bourgeois feminist's class sympathies prevent her from being an ally of the proletarian woman once she achieves her own emancipation. Thus, the idea of fostering sororal bond among women across different classes to fight against patriarchal forces disintegrates when confronted with the issue of class-division.

For Saleema, the daughter of the landowning upper class, her sympathies towards Sajidah, the middle class girl are available only to the extent to which she can be of use to her brother. Although her affection for Sajidah is not a pretense yet it can not surpass either her class sympathies towards her debauchee brother nor her presumptions towards the social position of Sajidah. The kind of feminist emancipation she envisions for herself- that achieves complete financial freedom and rejects conjugal ties between the sexes- she fails to envision the same for Sajidah. For Sajidah, merely safety from sexual harassment and being married to a good man seem to be adequate liberation from the patriarchal society in Saleema's view. In a similar vein neither Sajidah nor Saleema try to save Taji in earnest, the lowest among them in class hierarchy. From the perspective of Taji's sisters superior to her in class position, not only is freedom from exploitation not an absolute necessity for the lowly born girl, but sexual exploitation also seems to be a permissible evil. Her sexual exploitation becomes objectionable only when it is about to cost her her life - a situation where her domestic labour can no longer be exploited. Saleema and Sajidah's half-hearted attempt to save the girl and empty verbal sympathy indicate their failure to see Taji beyond her social class identity.

The path to freedom from patriarchy is vastly different for the various female characters in the novel but these different paths follow a predictable pattern if viewed in relation to the very different class positions of these characters. Their attitude towards each other as well as towards the degree of freedom their sisters are supposedly entitled to is no more than an extension of the position and privileges of their respective classes. Despite all of them being oppressed by patriarchy in some form, the same class sympathies that guide men also guide the women in their actions towards each other, thereby preserving class-alliances. The women of the upper class continue to exploit those from the working class turning

their gendered camaraderie into an empty gesture. In fact, the stunted form of solidarity they experience only functions to placate the oppressed, to make the lower classes not rebel in defiance. Mastur's novel captures an intimate picture of the reshuffling of classes that took place in the immediate aftermath of the partition. Nazim's family who lived in three-room government quarters in India gains a mansion in Pakistan and Kazim quickly rises to the rank of an influential bureaucrat in the new country. As the former middle class fill in the vacant position left by the old upper class they too continue to perpetuate the old class relation by exploiting the working class. This dialectic of class is repeated in the inter-relationship among the female characters that prevent them from transcending their class sympathies and forming alliances to help each other attain emancipation from the patriarchy that suffocates them.

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Assessing the multifaceted effects of ultraviolet radiation on fish: insights into embryological development, behavioral patterns, metabolic processes, physiological, biochemical and growth parameters

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ABSTRACT

The sun emits a spectrum of electromagnetic radiation, including ultraviolet radiation (UVR). Recent human activities have negatively impacted the stratospheric ozone layer, resulting in a global increase in UV light. This rise in UVR poses a serious threat to various fish species, impacting them at different life stages, from embryos and larvae to juveniles and adults. Studies conducted at the beginning of the 20th century marked the initiation of research on the effects of UVR on fish. Both Ultraviolet B (UVB) and Ultraviolet A (UVA) radiations have detrimental effects, manifesting as increased mortality, developmental malformations, growth reduction, loss of body condition, and behavioural, physiological, and metabolic changes in juveniles and adults. Even acute exposure to UVR induces profound morphological and functional changes in the skin of fry/fingerlings. Throughout all developmental stages, molecular and cellular processes are impaired, evidenced by elevated levels of DNA damage, apoptosis, and alterations in tissues' antioxidant status. This paper also provides an update on various photo-protective methods to mitigate the adverse effects of excessive UVR exposure. The current dynamics of stratospheric ozone and climate change contribute to fish being exposed to more UVR underwater. This interaction between environmental stressors and UVR introduces novel challenges, potentially impacting fish growth and survival. Recognizing fish's adaptive capacities to these environmental changes is crucial for assessing the potential impact on fisheries and addressing ecological concerns.

Keywords: Ultraviolet radiation, Harmful effects, Ozone layer, Fish, Life stages

Introduction

The solar spectrum, which is the primary source of energy for all ecosystems and is made up of electromagnetic radiation, played a significant role in the development of life on Earth. Spectrum made

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up of a variety of wavelengths gamma waves to radio waves. These electromagnetic waves contributed to the development of the early atmosphere of the planet and eventually resulted in the beginning of life [1]. After then, the study of the solar spectrum underwent a revolution, and by 1920, UV radiation's existence, characteristics, and connection to sunlight had all been thoroughly proved. The earth's life depends significantly on ultraviolet, visible, and infrared radiation. The solar spectrum includes visible and infrared light, which are what raises the earth's temperature to a point where it can sustain life. As water covers more than 70% of the Earth's surface, aquatic ecosystems are essential parts of the biosphere. The ecosystems include marine habitats like oceans, seas, intertidal zones, reefs, sea-beds, etc. as well as freshwater habitats like lakes, ponds, lagoons, rivers, streams, wetlands, and swamps. The inhabitants of these habitats are frequently exposed to sun ultraviolet (UV) rays. Modern human activities and the release of chlorofluorocarbons (CFCs) have resulted in a significant decrease in stratospheric ozone, which has led to an increase in ultraviolet radiation (UVR) reaching the earth's surface [2]. About 8–9% of all solar radiation is made up of the non-ionizing portion of the electromagnetic spectrum, which includes ultraviolet radiation. Before harmful UV radiation reaches the Earth's surface, it is filtered out by the atmosphere's main filter, which is made up of aerosols and ozone. These harmful ways are getting through because of the ozone layer's thinning because of pollution. Aquatic species may become significantly stressed if UVR penetration increases. The electromagnetic spectrum is made up of three groups: UV-A (320–400 nm), UV-B (280–320 nm), and UV-C (100–280 nm). UVR is a component of these groups. Although UV-A is the primary component of the solar UVR and has a higher penetration power in ecosystems, it is far less hazardous than UV-B. The atmosphere's molecular oxygen (O₂) absorbs UV-C, and the ozone layer (O₃) largely absorbs UV-B [3]. Fish in particular, as well as other aquatic species, are particularly susceptible to changes in their environment brought on by stress because their skin and gills are continually exposed to the water around them. From the beginning of the 20th century, there has been evidence of the harmful effects of ultraviolet radiation (UVR) on fish [4-6]. The most frequently reported adverse effects in embryos and larvae include increased mortality and decreased hatching success, as well as a higher incidence of morphological abnormalities and DNA damage [7-10]. It has also been shown that fish have physiologic and metabolic reactions when exposed to UVR. For instance, short and long-term UVR exposure altered the levels of cortisol, haematocrit, and plasma total protein content in fish such as the fathead minnow (*Pimephales promelas*), rainbow trout, roach (*Rutilus rutilus*), common carp (*Cyprinus carpio*), Atlantic salmon and North African catfish (*Clarias gariepinus*) [11]. However, the tolerance of juvenile and adult fish to UVR exposure has also been studied, and many species appear to be highly sensitive to both UVA and UVB radiation at later development stages in their life cycle [12]. The early development stages appear to be the lifecycle stages that are most susceptible to damage [13-17]. Among of the described impacts of UVR exposure in fish include decreased growth, poor development, behavioural abnormalities, the development of skin and eye lesions, inhibition of the immune system, decreased

disease resistance, DNA damage, and a number of metabolic and physiological stress alterations [11,18-20].

Reviewing the literature and contemporary research on the detrimental effects of UVR on marine and freshwater fish species is the main objective of this article. Acute, short-term, and long-term exposures impacts are discussed, as well as the strategies fish creatures have evolved to counteract UVR's effects.

Ozone layer and UV Radiation:

Ozone is a crucial component of the atmosphere. It is well known that the stratospheric ozone layer's ability to absorb UV rays is what shields life on earth from these rays. Although some ozone is also present in the troposphere, its concentration is far lower than that in the stratosphere. One kind of radiant energy that originates from the sun is ultraviolet radiation. Wavelength, measured in nanometres, is used to categorise the various types of energy or radiation (one nm is a millionth of a millimetre).

The stratosphere forms a thick layer around the entire planet that shields living things from the sun's destructive rays. The angle of solar radiation varies with latitude, season, and time of day, with the equatorial region seeing the highest effluence rate of UV-B radiation during the middle of summer at midday. Recently, this protective layer has been losing thickness due to human activity, and this phenomenon is known as the "ozone hole".

The stratospheric ozone layer significantly absorbs solar ultraviolet radiation. People and the environment will be exposed to increasing UV intensity due to stratospheric ozone loss. Modern human activities have significantly reduced stratospheric ozone, increasing the quantity of UV radiation impacting the earth's surface as a result [2]. Many negative consequences on human health, agriculture, animals, plants, and materials are linked to the rise in UV radiation. Abnormal weather patterns, anthropogenic pollution, and increasing solar UV-B may have a significant impact on the freshwater ecosystem [21]. When determining the likelihood that aquatic species will be harmed the intensity of solar UV radiation and the depth of UV penetration into the water column are crucial considerations [22].

Effects of Ozone layer thinning due to the thinning of the stratospheric ozone layer, there has been an average 7% rise in biologically active UV-B radiation in northern mid latitude over the past few decades [23]. Both aquatic and terrestrial organisms are negatively impacted by UV- B radiation.

Types of UV Radiation Rays:

There are three types spectral bands of ultraviolet radiation (UVR) that make up the solar energy that reaches the surface of the earth: Ultraviolet C, very dangerous mainly absorbed by stratospheric ozone (UVC, 200-280 nm) does not reach the earth's surface; contains ozone and oxygen); highly powerful and moderately damaging Ultraviolet B (UVB, 280–320); and somewhat energetic Ultraviolet A (UVA, 320-400 nm) and less hazardous [24-25].

Of the three types of UV, UVC has the shortest wavelength. UV radiation is more damaging the shorter the wavelength. UVC can't get through the atmosphere of the earth, though. The sun's natural UVC emissions do not reach the earth's surface, therefore although they have the shortest wavelength and are therefore the most hazardous, they do not pose a threat to aquatic life. According to several studies [26-29], UVB radiation is significantly attenuated and barely penetrates a few centimetres below the surface in muddy lakes to more than 20 metres in transparent marine seas.

UV-B causes granulocytosis and lymphocytopenia in the blood as well as changes in the way that the head kidney and blood phagocytes function. It also raises plasma cortisol levels [11]. Fish also get skin burns due to UV-B. These findings suggest that fish may experience stress and immunosuppression due to ambient UVR levels.

As UVA wavelengths are less attenuated than UVB wavelengths, they can penetrate the water column up to depths of more than 70 m [28, 30]. Haematocrit, plasma protein, and plasma immunoglobulin levels are all decreased by UV-A radiation, while the fraction of blood cells is increased [31]. According to a comparison study of UV-A and UV-effects B's on the roach (*Rutilus rutilus*), exposure to both UV-A and UV-B suppresses the temporary mutagenic proliferation of blood lymphocytes.

However, the tolerance of juveniles and adults to UVR exposure has also been studied, and many species appear to be highly sensitive to both UVA and UVB radiation at later development stages in their life cycles [13-17].

Effects of UVR on life stages of fish:

In clear aquatic environments, UV radiation can disperse quickly in water with physiologically relevant levels to a depth of at least 50 m. [32]. Ozone depletion has recently led to an increase in the penetration of solar UV-B radiation into the earth's surface water column [33]. The fish are severely affected by UV B and A radiations at many lifecycle phases, including embryo, larvae, juveniles, and adults, The most notable adverse effects are an increase in mortality and incidence of developmental malformations, a reduction in growth, a loss of body condition, and behavioural, physiological, and metabolic changes in juveniles and adults occur under short- or long-term UVB exposure during the early stages of development. Even following a brief exposure to UVR, the skin of fry and fingerlings experiences significant morphological and functional alterations. Increased DNA damage, apoptosis, and altered antioxidant status of tissues were indicators of molecular and cellular processes being compromised throughout all developmental stages [34].

Embryonic and larval stages of development:

A rise in mortality aberrant development, behavioural, and metabolic alterations

Freshwater and marine fish are equally UVR sensitive throughout the early stages of development. When exposed to an acute dosage of UVR (mostly UVB), or for a short- or long-term exposure period,

the most noticeable impacts of UVR exposure include a decrease in survival rates and an increase in the number and types of developmental abnormalities in both eggs and larvae. Following UVR exposure, these developmental defects have been linked to a high mortality rate [35-38] (**Table 1 and 2**). After 6 days, the survival rate of zebra fish (*Danio rerio*) embryos exposed for 2.4 hours to UVB was reduced by more than 50%, and a high incidence of developmental defects, such as caudal (posterior) notochord twisting and bending, was seen [39]. When exposed to UVB radiation, mid-gastrula stage embryos in the same species (6-7 hpf) died at rates greater than 70% [36]. After UVB exposure, there were also lower hatching rates and many foetal abnormalities, including larger pericardial sacs, spinal deformities, and mild spinal bending [36]. The exposure of zebra fish embryos to UVB light also resulted in a longer hatching period [36]. For instance, Japanese medaka (*Oryzias latipes*) fertilised eggs (4 cell stage) displayed strong tolerance to various UVA radiation doses. The number of resultant malformed embryos did, however, rise and the hatching period lengthened with an increase in UVA radiation [40]. After 40 days of exposure to UVB, rohu labeo's (*Labeo rohita*) specific growth rate started to decline [41]. Survival of embryo was shown to be inversely associated to the UVR intensity dose after short-term exposure in yellow perch, as the result of UV-B exposure the mortality rate is also high [42]. The death rate increased by 10–20% in northern pike (*Esox lucius*) larvae exposed to UVB for two days [43]. The marine water fishes like Atlantic cod (*Gadus morhua*), red seabream (*Pagrus major*), dab (*Limanda limanda*), North Sea plaice (*Pleuronectes platessa*), and northern anchovy (*Engraulis mordax*) survival rates in the early stages are also impacted by UVB radiation [19, 44-46] (**Table 2**). Under conditions of 20% ozone layer depletion more over 50% of the fertilised eggs in Atlantic cod died after 32 hours of exposure to UVB [47]. UVB had a deleterious effect on anti-predator escape capabilities in Atlantic cod larvae exposed to UVB radiation for 15 hours, which increased predation mortality [48].

Increased UVB levels due to ozone depletion caused substantial embryo mortality, a decline in hatching rate, and a loss of buoyancy in dab and North Sea plaice embryos exposed for 24 hours before hatching [45]. The time of radiation exposure during embryonic development determines the North Sea plaice's UVB sensitivity. In Chile, the common sardine is thought to be harmed by the UVB levels actually seen in the Gulf of Arauco and Concepcion Bay (*Strangomera bentincki*). Stage I: absence of embryo and Stage II: early embryo: embryo covers half of the chorion embryos from both species were subjected to radiation over a period of 4 days, whereas stage III: more than half of the chorion is covered by the late embryo. Embryos were exposed over a period of 3 days. The hatching success of both species decreased, their buoyancy changed, and they both had a number of abnormalities. The earliest stages of embryo defects comprised blisters on the yolk, the most advanced stages contained varying degrees of notochord twisting, and all stages involved dead tissue [38]. After 9 days of UVR exposure, Caspian Sea salmon (*Salmo trutta caspius*) larvae subjected to died completel [49]. After being exposed to the same UVB conditions, black seabream (*Spondyliosoma cantharus*) larvae had much greater survival

rates than red seabream larvae, indicating that black seabream is likely better adapted to settings with high UVB radiation than red seabream [50]. Moreover, after being exposed to UVB, red sea bream larvae's orientation behaviour changed. According to the authors' observations, this species can gain UVB tolerance during ontogenetic development [51].

Body alterations tissue damage and immune system manipulation:

Many tissues are exposed to the damaging effects of UVR throughout the early stages of development, and reports of physiological alterations and immune system modulation have been made. Larvae exposed to UVR have been found to develop lesions on their skin and gills in recent years. UVB exposure harmed the gill filaments and lamellae in Indian major carp (*Catla catla*). The gill epithelium of larvae exposed for 54 days showed damage, and scanning electron microscopy demonstrated a reduction in the number of micro ridges [52]. The digestive physiology and immune system of Indian major carp may have been negatively impacted by the same UVB radiation, which would have resulted in poor development and survival. Lysozyme levels were found to be lower in UVB-treated fish, which is a sign that the immune system of developing carp larvae has been suppressed [53]. There is more proof that UVB radiation can depress the immune system throughout the early stages of development. When exposed, rohu and *Labeo* larvae were examined, they found a drop in leucocytes and myeloperoxidase activity [41].

Due to damaged cells and a decrease in the size of the mucous-producing cells, five days of exposure to UVB caused the larval skin of sole (*Solea solea*), which has faintly pigmented skin, to develop the distinctive sunburn [54]. Salmon from the Caspian Sea experienced changes in the number of mucous-producing cells, the appearance of sunburn cells, and the thickness of the epidermis as a result of UVR exposure [15].

Table 1: A summary of how solar UV radiation affects freshwater fish species in their embryonic developmental stages (embryo and larvae)

Freshwater species	Develop mental stage	UV radiation	Exposure frequency	Exposure time	Effects of UVR	References
Zebrafish (<i>Danio rerio</i>)	Embryo	UVB/UV A	Acute	3-10 min UVB, 18-20 min UVA	High mortality, high malformation, low hatching rate	[36]
Zebrafish (<i>Danio rerio</i>)	Embryo	UVB	Short-term	3 days	Low hatching rate	[42]

Zebrafish (<i>Danio rerio</i>)	Larvae	UVB/UV A	Acute	150 min and 4 days	High malformation as effects of both UVA/UVB, Torsion and bending of posterior notochord.	[39]
Japanese medaka (<i>Oryzias latipes</i>)	Embryo	UVA	Short-term	3 days	High mortality, high hatching time, increase malformation, blister formation in fin	[17]
Japanese medaka (<i>Oryzias latipes</i>)	Larvae	UVB	Short-term	5 days	DNA damage, Skin lesions	[66]
Rainbow trout (<i>Oncorhynchus mykiss</i>)	Larvae	UVB	Acute	12 h	High mortality rate, DNA damage	[65]

Table 2: A summary of how solar UV radiation affects seawater fish species in their embryonic developmental stages (embryo and larvae)

Seawater species	Developmental stage	UV radiation	Exposure frequency	Exposure time	Effects of UVR	References
Atlantic cod (<i>Gadus morhua</i>)	Embryo	UVB	Short-term	10 days	High mortality rate	[44]
	Embryo	UVB	Short-term	7 days	High mortality rate, low hatching rate	[48]
Black Sea bream (<i>Acanthopagrus schlegel</i>)	Embryo	UVB	Short-term	2 days	Low hatching rate	[9]
Common sardine (<i>Strangomera bentincki</i>)	Embryo	UVB	Short-term	4 days	High mortality rate, lower hatching rate, hatching time increase, increase malformation, blisters in	[38]

					the yolk, twisted notochord	
Dab (<i>Limanda limanda</i>)	Embryo	UVB	Short-term	6 days	High mortality rate, low hatching rate, buoyancy lose	[45]
North Sea plaice (<i>Pleuronectes platessa</i>)	Embryo	UVB	Short-term	6 days	High mortality rate, low hatching rate, buoyancy lose	[45]
	Embryo	UVB	Short-term	2 days	High mortality rate, buoyancy lose	[46]
Red sea bream (<i>Pagrus major</i>)	Embryo	UVB	Short-term	2 days	Low hatching rate	[9]

Ionocytes also underwent deformation as a result of UVR exposure, and both their quantity and size were decreased. The damage found in these cells may have contributed to the high mortality rate seen after UV exposure. These mitochondrial-rich cells are crucial for the skin's osmoregulation, respiration, and excretion functions, especially during early development. Skin integument lost its ability to osmoregulation [49].

Cellular and molecular processes being compromised:

Direct and indirect photochemical routes define the harmful effects caused by UVR exposure at the molecular and cellular level [55]. Due to the absorption of particular wavelengths by these molecules, followed by the dissipation of the absorbed energy under photochemical reactions, certain macromolecules, primarily nucleic acids and proteins, are directly targeted biologically by UVR [56-58]. Tyrosine, tryptophan, and phenylalanine are examples of certain aromatic amino acids that can absorb specific UV wavelengths, causing photo-oxidative degradation of proteins and cross-linking of amino acids [57, 59]. Nucleic acids are the macromolecules most vulnerable to UV exposure among those that absorb UV rays [55, 60].

The maximum wavelength at which nucleic acids absorb light is approximately 260 nm, but it also extends into the UVB spectral region. At this wavelength, nucleotides, primarily pyrimidine, thymine, and cytosine, can be photo-destroyed, producing various photoproducts [61, 62]. The exposure's intensity and particular wavelength determine the extent and kind of DNA damage. Cyclobutane

pyrimidine dimers (CPDs), pyrimidine, pyrimidine photoproduct (6-4 PP), and photo hydrates are three different forms of photo-products that can be produced as a result of UVR exposure [62]. The most common photoproducts produced as a result of UVB exposure are pyrimidine dimers, CPDs (mostly the thymine TT dimers) [60,63]. CPDs have been identified as possible inhibitors of fish embryonic and larval development. Another study found that exposure of UVB for more than an hour increased the pressure on DNA by 10 CPD/Mb (mega base), which was responsible for 10% of the predicted mortality of Atlantic cod embryos [64].

Only wavelengths shorter than 360 nm were found to have a significant impact on CPDs formation, and CPDs burdens were typically smaller in eggs than in larvae [18]. Rainbow trout (*Oncorhynchus mykiss*) larvae were also found to exhibit this direct correlation between the quantity of pyrimidine dimers produced and the rise in mortality [7, 65].

Several strains of Japanese medaka larvae subjected to varying UVB conditions similarly showed UVB-induced DNA damage in the form of CPDs, and a positive association was seen between the UVB intensity and the amount of produced CPDs [66].

Although UVA is involved in the mechanisms of repairing DNA damage, exposure to UVA increased DNA damage significantly in North African catfish (*Clarias gariepinus*) [67]. After 150 minutes of exposure to UVB, osteonectin (osn) expression increased in zebra fish embryos. This increase was accompanied by an increase in mortality and developmental abnormalities [39].

Juveniles and adult stages of development:

Behavioural and metabolic abnormalities, as well as reduced growth

Fish growth and physical condition are known to be impacted by UVB exposure (**Tables 3 and 4**). After being exposed to sunshine coupled with UVB radiation in cages for 8 weeks, juvenile Atlantic salmon (*Salmo salar*) showed decreased growth and loss in body condition [14]. A decreased splenosomatic index was noticed in the UVB-enhanced treatment, which may have caused a decrease in the investment in the adaptive immunity [68]. When compared to fish exposed to normal UVB circumstances, sub adult three-spined sticklebacks (*Gasterosteus aculeatus*) subjected to UV-enhanced conditions over a 10-week period showed a similar loss in body condition and reduction in growth [68]. Three-spined stickleback adults' reproductive performance is impacted by long-term UVA radiation exposure (30 days), which lowers sperm velocity and causes alterations to the breeding pigmentation [16]. It appears that a rise in UVB radiation and such an increase in oxygen consumption are causally connected in rainbow trout juveniles [69]. Zebra fish, however, displayed decreased swimming ability after being exposed to UVB for two weeks. This decrease in muscle activity may be a mechanism to reduce the formation of intrinsic reactive oxygen species (ROS) in response to UVB exposure [70].

Physiological modifications and tissue lesions:

Serious lesions in organs and tissues, especially those that are immediately exposed, such the skin and eyes, are caused by UVR exposure. Fish have two layers of skin: epidermis and dermis. The outer layer, the epidermis, contains mucous cells as well as epidermal club cells (ECCs) and filament cells. The inner layer, the dermis, contains scales and different pigment cells. The area that serves as the fish's live interaction with its surroundings is called the epidermis [71]. ECCs may act as a first line of defence against viruses or parasites that enter the body through the skin, or they may aid in the healing of tissue that has been injured by UV radiation [72]. The most frequently mentioned side effect of solar UV-B on fish is skin damage. Fish living in natural water have also been observed to undergo alterations caused by UV-B. Numerous researchers have described sunburn or the effects of sunlight and UV radiation on fish. This issue was first identified in aquaculture settings where fish are kept in relatively shallow water. Despite the possibility that the harm won't be fatal to the fish [73]. There was a correlation between exposure to sunlight or UV radiation and dermal lesions, which are marked by white to grey necrotic patches and erosion. Sunburn is a common skin reaction to sufficient UV light, and it can be brought on by UV light of any type, including UV-A, UV-B, or UV-C. The energy needed. Compared to UV-B, UV-A requires a thousand times more energy to burn skin. Since UV-C rays have a shorter latent period and shorter persistence than UV-B rays, they are blocked by the ozone layer in the stratosphere before reaching the earth's surface [74, 75].

The top of the head, the dorsal fin and upper back, as well as the top of the caudal fin, are the areas of fish that get skin sores the most frequently. The damaged skin initially looks to turn yellowish in colour before transforming over time into patches of thicker, creamy-colour skin. As the sores spread, the skin flakes off; leaving a whitish or pink ulcer that exposes the underlying cartilage or muscle. Fins become frayed with a rough, ragged margin. When the wounds are extremely bad, the fish may lose its capacity to osmoregulate effectively, suffer from severe blood chemistry imbalances, and develop deadly kidney damage. Secondary bacterial and fungal infections frequently appear, and occasionally they conceal the original sunburn lesion that caused the issue.

If the issue is not identified quickly and the fish are not given the correct care, these illnesses can be more harmful than the consequences of sunburn. Unless in exceptional circumstances, mortality rates are often low; nonetheless, unattractive scar tissue may remain long after the wounds have healed, rendering even healthy fish unmarketable owing to their look. It is crucial to address the issue as soon as it arises because a little case will fully recover in a few weeks [76].

According to research, UV exposure causes skin cancer or cutaneous malignant melanoma in wild fish [77-79]. Almost 15% of the coral trout in Australia's Great Barrier Reef, which is located under an ozone hole, have malignant lesions on their scales, according to research teams [80].

Rainbow trout showed signs of sunburn after three days of UVB daily exposure [81]. The skin's darkening may have been caused by melanosome dispersion, a typical side effect of sunburn. After 5-7 days of UVB exposure, the number of mucous-producing cells, commonly known as goblet cells, drastically decreased in the dorsal skin of juvenile Arctic char (*Salvelinus alpinus*), European minnow (*Phoxinus phoxinus*), and rainbow trout. The quantity of cells that produce mucus was not affected by UVA. The innate immune response can be impacted by a decrease in mucous generating cells because less mucus is produced, after acute exposure to UVA/UVB for 8 hours, in adult fathead minnow similar result was found [82]. In addition, the UVR-treated fish showed a 50% decrease in the number of epidermal club cells (alarm cells), but no appreciable changes in the epidermis thickness [83]. After three days of UVA radiation, North African catfish's dorsal skin's mucus and alarm cells suffered serious damage. The fish exposed to UVA had thicker epidermis in the ventral skin, which also showed symptoms of inflammation and the presence of pyknotic cells [84]. In the eyes of rainbow trout exposed to UVB corneal epithelium/stroma destruction and chronic cataractous alterations in the front region of the crystalline lens occurred [85].

Table 3: A summary of how solar UV radiation affects freshwater juvenile and adult fish species

Freshwater species	Developmental stage	UV radiation	Exposure frequency	Exposure time	Effects of UVR	References
Common carp (<i>Cyprinus carpio</i>)	Juvenile	UVB	Acute	2 hours	Suppressed immunity: low lymphocyte, high granulocytes, high blood RBA, increase blood cytotoxic cells activity	[87]
Rainbow trout (<i>Oncorhynchus mykiss</i>)	Juvenile	UVB	Acute	4 hours	Suppressed Immune system :leucocytes number changes (low lymphocytes, high thrombocytes),low level of head kidney granulocytes RBA, low lysozyme activity	[87]
Arctic char (<i>Salvelinus alpinus</i>)	Juvenile	UVB	Short-term	5 days	Damaged skin: mucous cells decreases	[82]
Japanese medaka (<i>Oryzias</i>)	Adult	UVB	Short-term	15 days	High ROS production, change in the behavior, negative effects on swimming performance	[70]

<i>latipes</i>)						
Guppy (<i>Poecilia reticulata</i>)	Adult	UVB	Long-term	90 days	Huge protein damage occurred, suppressed immunity, whitespot infection arises	[70]
Fathead minnow (<i>Pimephales promelas</i>)	Adult	UVA/ UV B	Short-term	4 days	Skin damage: low mucous cells, high cortisol level	[83]

Table 4: A summary of how solar UV radiation affects seawater juveniles and adults fish species

Seawater species	Developmental stage	UV radiation	Exposure frequency	Exposure time	Effects of UVR	References
Atlantic salmon (<i>Salmo salar</i>)	Juvenile	UVB	Acute	No information	Skin damage: sunburn, epidermal and dermal necrosis, hyperplasia	[74, 75]
Black sea bream (<i>Acanthopagrus schlegel</i>)	Juvenile	UVB	Acute	1 hours	High mortality rate	[50]
Red sea bream (<i>Pagrus major</i>)	Juvenile	UVB	Acute	1 hours	High mortality rate	[50]
Atlantic salmon (<i>Salmo salar</i>)	Juvenile	UVB	Long-term	52 days	Reduced growth, low Hematocrit level, suppressed immunity: low IgM level	[90]

In comparison to the control group, rainbow trout eye lenses exposed to UVB for six days had more *Diplostomum spathaceum metacercariae* parasites present. The dorsal skin's mucus layer is thinned along with the increase in parasites [86]. Organs not directly exposed to radiation, such as the liver and red blood cells, have also shown UVR-induced alterations and damage (Table 3). Three days of UVA

exposure in Japanese medaka induced several morphological malformations in red blood cells, including acanthocytes, hemolyzed cells, sickle cells, swollen cells, and cell membrane lysis. This exposure also promoted apoptosis. Moreover, distorted nuclei, eccentric nuclei, nuclear budding, and bilobed nuclei were all discovered in the fish exposed to UVA [17]. UVA also harmed hepatic tissue in Japanese medaka.

Adult and young fish have shown a variety of physiological reactions to UVR exposure (Tables 3 and 4) When exposed to UVB radiation, rainbow trout, roach (*Rutilus rutilus*) and fathead minnow plasma cortisol levels increased. Such increases in cortisol levels, a main endocrine response of fish to stressful environments, typically elicit physiological, immunological, and metabolic alterations, influencing fish growth. The hematocrit and plasma total protein levels of Atlantic salmon, roach, rainbow trout, and common carp (*Cyprinus carpio*) are decreased by both short and long-term UVB radiation [11, 31, 83, 87]. The fish exposed to UVB showed poor nutritional and health status, as shown by a decline in both parameters [14, 31, 86].

After three days of UVA radiation, North African catfish had higher plasma total protein levels. Fish exposed to UVA showed modifications in a number of biochemical, haematological, and metabolic parameters. In UVA-treated catfish, for instance, the levels of creatinine, alanine aminotransferase, and aminotransferase increased, but the levels of the majority of the parameters, including glucose, cholesterol, alkaline phosphatase, hematocrit, haemoglobin, red blood cells, and platelets, decreased, and indicating that UVA can also cause a metabolic and physiologic disturbance in adult fish [84].

Regulation of the immune system:

The fish immune system is cellular and humoral components are adversely affected by UVA and UVB, among other impacts (**Tables 3 and 4**). The alteration in the ratio of the various leukocytes in peripheral blood is one of the most prevalent adverse consequences of UV exposure. The amount of lymphocytes decreased when the UVB exposure was increased in rainbow trout, but the amount of granulocytes remained constant. In the trout exposed to UVB, the number of thrombocytes increased by 20%. The UVB radiation affected these alterations in common carp [87]. The presence of lymphopenia/granulocytosis in blood may be a sign of UVB exposure due to increased cortisol levels [11, 87]. The immunological activity of uninfected rainbow trout was enhanced by UVB exposure over the course of six consecutive days [86].

The amount of lymphocytes in the blood of common carp decreased after 28 days of continuous exposure to UVB. The fish also displayed an increase in the proportion of granulocytes and monocytes during the third week of exposure, which coincided with lesions and infection in the dorsal surface [88]. For pathogens to be successfully destroyed, ROS must be produced during phagocytosis, often referred to as respiratory burst activity (RBA) [89]. After UVB exposure, the head kidney phagocytes often block this cell-based aspect of the innate immune system. Granulocyte RBA in common carp

dramatically decreased after exposure to UVB for one week, although UVB exposure resulted in a reduction in long-term UVB exposure [88]. Repeated exposure to UVB can alter the RBA of peripheral blood granulocytes in rainbow trout [86]. Non-specific cytotoxic cell activity, which typically has the same pattern as RBA in peripheral blood and head kidney, is another crucial innate immune system component that is negatively impacted by UV exposure [87,88]. NCC in teleosts are the equivalent of mammalian natural killer (NK) cells and are a natural defence against pathogens, viruses, and even neoplastic diseases [89]. As a result, exposure to UVR can affect this defence mechanism. In Atlantic salmon, prolonged UVB exposure lowered both complement bacteriolytic activity and immunoglobulin M (IgM) levels in the plasma [14, 90]. Common carp juveniles exposed to the highest dose of UVB experienced a substantial drop in plasma IgM concentration at 4 weeks, but not with other levels. Fish with skin lesions and fungi infections also had significantly lower IgM levels than fish in good health [88]. The fish's resistance to illnesses may then be reduced as a result of the immune system modulation/suppression brought on by UVB exposure. After 6 days of exposure to UVB, it was found that rainbow trout had a significant incidence of fungal infection on their skin [81]. Trematode parasites (*Diplostomum spathaceum*) and bacteria (*Yersinia ruckeri*) resistance in rainbow trout juveniles exposed to UVB was suppressed, demonstrating the detrimental effects of UVB on disease resistance [86]. It has been suggested that UVB has an immunosuppressive effect across generations after long-term UVB exposure in guppy (*Poecilia reticulata*) raised the fungal infection rates by white spot in their offspring [15].

Cellular and molecular process malfunction:

DNA damage and repair in North African catfish were influenced by UVA dose and recovery time after exposure [91]. According to the findings Japanese medaka may be more vulnerable to UVA exposure than North African catfish. After exposure to ambient UVB for 4 hours, alterations in the antioxidant status of the skin and muscles were seen in adult zebra fish [92]. In North African catfish and Japanese medaka, UVA-induced DNA damage and repair in erythrocytes were studied [40].

Fish developed some Mechanism for photo protection to combat the negative effects and prevent UV exposure:

Several defence mechanisms have been established by fish to minimize the adverse effects of UV radiation. These include: (1) modifications in behaviour to reduce UVB exposure; (2) physical obstacles, such as scales, being present; (3) utilizing UV-absorbing substances; (4) clearance of hazardous substances produced by UVR exposure; (5) proteins and DNA have built-in damage repair systems [12]. There have been reports of numerous fish species avoiding UV radiation. For instance, juvenile coho salmon (*Oncorhynchus kisutch*) raised in outdoor flumes may sense UVR and prevent overexposure by seeking out the shade [93]. Black seabream (but not red seabream) demonstrated the ability to avoid the greatest UVB level by hiding in the half of the tank that was covered with UV-

blocking film during a UVR avoidance experiment [50]. Aquatic species are protected by UV-absorbing compounds (UVACs), which include carotenoids, mycosporines, melanin, scytonemin, and the mycosporine-like amino acids (MAAs). Animals can consume UVACs, which are common UV-sunscreens produced by photosynthetic organisms, through their diet [94, 95].

Fish subjected to UV-B radiation showed both hypertrophy and hyperplasia in their skin's club cells [72]. These cells may only contribute to UV defence by their proliferative response or enhanced production of a substance that acts as a natural sunscreen.

One of the main components that contribute to the coastal waters' ability to absorb light is chromophoric dissolved organic matter (CDOM). All kinds of natural waters include CDOM, which can alter the colour of the water [96]. By selectively reducing sun radiation, CDOM works to shield aquatic species from the detrimental effects of UV radiation [97]. Due to human activity, CDOM concentrations in lakes are decreasing [98]. Niacinamide, a nutritional supplement, protects fish skin from UV-induced sunburn in farmed fish (10 mg/kg of feed) [99].

Discussion: The Earth's natural defence against harmful UV radiation is the ozone layer. However, the release of chlorofluorocarbons (CFCs) has surged due to industrial expansion and modern living, leading to significant damage to the ozone layer and heightened UV radiation levels on Earth's surface. This elevated UV radiation poses substantial risks to the ecosystem, particularly for aquatic environments that cover a substantial portion of the Earth's surface. Given the critical role of fish in both freshwater and marine ecosystems, there is a pressing need to study them to enhance their survivability. Fish, exposed to short and long-term ultraviolet radiation (UVR), can suffer molecular, cellular, and tissue damage. Adverse effects, notably increased mortality and a high prevalence of developmental defects during early development (eggs, embryos, and larvae), have been extensively documented. Other observed impacts include a drop in hatching success, an increase in hatching time, and behavioural abnormalities in fish larvae, such as a loss of normal swimming ability and impaired predator evasion.

Skin and gills appear to be the most affected tissues in fish larvae exposed to UVR, showing lesions such as sunburn, alterations in epidermal thickness, reduced mucous cell quantity and size, distortion in ionocyte structure, and damage to gill epithelial tissue. Juveniles and adults also experience growth reduction and loss of body condition following short- or long-term UVB radiation. Behavioural alterations in feeding, appetite, restlessness, swimming activity, and hunting performance have been noted in response to UVR exposure at these life stages.

Furthermore, UVR exposure adversely affects fish health by disturbing both innate and acquired immune systems, reducing susceptibility to illnesses. Cellular and molecular dysfunction, increased apoptosis, DNA damage, and changes in antioxidant status are evident across all developmental phases and organs.

Current data suggest considerable variations in underwater UVR levels due to stratospheric ozone loss, climate change, and interactions with other environmental and human stressors. Anticipating how fish will respond to these changes poses a significant challenge. Understanding the detrimental consequences of UVR is crucial for minimizing ecological issues, including predicting the impact of invasive species on native populations. Such knowledge can also be applied to fish aquaculture by modifying growing conditions in deep-water cages to reduce UVR damage and increase production.

Conclusion: With growing acknowledgment of the significant impact of UV radiation on aquatic ecosystems, numerous publications highlight the adverse effects of solar UV-B radiation on the community structure of various aquatic environments. While these studies demonstrate substantial impacts on individual aquatic species, there remains considerable uncertainty in assessing the broader effects on ecosystems. Several investigations suggest that heightened ultraviolet radiation not only affects individual aquatic species, but also influences the productivity and biodiversity of fish through alterations in macromolecules. The response of ecosystems to climate variability involves a complex interplay of synergistic and antagonistic influences in relation to UV radiation effects on aquatic systems. These interactions significantly complicate the understanding and prediction of impacts at the ecosystem level. Consequently, it can be inferred that UV radiation may play a more pivotal role than previously recognized in shaping the community structure of aquatic ecosystems. The depletion of the stratospheric ozone layer presents a looming threat of increased UV-B exposure, resulting in the reduced productivity of water bodies. This reduction manifests in lower rates of photosynthesis, diminished plankton growth, and an overall decrease in yield for many fish species. Therefore, future research efforts should prioritize the selection of UV-tolerant fish species to advance our understanding, explore genetic improvement possibilities, and develop effective responses to the combined stresses posed by changing climate conditions. This targeted research will contribute to the better management of fish culture in the face of evolving environmental challenges.

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The Nineteenth Century Hindu Revivalist Resolution of the Women's Question: Constructing the Ideal Hindu Woman in Jogendra Chandra Basu's Anti-Brahmo Novels

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ABSTRACT

Jogendra Chandra Basu, one of the leading figures of the late nineteenth century Hindu revivalism attacked the Brahmos scathingly not only through the newspaper, *Bangabasi* that he edited, but also through his novels like *Model Bhagini* (1886-88) and *Chhinibas Charitamrita* (1886) for the reforms they advocated. particularly the emancipation of women and the relaxation of the caste system and other Brahminical orthodoxy. In order to counter this refashioning of the Bengali woman in the light of Western modernity he presents the new emancipated Brahmo woman as a grotesque symbol of moral depravity in contrast to which the ideal Hindu womanhood should be imagined. Simultaneously he upholds the uneducated Hindu woman untouched by Western modernity as the exemplar of virtue, thereby presenting a fundamentalist Hindu resolution to the Women's Question, which posits a more orthodox alternative to what Partha Chatterjee delineates in his famous essay on the topic. In this paper I intend to demonstrate how these anti-Brahmo novels of Jogendra Chandra Basu construct the Hindu revivalist version of the ideal womanhood and thereby provide an alternative perspective to the more prominent discourse of the Women's Question.

Keywords: Colonial Bengal, nineteenth century, Hindu revivalism, Anti-Brahmo satire, women's emancipation

Introduction

One of the foremost advocates of the late nineteenth century Hindu revivalism in Bengal, Jogendra Chandra Basu's animosity towards the Brahmos as well as the reformist Hindus finds a vitriolic expression in his novels *Model Bhagini* (1886-88) and *Chhinibas Charitamrita* (1886). In both these novels Basu launches a scathing criticism of what he calls the *navyabangali* or the new Bengali, the product of western education and Brahmo liberalism. Though Jogendra Chandra's ideological affiliation with Hindu revivalism began under the influence of the moderate Hindu ideologue Akshay Chandra Sarkar his collaboration with Indranath Bandyopadhyay for the *Bangabasi* sharpened his

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orthodoxy and he emerged as a leading spokesman for Hindu revivalism. *Bangabasi* soon became the mouthpiece of anti-reformist, anti-Brahmo resurgence of ultra-orthodox Hinduism [1] advocating the infallibility of scriptural wisdom, the sanctity of Brahminical traditions and caste hierarchies and a fierce resistance to reformism and women's emancipation. The novels of Jogendra Chandra also became nothing but extensions of his journalism garbed in the form of fiction. In this paper I shall attempt to demonstrate how using, in the author's words, the snake venom (*kalkut bish*) of satire he tries to fashion the ideal Hindu female subject by projecting a negative image of the reformist Brahmos and thereby presents a Hindu fundamentalist view of the Women's Question which is far more orthodox and regressive than the compromise between Hindu tradition and Western modernity that the historian Partha Chatterjee delineates as the nationalist resolution to the same [2].

A central concern for nineteenth century social reformism among the Bengali Hindus was reimagining the role and position of women in society as a response to the charge of the backwardness of Indian women brought by the colonial commentators [3]. Whether dictated by a genuine concern for the backward condition of women or by the selfish desire of getting intellectually compatible life partners the Bengali male reformers championed the cause of women's education and modernisation although in a limited sense of the term. As with many other progressive movements the project of women's education and liberation found most favour among the Brahmos and by the middle of the nineteenth century Brahmo women constituted the majority of the educated women in Bengal [4]. They gained a limited mobility in social circles, albeit under male supervision, incorporated items of western clothing in their attire, adopted certain aspects of western etiquette and social manners, but still their primary role was imagined as the angel in the house, the true companion of a liberated husband. However, for the new Hindu orthodoxy that emerged in the last quarter of the nineteenth century this new woman was an anathema. The domestic space presided over by the woman was the last domain of tradition which had to be kept untouched by the influence of the alien colonial culture [5,13,14]. The political exigencies of the time meant that the world of the males could not be kept aloof from the material, political, social hegemony of the West, but the domain of the home could still be protected from this encroachment. As opposed to the material world of the outside, the home or the inside was the space of the spiritual, the traditional, the orthodox and its preservation was a political act of resistance to colonial hegemony [2]. Hence, for the Hindu revivalists of the late nineteenth century the need to keep the woman's world inviolate was of primary concern. It is therefore not a matter of surprise that the figure of the new woman would become the central butt of ridicule in the anti-Brahmo satires of Jogendra Chandra Basu.

Model Bhagini, as the name itself suggests is centred upon a *bhagini* or a Brahmo woman; the word *bhagini* being a sarcastic dig at the appellation used by members of the Brahmo community for a fellow woman member. The novel in its attempt to caution its Hindu readers against the perceived ill effects

of women's education and liberation paints a picture of the educated woman which is exaggerated to the point of turning the female protagonist into a grotesque monster devoid of even rudimentary human goodness. Presented in the mould of the much maligned stereotypical romantic heroine, Kamalini is introduced as a lovely, delicate woman with shapely breasts and flowing hair. However, the narrator's hyperbolic tone of praise changes abruptly as he notices stockings on her legs. This piece of western clothing together with her blouse marks her out as the new woman who wore stitched clothes as opposed to the traditional Hindu women who draped themselves in the sari only [6]. Her absurd act of wearing stockings in the sweltering heat of *Jaishtha* (May/June) is sarcastically attributed to some imported ailment, an obvious dig at the so called blind imitation of western fashion by the liberal Hindus and Brahmos. Soon as a male servant comes into her room to serve a glass of iced water the narrator is struck with double amazement that not only an unrelated man enters the heroine's room, but she does not even bother to cover her face with a veil [7]. The discarding of the *purdah* and the imitation of the western fashion were much lamented by the orthodox Hindus who saw these changes not only as an encroachment of corrupting western influence, but also as a loss of the modesty and virtue of the pure Hindu woman who would feel incited to coquetry and adultery which the heroine indulges in soon enough.

Kamalini reads Shelley and translates from Shakespeare's *Hamlet*, and an obviously exaggerated letter of praise from her science teacher reveals that she has unusual precocity in scientific studies [7]. These descriptions of Kamalini's academic achievements are purposely overblown because even the liberal Brahmo curriculum for women's education did not include physical science and had a very limited exposure to English literature which was mostly chosen for their didactic value [4]. Her frequent bouts of headache are attributed by her mother to her excessive mental exertion— a typical contemporary complaint against women's education, but they are refuted by the supposedly more enlightened Kamalini with a modern theory that it was not the exercise of the mind, but the pent up intellectual energy that caused women's headaches [7]. Kamalini also sings songs about the passing of youth with the romantic longing for the absent beloved [7]. Singing itself was considered risqué behaviour for women by traditional Hindus who would immediately associate this with the culture of courtesans and view this as her moral degeneration brought about by Brahmo upbringing. From her fetish for western clothes to her exaggerated zeal for learning to her singing Kamalini conforms to all the requirements of the dreaded and highly negative stereotype of the *adhunik brahmika* or the modern liberated Brahmo woman as it existed in the collective imagination of the traditional Hindus.

Brought up in this liberal Brahmo milieu with free mingling of men and women Kamalini not only has no concern for the *purdah*, but soon begins to revel in the company of men as a coquette constantly visited by her Brahmo "brothers" who come to see her in various capacities of tutor, physician, legal adviser or simply friends. Her initial interactions with her tutor Nagendranath and her physician

Mahendra further confirm the nature of their relationships. Kamalini's teasing refusal to divulge her problems to Nagendra and her final revelation of her secret into his ears all follow the classic model of flirtatious behaviour or the lover's banter. "Then Nagendranath brought his face, cheeks, nose and ears close to the lotus face of Kamalini. Two moons seemed to have appeared together on the earth. The woman's face was lodged on the man's cheek" [7]. (This and all subsequent translations from Bengali texts are mine.). Similarly, the extreme concern of Mahendranath for her headaches and fainting fits, much of which is an act put up by her to avoid going to her in laws' reveals their collusion as romantic partners.

The fact that Kamalini's moral degeneration proceeds from her exposure to western liberalism and education is made amply clear. As the novel hints, with male tutors and fellow students coming into the *antahpur* (the woman's inner chambers) all the time it is simply a matter of time before the woman would lose her modesty. While the Brahmos under the leadership of Keshab Sen had introduced the concept of the *anthapur shiksha pranali* [4] or home tutoring of women to bypass the objections against women travelling to schools, the novel turns it into a mockery by presenting it as a facade for promiscuity as young men and boys would frequent the house and stay till late in the name of studying [7]. The narrator sarcastically remarks about Kamalini's relationship with one of her admirers, "Even if I witnessed Kamalini and Nabaghanashyam lying pleasurably on the same bed together I will not believe that their intentions are bad because Nabaghanashyam is educated, Kamalini is educated" [7]. The novel makes a travesty of the entire project of the modernisation of the Bengali woman by turning this episode of Kamalini's education into the training of the coquette which culminates into the scandalous revelation of her intended midnight rendezvous with a suitor Nabaghanashyam by another jilted lover Kailash Chandra [7]. Jogendra Chandra's equation of the cause of women's fall with her exposure to western education and free access to the world of men is amply exhibited through Kamalini's education in *Model Bhagini*.

The ensuing gossip and public humiliation does not lead to remorse or rectification, rather it hardens Kamalini who begins to feign frequent fits of fainting whenever she finds herself in a crisis like the prospect of going to her husband's home and settling into a monogamous conjugality with a man who lacks western education and hence undesirable in her eyes. Kamalini's degeneration from an artful coquette to an unscrupulous, polyamorous, ruthless villain scheming against an innocent husband occupies the latter portion of the novel. Kamalini's sojourn with Mahendra (though officially chaperoned by her younger brother and great aunt) in Baidyanathdham and Brindaban on the pretext of recovering her health and their connivance along with Nagendranath to falsely convict her husband only take her further down the road to perdition.

Kamalini reaches the nadir of immorality in the climactic scene of the novel where she orchestrates a sinister plan to prove that her husband has gone insane. To sympathise with her misfortune and witness her wifely devotion in nursing her mad husband she invites a select group of her innumerable boyfriends. However it is evident that the gathering is more of a party to celebrate her final triumph in getting rid of her husband. “Kamalini has friends belonging to various categories. Hindus, Muslims, Christians and Brahmos all belong to her friends circle. She has teenagers, young gentlemen, older men are her friends” [7]. Kamalini’s appearance in this scene dressed in all black as a statement of her sadness is also loaded with bitter irony. The narrator makes it a point to also mention that though she had covered herself in black from head to toe her fair face was spared of this blackness because her husband though ill, was still alive [7]. On the surface it is presented as a marker of the overwhelming nature of her grief, but to the reader familiar with the Bengali idiom “*mukhe kali dewa*” the allusion to moral blackness becomes clear.

In the same sequence Kamalini delivers an impassioned speech about her misfortune and presents herself as the devoted wife who cannot witness the sufferings of her husband anymore. She even expresses her desire to be a *sati* had the law permitted it. Moreover, she would be a *sati* with a difference because just before that she expresses her desire to shoot her husband whose suffering she cannot tolerate any longer [7]. The contemporary anxiety about the educated woman’s possible refusal to conform to the dictates of the husband found expression in the emphasis on chastity [5,13,14] and the exaltation of the figure of the *satiswaddhi stree* (the devoted and chaste wife) which was a favourite of the orthodox Hindus for whom Savitri who brought her husband back from death, the sacrifice of the *satis* who supposedly burnt themselves willingly in their husband’s pyre, and the self-abnegating widows were exemplars of feminine virtue [8]. Kamalini’s speech is constructed around the same idea of the *sahadharmini* (equal partner in *dharma*) who can give up her life for her husband, but the vacuity of her eloquence is not lost on the reader who knows that she herself has endangered her husband’s life and her proposed plan for his treatment is nothing but a facade for inflicting further atrocities like forcing him to eat beef and shearing his *tiki* (the sacred caste marker of a Brahmin) in the name of treating his madness. By the end of the novel Kamalini degenerates into a veritable monster bereft of all humanity not only spiritually, but also physically as she gets infected by a disease that leads to decomposition of her skin and flesh. In the conservative moral universe of the novel there can be no other apotheosis for the transgressions committed by a woman.

The causal relationship drawn between the education and moral degeneration of women can also be seen in the depiction of the character of Rammani in Basu’s *Chhinibas Charitamrita*. Rammani, the widowed sister of a village weaver is lured by Chhinibas, the Brahmo protagonist of the novel to elope with him. She becomes the foremost student and resident of the female hostel set up by Chhinibas and his cronies in Krishnanagar. Though their relationship is described using the typical rhetoric of the

Brahmo brotherhood and is presented in terms of that of a reformer and his subject, the author makes it amply evident through various hints that it is nothing but lust that drives the entire project of women's reform. For example, though Rammani resides in a women's hostel along with several other women there is constant interaction with Chhinibas and his friends who supposedly come there for serious social and political discussions. What goes on under the veneer of such reformist programme is a free indulgence in promiscuity. "Binodini, with her body flushed with the red medicine went to her study room with Manmohan. Rammani also took Chhinibas' hand and conversing in Sanskrit went to another room" [9]. This peculiar system of studying while being intoxicated with a male tutor behind closed doors does not leave much to speculation about the real nature of these relationships. As in *Model Bhagini* reformism and moral corruption go hand in hand and at the end of the novel Rammani becomes as monstrous as Kamalini as she provokes Chhinibas to have his mother physically assaulted by watchmen when she comes looking for her son who had deserted her and interrupts their merrymaking in the process.

Rammani soon emerges as the crown jewel of this reformist school by not only acquiring education, but also attaining physical prowess to emerge as the strong feminine ideal of the nationalist imagination of her brother reformers. As the narrator mocking the tone of the reformists remarks, "Had I the good fortune of getting the company of Rammani, the veritable embodiment of *shakti*...I could have delivered India with this sword in my hand" [9]. A programme is organised to celebrate this paragon of ideal womanhood where she showcases her horse riding skills along with a few other students of her school. Unfortunately the horse decides to throw her off its back much to her discomfiture. However, the sycophantic press which works in collusion with the reformers projects her as the great feminine ideal and she becomes an icon among the reformist circles. How are we as readers supposed to interpret this episode? In the emerging Hindu nationalist rhetoric of the late nineteenth century much emphasis was placed on valour and martial attainment. Though this project was chiefly aimed at reinvigorating with strength and courage the Bengali masculinity which was traditionally perceived as effeminate, the symbol of *shakti* or the divine feminine archetype became a source of moral inspiration for this project and finally led to the emergence of the idea of *Bharatmata*. Similarly, courageous women sacrificing personal interests to stand by and inspire the men fighting for their nation or joining the fight themselves against colonisers and invaders became a recurrent trope in the nationalist literature of the time; the character of Shanti in Bankim Chandra's *Anandamath* being a perfect example of the latter type [10, 5,13,14]. These women characters even in their transgression of the home and entry into the male world of martial and political pursuits remain exemplary by virtue of the sincerity of their nationalistic pride, their sacrifice, self-discipline and moral uprightness, of which celibacy is an essential constituent, and her obedience to the male authority figure. Thus, in spite of their vociferous opposition to women's liberation even the orthodox Hindus were willing to make concessions for women's participation in nationalist movements albeit within certain strict limits. This is precisely where Rammani fails: her fall

from horseback being the symbol of this failure. Rammani lacks the purity of soul that is demanded of a true nationalist. Her promiscuity, hedonism, and lack of ascetic discipline make her unsuited for the role of a nationalist fighter. Similarly her horse riding is meant not so much for any genuine national service as for gaining personal fame and publicity for her mentor Chhinibas and the phony nationalism of his organisation. It is thus the western liberal ideology of the Brahma reformism that leads women to misdirected transgressions which are not only morally suspect but also unproductive or even harmful for the nation.

Rammani's academic accomplishments again, are as dubious as her horse riding skills. She is hailed as a scholar of Sanskrit by her peers and is chosen by Chhinibas for further training in Sanskrit studies in Benaras. However, the Sanskrit she speaks to show off her knowledge is full of errors as she basically suffixes every word with "ng" to make it sound like Sanskrit. For the orthodox Hindu author, the audacity of the lower caste woman to try to enter the upper caste male domain of Sanskrit studies is an act of double transgression and has to be presented as a ridiculous project. Hence, if the upper caste Kamalini's education makes her a fallen woman, the lower caste Rammani's pretensions to learning make her not only a fallen woman but a downright ridiculous one at that. In the process the Brahma's promotion of caste mobility as well as women's emancipation is held up to satire.

Besides the two central women characters both novels have a few other women characters that stand at various points on the spectrum of educational accomplishments. There is Kamalini's mother who sits uneasily on the margin of orthodoxy and emancipation being a coerced entrant into the project of reformation, Giribala the wife of Chhinibas' friend Manmohan, who has experienced and rejected the Brahma project of reformation and Aghor Babu's wife who remain out of its sphere of influence. Kamalini's mother Annapurna begins as an uneducated, orthodox housewife of an upper caste Hindu rural gentry. In the beginning she is described as an ideal Hindu wife, the *grihalakshmi* whose entry into her in laws' home ushered in good fortune for the family [7]. However, after the death of her father in law when she is taken away by her husband Ram Chandra who had newly converted to Brahmaism under the influence of Keshab Sen she is proselytised into his new fangled ideas. At first she resists and refuses to conform to her husband's lifestyle. But Ram Chandra emotionally manipulates her by questioning the genuineness of her love and devotion as a woman and ultimately, torn between the contrary demands of maintaining her private religious integrity and the duties of the *sahadharmini* she chooses the latter and reluctantly embraces her husband's *dharma*. Within just a year her reformation into a modern woman is complete with the rejection of the *purdah*, acquisition of basic education, eating prohibited food items and so on. "In the twelfth month, having completed her education, Annapurna clad in appropriate clothes started singing songs and playing the harmonium in front of an audience of devout brothers" [7]. The strength of conviction that Annapurna exhibits at the beginning of the story by refusing to cater to the new lifestyle of her husband seems to have waned with her entry into the

Brahmo fold and by the end of the novel she turns into an ineffectual figure, a passive enabler of her daughter's misdemeanours through her submission to their ways. In her failure to properly bring up her daughter she also becomes the author's way of refuting the reformist apologia for women's education that an educated mother raises better children.

Similarly, Giribala, the wife of Chhinibas' friend Manmohan though launches a spirited opposition against her husband's ways ultimately proves to be ineffectual in bringing about any positive change in him. Manmohan whose "maid was a liberal, the chef a radical" rues that his wife has not realized the value of fowl curry and "hasn't become civilized a bit" [9]. However, she is revealed to be well educated and with a mind of her own. She sees through the hollowness of her husband's posturing as a Brahmo reformer and makes fun of his foolish prudishness in wearing his coat and shirt even in the summer heat and in the seclusion of their bed chamber in the name of sobriety and manages to make him strip down to his undergarments. This shows that she wields some influence over her husband at least within the domestic space. When the husband requests her to write an essay on Divorce and Women's Rights she refuses outright stating how the results of the previous competition were rigged in favour of Rammani though she herself had written by far the best essay. Thus it is evident that she is well educated and well versed in the raging issues of the time, but her privileged insider's view of the hypocrisies of the movement has possibly changed her outlook and she refuses to function within the ideology of her husband's faith. She not only refuses to contribute to the essay writing competition, but also almost succeeds in persuading her husband into not providing false witness to implicate Dhananjay Bachaspati in a fake case of robbery lodged by Chhinibas. She tries to appeal to his humanity by describing the hapless condition of Bachaspati's wife and also uses her charms to cajole her husband to desist from testifying. However, the influence of the crafty Brahmo Chhinibas ultimately prevails and he is brainwashed into choosing the interest of his friend's dubious movement over his wife's appeal for truth and humanity. Unlike Kamalini's mother here is a woman who has presumably received modern education, but has distanced herself from it. Her comparatively stronger hold over her husband, her refusal to collude with the reformers and her active sympathy for and helping of Bachaspati's wife give her marginally more agency than Annapurna.

The representative of another version of womanhood is the unnamed young neighbour girl of Chhinibas' mother. This unnamed girl, the wife of Aghorbabu, represents the standard of moral virtue in the predominantly amoral world of Chhinibas and his company. She is the only support of the old hapless mother of Chhinibas after the latter squanders all her meagre savings and leaves her for good. She provides the old woman with food, keeps her company, consoles and boosts her morale with the hope of Chhinibas' returning. She is a typical Hindu village girl with no evident academic accomplishment beyond the ability to read; she reads Chhinibas' letter to his mother and the Ramayana while waiting for her husband's return [9]. She is a thoroughly orthodox Hindu woman who stays back

in the village while her husband stays in the city for work. Out of her selfless care and sympathy for Chhinibas' mother she enlists her husband's help to track Chhinibas and accompanies the old woman to Calcutta. Even in the city she maintains purdah— she does not go out to the drawing room to call her husband even when he is late and puts on the veil in front of her husband with whom she never makes eye contact and “talks in a subdued voice with her head lowered in modesty” [9]. She stays in the *antahpur* taking care of her household while also devotedly and ungrudgingly taking care of the ailing old woman waiting to meet her son. It is through her constant motivation and Aghorbabu's perseverance that the latter finally succeeds in accosting Chhinibas and bringing the old woman face to face with her son. Though it leads to tragic consequences because of the sheer inhumanity of Chhinibas the altruism, compassion, love and care exhibited by Aghorbabu's wife is exemplary and held up as the moral standard by which Chhinibas and the Brahmos are judged and condemned.

If placed on a continuum from complete indoctrination by and integration with modern education and Brahma liberalism to total immunity from its influence Kamalini stands at the first extreme and Aghorbabu's wife on the latter, with Annapurna and Giribala standing somewhere in between, the former somewhat closer to the liberal end. Similarly, if plotted on a scale of moral virtue Aghorbabu's wife would stand on the peak with Kamalini falling into the abyss of immorality. When juxtaposed together a clear correlation emerges between moral goodness and distance from modern education. The inference is simple; the more educated and liberal a woman is the more morally corrupt she becomes and may even turn into an inhuman monster. The author's ideological position vis-à-vis the woman's role is clear. The ideal woman of virtue as envisioned by the orthodox Hindu revivalist is one who has no transactions with education or western cultural notions. This inference can be furthered strengthened by Jogendra Chandra's pronouncements in other writings too. In the essay “Shikshita Bangalini” (The Educated Bengali Woman) he proclaims:

In those days we could come across in every household of Bengal women who were the very image of Sita, Savitri, Damayanti. They were embodiments of innocence, purity, wifely devotion, and perfection in household work, a veritable Lakshmi in the home. We have seen them even a few days ago. But today finding such a woman is harder than finding a needle in the hay stack. How did we come to such a pass?...A novelty called women's education has been imported to this country by the infidel government. This women's education is the cause of this catastrophe. It is no less poisonous than cobra venom. But this has become the object of the Babus' desire, their infatuation and enjoyment. This very venom spitting serpent has become the woman's greatest ornament...her wifely devotion, her motherly affection, her dedication to housework, the entirety of her world....What's more? Better to spend my life in widowhood than giving up education. Such is the attraction, such is the infatuation, such is the madness [11].

True to his orthodox Hindu ideology the author evokes examples of devoted wives from the Puranic Hindu past as his ideals of femininity and laments the loss of this utopia through the invasion of women's education which has taken the primacy of place in the lives of women by replacing their devotion for husbands. In evoking the idea that women's predilection for education leads to widowhood he echoes the sentiments of the early nineteenth century detractors of women's education whose imagined fear of widowhood had been adequately refuted by the time he was writing. However, for the ultra-orthodox author the force of traditional belief supersedes rationality and where logic fails to persuade traditional authority is held up as irrefutable. If women acquiring education become bad wives willingly opting for widowhood, it also makes them bad mothers. Elsewhere in *Bangalicharit* a character called Chanchala tells her husband that having become educated women should spend their time in pondering over scientific problems rather than thinking about housework. Why should educated women perform menial housework for which they can hire house helps? Even the job of the lactating mother can be done by hired wet nurses. And all these have to be introduced because the "white flower of civilization has blossomed" [11]. The significance of the adjective white is self-evident. It is the importation of ideas from the white west that has corrupted the brown women of Bengal, made her selfish, indifferent to her proper role of being the ideal mother, wife and mistress of the household. It is to be remembered that even the patrons of women's education during the nineteenth century hardly envisioned a role for women beyond her home, though their justification for education was that it would make them better companions for their educated husbands, better nurturers of the future generations and better managers of the household (Borthwick 1984: 64) [6]. But, Jogendra Chandra is not and even willing to allow such an argument in favour of education. Kamalini the educated woman is the nightmare in the name of a wife, her mother a failed wife, parent and mistress of the household, even Giribala in spite of her little victories over her husband is a failure when it comes to awakening good sense in her husband. The ideal conjugality witnessed in the two novels is that of Aghorbabu and his wife who shows the least penchant for education.

Jogendra Chandra's antipathy towards education, however, is more general. In another essay he writes, "A man or a woman can be well educated without even knowing the alphabet. ...The meaning of education is practical knowledge. Bookish knowledge is not education. It's the imitative talk of the parrot. Hindus only understand practical knowledge. There's no other meaning of education for the Hindus. Work, work, work—this is the only maxim for the Hindu" [12]. It is not only the subject matter of western education which is condemned for their corrupting influence, but the very concept of literacy is deemed unnecessary for a Hindu for whom practical knowledge and the ethics of work are all that is essential. Here is a Hindu nationalist ideologue who in his bid to distinguish his religious identity from the colonial hegemony tries to put forward a more fundamental and radical notion of difference with respect to the ideology of education. This assertion of radical alterity though regressive, irrational and historically unsound too, is what I think underlies the author's conception of the ideal Hindu female

subject who does not only need no western education, but no education at all beyond what is strictly practical for her role in society which again is conceived exclusively as that of the housewife. Moreover, in asserting that education is redundant even for men he also forecloses the reformist argument that women need education in order to be better wives to their educated husbands. Such an extreme reactionary stance which is hard to find even among the orthodox writers of the time [12] adds a different dimension to what Partha Chatterjee calls the nationalist resolution of the Women's Question in his influential essay of the same name. Chatterjee discusses how contrary to the perception that the Women's Question was subsumed by the more pressing nationalist question during the late nineteenth century, it was given a makeover through the construction of a set of binaries between male/female, outer/inner, material/spiritual and so on [2]. In this new conception the woman's emancipation was thought to be achieved not through an imitation of the west, but by asserting her difference from it. Women's education accordingly was meant to be focused on indigenous cultural and religious knowledge so that they could become the custodians of the indigenous heritage and preserve the spiritual core of the nation from the onslaught of the more materialistic western education whose adoption was unavoidable for the men of the bourgeois class. While the nationalist take on the women's question was not opposed to women's education per se, it was opposed to a certain conception of it on western lines. But, Jogendra Chandra takes it to an orthodox extreme by showing that education itself is unnecessary. As it has been seen earlier, in his scheme of things the farther the woman is from education the better she is as a moral subject and as a successful member of her sex. Giribala with her education as well as her distance from western modernity (as exemplified by her refusal to write about divorce and women's rights) together with her ethical concern for truth, honesty and compassion (as exemplified in her position regarding the Bachaspatis) would have been the exemplary woman of the nationalist imagination as delineated by Chatterjee. However, in Basu's conception she still falls short of the ideal which is reserved for the almost uneducated wife of Aghorbabu whose lack of education has not hindered her moral education, rather promoted the acquirement of her virtues through an orthodox Hindu upbringing. Thus, for the Hindu nationalist Jogendra Chandra the question of what constitutes the ideal female subject can only be resolved through a complete denial of bookish education to women whom the traditional scriptural wisdom transmitted through the family will inspire to become the Sitas, Savitris and Damayantis of the modern age. Thus through a demonization of Brahmo liberalism these satires ultimately aim to interpellate the ideal Hindu male and female subjects as upper caste adherents of a pure orthodox Brahminical patriarchal ideology in order to counter the forces of colonial hegemony and indigenous reform movements and thereby contribute an alternative perspective to the more prominent discourse of nationalist self-fashioning of the late nineteenth century Bengali *bhadralok* class.

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একবিংশ শতকে অষ্টাঙ্গ যোগের প্রাসঙ্গিকতা

ড. দিলিপ সরকার ¹

সারসংক্ষেপ

যোগ বলতে বোঝায় চিত্তবৃত্তির নিরোধ (সাংখ্য ও যোগ দর্শনে চিত্ত বলতে মন, বুদ্ধি ও অহংকারকে একত্রে বোঝায় এবং বৃত্তি বলতে বোঝায় চিত্তের বিষয়াকার ধারণ করা)। চিত্তবৃত্তির জন্য আত্মা নিজেকে চিত্তের সঙ্গে একাত্ম বলে মনে করে। আত্মার এই ভ্রান্তজ্ঞান নিরাসনের জন্য চিত্তবৃত্তি নিরোধই আবশ্যিক। সাংখ্য ও যোগ দার্শনিকদের মতে, দেহ, মন, ইন্দ্রিয় ও বুদ্ধি থেকে সম্পূর্ণ ভিন্ন আত্মার সম্যক জ্ঞান লাভ হলেই পরম পুরুষার্থ মেলে। এই সম্যক জ্ঞান লাভের জন্য চিত্তশুদ্ধি, মনের মালিন্য অপনয়ন ও অচঞ্চল অভিনেবেশ প্রয়োজন। চিত্তবৃত্তির নিরোধ আত্মশুদ্ধি প্রভৃতির জন্য যোগদর্শন অষ্টাঙ্গ যোগের অনুশীলনের উপদেশ দিয়েছে। এই গবেষণাপত্রে অষ্টাঙ্গ যোগের আটটি অঙ্গ সম্পর্কে বিস্তারিতভাবে আলোচনা করা হয়েছে। এছাড়াও এই গবেষণাপত্রে অষ্টাঙ্গ যোগের উপকারিতা ও একবিংশ শতকে অষ্টাঙ্গ যোগ প্রাসঙ্গিক কিনা সেই বিষয়েও আলোচনা করা হয়েছে।

বীজশব্দ : যম, নিয়ম, আসন, প্রাণায়াম, প্রত্যাহার, ধারণা, ধ্যান, সমাধি।

ভূমিকা

যোগশাস্ত্র হল একটি ভারতীয় দর্শন যা প্রায় দুই হাজার বছর আগে একটি বিশ্বব্যাপী জীবনশৈলী পদ্ধতি হিসেবে আটটি অন্তঃসম্পর্কিত উপাদান নিয়ে গঠিত। মহর্ষি পতঞ্জলি হলেন যোগ দর্শনের প্রতিষ্ঠাতা। মহর্ষি পতঞ্জলি সংকলিত ‘যোগসূত্র’ হলো যোগ দর্শনের মূল গ্রন্থ। যোগ অনুশীলনের ওপর ‘যোগসূত্র’ হল একটি অন্যতম সংগ্রহ গ্রন্থ। বিংশ শতকে যোগসূত্র বিশ্বজুড়ে রাজযোগ অনুশীলন এবং দার্শনিক ভিত্তিতে প্রচলিত ধারণার জন্য বিশ্বব্যাপী জনপ্রিয় হয়ে উঠেছিল, যার পরিচয় আমরা স্বামী বিবেকানন্দের ‘রাজযোগ’ গ্রন্থে পাই। যোগ শব্দের অর্থ হলো - যুক্ত হওয়া। আত্মার সাথে পরমাত্মার, ভক্তের সাথে ভগবানের যুক্ত হওয়া। মহর্ষি পতঞ্জলি যোগসূত্রের দ্বিতীয় সূত্রে বলেছেন - “যোগশিচিবৃত্তিনিরোধঃ”¹ অর্থাৎ যোগ হলো চিত্তবৃত্তির নিরোধ। চিত্ত বলতে প্রকৃতির পরিণাম মন, বুদ্ধি ও অহংকারকে একত্রে বোঝায় এবং বৃত্তি বলতে বোঝায় চিত্তের বিষয়াকার ধারণ করা। সুতরাং যোগ হল চিত্তের বিষয়াকার নিরোধ হওয়া। মহর্ষি পতঞ্জলি যোগ সাধনার উপায় স্বরূপ আটটি অঙ্গের কথা বলেছেন যা অষ্টাঙ্গ যোগ নামে পরিচিত। মহর্ষি পতঞ্জলি যোগসূত্রের দ্বিতীয় সূত্রে বলেছেন - “যমনিয়মাসনপ্রাণায়ামপ্রত্যাহার ধারণা ধ্যান সমাধয়োহষ্টাঙ্গানি”² এই আটটি অঙ্গ হল - যম, নিয়ম আসন, প্রাণায়াম, প্রত্যাহার, ধারণা, ধ্যান ও সমাধি। অষ্টাঙ্গ যোগ মূলত কীভাবে একটি অর্থবহ, সুস্থ এবং উদ্দেশ্যমূলক জীবন যাপন করতে পারা যায় সেই সম্পর্কে নির্দেশিকা হিসেবে কাজ করে। এই যোগানুষ্ঠানগুলি নৈতিক আচরণ ও সুশৃঙ্খলার মধ্যে দিয়ে আধ্যাত্মিক প্রকৃতি গঠনের সহায়তা করে। নিম্নে অষ্টাঙ্গ যোগের আটটি অঙ্গ সম্পর্কে বিশদভাবে আলোচনা করা হল -

(১) **যম :** যম হল অষ্টাঙ্গ যোগের প্রথম অঙ্গ। এটি হল যোগের প্রাথমিক নৈতিক ভিত্তি, যাকে বাদ দিয়ে যোগশাস্ত্র সম্ভব নয়। বলা যেতে পারে যম শুধু আমাদের জীবনের ব্যবহারিক দিকটি নয় বরং আধ্যাত্মিক অস্তিত্বকে সম্বোধন করে। মহর্ষি পতঞ্জলি যম অনুশীলনের জন্য পাঁচটি নৈতিক পদ্ধতির উল্লেখ করেছেন। যোগসূত্রের সাধনপদের ৩০ নং সূত্রে বলা হয়েছে - “অহিংসাসত্যাস্তেয়ব্রহ্মচর্যাপরিগ্রহা যমাঃ।”³ অহিংসা, সত্য, অস্তেয় ব্রহ্মচর্য ও অপরিগ্রহ এই পাঁচটি হল যম এর নৈতিক অনুশাসন। এই পদ্ধতিগুলি আমাদের এবং সমাজের নৈতিক জীবনযাপনের মৌলিক দিক নির্দেশনা

¹ দর্শন বিভাগ, কুম্ভমন্ডি সরকারি মহাবিদ্যালয়, দক্ষিণ দিনাজপুর, পশ্চিমবঙ্গ;

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দেয়। সাধারণত এই পাঁচটি নৈতিক পদ্ধতি প্রতিটি ধর্মেই অনুসরণ করা আবশ্যিক। এমনকি গীতার প্রতিটি অধ্যায়ে যম অনুশীলনের উপর জোর দেওয়া হয়েছে।

ক) অহিংসা: অহিংসা কথার অর্থ হল সর্বপ্রকার হিংসা বর্জন করা। কায়িক, বাচিক ও মানসিক সকল প্রকার হিংসা থেকে বিরত থাকা। জীবহত্যা (কায়িক), কটুবাক্যে অপরকে আঘাত করা (বাচিক), অপরের ক্ষতি-চিন্তা (মানসিক) এ সবই হিংসার অন্তর্গত। জীবহিংসা যেমন বর্জনীয়, তেমনি কথার দ্বারা অপরকে আঘাত করা, এমনকি অপরের ক্ষতি চিন্তাও বর্জনীয়। অহিংসা শুধু প্রাণীপীড়ন বর্জন করা মাত্র নয়, প্রাণীগণের প্রতি সন্তোষ পোষণ করাও বোঝায়। এমনকি হিংসামূলক চিন্তা শারীরিক ক্ষতি করার থেকেও এতো শক্তিশালী যে এর ফলে চিন্তাকারী ব্যক্তি এবং পারিপার্শ্বিক প্রাণীগণের উপরেও ক্ষতিকর প্রভাব পড়ে। অহিংসা অনুশীলন করার অর্থ হল সর্বদাই সতর্কতা অবলম্বন করা, যাতে সর্ব অবস্থায় নৈতিকতা বজায় থাকে। প্রতি মুহূর্তে নিজের এবং অন্যের চিন্তাধারা পর্যবেক্ষণ করা। যেমন একজন ধূমপায়ী পাশে থাকলে, ধূমের প্রভাবে স্বয়ং ধূমপায়ীর এবং পাশের ব্যক্তি ক্ষতিগ্রস্ত হয় তেমনি ভাবে হিংসা চিন্তার দ্বারা নিজের এবং অন্যের ক্ষতি হতে পারে। তাই স্পষ্টতা ও ভালোবাসার অভিনয় করার থেকে প্রকৃত অহিংসার অনুশীলন করা শ্রেয় অর্থাৎ অহিংসা কেবল নেতিমূলক সাধন নয়, অহিংসার একটি ইতিমূলক দিকও আছে এবং তা হল মৈত্রী। মৈত্রী অহিংসারই অন্তর্গত। হিংসা না করা হচ্ছে অহিংসার নেতিবাচক দিক আর মিত্রসুলভ আচরণ করা, প্রেম-ভালবাসা বিতরণ করা হচ্ছে অহিংসার ইতিবাচক দিক।

খ) সত্য: সত্য বলতে বোঝায়, যথার্থ কথন ও চিন্তন এবং মিথ্যা কথন ও চিন্তা বর্জন অর্থাৎ মিথ্যাভাষণ থেকে বিরত থাকাও সর্বদাই সত্যাচারণ করা। উদ্দেশ্য মহৎ হলেও অসত্য কথন বর্জনীয়। সত্য অপ্রিয় হলে মৌনতা অবলম্বন বাঞ্ছনীয়। স্বল্পভাষিতাও সত্য সাধনের একটি অঙ্গ। অধিক কথা বললে অনেক অসত্য কথা প্রায়ই বলতে হয়। সাধককে অসত্য ভাষণ, অপ্রিয় ভাষণ ও অতি-ভাষণ থেকে বিরত থাকতে হবে। সত্য সম্বন্ধে শ্রুতিতে বলা আছে - “সত্যমেব জয়তে নানৃতম্ সত্যেন পস্থা বিততো দেবযানঃ।”^৪

গ) অস্তেয়: অস্তেয় বলতে বোঝায়, পরদ্রব্য অ-গ্রহণ অর্থাৎ যা আমার নয় তা গ্রহণ করা যাবে না। এর অর্থ হল প্রয়োজনের অতিরিক্ত গ্রহণ না করা। যখন আমরা প্রয়োজনের অতিরিক্ত গ্রহণ করি তখন আমরা অস্তেয় অনুশীলনে ব্যর্থ হই অর্থাৎ অপ্রাপ্য দ্রব্য গ্রহণ করা হল স্তেয় এবং স্তেয় থেকে বিরত থাকাই হল অস্তেয়। সুতরাং স্তেয় হল অধর্ম বা অনৈতিক, অস্তেয় হল ধর্ম বা নৈতিক অর্থাৎ যা নিজস্ব নয়, এমন দ্রব্য গ্রহণ করা থেকে বিরত থাকা এবং সেসব দ্রব্যের প্রতি স্পৃহা ত্যাগ করাই হল অস্তেয় সাধন। এই বিষয়ে শ্রুতিতে বলা হয়েছে — “মা গৃধঃ কস্যাস্বিন্দনম্।”^৫

ঘ) ব্রহ্মচর্য: ব্রহ্মচর্য হচ্ছে জনেন্দ্রিয়ের সংযম। জনেন্দ্রিয়কে সংযত রাখার জন্য প্রয়োজন অন্যান্য ইন্দ্রিয়গুলিকেও সংযত করা, মিতাহার ও মিতনিদ্রা অভ্যাস, এবং সর্বপ্রকার কামচিন্তা বর্জন। এ প্রকার ব্রহ্মচর্য অনুশীলনে সাধক বীর্য লাভ করেন। অন্যভাবে বলা যায় ব্রহ্মচর্য কথার অর্থ হল ব্রহ্মের প্রতি নিজেকে চালনা করা। চক্ষুরাদি সমস্ত ইন্দ্রিয়কে অব্রহ্মচর্যের বিষয় থেকে সংযত করাই হল ব্রহ্মচর্য। এককথায় শরীর, মন ও বাক্যে বীর্য ধারণ করা হল ব্রহ্মচর্য। সন্ন্যাসী বা প্রকৃত যোগী তারা তাঁদের অব্রহ্মচর্যতা বা যৌনতার শক্তিটিকে অন্যকিছুতে রূপান্তর করে, প্রধানত তারা তা ব্রহ্মের প্রতি ভক্তি ও প্রেমে পরিণত করে এবং ঈশ্বর লাভে অগ্রসর হয়।

ঙ) অপরিগ্রহ: অপরিগ্রহ হচ্ছে অপরের দ্রব্য গ্রহণ থেকে বিরত থাকা, অর্থাৎ অপরের দ্রব্যের প্রতি লোভ-লালসা ত্যাগ করা। আমাদের সমাজে অর্থনৈতিক ব্যবস্থা অধিকাংশই লালসার উপর নির্ভরশীল। অপরিগ্রহ অনুশীলন অত্যন্ত কঠিন। ত্যাগ ব্যতীত অপরিগ্রহ অনুশীলন ব্যর্থ। বিষয় অর্জনের দুঃখ, রক্ষণে দুঃখ, ক্ষয় হলে দুঃখ, সঙ্গে সংস্কারজনিত দুঃখ এবং বয়সগ্রহণে অবশ্যস্বাবী হিংসার ফলে দুঃখ। এই সকল দুঃখের কবল থেকে মুক্তির জন্য মুমুক্শু ব্যক্তি প্রথমত, বিষয় ত্যাগ করেন এবং পরে তা অগ্রহণ করেন তথা অপরিগ্রহ সাধনে ব্রতী হন। কেবল প্রাণধারণের উপযুক্ত দ্রব্যমাত্রই স্বীকার্য। শ্রুতিতে বলা আছে - “ত্যাগেনৈকেনামৃততৃমানশুঃ।”^৬ অর্থাৎ একমাত্র ত্যাগ ও বৈরাগ্যই অমৃতত্ব দিতে সমর্থ। নিঃস্বার্থপরতা, ত্যাগ হল জীবনধারণের প্রকৃত নীতি। সব শাস্ত্রের উপদেশ এই - স্বার্থপর হয়ো না, নিঃস্বার্থ হও। ভাষ্যকার বলেছেন, অপরিগ্রহ তথ্য ত্যাগ ব্যতীত যোগসিদ্ধি সম্ভব নয়। তাই যোগীরা প্রথমেই যা কিছু নিজস্ব তা পরার্থে ত্যাগ করেন ও পরে আর প্রাণনির্বাহের অতিরিক্ত দ্রব্য পরিগ্রহণ করেন না।

(২) নিয়ম: অষ্টাঙ্গ যোগের দ্বিতীয় নীতিশাস্ত্র হল নিয়ম। পতঞ্জলি তাঁর ‘যোগসূত্র’-এর দ্বিতীয় পদের ৩২ নং সূত্রে নিয়ম প্রসঙ্গে বলেছেন - “শৌচসন্তোষতপঃস্বাধ্যায়েশ্বরপ্রণিধানানি নিয়মাঃ।”^৭ অর্থাৎ নিয়ম হল শৌচ বা শুচিতা, সন্তোষ বা সন্তুষ্ট থাকা, তপস্যা, স্বাধ্যায় ও ঈশ্বরপ্রণিধান। নিয়ম হল একধরণের স্ব-অনুশাসন পদ্ধতি বা নৈতিক আচরণ।

(২) শৌচ: ‘শৌচ’ শব্দের অর্থ শুচিতা বা শুদ্ধি। যোগের জন্য দেহ ও মন উভয়েরই শুচিতা দরকার। এই কারণে শৌচ দ্বিবিধ - বাহ্য ও

অন্তর। পরিষ্কার জলে প্রতিদিন স্নান করা, বাড়িঘর পরিষ্কার রাখা, সাত্বিক আহার গ্রহণ করা ইত্যাদি হল বাহ্য-শৌচ বা শুচিতার অন্তর্গত। আভ্যন্তর শুচিতা হচ্ছে, কুচিন্তা বর্জন ও সুচিন্তার অনুশীলন। অহংকার, অভিমান, অসূয়া প্রভৃতি কুচিন্তা থেকে মনকে মুক্ত করে শ্রদ্ধা, প্রীতি, প্রেম, প্রভৃতি সুচিন্তার অনুশীলনই হল আভ্যন্তর-শৌচ। শৌচের দ্বারা চিত্তশুদ্ধি হয় এবং চিত্ত-শুদ্ধির ফলে চিত্তে প্রসন্নতা আসে।

খ) সন্তোষ: সন্তোষ বলতে বোঝায় অহেতুক আকাঙ্ক্ষাকে বর্জন করে যা পাওয়া যায় তাতেই সন্তুষ্ট থাকা। অর্থাৎ সন্তোষ হল স্বল্পে তুষ্টি। যা পাইনি তার জন্য খেদ না করে যা পেয়েছি তাতে সন্তুষ্ট থাকাই সন্তোষ। অহেতুক আকাঙ্ক্ষায় চিত্ত অস্থির ও চঞ্চল হয়। সন্তোষের দ্বারাই চিত্তে শান্তি প্রতিষ্ঠিত হয়। তাই ভাষ্যকার বলেছেন - “যাঁহার মন সন্তুষ্ট তাঁহার সর্বত্রই সম্পদ, যেমন, যাঁহার পাদদ্বয় পাদুকাবৃত তাঁহার নিকট সমস্ত পৃথিবী চর্মাবৃতের ন্যায়।”^{১৮} -এই হল সন্তোষের সাধন অর্থাৎ এই নিয়ম অনুশীলন শিক্ষা দেয় যে, জীবনে যা কিছু প্রাপ্ত বস্তু আছে সেইভাবে জীবনকে গ্রহণ করতে পারলে সন্তোষ বা সন্তুষ্ট লাভ হবে। মোহ বা লোভ থেকে সন্তোষ আসে না। বাহ্যিক অস্থায়ী প্রাপ্তি থেকে যে সুখ তা ক্ষণিক। পরক্ষণেই তা নিশ্চিহ্ন হয়ে যায়। সন্তোষ, এই নিয়ম অনুশীলনের দ্বারা উপলব্ধ হয় যে সুখ, শান্তি তা আসে অন্তর থেকে, আত্মা থেকে। যা ক্রয় করা যায় না। এই মুহূর্তে জীবনে যা উপস্থিত রয়েছে সেটুকুই যথেষ্ট এইরূপ মানসিকতা থেকে সন্তুষ্টি পাওয়া যায়।

গ) তপস্যা: তপঃ শব্দের অর্থ হল তপস্যা বা ব্রত অথবা আত্মনিয়ন্ত্রণ। এটি শুধু আধ্যাত্মিক অনুশীলন নয় যে কোনো বাহ্যিক বিষয়কে অনুসরণ করে এই অনুশীলন করা সম্ভব। এটি একপ্রকার শৃঙ্খলা। তপস্যা হল এমন এক কার্যকরী শৃঙ্খলা যার সাধন করলে মন, দেহ ও আত্মায় অনুকূল শৃঙ্খলা গড়ে ওঠে। এটি হল একপ্রকার আন্তর্জাগতিক শক্তি যা মনকে শুদ্ধ, বুদ্ধ করতে এবং অনাবিল তৃপ্তি খুঁজে পেতে সহায়তা করে। স্বপ্নাহার, কখনো উপবাস, কোমল-শয্যা বর্জনপূর্বক কঠিন-শয্যা গ্রহণ, শীত-উষ্ণ সহন ইত্যাদি তপস্যার অন্তর্গত। তপস্যার দ্বারা চিত্তে স্থৈর্য প্রতিষ্ঠিত হয়।

ঘ) স্বাধ্যায়: স্বাধ্যায় শব্দের অর্থ হল অধ্যয়ন ও জপ। পবিত্র মন্ত্রের জপ এবং উপনিষদ, গীতা প্রভৃতি মোক্ষশাস্ত্র অধ্যয়নকে বলে স্বাধ্যায়। অধ্যয়ন আত্মজ্ঞানের প্রতি স্পৃহার উদ্রেক করে এবং জপ আত্মতত্ত্বে অনুপ্রবেশ ঘটায়। উপনিষদ, ভগবদগীতা প্রভৃতি মোক্ষশাস্ত্র অধ্যয়নের ফলে বিষয়চিন্তা ক্ষীণ হয় এবং আত্মজ্ঞান লাভের বাসনা দেখা দেয়।

ঙ) ঈশ্বরপ্রণিধান: ঈশ্বরপ্রণিধান হল ঈশ্বরের নিরন্তর চিন্তা বা ধ্যান এবং ঈশ্বরে সর্বকর্ম সমর্পণ। অন্যকথায় ঈশ্বরের কাছে আত্মসমর্পণ। এই নিয়ম ঈশ্বরিক প্রেম, ভক্তি ও সেবার সঙ্গে সংযুক্ত। প্রশান্ত ঈশ্বরচিন্তে নিজের চিত্তকে স্থাপন করে অর্থাৎ আত্মাকে বা নিজেকে ঈশ্বরে সমর্পণ করে - সর্ব অপরিহার্য চেষ্টা তাঁর দ্বারাই সম্ভব হয়েছে, প্রত্যেক কর্মে এইরূপ ভাবনা করা এবং কর্মের ফলাকাঙ্ক্ষা ত্যাগ করে ঈশ্বরে সর্বকর্ম সমর্পণ করা অর্থাৎ নিজেকে অকর্তা ভেবে ঈশ্বরকে স্মরণে রেখে কর্ম করলে ঈশ্বর প্রণিধানরূপ নিয়ম সাধন সম্ভব হয়। এই নিয়মানুশাসন আত্মার সাথে পরমাঙ্গার মিলনের সেতু তৈরী করে। ঈশ্বর-প্রণিধানের মাধ্যমে সাধকের চিত্ত মালিন্য দূরীভূত হয়। ঈশ্বরে প্রণিধান বা আত্মসমর্পণ করলে ঈশ্বর করুণাবশে সাধকের সাধন-পথের সকল বাধা অপসৃত করে সমাধিলাভকে সম্ভব করেন।

চ) আসন: ‘যোগসূত্র’-এ বলা হয়েছে, “স্থিরসুখম্ আসনম্।”^{১৯} - (সাধনপাদ-৪৬)। সকল অঙ্গপ্রত্যঙ্গকে স্থির রেখে সুখে ও সহজভাবে বসবার নাম হল ‘আসন’। মনঃসংযমের জন্য বিভিন্ন প্রকার আসন বা বসবার কায়দা অভ্যাস করা দরকার। যেমন-তেমন ভাবে বসে উচ্চচিন্তায় মনঃ সংযোগ করা যায় না। দেহের সঙ্গে মনের সম্বন্ধ খুবই নিবিড়। মনকে নিয়ন্ত্রিত করতে হলে দেহকেও নিয়ন্ত্রিত করা দরকার। দেহ নিয়ন্ত্রণের জন্যই বিভিন্ন আসনের দরকার। পদ্মাসন, বীরাसन, ভদ্রাসন প্রভৃতি বিশেষজ্ঞের কাছে নিষ্ঠার সঙ্গে শিক্ষা করলে দেহ সমস্ত রকম ব্যাধিমুক্ত হবে। দেহ নিরোগ হলেই শান্ত ও সুস্থ মনে আত্মচিন্তায় নিমগ্ন হওয়া সম্ভব। সেইজন্যই আত্মচিন্তার সহায়ক হিসেবে যোগাসনের নির্দেশ। আজকাল স্বাস্থ্যরক্ষার জন্য যোগাসন দেশে ও বিদেশে খুবই জনপ্রিয় হয়েছে।

৪) প্রাণায়াম: ‘যোগসূত্র’-এ বলা হয়েছে, “তস্মিন্ সতি শ্বাস-প্রশ্বাসযোগতিবিচ্ছেদঃ প্রাণায়ামঃ।”^{২০} (সাধনপাদ-৪৯) অর্থাৎ শ্বাসগতি ও প্রশ্বাসগতির যে বিচ্ছেদ তাকেই বলে প্রাণায়াম। প্রাণায়াম বলতে শ্বাসপ্রশ্বাস নিয়ন্ত্রণ বোঝায়। শ্বাসগ্রহণ করা (পূরক), শ্বাস ত্যাগ করা (রেকক) এবং দীর্ঘকাল শ্বাস রক্ষা (কুস্তক) - প্রাণায়াম প্রক্রিয়ার তিনটি দিক। একমাত্র বিশেষজ্ঞের কাছেই এই ব্যাপারে যথাযোগ্য শিক্ষা গ্রহণ করা উচিত। শ্বাস-প্রশ্বাস নিয়ন্ত্রণের ফলে হৃদক্রিয়ার যথেষ্ট উন্নতি হয় এবং হৃদশক্তি বৃদ্ধি পায়। আধুনিককালের চিকিৎসকেরাও একথা স্বীকার করেন। যোগ দার্শনিকগণ বলেন, প্রাণায়াম অভ্যাস হলে হৃদক্রিয়ার উন্নতি এবং হৃদশক্তির বৃদ্ধির সঙ্গে সঙ্গে মনোনিবেশ ক্ষমতা এবং দীর্ঘকাল অচঞ্চলভাবে চিন্তা করার শক্তিও বৃদ্ধি পায়। কুস্তক প্রক্রিয়া যথাযথভাবে আয়ত্ত করতে পারলে শ্বাসরোধের সঙ্গে সঙ্গে চিন্তা অন্তর্মুখীন হয় এবং দীর্ঘকাল আত্মচিন্তায় মগ্ন থাকা যায়। সেইজন্যই যোগ দর্শনে কুস্তকপ্রক্রিয়ার প্রাধান্য প্রতিষ্ঠিত হয়েছে।

৫) প্রত্যাহার: যোগমতে প্রত্যাহার হল পঞ্চম যোগাঙ্গ। ‘যোগসূত্র’-এ বলা হয়েছে - “স্ববিষয়াসম্প্রয়োগে চিত্তস্য স্বরূপানুকার ইবেদ্রিয়াণাং

প্রত্যাহারঃ।”^{১১} (সাধনপাদ-৫৪) অর্থাৎ স্ববিষয় অসংযুক্ত হয়ে চিত্তের স্বরূপানুকার লাভকেই ইন্দ্রিয়সমূহের প্রত্যাহার বলা হয়। প্রত্যাহার বলতে বিভিন্ন ইন্দ্রিয়কে তাদের বিষয় থেকে প্রতিনিবৃত্ত করে অন্তর্মুখী করা বোঝায়। আমরা জানি, বিভিন্ন ইন্দ্রিয়ের বিভিন্ন বিষয় এবং এরা সর্বদাই এই সব বিষয়ের দিকে উন্মাদের মতো ছোটে। চক্ষুর বিষয় রূপ, কণ্ঠের বিষয় শব্দ, নাসিকার বিষয় গন্ধ, জিহ্বার বিষয় স্বাদ এবং ত্বকের বিষয় স্পর্শ। বিভিন্ন ইন্দ্রিয় যখন এইসব বিভিন্ন বিষয়ের দিকে ধাবিত হয়, তখন মন চঞ্চল হয়ে ওঠে। এই অবস্থায় আত্মচিন্তায় মনোনিবেশ করা অসম্ভব ব্যাপার। সেইজন্যই যোগ দর্শনে ইন্দ্রিয় নিয়ন্ত্রণ করে বিষয়ানুরক্তি ত্যাগের উপদেশ দেওয়া হয়েছে। শাস্ত্রকারেরাও বলেছেন, ‘আবৃত্তচক্ষুঃ ভব’ অর্থাৎ চক্ষুইন্দ্রিয় যাতে বিষয়ে ধাবিত না হয়, সেই জন্য চোখ আবৃত কর। বিষয় পরিত্যাগ করলেই বিষয়ী বা আত্মার মনঃসংযোগ সম্ভব। সেইজন্যই প্রত্যাহারের নির্দেশ।

৬) ধারণা: ‘যোগসূত্র’-এ বলা হয়েছে, “দেশবন্ধশ্চিত্তস্য ধারণা।”^{১২} (বিভূতিপাদ-১) অর্থাৎ চিত্তকে কোন দেশে আবদ্ধ বা সংস্থিত রাখাকেই বলে ধারণা। চিত্তকে বাহ্য বা আন্তর দেশ বিশেষে আবদ্ধ করা যায়। ধারণা বলতে অভিপ্রেত বস্তুতে চিত্ত-সংযোগ বোঝায়। কোনো একটি বিষয়ে দীর্ঘকাল মনোনিবেশ করাই ধারণা। নিজদেহের নাভিদেশ, ভ্রুয়ুগল মধ্যবর্তীস্থান প্রভৃতি কোনো একটি বিষয়ে যেমন ধারণার পরে বিষয় হতে পারে, তেমনি আবার দেবদেবীর মূর্তি প্রভৃতি বাহ্য জিনিসও বিষয় হতে পারে। কোনো একটি বিষয়ে দীর্ঘকাল মনঃসংযোগ করার ক্ষমতা সাধককে উচ্চতর যোগাঙ্গে প্রবেশের অধিকার দেয়। যে লোক, কোনো একটি বিষয়ে দীর্ঘক্ষণ মনোনিবেশ করতে পারে না সে উচ্চতর যোগচর্চার অনুপযুক্ত। সেইজন্য যোগসাধনায় ধারণার প্রয়োজন অনস্বীকার্য।

৭) ধ্যান: ‘যোগসূত্র’-এ বলা হয়েছে, “তত্র প্রত্যয়েকতানতা ধ্যানম্।”^{১৩} (বিভূতিপাদ-২) অর্থাৎ ধারণাতে জ্ঞানবৃত্তির একতানতাকেই ধ্যান বলে। সাধারণভাবে ধারণাতে জ্ঞানবৃত্তি কেবল অভীষ্ট বিষয়েই আবদ্ধ থাকে। এইরূপ বিষয়ক জ্ঞান খণ্ড খণ্ড ভাবে ধারাবাহিক ক্রমে চলতে থাকে। অভ্যাসের দ্বারা যখন তাদের মধ্যে একতান বা অখণ্ড ধারা প্রবাহিত হয় তখনই তাকে যোগের পরিভাষায় ‘ধ্যান’ বলে। ধ্যান তাই চিত্তস্থৈর্যের অবস্থা বিশেষ। ধ্যানশক্তির বলে সাধক যে কোন বিষয় অবলম্বন করে ধ্যান করতে পারেন। ধারণাকে বিন্দু বিন্দু জল বা তেলের সঙ্গে তুলনা করা যায়। অন্যদিকে ধ্যান হল জলধারা বা তৈলধারার ন্যায়।

৮) সমাধি: ‘যোগসূত্র’-এ বলা হয়েছে, “তদেবার্থমাত্রনির্ভাসং স্বরূপশূন্যমিব সমাধিঃ।”^{১৪} (বিভূতিপাদ-৩) অর্থাৎ ধ্যান যখন ধ্যেয়ের স্বভাবের আবেশে জ্ঞানাত্মক স্বভাবশূন্য হয় তখন তাকে সমাধি বলা হয়। সমাধি যোগসাধনার সর্বশেষ স্তর। এই অবস্থায় মন-ধ্যানের ধনে এমন নির্বিষ্টচিত্ত হয় যে, সে তার স্বাতন্ত্র্য হারিয়ে ফেলে। তখন ধ্যানের বিষয়কে সাধক আর ভিন্ন বলে মনে করেন না। ধানের ধন ও তিনি তখন একাগ্র হয়ে যান। এই অবস্থায় যিনি সাধক, তিনিই ধ্যানের বিষয় এবং যা ধ্যানের বিষয় তাই সাধক অর্থাৎ তখন আত্মাই আত্মাকে দেখে। ধ্যানের ক্ষেত্রে ধ্যানের বিষয় এবং ধ্যানকর্ম ভিন্ন বলে মনে হয়। কিন্তু সমাধির সময় এই ভেদ লুপ্ত হয়ে যায়। মন তখন একান্তভাবেই এমন বিষয়লগ্ন হয় যে, বিষয় সম্বন্ধে চিন্তার কথা তার মনেই থাকে না। চিন্তার বিষয়ই তখন সাধকের সমস্ত চৈতন্য আচ্ছন্ন করে রাখে। এই অবস্থায় একটি অকম্প শিখাই জ্বলে। তার নাম আত্মা। আত্মাই ধ্যানের কর্তা, আত্মাই ধ্যানের বিষয়, অর্থাৎ সমস্ত সত্তাই আত্মাময়। চিত্তবৃত্তিনিরোধ বলে যে যোগ বা সমাধির কথা বলা হয়েছে, তা আর এই সমাধি অভিন্ন নয়। এই সমাধি উপায় আর ওই সমাধি উদ্দেশ্য অর্থাৎ চিত্তবৃত্তিনিরোধের জন্যই এই সমাধি আবশ্যিক।

উপরে আলোচিত অষ্টবিধ যোগাঙ্গের প্রথম পাঁচটি (যম, নিয়ম, আসন, প্রাণায়াম ও প্রত্যাহার) বহিরঙ্গ সাধন এবং শেষের তিনটি (ধারণা, ধ্যান ও সমাধি) অন্তরঙ্গ সাধন নামে পরিচিত। কারণ, প্রথম পাঁচটি যোগাঙ্গে চিত্ত সমাধির জন্য প্রস্তুত হয়, কিন্তু এরা সমাধির সঙ্গে অন্তরঙ্গভাবে সম্পর্কিত নয়। ধারণা, ধ্যান ও সমাধি চিত্তবৃত্তি নিরোধের সঙ্গে ঘনিষ্ঠ সম্পর্কে আবদ্ধ। অন্যভাবে বলা যায়, ধারণা লাভের জন্যই প্রথম পাঁচটি যোগাঙ্গের দরকার আর যোগীর লক্ষ্য যে সমাধি তা লাভের জন্য দরকার শেষের তিনটি যোগাঙ্গ। সুতরাং যোগীর লক্ষ্য সমাধির দিক থেকে দেখতে গেলে প্রথম পাঁচটি বহিরঙ্গ, আর শেষের তিনটি অন্তরঙ্গ।

অষ্টাঙ্গ যোগের উপকারিতা: পতঞ্জলির ‘যোগসূত্র’ অনুসারে, অষ্টমুখী পথ নামে একটি অনুশীলন রয়েছে যা আত্ম-জাগরণ এবং মুক্তির দিকে নিয়ে যায়। অষ্টাঙ্গযোগ, আটটি অঙ্গের রূপরেখা দেয় এবং শারীরিক, মানসিক এবং আধ্যাত্মিক স্বাস্থ্যের বিকাশ ঘটায়। এই যোগ-শৈলীর কিছু সুবিধা হল:

ক) অষ্টাঙ্গ যোগ অনুশীলনের ফলে শারীরিক শক্তির বিকাশ ঘটে। অষ্টাঙ্গযোগ অনুশীলন শরীরকে পুনরুজ্জীবিত, শক্তিশালী, নমনীয় ও নিয়ন্ত্রিত করে তোলে। এছাড়াও অষ্টাঙ্গ যোগ অনুশীলনের ফলে মনোবল এবং সহনশীলতা ধীরে ধীরে উন্নত হয়।

খ) যদি কারো কার্ডিও ওয়ার্ক আউটের প্রয়োজন হয় তবে অষ্টাঙ্গ যোগ অনুশীলন একটি উত্তমপস্থা। এটি শরীরের আদর্শ আকৃতি পেতে, যথাযথ ওজন পরিচালনা করতে এবং সুস্থ থাকতে সাহায্য করবে। অষ্টাঙ্গ যোগ অনুশীলনের সময় দীর্ঘ, ধীর ও গভীর নিঃশ্বাস যখন দ্রুত করা হয়, এটি

কার্যকরভাবে হৃদস্পন্দন বাড়াতে পারে। অষ্টাঙ্গ যোগের ভক্তির ক্রমগুলির অবিচ্ছিন্ন, দ্রুত অনুশীলন, অনুশীলনকারীকে তীব্রতার অনুভূতি দিতে পারে। অনুশীলনকারী যদি যৌগিক অনুশীলনের আরও জোরালো শৈলী পছন্দ করেন তবে অষ্টাঙ্গ যোগ তার জন্য সঠিক শৈলী।

গ) অষ্টাঙ্গ যোগ শরীরকে সুরক্ষিত করার একটি শক্তিশালী হাতিয়ার। এটি দেহের বিভিন্ন অঙ্গগুলির মধ্যে ভারসাম্য এবং সমন্বয় উন্নত করে। আসনগুলির একটি দ্রুত এবং তীব্র অনুশীলন দৈহিক ছন্দের একটি ভাল অনুভূতি জাগিয়ে তোলে এবং অনুশীলনকারীর শরীরের গতিবিধি এবং প্রবাহ সম্পর্কে সচেতনতা বাড়ায়।

ঘ) অষ্টাঙ্গ যোগ আবেগ, মানসিক নমনীয়তা ও শক্তির উপরও জোর দেয়। আসনগুলি কেবল অনুশীলনকারীর পেশী এবং জয়েন্টগুলিকেই প্রভাবিত করতে পারে না, আবেগগুলিকেও প্রভাবিত করতে পারে এবং শুদ্ধি ও সক্ষম করতে পারে। অষ্টাঙ্গ যোগ অনুশীলন করে অনুশীলনকারী অনুভূতি এবং আবেগের মধ্যে ভারসাম্য খুঁজে পাবেন। এটি অনুশীলনকারীকে মানসিকভাবে কঠিন পরিস্থিতি মোকাবেলা করতে, ব্যথা এবং চাপা আবেগের মধ্য দিয়ে কাজ করতে এবং সেগুলি কাটিয়ে উঠতে সহায়তা করবে। অনুশীলনকারীর আবেগের ভারসাম্য, তার অঙ্গ এবং পুরো শরীরকে আরও দক্ষতার সাথে কাজ করতে সাহায্য করবে এবং তিনি বুঝতে পারবেন তার শরীর এবং মন কতটা দৃঢ়ভাবে সংযুক্ত।

ঙ) অষ্টাঙ্গিক যোগব্যায়াম শরীরকে শ্বাস-প্রশ্বাসের সাথে সমন্বয় করে সচল রাখবে। এই অনুশীলনে শ্বাস সচেতনতা বিশেষভাবে গুরুত্বপূর্ণ। এই ধরনের চলমান ধ্যান ও শ্বাসের উপর অবিচ্ছিন্ন মনঃসংযোগ অনুশীলনকারীর মনকে শুদ্ধ করবে এবং শান্ত করবে, দুশ্চিন্তা থেকে মুক্তি দেবে এবং অব্যক্ত আচরণের ধরণগুলিকে পরিবর্তন করতে সাহায্য করবে। অষ্টাঙ্গযোগ-অনুশীলনকারীকে তার নিজের কাছে ফিরিয়ে আনবে এবং তাকে দৈনন্দিন ভিত্তিতে কেন্দ্রীভূত করবে। এই অনুশীলন আমাদের মনের বাইরে অভ্যন্তরীণ মিলন এবং গভীর উপলব্ধি অর্জন করতে শেখায়।

চ) অনুশীলনকারীর দক্ষতা এবং অভিজ্ঞতার উপর ভিত্তি করে সঠিক ক্রমে একই ভঙ্গি পুনরাবৃত্তি করার উদ্দেশ্য রয়েছে এবং সুবিধাগুলি শুধুমাত্র শারীরিক নয়। এটি অনুশীলনকারীর আধ্যাত্মিক সত্তাকে জাগ্রত করে। প্রথম চারটি অঙ্গ অনুশীলনকারীর বাহ্যিক অংশকে পরিষ্কার করে এবং তার চারপাশের বিশ্বের সাথে কীভাবে যোগাযোগ করতে হয় তা শেখায়। পরবর্তী চারটি অঙ্গ প্রত্যাহার, অভ্যন্তরীণ পরিচ্ছন্নতা এবং অনুশীলনকারীকে কীভাবে তার মনের সাথে সম্পর্ক যুক্ত করে তোলা যায় তার উপর গুরুত্ব প্রদান করে।

সিদ্ধান্ত: ব্যক্তি এবং সমাজ একে অপরের পরিপূরক। সুস্থ ব্যক্তি ছাড়া সুস্থ সমাজ সম্ভব নয়। সুস্থ ও পরিবর্তিত ব্যক্তিই পারে জাতি, ধর্ম, বর্ণ ইত্যাদির বৈষম্য ছাড়াই সুস্থ সমাজ গড়ে তুলতে। তাই, কাঙ্ক্ষিত ব্যক্তিগত এবং নৈতিক মূল্যবোধগুলি নিজেকে শুদ্ধ করতে এবং সমাজকে পরিবর্তন করতে সহায়তা করে। ব্যক্তি ক্রমাগত নিজেকে মূল্যবোধ পরীক্ষায় নিযুক্ত থাকে। আমাদের সর্বদা মনে রাখা প্রয়োজন যে নৈতিক মূল্যবোধ সততা, তৃপ্তি, শান্তি ও আনন্দ নিয়ে আসে; আর অনৈতিক মূল্যবোধ বিভ্রান্তি, দ্বন্দ্ব, দুর্দর্শা ও দুর্ভাগ্য নিয়ে আসে। তাই সামাজিক কল্যাণ ও বিকাশের জন্য যোগব্যায়ামের প্রয়োগ বর্তমান সময়ে আবশ্যিক। যোগের সূর্য যখন বর্তমান পৃথিবী ও সমাজের দিগন্তে আলোকিত হবে, তখন সামাজিক কুফল, সকল অনৈতিক ও অমানবিক-আচরণ বিলুপ্ত হবে এবং একটি শান্তিপূর্ণ, সমৃদ্ধ, সুখী ও পরিবর্তিত সমাজের স্বপ্ন পূরণ হবে। যোগ, প্রকৃতপক্ষে, একজন ব্যক্তিকে 'সত্যম্-শিবম্-সুন্দরম্' এবং 'সৎ-চিত্ত-আনন্দ' (সত্য-আনন্দ এবং চেতনা)-র মর্মে নিমজ্জিত করে।

যোগ একজনের শরীর, মন ও আত্মার উপর কাজ করে। তাই এটি বিশ্ব-শিল্প হিসেবে পরিচিত। যখন আমাদের শরীর, মন ও আত্মা, সুস্থ ও সেহর্দ্যপূর্ণ হবে, তখন আমরা বিশ্বে স্বাস্থ্য ও সৌহার্দ্য আনব। তাই যোগব্যায়াম সমগ্র বিশ্ব ও মানবতার জন্য আমরা হিন্দু, মুসলিম, খ্রিস্টান, ইহুদি অথবা ভারতীয়, ইতালীয়, জাপানি, চীনা বা আমেরিকান যে কেউ হই না কেন, আমরা সবাই মানুষ। শান্তিপূর্ণ, সমৃদ্ধ ও আনন্দময় জীবনের জন্য প্রত্যেকেরই শারীরিক, মানসিক ও আধ্যাত্মিক সুস্থতা প্রয়োজন এবং যোগব্যায়াম এই উদ্দেশ্য সাধিত করতে সাহায্য করে। শরীরের যন্ত্রণা একই রকম। মনের কষ্টগুলোও একই রকম। রোগ ও দুর্ভোগ কোন জাতি বা ধর্ম মানে না এবং সেই রোগগুলি নিরাময়ের জন্য যোগ হল অন্যতম পথ।

সমাজ ও পৃথিবীর রূপান্তরের জন্য প্রথমে ব্যক্তির রূপান্তর আবশ্যিক। যেহেতু ব্যক্তি সমাজের মৌলিক একক, সেহেতু রূপান্তরিত ব্যক্তিদের দিয়েই একটি পরিবর্তিত সমাজের সৃষ্টি হয়। ব্যক্তি ও সমাজ একে অপরের পরিপূরক। সুস্থ ও পরিশুদ্ধ ব্যক্তি ছাড়া সমাজের পরিবর্তন সম্ভব নয়। পতঞ্জলির যোগ দর্শনে যোগের আটটি অঙ্গ বর্ণনা করা হয়েছে। অষ্টাঙ্গযোগে, 'যম' মূলত একজন ব্যক্তির সামাজিক শৃঙ্খলার সাথে সম্পর্কিত, যা একজন ব্যক্তির জন্য সামাজিক আচরণবিধিকে নির্ধারিত করে, যেখানে 'নিয়ম' একজন ব্যক্তির জন্য ব্যক্তিগত আচরণবিধিকে নির্ধারিত করে। আজ ব্যক্তিগত ও সামাজিক আচরণবিধি লঙ্ঘনকারী ব্যক্তির বিভিন্ন অসামাজিক কার্যকলাপে জড়িত যার ফলে সমাজ দুর্নীতি, অপরাধ, প্রতারণা, সহিংসতা, ধর্ষণ ইত্যাদি সামাজিক কুফল দ্বারা প্লাবিত হচ্ছে। অষ্টাঙ্গ যোগ অনুশীলন করলে এইসব সামাজিক কুফল দমন করা যাবে, যার ফলে সমাজে সুস্থ ও সৌহার্দ্য পূর্ণ পরিবেশ বজায় থাকবে। এইভাবে, যোগব্যায়ামের সর্বজনীন প্রয়োগ বিবেচনা করে আমরা বলতে পারি যে, যোগ বর্তমান সময়ে

প্রাসঙ্গিক। এইভাবে, যোগব্যায়াম বিশ্বব্যাপী রূপান্তরের সম্ভাবনায়ুক্ত ব্যক্তি, পরিবার, সমাজ, জাতি এবং বিশ্বকে আরও সভ্য, পরিশীলিত এবং আলোকিত করতে একটি গুরুত্বপূর্ণ ভূমিকা পালন করতে পারে।

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Wittgenstein on Private Language

Edha Chakrabarti¹

ABSTRACT

A complete form of the ordinary language philosophy came to the lime light in the philosophy of later Wittgenstein. This paper attempts to give a clear picture of ordinary language philosophy as advocated by later Wittgenstein. It is divided into three sections. In the first section, it is discussed how Wittgenstein has applied ordinary language as a method for dissolving or solving philosophical problems. The second section is concerned with the rejection of Private Language by him and in the last section a brief critical examination has been done against Wittgenstein's view on the impossibility of Private Language. A concluding remark will be given too.

SECTION I

According to Later Wittgenstein, language is intimately connected to our ordinary life which includes practices, custom, linguistic and non-linguistic behavior. Wittgenstein opines that:-

“Language game is meant to bring into prominence the fact that speaking of language is a part of an activity, or of a form of life” [1].

Wittgenstein believes that when we speak something meaningfully, we do something with words. However, he emphasizes that there are no rules or conventions which govern various types of performances. While Wittgenstein talks about language-game, he is specifically concerned about impure language game. In pure language game linguistic aspects are considered, whereas in impure language game, not only language but social behaviour is also considered. He states that pure language game is dependent on impure language game as it is more fundamental.

In the philosophy of later Wittgenstein, ‘form of life’ means an underlying agreement of linguistic and non-linguistic behaviour, practices, assumptions, traditions, natural propensities which people share among themselves and thus it becomes a presupposition to every successful users of language. A word uttered by the speaker becomes meaningful to the hearer only when both of them have a common conceptual framework. This happens only when they are in identical social surroundings –an identical form of life. This is the reason why we cannot comprehend the language of a lion, as he does not share any identical form of life with us. According to Wittgenstein, language is a social function, which depends upon the understanding of another person. So it is impossible that it should be employed in a private use. Bolton, says, ‘A word has meaning in human life’ [2].

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SECTION II

Wittgenstein states:-

“When one says “He gave a name to his sensation” one forgets that a great deal of stage-setting in the language is presupposed if the mere act of naming is to make sense. And when we speak of someone’s having given a name to pain, what is presupposed is the existence of the grammar of the word pain; it shows the post where the new word is stationed’ [3].

It follows from his enquiry that a word in order to be meaningful must follow some rules which determine the linguistic role of it. If a word is to be defined privately then it must be done extensively. We must point out to our sensation in the same manner that we do in pointing a material object to give it a name. The speaker of a private language tries to establish a connection between a word or sign and a sensation. But the problem is that it is impossible to tell whether one has remembered the connection correctly. He says, there is ‘no criterion of correctness’ for private ostensive definition. It is true; we cannot point to happiness in the same way we point to a tree. Memory can be used as a criterion by which we can tell that the word ‘happiness’ so used in a certain way will be so in future. However, there is no guarantee that one has remembered the thing properly. So, private ostensive definition is impossible, meaningless. As rules cannot be followed privately, therefore communication would be jeopardized. If ‘happiness’ refers to a private sensation, it is not a working part of the machine of language, but a mere idle decoration.

It is followed from the above discussion that Wittgenstein holds that the sensations are private and words or signs used in private language cannot be defined meaningfully. Language must be public and must be shared. So, private language is impossible.

SECTION III

Criticism against Wittgenstein’s view on the impossibility of Private Language has been made by A. J. Ayer in the ‘Proceedings of the Aristotelian Society’ [4]. Wittgenstein holds that a sign to be meaningful must be understood by people. Ayer argues that it is logically possible that a person like ‘Robinson Crusoe’, who is alone from birth, can invent a language for his own purpose though it has not been thought by anyone else. Although it is difficult, communication is not possible even if one has only private experiences.

Ayer opines that for a person to use language meaningfully, it is not necessary that another person should understand him. Another point is that he tries to refute the basic assumption upon which he believes that Wittgenstein’s argument is based on i.e. it is logically impossible to understand a sign unless one can observe the object with which it is naturally associated. According to him, to understand a statement, it is not necessary to observe the object or fact which it indicates or to observe something with which it is naturally related.

Conclusion: Rush Rhees criticizes the argument given by Ayer against Wittgenstein's rejection of private language in his article, "Can there be a Private Language [5]?" He argues that language can never be used privately. It is a social phenomenon, based on community agreement, it is communicated and shared. He has refuted Ayer by saying that a lonely person like Robinson Crusoe can discover and advance a language privately of his own to satisfy his purpose. However, he says that language is closely associated with our form of life. An expression becomes significant when people follow certain rules and as a matter of fact rules cannot be used privately. So, private language is unfeasible.

In fine it may be said that although Wittgenstein tries to analyse ordinary language as well as he has rejected the private language to solve the philosophical problem, however, he has realized that it is not the only way to solve the problem. He believes that there is no need to construct formal language for philosophical discussion. Philosophical problems can be dissolved if language that we use can be properly understood.

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Molecular Docking Investigation of Anticancer Drug Actinomycin D (ActD) and Interaction with DNA

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ABSTRACT

To understand the Philosophy of anticancer activity of Actinomycin D and its interactions with DNA, molecular docking search is computed. Out of fifty different conformers, four conformers show greater binding scores than other conformers, such as, -20.48, -20.31, -17.89, -16.76 kJ/mol. Phenoxazone ring and two cyclic polypeptides can interact to bind or intercalate the duplex DNA individually and simultaneously. However Phenoxazone ring can intercalate inside the pocket of duplex with greater inhibition constant K_i 728.38 μ M.

Keywords: Docking, ActD, DNA

Introduction

Nowadays molecular docking investigation in the field of Computer Aided Drug Design (CADD) is an important area of research in the broad area of both chemistry and biology, placing a small molecule into the binding site of the a protein or DNA target specific region. To find a lead molecule from natural sources and its biological or organic synthesis for getting a perfect drug is a tedious experimental process. Fortunately, computational tools are quite helpful in rationalizing the path of drug discovery and secure a valuable position in the modern scenario of structure-based drug design [1].

Recently, molecular docking studies of anticancer drug with DNA are important for chemotherapy uses. In this study, a molecular docking study of anticancer drug Actinomycin D and DNA has been introduced. For searching, the history of anticancer compounds and their variety of application and structures for example, vincristine, cyclophosphamide, actinomycin D, BCNU, mithramycin, duanorubicin and adriamycin and platinum based complexes cisplatin based drugs, but due to severe side effects best anticancer drugs are still unknown. Sometime combination of drugs like Vincristine, actinomycin D, cyclophosphamide (VAC) could be safely and effectively administered in rhabdomyosarcoma and Ewing's sarcoma [2]. Tang et al. [3] synthesized ruthenium (II) polypyridyl complexes and molecular docking studies with DNA-interaction. It is on the 2023 World Health

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Organization's List of Essential Medicines [4]. Actinomycin D (ActD) or dactinomycin is the most significant polypeptide antibiotic among all actinomycins, isolated from soil bacteria belonging to the Streptomycin genus.

Lian et al. [5] established ActD-d(GAAGCTTC)₂ and ActD-d(GATGCTTC)₂ complexes in NMR spectroscopic studies, forms a very stable complex with d(GATGCTTC)₂ in a cavity created by the T:T mismatched base pair, but unstable A:A-mismatched d(GAAGCATC)₂ duplex, may trap the cruciform structure of the (CAG)_n/(CTG)_n sequence and may stopping the expansion during replication.

Methods and Material: We used Autodock [6,7] for molecular docking of actinomycin D (Drug Bank DB00970.sdf) and DNA (ID 7dq0.pdb). Genetic algorithm parameter is used during docking.

Results and Discussion: 3D geometry, HOMO-LUMO orbitals and their energies obtained from quantum mechanical calculation shown in the Figure 1. The calculated dipole moment is 5.535D. The 1- and 9-positions of phenoxazone ring is occupied by two bulky cyclic polypeptides. Molecular docking calculation shows that both the cyclic peptides and phenoxazone ring interact with the duplex structure of the DNA at different sites.

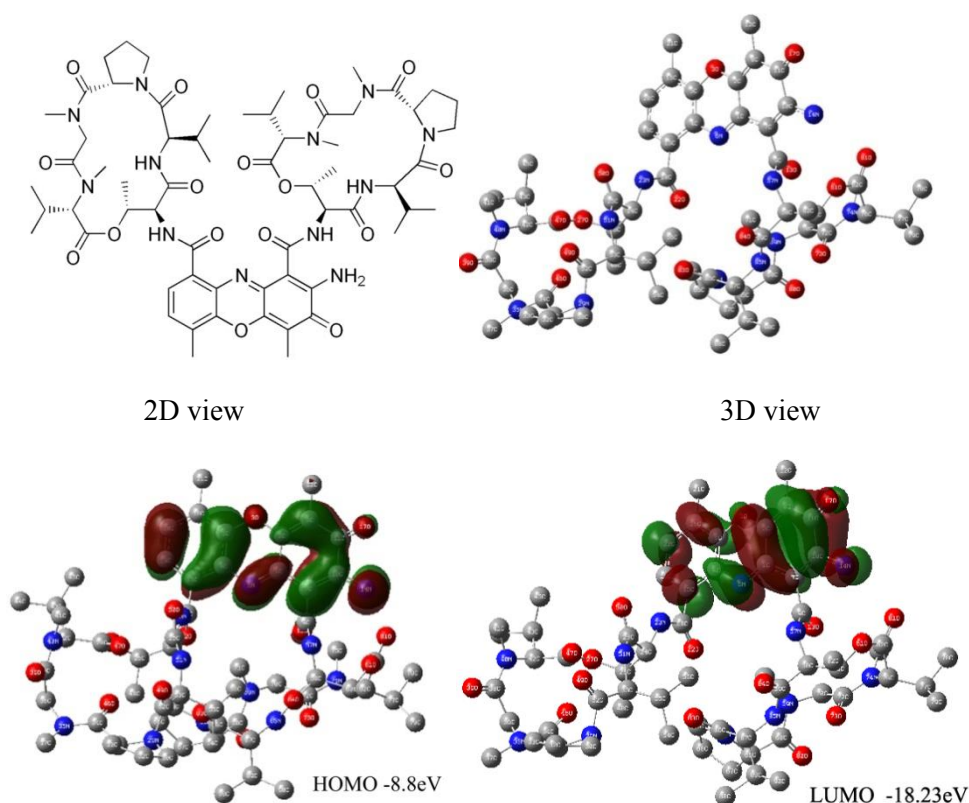


Figure 1. Actinomycetine D, 2D view, 3D view HOMO and LUMO orbitals with electronic energies.

Fifty different conformations of non-covalent interaction between ActD and DNA duplex are found. Out of them, in conformation A as shown in Figure 2, both the cyclic peptides intercalated between the two strands, by three hydrophobic interactions, residues 1B, 2B, 4A and drug atoms 391, 392 and 411 and hydrogen bonding between residue 1B and phenoxazone ring of the drug molecule ActD forcing from outside entering the grooves of DNA. The calculated binding Free energy, Inhibition constant and RMSD values are given in the Table 1. Satange et al. [8] showed that the phenoxazone ring is intercalated between G2:C13 and C3:G12 base pairs and bulky cyclic peptide rings enlarge the minor groove and partially unfold the duplex.

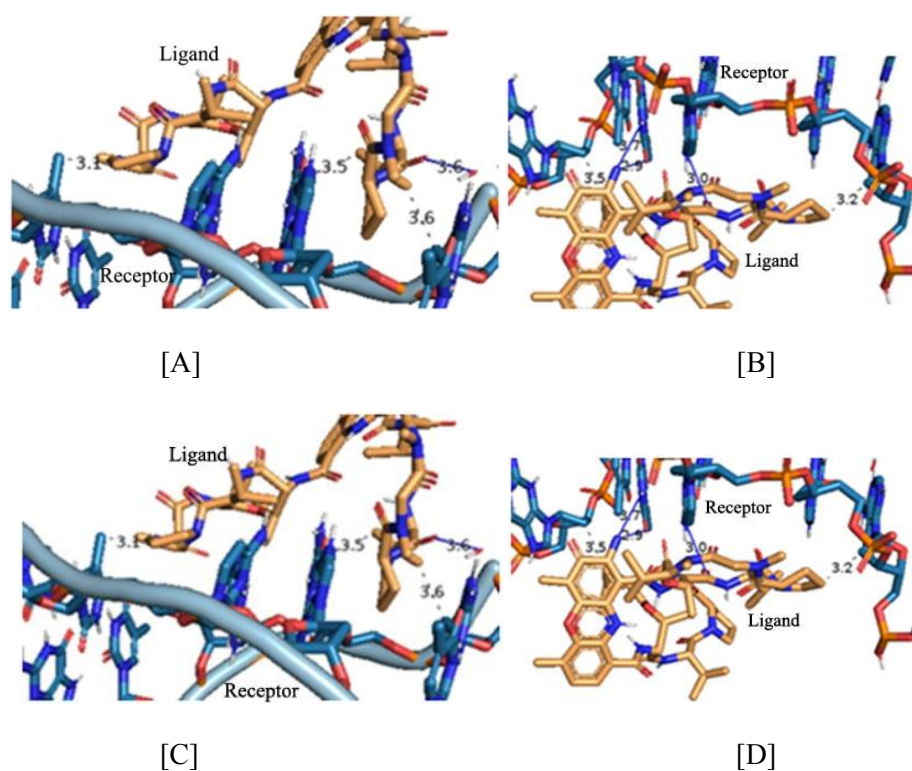


Figure 2. [A], [B], [C] and [D] are conformations of non-covalent interactions between ActD and DNA; dotted line shows Hydrophobic interactions and blue straight line shows H-bondings.

In conformation B as shown in Figure 2, from Table 1, calculated binding score -20.31, K_i value 275.8 μM and number hydrophobic and hydrogen bonds are 2 and 3 respectively. Hydrophobic interactions of residue 1A (DA type) and ligand (atom 373, of distance 3.16Å) and residue 3B (DG type) and ligand (atom 433 of distance 3.53Å); and hydrogen bonding DNA residues 3A(DC), 4B(DT) and 4B(DT); all the moieties of ActD such as phenoxazone ring and two cyclic peptides of the simultaneously interacting with the duplex in this conformer.

Table1. Binding free energies, K_i , RMSD number of interactions between ActD and DNA

Conformers	Binding energy (kJ/mol)	K _i (μM)	RMSD	Hydrophobic Interactions	Hydrogen Bonds
A	-20.48	254.24	12.80	3	1
B	-20.31	275.8	13.39	2	3
C	-17.89	728.38	17.92	5	2
D	-16.76	1.15	15.36	2	3

In conformation C as shown in Figure 2, from Table 1, calculated binding Free energy -17.89 kJ/mol, greater score of K_i 728 μM number of total interaction is seven similarity of finding's of Satange et al, phenoxazone ring intercalation in base pairs of duplex forcing by two cyclic polypeptide moiety of the drug ActD.

Conclusion: Actinomycin D interacts with the duplex DNA by several number hydrophobic and hydrogen bonding and intercalation of the Phenoxazone ring in the pocket of DNA driving force from outside of the two cyclic polypeptides has been observed.

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Human & Wildlife: From Conflict to Coexistence, a Journey towards Resilience

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ABSTRACT

As human population is increasing day by day, their need for space and other vital resources is continuously growing. Competition arises between human and wildlife for getting resources and it finally rises Human Wildlife Conflict (HWC). HWC has pessimistic effect on both Human and Wildlife. Human & Wildlife coexistence is a part of HWC management to enhance the safety of people and wildlife, and to create mutual benefits of coexistence.

Keywords: Human wildlife conflict, coexistence, HWC management, sustainable development, ecosystem, wildlife

Introduction

The growing human population has led to increased demand for natural resources, resulting in habitat destruction and wildlife fragmentation, leading to human-wildlife conflicts, where wildlife threats threaten human interests [1]. People frequently attack animals in self-defense, as well as preemptive or punitive killings, which can contribute to the extinction of species. It also has an impact on many aspects of life, such as farmers', herders', artisanal fishermen's, and indigenous peoples' incomes, especially those who live near wildlife.

Human-Wildlife Conflict Management (HWCM) is a strategic approach to reduce conflicts between humans and wildlife, involving activities like observation, analysis, forecasting, avoiding, reacting, and mitigating HWC. Human-wildlife coexistence refers to people and wildlife coexisting in close vicinity, whether in contested, neutral, or beneficial coexistence, when both humans and wildlife's requirements are usually fulfilled [1].

1. Reasons behind Human Wildlife Conflict:

The rise of human-wildlife conflict has been aided by a number of global phenomena pertaining to human populations, habitat change, and animal distribution and behavior.

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1.1. Growth in Human Population:

The human population explosion has resulted in an increased demand for natural resources. To keep up with the increased population, settlements in both urban and rural areas have begun to spread. Several communities have sprung up on the outskirts of protected areas, encroaching on forest regions and exploiting them for their own gain.

1.2. Land Use Transformations:

Humans intrude on protected forest parts to clear big forest covered areas for agricultural and horticultural development. They also clear land for monoculture plantations of Areca nut, Teak, and other hardwoods. Developmental activities – Hydroelectric projects result in the submergence of nearby forest lands and habitat fragmentation. Large wildlife habitats are broken up into little bits as areas are cleared for mining and businesses [2].

1.3. Livestock Grazing:

Human-wildlife conflict arises as a result of livestock grazing in forests, as carnivores are drawn to the easy prey and become direct opponents of livestock grazers. Livestock grazing has posed a serious danger to our wildlife and their ecosystems in a number of ways. The most apparent result is a reduction of wild herbivore populations, which must compete for food with livestock. There is less attractive biomass for wild herbivores as more cattle graze and chew the natural vegetation. Unpalatable plant species often invade the area as animals eat pleasant native plant species. Furthermore, livestock grazing contributes to the transfer of contagious diseases from domestic to wild animals, which frequently results in the death of wild ungulates. Soil erosion in forest environments is exacerbated by heavy grazing [2, 3].

1.4. Habitat Fragmentation and Shrinkage:

As a result of the aforementioned factors, vast wildlife habitats are fragmenting and forest covered areas are diminishing in size. As a result, wild animals are unable to thrive in that environment since their demands are not met. As a result, they wander throughout the neighborhood looking for resources. Villagers lose their valuable cattle, such as cows, sheep, and goats, when wild animals such as tigers and leopards attack [2].

2. Global Effect of Human Wildlife Conflict:

2.1. Effect on Wildlife and Ecosystem:

Chronic and unmanaged HWC can harm ecosystems and biodiversity, and in some situations, have long-term consequences. People often kill animals in self-defense, as preemptive or retaliatory killings, which can lead to the extinction of species involved in conflict. In the northern hemisphere, people

killed bears, wolves, and lynx in order to prevent livestock predation and increased human safety [4] Since every species plays a specific role in its environment, its extinction has a negative impact on the ecosystem. The extinction of apex predators, for example, has cascading effects across the ecosystem. Their absence might result in an increase in prey species like deer and wild boar, which has harmful consequences for ecosystem vegetation. The natural renewal of forests is hampered by heavy grazing or browsing by these herbivores [5].

It has been estimated that conflict-related killing affects more than 75% of the world's felid species. With the increased population, settlements in both urban and rural areas have begun to spread. Several communities have sprung up on the outskirts of protected areas, encroaching on forest regions and exploiting them for their own gain [2, 3].

Despite the fact that cheetahs rarely prey on cattle, retaliatory killing has been blamed for 48 percent of cheetah deaths in Namibia [6]. People's retaliatory killing accounts for half of all tiger deaths [7]. Due to livestock predation, snow leopards are increasingly coming into conflict with herders. HWC was responsible for 55% of all snow leopard deaths worldwide [8].

2.2. Effect on Local Communities:

Wildlife have direct impacts on human communities in living in proximity of protected areas, causing injuries, loss of human lives, loss of livestock, crops, and property. Although the impact of HWC differs from person to person within communities. Farmers in remote areas lose crops, and people face tragic encounters with predators or herbivores while moving from one town by walking or bicycling. Conflict severity and damage can severely impact food security, livelihoods, and well-being. HWC's negative effects are amplified in vulnerable, disadvantaged groups [9].

2.3. Effect on Equity:

Living near animals has economic and physiological costs that are unequally dispersed and disproportionately fall on those who live with the wildlife; on the other hand, the advantages of a species' survival are often more widely distributed. This unequal persists at various scales, both locally and globally. Indigenous peoples and rural communities regularly encountering such wildlife carry the burden of living with them [10, 11].

Chronic unmanaged HWC can undermine governments' political legitimacy, as communities often blame them for wildlife conflicts, believing the government is responsible for their losses. Many government agencies are working to resolve conflicts in HWC hotspots, in spite of having lack of resources and capacity to implement effective HWC management measures. When the government's reaction to HWC is inadequate, communities lose patience with both the wildlife and the government for failing to meet their needs. Local communities and ethnic peoples believe that governments only

intervene when poachers kill elephants, not when elephants kill people. Such circumstances can lead to local community discontent and distrust of government and its policies, reducing HWC management effectiveness, discouraging civil engagement, and harming the state's reputation, all of which have an impact on local community development [12].

2.4. Effect on Socio-political Dynamics:

When societal needs and responses are not sufficiently addressed, HWC can set people against one another. Such disagreements can be harmful to communities and undermine governments' political credibility [13].

2.5. Effect on Production and Business:

HWC can negatively affect businesses of agricultural goods and other commodities, leading to localized food insecurity and decreased productivity and competitiveness from producers [14].

2.6. Effect on Sustainable Development:

Because HWC focuses on wildlife-human interactions, there is no other conservation issue that is as closely tied to the Sustainable Development Goals (SDGs) as human-wildlife coexistence, even if it is not explicitly recognized as one. Because of these ties, if HWC is not sufficiently managed, it significantly influences negatively on the majority of SDGs. As a result, if the drivers of HWC are not identified and handled properly, sustainable development efforts may induce or exacerbate it [15].

3. What is required?

HWC poses a global threat to sustainable development, food security, and biodiversity conservation. Holistic management approaches involving communities, governments, civil society, donor agencies, and businesses are needed [16].

4. HWC Management & Moving from Conflict to Coexistence:

Successful HWC management requires integrated, holistic approaches considering multiple elements. Understanding human-wildlife relationships is crucial for reducing conflicts and promoting coexistence. Although eliminating conflict is impossible, a well-planned, coordinated approach can lead to coexistence [16].

4.1. The Fundamentals of HWC Management:

Holistic and integrated management approaches are needed to help those affected by HWC and achieve coexistence, while also promoting community benefits from wildlife.

Holistic approaches: Holistic approaches consider local development and conservation plans, human aspiration, social dynamics, sectoral plans, conflict drivers, and local socio-cultural contexts.

Integrated approaches: Integrated conflict management strategies involve preventing, mitigating, responding to HWC, researching, monitoring, and supporting policies to strengthen local conflict management, including nuances of HWC, to understand specific conflict contexts [17].

4.2. Six Elements of HWC Management:

1. Understanding the conflict: Researching all aspects of the conflict profile to understand the context for conflict in any given situation. Conflict between humans and wildlife can be direct or indirect. Direct conflicts occur when wild animals attack humans due to territorial, predatory, or defensive instincts. These attacks are common worldwide and are influenced by interspecific competition for livestock and domestic animals. Bear attacks, for example, can lead to human injuries or deaths. Puma assaults in the US and Canada result in 58 victims, with children being the most targeted [18].

Wild animals attacking domestic animals can lead to indirect conflicts, as predators play a crucial role in ecosystem balance and community structure. Hunting reduces prey availability, causing carnivores to replace domestic species with natural prey, and transportation systems can exacerbate these conflicts [18].

To understand HWC properly we must analyze the drivers of HWC. The key drivers of HWC are overpopulation of humans, mining and urban development, climate change, habitat fragmentation, habitat loss and degradation [19].

Identifying "HWC Hotspots" is crucial for addressing human-wildlife conflict. These hotspots are predicted to cause crop loss, animal mortality, human death, and wildlife damage. Geo-spatial assessments using primary and secondary data can help identify these hotspots. Hotspots can be classified as incident hotspots or vulnerability hotspots. Databases can be created involving forest department staff, researchers, and local peoples, using modern technologies like GIS [19].

2. Mitigation: Reducing the impacts of HWC after it occurs. Mitigation strategies involve nonlethal and lethal methods. These methods are to address the HWC related problems and protect species. Common methods include electric fences, lighting systems, human surveillance, confinement, and translocation [18].

Compensation schemes aim to mitigate economic losses and promote wild animal tolerance by offering direct payments to individuals or families for threats to their crops, livestock, property, or personal safety [20]. Many authors suggest that people in HWC hotspots may be partially or fully reimbursed in cash or alternative measures, but to ensure long-term livelihood viability, they suggest gaining expertise in non-land/non-farming revenue-generating alternatives and establishing self-help groups [19].

3. Response: Response teams are crucial in mitigating human-wildlife conflicts (HWC) as they take prompt action to prevent conflicts and minimize their effects. In emergency situations like human deaths, wild animal injuries, crop damage, property damage, livestock injuries, or animal sightings near

humans, primary and rapid response teams can be employed, adhering to HWC Mitigation Hub or Control Room [19].

The first step in addressing a conflict involves identifying and tracking animals, using camera traps, following the tracks and trails of the animals and after the identification of animals standard operating procedures (SOP) are to be followed. This includes media involvement, crowd control, handling medical emergencies, and post-response animal management. Additional teams, medical and veterinary teams, drugs, and equipment are also needed [19].

4.Prevention: Stopping or preventing HWC before it occurs, Preventing HWC involves understanding animal movement patterns, adjusting land use, and creating wildlife corridors for influencing the coexistence between humans and wildlife, thereby increasing effective population size. (Williams & Johnsingh, 1996). Physical barriers such as electric fences and wall net trenches can effectively deter animals from entering local areas [21].

Early warning systems using satellite telemetry, drones, and other technologies can effectively alert communities when wild animals arrive, but their effectiveness needs to be enhanced, along with robust response teams [19].

5.Policy: Enabling HWC management through protocols, principles, provisions, and measures stipulated in legislation and undertaken by authorities to prevention and management of HWC. International conventions and treaties, such as the Convention on Biological Diversity, CITES, and CMS, are crucial for mitigating HWC in India. Implementation and enforcement are challenging, but international guidelines and protocols from institutions like the IUCN provide a safeguard for conflict management, including reintroduction guidelines and the IUCN SSC Task Force on HWC [19].

The Kunming-Montreal Global Biodiversity framework, adopted at the 15th CBD conference, aims to achieve 4 long-term goals by 2050 and 23 targets by 2030. Specifically Target 4 focuses on HWC management. It aims to minimize human-induced extinction of threatened species, conservation of genetic diversity, and manage human-wildlife interactions for coexistence.” [22].

The 13th conference of the Convention on Migratory Species of wild animals approved the inclusion of the Asian elephant in Appendix I, aiming to improve international collaboration, legal protection, reduce human-elephant conflict, and enhance the gene foundation of the population [23]. The IUCN SSC Task Force on Human-Wildlife Conflict (HWCTF) is a global advisory group of experts integrating ecological and social sciences to address human-wildlife conflict. It aims to foster links between policy, science, and communities, assimilating knowledge and capacity for HWC management across IUCN commissions and members [24].

Following independence, our nation's constitution included provisions supporting wildlife conservation. A number of laws, including the Indian Forest Act 1927, the Wild Life (Protection) Act 1972, the Environment (Protection) Act 1986, and the Biological Diversity Act 2002, are in place in India to regulate HWC. In addition, a dedicated National Human-Wildlife Conflict Mitigation Strategy

and Action Plan of India (2021–26) has been taken to counter HWC. B SOPs have been created by the National Tiger Conservation Authority (NTCA) to handle crises brought on by conflicts between humans and tigers [19].

The National Wildlife Action Plan (2017-31), drafted by a 12-member committee, focuses on wildlife health, marine ecosystem conservation, HWC reduction, coastal ecosystem conservation, and climate change integration [25].

The foundation of HWC-NAP (National Human-Wildlife Conflict Mitigation Strategy and Action Plan of India (2021–26)) is "systems thinking," which helps us identify new opportunities by allowing us to address a problem's underlying causes instead of only treating its symptoms. The fundamental conceptual framework is the Drivers-Pressures-State-Impact-Response (DPSIR) model. It has five major strategic priority. (A) Addressing the key drivers of HWC, (B) Reducing the pressure leading to HWC, (C) Collecting data regarding HWC to decision makers, response team for effective mitigation, (D) Reducing the negative impact of HWC on human and wildlife, (E) Effectively implementing the national, state and local HWC mitigation plans, by strengthening financial and institutional structures. The HWC-NAP is supported by four supplementary frameworks for : (i) Establishment and Capacity Development of HWC Mitigation Response Teams; (ii) Developing State Human-Wildlife Conflict Strategy and Action Plans: A Coordinated Approach towards Mitigating Human-Wildlife Conflict in India; (iii) Developing Division-level HWC Management Action Plans: A Coordinated Approach towards Mitigating Human-Wildlife Conflict in India; (iv) Legislative Framework for National Human-Wildlife Conflict (HWC) Mitigation Strategy & Action Plan. Beside this it also contains following issue-specific and species-specific guidelines are developed, to provide focussed guidance: Forest-Media Cooperation; Occupational Health and Safety; Crowd Management; Medical Emergencies; Guidelines for Mitigating Human-Elephant, -Leopard, -Gaur, -Snake, -Crocodile, -Macaque, -Wild Boar, -Bear, -Bluebull, -Blackbuck conflict [19, 26]. Government of India also publish two advisory naming: Advisory to deal with Human Wildlife Conflicts (2021) in January 2021, the advisories are to recommend States/ Union Territories for dealing with human-wildlife conflict situations and seeks expedited inter-departmental coordinated and effective actions. The second advisory is issued on June 2022 [26].

6. Monitoring: Measuring the performance and effectiveness of HWC management interventions over time. HWC management is a dynamic process evolving with government policies. Feedback from field workers, researchers, wildlife experts, and locals is crucial for effective management. Data on human and animal conflict frequency and behavioral patterns of wild animals can help reduce economic and physical loss. Monitoring systems for HWC are less effective than anti-poaching systems. Research and conservation organizations have created monitoring programs, but lack standardized tools and international data sharing [4].

The Polar Bear-Human Information Management System (PBHIMS) standardized data collection procedures across polar bear range nations, enabling the sharing of incidents and effective conflict management tools, overcoming cross-border data exchange challenges [27].

SMART (Spatial Monitoring and Reporting Tool) is an open-source tool for measuring for the incidence of HWC and thus enhancing wildlife law enforcement patrols and conservation initiatives, implemented in various countries for technical viability [4].

The first four elements are most commonly used in HWC management, while monitoring and implementation of policies are less frequently applied but crucial for integrated conflict management [17].

4.3. Event Book System of Namibia: An Integrative Approach to Monitor & Counter HWC:

Namibia's communal conservancies manage natural resources for a sustainable wildlife economy. They use the Event Book System to track wildlife damage, with community members selecting variables and conservancy staff providing tools. Local game guards help prevent poaching, manage human wildlife conflicts, and maintain the Event Book. The conservancy owns event cards and data, which are stored in administrative offices [4].

The decentralized monitoring method promotes community ownership over wildlife on properties, fostering information exchange between Government and the local communities. Event Book records of livestock, property, and agricultural damage due to HWC as well as human mortality is analyzed regularly. Annually summarized data is used to assess conservancy success, establish hunting limits, and compile the country's State of Conservancies report [4].

Namibia has developed a successful legal framework for managing long-term human-wildlife conflict (HWC) due to its progressive environmental protection laws and constitution. The Ministry of Environment and Tourism has developed Namibia's National Policy on Human-Wildlife Conflict Management, which integrates aspects of HWC into a comprehensive document, including legislative frameworks, best management practices, financial mechanisms, public education, and rapid conflict response procedures [28].

Namibia's Community-Based Natural Resource Management (CBNRM) policies grant decentralized rights to communal area conservancies, self-governing legal entities responsible for wildlife protection and sustainable resource use revenue generation [29]. This approach sets Namibia apart from other countries, where wildlife is typically state-responsible. Namibia's conservancies have tripled elephant populations since the 1990s, secured the largest free-roaming black rhino population, and contributed \$86 million to the country's net national income in 2018 [30].

The government has introduced the HWC Self-Reliance Scheme to compensate landholders for wildlife losses in communal areas, requiring certain measures. The Ministry of Environment and Tourism (MET) encourages conservancies to maintain a tourism and hunting revenue fund [31].

4.4. Diverse Approach for Diverse Country like India:

India's population growth and resource demand are causing habitat loss, fragmentation, and wildlife degradation. Human-wildlife conflicts are intensifying, leading to conflicts with wildlife. States implement HWC management policies, including advisories, ex gratia schemes, insurance schemes, like Pradhan Mantri Fasal Bima Yojana (PMSBY).

The Wildlife Protection Act of 1972 empowers Chief Wildlife Wardens in India to promote peaceful coexistence between humans and wildlife. The National Wildlife Action Plan (2017-31) mandates conflict management plans, post-conflict relief, and ecological information gathering for inclusive interactions between human and wildlife.

The Indian government has developed the National Human-Wildlife Conflict Mitigation Strategy and Action Plan of India (2021–26) in collaboration with The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), state forest departments, Wildlife Institute of India, and local partners. The plan aligns state and division-level HWC management strategies, addressing SDGs, climate change, and biodiversity [26].

5. Benefits of HWC Management and Human Wildlife Coexistence:

5.1. Benefits to Wildlife and Ecosystem:

Holistic HWC management allows species to thrive in their habitats, supporting ecosystem health and functions. It impacts marine and terrestrial large carnivores and megaherbivores, which play critical roles in their ecosystems. These species contribute to the complex web of life, providing clean air, water, fertile soils, and stable climates. Healthy ecosystems support food, medicines, materials and supports millions of jobs.

Carnivores balance prey species through direct predation and fear, preventing overconsumption and promoting natural regeneration and plant growth, creating crucial habitats for various species. Herbivores like Elephants, have the unique ability to shape landscapes by felling trees, creating paths, supporting ecosystem rejuvenation, digging waterholes, and maintaining plant species diversity [32].

6.2. Benefits to Local Community:

Effective management and reduction of HWC in communities can save lives and costs, improve safety, and foster cohabiting with wildlife. Solid policies and support structures can also lead to increased wildlife tolerance and a lower risk of species extinction [4].

Empowered, trained communities can effectively manage HWC, providing long-term revenue and increased success rates due to local residents' involvement [4].

6.3. Benefits to Social Dynamics:

Greater stakeholder involvement, improved communication, and conflict transformation are all benefits of comprehensive HWC management [4].

Elephants in Assam, India, cause significant loss for many tribes, especially those who are isolated or marginalized. WWF-India has been working for over 20 years to reduce conflicts between humans and elephants in the region. They have formed over 70 volunteer anti-depredation squads (ADSs) in Sonitpur, Biswanath, and Nagaon districts, equipped with protective gear to safeguard crops and property. These squads also assist the Forest Department in evicting wild elephants. WWF-India has increased ADSs' confidence in handling conflicts by equipping them with tools and technical knowledge. WWF-India's experiences with ADSs suggest that effective communication with stakeholders is crucial for establishing and maintaining flexible, creative, and successful responses to HWC [4].

6.4. Benefits to the Sustainable Development:

HWC management enhances understanding, reduces biases, and builds trust between the Government and the local peoples. It's crucial for sustainable development and conservation. It boosts local economies, reduces environmental risk, and improves education, health, and infrastructure. It also promotes conservation benefits like increased species knowledge, tolerance, and wildlife killing. Well-planned sustainable development benefits both sides by promoting HWC management [4].

Integrated HWC management creates partnerships between conservation organizations and the development sectors, ensuring social, ecological, and economic sustainability. These partnerships reinforce objectives, deliver conservation benefits, and build trust in conservation initiatives.

Humanitarian partners' expertise in disaster and risk management can improve HWC management by providing emergency food supplies and improving health structures, fostering successful cross-sector partnerships for sustainable development [33].

6.2. Benefits to Commodity Production and Supply Chain:

Well-designed HWC management plans can boost revenue from forestry, agriculture, aquaculture, and free-range animal production, while ensuring wildlife coexistence on farms and plantations. Effective and integrated HWC management positively impacts enterprises, regional economies, worker safety, and animal survival, promoting an environmentally and socially responsible economy that benefits wildlife and people [4].

6.2. Opportunities to Financial Investments:

Integrated HWC management aligns economic growth with wildlife and biodiversity protection, offering a lucrative investment opportunity for multinational organizations and businesses. Funding in HWC management initiatives ensures wild species existence, preserves ecosystem services, and benefits communities by bridging the gap between conservation and regional economy [4].

Conclusion: We still don't know a lot about the causes and consequences of human-wildlife conflict. An inter- and transdisciplinary approach incorporating social and natural science, psychology, and environmental legislation can help to better understand HWC. Study on climate change, urbanization, industrialization, and changes in agriculture should contribute to a better knowledge of trends that can be used to manage HWC. It will be a significant step forward when the international community can band together and cooperate to develop and scale up integrative and comprehensive approaches to HWC management. If new policies can strike the perfect balance between processes that deter harsh human behavior toward wildlife and those that encourage and enable tolerance, humans and wildlife may be able to coexist in a more peaceful way for a long time.

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Determinants of agricultural credit supply from institutional agencies: a micro-level study in jalpaiguri district with qualitative response regression models

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ABSTRACT

A dedicated agricultural credit policy with uninterrupted and extended flows play a major decisive role in increasing agricultural production, productivity and strengthening the livelihood security of rural sector. At macro-level, an agricultural credit policy takes into account major policy directions with regard to terms, conditions and standards of credit disbursal. The major emphasis of macro credit policies are laid on the basis of region specific lending guidelines. Various scholarly articles and sponsored research projects pointed to the fact that at micro-level demand for farm credit stood at a much higher level than institutional credit supply to agrarian sector. In general, these studies suggested in favour of supply driven farm credit policy at subsidized rates. In India, initiatives taken by the central government and apex financial institutions had paid off and supply of institutional credit to agricultural sector increased significantly during the late 90's and early 21st century. However, macro policy formulations regarding reforms in financial sector and inclusion of new priority sector lending avenues not only diverted funds away from agricultural sector rather hiked up acute regional disparity in credit supply to agricultural sector. In this article, a holistic attempt has been carried out to explore determinants of institutional credit flow to agrarian sector at sampled villages of Jalpaiguri district with considerations pertaining to regional rural bank, district central cooperative bank and various public sector scheduled commercial banks at local level.

Keywords: Commercial bank, Credit, Variable, Logit, Probit

Introduction

A dedicated policy on uninterrupted and extended flow of agricultural credit plays a major decisive role in raising agricultural production, productivity and strengthening the livelihood security of rural sector. In addition to volume of credit supply the availability, cost-effective and adequate credit is of paramount importance for the small and marginal farmers. At macro-level, an agricultural credit policy takes into

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account major policy directions with regard to terms, conditions and standards of credit disbursal. In reality, all macro credit policies targeted at timely and adequate support to farmers with special focus on small and marginal farmers. These macro credit policies laid emphasis on region specific lending policies by means of credit planning and their holistic implementation throughout the country. During post-reform period, some notable policy initiatives adopted for farm sector by government are kisan credit card scheme (1998), farm credit package (2004), interest subvention scheme (2006-07), collateral free loan, revival package for short-term cooperative credit, debt waiver and debt relief scheme (2008) and bringing green revolution in Eastern India during 2010-11.

The macro-level farm credit policies aimed at general guidelines and procedures towards financial agencies having direct contact with farmers at grass root level. However, various scholarly articles and sponsored research projects pointed to the fact that at micro-level demand for farm credit stood at a much higher level than institutional credit supply to agrarian sector. In general, these studies suggested in favour of supply driven farm credit policy at subsidized rates. As a consequence, various steps were adopted to ensure gradual dilution of norms, amalgamation of schemes and procedures in favour of agricultural credit lending business. All such initiatives by the central government and apex financial institutions led to significant hike in institutional credit supply to agricultural sector. The post-reform period recommendations on squeezing agricultural credit factored sudden decline in agri-credit to agri-GDP ratio that touched at nearly fourteen percent in 1998-99. The period after 1998-99 witnessed inclusion of farmer friendly policy packages which further pushed the ratio up to 40 percent (2006-07) mark and further to 49 percent (2015-16) and subsequently 53.8 percent in 2019-20 respectively.

In reality, during the late 90's and early 21st century reforms in financial sector not only diverted funds away from agricultural sector rather hiked up acute regional disparity in credit supply to agricultural sector. Therefore, it is quite necessary to study at micro-level the patterns of institutional credit supply to agricultural sector in order to measure financial inclusion at the grass root level. In this article, a holistic attempt has been carried out to explore determinants of institutional credit flow to agrarian sector at sampled villages of Jalpaiguri district. As regards institutional agencies, consideration has been made in favour of service branches of regional rural bank (RRB) namely; Uttarbanga Kshetriya Gramin Bank (UBKGB), Jalpaiguri Central Cooperative Bank (JCCB) and Public Sector Scheduled Commercial Banks (PSB-SCBs) that are operational within seven kilometers radius from dwelling places of at least 150 farmer households respectively.

Literature review: Experts had put lot of efforts in the study pertaining to the patterns of rural society, their changing tastes, preferences and effectiveness of government farm-credit policies. Theoretical views primarily focus on the poor access to institutional farm credit from the supply-side perspective. Supply-led theories emphasized the role of supply of credit in prior to the creation of demand (T.Patrick, 1966). The old paradigm of sector directed supply-led and subsidized credit had been based on faulty assumptions about the willingness and ability of poor farmers and other entrepreneurs to pay for

financial services which led to faulty policy design and implementation. Since the mid 1980s, there has been a paradigm shift in financial policy. The new paradigm led by demand driven credit policy focuses on building sustainable financial institutions and systems. Study conducted by Gambhir (2012) in Indian context shows that farmers across all size classes have managed tactfully to avail high interest backed credit through cumbersome procedure. Their judgement goes for cheap credit provision backed by simplified procedures in favour of marginal and small farmer's category. Chaudhuri (2001) is of the opinion that an increase in formal sector gross credit supply and keeping interest rate at a fixed rate would eventually lower informal sector interest rate and improves general welfare of farming class through increase in farm production and productivity.

According to Aiyer (1984), higher borrowing costs incurred by small and potential borrowers as compared to large borrowers discourage the former to approach the formal credit institutions. Franz (1993) mentions that poor rural people do not approach institutional credit agencies simply because they value the risk associated with indebtedness to be higher than the possible return on investment. To obtain loan a farmer has to go through the filtration procedures that are required by the lenders' credit delivery system (Vogel, 1986). This filtration system results in borrowing costs. Tinnermeir (1977) argued that for credit diversion aspects subsidized interest rates are major contributing factor on the part of borrower and political intervention on the part of lender in the credit market. If the interest income is greater than or equal to the cost of lending, this may positively influence the financial institutions in increasing the supply of agricultural credit. Kinnon (1973) is of the opinion that the ceilings on interest rates do not permit banks to incorporate the additional administrative costs necessary in advancing small loans and supervise them. Hence, in an attempt to reduce transaction cost which is high for servicing small borrowers, formal lenders basically ration credit to them. Consequently, banks advance loan to those who offer lower risk and better security (Khambata, 1985). According to A.Sillers (1983), formal credit is invariably rationed in terms of the ability to offer collateral. However, a typical borrower in unorganized credit market has no access to organized credit market because of the collateral that he offers is not acceptable in the organized credit market (K.Sarap, 1991).

There are several gaps in the present institutional credit delivery system like inadequate provision of credit to small and marginal farmers, paucity of medium and long-term lending, limited deposit mobilization and heavy dependence on borrowed funds. With respect to use based classification, Reddy (2012) observed that borrowings from formal sector are for longer duration and required for productive purpose only. R.L.Godhra (2014) examined various issues and concerns in agricultural credit delivery systems in India. They used both primary and secondary data from the beneficiaries of six banks of three districts of Haryana. Their analysis suggests that credit delivery to the agriculture sector continues to be insufficient. Moreover, their analytical approach suggests that formal institutional system is hesitant to provide credit to small and marginal farmers. They argued that post-financial sector liberalization era could not establish an equitable and efficient delivery of agricultural credit systems

India. As regards performance of institutional credit delivery system during economic reform period, Gandhimathi (2012) observed that during pre-reform period cooperative banks had highest share in total agricultural credit disbursement which got reversed after economic liberalization in 1990's. He showed that rural cooperative banking system achieved quantitative progress in credit delivery mechanism and virtually neglected qualitative aspects.

D.Rajasekhar (1993) explained that financial institutions did not help small and marginal farmers, landless labourers for whom they are primarily set-up. Research study by Golait (2007) shows that formal credit delivery to the agriculture sector is quite inadequate as the system is still hesitant on various grounds regarding small and marginal farmers. A study conducted by S.Ibrahim (2011) showed that income level, collateral, education, marital status have significant positive impact on farmer's access to credit while interest rate and transaction costs impact it negatively. The study on financial inclusion in India (Chattopdhyay, 2011) shows that despite improvement in outreach activity in the banking sector, the achievement is not significant enough. In Bangladesh, the Grameen Bank Model (GBM) emerged as a viable way to reach the poor and it was quickly replicated in other parts of the world (Bayulgen, 2008). In India, the SHG-Bank linkage scheme offering need-based credit became more prevalent.

Methodology: The study universe is confined to the Jalpaiguri District of West Bengal. Sampling frame includes rural households dwelling at rural sector of community development blocks of study district. The basis of sampling procedure is three-stage stratified sampling method (Patton, 2001). In social science research, a familiar sampling method is stratified sampling which implies on dividing the whole of study population into various sub-groups (or strata) and application of purposive sampling in each of the sub-groups (Saunders, 2012). In pursuit of research interest, out of total 09 C-D Blocks in Jalpaiguri district 06 C-D blocks (Jalpaiguri Sadar, Maynaguri, Dhupguri, Nagrakata, Kranti and Rajganj)

are considered as independent sampling unit. Remaining three hilly C-D blocks i.e; Mal, Matiali and Banarhat with wide coverage of tea-garden belts are omitted from sampling unit. From each of six C-D blocks, three villages are randomly selected such that total number of sample villages (micro-level) stand at eighteen only. With regard to study objectives, sampled villages (18 nos.) are intensively surveyed in order to select sample service branches of SCBs, RRB-UBKGB and JCCB. Keeping in mind the location of service branches within seven kilometers radius from dwelling places of at least 150 farmer households, a total of fifty two (52) service branches (Table 1) are randomly selected for collection of primary data. From each PSB-SCB sample branch, 03 branch staffs and 01 bank mitra/business correspondent are being interviewed. Similar investigations are also conducted in case of UGKGB and JCCB branches but with only 02 branch staffs and 01 bank mitra/business correspondent engaged with banking operations. In each case, respondents engaged with each service

branch (PSB-SCB/RRB/JCCB) are interviewed. Consequently therefore, a sum of 191 (35X4+9X3+8X3) sample responses is recorded for further processing and analysis.

Table 1: Distribution of sampled service branch network and respondents

Panel A			
Bank Types	Bank Numbers		Sample observations
PSB-SCBs	35		35X4= 140
RRB-UBKGB	09		9X3= 27
JCCB Ltd.	08		8X3= 24
Total	52		191
Panel B			
C.D Blocks	PSB-SCBs	RRB-UBKGB	JCCB Ltd.
Jpg Sadar	07	02	02
Maynaguri	05	01	01
Dhupguri	07	01	02
Nagrakata	04	02	01
Kranti	05	02	01
Rajgan	07	01	01
Total	35	09	08

Source: Field survey by researcher

The study pertains to establish following research objectives such as- (a) To evaluate the relation between size of land holding kept in mortgage and institutional credit supply (b) To understand role of farming experience and banking habits of farmer customers on institutional credit supply (c) To analyse influence of credit size and previous debt obligations on formal credit supply (d) To examine the nature of crop-specific credit flows to needy farmers. Responses obtained from branch officials are recorded and classified as per research objectives to understand bankers perceptions on whether or not to sanction credit to needy farmers.

The dependent variable such as willingness to sanction credit for needy farmer (WSCNF) is of binary nature. Approval for credit sanction (A_i) is assigned a dummy value of one ($A_i = 1$) and non-approval is accorded a dummy value of zero ($A_i = 0$) respectively. As regards statistical method, qualitative

response regression models such as ML-Binary Probit and ML-Binary Logit are incorporated in data analysis. Theoretical construction of such regression models are given as below –

[A] A typical logistic probability distribution function is expressed below as,

$$P_i = \frac{1}{1 + e^{-(\beta_1 + \beta_{2i}x_i)}} \dots\dots\dots (i)$$

Where, x_i is independent variable and $P_i = E(Y_i = 1/x_i)$ means probability of occurrence of independent events such that the dependent variable Y_i assumes dummy value of 1.

Equation (i) can be written in simplistic form as follows-

$$P_i = \frac{1}{1 + e^{-z_i}} = \frac{e^{z_i}}{1 + e^{z_i}} \dots\dots\dots (ii)$$

$$\text{and, } z_i = \beta_1 + \beta_{2i}x_i \dots\dots\dots (iii)$$

β_{2i} = Represent Coefficients of independent explanatory variables.

β_1 = Represent Coefficient of Constant-term

i = Subscript or position indicator of explanatory variable.

From (iii), as z_i falls within range as between $-\alpha$ and $+\alpha$, P_i ranges between 0 and 1, where P_i may be expressed as nonlinearity related to z_i (i.e; x_i) but also β 's. Thus, we cannot use the familiar OLS procedure to estimate the parameters. This nonlinearity issue can be made linear by taking natural log of odds ratio. From (ii), if P_i refers the probability of occurrence of x_i then $(1 - P_i)$ is the probability of non-occurrence of x_i , then

$$1 - P_i = \frac{1}{1 + e^{z_i}} \dots\dots\dots (iv)$$

From (iii) and (iv) the following relation is obtained-

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{z_i}}{1 + e^{-z_i}} = e^{z_i} \dots\dots\dots (v)$$

The relation simply shows the odds ratio in favour of occurrence of x_i variable. On application of natural logarithm in equation (v) the logit regression model is obtained as follows-

$$L_i = \ln \left(\frac{P_i}{1 - P_i} \right) = z_i = \beta_1 + \beta_{2i}x_i \dots\dots\dots (vi)$$

L_i = Is the log of the odds ratio

L_i = Is linear in x_i as well as parameters of β_1 and β_{2i}

For estimation of coefficients (i.e.; β_1, β_{2i}), the relation (vi) can be expressed as follows:

$$L_i = \ln \left(\frac{P_i}{1 - P_i} \right) = \beta_1 + \beta_{2i}x_i + u_i \dots\dots\dots (vii)$$

Where, L_i, x_i, β_1 and β_{2i} hold as usual mentioned in equation (vii). u_i is the stochastic error term.

Equation (vii) is representative of simple logistic regression model whereas multiple logistic regression analysis applies when there is a single dichotomous outcome and more than one independent variable. In general, the multiple logistic probability distribution function can be expressed as follows:

$$P = \frac{e^{(b_0+b_1x_1+b_2x_2+\dots+b_px_p)}}{1+e^{(b_0+b_1x_1+b_2x_2+\dots+b_px_p)}} \dots\dots\dots (viii)$$

Where, P is the expected probability that the outcome is present and x_1 through x_p are distinct independent variables wherein $b_0, b_1, b_2, b_3 \dots \dots b_p$ are regression coefficients.

Expected probability that the outcome is not present is given by,

$$1 - P = \frac{1}{1+e^{(b_0+b_1x_1+b_2x_2+\dots+b_px_p)}} \dots\dots\dots (ix)$$

On taking natural log of odds ratio, the multiple binary logit regression model is obtained as follows –

$$\ln \left(\frac{P}{1-P}\right) = b_0 + b_1x_1 + b_2x_2 + \dots + b_px_p \dots\dots\dots (x)$$

In logistic regression model (x), the derived coefficient e.g; b_1 indicate change in expected log of odds relative to a one unit change in x_1 , holding all other explanatory variables constant (Maddala, 1992). The anti-log of expected regression coefficient represents a crude or unadjusted odds ratio.

[B] A typical Probit regression model (D.Gujarati, 2012) can be expressed as given below:

$$f(X) = \frac{1}{\sqrt{2\sigma^2_n}} e^{-(X-\mu)^2/2\sigma^2} \dots\dots\dots (xi)$$

and CDF $f(X) = \int_{-\alpha}^{X_0} \frac{1}{\sqrt{2\sigma^2_n}} e^{-(X-\mu)^2/2\sigma^2} \dots\dots\dots (xii)$

Where X follows normal distribution and X_0 is a particular value of X .

To motivate probit model, the occurrence of an outcome variable in binary form depends on an unobservable utility index I_i (latent variable) such that it is determined by one or more explanatory variables, say X_i . The utility index I_i is expressed as-

$$I_i = \beta_1 + \beta_{2i}X_i \dots\dots\dots (xiii)$$

Given these expressions, the probability that I_i is greater than I_{*i} can be determined from standard normal CDF as:

$$P_i = P(Y = 1|X) = P(I_{*i} \leq I_i) = P(Z_i \leq \beta_1 + \beta_{2i}X_i) = F(\beta_1 + \beta_{2i}X_i) \dots\dots\dots (xiv)$$

Where, $P(Y = 1|X)$ means the probability that an event occurs given the values(s) of the regressor(s) and Z_i is standard normal variable such that $Z_i \sim N(0, \sigma^2)$.

To obtain information on I_i, β_1 and β_{2i} an inverse of equation (xiv) is obtained such that

$$I_i = F^{-1}(P_i) = F^{-1}(P_i) = \beta_1 + \beta_{2i}X_i \dots\dots\dots (xv)$$

The above equation (xv) gives the expression for Binary-Probit Model and Maximum-Likelihood (ML) method is applied to estimate the parameters of regressors.

An extended version of Binary-Probit Model involve multiple explanatory variables which is given as,

$$I_i = F^{-1}(I_i) = F^{-1}(P_i) = b_0 + b_1x_1 + b_2x_2 + \dots + b_px_p \dots\dots\dots(xvi)$$

Where, $b_0, b_1, b_2 \dots \dots \dots b_p$ are parameters of regressors and Maximum-Likelihood (ML) method is applied to estimate the parameters of regressors. I_i (Latent variable) is an unobservable utility index. To understand loan approval status a list of explanatory variables (Table 2) are considered for inclusion in analysis and these are:

Table 2: Measurement of explanatory variables for willingness to sanction credit

Explanatory variables for willingness to sanction credit for needy farmer (WSCNF)		
Variables	Description	Measurement Type
AMTCB	Amount of Credit Borrowed by Farmer	Continuous
AEXPF	Experience of Farmer in Years	Continuous
PDVAL	Previous Debt Obligation Value	Binary Have previous debt = 1 Not have previous debt = 0
LNDPM	Land Property Mortgage	Continuous
BNKHC	Banking Habits of Customers	Categorical High association = 3 Moderate association = 2 Least association = 1
CSHCC	Cash Crop Cultivation	Categorical High area cultivation = 3 Moderate area cultivation = 2 Low area cultivation = 1
DRYCC	Dry Grain Crop Cultivation	Categorical High area cultivation = 3 Moderate area cultivation = 2

		Low area cultivation = 1
FIBCC	Fibre Crops Cultivation	Categorical High area cultivation = 3 Moderate area cultivation = 2 Low area cultivation = 1
HRTCC	Horticulture Crop Cultivation	Categorical High area cultivation = 3 Moderate area cultivation = 2 Low area cultivation = 1
PIADY	Pisciculture and Animal Husbandry	Categorical For Pisciculture = 3 For Animal Husbandry = 2 Do not practice pisciculture and animal husbandry = 1

Source: Prepared by researcher for field data analysis

To understand better significance of determinants in credit supply the following hypotheses are considered for analysis:

- (i) Credit application with high amount is liable for rejection ($A_i = 0$).
- (ii) Long years of farming experience positively influence institutional credit suppliers ($A_i = 1$).
- (iii) Past history of outstanding debt obligations discourage banks in credit supply ($A_i = 0$).
- (iv) Large farm land kept in mortgage with bank yield significant credit supply ($A_i = 1$).
- (v) Good banking habits exhibit better chances of credit approval to needy farmer ($A_i = 1$).
- (vi) Cash crops cultivation exhibit better chances of credit approval to needy farmer ($A_i = 1$).
- (vii) Cultivation of dry grain crops attract better scope for credit supply to needy farmer ($A_i = 1$).
- (viii) Fibre crops cultivation exhibit poor chances of credit approval to needy farmer ($A_i = 0$).
- (ix) Cultivation of horticulture crops exhibit better chances of credit approval from institutional agencies than otherwise ($A_i = 1$).
- (x) Pisciculture and animal husbandry activities earn high favour from institutional agencies than otherwise ($A_i = 1$).

Findings: On the basis of regress or variables two outcome statistical inference Tables 3 and 6 have been portrayed below. It is noteworthy that statistical inference Table 3 belongs to the method ML-Binary Logit regression whereas another subsequent Table 6 represents method ML-Binary Probit regression technique. Given the binary dependent variables (WSCNF) and nature of explanatory variables (Table 2), sampled data are processed with assistance of software package SPSS ver. 22. The summary outcome of software command operations is presented as below:

Table 3: Determinants for willingness to sanction credit for needy farmer (WSCNF): ML-Binary Logit model

Dependent Variable: Willingness to Sanction Credit for Needy Farmer (WSCNF)					
Method: ML-Binary Logit					
Sample: 1-191					
Included Observations: 191					
Convergence after 5 iterations					
Variable	Coefficient	Std. Error	z-Statistic	Probability	Odds Ratio
Constant	1.20510	0.34104	3.53356	0.00041	3.33709
AMTCB	-0.27443	0.09511	2.88533	0.00391	0.76000
AEXPF	0.41721	0.13805	3.02213	0.00251	1.51772
PDVAL	-0.07588	0.05544	1.36861	0.17112	0.92692
LNDPM	0.03241	0.01373	2.35928	0.01831	1.03294
BNKHC	0.05618	0.04285	1.31084	0.18991	1.05778
CSHCC	1.23510	0.43290	2.85306	0.00433	3.43872
DRYCC	1.37221	0.47287	2.90182	0.00371	3.94405
FIBCC	-3.62332	8.11428	0.44653	0.65521	0.02669
HRTCC	0.16633	0.07815	2.12832	0.03331	1.18096
PIADY	0.06648	0.02185	3.04201	0.00235	1.06873
Mc-Fadden <i>R</i> -squared	0.05511	Mean dependent var.			
	0.26957				

S.D dependent	0.62215	S.E. of regression
0.42117		
Akaike info criterion	1.17539	Cox & Snell R square
0.25511		
Schwarz criterion	1.17913	Nagelkerke R square
0.36113		
Hannan-Quin criterion	1.54127	Log likelihood
-169.1181		
LR statistic (10 df.)	63.58105	Restr. log likelihood
-124.6611		
Prob. (LR statistic)	0.00001	Avg. log likelihood
-0.70581		

Source: Calculated by researcher

Table 4: Hosmer and Lemeshow Test

Hosmer and Lemeshow Test – ML-Binary Logit Method		
Chi-square	df.	sig.
10.0119	10	0.25433

Source: Calculated by researcher

Table 5: Classification Table: ML-Binary Logit Method

Observed		Predicted		Percentage Count
		Credit Sanction		
Credit Sanction		No	Yes	
	No	28	13	68.29
	Yes	20	37	64.91
		Overall Percentage Count		66.32

Source: Calculated by researcher

Table 6: Determinants for willingness to sanction credit for needy farmer (WSCNF): ML-Binary Probit model

Dependent Variable: Willingness to Sanction Credit for Needy Farmer (WSCNF)				
Method: ML-Binary Probit				
Sample: 1-191				
Included Observations: 191				
Convergence after 5 iterations				
Variable	Coefficient	Std. Error	z-Statistic	Probability
Constant	1.12680	0.51134	2.20363	0.02755
AMTCB	-0.21749	0.06155	-3.53356	0.00041
AEXPF	0.36730	0.15615	2.35225	0.01866
PDVAL	-0.07698	0.14779	-0.52093	0.60241
LNDPM	0.02853	0.01260	2.26504	0.02351
BNKHC	0.05709	0.04230	1.34973	0.17710
CSHCC	1.6258	0.68388	2.37729	0.01744
DRYCC	1.4621	0.49647	2.94495	0.00323
FIBCC	-4.3253	3.28696	1.31589	0.18821
HRTCC	0.18561	0.05961	3.11331	0.00185
PIADY	0.07581	0.02593	2.92360	0.00346
Mc-Fadden R-squared	0.09722		Mean dependent var.	0.35957
S.D dependent var.	0.44222		S.E. of regression	0.42061
Akaike info criterion	1.09673		Cox & Snell R square	0.24111
Schwarz criterion	1.11351		Nagelkerke R square	0.43122
Hannan-Quin criterion	1.06473		Log likelihood	-117.7011
LR statistic (10 df.)	96.48201		Restr. log likelihood	-203.6685
Prob. (LR statistic)	0.00001		Avg. log likelihood	-0.639151

Source: Calculated by researcher

Table 7: Hosmer and Lemeshow Test

Hosmer and Lemeshow Test – ML-Binary Probit Method		
Chi-square	df.	sig.
7.056	10	0.6811

Source: Calculated by researcher

Table 8: Classification Table: ML-Binary Probit Method

Observed		Predicted		Percentage Count
		Credit Sanction		
Credit Sanction		No	Yes	
	No	30	11	73.17
	Yes	18	39	68.42
		Overall Percentage Count		70.40

Source: Calculated by researcher

Discussions: On the basis of Tables 3, 4, 5, 6, 7 and 8; a comparative study (Table 9) has been prepared pertaining to goodness of fit tests for binary Logit and binary Probit regression models. A summary comparison is presented as below:

Table 9: Comparisons between Goodness of Fit Tests

Goodness of Fit Tests parameters	ML-Binary Logit regression model	ML-Binary Probit regression model
<i>LR statistic</i>	63.58105	96.48201
<i>Log likelihood</i>	-169.1181	-117.7011
<i>Akaike info criterion</i>	1.17539	1.09673
<i>Schwarz criterion</i>	1.17913	1.11351
<i>Hannan-Quin criterion</i>	1.54127	1.06473
<i>Mc-Fadden R-squared</i>	0.05511	0.09722
<i>Cox & Snell R square</i>	0.25511	0.24111
<i>Nagelkerke R square</i>	0.36113	0.43122

<i>Hosmer and Lemeshow</i> Test	χ^2	10.0119	χ^2	7.056
	d.f	10	d.f	10
	p	0.25433	p	0.72014
Overall Percentage Count	66.32		70.40	

Source: prepared by researcher

The Table 9 depicts overall ten (10) statistical parameters. For binary regression models, likelihood is a probability that the dependent variable may be predicted from the observed values of the independent variables. In practice, it is quite easier to follow the logarithm of the likelihood function which is better known as log-likelihood. The log-likelihood varies from $-\alpha$ (-infinity) to 0. For higher log-likelihood value, better is the model fit to data-set. Both binary models have same d.f of 10 and applied to same set of sampled data. The probit regression model has log-likelihood of -117.70 which is higher in value compared with log-likelihood of -169.11 obtained from the logit regression model. In binary regression model, the likelihood-ratio test statistic interprets the goodness of fit of two competing statistical models. In fact, the likelihood-ratio test statistic is quite useful statistical tool for comparing two point hypotheses (null and alternate) given the data-set. The equivalent of F-test in the linear regression model is the Likelihood Ratio (LR) statistic with associated p value. In fact, LR test statistic follows the χ^2 distribution with d.f equal to number of explanatory variables. A likelihood ratio above 10 and more is considered to provide strong evidence in favour of best model fit. Here, LR test statistic is statistically significant at $p < 5\%$ level of significance for both models. However, LR statistic is positive for both and stands higher in value for probit model.

The Akaike information criterion is a statistical measurement on relative amount of information lost by a given model. In fact, AIC estimates prediction error for a given set of data. Given a good fit to sampled data, lower AIC scores are better compared with higher AIC scores. Here, AIC score for probit regression model is lower than AIC score for logit regression model outcome. Schwarz criterion (SIC) or Bayesian information criterion (BIC) is a statistical tool for goodness of fit and depends on log-likelihood function. According to this criterion, the best model is with lowest SIC value among different models with same data set and degrees of freedom. The SIC value is lower for both model outcomes. However, for the Probit regression model the SIC value is marginally less. Hannan-Quin criterion (HQC) is an alternative statistical criterion for model selection. As against the AIC, the HQC is not based on log-likelihood function. In fact, for any two estimated models the one with lower value of HQC is much preferred as it imply better fit model. On comparing HQC of both model outcomes, the probit regression model shows lower value for HQC.

Like least square method, Mc-Fadden R -squared is a measure of goodness of fit (pseudo R -squared). It ranges from 0 to 1 such that 0 indicates regressors does not fit good while 1 suggest perfect fit for model respectively. So, within range higher value represents best fit. The Mc-Fadden R -squared for probit regression is much higher than logit regression outcome but within prescribed range in theory. Cox and Snell R -squared is also a measure of goodness of fit for binary regression model. Such test statistic is derived from likelihood ratio test statistic. Theoretically, Nagelkarke R -squared ranges from 0 to 1. The closer the value to one (1) indicates a better fit of model to data-set.

From binary logit outcome, it is found that the model alone explains between 25.5% (Cox and Snell R -squared) and 36.11% (Nagelkerke R square) of the variance in dependant variable and correctly classified 66.32% of cases. On the other hand, the binary probit model outcome suggests that the model alone explains between 24.11% (Cox and Snell R -squared) and 43.12% (Nagelkerke R square) of the variance in dependant variable and correctly classified 70.40% of cases respectively. Hence, probit model is comparatively better pertaining to variance explanation for dependent variables. Lastly, Hosmer and Lemeshow Test is another statistical test for goodness of fit for binary regression models. The HL test intends to measure on whether the observed event rates match the expected event rates given the data-set. Like another goodness of fit test, the HL incorporates χ^2 , d.f and p value. Theoretically, larger χ^2 value with small p value indicates poor fit model and vice-versa. The outcome for probit model shows smaller χ^2 value (7.056) with larger p value (0.72014) vis-à-vis logit regression model outcome. Hence, the probit model fits best to sample data-set with ten degrees of freedom. The following Table 10 presents the statistical inference summary with respect to the probit regression model fitted to observed sample data-set.

Table 10: Inference summery of Table 6.33 regarding determinants of ML-Binary Probit Model

Variables	Coefficient	One unit Increase/change* in category of explanatory variable on <i>Probit</i> index or Z-score	Prob. of Z at 5% level of significance	Result (H_0/H_1)**
AMTCB	-0.21749	Decreases z score by 0.217 points	0.00041	Significant and Accepted
AEXPF	0.36730	Increases z score by 0.367 points	0.01866	Significant and Accepted

PDVAL	-0.07698	On having (= 1) versus not having (= 0), reference group decreases z score by 0.077 points	0.60241	Insignificant and Rejected
LNDPM	0.02853	Increases z score by 0.029 points	0.02351	Significant and Accepted
BNKHC	0.05709	On having high association (=3) versus moderate(=2)/low(=1) association, ref. group increases z score by 0.057 points	0.17710	Insignificant and Rejected
CSHCC	1.6258	On having high (=3) and moderate association(=2) versus low(=1) association, ref. group increases z score by 0.625 points	0.01744	Significant and Accepted
DRYCC	1.4621	On having high (=3) and moderate association(=2) versus low(=1) association, ref. group increases z score by 0.462 points	0.00323	Significant and Accepted
FIBCC	-4.3253	On having high (=3) and moderate association(=2) versus low(=1) association, ref. group decreases z score by 0.325 points	0.18821	Insignificant and Rejected
HRTCC	0.18561	On having high (=3) and moderate association(=2)	0.00185	Significant and Accepted

		versus low(=1) association, ref. group increases z score by 0.185 points		
PIADY	0.07581	On having high (=3) and moderate association(=2) versus low(=1) association, ref. group increases z score by 0.076 points	0.00346	Significant and Accepted

Source: Computed by researcher for data analysis

*holding other variables constant. ** $H_0 = null\ hypothesis$, $H_1 = alternate\ hypothesis$

Conclusion: At macro-level, credit policies targeted at timely and adequate support to farmers subject to terms, conditions and standards of credit disbursal. These macro credit policies also laid emphasis on region specific lending policies through credit planning and holistic implementation of the same with special focus on small and marginal farmers. However, net flow of farm credit to farmers at micro level depends on managerial efficiency and pro-farmer attitude of local institutional set-up, non-institutional supply conditions vis-à-vis farmers' demand perspectives. In view of such observations, the present research aims to study at micro-level the patterns of institutional credit supply to agricultural sector and measure prospective determinants on willingness to sanction credit for needy farmers. The field survey shows that UKGB is the only RRB to serve through service branches in the sample blocks. In the group of PSB-SCBs offering services at nearby locations are State Bank of India, Punjab National Banks, Central Bank of India, UCO Bank, Indian Bank, Indian Overseas Bank, Bank of India and Canara Bank. Statistical inference shows that bank officials favour farmer customers with long farming experiences, large mortgaged land property in addition to giving due preference for credit demand of small size from farmer households. It is also quite noteworthy that issues like previous debt obligations and banking habits of farmer customers are not significant parameters in the decision making domain of bankers. On the other hand, credit supply to food crops such as paddy, wheat, potato, pulses, oilseeds, horticulture etc. gained much favour from institutional agencies. However, credit supply to cultivation of fibre crops received moderate importance from local financial agencies. In practice, policy goals pertaining to spread of institutional credit supply should focus on the needs and aspirations of micro and small category farmer HHs. Technological upgradations with inclusion of innovative mortgage packages, spread of oilseeds and horticulture cultivation is quite necessary in order to make farming a viable profession among younger generation. Moreover, development of credit instruments for local

needs of allied agricultural sector should get priority pertaining to better livelihood earnings and debt repayment prospects.

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An appraisal of the scope of domestic tourism in Dooars foothills tourist circuit in the post-pandemic scenario

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ABSTRACT

The COVID-19 pandemic has wreaked havoc on world economy including tourism and hospitality industry. After suffering a slump for almost three consecutive years since 2020, the industry is on verge of a slow and steady revival. But with episodic invasion of newer variants of the disease, international tourist movement is still fluctuating. In such a scenario, promoting domestic tourism in a country like India can be of great help to its economy for its huge domestic tourism market. Tourism Department, Govt. of West Bengal has been working on promotion and development of different tourist circuits in the state for the last two decades. Dooars circuit, located in a comparatively backward region in the northern foothills of the state, deserves more attention. With various kinds of tourist spots and events, it attracts visitors throughout the year. The pandemic and subsequent lockdown has affected the tourism sector, here, and the people earning their livelihood from it. While the arrival of international tourists still remains slow, promoting domestic tourism in Dooars is the only feasible way to protect the industry and its workers. The present paper attempts to make an appraisal of the tourism infrastructure and services available at different tourist attractions spread over the region. It aims to suggest some policies for improvement of the tourism scenario in general and domestic tourism in particular.

Keywords: COVID-19, Domestic Tourism, Dooars Foothills, Post-pandemic Scenario, Tourist Attractions

Introduction

Tourism no more remains a leisure activity and has been well accepted as a developmental tool across the world. It was introduced as an economic activity in India during 1950s in its second five year plan.

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With dedicated ministries for tourism operating in central and state levels, Indian Tourism Development Corporation (ITDC) was introduced in 1966 (Nair & Ramachandran, 2016) for progressive development, promotion and expansion of tourism in the country. State governments too launched various bodies to foster tourism growth within their boundaries, e.g. West Bengal Tourism Development Corporation Limited (WBTDCL) came up in 1974. Due to these concerted efforts contribution of tourism to the country's total GDP and total employment reached 5.20% and 12.38% respectively in the year 2015-16 (National Council of Applied Economic Research, 2018).

United Nations, in 1994, has defined domestic tourism as residents of a country travelling within its borders. Though domestic tourists outnumber the international travelers almost everywhere, most countries have lacked data on domestic tourism and a dedicated strategy for augmenting the same until the dawn of this century. This might be due to the inability of it in foreign exchange earnings and the misconceived notion of it playing a little role in regional development. But in the last two decades the importance of domestic tourism has been realized by all. It increases income and employment opportunities, brings prosperity to backward regions through the development of indigenous resource base, acculturation effects of tourism dissolve the linguistic, religious and ethnic barriers between guests and hosts (Chakravarti, 2006). Haxton (2015) has rightly opined that "Domestic travel supports and develops local and national pride, provides a rationale for an upgrading of infrastructure, disperses visitors geographically across regions, smooth seasonality and creates employment opportunities." (Haxton, 2015) As a key driver of tourism sector, domestic tourism accounted for 73% of total tourism spending in the world in 2017. India experienced a domestic visitor spending of 186 billion US \$ in 2018 i.e. 87 % of total travel and tourism spending in the country in that year (World Travel & Tourism Council, 2018). This proportion of domestic visitor spending in India might be related to the facts like-growth in middle income population with increase in spending power, the vastness of the country with a lot to explore, improvement in transport linkages across the country and government initiatives in promoting tourism in general and less explored locations in particular etc.

With the arrival of COVID-19; prolonged travel bans, border closures, events cancellations, quarantine requirements and the fear of contracting the virus etc. had placed extreme challenges on tourism and hospitality sectors globally (Gosling, Scott, & Hall, 2021). Just like anywhere in the world, foreign tourist arrival in India had also dipped in the year 2020 and 2021 and increased again in 2022 (6.19 million). But the count remained far behind the pre-pandemic level of 10.93 million recorded in 2019 (Ministry of Tourism, Govt. of India, 2023). During the early pandemic days, the World Bank Group had predicted quick recovery for countries with substantial domestic tourism market (Markets & Technology Global Tourism Team, 2020). Taking note, the Indian government also extended its support to the domestic tourism industry via extension of approval for tourist establishments, extension of recognition of travel agents and via spreading digital awareness about tourist destinations and activities in the country (Ministry of Tourism, Govt. of India, 2020). But these could not totally save the industry and there was an estimated 14.5 million loss of jobs (National Council of Applied Economic

Research, 2021) resulting into a high level of unemployment. It is needless to say that along with the numbers of domestic and foreign tourists, the number of employment in tourism sector still remain below pre-pandemic level. Though the situation has improved with time and the sector is showing signs of a bounce back (United Nations World Tourism Organization, 2022), it still needs special attention.

The state of West Bengal had 76 million tourist arrivals in 2016 out of which 74.5 million were domestic travelers i.e. 4.51% of domestic tourist visits in the country (India Brand Equity Foundation, 2018). The domestic tourists visiting the state have increased to 84.54 million in 2022, but the share has marginally increased to 4.88% (Ministry of Tourism, Govt. of India, 2023). This shows the urgent need for aggressive campaigning, improved transport and communication etc. to increase the domestic tourist visits in West Bengal. West Bengal Tourism Policy, 2016 has identified six (6) Primary Tourist Circuits in the state out of which two (2) circuits, namely- Darjeeling Himalayas and Dooars Foothills (Tourism Department, Govt. of West Bengal, 2016) fall within five (5) Northern Bengal districts of Alipurduar, Cooch Behar, Darjeeling, Jalpaiguri and Kalimpong. Located within Darjeeling Himalayan region Darjeeling and Kalimpong have a totally different physical and cultural mosaic compared to the rest of the districts located within *Dooars foothills and flood plains* which is the study area for this article. The Dooars foothills too have suffered losses in tourism sector, during the pandemic, and eagerly await revival to support its economy. This article attempts to find out the scope of domestic tourism in the study area in order to facilitate better tourism management in the current post-pandemic scenario.

Selection of the Study Area:

In J. F. Grunning compiled Jalpaiguri District Gazetteer (1911), the Dooars region has been related to 'Kirat Desh' as described in the Mahabharata (Ghosh A. G., 2008). According to the Puranas, between the 1st and 2nd century A. D, the region fell within the ancient kingdom of Jalpeshwar. Later *Khen* kings ruled the entirety of present day Alipurduar, Cooch Behar and Jalpaiguri districts during the 14th and 15th century before being replaced by *Koches* in the 16th century. Over time the kingdom got separated between *Koch* kings of Cooch Behar and *Raikats* of Baikunthapur, present day Jalpaiguri, followed by expansion of *Bhutanese* hegemony over the *eighteen* (18) Dooars (gateway) portions located along the northern foothill region. Following the treaty with the British East India Company in 1773 (Pal, 2018), rulers of Cooch Behar and Baikunthapur turned into feudal lords under British governance. After two *Anglo-Bhutan* wars between 1772 and 1865, the entirety of Dooars came under British rule (Deb, 1976) as per the Treaty of Sinchula (1865). In 1869 the entire Western Dooars lying to the west of River Sankosh up to River Tista was turned into a district named Jalpaiguri (Chattopadhyay S. , 2019) with the state of Cooch Behar lying south to it. Prior to British occupancy, the region was already inhabited by Mongoloid tribes like *Mech, Garo, Koch, Rabha, Toto, Drukpa, Bhutia* and *Rajbanshi* etc. (Basu, 2001). Forceful immigration of Dravidian and Austric tribes like- *Oraon, Santhal, Munda*, etc., from Chhotanagpur plateau region, was organized by the European plantersto run their tea estates in late 19th century. After independence in 1947, both Cooch Behar and

Jalpaiguri became districts within the state of West Bengal. Then on 25th June, 2014 the Alipurduar sub-division of Jalpaiguri was turned into a full-fledged district (Sen, 2018).

Located between 25°55' N and 26°58'N and between 88°23'E and 89°54'E, the study area is composed of alluvial deposits brought by rivers Tista, Jaldhaka, Torsa, Kaljani, Raidak, Sankosh etc. and their tributaries. With exception of Buxa hills running along the international boundary between India and Bhutan, the entire area is an uneven plain sloping towards the south-east. Rainfall increases northward with Buxa in Jalpaiguri being the wettest place in the state. November, December and January are the cold and dry months while both temperature and rainfall increase afterwards till August. Concentration of dense natural vegetation is observed more on the northern portions of the study area which declines southward with no notable forest present in Cooch Behar district (Chaudhury, 1903). The vegetation found here falls within Tropical Moist Deciduous Forest with Bamboo, Jackfruit, *Peepal* (fig), Teak, Betel Nut Palm, *Simul* (red cotton), Rain Tree and Orchids being the typical flora species. In those widely famous forest land of Jaldapara and Goumara National Parks and Buxa Tiger Reserve; Elephant, Indian Gaur, Rhinoceros, Leopard, different Deer species are amply found with Tiger and Bear sightings being very limited in occurrence. Though most of the work force in the study area depends upon primary activities like agriculture, fishing etc. the economy of Dooars foothills and floodplain has been typically identified with 4 *T's* of *Tea*, *Timber*, *Tobacco* and *Tourism*. With 90% tobacco production of the state being limited to Cooch Behar (Laskar, 2018), with gradual deterioration of tea estates in Dooars due to different natural and socio-economic reasons (Sharma, 2018) and with restrictions on lumbering to protect the natural vegetation; tourism has eventually turned out to be a reliable source of income opportunities for the local people here. Over this vast forested foothills and floodplains a huge number of explored and unexplored tourist attractions are located across Alipurduar, Cooch Behar and Jalpaiguri. All these fall under Dooars Foothills Tourism Circuit or Sub-Himalayan Region according to West Bengal Tourism Policy, 2016 (Chakravarti, 2006).

With their varied physiography, ample natural vegetation and wild life and being home to different ethnic human tribes; the districts of Alipurduar and Jalpaiguri host a number of natural, adventure, leisure, ethnic and religious tourism sites. On the other hand Cooch Behar hosts a handful of religious and historical tourist attractions but lacks in scope for nature, adventure or leisure tourism. In such scenario, categorisation of existing tourist attractions and identification of potential tourist spots in the study area are necessary. Along with that an appraisal of the tourism scenario in the study area has been attempted in the present article involving identification of challenges for the development of local tourism and suggesting measures for future development.

Objectives: Following objectives have been set for the current study-

- Identification and Classification of existing and potential tourist attractions in the study area.
- Appraisal of Tourist infrastructure and existing facilities in the study area.

- Suggesting some measures for better tourism management in the study area through the growth of domestic tourism.

Literature Review: Repeated mentions of the tourist destinations spread over the study area have been found in different books, journal articles, periodicals, and various web sources etc. '*Uttar Banga-r Purakirti*' (1985) enlists all the historical places of North Bengal (Das, 1985) some of which are popular tourist destinations and some other with huge potential. In '*Uttar Bango Parichoy*' (Ganguly, 2003) the author has introduced us to the forest and wildlife found in North Bengal, to various tribes living here and about their societies and culture along with the tourism potential of Dooars region. '*Uttar Banga-r Pothe Pothe*' (2005) introduces all the tourist attractions in Darjeeling Himalaya and Dooars foothills regions (Bhattacharya, 2005). Another two articles have enlisted and discussed about the famous tourist attractions in the Alipurduar district (Chattopadhyay S. , 2018) and introduced us to the forest resources and wild animals and birds there (Modak, 2018) respectively. Monthly Journal '*Ekhon Dooars*' regularly publishes articles on forest, people and society as experienced in the Dooars region. From the same publishing house three (3) books; namely- '*Alipurduar*' (2018), '*Kochbihar*' (2018) and '*Jalpaiguri*' (2019); edited by Pradosh Ranjan Saha have been helpful in identifying existing and potential tourist destinations spread over these three districts. More such publications introduce us to the ample water and forest resources of North Bengal and with the diversity of human culture observed in the region. Along with that information uploaded on web portals of tourism department and forest department of the Govt. of West Bengal have helped in preparing the present article. Another important aid to this has been the West Bengal Tourism policy, 2016 which has chalked out roadmap for tourism development in the state. To understand the impact of domestic tourism globally, reports published by World Travel and Tourism Council have been helpful. Similarly guidelines of different schemes, like- '*Dekho Apna Desh*', '*Adopt a Heritage*' etc. launched by the Ministry of Tourism, Govt. of India, to promote domestic tourism in the country have assisted in preparation of this article. Again Domestic Tourism Survey Reports published time to time by Govt. of India and articles on domestic tourism published by various scholars have helped in preparation of the article. Nair and Ramachandran (2016) have discussed about the determining factors of domestic tourism in India. Chakravarti (2006) has tried to highlight potential tourist destinations in West Bengal and has prescribed an action plan for development of domestic tourism in the state. The COVID-19 pandemic has dent deep into the structure of global travel and tourism industry. In a note titled '*Rebuilding Tourism Competitiveness: Tourism response, recovery and resilience to the COVID-19 crisis*', the World Bank Group has apprehended that the travel and tourism sector emerging from the pandemic is likely to be smaller in terms of both employment and revenue. Researchers have attempted to address the major challenges faced by hospitality and tourism sectors amid existing pandemic in India (Kaushal & Srivastava, 2021). Another study, conducted in the Indian state of Goa, has revealed how people have started to prefer domestic tourism and is also avoiding travel in groups after pandemic and how hygiene conditions in host

destinations influence their travel decisions (Sukthankar & Gaonkar, 2022). In that light, it seems timely to take an appraisal of tourism infrastructure and services found in Dooars region and to suggest policy measures for aiding domestic tourism there in this post-pandemic scenario.

Methods Applied: Development of tourism starts with the identification of tourist attractions, both existing and potential, in any region followed by measurement of their tourism potential which again depends upon the tourist footfall and their remarks along with other variables like ease of access, duration and distance of journey, cost of trip etc. Thus a survey of existing literature and other secondary sources has been conducted followed by field visit and interactions with local people, tourists and drivers in the last quarter of 2022. The author consider a qualitative approach of research to be more relevant here and attempts the same.

The present study is largely exploratory in nature involving interview of tourists and tourist car drivers selected by convenience sampling, along with an opinion poll among the residents of the districts of Alipurduar, Cooch Behar and Jalpaiguri. The residents are selected via purposive sampling method through an online survey using Google Forms. Only those who responded, and expressed their desire of planning a tour immediately after the pandemic, were asked to name the top ten (10) tourist destinations in their home districts. On the other hand the authors personally visited the popular destinations in the study area, dedicated taxi stands and interviewed the tourists and car drivers running tourist vehicles in the region. While the tourists were asked about their experiences and favourite spots, the drivers were inquired about some new and little explored spots they would suggest the tourists to visit. Thus both popular and potential tourist attractions spread over the study area are easily identified. Table 1 shows the actual number of respondents involved in the survey.

Table 1: Sample Size of the Study

District	Resident Respondents	Tourist Respondents	Drivers Interviewed
Alipurduar	51	45	10
Cooch Behar	87	39	18
Jalpaiguri	43	37	07

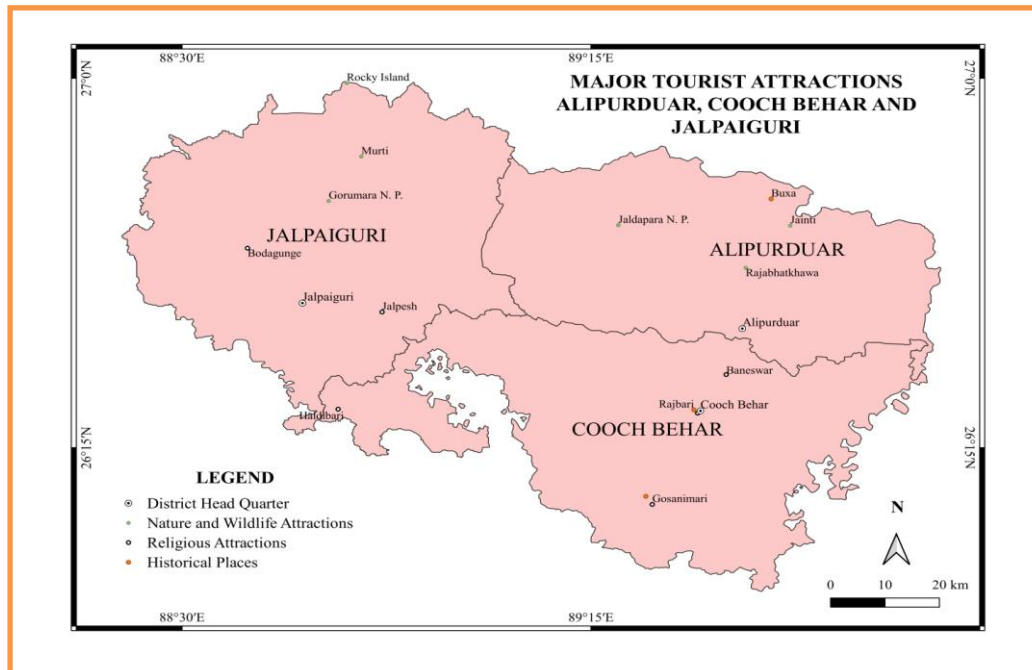
Source: Primary Survey

A total of 30, 23 and 32 such tourist attractions have been found in Alipurduar, Cooch Behar and Jalpaiguri districts respectively. The same tourist attractions have been colour coded into *Green*, *Blue* and *Orange sites* according to their popularity and tourist footfall in those places. *Green* sites are those experiencing the maximum tourist footfall, *Blue* sites are known but visited less and *Orange* sites are least explored by tourists. Now the tourist attractions, falling into the above three categories, have been separately arranged as per their nature into various tourism products. For an appraisal of existing tourism infrastructure and facilities tourist spots in the study area have been visited personally as far as

possible to identify the challenges or hindrances for tourism development and to understand the scope for future development.

For graphical representation of the distribution of tourist attractions (figure 1) in the study area, mapping software Q-GIS has been applied.

Fig 1: Location Map of the Study Area



Source: Prepared by Author

Identification of Tourist Attractions and their Classification based on Popularity and Tourist Footfall: Tourist destinations in hill districts of Darjeeling and Kalimpong are separate from those in Doars Foothill region as the later do not demand an overnight stay at those places to enjoy their wonder. Tourist attractions spread over Alipurduar, Cooch Behar and Jalpaiguri can be visited on the same day by selecting certain tourist routes. Thus Doars Foothill circuit is ideal for domestic tourism opportunities in the post-pandemic time as tourists do not need to risk their health by spending the night away from the safety of their home. West Bengal Tourism Policy, 2016 had proposed development of seven (7) tourism products through development of amenities and infrastructure along with widespread promotional measures. These are- Nature and Wildlife Tourism, History and Heritage Tourism, Eco and Rural Tourism; Sports, adventure and activity Tourism; Cruise Tourism, Plantation Tourism and Business and MICE Tourism. There is ample scope for developing History and Heritage Tourism in the study area. However, in present scenario, there is hardly any scope for developing cruise or sports based tourism activities in this area. Adventure activities in the study area are mostly limited to trekking, rock climbing activities and all such facilities are found in forest locations. So those have been included within Nature and Wildlife Tourism. Similarly Rural and Ethnic Tourism attractions take into account the spots and events associated with local society, livelihood and culture. Doars has a unique cultural

blend of major Indian religions such as Hinduism, Islam, Christianity and Buddhism along with presence of tribal totemic and animistic belief. So a separate mention of Religious Tourist attractions is necessary here. Hotels, resorts and homestays operating within or adjacent to the forests and tea plantations provide a unique experience and opportunity for leisure. Though tea or timber industry in North Bengal is currently going through a severe economic and political turmoil, but plantation tourism based on such industries appears to be rewarding. For the present article, the handful number of plantation sites in the study area has been taken along leisure tourism spots. Again numerous parks, picnic spots, zoos and museums developed for the purpose of relaxation and amusement are also categorized in the same Leisure Tourism opportunities. Thus tourist attractions in the study area can be classified into following tourism products-

- Nature, Wildlife and Adventure Tourism
- History and Heritage Tourism
- Religious Tourism
- Rural and Ethnic Tourism
- Leisure Tourism

Table 2 shows the major *Green* Tourist Attractions, both the spots and events with maximum popularity and tourist footfall, spread over Alipurduar, Cooch Behar and Jalpaiguri districts. Table 3 showcases *Blue* tourist spots and events visited by comparatively less number of people whereas Table 4 represents *Orange* tourist spots and events which have lowest tourist footfall. From these *blue* and *orange* spots, tourist attractions with huge potential could be identified for future development. Coupled with that, attractions appearing in those tables have been arranged separately into the aforementioned tourism products.

Table 2: *Green* Tourist Spots and Events of the study area

Nature, Wildlife and Adventure Sites	<ul style="list-style-type: none"> • Nature Interpretation Centre, <i>Rajabhatkhawa</i>, <i>Jainti</i> River Bed, Wildlife Visit at <i>Jaldapara</i> National Park; <i>Alipurduar</i> • <i>Rocky Island</i>, <i>Murti</i> River Bed, ‘<i>BhorerAlo</i>’ Tourism Hub <i>Gajoldoba</i>, Wildlife Visit at <i>Gorumara</i> National Park; <i>Jalpaiguri</i>
History and Heritage Sites	<ul style="list-style-type: none"> • Ruins of <i>Buxa</i> Fort, <i>Alipurduar</i> • <i>Rajbari</i>, <i>Cooch Behar</i>
Religious Attractions	<ul style="list-style-type: none"> • Holy <i>Pokhri</i> Lake, <i>Jainti</i>, <i>Phoentsholing</i> Buddhist monastery and Crocodile Park near <i>Jaigaon</i>; <i>Alipurduar</i> • <i>Madan Mohan</i> Temple, <i>Shiva</i> temple and ‘<i>Mohan Dighi</i>’, <i>Baneswar</i>; <i>Cooch Behar</i> • <i>Shiva</i> Temple, <i>Jalpesh</i>; <i>Jalpaiguri</i>

Rural and Ethnic Tourism Sites	<ul style="list-style-type: none"> • ‘Rasmela’; Cooch Behar • Shiv ratri r Mela, Jalpesh; Jalpaiguri
Leisure Tourism Sites	<ul style="list-style-type: none"> • Sagar Dighi, NN Park; Cooch Behar

Source: Primary Survey and Secondary Sources

Table 3: Blue Tourist Spots and Events of the study area

Nature, Wildlife and Adventure Sites	<ul style="list-style-type: none"> • Trek to Buxa and Lepcha Kha, Wildlife visit at Buxa Tiger Reserve, Leopard Rescue Centre, South Khairbari, Trek to Mahakal Limestone Caves, Boat ride at Sikiajhora; Alipurduar
History and Heritage Sites	<ul style="list-style-type: none"> • Ruins of ‘Nal Raja r Garh’, Mendabari; Alipurduar • Ruins of Kamta Palace at ‘Gosanimari Rajpat’, Dinjata; Cooch Behar
Religious Attractions	<ul style="list-style-type: none"> • Mahakal Buddhist Monastery and Shiva Temple near Jainti; Alipurduar • MadhupurDham, Kateshwari Temple, Gosanimari, Shah Pir r Darga; Cooch Behar • Bhramari Devi Temple, Bodagunge, Devi Choudhurani Temple, Shikarpur, Jatileshwar Shiva Temple; Jalpaiguri
Rural and Ethnic Tourism Sites	<ul style="list-style-type: none"> • Fair at ‘HuzurSaheb r Darga’, Haldibari; Cooch Behar
Leisure Tourism Sites	<ul style="list-style-type: none"> • Raimatang Picnic spot and Resort, Hollong Forest Bungalow, Fanskhawa Picnic spot and Resort, Malangi Forest Resort, ‘MonerManush’ Picnic Spot, Chilapata, Kunjanagar Eco Park, Poro Busti Eco Park and Picnic Spot; Alipurduar • Rasik Bil Mini zoo; Cooch Behar

Source: Primary Survey and Secondary Sources

Table 3: Orange Tourist Spots and Events of the study area

Nature, Wildlife and Adventure Sites	<ul style="list-style-type: none"> • Bhutan ghat; Alipurduar • Laliguras, Samsing Tea Estate, Malbazar, Trek to Mahakal caves via Chamurchi, Trek to Bhutan Border via Chengmari, Trek to Samsing via Chilouni; Jalpaiguri
History and Heritage Sites	<ul style="list-style-type: none"> • Mosque Ruins at Majidkhana, Shamuktola; Alipurduar

	<ul style="list-style-type: none"> • Ruins of ‘<i>Bokali r Math</i>’, <i>Bokali</i>, Ruins of ‘<i>Chila Ray r BoroKot</i>’, <i>Tufanganj</i>; <i>Cooch Behar</i> • Ruins of <i>Pal</i> kingdom, <i>Mohitnagar</i>, <i>RaikatRajbari</i>; <i>Jalpaiguri</i>
Religious Attractions	<ul style="list-style-type: none"> • <i>Kamakhya Temple</i>, <i>Kamakhyaguri</i>, <i>Gurudwara</i> and <i>Balaji Temple</i>, <i>Hasimara</i>; <i>Alipurduar</i> • <i>Debi Bari</i>, <i>Rajmata Temple</i>, <i>Dangorai Temple</i>, <i>TorsaPirDham</i>; <i>Cooch Behar</i> • <i>Garteshwari Temple</i>, <i>Satkura</i>, Old Mosque in <i>Jalpaiguri Town</i>, Buddhist Monastery, <i>Malbazar</i>, Buddhist Monastery, <i>Samsing</i>; <i>Jalpaiguri</i>
Rural and Ethnic Tourism Sites	<ul style="list-style-type: none"> • Interaction with Tribal residents at Forest villages of <i>Jaldapara</i>, B.T.R East and Division, ‘<i>Bhandanior Ban Durga Puja</i>’ and Fair in <i>Kamakhyaguri</i>; <i>Alipurduar</i> • Annual Fair at <i>MadhupurDham</i>, ‘<i>Ashtami SnanMela</i>’ on banks of <i>Gadadhar</i> river; <i>Cooch Behar</i> • Interaction with Tribal residents of Forest villages of <i>Jalpaiguri</i> and <i>Baikunthapur</i> Division, <i>Baruni</i> fair, <i>Berubari</i>, ‘<i>Kalipuja r Mela</i>’, <i>Hamiltonganj</i>, ‘<i>Bhandani or Ban Durga Puja</i>’ and Fair in <i>Maynaguri</i>, Fair at ‘<i>KaluSaheb r Mazar</i>’; <i>Jalpaiguri</i>
Leisure Tourism Sites	<ul style="list-style-type: none"> • <i>Raidak Forest Resort</i>, <i>Hatipota Forest Resort</i>, <i>Shilbunglow Forest Resort</i>, <i>Kholta Eco Park</i>; <i>Alipurduar</i> • ‘<i>Keshav Ashram</i>’, ‘<i>Rani r Bagan</i>’, Railway Museum, ‘<i>Sal Bagan</i>’; <i>Cooch Behar</i> • <i>Mal Park</i> and Tourist Complex, <i>Malbazar</i>, <i>Tilabari Tourist Complex</i>, <i>Dhupjhora</i>, <i>Damdim</i>, Forest Bunglow, <i>Chapramari</i>, Forest Bunglow, <i>Khutimari</i>, Forest Bunglow, <i>Bodagunge</i>, <i>Nagrakata</i>; <i>Jalpaiguri</i>

Source: Primary Survey and Secondary Sources

An Appraisal of Tourism Infrastructure and Facilities in the Study Area: Domestic Tourism plays an important role in improving the overall development of the destinations which in turn promotes well-being for locals and helps to attract the educated young professionals upon which high value added sectors increasingly depend (Haxton, 2015). A real appraisal of existing tourism infrastructure and facilities in the study area requires a firsthand experience of visiting as many tourist attractions as possible. Information about the spots not visited must be gathered from reliable sources and cross checked simultaneously. Such a detail exploration of the present study area reveals the following issues causing hindrances in realisation of tourism development in its full potential.

- **Misappropriation of Potential Tourist Attractions:** Apart from the most popular and most visited tourist sites discussed above, there are many more spots in the three districts of the study area which have huge potential to be developed as major tourist attractions. Ruins of Khen capital city at Gosanimari Rajpat in Cooch Behar are yet to be fully excavated. Adjacent to the

ruins is located the Kamteshwari temple rebuilt by Koch king Pranaranayan in 1665 (Chaudhury, 1903). Together these two have a great potential to attract history buffs and common tourists. Located again in Cooch Behar, Madhupur Dham is a pilgrimage site for the Sankarapanthi Vaishnavas and requires promotion for realisation of its full potential. The road leading to the place needs expansion and maintenance urgently. Keshav Ashram located on the bank of Torsa River is a great place to spend the afternoon, but it is neither promoted nor maintained properly. Similarly Nal Raja-r Garh located within Chilapata forest in Alipurduar has a huge potential to turn into a major attraction. The last excavation at this location happened way back in 1967 (Singh, 2018) which might be due to its remote location within core area of the forest. Bhramari Devi temple in Jalpaiguri is one of the fifty one (51) '*Sati-Pithas*' devoutly revered by Hindus, but unfortunately people outside the district hardly know about the place.

- **Crowding Causing Pressure at Major Destinations:** On the other hand tourists and locals throughout the year gather at popular destinations in huge number causing stress on the environment. Deterioration of environment is quite evident in places like Murti River Bed, Rocky Island and Jainti River Bed etc. Plastic and other wastes are found to be scattered over those places along with waste water from nearby resorts and make shift eateries pouring out in the river without any check. Artifacts of the historical sites are evidently at risk in places like Buxa where graffiti are illicitly scribbled on walls by visitors. Illegal activities like-felling of trees or playing loud music inside the core forest are often reported to be performed by local forest villagers and tourists, which cause stress on the wildlife of the aforesaid sanctuaries and national parks. Places like Rajbari or Madan Mohan Temple in Cooch Behar are regularly visited by many a people which limits opportunity for the authorities to maintain cleanliness and sanitization of the surroundings at regular interval, must for any popular tourist attraction in the post-pandemic time. In the current situation it is mandatory to maintain hygiene norms by effective sanitary practices in all spots with high visitor footfall. But the staff strengths in all those places are too inadequate to maintain such norms on regular basis.
- **Lack of Proper Vision and Planning from the Concerned Authorities:** Governments use domestic tourism as a tool to eliminate local poverty, generate employment and economic growth, upgrade infrastructure and to alleviate pressure from overcrowding through discretionary pricing policies and the provision of non-wage tourism benefits (World Travel & Tourism Council, 2018). But after exploring the current study area, it seemed difficult to locate the Tourism Department Offices or Tourist Information Centres in any of the three districts. Official data on annual or monthly tourist arrivals which is a must for any tourism related development is almost unavailable. The Government websites provide information only about the major tourist spots in the Dooars Foothills circuit, promotion of lesser known spots is almost absent. Transport, another major determinant for tourism development, is

totally unorganized in the study area. There is no public vehicle service connecting tourist spots in the region and tourists have to hire costly private cars to reach most of the places. Most of the spots do not have toilets, restrooms or food counters in their vicinity. Again while opening after lockdown, they are found to be ill-prepared with basic precautionary COVID norms. According to a study conducted in South India back in 2016, 91.1% respondents felt that Indian travel destinations required improving their hygiene level (Nair & Ramachandran, 2016). The tourist attractions here in the study area are no different; it is hard to find a public toilet during Rasmela in Cooch Behar or during Shiv Ratri-r mela at Jalpesh. All these expose the lack of vision and planning on the government's end for development of tourism in this region.

- **Absence of Participation of Local People in Tourism Management:** Participation of locals in tourism management not only creates an alternate employment opportunity for them, but also involves them in protection and maintenance of the tourist spots itself. They should be thoroughly informed about the importance of the tourist attractions in their locality and should be encouraged to preserve those. To adjust with staff shortage they could be employed on temporary basis in such spots for sustainable management. This would create economic opportunities for locals. But such initiatives are rare in the study area barring a few exceptions as observed during trek to Buxa from Santalabari in Alipurduar where local Drukpa people assist as guides or in recruitment of forest villagers as forest guides in Gorumara and Jaldapara national parks.

Policy Suggestions for Better Tourism Management: On the basis of above discussion following measures should be taken for improvement of tourism scenario in the Dooars Foothills Tourism Circuit spread over the study area.

- Tourist Information Centres need to be developed in all the district headquarters in Alipurduar, Cooch Behar and Jalpaiguri which would provide all sort of assistance to tourists. Monthly tourist inflow should be measured so that peak and lean seasons of tourism can be properly identified. This in turn would help in tourism management and planning.
- The already discussed *Blue* and *Orange* tourism sites with lesser tourist footfall and greater potential need to be identified and promoted by the Department of Tourism. Information about those places should be visible in website and booklets containing such information should be circulated from the tourist information centres. '*Dekho Apna Desh*' initiative launched by the tourism ministry in January, 2020 could be exemplary in this regard (Ministry of Tourism, Govt. of India, 2020). It carries out series of webinars showcasing diverse culture, heritage, destinations and tourism products of the country along with encouraging Indian tourists to visit *fifteen* (15) domestic travel destinations in a year. On the same line Arunachal Pradesh state government has launched '*Dekho Apna Pradesh*'

campaign to promote travel destinations within the state (The Economic Times, 2021). The West Bengal Government or the district authorities in the study area can take similar steps to promote domestic tourism here.

- An assessment of the impact of huge tourist footfall at popular destinations should be made by experts and measures to be taken accordingly. Tourism assistants can be recruited to guide the visitors, CCTV cameras and security personnel can be hired for protecting the surrounding and a ceiling in daily tourist arrivals can be thought of if necessary. Additional precautionary measures are required to be taken in this post-pandemic situation and employees should be trained to address hygiene issues and maintain sanitary practices. Temporary staffs could be recruited from local communities and they should be trained accordingly to maintain hygiene norms inside the establishments and to encourage their fellow community members to maintain the same in the surroundings.
- Public toilets, at least mobile toilets, need to be set up at each and every major tourist destinations. Mobile toilets must be there at natural attractions like Murti or Jainti and at picnic spots especially during peak season. Hotels and resorts operating in such locations should strictly maintain environmental norms and cannot be allowed to pollute the environment. Maintaining standard norms of waste management and sanitary practices have become crucial for both hosts and tourists during the pandemic. Tourists should be encouraged to not pollute the surroundings and Plastic Free Zones can also be set up particularly at those *Green* tourist sites with maximum footfall.
- There should be dedicated public vehicle service with online booking facility connecting tourist attractions spread over the study area. Based on the demand of individual tourist circuits, frequency of movement of such vehicles needs to be determined. Roads connecting tourist spots must be properly maintained and street lights must be installed around those places.
- Participation of local people is mandatory for the success of tourism management anywhere. In this regard '*Adopt a Heritage*' scheme (Ministry of Tourism, Govt. of India, 2020) launched by Govt. of India can be helpful. The scheme aims at developing amenities at tourist sites to improve the tourist experience involving local communities. Again '*Incredible India Tourist Facilitator*' (IITF) Certification Programme launched by the Tourism Ministry of central government has created an online learning platform to generate a pool of well-trained and professional tourist facilitators across the country (Ministry of Tourism, Govt. of India, 2020). Schemes like these would eventually raise awareness about the tourist spots, would create employment opportunities for the locales and support their livelihood along with ensuring development and maintenance of sustainable tourism infrastructure and practices. The district administration can take similar measures for historical sites lacking maintenance,

for sites of nature tourism and picnic spots etc. Locales can be trained as tourist guides, security personnel at historical sites like ruins at Gosanimari or at different trekking routes spread over the districts of Alipurduar and Jalpaiguri. Self Help Groups may be recruited for maintenance of cleanliness and for conservation purposes at tourist destinations. Students of local schools and colleges can be temporarily recruited as volunteers during annual events like *Ras Mela* in Cooch Behar or *Shiv Ratri-r Mela* at Jalpesh or during annual fair at *Huzur Saheb r Darga* in Haldibari which experience huge footfall. This would increase their awareness about their local heritage and they would learn about their social responsibilities.

Conclusion: COVID-19 has seriously affected tourism industry around the world and it would take time to get back to normalcy. The Markets & Technology Global Tourism Team of the World Bank Group (2020) has already apprehended that the travel and tourism sector emerging out of the pandemic is likely to be smaller in terms of both employment and revenue. India has been expected to suffer a 40% decline in revenue earning from tourism in 2020 in comparison to 2019 (Ghosh A. , 2020). Again a huge share of working population here is engaged in unorganized sectors like tourism and they have suffered job loss, pay cuts etc. In absence of foreign tourist arrival, strong domestic tourism only can help a country to withstand shocks and demand fluctuations (World Travel & Tourism Council, 2018). Countries could form regional travel bubbles to secure a quick recovery (Markets & Technology Global Tourism Team, 2020). Fortunately India has also focused on the same path of promoting domestic tourism and has taken initiative for effective implementation of COVID guidelines while providing some relief to the sector by different means.

Dooars is well known for its tea and tourism industry, but the potential it carries has never been utilized fully with proper planning. It is also one of the most backward regions in the state in terms of economic opportunities or development of public infrastructure. The pandemic has not spared the region and the economic loss in general and the loss suffered by tourism sector in particular remain to be quantified. In such a scenario it is convenient to promote domestic tourism here by forming regional travel bubbles within well-planned guidelines. The crisis can be utilized as an opportunity to develop overall tourism scenario in the study area. The present paper offers an exploratory research on tourist destinations, tourism services and infrastructure of the Dooars foothills tourism circuit. But in absence of in depth empirical study and any sort of quantification, the observations found cannot be generalized. So it would be ideal to consider it as a case study conducting appraisal of the tourism scenario found in Dooars region and the policy measures suggested could be followed for the betterment of the same in present pandemic time and even after that.

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তপোবিজয় ঘোষের 'এখন প্রেম' : সময়ের তীর আঘাতে ভেঙে যাওয়া অনুভূতি

পিয়ালী খাঁ*

সারকথা

টালমাটাল রাজনৈতিক পরিস্থিতিতে সমাজে দেখা দেয় আমূল পরিবর্তন। এদিকে অর্থনৈতিক মন্দায় জর্জরিত সাধারণ জনজীবন। উত্তাল রাজনৈতিক পরিবেশ প্রভাব ফেলে মানুষের সম্পর্ক তথা অনুভূতিতে। 'এখন প্রেম' গল্পের কেন্দ্রীয় নারী-পুরুষ চরিত্র দুটি অর্থাৎ কৃষ্ণা ও সীতেশ এমন পরিবেশের শিকার। সত্তর দশকের জীবন্ত দলিল এ গল্প। অত্যন্ত মুগ্ধমানায় সাবলীলতার সাথে গল্পকার তপোবিজয় ঘোষ ফুটিয়ে তুলেছেন মধ্যবিত্ত শ্রেণির হতাশা, নৈরাশ্যবোধ। উদ্ভূত পরিস্থিতি যেখানে মানুষের মধ্যকার পারস্পরিক অনুভূতিকে নিয়ন্ত্রণ করে।

সূচক শব্দ : অস্থির রাজনৈতিক পরিবেশ, অর্থনৈতিক মন্দা, উত্তাল সমাজ, পারস্পরিক সম্পর্ক।

তপোবিজয় ঘোষ একইসাথে গল্পকার ও সমাজবিশ্লেষক। কালচেতনার কথাকার তিনি। রাজনীতি তাঁর গল্পের অভিন্ন সত্তা। তাঁর সাহিত্যচর্চার অঙ্গীকারটিও বড় চমৎকার। সারাদেশ যখন একদিকে ক্ষুধা, ঘৃণা, প্রতিবাদ, ক্রোধের আগুনে জ্বলন্ত; বুলেটে বেয়নেটে ছিন্নভিন্ন তখন নিরাপদে ঘরের কোণে বসে তিনি গল্পরচনা করতে চাননি। তাঁর রাজনৈতিক বিশ্বাস ও দর্শন অনুযায়ী তিনি আপ্রাণ চেষ্টা করেছেন প্রতিবাদ ও প্রতিরোধের সাহিত্যসৃষ্টির। নিষ্ঠীক দৃঢ়চেতা লেখক হিসেবেই বাংলা সাহিত্যে তাঁর আগমন।

বিশ্বযুদ্ধের অভিঘাতে ধ্বস্ত সাধারণ মানুষের জীবন--- অর্থনৈতিক মন্দা, দাপ্তাবহল পরিবেশ, স্বপ্নভঙ্গের কারুণ্য তাদের নিত্যসঙ্গী; আর এই ভয়াবহ পরিস্থিতিতেই বেড়ে উঠেছেন লেখক স্বয়ং। তাই তো তাঁর লেখনীতে সমাজের রূঢ় বাস্তবতার দিকগুলি এত সুস্পষ্টভাবে রূপলাভ করেছে।

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সত্তরের দশকে পশ্চিমবঙ্গে চলা অস্থির রাজনৈতিক মাৎস্যন্যায়ের সঙ্গে তপোবিজয় নিজেই পরিচিত। দাপুটে কচি প্রাণের মর্মস্কন্দ আর্তনাদে ভরে থাকতো তখনকার আকাশ বাতাস। লেখকের বিশিষ্ট ছোটগল্প 'এখন প্রেমের' (প্রথম প্রকাশ ১৯৭১) মধ্যেও সত্তর দশকের সেই ভয়াবহতা ফুটে উঠেছে যা মানুষের স্বাভাবিক আবেগ অনুভূতিগুলোকে চূর্ণ বিচূর্ণ করে দিয়েছে---স্বল্প হয়ে গেছে তারা সময়ের আঘাতে।

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এখন কাহিনির অন্দরে প্রবেশ করে 'এখন প্রেম' গল্পটির একটি সংক্ষিপ্তসার করে নেওয়া যাক। গল্পের কেন্দ্রে রয়েছে সীতেশ নামের মধ্যবিত্ত যুবক, পেশায় কেরানি। তার একজন প্রেমিকা আছে, নাম কৃষ্ণা; পেশায় 'স্কুল-মাস্টারনী'। প্রতিমাসের প্রথম রবিবারে তারা একটা করে সিনেমা দেখে। গল্পের শুরু এমনই কোনো একটা রবিবারে সিনেমাহলের সামনে কৃষ্ণার জন্য সীতেশের অনন্ত অপেক্ষার মধ্য দিয়ে। কিন্তু এক বিশেষ পরিস্থিতির সম্মুখীন হয়ে কৃষ্ণা সেখানে পৌঁছাতে পারেনা। দোলাচলতার মধ্যে পড়ে সীতেশ নানা কারণ অনুমান করতে থাকে; কখনো বিরক্ত হয়, কখনো ক্ষিপ্ত, কখনো অস্থির, কখনো বা হতাশ। পরদিন কৃষ্ণা নিজে থেকেই ফোন করে সীতেশকে জানায় তার অনুপস্থিতির কারণ---তাদের পাড়া জুড়ে তান্ডবলীলার কথা---বোমাবাজি, খুনোখুনি, পুলিশ... আরও কত কী! এবং এই রাজনৈতিক অস্থিরতা তথা গন্ডগালের মধ্যে পড়ে বাস বন্ধ হয়ে যাওয়ার কথা জানাতেও ভোলেনা সে। সব কিছু শুনে সীতেশ অফিস থেকে ফেরার পথে কৃষ্ণাদের বাড়িতে গিয়ে হাজির হয়। এদিকে সন্ধ্যার পর থেকে টালিগঞ্জে শুরু হয়ে যায় ফের তান্ডবলীলা। লেখকের বর্ণনায়---'...একটু একটু করে রাত বাড়তে থাকে। বাইরে ঘন অন্ধকারে তীব্র সার্চলাইট জ্বালিয়ে পুলিশের গাড়ি ছোটোছোটো করে। এরিয়ালের সফ ফলা সাপের জিভের মতো লকলক করে। কিছুক্ষণ নিঃশব্দ থাকার পর আবার কোথাও বোমা ফাটে। পুলিশের রাইফেল গর্জে ওঠে। দলবদ্ধ ছোট বৃটজুতোর বিকট শব্দে ভাঙাবাড়ির ডেরা থেকে কবুতরেরা উড়ে পালায়, নিচের উঠানের গোয়াল থেকে গরুগুলো ডাকতে থাকে।'১ ফলে অবস্থার পরিপ্রেক্ষিতে সীতেশকে অগত্যা কৃষ্ণাদের বাড়িতে রাত্রিবাস করতে হয়। বেশ রাতে পার্শ্ববর্তী অস্থিরতা শান্ত হলে সীতেশ ও কৃষ্ণা পারস্পরিক ভালোলাগায় একে অপরের নিবিড় বন্ধনে আবদ্ধ হতে চায়---অন্তরের প্রেম বিকশিত হয়ে শরীরে মুক্তি পেতে চায়---'সীতেশ রক্তের মধ্যে কেমন উত্তেজনা অনুভব করে।...আরো কাছাকাছি সরে আসে। কৃষ্ণার চোখে একধরণের উজ্জ্বল তীব্রতা দেখা দেয়। নিঃশ্বাসের শব্দ গাঢ় হয়। চিবুকের নিচের অংশ কাঁপতে থাকে।'২ কিন্তু দুটি রক্তমাংসের শরীরের আরো আরো কাছে আসার মুহূর্তে বাইরে 'সহসা অন্ধকার কাঁপিয়ে রাইফেল গর্জে ওঠে...'৩ ভয়ে কৃষ্ণা ছিটকে সরে যায়। জানলা দিয়ে তাকিয়ে তারা সাক্ষী হয় এক ভয়ঙ্কর নির্মম দৃশ্যের---মুখ খেঁতলানো, বিস্ফারিত চোখের এক যুবককে টেনে হিঁচড়ে নিয়ে যাচ্ছে পুলিশ যার সারা শরীর রক্তে ভেজা। সাথে সাথে সীতেশ কাঁপা হাতে জানলা বন্ধ করে দেয়। আর তারপর? 'তারপর সারারাত্রি ওরা কেউ কোনো কথা বলল না।... সারারাত্রি তন্দ্রাহীন নির্মম চোখে নিঃশব্দে বসে থেকে সূর্যোদয়ের প্রতীক্ষা করতে লাগল।'

গল্পের নাম 'এখন প্রেম'। 'এখন' শব্দটির উপর গুরুত্ব দিয়ে লেখক সময়ের সংঘাতকেই তুলে ধরতে চেয়েছেন। এখন সময়টা এমনই যেখানে রাজনৈতিক অস্থিরতা, হত্যালীলা মুখ্য হয়ে ওঠে; আর প্রেমের মতো মানবিক সম্পদ গৌণ হয়ে যায়। দিশেহারা হয়ে যায় দুই নর-নারী যারা পরস্পর সন্মিলনে আবিষ্ট হতে চেয়েছিলেন। প্রেমিক-প্রেমিকার ওষ্ঠাধর যুগলও চরম মিলন থেকে বঞ্চিত হয়। তাদের চুশ্বনকে সফল হতে দেয়না গুলিতে আহত যুবকের আকুল তীর চিৎকার। রোমান্সের সুন্দর প্রেমঘন মুহূর্ত নিমেষে উবে যায় কর্পূরের মতো। আর তারপর সমস্ত আবেগ, সুখানুভূতির সমাপ্তি ঘটিয়ে জেগে থাকে এক দীর্ঘ রাত্রি--'ঠান্ডা নীল পাংশু মুখে শক্ত কঠিন শরীর' নিয়ে দুই যুবক-যুবতী সময়ের প্রহর গুনতে থাকে ত্রস্ত হয়ে। সারারাত পরস্পরের দিকে তারা একবারও তাকায় না পর্যন্ত। ভাঙাচোরা বাড়িটার তিনতলার অন্ধকার ঘরে বসে থাকা এই যুগলের হৃদয়ের মিলনোৎসুক অনুভূতিটাও যে ভেঙেচুরে গেছে সময়ের আঘাতে পড়ে, তা বেশ বোঝা যায়। সেদিক থেকে দেখলে গল্পের 'এখন প্রেম' শিরোনাম সুপ্রযুক্ত ও সার্থক, একথা নিঃসন্দেহে বলা যায়।

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'এখন প্রেম' ছোটগল্পের অল্প পরিসরে প্রতিটি চরিত্র যেন স্বয়ংসম্পূর্ণ হয়ে উঠেছে। এ ব্যাপারে লেখককে সাহায্য করেছে জীবনসংসার সম্পর্কে তাঁর অভিজ্ঞতা। মধ্যবিত্ত শ্রেণির স্বভাবচরিত্র, জীবনকে এ গল্পেও তিনি প্রকট করে তুলেছেন। আমরা জানি, মধ্যবিত্তের সাধ আর সাধ্যের মধ্যে বিস্তর ফারাক। তবুও 'সদ্য মাইনে পাওয়া পকেট' কেরানি সীতেশকে প্রতিমাসের প্রথম রবিবারে সিনেমা দেখার শৌখিনতাকে 'পারমিট' করে। লেখক জানাতে ভোলেননি যে আগে সীতেশ আরো হিসেবি ছিলো, সিনেমা দেখার টাকা ক'টা বাঁচালে সংসারের কী কী উপকার হতে পারে তা ভাবনাচিন্তা করতো; কিন্তু---'সমুদ্রে যে শয়ন করেছে শিশিরে তার কি ভয়-গোছের একটা নির্লিপ্ততা সীতেশকে এখন মরিয়া করেছে।'৫ কত সহজে মাত্র একটি বাক্যের অসাধারণ প্রয়োগের মধ্য দিয়ে তপোবিজয় ফুটিয়ে তোলেন মধ্যবিত্তের আঁতের কথা। অর্থনৈতিক অনিশ্চয়তা যে তার মতো কেরানির সদা সঙ্গী তা বুঝতে সীতেশের বিলম্ব হয়না, তাই তার ছোট্ট সাধটুকুকে সে বিসর্জন দিতে চায়না; বরং আর্থিক দিকটা সম্পর্কে কেমন একটা উদাসীন নিস্পৃহ হয়ে পড়ে। বিবেকের টানাপোড়েনের সঙ্গে সীতেশদের নিত্য সংগ্রাম করতে হয়। আমাদের মনে পড়ে যায় আরেক বরণ্য লেখক মতি নন্দীর 'বেহুলার ভেলা' গল্পটির কথা যেখানে মাসের শেষ শনিবারে পকেট একদম খালি করে মধ্যবিত্ত প্রমথ খাসির মাংস কিনেছিলো পরিবারের মানুষদের মুখে হাসিখুশি ভাব দেখবে বলে। এও তো মধ্যবিত্তের সাধ মেটাতে সাধ্যের সীমানা ডিঙানোর ইচ্ছা।

কৃষ্ণার জন্য সিনেমাহলের সামনে অপেক্ষারত সীতেশ যখন বুঝতে পারে যে কৃষ্ণা আর আসবেনা,তখন সে চক্ষুলাঙ্কা কাটিয়ে উঠে টিকিট দু'টো ব্ল্যাক করতে চায়। যদিও মনের মধ্যে চলতে থাকে একধরনের দোলাচলতা। এদিকে তার অভাবী সত্তাটাও যে নাছোড়,তাই 'সত্যি সত্যি 'ব্ল্যাক' করে বসে---এই ভয়ে ঝাঁপিয়ে-পড়া মানুষের ভিড় ঠেলে রাস্তায় নেমে সামনে যাকে পায় তার হাতে গুঁজে দিয়ে টাকা তিনটে নিয়ে ময়দানের দিকে হাঁটতে শুরু করে।'৬ তবে পাশাপাশি তার প্রেমিক হৃদয়টিও পাঠকের কাছে উন্মুক্ত হয়ে পড়ে। কৃষ্ণা না আসায় 'একটা ক্ষিপ্ত বিষন্নতা সীতেশের পায়ে পায়ে জড়িয়ে থাকে।'৭ তার মনে হয়,মেয়েদের সঙ্গে কখনো কোনো প্রোগ্রাম করা ঠিক না,ওরা একেবারেই কথা রাখতে পারেনা,পুরুষের গুঁছিয়ে তোলা কাজকে অগোছালো করতে ওরা চিরকালই পটু। সীতেশের এই চিন্তাভাবনার মধ্য দিয়ে ক্ষোভের প্রকাশ ঘটলেও এও প্রেমের অপর দিক বৈকি। প্রেমিকার সঙ্গে 'প্রোগ্রাম' সাকসেসফুল না হওয়া থেকে এ ক্ষোভের জন্ম ও সঞ্চার। আবার কৃষ্ণার জন্য উৎকর্ষিত না হয়েও সে পারেনা। পরদিন ফোনে সবকিছু জানতে পেরে সে কৃষ্ণাদের বাড়ি যায়। আবার সীতেশকে তাদের বাড়ি আসতে দেখে কৃষ্ণার মনে উৎকর্ষা প্রকাশ পায়,প্রেমিক সীতেশের তা ভালো লাগে। কৃষ্ণার জীবনসংগ্রামেরও প্রত্যক্ষ সাক্ষী সে। এই যুদ্ধে ক্লান্ত শ্রান্ত কৃষ্ণার পাশে থেকে সে তাকে সর্বতোভাবে বুঝিয়ে দিতে চায় যে,এই লড়াইয়ের অপর নামই জীবন।

কৃষ্ণা সংসারের আখমড়াইকলে পিষ্ট মধ্যবিত্ত ঘরের এক চাকুরিরতা মেয়ে। 'পথ হাঁটতে মানুষ' গল্পের অর্চনার মতো সেও জানে যে সংসারের প্রতিটি মানুষ তার উপর নির্ভর করে আছে। সেও অর্চনার মতোই চিৎকার করে উঠতে চায় মুক্তির জন্য। কিন্তু বাস্তবে তা পারেনা। আর তাই সর্বক্ষণ এক ক্লান্ত বিষাদ দুরারোগ্য ব্যাধির মতো তার শরীর মনকে ছেয়ে থাকে। এই জীবন তাকে আর কোনো আনন্দের রসদ জোগাতে পারেনা। বারবারই তার মুখ থেকে বেরোয়--- "ধুং,আর ভালো লাগেনা।"৮ মধ্যবিত্ত ঘরের চাকুরিজীবী মেয়ে প্রেমিকের সাথে দেখা হলে প্রথম কথা শুরু করে--- "স্কুলের ডি-এ-টা আজও এল না!"৯ এই একঘেয়ে ক্লাস্তিকর জীবন তার যেন আর সহ্য হয়না। তবে এখানেই শেষ নয়। তার মধ্যেও ভালোবাসার একটা গাঢ় জীবন্ত রঙ খুঁজে পায় সীতেশ। দুর্যোগপূর্ণ পরিস্থিতি সমাপ্ত হলে রাত্রির সীমাহীন নীরবতায় জীবনযুদ্ধের রণক্লান্ত কৃষ্ণা প্রেমিকের বৃকে তার আশ্রয় খোঁজে। আমরা পাঠকেরা পরিচিত হই এক পরিপূর্ণ নারীর ভিন্ন সত্তার সাথে।

কৃষ্ণার মা সীতেশের আবালায় পরিচিত এবং এককালে সীতেশকে তিনি পুত্রবৎ স্নেহ করলেও এখন সীতেশের উপস্থিতি তাঁর বিরক্তি উৎপাদন করে মাত্র। ধরা গলায় সীতেশকে তিনি বুঝিয়ে দেন কৃষ্ণাই পরিবারের একমাত্র রোজগারে,তাকে ছাড়া এইমুহুর্তে তাঁর সংসার অচল,বিশেষত যতদিন পর্যন্ত না তাঁর ছেলে মন্টু একটা চাকরিবাকরি

পায়। একসময়ের 'স্নেহ টলটলে' মাসিমার মুখে 'অসম্ভব কর্কশতা' দেখে সীতেশের সাথে সাথে আমাদের বুকের ভেতরটাও টনটন করে ওঠে। অথচ বাড়ি সার্চ হওয়ার আসন্ন সম্ভাবনায় সীতেশকে তাঁর আর 'অপ্রয়োজনীয় অবান্তর' মনে হওয়া, বরং সে হয়ে ওঠে এই বৃদ্ধার 'বিশ্বস্ত অবলম্বন।' মনে হতে পারে এ হলো মধ্যবিত্তের স্বার্থপর মানসিকতা--
--কাজের সময় কাজি আর কাজ ফুরোলে পাজির মতো, কিন্তু ওই দুশ্চিন্তাগ্রস্ত অসহায় বিধবাকে দোষও দেওয়া যায়না। তিনিও যে জীবনরণে লড়াই করে চলা আর এক ক্লান্ত-ধ্বস্ত সৈনিক।

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'এখন প্রেম' গল্পে সামাজিক অস্থিরতার পাশাপাশি 'প্রেম' নামক মানুষের স্বাভাবিক প্রবৃত্তিটিও অনেকখানি জায়গা দখল করে নিয়েছে। আর সেইসাথে লেখকের অসামান্য লেখনী স্টাইল অপূর্ব মুক্তিমানায় এই অনুভূতিকে গল্পের শরীরে ছড়িয়ে দিয়েছে। বিষাদগ্রস্ত কৃষ্ণাকে প্রেমিক স্বান্তনা দেয়, বোঝাতে চায় বাস্তবটাকে---"সার্কাস দেখানি? একটা সরু তারের ওপর দিয়ে ছাতা হাতে মেয়েরা কেমন সন্তর্পণে হেঁটে ওপার পৌঁছে যায়? আমাদের বাঁচাটাও তেমনি, রকমারি সমস্যার সরু তারের ওপর দিয়ে হাঁটা-চলা, বেড়ে-ওঠা। আর ওই রঙচঙে ছাতাটা আমাদের ভালোবাসা, জীবনের ব্যালেন্স রাখা!" ১০ কী চমৎকার ব্যাখ্যা জীবনের! পাঠকের বুঝতে অসুবিধে হওয়া সীতেশের জবানিতে এ উপলব্ধি ও জীবনভাবনা স্বয়ং লেখকের। আবার প্রেমিকার জন্য অপেক্ষমান সীতেশ যখন রাগে ক্ষোভে বাড়ির দিকে রওনা দেয় তখনকার বর্ণনায় লেখক জানান---'...এখুনি টালিগঞ্জে ছুটে যাওয়ার কথা সে চিন্তা করে না। কৃষ্ণা কি কৈফিয়ত দেয় সেটা জানা দরকার। দোষটা যখন তারই তখন অনুতাপ-টনুতাপ তারই হওয়া উচিত। সীতেশ কেন পৌরুষ খুইয়ে ছুটে যাবে আগে? ঘাড় শক্ত করে সে একটা ট্রামের দিকে এগুতে থাকে।' ১১ আমাদের বড় ভালো লাগে প্রেমিকার প্রতি মান-অভিमानে দীর্ঘ রক্ত-মাংসের এই সজীব চরিত্রকে। পরেরদিন কৃষ্ণার সাথে ফোনে বাক্যলাপটিও বড় জীবন্ত। আবার কৃষ্ণাদের বাড়িতে সেই রাতে কৃষ্ণার শীর্ণ শ্যামল মুখ সীতেশের চোখে অনেক বেশি নরম আর সুন্দর রূপে ধরা পড়ে। তার প্রেমিক চোখ কৃষ্ণার গালের ভাঁজে বয়সের রেখাকে দেখতেই পায়না। তাদের সেই সুন্দর মুহূর্তের সাক্ষী থাকে আকাশের 'সরু ঘোলাটে চাঁদ।' সীতেশ-কৃষ্ণার জীবনও যে তাই---একরত্তি, ঘোলাটে, আলোহীন। তবুও 'আকাশটা অদ্ভুত দেখায়। ঠান্ডা বাতাস জলকণা বয়ে আনে।' ১২ সীতেশদের গতানুগতিক জীবনেও যেমন হঠাৎ করে এই রাত এক বলক সুন্দর অনুভূতির বার্তা নিয়ে উপস্থিত হয়। সীতেশের মুখ থেকে বেরিয়ে আসে---"আজকের রাতটা বড় অদ্ভুত! অনেকদিন মনে থাকবে!" ১৩ আর এটাই তার ট্রাজেডি হয়ে যায়। বাস্তবিকই যে রাত প্রেমিকার চোখে চোখ রেখে, তার স্নিগ্ধ কোমল স্পর্শে হৃদয়ের না বলা কথায় বাঙময় হতে পারতো; তা দীর্ঘ হোলো, ছিন্ন-ভিন্ন হোলো নিয়তির

নিষ্ঠুর পরিহাসে। রাজনীতির জালব উপাস চাপা দিয়ে গেলো গভীর প্রেমানুভূতিকে। এই ভয়াবহ রাতের অভিজ্ঞতাও কখনো ভোলার নয়। গুরু গুরু দেয়া ডাকলো না তাদের মিলনবেলায় বরং গর্জে উঠলো উদ্যত রাইফেল। সেই পরিস্থিতিতে দাঁড়িয়ে সীতেশ ও কৃষ্ণা 'দুজনেই খরখর করে কেঁপে ওঠে।'১৪ --- না,কোনো ভালোলাগা থেকে নয়; ভয়াবহতা প্রত্যক্ষ করে। কী অদ্ভুত বৈপরীত্য! সেলাম জানাতে হয় গল্পকারকে তাঁর নির্মাণকৌশলের জন্য। ছোট ছোট বাক্যগুলো যেন তীরের মতো বিদ্ধ করতে থাকে আমাদের। সীতেশ-কৃষ্ণার মতো আমাদের অনুভূতিও যেন অসাড় হয়ে যায় ঘটনার আকস্মিকতায়।

রাজনীতির চরম বীভৎসতা এ গল্পের পরতে পরতে। সত্তর দশকের রাজনৈতিক অবস্থার জীবন্ত দলিল এ গল্প। খুন,বোমাবাজি,কার্ফু,যুবকদের ধরপাকড়,রক্তাক্ত দেহের তীর গোঙানি,পুলিসের বুটের দাঙ্গিক আওয়াজ---সব মিলিয়ে দমবন্ধ করা এক পরিবেশ। কৃষ্ণার ভাই মন্টু রাজনীতি করে বলে পুলিসের খাতায় তার নাম আছে। কিন্তু কৃষ্ণা বা সীতেশ এর সঙ্গে জড়িত না থেকেও কখন যেন সামিল হয়ে যায় এই বীভৎস পরিস্থিতির সাথে। তবে সব কিছুর শেষেও লেখক এক সদর্খক ইঙ্গিত রেখে যান। মেঘ দেখে করিসনে ভয়,আড়ালে তার সূর্য হাশে। সীতেশ ও কৃষ্ণা সারারাতের আঁধার শেষে নতুন ভোরের অপেক্ষায় থাকে,সূর্যোদয়ের প্রতীক্ষা করে। কাজেই রাজনীতির দানবীয় উপাসে এ গল্পের সমাপ্তি সূচিত হয়না,নির্মিত হয় এক গভীর প্রত্যয়---আঁধারের শেষে ভোর হবে। এই বিশ্বাস না থাকলে মানুষ বাঁচবে কেমন করে? ছোটগল্পের নীতিই হোলো 'শেষ হয়ে হইল না শেষ।' নতুন সূর্যের আগমনে সীতেশ-কৃষ্ণার জীবনের সবটুকু অন্ধকার ঘুচে যাবে,সামাজিক নৈরাজ্যের অবসানে পুনরায় তাদের জীবনে শুভ মুহূর্ত সৃষ্টি হবে; যেদিন কোনো ঘোলাটে চাঁদ নয়,তাদের সঙ্গী হবে পূর্ণিমার গোল থালার মতো চাঁদ। জ্যাংলার স্লিঙ্ক মধুর আলোয় উদ্ভাসিত হবে তাদের জীবন,দুই মিলনোন্মুখ ওষ্ঠাধর কাছাকাছি এসে থেমে যাবেনা,পরিণতি পাবে আলিঙ্গনে---এ দৃশ্য তো পাঠকবর্গ তাদের মানসচক্ষুতে দেখতেই পারে।

যুগের দাবিতে যে মধ্যবিত্ত শ্রেণির উৎপত্তি তার মধ্যে যুগোচিত হতাশা,নৈরাশ্য যে থাকবে তা বলাই বাহুল্য। তপোবিজয় অত্যন্ত দক্ষতার সাথে এই শ্রেণির মানুষগুলোর মানসিক দোলাচলতা,নিষ্পৃহতার দিকটি চিত্রিত করেছেন। একটা ছোট দৃষ্টান্ত দেওয়া যাক,উদ্ভূত পরিস্থিতির চাপে পড়ে সীতেশকে যখন কৃষ্ণাদের বাড়িতে রাত্রিবাসের সিদ্ধান্ত নিতে হয়,তখন তার মধ্যে অসম্ভব অস্বস্তি ঘুরপাক খায়---'সত্যি রাত্রিবাস? এখানে এই কৃষ্ণাদের বাড়িতে? কখনো এ বাড়িতে থাকেনি সে। থাকা যায় না। মাসীমা কি ভাববেন অন্য ভাড়াটেরা কি ভাববে!'১৫ ---অবিবাহিত সীতেশের এই দোলাচলপূর্ণ মনোভাব তার মধ্যবিত্ত সংস্কারজাত। অন্যদিকে যুগোচিত হতাশা ধরা পড়েছে কৃষ্ণার আচরণে

কথাবার্তায়। আর্থিক দুর্বিপাকে পড়া জীর্ণ সংসারতরির কাড়ারি সে। তার সম্পর্কে লেখকের 'স্কুল-মাস্টারনী' (শিক্ষিকা নয়) শব্দটির সচেতন প্রয়োগ পাঠকের দৃষ্টি এড়ায় না। কত স্পষ্টভাবে চেনেন তিনি মধ্যবিতদের! ---'মধ্যবিত ঘরের স্কুল-মাস্টারনী মেয়েদের শরীর এত ঠুনকো না,কথায় কথায় অসুখ হয় না। অন্তত হওয়া উচিত না।'১৬ অসুখ তো উচ্চবিতদের বিশ্রামের নামান্তর,মধ্যবিতদের কষ্ট সহ্য করা অভ্যস্ত দেহে সে খুব সহজে ধরা দেয়না। আবার কৃষ্ণার মা 'নিম্পূহ কর্তে' ভাবী জামাতাকে যখন বলেন,"এস বাবা অনেকদিন দেখিনি যে?"১৭,তখন বোঝা যায় মধ্যবিতের কর্ত আর মুখনিঃসৃত কথার মধ্যে কতখানি ফারাক থেকে যায়!

তপোবিজয়ের লেখা সহজ সরল ও স্বচ্ছ। তাঁর গল্পে বর্ণিত দৃশ্যগুলি যেন পাঠকের চোখে ছবির মতো ভাসতে থাকে। জাঁতাকলে পড়া হাঁদুরের সাথে সীতেশের,অরণ্যের হিংস্র প্রাণী কর্তৃক নিহত হরিণকে ঘাড়ে গলায় দাঁত বসিয়ে টেনে নিয়ে যাওয়ার অনুশঙ্গে পুলিশ ও যুবকের বিষয়টি তপোবিজয় বড় নিপুণতায় ফুটিয়ে তুলেছেন। আর একটি বাক্য লক্ষ্য করা যাক---'ভেতরে মূল ছবিটাও শুরু হয়ে গেছে। সিনেমায় চলে এক কাল্পনিক ছবি,হলের বাইরে চলে সীতেশের জীবনের বাস্তব ছবি।'১৮ এধরণের বৈপরীত্য অঙ্কনেও লেখক সিদ্ধহস্ত। কিম্বা,ওই বাক্যটা---'ওর (কৃষ্ণার) টান করে বেণী বাঁধা চুলের মাঝখানে বড় সাদা সিঁথিটায় বিকেলের পড়ন্ত রোদ্দুর চিকচিক করে।'১৯ কৃষ্ণার চওড়া সাদা সিঁথিটা তার মতোই যেন ক্লাস্ত,বিষাদগ্রস্ত যা সীতেশের হাতে রেঙে উঠবার প্রতীক্ষায় রত।

'লেখা ও রেখা' পত্রিকায় প্রকাশিত তপোবিজয়ের 'এখন প্রেম' নামাঙ্কিত গল্পটি তাঁর সৃষ্টির বিশেষ পরিচয়বাহী। শাস্ত্রত অনুভূতি ও কর্তোর বাস্তবের দোদুল্যমানতায় এ গল্প হয়ে উঠেছে এক সার্থক রচনা। দুরারোগ্য কর্কটরোগ তাঁকে এত শীঘ্র কেড়ে না নিলে বাংলা সাহিত্য এই নিষ্ঠুর লেখকের লেখায় আরো সমৃদ্ধশালী হয়ে উঠতে পারতো বলে আশা করা যায়।

মূল গ্রন্থ : কালচেতনার গল্প, দ্বিতীয় খন্ড, তপোবিজয় ঘোষ, ন্যাশনাল বুক এজেন্সি, প্রথম প্রকাশ -- মার্চ ১৯৮৫,

তৃতীয় মুদ্রণ-- এপ্রিল ১৯৯৬ ।

সহায়ক গ্রন্থ ও পত্রিকা :

১। গল্পচর্চা, সম্পাদনা ড. উজ্জ্বলকুমার মজুমদার, বঙ্গীয় সাহিত্য সংসদ, প্রথম সংস্করণ-- প্রজাতন্ত্র দিবস ২০০৮ ।

২। তবু একলব্য, সাহিত্য ও সংস্কৃতি বিষয়ক পত্রিকা, সপ্তম বর্ষ, বইমেলা সংখ্যা,১৪১৯, জানুয়ারি ২০১৩ ।

তথ্যসূত্র :

- ১। তপোবিজয় ঘোষ, কালচেতনার গল্প, দ্বিতীয় খন্ড, ন্যাশনাল বুক এজেন্সি, প্রথম প্রকাশ -- মার্চ
১৯৮৫, তৃতীয় মুদ্রণ-- এপ্রিল ১৯৯৬, পৃষ্ঠা- ১৪২
- ২। প্রাগুক্ত, পৃষ্ঠা-১৪৩
- ৩। প্রাগুক্ত, পৃষ্ঠা-১৪৩
- ৪। প্রাগুক্ত, পৃষ্ঠা-১৪৪
- ৫। প্রাগুক্ত, পৃষ্ঠা-১৩৭
- ৬। প্রাগুক্ত, পৃষ্ঠা-১৩৭
- ৭। প্রাগুক্ত, পৃষ্ঠা-১৩৭
- ৮। প্রাগুক্ত, পৃষ্ঠা-১৩৮
- ৯। প্রাগুক্ত, পৃষ্ঠা-১৩৮
- ১০। প্রাগুক্ত, পৃষ্ঠা-১৩৮-১৩৯
- ১১। প্রাগুক্ত, পৃষ্ঠা-১৩৯
- ১২। প্রাগুক্ত, পৃষ্ঠা-১৪২
- ১৩। প্রাগুক্ত, পৃষ্ঠা-১৪৩
- ১৪। প্রাগুক্ত, পৃষ্ঠা-১৪৩
- ১৫। প্রাগুক্ত, পৃষ্ঠা-১৪১
- ১৬। প্রাগুক্ত, পৃষ্ঠা-১৩৭
- ১৭। প্রাগুক্ত, পৃষ্ঠা-১৪০
- ১৮। প্রাগুক্ত, পৃষ্ঠা-১৩৭
- ১৯। প্রাগুক্ত, পৃষ্ঠা-১৩৮

Postgraduate Students' Academic Procrastination: A Survey

Dr. Prakriti Ranjan Sarkar¹

ABSTRACT

The current study is a mixed method research that involves a survey of Academic Procrastination among the Postgraduate (PG) Students in Kolkata. The study included a sample of 198 PG students from government sponsored colleges of Kolkata. Data was collected through an information schedule and an adapted academic procrastination scale (Tuckman Procrastination Scale). Procrastination is nowadays a common phenomenon among students particularly for those who are studying at the higher education level and this is doing more harm to their academic performance and career. Therefore, the present study was conducted to survey the extent of Academic Procrastination and to study the relationship between academic procrastination and academic achievement of PG students. The sample was drawn using simple random sampling technique from four PG colleges in Kolkata. The results demonstrated that a significant correlation was found between academic procrastination and academic achievement of postgraduate students. Findings further revealed that the subjects procrastinate in the same way irrespective of their gender. Consequences of procrastination on academic achievement of students and task-coping and time management training programmes were suggested at the end.

Keywords: Academic, Procrastination, Survey, Postgraduate, Students

Introduction

Procrastination refers to avoiding a task that needs to be accomplished. It is more often the practice of doing a more pleasurable task in place of less pleasurable task, or carrying out less urgent tasks instead of more urgent tasks, thus putting off impending tasks to a later time. Sometimes, procrastination takes place until the delaying till the "last minute" before a deadline. Procrastination is intentionally delaying or deferring work that must be completed. Every single human being has to complete numerous tasks during a day for an effective performance, but for certain reasons completion of these required tasks is often delayed. This tendency to put things off until the last moment- or to beyond the last moment in college and university students is particularly vulnerable obstruction in the way of their effective time

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management. This problem is called procrastination. Some persons just like to put off taking actions. They never do today what can be put off until tomorrow. It is very common among college students. An assessment indicates that 80 per cent to 90 per cent college students engage in procrastination (O'Brien, 2002).

Now, Academic procrastination is a form of procrastination behavior pattern that can have particularly serious consequences for students whose academic lives are characterized by frequent deadlines. Obviously, it can also be in delaying studying behaviours like in submitting term papers, assignments, projects works or reports, and missing deadlines for tasks related to academic life, such as returning library books, registering for an examination, and so on. Coming late in classes or delaying in handling practical works is also consequences of academic procrastination (Scher and Osterman, 2000).

Academic Procrastination

Academic procrastination is highly frequent in students and is regarded as detrimental to academic progress and success. It is estimated that academic procrastination in tasks related to academic life is a common phenomenon for about 70 per cent of university students (Ferrari et al., 2005). The most common consequence of procrastination is poor academic performance. While much has been studied about procrastination in adults, lesser studies are on young adults. Taking this point into attention the researcher made an attempt to study the relationship between academic procrastination and academic achievement of postgraduate students in Indian context.

Objectives of the Study

1. To examine the academic procrastination of postgraduate students in Kolkata.
2. To compare the academic procrastination of male and female postgraduate students in Kolkata.
3. To investigate the relationship between academic procrastination and academic achievement of Postgraduate students in Kolkata
4. To suggest strategies to overcome academic procrastination.

Null Hypothesis

H₀₁ – There is no significant difference in academic procrastination of male and female postgraduate students.

H₀₂ – There is no significant association between academic procrastination and academic achievement of postgraduate students.

RESEARCH METHODOLOGY

This study is a mixed method study. The present study adopted both quantitative and qualitative research methodology to explore the academic procrastination of male and female postgraduate students.

Sampling

Simple random sampling technique was adopted to select the total postgraduate sample of 198 postgraduate students from four government sponsored colleges in Kolkata. Simple random sampling is a type of probability sampling method. Participants from a population are randomly chosen. All population members have an equal chance of being selected. This method has a tendency to harvest truly representative, and unbiased samples.

Tools

In this study demographic Information Schedule and Tuckman Procrastination Scale, 2001 were used to collect data.

- **The Tuckman Procrastination scale** has a total of 56 statements. The statements are rated on a 5 point Likert scale with response options of Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree. The adapted scale has a reliability of 0.79
- **Demographic Information Schedule** – The demographic data of the participants were gathered through Demographic Information Schedule that collects information on participants' name, gender, class, streams (Arts/Science/Commerce), age, and last obtained grades/CGPA as academic achievement that is final score in UG level.
- **Focus Group Discussion** - Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic like strategies to overcome procrastination for obtaining several perspectives about the same topic

Data Collection

Data collection was done in this mixed study using the tools. All the participants were administered the adapted version of Tuckman Procrastination Scale, the short demographic information schedule and focused group discussion in an out of classroom setting. On an average it took approximately 50-60 minutes.

Data Analysis and Results

Descriptive as well as inferential statistical techniques were used for the analysis of data. Mean and Standard Deviation were employed to analyze the academic procrastination of postgraduate students. Pearson correlation Coefficient was utilized to examine the association between academic procrastination and academic achievement. t-test was used to assess the significant difference of the academic procrastination between male and female postgraduate students.

Table: 1.0 Gender in sampling				
Sample	Male	Female	Male %	Female%
PG Students	98	100	49.49	50.51

Gender

A pie chart titled 'Gender' showing the distribution of PG students. The chart is divided into two segments: a blue segment representing Male at 49% and a red segment representing Female at 51%.

Table: 1.0 reflect that student sample comprised 49.49% male and 50.51% female student. It is quite equal proportion in terms gender dimension. Table : 2.0 reveals that 24.75% of the PG students are high procrastinators where as a large portion , 51.01% are moderate procrastinators and the 24.75% are low procrastinators. This distribution is following a pattern of normal probability curve. That means at both extremes of the procrastinations samples are fewer in number.

Table: 2.0 Distribution of Academic Procrastination Scores			
Classification	Academic Procrastination Scores	No. of students	Perce nt
High procrastinators	Above 174	48	24.24
Moderate procrastinators	Between 130-174	101	51.01
Low procrastinators	Below 130	49	24.75

A horizontal bar chart showing the distribution of academic procrastination scores. The x-axis represents the percentage of students. There are three bars: a red bar for High procrastinators at 24.24%, an orange bar for Moderate procrastinators at 51.01%, and a blue bar for Low procrastinators at 24.75%.

In table no 3.0 the calculated t value is 1.2 which is not significant at 0.05 level of significance. It means that male students do not significantly differ in academic procrastination from female students. So there exists no significant difference of academic procrastination with respect to gender. In the beginning it was assumed that **H₀1** – There is no significant difference in academic procrastination of male and female postgraduate students. The null hypothesis is accepted.

Table: 3.0 Difference of Academic Procrastination Scores with respect to Gender

Variable	Group	N	Mean	SD	t	Level of Sig.
Academic Procrastination	Male	98	158.27	22.2	1.2	Not significant at 0.05 level
	Female	100	152.25	24.95		

In the beginning for the purpose of studying the relationship between academic achievement and academic procrastination null hypothesis 2 was formulated. There is no significant association between academic procrastination and academic achievement of postgraduate students. The Table-3.0 reveals that coefficient of correlation (r) between academic achievement and academic

Procrastination is - 0.51 which is negative but significant at 0.05 level. So the null hypothesis that no significant relationship between academic achievement and academic procrastination is rejected. The ‘r’ value indicates that academic procrastination is negatively correlated with academic achievement. So, it can be concluded that higher the academic procrastination among students lowers the academic achievement of the students and vice-versa. The results of the study are in consonance with the result of Charine (2015) who also found a strong negative correlation between academic procrastination and academic grades. So the null hypothesis is not accepted.

Table: 3.0 Correlation between Academic Procrastination and Academic Achievement

Variables	N	df	r	Level of Sig
Academic Procrastination	198	196	-0.51	Significant at 0.05 level
Academic Achievement	198			

Qualitative data collected through the focused group discussion were first transcribed and then coded into themes. It was analysed using deductive reasoning, which is a way of finding, organizing, characterizing, and reporting the themes in the collected data (Balkis and Duru, 2009). Based on the conceptual framework, the transcribed data from interviews and surveys were divided into various themes. Based on the data Table 4 represents the findings of content analysis.

Table: 4.0 Strategies to overcome Academic Procrastination

Strategies	
To overcome Academic Procrastination	Self-realization that you're procrastinating. Select a good study location to eliminate distractions. Set realistic goals that you can Reach. Select likeminded peers and work in group. Take occasional breaks. Hold yourself accountable. Don't blame on others

Findings of the Study

- No significant difference was found in academic achievement of postgraduate students with respect to their gender.
- A significant but negative correlation was found between academic achievement and academic procrastination of secondary school students
- Students expressed a set of strategies mostly self-regulation that can help overcoming procrastination

Discussion: The present research examined - the academic procrastination of postgraduate students, the relationship of academic procrastination with academic achievement,- the difference in academic procrastination of male and female students, and to find out few strategies to overcome procrastination. The finding of the present study specifies that academic procrastination is negatively correlated to academic achievement. This finding is supported by similar findings of the studies conducted by Balkis and Duru (2009) who also found a negative and meaningful correlation between academic procrastination and academic achievement, Similar results are reported by the study of Charine (2015) who also found a strong negative correlation between academic procrastination and academic grades. So it can be said that students who have strong tendencies to procrastinate tend to have low examination grades than non-procrastinators. So there is an urgent need to find out suitable strategies that students can adopt to overcome their procrastinating behaviour. Self realization that they are procrastinating.

Selection of a good study location to eliminate distractions. Setting realistic goals that the can reach. Selecting likeminded peers and working in groups are the strategies that can help to lower procrastination. Taking occasional breaks. Holding oneself accountable and not blaming on others is key to lower procrastination. Popoola (2005) recommended that procrastination should be considered as detrimental to the academic performance of students they need for time management. A student who is able to confront and control his or her procrastinating behaviour the first stage is to look at his/herself critically and determine the distractive and incompetence attributes that negates his positive behaviours towards his academic activities. Procrastination as a form of incompetence has to be eliminated in order to cure it (Akinsola and Tella, 2007).

Conclusion: The Twenty First century is an age of aggressive competition; therefore one must be just in time for everything. Academic procrastination is damaging to academic performance owing to its link to contrary behaviors such as poor study behaviours, stuffing for examinations, examination anxiety, delayed submission of homework assignments and term papers, inferior grades, and sense of guilt and hopelessness postponement, procrastination, drift indecision, dogmatic attitude, inflexibility and non-compromising mindset. Academic procrastination is viewed as a complex phenomenon that encompasses cognitive as well as behavioral components. The behavior of students who procrastinates their academic responsibilities is a phenomenon related to learning. It is now again established that academic procrastinators lag in academic achievement. So it is high time for teachers, faculty members, educators and the educational administrators must train students to do time management, to do crisis management as well as trouble management. S/he must do it, and should not get derailed or sidelined in line of delay, adjournment, drifting and hesitancy. So, future researchers should find some practical ways to help students to reduce their frequency of such behavior. It is suggested that some programs should be planned and executed to teach task- coping strategies for students.

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জনপ্রিয়তার নিরিখে তথ্যানুসন্ধানে ডাকঘর নাটক

রক্তিম সরকার¹

সংক্ষিপ্তসার

পাঠ্য ও প্রয়োগগত দিক থেকে ‘ডাকঘর’ নাটক জনপ্রিয়। তত্ত্বগত নিরিখে যেমন নাটকের সাহিত্যমূল্য আছে, তেমন তার প্রয়োগমূল্য রয়েছে। তত্ত্বগতভাবে এই নাটকের জনপ্রিয়তার বিষয়গুলি এই সন্দর্ভ দেখবার চেষ্টা করা হয়েছে। রবীন্দ্রনাথ তাঁর নাটক রচনার ক্ষেত্রে বারবার ভাঙাচোরা করেছেন। বলা যেতে পারে যে, নাটকের বিষয়গত বৈচিত্রের মধ্য দিয়ে নতুন ধারার সূচনা করেছেন। নাটকে বিষয়ের ব্যঞ্জনা কিংবা শব্দবন্ধের দ্যোতনায় ব্যক্তিগত জীবনের টানাপোড়েনের দ্বন্দ্ব পাঠকের সামনে গভীরভাবে তুলে ধরেছেন। লেখক তথা শ্রুতা, ভাষার সাহায্যে বর্ণিত বিষয় বা ঘটনার সঙ্গে সহৃদয় ও সংবেদনশীল পাঠকের মধ্যে যোগসূত্র তৈরি করেন এবং এটি শৈলীগত উপাদানের যোগফল। আমরা জানি সাহিত্যে মানব চরিত্র ও তার পারিপার্শ্বিক আর্থ-সামাজিক ঘটনাদি বর্ণনার পাশাপাশি মানসিক অন্তর্দ্বন্দ্ব নান্দনিকভাবে প্রকাশ পেয়ে থাকে। যেহেতু সাহিত্য মানুষের মানবধর্মের দ্বারা সৃষ্টি হয়, সেহেতু সমাজ থেকে বিচ্ছিন্ন হয়ে সাহিত্য সৃষ্টি করা সম্ভব নয়। তাঁর নাটক যখন মঞ্চে উপস্থাপিত হচ্ছে তখন দেখা যাচ্ছে মূল নাটকের পাঠ-কে কেন্দ্র করে এক একজন নাট্যনির্দেশক তাঁদের মতো করে নাটক মঞ্চায়ন করছেন। অর্থাৎ প্রয়োগগত দিক থেকে অভিনবত্ব আনার চেষ্টা করেছেন। সবক্ষেত্রে তাঁরা সফল হয়েছেন এমন বলা যায় না। অভিনবত্ব আনতে গিয়ে নাটকের মূল ছন্দকে আঘাত করেছেন। আমাদের এই আলোচনার বিষয় সেদিকে কেন্দ্রে রেখে। বহুরূপী নাট্যগোষ্ঠী রবীন্দ্রনাথের নাটককে নতুন মাত্রা দান করেছেন। শুধু বাংলাভাষায় নয়, অন্যভাষাতেও ‘ডাকঘর’ জনপ্রিয় সেদিকে আলোকপাত করার চেষ্টা হয়েছে।

সূত্রশব্দ: জনপ্রিয়তা, call of the open road, প্রয়োগগত দিক, নাট্যশোধ সংস্থা, উপস্থাপনা, বহুরূপী, অভিনবত্ব।

‘জনপ্রিয়’ শব্দের প্রসারতা সুদূর বিস্তৃত। তার একটা ইতিহাস রয়েছে। সেবিষয়ে বিস্তারিত আলোচনা করার উদ্দেশ্য এই সন্দর্ভের নয়। শুধু এটুকু বলা যেতে পারে কী কারণে একটা টেক্সট বা পাঠ্য জনপ্রিয় হতে পারে সেদিকে আলোকপাত করার চেষ্টা করা হয়েছে। বিশেষ করে নাটক পাঠ্য হিসাবে এবং তার প্রয়োগগত উপস্থাপনার দিক থেকে কাল থেকে আরেক কালে তথা সময় উপযোগী ও তাৎপর্যপূর্ণ হয়ে ওঠে সেবিষয়ে আলোচনা করা যেতে পারে। সাধারণ রঙ্গালয়ে রবীন্দ্রনাথের নাটক শুরু হয় ১৮৮৬ সাল থেকে। প্রথম নাটক রবীন্দ্রনাথের ‘বোঁঠাকুরাণীর হাট’ অবলম্বনে ‘রাজা বসন্ত রায়’। এই নাটকের মুখ্য চরিত্রে সুকুমারী, ভবতারণীসহ প্রমুখরা অভিনয় করেছিলেন। রবীন্দ্রনাথের নাটকগুলি ছিল তৎকালীন প্রথাগত নাটকের ধরণ থেকে আলাদা। এমন কি অগ্রজ জ্যোতিরিন্দ্রনাথের নাট্যরচনারীতি অনুসারীও যে ছিলেন এমনটা জোর করে বলা যায় না। বলা যেতে পারে তাঁর নাটকের দেশাত্মবোধ, জনপ্রিয়তা রবীন্দ্রনাথকেও উদ্বুদ্ধ করেছিল নাটক রচনায়। ফলে রবীন্দ্রনাথও তাঁর নাটকের যাত্রা শুরু করলেন ‘রুদ্রচণ্ড’-র মত ইতিহাসাশ্রয়ী নাটক দিয়ে। নাটক রচনার পূর্বেই নাটক সম্পর্কে একটা ধারণা মোটামুটি স্পষ্ট হয়ে গিয়েছিল তাঁরা। জ্যোতিদাদার ‘এমন কর্ম আর করব না’ প্রহসনে ‘অলীকবাবু’র চরিত্রে রবীন্দ্রনাথের অভিনয়ের কথা যেমন জানা যায়, তেমনি, ১৮৮০-তে ‘মানময়ী’ নাটকে ‘মদন’-এর ভূমিকায় অভিনয় করতে দেখা যায় তাঁকে। জ্যোতিরিন্দ্রনাথের ‘সরোজিনী’ নাটকের সংশোধন বিষয়ে পরামর্শ দিয়ে ‘জুল জুল চিতা দ্বিগুণ দ্বিগুণ’ গানটি এবং ‘মায়াময়ী’ নাটকের ‘আয় তবে সহচরী’ গানটি রবীন্দ্রনাথেরই সংযোজন। এছাড়াও ‘পুরু-বিক্রম’-এর দ্বিতীয় সংস্করণে (১৮৭৯) ‘একসূত্রে বাঁধিয়াছি’ গানটিও তাঁরই লেখা। সুতরাং, প্রায় চৌদ্দ-পনের বছর বয়স থেকেই নাটকের মধ্যে আবেগ, ভাষা, সংলাপ, কোথায় সংলাপের বদলে গানের ব্যবহার প্রয়োজন ইত্যাদি নিয়ে একটা

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ধারণা তৈরি হয়ে গিয়েছিল তাঁর। আর ‘সরোজিনী’ প্রকাশের পর তো জ্যোতিরিন্দ্রনাথ বলছেনই—“রবিকে প্রমোশন দিয়া আমাদের সমশ্রেণীতে উঠাইয়া লইলাম।”^{১১} এর ফলে রবীন্দ্রনাথের সাহিত্য জ্ঞান, মানসিক পরিণতি, আত্মবিশ্বাস বেড়ে যায়। ‘রুদ্রচণ্ড’-র পাশাপাশি ‘ভিখারিনী’ (ভারতী/ শ্রাবণ-ভাদ্র ১২৮৪), ‘করুণা’ (ভারতী/ ১২৮৪ আশ্বিন — ১২৮৫ ভাদ্র) ইত্যাদি মৌলিক রচনাতেও তাঁর সাবলীল পদক্ষেপের সূত্রপাত হয়। রবীন্দ্রনাথের সমগ্র জীবনের নাট্যবিবর্তন বিশ্লেষণ করলে দেখা যাবে, পাশ্চাত্য ও সংস্কৃত নাট্যরীতি অনুসরণ করে নাট্যচর্চা শুরু করলেও প্রথমাধি প্রচলিত ধারা থেকে আলাদা পথেই হাঁটছিলেন তিনি। সেই সময় গিরীশ ঘোষ, মন্মথনাথদের পুরাণের চর্চিত চর্ষণ আর ঐতিহাসিক নাটকের পুনরাবৃত্তি রবীন্দ্রনাটকে দেখা যায় না। বরং বরাবরই একঘেয়েমিতা থেকে সরে এসে একটা পরীক্ষামূলক পথে নাট্যচর্চা করেছেন তিনি। তাই ‘রুদ্রচণ্ড’, ‘বিসর্জন’ ঐতিহাসিক হয়েও ইতিহাসকে অতিক্রম করে শিল্পের পর্যায়ে উন্নীত হতে পেরেছে। ‘বাল্মীকি প্রতিভা’, ‘কালমৃগয়া’ পুরাণ নির্ভর হয়েও আপন বৈশিষ্ট্যে উজ্জ্বল। আর ‘চিত্রাঙ্গদা’ তো বলাই যায় পুরাণের নব মূল্যায়ন। ‘প্রকৃতির প্রতিশোধ’ নাটকে প্রথম দেখা গেল নাট্য লক্ষণ এবং সেই সঙ্গে মনে রাখতে হবে, ‘প্রকৃতির প্রতিশোধ’-এ স্থান-কালের কোনও নির্দিষ্টতা নেই। পরবর্তীকালে ‘শারদোৎসব’ পর্বের নাটকগুলিতেও বাস্তবধর্মী স্থানের কোনও উল্লেখ তো থাকলই না, উপরন্তু নাটকগুলি হয়ে উঠল কালোস্তীর্ণ।

‘ডাকঘর’ রচনা, মতামত ও পাঠবিচারের সঙ্গে সঙ্গে যে বিষয়টি বিশেষভাবে উল্লেখযোগ্য তা হল নাটকটির উপস্থাপনার দিক। বলা যেতে পারে, রবীন্দ্রনাথ অসচেতনভাবে পটভূমি বিন্যাস, কাহিনি বিন্যাস প্রভৃতি ধারাগুলিতে বৈচিত্র্য আনবার চেষ্টা করেছিলেন। তাঁর নাটকগুলিকে কোনো একটি বিশেষ দর্শনে আবদ্ধ করা সম্ভবপর নয়। সময়ের সঙ্গে সঙ্গে বর্ধিত হতে থাকে দর্শনগত চিন্তা ভাবনা, তার সঙ্গে অভিজ্ঞতা ও বোধের বৈচিত্র্য মিশতে থাকে। ‘ডাকঘর’ রবীন্দ্রমানসের এক বিশেষ পর্বে রচিত। এই নাটকে মাধবদত্ত বিষয়ী মানুষ হলেও অমলের আসন্ন মৃত্যুতে তার ঘর শূন্য হয়ে যাওয়ার আশঙ্কা তাকে মানবী স্পর্শ এনে দেয়। কবিরাজের পুঁথিগত বিদ্যার বিপরীতে রয়েছে রাজকবিরাজের মুক্তির বার্তা। আর মোড়ল চরিত্রটি আপন অহংকারে মুখরা। অমল শিশুচরিত্রের সার্থক বিকাশ ঘটেছে তার সরল মনের কৌতুহল এবং রাজার চিঠির অপেক্ষায় নিদ্রায় আচ্ছন্ন হয়ে যাওয়ার মধ্য দিয়ে। সি. এফ. এনডুজকে রবীন্দ্রনাথ লিখছেন- “Amal represents the man whose soul has received the call of the open road- he seeks freedom from the enclosure of habits sanctioned by the prudent and from wall of rigid opinion built for him by the respectable”^{১২} ‘call of the open road’ তথা রাস্তা বা পথের কথা বলা হয়েছে। এই নাটকের পটভূমিতে অমলকে ঘরের মধ্যে জানলার ধারে দেখা যায়। তার বাইরে বেরানো নিষেধ। আর বাইরের সুদূর বিস্তৃত পথে দইওয়ালা, প্রহরী, ছেলের দল, সুধাকে দেখা যায়। তারা ঘরের বাইরে রাস্তা তথা পথ থেকে অমলের সঙ্গে কথা বলে। তবে চরিত্রের প্রতীকধর্মীতা প্রসঙ্গে শঙ্খ ঘোষ তাঁর গদ্যসংগ্রহের পঞ্চম খণ্ডে ‘নাট্যমত ও ভাষার সন্ধান’ প্রবন্ধে শরৎ ও বাদল হরকরা চরিত্রের মধ্য দিয়ে প্রতীকের স্পষ্ট প্রয়োগ সম্পর্কে অভিমত ব্যক্ত করেছেন।

সঙ্গনুসারে বলা যেতে পারে, অমলের ঘর থেকে বাইরে বেরানোর নিষেধের সঙ্গে বাইরে থাকা চরিত্রগুলোর সঙ্গে কথোপকথনের মধ্য দিয়ে নাটকীয় দ্বন্দ্বিক ভাবনা তুলে ধরা হয়েছে- “ঘর মানে তাহলে মাতৃজঠর, নিশ্চিত আশ্রয়; আর পথ মানে ব্যক্তিগত অনুসন্ধান, কোনো এক নির্দিষ্ট লক্ষে পৌঁছানোর উপায়।”^{১৩} পথ ‘এক নির্দিষ্ট লক্ষে’ পৌঁছে যাবার উপায় কিনা সেটা তর্কসাপেক্ষ আলোচনা। আমরা সেই পরিসরে প্রবেশ না করে এভাবে বিষয়টাকে দেখতে পারি যে, রবীন্দ্রনাথ তাঁর গূঢ়তর ভাবনাকে শব্দের ছায়ায় প্রকাশ করতে ভালোবাসেন। এই নাটকের ক্ষেত্রে অমলের ঘুম আসা তার অন্যতম উদাহরণ। তিনি ব্যঞ্জনাত্মক ভঙ্গিতে সেই শব্দের ব্যবহার করেছেন। আবার কোনও কোনও তাত্ত্বিক বিদগ্ধজন সব কিছুকে অতিক্রম করে এর মধ্যে ভিন্নতর ব্যাখ্যা অন্বেষণের চেষ্টা করেছেন। একটু খেয়াল করলে দেখা যাবে, যে বয়স তার খেলার, সেই বয়সে নিষেধের বেড়া জালে থাকতে বাধ্য হয়ে খেলনা বিলিয়ে দেওয়ার মধ্যে সুদূরের ডাকে সাড়া দেওয়ার আকৃতিকে চিনে নেওয়া যায়। অর্থাৎ নিজের যা কিছু প্রিয়, সমস্ত অকপটে বিলিয়ে দেওয়ার মধ্যে পৃথিবী জগতের প্রতি অমল এবং সেই সঙ্গে স্রষ্টারও বিমুখতাকে চিনে নেওয়া যায়। কিন্তু তখনও স্পষ্ট হয় না পরপারের সেই আহ্বানের স্বরূপ। প্রহরীর সঙ্গে কথোপকথন সূত্রে অমলের মনোবাসনা প্রথম ব্যক্ত হয়- ‘বড় হলে আমি রাজার ডাক হরকরা হব’। অন্ধকারের ভিতর দিয়ে যেমন প্রহরীর ঘন্টা বাজে ‘ঢং ঢং ঢং’ ঠিক তেমনি করেই অমল শুনতে পায় কোনো এক অজানা অথচ বহু কাঙ্ক্ষিতের পদধ্বনি। একইরকম ভাবে ‘ডাকঘর’ রচনাপর্বে সুদূরের আহ্বান এসে পৌঁছেছিল রবীন্দ্রনাথের কাছেও। কবির মন অকারণে হয়ে উঠছিল চঞ্চল, তিনি পৌঁছতে চাইছিলেন সুদূরের আহ্বানকারীর

কাছে, যিনি প্রতীকায়িত হয়েছেন ডাকঘরের রাজা রূপে। রবীন্দ্রনাথের অন্তরের এই তাগিদটাই স্বতঃস্ফূর্তভাবে প্রকাশ পেল ‘ডাকঘর’-এ। সেখানে কোনও সম্পাদকের অনুরোধ বা পত্রিকায় লেখা যোগানের তাগিদ নেই। বরং আছে কবিমনের ভাবোচ্ছ্বাসের প্রকাশ।

যেমন, শান্তিকুমার দাশগুপ্ত ‘রবীন্দ্রনাথের রূপকনাট্য’ গ্রন্থে বলেছেন যে, অমলের মুক্তির বিলম্ব নেই—জীবাত্মা এইবার পরমাত্মার আহ্বানলিপি পাবে। অন্যদিকে আশুতোষ ভট্টাচার্য ‘বাংলা নাট্যসাহিত্যের ইতিহাস’ গ্রন্থের দ্বিতীয় খণ্ডে বলেছেন, “অমলও মানবাত্মার প্রতীক, বন্ধনই আত্মার পীড়া। অমলের পীড়া শারীরিক কোনো বিকার মাত্র নহে, ইহা মনের অস্বস্তি—অবস্থা।” আবার সত্যেন্দ্র ঘোষালের মতে ডাকঘর নাটকের মূল কথা পরম আনন্দময়তা এবং ‘পরম প্রেমাস্পদ যে ব্রহ্ম’-এর কাছে মনকে পৌঁছানোর কথা বলেন। শুধু তাই নয় রবীন্দ্র-চেতনায় মৃত্যু, বিচ্ছেদ বা দুঃখ বিচ্ছিন্ন বা কাকতালীয় ঘটনা নয়; গভীরতর ব্যঞ্জনার দিক থেকে যেন জীবনেরই ‘নিত্যসহচর’^৪।

রবীন্দ্রনাথকে পেরিয়ে আসতে হয়েছে ধারাবাহিক প্রিয়জন বিচ্ছেদের চরম বেদনার দীর্ঘপথ। তাঁর চৌদ্দ বছরের কিশোর বয়সে হারাতে হয় মা সারদাদেবীকে (২৭শে ফাল্গুন ১২৮১/ ১০-ই মার্চ ১৮৭৫)^৫। কাদম্বরীদেবী, ভ্রাতুষ্পুত্র বলেদ্রনাথ, প্রিয় ভ্রাতুষ্পুত্র নীতিন্দ্রনাথ, মৃগালিনীদেবী, রেণুকা, মর্হর্ষি দেবেদ্রনাথ, পুত্র শমীন্দ্রনাথ এদের মৃত্যু কঠিন, ভয়াল, মর্মান্তিক এই বেদনাই তাঁকে সচকিতে জানিয়ে দিয়ে যায় মৃত্যু ততটাই অনিবার্য, যতটা অপরিহার্য জীবন। তাঁর সৃজনীতে দুঃখ-সুখের অনুভূতিগুলো গাঁথা হতে থাকে। আসলে রবীন্দ্রনাথের সাহিত্যজীবন কিংবা ব্যক্তিজীবনে অনেক বেশি ওঠাপড়া ছিল- “আমি পুনশ্চ বলিতেছি তোমার দুঃখ অবসাদ যতই প্রবল হউক না কেন, তোমাকে তাহা যতই পীড়া দিক না কেন তবু আমি তাহাকে তুচ্ছ বলিয়াই মানিব।”^৬

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আলোচনার সাপেক্ষে বলা যেতে পারে শিল্পকর্মে সৃজনশীলতার পাশাপাশি বিনোদনের আনুষঙ্গিক প্রসঙ্গ আমাদের স্মৃতির অগোচরে চলে আসে। নাটকের ক্ষেত্রেও তাই। নাটকের জনপ্রিয়তা প্রসঙ্গে যে বিষয় সর্বপ্রথমে বলা যেতে পারে তা হল, নাটককার নাটক রচনা করে থাকেন। এবং সেই নাটককে নান্দনিকভাবে পরিবেশন করে থাকেন নাট্য নির্দেশক, অভিনেতা, আলোকশিল্পী, সঙ্গীত পরিচালক, আবহ সঙ্গীত প্রক্ষেপক, রূপসজ্জা শিল্পী ও মঞ্চ পরিকল্পনাকারী শিল্পী প্রমুখ নেপথ্য মানুষ বা শিল্পীরশিল্পী অর্থাৎ সৃজনশীল ভাবনার স্পর্শ তাঁর কর্মকাণ্ডের সঙ্গে নির্লিপ্ত থাকবে ও নাট্য প্রযোজনার সঙ্গে জড়িত শিল্পকর্ম আনন্দ দান বিষয়ক একটা মাধ্যমরূপে পরিলক্ষিত হয়ে থাকে। অর্থাৎ “নাট্যের প্রয়োগ-রীতিকে সমাজের বিশেষ পর্যায় থেকে বিযুক্ত করে নিয়ে... সমাজের বস্তু-সঞ্চয়ের এবং প্রয়োগ-বিজ্ঞানের উন্নতির মাত্রা হিসাব না করে ব্যাখ্যা করা সম্ভব নয়।”^৭ এটিকে স্মরণে রেখে আমরা ‘ডাকঘর’ নাটকটির দিকে দৃষ্টিপাত করার চেষ্টা করব।

রবীন্দ্রনাথের মৃত্যুর পর তাঁর নাটকগুলিকে মঞ্চসফল য়াঁরা করেছেন তাঁরা হলেন বহুরূপী নাট্যগোষ্ঠী। বহুরূপীর প্রযোজিত রবীন্দ্রনাথ ঠাকুরের ‘ডাকঘর’ নাটক য়াঁরা চাম্বুস দেখেননি এবং জনপ্রিয়তার নিরিখে অন্যান্য নাট্যসংস্থার প্রযোজিত ‘ডাকঘর’ নাটক কালের নিয়মে যাদের দৃষ্টির অগোচরে থেকে গেছে তাঁদের কাছে প্রযোজনা সম্পর্কে জানবার একমাত্র অবলম্বন বিভিন্ন পত্র-পত্রিকা। সেখানে প্রকাশিত তথ্যের ভিত্তিতে আমাদের এই সম্যক আলোচনা। প্রসঙ্গ অনুসারে বলা যেতে পারে, তার জন্য ‘NATYA SHODH SANSTHAN, An Archive of Indian Theatre, Kolkata, সংস্থার ‘১১২’ সংখ্যক ফাইলের সহায়তা অনস্বীকার্য এবং তার থেকে প্রাপ্ত তথ্যের ভিত্তিতে বিষয়গুলোকে দেখবার চেষ্টা করা হয়েছে। ‘ডাকঘর’ নাটকে কোনও অঙ্ক সংখ্যা নেই, তার পরিবর্তে আছে ১, ২ করে বিভাগ।^৮ সুতরাং বলা যায় যে, অঙ্ক, দৃশ্য সংখ্যার উল্লেখ না থাকলেও মঞ্চ নাটকের সংলাপের মধ্যেই ঘটনার বর্ণনা ও উপস্থাপনা থাকতে পারে।

বহুরূপীর ‘ডাকঘর’ নাটকের মঞ্চায়ন নিয়ে আলোচনা করার আমরা যদি বিশ শতকে শেষের দিকে এবং একবিংশ শতাব্দীর দিকে তাকায় তাহলে দেখতে পাব অনেক নাট্যদল ‘ডাকঘর’ নাটকটি মঞ্চে উপস্থাপন করেছিলেন। ২০১২-তে ‘ডাকঘর শতবর্ষ’। উক্ত বছর ২৭-শে মে থেকে ২-রা জুন চৈতন্য লাইব্রেরিতে ‘ডাকঘর’ প্রযোজিত হয়। ৩১-শে মে থেকে ২-জুন প্রতিদিন পঞ্চজ মুন্সির নির্দেশনায় মিনার্ভা থিয়েটারে অভিনীত হয় বিডন স্ট্রিটের ‘শুভম’ নাট্যগোষ্ঠী প্রযোজিত ‘ডাকঘর’। এর সঙ্গে ছিল ঐ একই নাট্যগোষ্ঠীর তরফ থেকে শুভাশিস গঙ্গোপাধ্যায়ের নির্দেশনায় ‘যখন ডাকঘর আছে অমল নেই’ নাটকটি। এছাড়াও অনুষ্ঠানে ছিল সৃজনের ‘ডাকঘর’, আলোক রায়চৌধুরী ও শ্রাবণী সেনের ‘ডাকঘরের গান’, সুমিতা সামন্তর ‘রাজার

চিঠি' এবং শাঁওলী মিত্রের 'ডাকঘরের একক পাঠ'। বিশ শতকের আশির দশক থেকে বেশ কিছু নাট্যগোষ্ঠী এই নাটক মঞ্চস্থ করেন। চ.চ.১৯৮৭-র 'দেশ' পত্রিকার একটি বিজ্ঞপ্তি থেকে জানা যাচ্ছে 'সোপান' গোষ্ঠী 'ডাকঘর'-এর একটি অভিনয় করে সরোজ পালের নির্দেশনায়। নাটকটি সম্পর্কে 'Business Standard' ৫/১/১৯৯২ তারিখে এটিকে "পরিচ্ছন্ন প্রযোজনা" বলে ভূয়সী প্রশংসা করেন।

শিবপুর 'ভবিষ্যৎ' নাট্যদল আকাদেমি মঞ্চে ৩১/৫/১৯৮৭-তে অভিনয় করেন 'ডাকঘর'। এই নাট্য প্রযোজনা সম্পর্কে ভিন্ন মত শোনা যায়- "...সূচ্যরূ মঞ্চ-পরিষ্কল্পনা, আলোকসম্পাত এসবই ভবিষ্যতের ডাকঘরকে যতখানি মর্যাদাকর প্রযোজনা হিসেবে চিহ্নিত করেছে, তেমনি দইওয়লা বা প্রহরীর পাঠ ভুলে যাওয়া অথবা সুধাকে আদিবাসী নৃত্যের চওে নাচতে নাচতে মঞ্চে প্রবেশ করানো কিংবা শেষ দৃশ্যে মেলোড্রামাটিক বাংলা ছবির মতো অমলকে জড়িয়ে সুধার কান্না জড়িত সংলাপ ভবিষ্যতের 'ডাকঘর'-কে ততখানি সাদামাটা (কিছুটা বিরক্তিকর) প্রযোজনায় রূপান্তরিত করেছে।"^{১৯} নাট্যশোধ সংস্থার ১১২ সংখ্যক ফাইল থেকে জানা যায় যে, ১৯৮৭-র ১৬-ই মে 'ডাকঘর' মারাত্মি ভাষায় অভিনীত হয় নিউ দিল্লির কামানী অডিটোরিয়ামে। অনুবাদক অশোক সাহানী। শ্রীমতী সুলভা দেশপাণ্ডের নির্দেশনায় ও রামনাথ তরওয়ালের সহ-নির্দেশনায় নাটকটি মঞ্চস্থ হয়। কবির ৫০ বছরের মৃত্যুবার্ষিকীতে চ-ই আগষ্ট ১৯৯১-তে কলকাতায় একাদেমির সামনে কবির প্রতিমূর্তির পাদতলে 'ডাকঘর' নাটকের একটি অভিনয়ের খবর পাওয়া যাচ্ছে ১০/৮/১৯৯১-এর একটি রিপোর্ট থেকে। সেখানে উপস্থিত থেকে বক্তব্য রাখেন তৎকালীন উপরাষ্ট্রপতি শঙ্করদয়াল শর্মা, সাহিত্য আকাদেমির সম্পাদক ড. ইন্দ্রনাথ চৌধুরী এবং বিশ্বভারতীর ভাইস চ্যান্সেলর অল্লান দত্ত। 'স্বতন্ত্র ভারত' নামে লক্ষ্ণৌর একটি হিন্দি দৈনিক থেকে (১২/৫/২০০১) জানা যাচ্ছে যে, জনপ্রিয়তার কারণেই 'দ্য কৌসুর কোম্পানি' 'The Post Office' মঞ্চস্থ করে। এবং পরবর্তী একমাস অর্থাৎ ৩০ জুন পর্যন্ত নাটকটি প্রতি সপ্তাহে দু'বার মঞ্চস্থ করার ব্যবস্থা করা হয়। প্রাচ্য এবং পাশ্চাত্য উভয় সঙ্গীতের মিশ্রণও এই নাটকে ছিল বলে জানা যায়। নাটকটি ২০১৬ সালের ৩১-শে জুলাই তারিখেও 'রায় উমানাথ (বালী)' প্রেক্ষাগৃহে মঞ্চস্থ হয়। নির্দেশক ছিলেন অচলা বোস। সমগ্র ভারতব্যাপী 'ডাকঘর'-এর অভিনয় ছড়িয়ে পড়েছে। ২১শে ডিসেম্বর, ২০১১ তারিখে ডোগরি ভাষায় সুধীর মহাজনের 'ডাকঘর' অভিনীত হয় জম্মুর অভিনব থিয়েটারে। নির্দেশক রবীন্দ্র শর্মা। রবীন্দ্রনাথের সার্থশতবর্ষ উপলক্ষে অনুষ্ঠিত এই মঞ্চায়নে ছিল লৌকিকতার ছোঁয়া— Today's production, an adaptation in Dogri was conspicuous for bringing in native characters like Gujjar and folk songs to give it a local feel and context.^{২০}

'ঋত্বিক ভারত'-এর প্রযোজনায় এবং গৌতম রায়চৌধুরীর নির্দেশনায় ২০১১-র ১৫-ই ফেব্রুয়ারি জাতীয় নাট্যশালায় অভিনীত হয় 'ডাকঘর'। নাটকটি প্রসঙ্গে নির্দেশক লিখেছেন— "১৯০৫-এর বঙ্গভঙ্গের ব্যথায় কবিমন উদ্বেলিত ছিল তাই ১৯১৩-য় 'ডাকঘর'। মোড়ল কবিরাজেরা সেই রাষ্ট্রতন্ত্রের প্রতীক। বিশ্বপ্রকৃতি থেকে উঠে আসা দই-ওয়লা, অপরিসীমের মধ্যে থেকে ভালবাসার বাঁশীর ধ্বনি নিয়ে আসা মুক্তি পথের দূত প্রহরী... মধ্যসত্ত্বভোগী, দৃঢ়তাহীনের প্রতীক পিসেমশাই অমলকে ভালবাসে, কিন্তু রক্ষা করতে পারে না। অমলের মৃত্যু, মৃত্যু নয়। বদ্ধতা থেকে অসীমের সাথে মহামিলন..."^{২১} নির্দেশক গৌতম রায়চৌধুরী নাটকটিকে 'রক্তকরবী'র পর রবীন্দ্রনাথের 'দ্বিতীয় শ্রেষ্ঠ নাটক' বলেছেন। কল্পনা ও বাস্তবকে একসঙ্গে ধরতে গিয়ে তাকে যথেষ্ট বেগ পেতে হয়েছে।

তাহলে দেখা যাচ্ছে, নাটকের মধ্য দিয়ে নাট্যকার নিজেকে প্রকাশ করতে চায়। সেই সৃষ্টির ভেতরে যেমন তাঁর আনন্দ থাকে, তেমনভাবে বলা যায় যিনি নাটকটি নির্দেশনা দিচ্ছেন তাঁর থাকে ভাব প্রকাশের আনন্দ। আসলে তিনি তাঁর বক্তব্য উপভোক্তার সামনে উপস্থাপিত করবার চেষ্টা করে। সেই ভাবনা চিন্তা থেকে যখন কোনো নির্দেশক 'ডাকঘর' মঞ্চস্থ করেন, তখন দেখা যায় সেই প্রযোজনার নেপথ্যে তাঁর বা তাঁদের কোনো না কোনো উদ্দেশ্য থাকে। জনপ্রিয়তা সেই উদ্দেশ্যের একটা অবলম্বনমাত্র, কিন্তু সৃজনশিল্পের পূর্ণাঙ্গ মাপকাঠি নয়। 'ডাকঘর'-এর জনপ্রিয়তা যে কতদূর পর্যন্ত পৌঁছেছিল তার প্রমাণ পাওয়া যায় একটি সংবাদে এবং আরও জানা যায় সুশান্ত মণ্ডলের নির্দেশনায় বিশেষ ক্ষমতাসম্পন্ন differently abled children (WB) শিশুদের নিয়ে এই নাটকটি মঞ্চস্থ করা হয়। এগারোতম জাতীয় নাট্য উৎসবে National School of Drama-র উদ্বোধন অনুষ্ঠানে এটি মঞ্চস্থ হয়। পত্রিকায় লিখছেন— "Written by Tagore a century ago, the play directed by Sushanta Mondal saw the troupe of deaf and dumb children from Bodhir Bidya bHawan take to the stage last evening."^{২২} নাটক মঞ্চে উপস্থাপনা করার জন্য নাট্য নির্দেশকের পরিকল্পিত ভাবনা কাজ করে। তিনি যেকোনো একটি নাটকের মূল টেক্সট-কে নির্বাচন করেন, তারপর সেই টেক্সট বা পাঠ-কে অবলম্বন করে তাঁর

মনোজগতে নিজস্ব একটি পাঠ নির্মাণ করে। নাটক পাঠকের কথা ভেবে লেখা হলেও, তাকে মঞ্চে উপস্থাপন করার ভাবনা কোথাও যেন থেকে যায়। সাহিত্যগুণের পাশাপাশি নাটকের প্রয়োগের দিক সমানভাবে গুরুত্বপূর্ণ। এ বিষয়ে গুরুত্বপূর্ণ উপাদান নাটকের মঞ্চভাবনা। একটা স্থানের প্রয়োজন নাটক অভিনয়ের জন্য। মঞ্চে যে নাটক প্রয়োজিত হয়, তার নেপথ্যে উচ্চস্তরের চিন্তা ভাবনা কাজ করে- “play of argument অর্থাৎ একটা ভাবনাকে কেন্দ্র করে তর্ক... Play of argument হচ্ছে your examination in two sight- একটা বিষয়কে দুটো বিভিন্ন দৃষ্টিভঙ্গিতে দেখা”^{১০}

বহুরূপীর প্রযোজনা তৃপ্তি মিত্রের নির্দেশনায় ১৯৫৭-র ২৪-শে ফেব্রুয়ারি নিউ এম্পায়ার থিয়েটারে এর প্রথম অভিনয় ‘ডাকঘর’। ঠাকুরদার ভূমিকায় শম্ভু মিত্র এবং অমল চরিত্রে শাওলি মিত্র- “সেদিন নিউ এম্পায়ার মঞ্চে ‘বহুরূপী’র আরেক রূপ দেখা গেল রবীন্দ্রনাথের ‘ডাকঘর’-এ... অভিনয়, মঞ্চসজ্জা, আবহকল্পনা এবং সবকিছু মিলিয়ে নাট্যরূচির ক্ষেত্রে এঁরা স্বদেশে একটি নতুন মান স্থাপন করেছেন”^{১১} কিন্তু আশ্চর্যজনকভাবে রবীন্দ্রনাটক বহুরূপী তথা শম্ভু মিত্র ও তৃপ্তি মিত্রের প্রযোজনার কল্যাণে এক নতুন মাত্রা পেলে। জীবনের গভীরতা ও জটিলতা বোঝাবার জন্য রবীন্দ্রনাথ যে ধরণের নাটক রচনা করেছিলেন, তাকে নাট্য প্রযোজনায়, বাচনভঙ্গীর অভিনবত্বে বহুরূপী মঞ্চে উপস্থাপিত করেছিল। নাটকের গল্প বা কাহিনি মানুষের কাছে তুলে ধরার নিজস্ব একটা ছন্দ বা প্রক্রিয়া আছে। দর্শক যদি নাটকের প্রয়োগগত দিকের সঙ্গে নিজেকে একাত্মীকরণ করতে পারে, তবেই সেই নাটক জনপ্রিয় হয়ে উঠতে বাধ্য। কুমার রায়, তাপস সেন, খালেদ চৌধুরী সেই পদ্ধতিগত নাট্যচর্চার পথিকৃৎ ছিলেন। প্রথাগত ধারণার বাইরে গিয়ে রবীন্দ্রনাট্যের নবনির্মাণ করা সম্ভব শম্ভু মিত্র তার উজ্জ্বল পথিকৃৎ। বহুরূপী গণনাট্য সংঘ থেকে সরে এসে যখন প্রতিষ্ঠা লাভ করে তাদের আদর্শের জায়গা থেকে নাটক মঞ্চস্থ করে এবং তারা রবীন্দ্রনাথের নাটককে অভিনয় ও প্রযোজনা নিরিখে উচ্চমার্গে পৌঁছে দিয়েছিল। শম্ভু মিত্র ছিলেন তার অন্যতম পথিকৃৎ- “শম্ভুবাবু হচ্ছেন একজন অভিনেতা যিনি কণ্ঠস্বরের ওপর খুব বেশি ঝোঁক দিয়ে এসেছেন সারাজীবন। নির্মলেন্দু লাহিড়ির প্রচণ্ড প্রভাব পড়েছে তাঁর ওপর... শম্ভুবাবু একটা জিনিস করতে পারতেন যেটা ওঁর কাছ থেকে শিক্ষা করা উচিত... এই মাপা চমক। মাপা হবো লাগাম ছাড়া হবো না- এর শিক্ষক তো শম্ভু মিত্র”^{১২} নাটকের কাহিনি বা বক্তব্য দর্শককে কিভাবে গ্রহণ করতে সক্ষম তা তিনি আমাদের দেখিয়েছিলেন। বাহ্যিক বা আলগাভাবে অভিনয় করা যায় না, তার জন্য দরকার প্রস্তুতি। নাটকে সংলাপধর্মী ভাষা ও শৈলীগত বৈচিত্র্য গল্প-উপন্যাস-লিরিকধর্মিতা থেকে নাটককে স্বতন্ত্রতা দান করছে। ‘এক্সপ্লেনেশন’ তথা বিষয়ের ব্যাখ্যান, ‘ইলাস্ট্রেশন’ বা বর্ণনার বিশদীকরণ ও ‘ডায়ালগ’ বা নাটকে ব্যবহৃত সংলাপ আসলে সংস্করণের তাত্ত্বিক পার্থক্য গড়ে তোলে। যেমন, ‘ডাকঘর’ নাটকে—

মাধব দত্ত। কী পাগলের মতো কথা! কাজ নেই, কর্ম নেই, খামকা পাহাড়টা পার হ’য়ে চলে! যাই! কী যে বলে তা’র ঠিক নেই। পাহাড়টা যখন মস্ত বেড়ার মতো উঁচু হ’য়ে আছে তখন তো বুঝতে হবে ওটা পেরিয়ে যাওয়া বারণ—নইলে এত বড়ো বড়ো পাথর জড়ো ক’রে এত বড়ো একটা কাণ্ড করার দরকার কী ছিল?

অমলা। পিসেমশায়, তোমার কি মনে হয় ও বারণ ক’রছে? আমার ঠিক বোধ হয় পৃথিবীটা কথা কইতে পারে না, তাই অমনি ক’রে নীল আকাশে হাত তুলে ডাকচে! অনেক দূরের যারা ঘরের মধ্যে ব’সে থাকে তা’রাও দুপুরবেলা একলা জানলার ধারে ব’সে ঐ ডাক শুনতে পায়। পণ্ডিতরা বুকি শুনতে পায় না।

নাটকের সংলাপের মূল কাজ হচ্ছে ঘটনা ও চরিত্রের পরিচয়কে বহন করা। নাটকের ঘটনা উপস্থাপনার অন্তরালে কী কী ঘটছে তা পাঠক ও দর্শকদের জানানো দরকার হয়ে পড়ে। অমলও তার পিসেমশায়ের কথোপকথনের মধ্য দিয়ে অমলের ঘরের বাইরে যাওয়ার ইচ্ছা বা বাসনায় উপস্থাপিত হয়েছে। বিভিন্ন আলোচনা থেকে সে কথায় বারবার আমাদের সামনে হাজির হতে থাকে। এবং সেই সঙ্গে বলা যেতে পারে যে, নাটকের বিভিন্ন উপাদানগুলো সুনির্দিষ্ট নিয়ম রীতি মেনেই চলে এবং সেগুলোকে নান্দনিকভাবে উপস্থাপিত হচ্ছে কিনা সেটা একজন নাট্যনির্দেশকের ওপর বেশ কিছুটা নির্ভর করে। শম্ভু মিত্র সেই কাজটা সুচারুভাবে করতে পেরেছিলেন বলেই আমাদের ধারণা। ১৯৭৩-এ বহুরূপীর ২৫ বছর পূর্তিতে ‘ডাকঘর’ আবার মঞ্চস্থ হয়। কুমার রায় ঠাকুরদা চরিত্রে অভিনয় করেন। অমলের ভূমিকায় অভিনয় করেন চৈতি ঘোষাল।^{১৩} সুতরাং আলোচনার সূত্র ধরে বহুরূপীর ‘রবীন্দ্রনাটক’-এর জনপ্রিয়তা তথ্যানুসন্ধানের মধ্য দিয়ে দেখাবার চেষ্টা করছি। আমরা জানি স্বয়ং রবীন্দ্রনাথ নিজে এই নাটকটি প্রযোজনা করেছিলেন। বহু বছর পর

বহুরূপী তাদের নিজস্ব ভঙ্গিমায় সেই নাটককে সাধারণ দর্শকের কাছে পৌঁছে দিলেন ‘গিমিক’ অথবা জনপ্রিয়তার নিরিখে নয়, বলা যেতে পারে রবীন্দ্রনাটকের ভিন্ন সুর, ব্যাখ্যা এবং তাৎপর্যতার ব্যঞ্জনায়া। একটু লক্ষ করলেই দেখা যাবে, সমগ্র জীবন ধরে রবীন্দ্রনাথও ঠিক এই বোধেই পৌঁছেছেন। মৃত্যু আসলে তাঁর কাছে জীবনেরই আরেকটি প্রতিরূপ, যার কাছে পৌঁছতে হলে চাই দুঃখের সাধনা, বেদনার তপস্যা। যেখানে জীবনের ক্ষুদ্র স্বার্থ, ব্যক্তিগত ক্ষয় ক্ষতি বিলীন হয়ে যায়, আসে মুক্তি আর জীবন ভরে ওঠে নিত্য আনন্দের মধুর রসে। সেখানে পেয়ে হারানোর ভয় থাকে না। তাই শেষ পর্যন্ত রবীন্দ্রসৃষ্ট সাহিত্য এবং সেই সঙ্গে ‘ডাকঘর’ ও অমলও হয়ে ওঠে নিত্য প্রেমময়।

সমাজের সঙ্গে সাহিত্যের সম্পর্ক আছে বটে, কিন্তু ‘সাহিত্য সমাজের দর্পণ বিশেষ’ একথাকে একভাবে খণ্ডন করা যেতে পারে যে- সাহিত্যে সমাজের প্রতিফলন থাকবে এটা ঠিক, কিন্তু শুধুমাত্র সমাজেরই প্রতিচ্ছবি হবে এমনটা সাহিত্যে সম্ভবপর নয়। অর্থাৎ ‘শুধুমাত্র সমাজের প্রতিচ্ছবি’ এই পদগুচ্ছে আমাদের আপত্তি। কারণ, সাহিত্য জীবনেরও কথা বলে এবং ব্যক্তির জীবনের চালচিত্র ও লেখকের ব্যক্তিত্ব প্রকাশ পেয়ে থাকে। আমাদের চারপাশে যখন রাজনৈতিক দলাদলি, স্বার্থের জন্য হানাহানি কুক্ষিগত করতে চাওয়ার প্রবণতা ইত্যাদি চলে, তখনও প্রতিদিনের এই রক্তাক্ত বিচ্ছিন্নতা ও আবর্জনাকে সরিয়ে রাজকবিরাজের সেই সংলাপই সত্য হয়ে উঠতে চায়—“একী! চারিদিকে সমস্তই যে বন্ধ। খুলে দাও, খুলে দাও, যত দূর-জানালা আছে সব খুলে দাও।” তাই বর্তমান সময়ের প্রেক্ষিতে দর্শক বা পাঠক নিজের মত করে ‘ডাকঘর’কে চিনে নিতে পারেন। বিগত তিন-চার দশক ধরে একের পর এক ‘ডাকঘর’-এর ভাষান্তর হয়েছে। মঞ্চায়ন হয়েছে। নাট্যনির্দেশক তাঁর দৃষ্টিকোণ থেকে নাটকটির উপস্থাপনা করেছেন। উপরে উল্লিখিত অভিনয়গুলি ছাড়াও স্কুল-কলেজে ‘ডাকঘর’-এর অভিনয় হয়ে চলেছে। এটা বলা যায়, রবীন্দ্রনাথকে নতুন করে আবিষ্কারের যে শুভ সূচনা হয়েছিল, তার ধারাবাহিকতা আজও বজায় রেখেছে বাংলার নাট্যপ্রেমীরা।

তথ্যসূত্র:

- ১) বসন্তকুমার চট্টোপাধ্যায়(সম্পাদিত), জ্যোতিরিন্দ্রনাথের জীবনস্মৃতি, কলকাতা: প্রজ্ঞাভারতী, প্রথম সংস্করণ দীপাঙ্কিতা ১৩৮৯, পৃ. ৫৮
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Sustainability of Orchid *Rhynchostylis retusa* (L) Bl. through *in vitro* seed culture

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ABSTRACT

Rhynchostylis retusa considered as medicinal orchid is because of its properties since earliest times to cure diseases like fever, palsy, rheumatoid arthritis, skin allergies, and irregular menstruation. This species is identified as an endangered species and the inflorescence looks peculiarly like a foxtail. The initiation of germination and growth study was undertaken from the seed pod. The investigation recorded in three different nutrient media with different concentrations of α -Naphthalene acetic acid (NAA). Out of the three different media tested in the present research. The percent germination of seed varied in different media although all the basal media supplemented with the same growth regulators. This species revealed optimal growth of 92% in Orchimax medium within 126 days. In case of Knudson C medium 82% of seeds germinated and in Vacin & Went medium the percent of germination was 25%. The growth regulators added were 10% to 20% coconut water and 0.5 mg/L to 2mg/L NAA. The highest percent of germination was obtained when combined with 20% coconut water and 2mg/L NAA.

Keywords: Rhynchostylis, medicinal orchid, seed germination, vulnerable

Introduction

Orchids, perhaps the most threatened plants on the globe comprises a unique and distinctive group of plants. Taxonomically, one of the largest monocotyledons group of plants belonging to vastly evolved second largest family Orchidaceae with 750 genera and 18000 species (Heywood, 1993) or 788 genera and 18500 species (Mabberley, 1998) constituting second largest family of flowering plants in the world. Orchid species are found in almost all regions of the world but their greatest diversity occurs in the tropical and subtropical climate where positive factors for growth, thick vegetation and high humidity prevail. India accounts for nearly 7% of the world's orchid genetic diversity contributed 1300 species in 184 genera. Economically, orchids can be divided into two major categories, under one category most of the orchids are horticultural and floricultural plants that can spin cash in the international market, generate jobs and create an eco-friendly industry while medicinally important

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group of orchids having inherent therapeutic value constitute the second category and are used to cure many simple and complex diseases. Raj Bhandari & Bhattarai (2001) documented 53 species having medicinal value from north eastern region of India. The most significant use of orchid is ornamental because of their exquisitely attractive flowers or inflorescences remain fresh for longer period of time in comparison to other flowers. These qualities have made orchid growing a high profitable industry all over the world. So, orchids are cultivated in a large scale for cut flowers and potted plants. On the other hand, a large number of species bear attractive flowers and their capacity for inter specific as well as intergeneric breeding has generated tremendous possibilities producing hybrids or diverse floral characters. There are about 70 species of Indian orchids that have been used in breeding programs for producing hybrids in and outside the country.

Their vulnerability depends upon certain reasons like, specialized life cycle. The vegetative propagation and multiplication of orchids is very slow process and it takes a long duration. In case of vegetative propagation through separation of stem and pseudobulbs one may not get more than a few plants after 4-5 years. Moreover, the pollination of orchid flower depends on the pollinators. In the seeds of orchid, there is lack of reserve food material i.e., absence of endosperm, cotyledon etc. The seed germination of orchid is always dependent on the association of mycorrhizal fungi, in some cases they are species specific. Therefore, only less than 1% of seed germinate in their natural environment due to non-availability of specific fungi, so slow vegetative propagation through asexual method and the need of mycorrhizal fungi for seed germination make their life cycle more vulnerable. Owing to ornamental and therapeutic values which they possess has made them so sought.

The medicinal uses of *R. retusa* counted are as: paste of leaves and roots used for rheumatism. Leaf juice can be used in constipation, gastritis, acidity and as emollient. Decoction of root is used in menstrual pain, arthritis, palsy, cuts and wounds. Dry flowers are used as emetic (Panda and Mandal, 2013). The natural and wild habitats of *R. retusa* are being vanished due to its illegal international marketing and over exploitation. The plant is ferociously uprooted from forests and shows extreme demand to be maintained by tissue culture.

Material and Method: *Rhynchosylis retusa* (L.) Blume is a very less studied plant species among Orchidaceae that is kept under 'Endangered' category appendix II (with strictly controlled international trade) of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) by the Government of India due to its population decline in wild (Das et al 2013). It is native to India and Tropical Asia, and the state flower of Arunachal Pradesh. Besides, the plant has its distribution in other states of India like Andaman and Nicobar Islands, Chhattisgarh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal.

Morphologically the plant is a free-growing form and more robust in their habitat, short, stout, erect plant covered as epiphytic on trees in Sikkim, Darjeeling, Meghalaya and Nepal at elevations of 1000-1500 m. The sheaths of old leaves bear 3-5 pairs of thick fleshy, strap like leaves crowded on the upper part of the stem. Leaves arching was 15-45 cm long x 2.5-3 cm striated, unequally bilobed at the apex. Inflorescence was arching, 25-45 cm long, densely flowered. Each flower measures 18-20 mm across, white or light purple-pink marked and spotted purple. Flowering time is in between July – September.

The seed pod of *R. retusa* considered as the explant in this study has been collected from Sikkim (Latitude 27.20 N, Longitude 88.40). The seeds are minute and exhibit very poor level of differentiation. The development of the embryo is suppressed as such that the embryo is arrested at a bulbous stage. In spite of being insubstantial embryo, they can germinate in nature if infected with a suitable fungus (Bernard, 1904). However, the germination can bypass the fungal requirement by supplying an appropriate sugar rich nutrient medium *in vitro* (Knudson, 1925). Significantly, the orchid ovules are also capable of development *in vitro*.

The present investigation deals with initiation of germination and developmental biology from the seed pod where the seeds are unique and poorly developed even on maturity. As seeds of *R. retusa* orchids are minute, fragile, undifferentiated, it is considered worthwhile to study *in vitro* germination of immature seeds from green capsule in different media. Presence of charcoal in the medium has shown significant result.

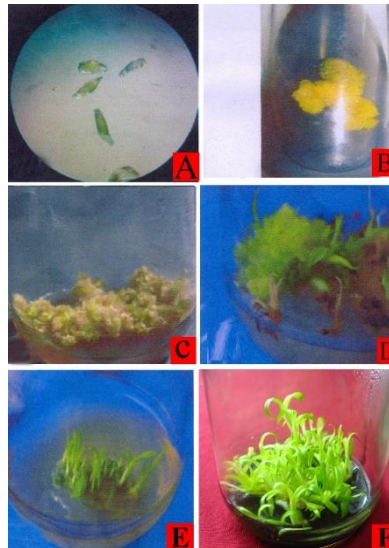
The media preparation is required immediately after the collection of the explant, and that requires very careful and systematic steps. Three different media, i.e., Orchimax, Knudson and Vacin & Went were prepared as the following steps:

1. The required amount of the desired media was dissolved in little amount of the distilled water, dissolved properly and carefully.
2. All the additives and desired hormones were incorporated carefully and slowly.
3. The volume was made up to the required total volume by the addition of distilled water.
4. pH was adjusted prior to autoclave as 5.00. If the pH of the media indicates below 5.00, it was balanced with the help of few drops of 1(N) NaOH and if it exceeds 5.00, then was balanced with few drops of 1(N) HCl.
5. To solidify the medium required amount of agar-agar powder (8gms/L) was added and brought to boil with continuous stirring so as to avoid the formation of lumps in the medium.
6. The proper amount of the medium was dispensed in the culture tubes, vessels and Erlenmeyer flasks.

7. Tubes, flasks and vessels were adequately capped and covered with the help of brown paper and rubber bands.
8. The prepared culture medium was sterilized under high temperature and pressure in an autoclave maintaining the pressure at 121°C and 15 lb psi for 15 minutes.
9. After sterilization, they were taken out from the autoclave, cooled at room temperature and kept at the working table of laminar air flow and further sterilized by spraying 70% ethanol.

The pod was first cleaned thoroughly with the help of a soft brush, scraping slowly and washing under running tap water followed by submerging with 5% Tween 20 (liquid detergent) for 10 minutes and subsequently rinsed with distilled water until the froth is totally washed away. Further, the pod was taken to the laminar air flow and on that table once again it was surface sterilized by freshly prepared 0.1% mercuric chloride solution for 15 minutes with occasional agitation and was subsequently rinsed three times with autoclaved distilled water. Further, after surface sterilization, when the explant was ready for the inoculation, it was taken in a sterile petri dish containing filter paper to soak the surface water of the pod or capsule. The capsules were cut longitudinally with the help of sterilized surgical blade and forceps. Mass of tiny seeds were inoculated on the slant surface of the prepared media in the culture tubes. The seeds are placed on a solid medium establishing a good contact between them and the medium with even distribution. The seeds are not totally buried in the agar solidified medium in order to prevent death from improper gas exchange. After inoculation of the seeds, the culture tubes were kept at $22 \pm 1^\circ\text{C}$ under 16 hours photoperiod from cool white light giving 2659 lux.

Result and Discussion: The seeds (Fig. A) were inoculated in three different nutrient media, Orchimax, Knudson 'C', and Vacin & Went. The media was added with the growth regulators 10-20% coconut water and three different concentrations of NAA (Table 1). The seeds started swelling after 21 days in Orchimax media, after 49 days turned into globular PLBs (Fig. B) followed by spherule stage rather known as plantlets (Fig. C) and after 126 days the seeds germinated into plantlet (Fig. D). Orchimax media combined with 2mg/L NAA and 20% coconut water was found to be the best for seed germination *in vitro*. Results of the growth and plantlet formation have been described in Table 1. The healthy plantlets (Fig. E&F) when attained the height of 5.5 cm were taken for hardening.



Different stages of seed culture and micropropagation of *Rhynchosyilis retusa*;
 A: Seeds of *R.retusa*; B: PLBs of *R.retusa*; C & D: PLBs producing plantlets of *R.retusa*; E & F: regenerated plantlets of *R.retusa*.

Table 1: No. of days taken for swelling of embryo, spherule stage, PLB and plantlet formation and percent of germination of *R. retusa* in Orchimax, Knudson “C” and Vacin & Went medium.

Media	Growth regulators	Number of days for the formation of				Percent germination
		Swelling of embryo	Spherule stage	PLB stage	Plantlets	
Orchimax	0.5mg/L NAA +10%CW	28	63	84	229	50%
	0.5mg/L NAA +20%CW	28	56	77	217	50%
	1.0 mg/L NAA +10%CW	28	60	84	203	59%
	1.0mg/L NAA +20%CW	28	56	82	210	60%
	2.0mg/L NAA +10%CW	28	63	79	196	78%
	2.0mg/L NAA +20%CW	21	35	49	126	92%
	0.5mg/L NAA +10%CW	63	87	94	269	55%
	0.5mg/L NAA +20%CW	63	77	98	252	55%

Knudson "C"	1.0 mg/L NAA +10%CW	49	77	91	245	59%
	1.0mg/L NAA +20%CW	49	70	84	245	61%
	2.0mg/L NAA +10%CW	49	70	77	154	80%
	2.0mg/L NAA +20%CW	49	63	66	140	82%
Vacin & Went	0.5mg/L NAA +10%CW	No sign of germination				
	0.5mg/L NAA +20%CW	No sign of germination				
	1.0 mg/L NAA +10%CW	63	84	No growth	No growth	0%
	1.0mg/L NAA +20%CW	63	84	No growth	No growth	0%
	2.0mg/L NAA +10%CW	49	91	126	No growth	0%
	2.0mg/L NAA +20%CW	42	91	119	280	25%

NAA = α -Naphthalene acetic acid; CW= coconut water.

Conclusion: The output of the present study showed evidently that Orchimax medium was best among the three different media tested. Since primitive, orchids have been used as traditional herbal drugs. With the advancement of human civilization and exploration of orchid's world over for medicinal, ornamental and scientific purposes, the actual depletion of orchid began from there. Therefore, other than economic consideration it is better to protect and conserve them for generation after generation before they reach the point of extinction.

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High-Temperature Superconductors: An Experimental Review

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ABSTRACT

High-temperature superconductors (HTS) have made significant technical advancements possible by permitting the creation of strong magnets and the efficient transfer of energy. Of these, ceramic copper oxide materials, or cuprates, have become leading candidates because of their exceptional high-temperature superconductivity. An overview of current developments in HTS is given in this abstract, with an emphasis on ceramic copper oxide materials and other high-temperature materials. A thorough summary of recent developments in the field of high-temperature superconductors is given in this experimental review, which also highlights experimental methods and conclusions pertinent to ceramic copper oxide materials and other high-temperature compounds. With implications for a wide range of technological applications, this study seeks to provide important insights into the state-of-the-art and future directions for experimental research in HTS by synthesizing and interpreting experimental data.

Introduction

The advancement of high-temperature superconductors (HTS) and the deciphering of its enigmas are largely dependent on experimental research. The characteristics and behaviors of different HTS materials have been the subject of much investigation by researchers over the past few decades, with an emphasis on ceramic copper oxide compounds also referred to as cuprates and other intriguing possibilities. This short introduction lays the groundwork for a review of recent developments in HTS experiments, highlighting the strides made in our understanding of the special properties and possible uses of materials such as ceramic copper oxide.

Superconductivity at high temperatures has been found in ceramic copper oxide materials ($\text{YBa}_2\text{Cu}_3\text{O}_7$, $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$); this finding represents a major breakthrough in condensed matter physics and materials research. Cuprate superconductors have been the focus of extensive experimental investigation since their discovery in the late 1980s, with the goal of understanding the mechanisms underlying their high-temperature superconductivity. The intricate interaction of electronic, magnetic, and lattice properties in cuprate materials has been uncovered through the use of experimental methods that span from structural characterization and spectroscopy to transport studies.

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New experimental research has shed important light on the nature of the pseudogap events, the nature of the superconducting phase transition, and how doping and disorder affect the electrical characteristics of cuprate superconductors. Additionally, improvements in synthesis and fabrication methods have made it possible to create high-quality cuprate samples with carefully regulated compositions and structures, which has made it easier to conduct in-depth analyses into the basic characteristics and possible uses of these materials.

Experimental research has concentrated on investigating other high-temperature superconductors, such as iron-based superconductors (FeSCs) and magnesium diboride (MgB₂), in addition to ceramic copper oxide materials. Experimental research on FeSCs has uncovered fascinating phenomena like non-traditional pairing mechanisms and the interaction between magnetism and superconductivity, while studies on MgB₂ have emphasized the material's exceptional performance at high magnetic fields and usefulness.

The significance of experimental research in expanding our knowledge of high-temperature superconductors, such as ceramic copper oxide and other materials, is emphasized in this introduction. Through the synthesis and analysis of experimental data, scientists hope to clarify the basic principles guiding superconductivity at high temperatures and to utilize the special qualities of HTS materials for revolutionary applications in technology. A thorough summary of recent experimental developments in this dynamic, multidisciplinary subject will be given in the upcoming review, which will also provide insights into the state-of-the-art and future directions of HTS research and development.

Structure and phase diagram of cuprates: The class of superconductors known as cuprates has the highest known critical temperature for bulk materials. These are ceramic compounds with a layered crystallographic structure made up of buffer layers of electrically inert oxide between layers of copper oxide. Two well-researched cuprate compounds are yttrium barium copper oxide (YBCO) and bismuth strontium calcium copper oxide (BSCCO). Currently, only a small number of high-temperature superconductors are employed in industrial settings. These compounds can be used to create long, flexible wires, despite their brittle ceramic characteristics. Applications include tiny electric motors, transformers, generators, high-field electromagnets, zero-loss transmission lines, and fault current limiters to safeguard electrical networks.

The high-T_c cuprates are essentially tetragonal in nature, and they all contain one or more quasi-two-dimensional CuO₂ planes that are divided by other atoms (Ba, O, La, etc.). It is commonly acknowledged that all high-T_c cuprates appear to share two characteristics:

1. In their undoped regime, the cuprates are antiferromagnetic insulators, which are rapidly destroyed on doping and the superconducting phase emerges.

2. The dominant physical processes (charge transport, antiferromagnetic exchange, etc.) that participate in the formation of the superconducting phase are thought to be confined to the CuO₂ planes, while the out-of-plane atoms (e.g., Ba, O, La, etc.) serve only as charge reservoirs.

Additionally, it appears that the number of adjacent CuO₂ planes and the ideal value of the critical temperature are correlated. For example, Tl₂Ca₂Ba₂Cu₃O₁₀ (T_c=125K) has three adjacent CuO₂ planes, whereas La_{1.85}Sr_{0.15}CuO₄ (T_c=39K) has one.

The general phase diagrams and structures of a few high-T_c superconducting compounds are now briefly discussed.

La_{2-x}Sr_xCuO₄: High-temperature superconductor material La_{2-x}Sr_xCuO₄, also referred to as LSCO, is composed of these constituents. It is renowned for having the unmatched capacity to conduct electricity at temperatures much greater than those of conventional superconductors. The quantity of strontium (Sr) used in place of lanthanum (La) in the formula is denoted by "x," which can be changed to change the material's characteristics. Atomic layer-by-layer molecular beam epitaxy (ALL-MBE), for example, is a sophisticated technology that may be used to build LSCO films and produce single-crystal films with atomically smooth surfaces and interfaces. These films are essential for many applications of high-temperature superconductors (HTS), such as electrical devices such as nanowires and tunnel junctions. In conclusion, La_{2-x}Sr_xCuO₄ is an essential substance for the investigation and practical application of high-temperature superconductivity, and the synthesis of this material is a vital component of current research in the area.

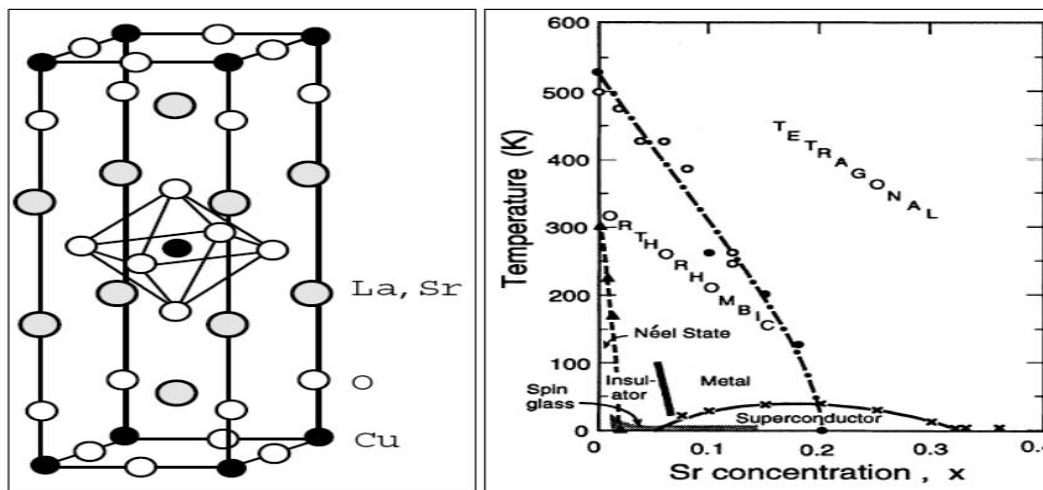


Figure 1.1: (a) Crystal structure of La_{2-x}Sr_xCuO₄ [1] (b) Phase diagram of La_{2-x}Sr_xCuO₄ [2]

La₂CuO₄, a Mott insulator, is the parent compound of the first high-T_c superconductor ever found [3]. The CuO₂ planes are spaced roughly 6.6 Å apart, with the charge reservoir formed by two LaO planes in between. Now, doping (replacing La³⁺ with Sr²⁺) adds less electrons to the CuO₂ planes; this shortfall is met by electrons from oxygen ions, which change their configuration from O²⁻ to O⁻, forming a single hole in the p shell. The two LaO planes, which make up the charge reservoir, absorb electrons from the

CuO₂ planes. Low temperatures are the site of a superconducting phase for Sr-doping between $x \sim 0.05$ and ~ 0.30 . At the "optimal" doping level of $x \sim 0.15$, the greatest value of T_c is observed. These compounds also exhibit a structural phase transition, as seen in Fig. 1.1 (b). Tetragonal structures are found at high temperatures, while orthorhombic structures are found at low temperatures.

YBa₂Cu₃O_{6+x}: A class of crystalline chemical compounds known as yttrium barium copper oxide (YBCO) demonstrates high-temperature superconductivity. It contains the first known material to reach superconductivity above liquid nitrogen's boiling point (77 K, or -196.2 °C). YBa₂Cu₃O_{7-x} (Y123) is the generic formula for many YBCO compounds. However, there are materials with different Y:Ba:Cu ratios, such as YBa₂Cu₄O₇ (Y124) or Y₂Ba₄Cu₇O₇ (Y247). YBCO belongs to the broader class of rare-earth barium copper oxides (ReBCO), in which yttrium is absent and other rare earth are present. Georg Bednorz and Karl Müller were awarded the 1987 Nobel Prize in Physics as a result of their discovery of YBCO's superconducting qualities. For YBCO, the critical temperature (T_c) is roughly 93 K.

Two two-dimensional CuO₂ layers make up the unit cell of YBCO, whose crystal structure is derived from the perovskite structure. The compound's oxygen content, shown by the value of x , has an impact on the superconducting qualities. Because of its exceptional superconducting qualities and possible uses in a variety of industries, YBCO has been the subject of extensive research.

There are two CuO₂ planes per unit cell in YBa₂Cu₃O_{6+x} (YBCO), spaced about 3.2 Å apart and divided by yttrium ions [4]. Fig. 2.2(a) depicts this compound's tetragonal structure. An oxygen, copper, and barium atom-filled charge reservoir divides the nearby CuO₂ planes. These conducting planes are spaced around 8.2 Å apart from one another in pairs.

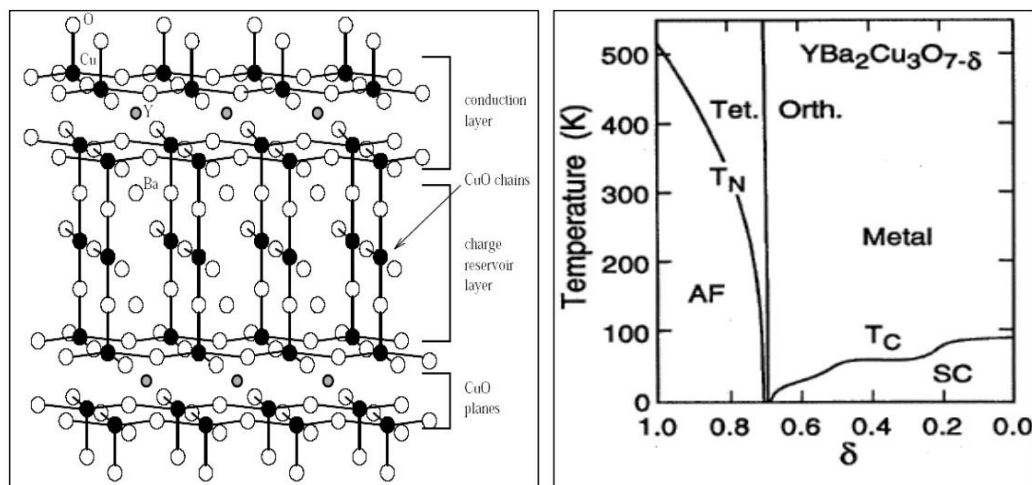


Figure 2.2(a) Crystal structure of YBa₂Cu₃O_{6+x} [5]. (b) Phase diagram of YBa₂Cu₃O_{6+x} [6]. Here $\delta = 1 - x$

x

The phase diagram of YBCO is displayed in Fig. 2.2(b). An antiferromagnetic phase is observed with a Neel temperature greater than 500K when x is close to zero. Superconducting phase

begins to form at doping level $x \sim 0.3$ ($\delta \sim 0.7$ in the figure notation), where antiferromagnetic order vanishes. For this chemical, the best doping level with the highest T_c is attained at $x \approx 0.92$. At $x \sim 0.3$, there is also a structural phase transition from a tetragonal to an orthorhombic phase.

Hg family: A class of intricate cuprate superconductors with different numbers of CuO_2 layers is known as the Hg family. Let's examine some salient features of this family:

- **Composition:** Compounds containing mercury (Hg) are part of the Hg family, which also include elements like bismuth (Bi) and thallium (Tl).
- **Critical Temperature (T_c):** The highest proven critical temperature (Hg1223) is found in the three-layered mercury complex $\text{HgBa}_2\text{Ca}_2\text{Cu}_3\text{O}_{8+\delta}$, which is commonly referred to as Hg1223. Its T_c is roughly 135 K.
- **Layer Structure:** The various members of the Hg family have different layer structures.

For instance, HG1223: There are three CuO_2 layers in this molecule. Within its name, the indexes stand for HgO plane count is the first index. The second index is the distance between BaO layers. Third index: The number of layers that separate the Ca atoms. CuO_2 layer count is the final index. The one, two and three layer members of the Hg family are shown in Fig. 3.

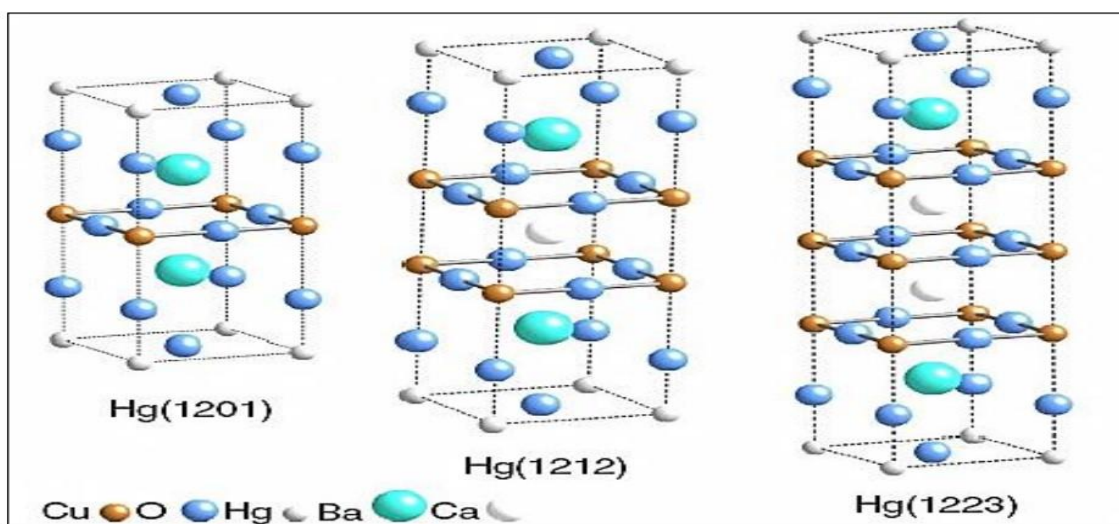


Figure 3. The CuO_2 layer is moreover the essential component of the Hg-cuprate superconductors. The 1223 structure on the right has no apex oxygen ions; ideally doped T_c is 94K Hg (1201), 127 K Hg (1212), and 135 K Hg (1223). The 1201 structure on the left has apical Os above and below the Cu sites. [7]

$\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_4$: While hole-doped compounds make up the majority of high- T_c superconductors, a tiny percentage can also be doped with electrons. The majority of materials in this class have the chemical

formula $R_{2-x}M_xCuO_4$, where M is Ce or Th and the lanthanide rare-earth (R) substitution is Pr, Nd, Sm, or Eu, in addition to the most often studied compound $Nd_{2-x}Ce_xCuO_4$ (NCCO) [8]. The joint phase diagram of the LSCO/NCCO material systems is displayed in Figure 4(b). The electron-doped side of NCCO has been reported to exhibit maximum Neel temperatures of 270 K [9]. The phase diagram makes it clear that superconductivity is a comparatively "small" effect in comparison to antiferromagnetism. Near $x = 0.15$, the "optimal doping" is discovered. Furthermore, there is currently no proof that the electron-doped substances have a spin-glass phase.

Other kinds of high-Tc superconductors, such as iron-based superconductors (iron pnictides and chalcogenides), organic superconductors, and hybrid materials, are also being studied in addition to ceramic copper oxides. These materials have special qualities and may have uses in the future; experimental research is being done to better understand these qualities and create new compounds with improved superconducting behavior.

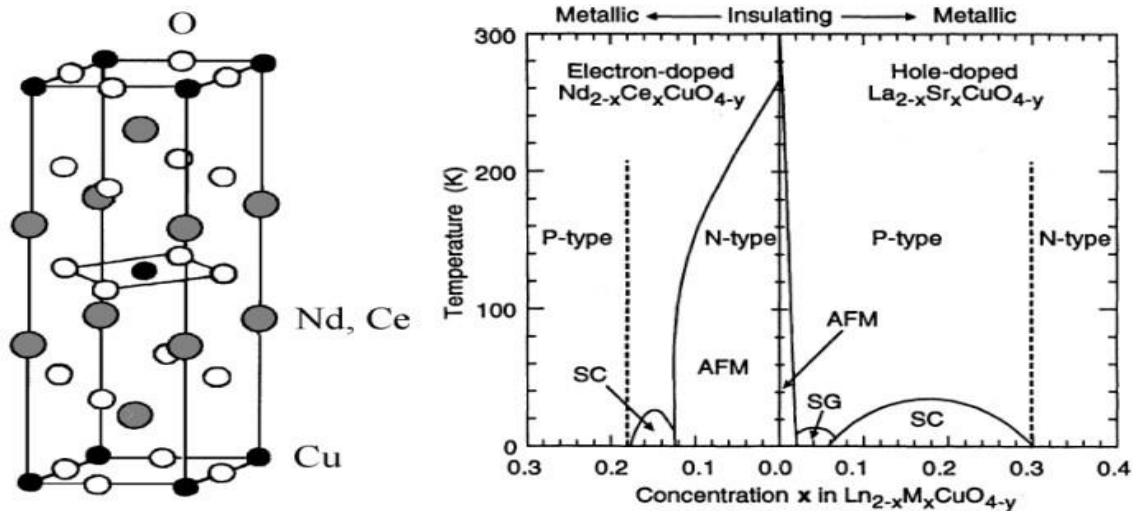


Figure 4(a) $Nd_{2-x}Ce_xCuO_4$ crystal structure [1] (b) For a more accurate comparison, the phase diagrams of $Nd_{2-x}Ce_xCuO_4$ and $La_{2-x}Sr_xCuO_4$ combined are shown [1].

Properties of High Tc Cuprates: We now discuss the experimental aspects of non-conventional superconductors, with special attention to non-conventional superconducting materials such as Yttrium Barium Copper Oxide (YBCO) and Lanthanum Strontium Copper Oxide (LSCO). The sections that follow examine these experimental aspects.

Table 1. Superconducting temperature, crystal structure and lattice constants of some cuprate superconductors [32, 33, 34, 35] are given below in table no. 01:

Name	Formula	Temperature(K)	Number of planes of CuO ₂ in unit cell	Crystal structure
Bi-2201	Bi ₂ Sr ₂ CuO ₆	20	1	Tetragonal
Tl-2201	Tl ₂ Ba ₂ CuO ₆	80	1	Tetragonal
Bi-2212	Bi ₂ Sr ₂ CaCu ₂ O ₈	85	2	Tetragonal
Y-123	YBa ₂ Cu ₃ O ₇	92	2	Orthorhombic
Hg-1201	HgBa ₂ CuO ₄	94	1	Tetragonal
Tl-2212	Tl ₂ Ba ₂ CaCu ₂ O ₈	108	2	Tetragonal
Bi-2223	Bi ₂ Sr ₂ Ca ₂ Cu ₃ O ₁₀	110	3	Tetragonal
Tl-1234	TlBa ₂ Ca ₃ Cu ₄ O ₁₁	122	4	Tetragonal
Tl-2223	Tl ₂ Ba ₂ Ca ₂ Cu ₃ O ₁₀	125	3	Tetragonal
Hg-1212	HgBa ₂ CaCu ₂ O ₆	128	2	Tetragonal
Hg-1223	HgBa ₂ Ca ₂ Cu ₃ O ₈	134	3	Tetragonal

Antiferromagnetism and Superconductivity: One of the intriguing aspects of high-T_c cuprates close to $\delta=0$ is the interaction between $d_{x^2-y^2}$ wave superconductivity and antiferromagnetism. The coexistence of d-superconductivity and antiferromagnetism has been demonstrated by the combination of transport research and tunneling and photoemission studies [10]. Neutron scattering tests conducted in YBa₂Cu₃O_{6.5} [11] and LSCO ($\delta = 0.10 - 0.15$) [12] have demonstrated an incommensurate AF peak, suggesting the co-existence of superconductivity and antiferromagnetism at low temperatures. Staggered magnetism induced on Cu sites surrounding non-magnetic Zn impurities is revealed by an NMR measurement of YBa₂Cu₃O_{6.7} [13]. It is possible that the Zn-induced moment seen in the bulk susceptibility tests is the result of this staggered magnetization. Additionally, NMR studies [14] conducted on a five-layered HgBa₂Ca₄Cu₅O_{12+ δ} (Hg-1245) indicate that the inner layer's electrons exhibit a phase diagram similar to Fig. 5, where co-existence has been noted at a specific doping region. The Scanning Tunnel Spectroscopy (STS) studies conducted under magnetic fields on YBa₂Cu₃O_{7-x} [15] and BSSCO [16] reveal the non-conventional local density of states (DOS) inside the vortex core together with modest double peak structure near the Fermi energy. Conversely, the traditional Bogoliubov-de Gennes mean field theory [17] anticipated the DOS at the vortex core, which has a big peak around the Fermi energy (zero-energy peak). The AF correlations within the vortex could be the

source of these unusual electronic states. There are other phases incommensurate to SDW striped phases that compete and interact with the superconducting phases, in addition to the ordered antiferromagnetic (Néel) phase. Strong amplification of spin-stripe order at low energies caused by small magnetic fields is revealed by neutron scattering tests on LSCO [18].

Combining tunnelling and photo emission observations with transport studies on LSCO has shown the co-existence of 2D d-wave superconducting correlations with π -phase shifted antiferromagnetic stripes at low temperatures below 40K [19]. Resonant inelastic X-ray scattering measurements conducted recently [20] on $\text{YBa}_2\text{Cu}_4\text{O}_8$, $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$, and $\text{Nd}_{1.2}\text{Ba}_{1.8}\text{Cu}_3\text{O}_{6+x}$ plainly demonstrate the presence of dispersive, damped magnetic excitations with substantial spectral weight in the proper spectral range to cause pairing.

The decrease in T_c value is readily explained by the absence of the spin-fluctuation pairing glue, which is interpreted by the suppression of magnetic spectral weight near the antiferromagnetic wave vectors revealed by inelastic neutron scattering data [21]. Strong electron correlations are expected to exist even in heavily overdoped copper oxides, as suggested by recent resonant inelastic X-ray scattering results that show noticeable spin variations at reduced wave vectors [22, 23]. The superconducting pair-breaking peak of somewhat underdoped Hg-1223 is linked to a drop on its higher-energy side, and they both vanish at T_c , according to a Raman Scattering investigation of the material. A novel pairing process is revealed by this result: at lower energies, the pair-breaking peak gains the spectral weight that was lost in the drop [24].

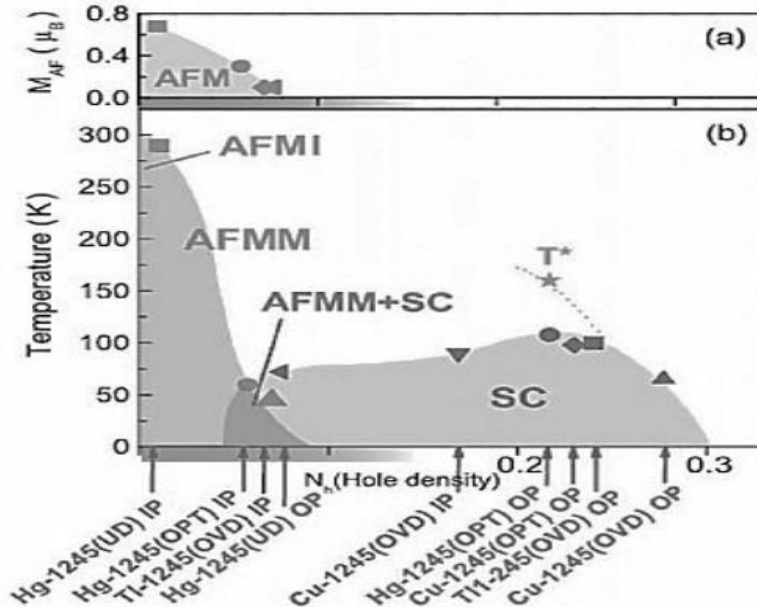


Figure 5(a) shows the phase diagram produced by analyzing NMR data collected in the inner plane (IP) and outer plane (OP) for different five-layered high- T_c superconductors. (b) Shows the staggered magnetic moment as a function of hole density. Here, AF metal, AF insulator, and superconductivity are denoted by the symbols AFMM, SC, and AFMI, respectively. For Hg-1245 (optimal doping), a drop in $1/T_1T$ at the outer plane yields a pseudo-gap temperature known as T^* [14].

Pseudo gap: The NMR experiments' temperature-dependent relaxation rate (Fig. 6) reveals a gradual but pronounced reduction of T_1^{-1} below T^* , confirming the gapped behaviors [25]. "Spin gap" is the term used to describe this gapped phenomenon. Numerous other physical parameters, including optical conductivity [26] and Hall coefficient [27], have been found to exhibit similar gap phenomena. The ARPES experiments directly detected the presence of the energy gap in electronic spectra at T_c [28,29]. As illustrated in Fig. 7 [29,30], this gap, which is basically observed below T^* , has the same angular dependences in the Brillouin zone as that in the superconducting state, that is, in the dx^2-y^2 -wave gap. The gap has been referred to as a "pseudo-gap" following these single particle spectra measurements, which contrast with scanning magnetic excitations using NMR. There is a 'Fermi arc,' which is defined as a segment of a Fermi surface with finite quasiparticles that peaks above T_c and diminishes to a point as T approaches zero [31]. This argument has been made up recently. Similar to the $d_{x^2-y^2}$ state, this implies that the pseudogap state at $T=0$ is a nodal liquid with gapless excitations only present at locations close to $(\pi/2, \pi/2)$.

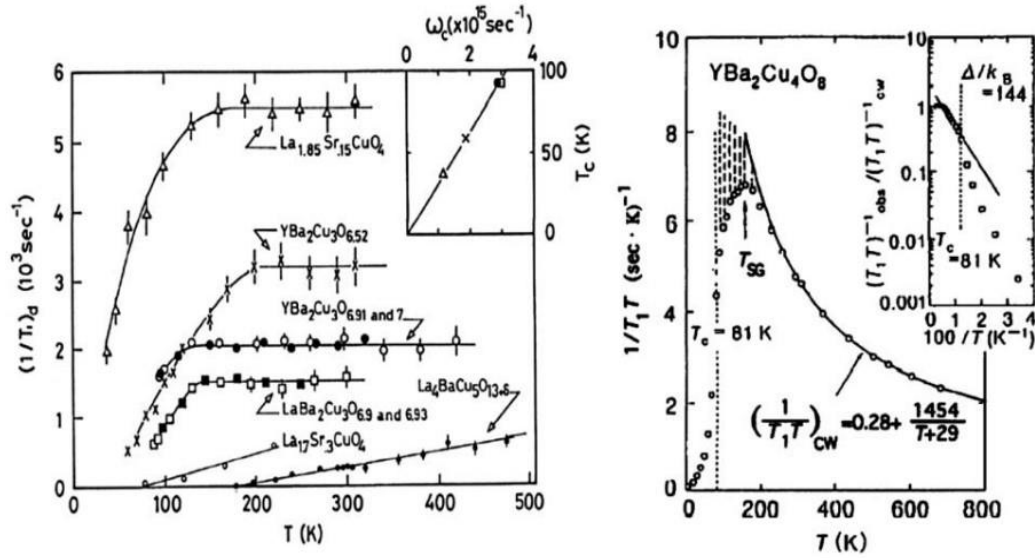


Figure 6(a). Temperature dependence of the Cu d-spin contribution to the relaxation rate, $(1/T_1)d$, for a number of high- T_c compounds. (b) $\text{YBa}_2\text{Cu}_4\text{O}_8$ temperature dependence of $(1/T_1)T$. This figure's spin-gap temperature, T_{SG} , is now referred to as the "pseudogap temperature," or T^* [25]

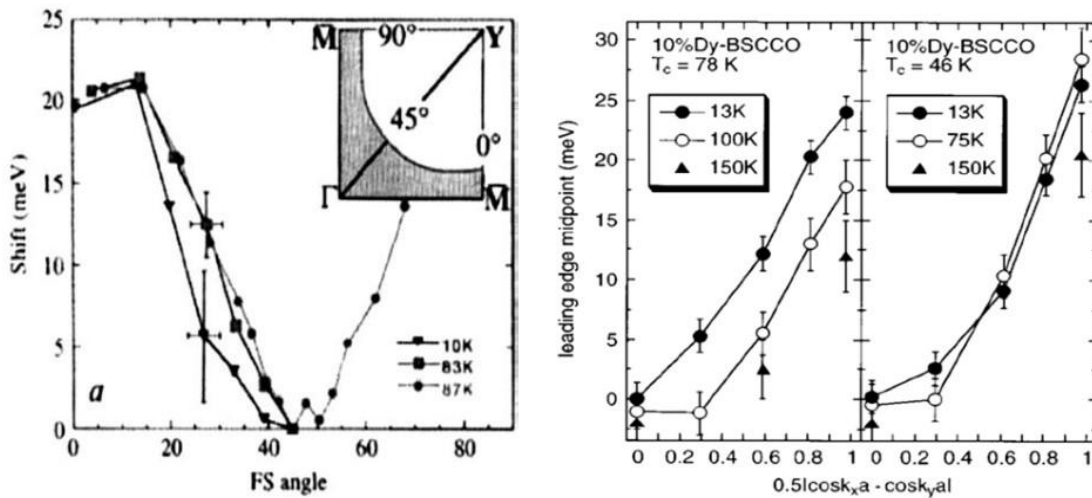


Figure 7 The momentum dependences of leading edge shifts are displayed in Figure 7 ARPES data for Fermi energy. Measured (a) in $T=14 \text{ K}$ in $T_c=87, 83, \text{ and } 10 \text{ K}$ samples of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ [29] and (b) in $\text{Bi}_2\text{Sr}_2\text{Ca}_{1-x}\text{Dy}_x\text{Cu}_2\text{O}_{8+\delta}$ superconducting and normal states [30]. For contrast, the abscissa in (b), $0.5|\cos k_x a - \cos k_y a|$, was chosen with a dx^2-y^2 wave gap, which would appear as a straight line on this map.

This is a summary of the significant experimental findings found in sections 2.1. And 2.2. Initially, doped Mott insulators comprise the HTSC materials. Second, in the low temperature zone, superconductivity and antiferromagnetism interact strongly. In the superconducting phase, the

impurities or vortices appear to cause AF local correlation. Thirdly, T_{onset} and T^* ($T_{\text{onset}} < T^*$) are the two distinctive temperatures above T_c . There is a pseudogap in the under-doped area of the quasiparticles spectrum in the temperature range $T_c < T < T^*$. A gapped behavior for spin excitations is seen in this region, suggesting the creation of singlet pairs in spin degrees of freedom. The gapped behaviors of the electronic energy spectrum are comparable to those of $d_{x^2-y^2}$ wave superconductivity.

Conclusion: Experimental research on ceramic copper oxide and other high- T_c materials continues to drive advancements in our understanding of superconductivity and pave the way for exciting new applications in technology and fundamental science. In order to generate unique hybrid structures with advanced functionalities and emergent features, researchers are examining the integration of HTS materials with other functional materials systems, such as ferroelectrics, multiferroics, and topological insulators. The goal of experimental research is to create useful applications for high-temperature superconductivity (HTS) materials in a variety of domains, including as quantum computers, magnetic resonance imaging (MRI), particle accelerators, and power generation and transmission. In order to create high-temperature superconducting (HTS) devices with enhanced performance and dependability, fabrication processes such thin-film deposition, nanostructuring, and patterning are being refined.

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Nationalism beyond the nation: M.P.T. Acharya, anti-colonialism and the language of libertarianism

Saptadeepa Banerjee¹

ABSTRACT

The history of Indian Nationalism is usually read and understood in the context of India's struggle for freedom from colonial rule, organised within the geographical confines of the country in the nineteenth and twentieth century's. Consequently, the study of the history of India's anti-colonial struggle is often restricted to major political, socio-economic and cultural settings within colonial India, that constituted the broader context in which the nationalist movement took off. Some recent works, however, involve a study of the dynamics of Indian nationalism through the eyes of Indian nationalists who did not always function within the physical domain of colonial India, but played a fundamental role in bringing India's struggle for freedom within the broader ambit of international anti-colonialism. These recent dimensions have facilitated a more comprehensive and holistic understanding of the trajectories of development of Indian Nationalism beyond the Congress led National Movement for independence from colonial rule on the one hand, and the peripheral spontaneous popular movements, on the other. Such histories have become essentially important in understanding the global 'reach' of anti-colonial struggles that got intertwined with the larger question of 'resistance and freedom from oppression' through the practice of anarchism – a 'global phenomenon'.

In this regard, this paper would seek to take a look the Indian nationalist, revolutionary, anarchist and libertarian socialist, Mandayam Prativadi Bhayankaram Acharya (M.P.T. Acharya), his revolutionary activities within and beyond the geographical boundaries of India, his contribution to the global anti-colonial struggle and the theory and practice of anarchism, in order to examine these new interventions in the history of the Indian Nationalism, and situate India's struggle for freedom from colonial rule in the context of 'global' anti-colonialism. Such a study will also facilitate a more comprehensive understanding of the manner in which the question of 'freedom' acquired a broader meaning for nationalists who engaged in anti-colonial struggles not only to gain freedom from colonial domination, but also to free the larger human society from the shackles of oppression. Such engagement of nationalists like Acharya facilitated the development of the language of libertarianism in the twentieth century.

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Introduction

M.P.T. Acharya's life as a revolutionary and the significant contribution that he rendered towards the development of nationalism and anti-colonial struggle in India have largely been overlooked in the historiography of the Indian National Movement. Born in 1887 in Madras, Acharya's long revolutionary career spanned across several decades of engagement with anti-colonial struggle against British imperialism and witnessed important transitions in terms of his commitment to certain ideologies, the most important being his loss of faith in the Bolshevik variant of communism as practiced within the Union of Soviet Socialist Republics, and his increasing faith in the anarchist way to freedom. With regard to the question of libertarianism in Acharya's anti-colonial and anarchist thought, Ole Birk Laursen, in his compilation of Acharya's writings, a major contribution to the study of the evolution of the latter's political thought, has noted that, 'For Acharya, the question of Indian Independence was connected to greater questions about individual freedom through anarchist philosophy.'ⁱ Laursen further stated that, 'Acharya's anarchist writings signal a decidedly international approach to the question of freedom that extended beyond the concerns of the establishment of an independent Indian nation-state.'ⁱⁱ Thus, Indian Nationalism, which geared towards the attainment of independence from colonial rule, came to be understood in the broader context of human society's struggle for freedom from all forms of domination and exploitation. Acharya's concerns about the question of 'freedom' thus got translated into his critique of anti-colonialism and Bolshevik communism in the twentieth century and facilitated the evolution of the anarchist language of libertarianism in the context of the Indian Freedom Struggle.

Historiographical trends

Not merely in the domain of the history of Indian Nationalism, but also in the global history of anarchism, Acharya largely continued to be ignored, until some attempts were made in recent works to explore his role and contribution in the anti-colonial struggle.ⁱⁱⁱ Acharya's revolutionary activities had an internationalist scope in terms of the associations and networks that he developed with revolutionary groups of all shades across the world, and helped take the anti-colonial struggle of India beyond geographical boundaries. As remarked by Laursen in his recent work on M.P.T. Acharya,

Acharya's flight from Russia and his letter to Reisner illustrate several key issues and questions that are central to understanding the multifarious and complex nature of his trajectory through the underbelly of global political events: nationalism, anticolonialism, exile, war, revolution, communism, anarchism, pacifism, freedom, and independence. These issues preoccupy the intellectual biography of Acharya, which accounts for the complex, and entangled histories of

anticolonialism and anarchism through a detailed exploration of his actions, wanderings, thoughts, and connections with key actors of the time.^{iv}

The anti-authoritarian or anarchist intervention in the history of India's anti-colonial struggle, has been made by Maia Ramnath in her work entitled, *Decolonizing Anarchism*, where she has tried 'to bring an anarchist approach to anticolonialism and an anti-colonial approach to anarchism', and has dedicated a separate section to Acharya.^v It is interesting to note that such an intervention has facilitated the blending of the domains of anti-colonial struggle and anarchism through an understanding of the major 'intersections' between the two, particularly with regard to the notion of 'freedom' that is central to both.^{vi} Ramnath in her book has categorized Acharya as a 'Critical Leftist' who, like many other Indian revolutionaries of the time, was heavily imbued with the ideals of 'revolutionary socialism'.^{vii}

Works on M.P.T. Acharya, prior to this recent anarchist intervention, also drew attention to the major lacuna that existed in the historiography of Indian Nationalism. Writing in 1991, Bishambar Dayal Yadav, in his compilation of the memoirs of M.P.T. Acharya, focused attention on the predominant historiographical trends on Indian nationalism. In his view,

The focus of interest in the historiography of the anti-imperial struggle in India has been on the nature of the colonial state and the resistance offered to the colonial exploitation by the dominant sections of the society. Parallel to the domain of elite politics, there existed the peoples' movement at the core and on the periphery there continued several anti-imperialist struggles which may be called as revolutionaries-terrorist movement. Some of the studies have got confined its scope to examining the freedom struggle against the backdrop of manifold wrongs of British imperialism. To such scholars, the freedom movement is basically a 'native movement' against the foreigners in which the activities of Indian revolutionaries found a passing reference as far as the question of ideology and programme of Indian revolutionaries abroad were concerned. Their attempts to promote the cause of India's independence abroad are undoubtedly significant in the annals of India's liberation movement. They sought support from the anti-imperialist forces for India's emancipation from British imperialism. It was the revolutionary movement which exposed the imperial designs of exploitation.^{viii}

These words of B.N.S. Yadav broadly bring to the fore his basic objective in locating Acharya and his revolutionary activities within this overall historiographical tradition on Indian Nationalism, that has

mostly not taken note of such revolutionary entities, apparently functioning from the margins of the Indian National Movement. Such revolutionaries who continued to aid the Indian Freedom Struggle from abroad, according to Yadav, 'offered an alternative whose basic motive was to place the freedom struggle above the racial issues and the capitalist pressures in order to effect economic and social emancipation of the masses.'^{ix} Thus, for Yadav, Acharya was an Indian Nationalist, 'who had the mission to devote every hour of his life to espouse the Indian cause and enlist world sympathy for India's independence.'^x Acharya's revolutionary activities, in order of his movements, were spread across a large number of countries including 'India, Europe, the Middle East, the United States, and Russia', that made it difficult to record his 'personal and political development from anti-colonial nationalist to co-founder of the Communist Party of India (CPI) in October, 1920', for a long time.^{xi} Laursen's collection and compilation of Acharya's writings from archives across the world has contributed immensely by bringing to the fore valuable information pertaining to Acharya's life and political thought. This work has brought together several documents that had until now, not been accessed by historians who have worked on Acharya. Laursen's biography of Acharya, which is a result of his years of tireless research in different countries across the globe, is based both on the published writings as well the unpublished writings of the latter, retrieved from archives.

Followed by Yadav's compilation of Acharya's memoirs, C.S. Subramanyam wrote a biography of Acharya which covered the period of his revolutionary years in India, and in other countries till 1935. However, Subramanyam did not write about Acharya's activities in India after his return to the country in 1935. According to him,

....19 years after his return to India his participation in active politics appears to be very little. He wrote some articles for newspapers, including some in Harijan 1951/53. There is little that one could say about him as a participant in the freedom struggle of this period.^{xii}

Critiquing this clear absence of nineteen years of Acharya's life and activities in this biography, Laursen has drawn attention to Subramanyam's failure to take note of a significantly long phase of the revolutionary's life, i.e., the anarchist phase.

Another dimension to the existing historiography on Acharya has been added by Andrew Davies who has discussed the element of 'transnationalism' in the Indian anti-colonial struggle. In this regard, Davies' work is a recent contribution. Davies has highlighted that Acharya was functioning at a time when revolutionary activities across Europe and other parts of the world were being closely monitored by the British authorities. The last decades of the nineteenth century, that is, the 1880s and 1890s witnessed the rise of revolutionary anarchism in Europe and the anarchist commitment to 'propaganda by the deed' gained ground. At around the same time, Indian radicals travelled to Europe to be trained in militant revolutionary activities which involved training imparted in bomb-making.

Davies has tried to trace the elements of ‘transnational connections’ of the anti-colonial struggle that helped build a wider network of global revolutionary movements, and create ‘international spaces’, through the endeavours of revolutionaries like Acharya. He has talked about the ‘politics of friendship’ that found expression through inter-racial marriages, like that of Acharya and his wife Magda Nachman. Davies has emphasised that, ‘Indian anticolonialists in Europe occupied a socially and politically cosmopolitan world which, while dangerous opened up a world full of radical new possibilities.’ His overall approach has been to situate Acharya in the history of transnational revolutionary activities through the ‘geographies of social movements’. He has however put greater stress on identifying Acharya as a nationalist revolutionary and later an anarchist than an ‘internationalist’. Underscoring the significance of Acharya’s involvement in the ‘international spaces’ of anti-colonial struggle, Andrews Davies has remarked,

Whilst majority of the involved would, at least initially, have characterised themselves as ‘nationalists’ working for Indian independence, there were different counter-currents at work within these movements. From socialism and communism to Acharya’s anarchism, we can see how anticolonialism was diverse and produced relationally in the spaces and places in which people like Acharya ‘touched down’. Places like Pondicherry, Paris, Berlin, Gibraltar and Constantinople all provided different ways of envisioning how best to fight for and mobilise others to become involved in anticolonial work. Seeing Acharya’s life as relationally interconnected with other anticolonialists, as well as other individuals like his wife Magda Nachman, continues to emphasise the spaces of cosmopolitan encounter. ^{xiii}

Acharya and anti-colonialism: the revolutionary odyssey

Acharya’s early years of anti-colonialism, in Laursen’s view, can be important in understanding the ‘global reach of Indian anticolonialism in the first decades of the twentieth century’, that would in turn help understand ‘nationalism as an international project’.^{xiv} In his recent biography on Acharya, he has remarked that,

Exploring Acharya’s early years in India, his initiation into nationalist politics, and journey into exile opens a new window onto the Indian nationalist movement of the early twentieth century. It allows for a closer look at the radicalisation and militancy of Indian anticolonialism at the time and the British authorities’ response to this. ^{xv}

Acharya's revolutionary career had its modest beginnings in India through his association with the publication of two newspapers – *Bala Bharat* in English (1906),^{xvi} and *India* in Tamil, along with *Subramaniya Bharati* (published from Madras and Pondicherry during 1907-1908).^{xvii} His early years in Madras constituted a period when there was an 'intensification of the differences between the moderates and the radicals and the growth of a countrywide Swadeshi and Boycott movement'.^{xviii} Politically this period witnessed the growth of extremism in the Congress led Indian National Movement along with revolutionary movements organised beyond the domain of Congress politics. In 1907, Acharya visited Bal Gangadhar Tilak in Poona and also participated in the Surat Congress of the Indian National Congress which saw the split between the moderates and the extremists. During this period, consistent attempts were made by the British government to suppress revolutionary activities conducted mostly through the circulation of 'seditious literature',^{xix} which compelled Acharya to leave Pondicherry, first for Marseilles, and then for Paris in 1908. The initial phase of his revolutionary career was thus, based in Pondicherry, France (Paris) and England (London).

In Britain, the Indian National Congress had constituted a British Committee that was involved in 'propaganda work' against colonial rule in India.^{xx} Acharya became associated with the 'India House' of Shyamaji Krishnavarma in London, which was a major centre of refuge for Indian nationalists in London and for conduct of anti-colonial activities against the British.^{xxi} Some of his major associations during this period were V.D. Savarkar, Varahaneri Venkatesa Subramaniam Aiyer and Virendranath Chattopadhyay (Chatto), who was 'tagged' an anarchist despite being associated with the Russian Communist Party.^{xxii} Indian revolutionaries in Britain and France at this time were trained in militant methods of revolutionary activities, and often sent back to India after completion of their training, to support the revolutionaries and different secret societies. Apart from being associated with the 'India House', Acharya was connected with the revolutionary organisation, *Abhinava Bharat* that got him involved in training in firearms. He was also associated with the publication of the papers *Talwar*^{xxiii} and *Bande Mataram*.^{xxiv} These revolutionary newspapers that voiced anti-colonial ideas, found their way into Pondicherry and other parts of India along with other journals like the *Indian Sociologist* (London) and the *Gaelic American* (the United States).^{xxv}

In Paris, Acharya worked in collaboration with Bhikaji Cama, Shyamaji Krishnavarma, Lala Har Dayal, Virendranath Chattopadhyay, S.R. Rana, and engaged with French socialists, as well as some nationalists and revolutionaries from Egypt, Turkey and Russia who were in exile in Paris at that time.^{xxvi} These revolutionaries laid a lot of emphasis on associating with countries like Russia, Germany and Japan that were essentially anti-British, in order to promote anti-colonial struggle in India. Acharya moved to Germany in 1910 for revolutionary training and then went off to Constantinople to join the Young Turks in the Committee of Union and Progress (CUP).^{xxvii} This was part of the larger efforts made by the Indian revolutionaries to build contacts with the nationalists in Turkey, Persia and Afghanistan. German initiatives in this regard were equally important.

In 1912 he left for New York and met George Freeman, the editor of *The Gaelic American*.^{xxviii} During his stay in North America, he attended meetings of the *Ghadar* Party and met several Irish revolutionaries and anarchists. In San Francisco, Acharya translated for the Tamil edition of the *Ghadar*, organ of the Ghadar Party. He also joined the commissions sent to Egypt and Mesopotamia by the Berlin India Committee and the German Foreign Office in order to instigate mutiny among soldiers of the British Indian Army, and weaken their military base. From the United States, Acharya returned to Paris on the call of his friend Chatto, and the two then moved to Stockholm to attend the International Socialist Congress in 1917. As noted by Yadav, ‘the basic motive to attend the Congress was to create sympathy for the liberation of the country among Russian extremists and other socialist leaders of Europe.’^{xxix} By this time, Chatto had already established the Indian Independence Committee in Berlin.^{xxx} Underscoring the significance of these early years of Acharya’s revolutionary career, Laursen wrote, ‘Acharya’s association ‘with proto-nationalists, pan Islamists, *Mujahirs*, communists, Bolsheviks, and anarchists, all as part of the struggle for Indian freedom from British rule’, imparted an internationalist tenor to his anti-colonialism.’^{xxxi} With regard to the significance of the first fifteen years of Acharya’s exiled life, Laursen has commented in the biography that,

The first fifteen years of Acharya’s life in exile were characterised by movement and action, resistance and reaction, always negotiating global revolutionary politics with the aim of liberating India from British rule.....In many ways, the struggle for Indian independence found its maturity outside India, among intellectuals, sailors, and workers in exile, in conversation with other colonised and subject peoples and inspired by global thoughts on revolution and self-determination. Revolutionaries like Acharya lived itinerant lives, often travelling under false names and nationalities, smuggling banned literature and arms, connecting and disrupting notions of periphery and centre, and, in doing so, contributed to shaping global anticolonial radical communities.^{xxxii}

The Russian Revolution of 1917

The Russian Revolution of 1917 renewed the vigour of anti-colonial struggle globally. Indian revolutionaries like Acharya reposed implicit faith in the declaration of the Soviet Union that it would render assistance to Indian revolutionaries in their fight against colonial oppression and to ‘nations struggling for self-determination’.^{xxxiii} During their stay in Stockholm, Acharya and Chatto had established contacts with the Russian Social Democratic Labour Party (RSDLP). After the Revolution of 1917, they hoped that the leaders of the new Soviet regime would help Indian revolutionaries place their ‘standpoint at the coming peace negotiations’.^{xxxiv} Their visit to Moscow in 1919, prior to the visit to Kabul, brought them in contact with Lenin. Acharya, along with some other Indians under the

leadership of Mahendra Pratap, was then sent by Lenin to build contacts with the 'Provisional Government of India'^{xxxv} in Kabul that had been set up by Mahendra Pratap. Differences of opinion with Mahendra Pratap, pertaining to propaganda work that needed to be done among the *Mujahirins*^{xxxvi} in Afghanistan, and the Indians, led to the founding of the Indian Revolutionary Association (IRA) or the *Inquilabin-I-Hind* in Kabul in 1920 by Acharya and Abdur Rabb.^{xxxvii} This Indian Revolutionary Association comprised 'revolutionary pan-Islamists, nationalists, proto-communists, and anarchists.'^{xxxviii}

During this period, Acharya was in favour of allying with the Bolsheviks. He attended the Second Congress of the Third International or Comintern (1920), organised at Petrograd and Moscow where he met M.N. Roy and Abani Mukherji,^{xxxix} and also attended the Third Congress of the Comintern in 1921. Acharya and Rabb on being expelled from Afghanistan due to their anti-British activities, eventually went off to Tashkent where they established the Provisional All-India Central Revolutionary Committee (PAICRC) in 1920. Acharya played an instrumental role in the founding of the exiled Communist Party of India along with M.N. Roy, in the same year (Acharya as the Chairman and M.N. Roy as the Secretary of the CPI).^{xl} However, Acharya's disagreements with M.N. Roy over the 'direction of the CPI, unhappy to subordinate the project of Indian national liberation to the Comintern', and other issues^{xli}, led to his expulsion from the CPI in 1921.^{xlii} In the words of Ramnath, 'Acharya had always been part of the less orthodox faction, and his true ideals, at least in his colleagues' view, leaned in an antiauthoritarian direction. By the time he left Moscow, Acharya's differences with Roy developed into "differences with the Communist International and with the Communist regime in Russia itself."^{xliii}

Acharya's stay in Russia brought him into contact with anarchists like Alexander Berkman, Emma Goldman, Rudolf Rocker and Milly Rocker.^{xliv} He also wrote articles for several Russian journals on issues pertaining to 'revolutionary developments and movements in India.'^{xlv} His revolutionary endeavours at this time also involved attempts made to send in arms to India from the Indo-Afghan border. The IRA, however, continued to maintain its independent stance with regard to the conduct of the struggle for Indian freedom from British rule, instead of being controlled by the Comintern-led anti-colonial struggle. Acharya's wider anarchist connections in Europe at this time included his association with the 'Anarcho-communist party' in France. He was also in favour of 'inclusion of the anarcho-syndicalists at the early congresses in Moscow.'^{xlvi} At this juncture he is said to have clearly described himself as an 'Anarcho-Syndicalist.'^{xlvii}

Association with the Bolsheviks constitutes an important phase in the revolutionary career of Acharya, with regard to the major transition that one can discern in his ideological affinities during this period. He declared that, "I have been doing propaganda against English rule in India' but 'I am also a convinced anti-Bolshevik."^{xlviii} This inclination towards anarchism primarily stemmed from his disillusionment with the practice of communism within the Bolshevik state. In 1926, in one of the letters

to *Mahratta*^{xlix} that he wrote from Berlin, he emphatically urged that anarchism would be the final phase in the transition to a communist society. Labelling Bolshevik communism as ‘false communism’, he wrote that, ‘Communism is the last stage of society, beyond Anarchism even.Communism can come through and beyond Anarchism and not before and behind it.’¹ Acharya’s break with Bolshevik communism, thus, marked a critical juncture in the evolution of his libertarian socialist thought. He made a definitive turn towards anarchism that upheld the principles of decentralisation, collectivism and federalism.

Libertarian Socialism: critique of Bolshevik communism

One can locate Acharya’s critique of Bolshevik communism in the post-1917 period that witnessed a ruthless suppression of anarchist ideas and tendencies within the Soviet Union. His critique of Bolshevik communism involved a re-visit to the Marx-Bakunin polemical conflict of the nineteenth century within the International Workingmen’s Association (1864-1876), that brought to the fore divergent tactics and strategies pertaining to the organisation of the international working class movement in the nineteenth century. In his essay, ‘Disruption of Marxism’ written in the year 1927, he emphatically stated,

Either Marxism or Bakunism is going to win private capitalism: if the former, we will have Marxist capitalism to get rid of; if the latter we will have made a beginning towards Socialist Internationalism and equals and brothers in Solid Unity.^{li}

Acharya, through this essay, spoke in defense of Bakuninism that according to him was representative of ‘true communism.’ He continued,

.....the Marxist and Leninist assurance of “withering and dying out of the proletarian State” entailed the ‘teaching’ of ‘wrong Socialist theories of even Marxism and by suppressing every freedom of thinking even of the Communists in their State-Soviets, besides of course restoring capitalism, native and foreign, to prevent proletarian socialism from raising its head.^{lii}

It is interesting to note how Acharya’s anarchist critique of the proletarian dictatorship in the transitory phase of socialist revolution echoed Bakunin’s critique of Marxian socialism in the First International. Bakunin had only predicted what the nature of proletarian state would be like in the nineteenth century, but Acharya witnessed the ramifications of the socialist revolution in the twentieth century.

Is it proletarian class dictatorship when the workers have to elect only communist party members to dictate to them in the name of the proletariat, and they are dictated in the capitalist interest of the elected

in office and paid fat salaries and obeyed for not doing anything good but all evil to the working class?.....Bolshevism lead only to the concentration or centralization of Capitalism in the hands of the State, but does not bring the people any nearer to Socialism, and even tries to postpone the realization and materialization of Social-Society.^{liii}

For Acharya, the anarchist critique of Bolshevism and the ‘dictatorship of the proletariat’ brought to the fore the question of ‘freedom’, that he discussed in his writings. His critique of Bolshevik communism also involved his defense of anarchism.

But the Anarchist Socialists – even when they have not established “an anarchist rule” – which is probably what can convince the anti-anarchists – have told a definite, positive thing, have given a synthesis when they said that socialism can only be without rulerships of any kind by a part of mankind – however vast a part that be – over the rest, and therefore the abolition and prevention of every rule by man over man is the first condition of realizing Socialism, equality, democracy, brotherhood and oneness.^{liv}

Similar to the aims and objectives of the International Workingmen’s Association outlined in the Inaugural Address delivered by Karl Marx in 1864, Acharya reiterated that it was only the ‘subject peoples themselves’ who could bring about their own freedom.^{liv} Centralisation of economic power in the hands of the leaders of the Bolshevik or other totalitarian regimes would not necessarily lead to the ‘improvement in the economic situation of the people.’^{lv} The practice of communism in Soviet Russia was not communism in its true form, but was essentially ‘Russian Bolshevism which is a danger to the peace of the world.’^{lvii} Bolshevik communism was merely considered as a variant of capitalism practiced in the rest of the world.

...what the Bolsheviks do in Russia and try to do elsewhere is just Capitalism of another type, and the quarrel between Capitalists and Bolsheviks is not about Communism but about the type of Capitalism which should prevail. Both have a common basis of thought, which is capitalistic. What the Capitalists are against is the Bolshevik attempt at doing away with divided private owners and setting up a state by their party as the sole owner. The mode of management is the same, namely, making the entire people wage-slaves, exactly as Capitalist owners do. The issue between them is not whether or not Capitalism should be totally abolished and Communism should be ushered in, but who should manage Capitalism. Both are opposed to Communism.

Neither the Capitalists nor the Bolsheviks will argue about Communism. Yet Bolshevism is supposed to be Communism and the opposite of Capitalism! It is State Capitalism – Capitalism by the state, – owned and run by the Bolshevik party pretentiously calling itself Communist. All the three brands, Marxism, Leninism, or Socialism are advocates of state ownership and state Capitalism, and they want it to be kept under the control of the Bolshevik party of Moscow throughout the world.^{lviii}

Anarchism, pacifism and the language of libertarian socialism

The ruthless suppression of anarchists in Bolshevik Russia, which Acharya vehemently critiqued, compelled him to flee Russia along with his wife and spend the next 30 years of his life in Germany (Berlin) and in India (Bombay). In Berlin he was actively involved in the League of Oppressed Nationalities, founded in 1927, as well as the Indian Independence Committee, that already existed. In 1927 he also joined the International Anti-Militarist Bureau against War and Reaction (IAMB) and the International Antimilitarist Commission. Acharya attended the founding meeting of anarcho-syndicalist International Workmen's Association (IWMA) in 1922 along with Rudolf Rocker, Augustin Souchy and Alexander Schapiro, which indicated a direction towards the blending of anti-colonialism with anarchism.^{lix}

Even during his stay in Germany, Acharya kept himself abreast of the 'trade union activity in Madras' and 'wrote to one of the key figures in the Labour-Kisan Party^{lx} there in July 1923 concerning the New International Workmen's Association, which unlike the Comintern he described as "anti-political and federal"...'.^{lxi} Concerns pertaining to labour issues in India can be discerned from this. The issue of 'class struggle' and role of 'trade unions' in the context of the impact of industrialisation and colonialism in India were discussed intensely.^{lxii} In the article, "In India" (1927), published in the anarcho-syndicalist newspaper *La Voix du Travail (The Voice of Labour)*, Acharya wrote,

The situation of the Indian worker is that of every exploited worker. They must fight simultaneously against brutal capitalism and against politicians, because capitalists, government, and reformist leaders collude in their activities against the interests of the working class. What is needed for the Indian proletariat is new workers' organizations, of a revolutionary syndicalist character, which alone can tear it out of the misery in which it grows. Only federalist organizations, given their complete independence, can create a solid foundation for class struggle in India.^{lxiii}

These concerns related to the lack of working class consciousness, splits in trade unions, and communist influence on the organisation of the labour movement in India also found expression in many of his writings in post-Independent India.^{lxiv}

One of the primary engagements of Acharya at this time was to covertly send anarchist and anarcho-syndicalist literature to India.^{lxv} Such literature, however, could not be easily sent to India during this period because of the existing Sea Customs Act which ‘prohibited “the bringing by sea or by land into British India of any publications issued by the International Working Men’s Association (*Internationale Arbeiter Assoziation*), Berlin, in whatever language they may be printed.’^{lxvi} Despite the existence of these impediments, Acharya made efforts to send anarchist literature to labour associations in India as well as the several regional leaders of the Communist Party of India like Satya Bhakta (founder of the CPI in Kanpur) and J.P. Begerhotta (Secretary of the CPI), and many others.

In Germany he was also in contact with Russian-American anarchist Alexander Berkman and his long time friend, Chatto. However, he dissociated himself from Indian revolutionaries during this period, almost ‘became a recluse’^{lxvii} and was mostly pre-occupied with the question of ‘freedom’ during his stay in Berlin. He also expressed his ideological commitment to anarchism through a letter to Chittaranjan Das, the editor of the newspaper *Forward*.^{lxviii} Such an engagement with the idea of freedom ‘synthesised his thoughts on anarchism with anticolonialism’ and marked a new phase in the evolution of his revolutionary ideology.^{lxix} The rise of Nazism in Germany, however, forced him to escape from the authoritarian regime of Hitler in search for ‘freedom’ in his motherland. He reached India in 1935 and dedicated roughly the next two decades of his life trying to build an anarchist movement in his own country. It is important to note that the emergence of authoritarian regimes in the inter-war period played a fundamental role in giving a concrete shape to his anarchist thought.

During his years in India, Acharya published a lot of anarchist writings and brought in the concept of *nirajya* or anarchy in the context of the Indian National Movement. He contributed to anarcho-syndicalist newspapers like *Rabochii Put (Way of the Worker)* edited by G.P. Maximov and Alexander Schapiro^{lxx} and several articles on anarchism to national and international journals between 1923 and 1954. In the meanwhile, Chatto played an instrumental role in the founding of the League against Imperialism (LAI), based in Berlin and backed by the Comintern.^{lxxi} Summarising Acharya’s activities and ideological inclinations in this period, Laursen has commented that Acharya, ‘articulated his own perspectives on anarchism, often renouncing Bolshevism and the Comintern, commenting on the Indian independence struggle, particularly Gandhian pacifism, as well as developing an anarchist economic critique of state capitalism.’^{lxxii}

After his return to India, Acharya also wrote his memoirs, *Reminiscences of a Revolutionary*, which was published in the *Mahratta*. He revived contact with his friend Guy Aldred for sending home anarchist literature including Proudhon’s *What is Property* and Bakunin’s *God and the State*. In the

post-Second World War period, Acharya's involvement with labour issues continued through his critique of the increasing influence of the CPI on the labour movement in India and the emphasis that it put on 'peaceful nation building after the war.'^{lxxiii} He sought to re-establish connections with anarchists from across the world like Voline, Hippolyte Havel, Alexander Schapiro, as well as anarchists from East Asia. During his last years, he tirelessly worked for the dissemination of anarchist ideas in India. He also contributed articles discussing labour issues and the labour movement in India to the anarcho-syndicalist newspaper *Rabochii Put*.^{lxxiv} With regard to his concerns regarding the prevailing conditions in the post-Second World War period, Acharya commented, "the days are bad for all governments – that is the only relieving feature. Fascism in 1948 will be more bankrupt than when Hitler or Mussolini established it. I think even Bolshevism is impossible now. There may be chaos but not centralism."^{lxxv} He also participated in the Commission for International Anarchist Relations in the post-Second World War period.

Gandhian notion of *ahimsa* (non-violence) had left a deep impact on Acharya. At this stage he blended his 'anticolonial anarchism with cooperativism and pacifism.'^{lxxvi} Such an intervention in his anarchist thought indicated his move from his early revolutionary militancy to pacifism. It was through '...periodicals such as *Kaiser-i-Hind* and, more explicitly, *Harijan*,'^{lxxvii} that 'Acharya finally articulated and embraced Gandhism within the anarchist tradition.'^{lxxviii} In his letter to Russian-American anarchist Boris Yelensky he stated, "The only people who are nearest to anarchism are the Gandhians of the *Harijan* group. They are near-anarchists because they want decentralization (independent village communes), production for use and direct action."^{lxxix} However, prior to expressing his admiration for Gandhi's non-violence, Acharya in his essay "Mother India", published in 1928, had made a trenchant critique of Gandhi's 'pacifism', calling it was 'half pacifism'.

While he is violently opposed to violence in general, he is more opposed to the mass liberation from violence than to the violence of Governments. He does not believe that the violence established by Governments at their expense creates and necessitates the violence of the people at times. While he wishes to abolish the violence of individuals and groups, he believes, that violence of governments is impersonal, necessary – nay perhaps in the end good.

I do not mean to say that Gandhi is himself directly concerned in this or any other Governmental violence against people, but still – so long as he does not denounce all governments, i.e., parts of Society over the whole and at the same time countenances some governments against others, he is indirectly with that violence.^{lxxx}

Writing in 1930, however, Acharya through his essay on “Gandhi and Non-Violence” expressed his deep admiration for the nature of ‘revolutionary pacifism’ practiced by Gandhi in the context of the Civil Disobedience Movement of 1930.^{lxxxix} With regard to Gandhi’s role in the Civil Disobedience Movement, Acharya in his article, “Nationalism in India” published in the journal *Man! A Journal of the Anarchist Ideal and Movement* (1933), wrote:

...Gandhi by sanctioning and initiating passive polite and unarmed violation of salt monopoly law, intervened successfully between governmental and popular violence and led the violent energies of the people into channels of unconquerable solidarity against the government and its laws. He overtook and unnerved the government and its readiness to use and justify its own violence over all. As such he acted like an Anarchist tactician of the first magnitude, caring for no laws when he gave his personal ultimatum to the Viceroy.^{lxxxii}

Commenting further on Gandhi’s pacifism and its connection with the practice of anarchism during the course of the Civil Disobedience Movement in India, Acharya continued:

Since that day pacifism has come to stay and grow in India, going from success to success – not halting in spite of his repeated incarcerations Gandhi made the movement go without and against leadership – it is a great autonomous education to the people. In one stroke he killed off both Marxism and its opposite, authoritarianism. That day we must reckon as the birth of popular Anarchy in the world – not only in India. He planted the seed of Anarchism – even if he did not want or know it, because he wanted nothing should intervene and cross pacific education.^{lxxxiii}

Acharya during this period viewed Gandhism and Indian Nationalism through the lens of pacifist tendencies in India’s struggle from freedom from colonial rule. He stated,

It may be nationalism against imperialism but still it is international in spirit and purpose, because it is pacifist and simple. All nationalities are welcome in this struggle. In India or outside. It believes each nation and individual knows its or his affairs better than anyone can tell. Leave us in peace and live in peace. That is Indian nationalism.

It is more international than Bolshevik state bureaucracy in Russian territory. It depends least upon business and money and arms – because it depends upon and is born of the people instead of being superimposed. It is educating people not to depend upon leaders and

armed forces and state paraphernalia. It is a self-moving tye, organically naturally, spontaneous. Uniting all its parts and including engulfing all into one mutually interested whole. It is a rock in formation against which all armies of the world will fail – for armies are autonomous having only wheels within wheels – unthinking and tyeless. The party and state movement depend upon the principle of exclusion, while the Indian movement is all-embracing. Hindus, Mussulmans, Jews, Christians of all classes and races. Men, women, and boys and girls taking an equal part as independent beings in the movement. If it is nationalism, it is greater than Socialism, which try to include only a class, no, only actual workmen organized in unions or party politicians in the name of the workers “as a class.” It is abolition of classes and class war, which is going on in India peacefully in the name of nationalism.

The movement gives anarchist training, which is exactly what the Bolshevik and anti-Marxian world is afraid of, and even anarchists are mistakenly skeptical about. But India is teaching in practice the anarchist principles – to the whole world. Be it national because territorial at present. Nonetheless it is anarchic, anti-bourgeois, and anti-Marxian. It is stealing a march over coming anarchy in the West and in the world. Hail Gandhism because it is anarchic – it is new to a fossil world of ideas. ^{lxxxiv}

Apart from engagement with the issue of pacifism, one of his other concerns during this time was also the rise of ‘Hindu nationalism’ in India which led to his critique of V.D. Savarkar and the activities of the Hindu Mahasabha.

The libertarian alternative – anarchist social organisation

According to Ramnath, revolutionaries like Acharya were not merely talking about ‘injustice, oppression, and exploitation’ but were also concerned with the ‘nature of a liberated society’. In this regard, it is important to discuss in some detail his ideas on anarchist social organisation in the post-revolutionary period. With regard to the nature of the post-revolutionary political, economic and social organisation one can take a look at the essay entitled, ‘Principles of Non-Violent Economics’ which he authored in 1947. The economic system, according to Acharya would be,

...free from all domination or strict regulation – or even control – on the part of those who from outside want to make it serve other ends than the consumers’ interest. Now all state systems, whether

Bolshevist or purely capitalist, can only be run from outside, since they are part of society that feeds on the majority, namely the producers and consumers. This system of parasitism must be abolished and not tolerated or reinforced by a metaphysical, mental, or spiritual method of support.^{lxxxv}

This was a ‘practical economic system’ which would do away with wages and exchange. Even if this system signified a ‘primitive’ form of economy, such primitivism would put an end to the ‘exploitation and domination’ of the toiling masses. In the post-revolutionary liberated society, Acharya vociferously championed the need for the abolition of the ‘state’ and all forms of ‘monopolies’, ‘privileges of property’ and the creation of a ‘federation of independent communes.’ In his view, ‘The only system, which can replace them and other equally erroneous economic methods, is the administration of production by the consumers for the purpose of establishing equality of consumption.’^{lxxxvi} ‘Autonomous communes’ would ensure the proper functioning of ‘real democracy’ and ‘social solidarity’.

It is only thus that the energy of all members of the whole society can be liberated and directed into social and international channels – bringing pleasure and prosperity to each and all. All control and government authority of any kind will thus become superfluous – as each individual will make his nearest neighbor and his most remote fellow-creature feel his responsibility.^{lxxxvii}

These ‘autonomous communes’ working in close association under the rubric of a federation, would lead to the decentralisation of society and, in such

a society, a nation, an international humanity divided into communist-social groups without authority, these groups can be easily led to coordinate their economic affairs VOLUNTARILY, needless to say, in view of their common and equally profitable aims. No impediment will be placed in the way of co-operation by any central authority and no autonomous commune will be materially self-sufficient, be it in a question of necessaries or comforts, not to speak of luxuries. It cannot be, it would not possibly be, by exchange that such co-operation will be realized, but by a common participation in production and by a proportionate acquisition of products by the different communes.

A registration office created by the various communes in cooperation, and the use of modern technical means of communication for broadcasting wireless messages – day and night – indicating the total

utilities available for the total population of a union of federated communes, would suffice to enable each federation to know how many utilities can be consumed in the communes considered separately. Telegraphic and telephonic messages will suffice to direct the utilities where they are needed.^{lxxxviii}

Acharya also devoted a separate section to ‘local autonomy’ that would prevail in the libertarian society, in his essay ‘Principles of Non-Violent Economics’ (1947). With regard to production and distribution of goods and services in these local ‘autonomous communes’ Acharya wrote,

Apart from the question of determining what necessities are to be satisfied as indispensable to all communes, the communes should be left entirely free to distribute the utilities “democratically” as they think fit. They should be left entirely to themselves as regards all that concerns their productive and consuming functions and their internal affairs. There should be variety in life – advantages and disadvantages, liberty of movement and change, liberty of choice in responsibilities too – for each man or each woman who wants to stay in or leave a commune – and a similar right for each commune to receive or keep or eject any man or any woman. If the question of food and other needs of every man, woman, and child is thus solved, if there is certainty of work for every capable adult and education secured for every child, all conceivable varieties of marriage and separation, and the protection of every child are problems easily solved with the help of collective community. In these communes, the child cannot be a burden; he will, indeed, be welcome as a member for he contributes to the improved welfare of the whole society.^{lxxxix}

As for ‘money and ‘wages’ in the ‘autonomous communes’, Acharya wrote,

*This federation of independent communes has within itself no need whatever for a foreign office. If commerce or exchange with the outside is necessary, a common commission can be constituted to sell surplus products outside and with the money thus obtained procure necessary utilities – the operations passing outside at the prices current on outside markets. **Within the federation itself, there could not possibly be any question of prices, exchange, or monetary complications. Hence, no money and wages.***^{xc} (Emphasis is mine)

Acharya underscored the ‘democratic’ distribution of ‘utilities’ in a ‘collective community’ in this essay, thereby bringing to the fore the ideological continuities in anarchist thinking in differing contexts, and the real essence of what anarchist libertarianism stood for. In Acharya’s words, ‘It is the communes enjoying an economy of this nature that can constitute a real democracy.’^{xci} Interesting parallels can be drawn between the blueprint of post-revolutionary anarchist society as outlined by Acharya in this essay and that of the anarchist thinkers of the late nineteenth century who extensively discussed the principles of production and distribution, exchange, etc., in federated communes in the post-revolutionary period. Anarchist thinkers like James Guillaume and Peter Kropotkin in the late nineteenth century emphatically stated that the principle governing the distribution of goods and services in the post-revolutionary anarchist federation of communes should be *from each according to his ability, to each according to his needs* and eventually *to each according to his wish*. This principle of distribution in the future anarchist society as envisioned by Guillaume and Kropotkin helped outline the differences between ‘collectivism’ and ‘communism’ in the late nineteenth and early twentieth century. Writing at the beginning of the twentieth century, Guillaume, in one of his letters, discussed production and distribution of goods and services in the post-revolutionary anarchist society in the following words,

*As to the distribution of the products of collective labour, I wrote: “...Once the worker owns the instruments of labour, all rest is of secondary importance. How the products of collective labour will be equitably shared must be left to the judgement of each group.”... The collectivists knew very well that when the instruments of production are common property, labour becomes a **social act** and therefore the products are social products. In 1871 Bakunin wrote: “Only collective labour creates wealth. **Collective wealth must be collectively owned.**”...In my essay “On building the New Social Order” I stated clearly that in the collectivist society, when machines will triple production, goods will not be sold to consumers but distributed according to their needs...these, and many other quotations that I could easily supply, show clearly that the collectivist Internationalists never accepted the theory of “to each according to the product of his labor.”^{xcii}*
(Emphases are mine)

Regarding wages and exchange, Guillaume in his essay, ‘Ideas on Social Organisation’ talked of creating a Bank of Exchange in the anarchist society where the producers would bring in all their produce, and the consumers would procure the produce with ‘labour vouchers’.^{xciii} However, with expanding industrial and agricultural production, the consumers would no longer have to purchase the commodities, as the produce from then on would be distributed, instead of being sold. Thus, eventually the principle *from each according to his ability to each according to his needs*, and then *from each*

according to his ability to each according to his wish, would be the basis of distribution in the autonomous federation of communes. Since ‘labour vouchers’ or ‘labour cheques’ would become redundant at a particular stage, there would be no requirement of any remuneration and the collectivist ‘Wages System’ would be done away with. Kropotkin critiqued this collectivist ‘Wages System’ and advocated for its abolition.^{xciv}

Acharya’s engagement with the ideas pertaining to constructivist elements in the theory and practice of anarchism can be discerned from the essay that he contributed to the edited volume *Whither India?* in 1948.^{xcv} The essay is extremely important in understanding his ideological inclinations at a time when India had already gained independence from colonial rule and was going through a period of political and socio-economic reconstruction. An analysis of Acharya’s anarchist ideas, situated within this broader spectrum of India’s independence, has added a new dimension to the study of the eventual evolution of his political ideology through decades of revolutionary involvement in the Indian National Movement. As Laursen has noted in his sourcebook of Acharya’s essays,

Acharya’s tireless agitation and prolific intellectual output reached some of India’s most prominent political authors. Shortly after independence in August 1947, Iqbal Singh and Raja Rao invited Acharya to contribute an essay “What is Anarchism?” to the collection Whither India? (1948). “We are to-day passing through a phase of extreme intellectual confusion and disorder,” they note in the Introduction. “In so far as Indian politics has evolved an ideological basis, they continue, “it can be claimed that this has resulted in the emergence of two major trends. These are Gandhism and Marxism.” To the editors, Gandhism was “a complex and synthetic philosophy which has its roots in the tradition of moral humanism of the Indian thought, but at the same time draws liberally from European Utopian Reformism ranging from Rousseau through Proudhon and Kropotkin to Ruskin and Tolstoy. Appearing alongside prominent figures such as Jawaharlal Nehru, Nirmal Kumar Bose, V.S. Srinivasa Sastri, Jayaprakash Narayan, K.S. Shelvankar, and Muhammad Ali Jinnah, Acharya’s essay put forth the case for anarchism’s relevance within India’s political environment at the cusp of independence.”^{xcvi}

A discussion of some the ideas elucidated by Acharya in this essay would help bring to the fore the important connections between Acharya’s understanding of anarchism, and that of the classical anarchists of the nineteenth century and their disciples, who developed their language of libertarian socialism in the context of the international working class movement. The two currents of anarchism – anarcho-communism and anarcho-syndicalism that had emerged within the theory and practice of

anarchism in the nineteenth century, found explicit mention in Acharya's essay, thereby indicating certain important ideological linkages between anarchism as understood, and practiced globally. The anarchist conception of society, state and government, freedom,^{xcvii} revolutionary direct action, general strike, collectivism, federalism, found place in this essay in the context of the developments in post-Independent India. Acharya talked of the practice of anarchism as a viable alternative to establishing a state structure in the post-revolutionary period. Here he brought in the notion of 'non-state anarchy' as a 'government of society by society, by all members of society.'^{xcviii} Echoing the anarchists of the nineteenth and twentieth centuries from across the world, Acharya opposed any form of 'centralism' and laid stress on the need to create an anarchist society based on the principles of 'decentralism and federalism'. His vociferous negation of states, governments and constitutions – whatever be its nature – can be crucial in trying to make some sense of how he would have imagined political and socio-economic re-organisation in post-Independent India. Every form of government implied the rule of the minority over the majority and could never be truly representative in nature. States, governments and constitutions served as instruments of violence perpetrated against society at large. He wrote,

Every government can be only a section of the society against all the rest. There can be no people's government possible, except under anarchy. People (society) or government but not people's (or social and socialist) government. The anarchists, when they insist on non-governed society, mean government of the people, by the people, for the people – directly by the people themselves without any intermediary. Society ruling itself, not ruled by a party over itself, which can only be done with violence.^{xcix}

In his vision of anarchist social re-organisation, he championed the need for the creation of an independent society without states, decentralisation of power, federalism and preservation of local autonomy and social solidarity that would make governments redundant. In this anarchist society, 'production', 'social services' and 'distribution' would be organised by the people themselves (who constitute the society) only through 'agreement' and not any imposition from above. His 'bottom-up' view of social re-organisation can be located in the classical anarchist tradition of the nineteenth century. The question of 'freedom' that had been Acharya's major pre-occupation during the course of his engagement with the anti-colonial struggle in India got enmeshed in his understanding of 'freedom' within the anarchist tradition. The existence of a state necessitates the surrender of the liberty of the people to a minority that forms the government, apparently claiming to be representative of the majority in society. An anarchist society would instill a sense of 'responsibility' in people and, hence, would not require any government to direct them. Only revolutionary direct action that involved 'general or social strike' by the people could lead to their 'economic betterment.' In this regard, he drew attention to the role of anarcho-syndicalist trade unions in bringing about the emancipation of the working masses.

Acharya critiqued the party system and any form of government – even if it was a government formed out of revolution like the Bolshevik state, that took away the liberty of people and insisted that, ‘freedom, democracy, and socialism’ can only be achieved in an anarchist society.

Conclusion: The sensitivities of Indian nationalists towards the global anti-colonial struggle, as it took shape in the first half of the twentieth century, can be discerned from the nationalist fervor of Acharya. Indian Nationalism acquired an internationalist spirit, and helped develop a common language of libertarianism for the varied struggles of peoples, across the world, against domination and exploitation. Anti-colonialism, during the twentieth century, thus, did not remain restricted merely to the understanding of Indian experiences but also included the experiences of peoples hailing from varied political, economic and socio-cultural terrains. It thus, lent an internationalist tenor to Indian Nationalism. The struggle against colonialism got enmeshed in the question of pacifism in the broader context of the World Wars, their impact on the global political and economic scenario, especially in the colonies, and the effectiveness of non-violence in the conduct of the Freedom Struggle in India. The formation of the Bolshevik state and the ruthless suppression of the voices of dissent within the Soviet regime, raised more important questions pertaining to the nature of a socialist state in the post-revolutionary period. The experiences within the Bolshevik state over the nature of ‘true communism’ necessitated a dialogue with the question of ‘freedom’ and what libertarianism entailed. It is, thus, important to locate Acharya in the dynamics of the anarchist movement in the first half of the twentieth century that sought to abolish states and in its place create a liberated society that would ensure the freedom of mankind. It is through Acharya, that one can identify the major points of intersection between global anti-colonialism, pacifism, anarchism and the Indian National Movement, as summed up by Laursen in the following words:

...by tracing Acharya's path from Indian nationalist to exiled anticolonialist, his alliances with other colonial and subject peoples and engagement with international socialists, his turn to communism and swift rejection of Bolshevism in favour of anarchism, we arrive at a more nuanced understanding of the multifarious nature of the Indian freedom struggle.^c

The necessity of this libertarianism in India, to be achieved through anarchism, was expressed by Acharya in the following words,

For India with its vastness and diversity, there is only one solution possible: Anarchist, decentralised, economic and practical socialism alone will avoid the different quarrels for political power – not any of

the modern 'new-fangled' theories wherein all show that the State is identical with the society and therefore with socialism.^{ci}

Acharya 's language of libertarianism, thus, evolved out of his lifelong commitment to the cause of India's struggle against colonial domination along with his broader concerns regarding the issues of pacifism and freedom in an anarchist sense. Acharya's engagement with the cause of freedom facilitated the development of the language of anti-authoritarianism and libertarianism, not merely in the context of anti-colonialism in the Indian Freedom Struggle but also in the wider socialist tradition that witnessed the emergence of the Bolshevik 'authoritarian' variant of communism in the twentieth century.

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- ii. Ibid., p. 4.
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- iv. Ibid., p. 40.
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- vi. Ramnath, *Decolonizing Anarchism*. She brings in the notion of the 'decolonization' of anarchism, by undertaking a study of the anti-colonial movement of India through the anarchist perspective and expanding the domain of anarchist studies to South Asian history.
- vii. Ramnath, op.cit., p. 124.
- viii. Acharya, M.P.T. *Reminiscences of an Indian Revolutionary* edited by Bishamber Dayal Yadav (1991), New Delhi: Anmol Publications, p. 1.
- ix. Ibid., p. 5.
- x. Ibid.
- xi. "Introduction" by Laursen in Acharya, *We Are Anarchists*, op.cit., p. 2.
- xii. Subramanyam, C.S. (1995): *M.P.T. Acharya: His Life and Times*. Madras: Institute of South Asian Studies, p.16.

xiii. Davies, Andrew (2019): *Geographies of Anticolonialism: Political Networks Across and Beyond South India, c. 1900-1930*, The Royal Geographical Society (with the Institute of British Geographers) and John Wiley & Sons Ltd. pp. 154-55.

xiv. Laursen, *Anarchy or Chaos*, p. 42.

xv. Ibid., p. 41.

xvi. The *Bala Bharat* was an English Daily published from Madras.

xvii. The weekly *India* was started by a group of radicals in Madras who were dissatisfied with moderate Congress politics.

xviii. Subramanyam, op.cit., p. 9.

xix. "Introduction" by Yadav in Acharya, *Reminiscences*, p. 4.

xx. Ibid., p. 7.

Propaganda work involved publishing of the *India* and formation of an Indian Parliamentary Committee within the British Parliament.

xxi. The India House reposed faith in the revolutionary path to attain freedom from colonial rule of the British and critiqued the moderate policies of the INC. For a detailed account of Acharya's involvement with the India House, see "Introduction" by Yadav in Acharya, *Reminiscences*, pp. 7-23.

xxii. Ramnath, op.cit., p. 126.

xxiii. The publication of *Talvar* started from Berlin. Virendranath Chattopadhyay was put in charge of the newspaper.

xxiv. The publication of the *Bande Mataram* started from Geneva on 10th September, 1909. The objectives of both *Talvar* and the *Bande Mataram* were – 'there were three stages to be passed through: "the first of educating the people, the second war, and the third reconstruction.' See Yadav, op.cit., p. 27.

xxv. The Sea Customs Act of 1878 had also been passed to prevent the entry of 'seditious literature' into India.

The Indian Press Act of 1910 was implemented, in this regard, with the objective of gagging the voice of the revolutionaries.

xxvi. All these revolutionaries were instrumental in the founding of the Paris Indian Society. Subramanyam, op.cit., p. 11.

xxvii. Laursen, *Anarchy or Chaos*, p. 41.

xxviii. *The Gaelic American* was an Irish nationalist newspaper published in New York, United States of America, between 1903 and 1951.

xxix. Yadav, op. cit., p. 41.

xxx. Chatto claimed that the Indian Independence Committee in Berlin was ‘a revolutionary body, similar to the Irish Sinn Fein, striving for the independence of India.’ See Ramnath, op. cit., p. 129.

Important members of the IIC were Mohammed Barakatullah, Bhupendranath Dutta, Champakaraman Pillai and Chadrakant Chakravarti. See Subramanyam, op.cit., p. 12.

xxxi. Laursen, *Anarchy or Chaos*, p.39.

xxxii. Ibid., p. 43.

xxxiii. Yadav, op.cit., p. 44.

xxxiv. Ibid.

xxxv. Ramnath, op.cit., p. 129.

xxxvi. *Mujahirins* came from India to Afghanistan

xxxvii. Subramanyam, op.cit., p. 14.

xxxviii. Laursen, Ole Birk, “M.P.T. Acharya: The Forgotten Indian Anarchist in Europe Who Fought for True Freedom”

in *The Wire*. The Indian Revolutionary Association is considered to have been a ‘precursor’ to the CPI.

<https://thewire.in/history/mpt-acharya-indian-anarchist-europe-true-freedom>

Accessed on 10th September, 2022.

xxxix. Ibid.

xl. “Introduction” by Laursen in Acharya, *We Are Anarchists*, p. 8.

xli. Acharya was expelled from the Communist Party of India (CPI) “on account of actively supporting people engaged in frankly anticommunist propaganda.” See “Introduction” by Laursen in Acharya, *We Are Anarchists*, p. 8. Acharya was opposed to the centralising tendencies that M.N. Roy had exhibited in the functioning of the CPI.

xlii. “Introduction” by Laursen in Acharya, *We Are Anarchists*, p. 8.

xliii. Ramnath, op. cit., pp. 130-31.

xliv. Laursen, “M.P.T. Acharya: The Forgotten Indian Anarchist in Europe.”

xlv. Ramnath, op.cit., p. 130.

xlvi. Ibid., p. 131.

xlvii. Ibid.

xlviii. "Introduction" by Laursen in Acharya, *We Are Anarchists*, p. 13.

xlvi. Mahratta was an English weekly newspaper started by Bal Gangadhar Tilak in 1881.

l. Acharya, "Communism in Its True Form" in Laursen (ed.), *We Are Anarchists*, p. 44. This was a letter sent to the Editor of the *Mahratta* (Poona) in June, 1926.

li. Acharya, "Disruption of Marxism" in Laursen (ed.), *We Are Anarchists*, p. 65. The essay was published in the New York based anarchist newspaper *The Road to Freedom*, edited by Hippolyte Havel, in July, 1927.

lii. Ibid., p. 61.

liii. Ibid., pp. 61-64.

liv. Ibid., p. 62.

lv. Laursen, *Anarchy or Chaos*, p. 44.

lvi. Acharya, "Letters to the Editor", *Thought* (1950-52), section on 'Bogey of Revolution' in Laursen (ed.), *We Are Anarchists*, p. 264.

lvii. Acharya, "Confusion between Communism and State Capitalism" in Laursen ed., *We Are Anarchists*, p. 258. The article was published in the journal *Harijan*, started by M.K. Gandhi in 1932.

lviii. Ibid., pp. 258-59.

lix. "Introduction" by Laursen in Acharya, *We Are Anarchists*, p. 10.

lx. The Labour Kisan Party of Hindustan was formed in 1923 in Madras and was formally attached to the Communist Party of India.

lxi. Ramnath, op. cit., p. 132.

lxii. Acharya, "In India" in Laursen ed., *We Are Anarchists*, pp. 56-57. The article was published in the anarcho-syndicalist newspaper *La Voix du Travail* (*The Voice of Labour*) in 1927.

lxiii. Ibid., p. 57.

lxiv. Acharya, "Labour Splits in India" in Laursen (ed.), *We Are Anarchists*, pp. 185-190. The article was published in *Freedom: Anarchist Fortnightly* in May, 1947.

In one of his later essays, he labeled the trade unions as 'Pillars of Capitalism.'

lxv. Such literature included the newspaper *Freedom*.

lxvi. "Introduction" by Laursen in Acharya, *We Are Anarchists*, p. 11.

lxvii. "Introduction" by Laursen in Acharya, *We Are Anarchists*, p. 9.

lxviii. *Forward* was a Bengali radical newspaper edited by Chittaranjan Das.

lxix. Laursen, *Anarchy or Chaos*, p. 44.

lxx. The *Rabochii Put (Way of the Worker)* was published from Berlin.

lxxi. "Introduction" by Laursen in Acharya, *We Are Anarchists*, op. cit., p. 14.

The founding Congress of the League Against Imperialism (LAI) was attended by Acharya as well as Jawaharlal Nehru.

lxxii. "Introduction" by Laursen in Acharya, *We Are Anarchists*, p.15.

lxxiii. Ibid., p. 25.

lxxiv. Ramnath, op.cit., p. 132.

lxxv. "Introduction" in Acharya, op.cit., p. 28.

lxxvi. Laursen, *Anarchy or Chaos*, p. 44.

lxxvii. *Harijan* was a journal founded by Gandhi in 1932.

lxxviii. Laursen, *Anarchy or Chaos*, p. 46.

lxxix. "Introduction" by Laursen in Acharya, *We Are Anarchists*, p. 29.

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lxxxiii. Ibid., pp. 132-133.

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lxxxvii. Ibid., pp.78-79.

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xcii. Dolgoff, Sam (ed.) (1971): *Bakunin on Anarchy: Selected Works by the Activist-Founder of World Anarchism*, New York: Vintage Books, A Division of Random House, pp. 158-59. This letter, written by Guillaume on 24th of August, 1909, was left unpublished until the volume of Bakunin's writings edited by Sam Dolgoff appeared in 1971.

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xcix. Ibid., p. 194.

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Generalized completely regular seminearrings

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ABSTRACT

In an attempt to study those seminearrings which can be decomposed as union of near-rings (zero-symmetric near-rings) in the class of additively completely regular seminearrings, we introduce the notions of generalized left (right) completely regular seminearrings and characterize generalized left (right) completely regular seminearrings as union of near-rings (zero-symmetric near-rings) which is the semigroup theoretic analogue of “A semigroup is completely regular if and only if it is a union of groups”.

Key Words and Phrases: Generalized left completely regular seminearring, Generalized right completely regular seminearring, Near-ring

Introduction

Seminearring is a natural generalization of semiring as well as of near-ring. A semiring without one distributive property becomes a seminearring and a near-ring without the existence of additive inverse becomes a seminearring. Following Weinert [10] we call $(S, +, \cdot)$ is a seminearring if (1) $(S, +)$ is a semigroup (not necessarily commutative), (2) (S, \cdot) is a semigroup (not necessarily commutative), (3) $(a + b) \cdot c = a \cdot c + b \cdot c$ for all $a, b, c \in S$ (“right distributive law”). A (right) seminearrings $(S, +, \cdot)$ is said to be with zero if 0 is the additive identity of S and 0 satisfies the property $0 \cdot a = 0$. A seminearring S is said to be *zero-symmetric* if S is a seminearring with 0 in which $s \cdot 0 = 0$ for each $s \in S$. The seminearring considered in [3] was zero-symmetric. But throughout this paper, unless mentioned otherwise, the seminearring need not have to be with zero.

The study of additively regular seminearrings initiated in [9] and continued in [4]. One nice aspect of studying additively regular seminearrings is to obtain semigroup theoretic analogues. In [4], while studying additively completely regular seminearrings a characterization of a left (right) completely regular seminearring as a bi-semilattice (Bi-semilattice is a suitable substitute of semilattice in the setting of seminearring) of left (right) completely simple seminearrings (*cf.* Theorems 2.23 and 2.24 of [4]) has been obtained which is the semigroup theoretic analogue of “A semigroup is completely regular if and only if it is a semilattice of completely simple semigroups”. Also, a characterization of left (right) Clifford seminearring as a distributive lattice of near-rings (zero-symmetric near-rings) (*cf.*

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Theorems 3.13 and 3.14 of [4]) has been obtained which is the semigroup theoretic analogue of “A semigroup is Clifford if and only if it is a semilattice of groups”. But we could not obtain the characterization of union of near-rings (zero-symmetric near-rings) in the class of left (right) completely regular seminearrings which is the semigroup theoretic analogue of “A semigroup is completely regular if and only if it is a union of groups” (*cf.* Concluding remark of [4]). The main purpose of the present paper is to make an attempt to complete this unfinished work, *i.e.*, to characterize those seminearrings which can be decomposed as union of near-rings (zero-symmetric) in the class of additively regular seminearrings

Generalized Completely Regular Seminearrings

We assume that a good extent of the semigroup theoretic background of seminearrings are well-known from [11].

Definition 2.1. [2] Suppose $(S, +, \cdot)$ is a seminearring. Then S is said to be an *additively regular seminearring* (*additively inverse seminearring*) if $(S, +)$ is a regular semigroup (*resp.* an inverse semigroup).

Notations 2.2. Throughout this paper, unless mentioned otherwise,

- (i) for a seminearring S , $E^+(S)$ denotes the set of all additive idempotents;
- (ii) in an additively completely regular seminearring S , for $a \in S$, an element $x \in S$ satisfying $a + x + a = a$ and $a + x = x + a$ is denoted by x_a ;
- (iii) L^+, R^+, H^+ and J^+ denote the Green's relations L, R, H and J on the semigroup $(S, +)$, the additive reduct of the seminearring S ;
- (iv) in a seminearring S , L_a^+, R_a^+, H_a^+ and J_a^+ denote the L^+, R^+, H^+ and J^+ classes of $a \in S$, respectively;
- (v) in an additively completely regular seminearring S , for each $a \in S$, $(H_a^+, +)$ is a group. The identity element of this group is denoted by $0_{H_a^+}$.

Definition 2.3. [6] A *near-ring* is a set N together with two binary operations ‘+’ and ‘ \cdot ’ such that

- (1) $(N, +)$ is a group (not necessarily abelian),
- (2) (N, \cdot) is a semigroup (not necessarily commutative), and
- (3) for all $a, b, c \in N$, $(a + b) \cdot c = a \cdot c + b \cdot c$ (‘right distributive law’).

Definition 2.4. A seminearring $(S, +, \cdot)$ is called *generalized left completely regular* if for each $a \in S$ there exists an element $x_a \in S$ satisfying the following conditions:

- (1) $a = a + x_a + a$
- (2) $a + x_a = x_a + a$
- (3) $(a + x_a) a = a + x_a$

Definition 2.5. A seminearring $(S, +, \cdot)$ is called *generalized right completely regular* if for each $a \in S$ there exists an element $x_a \in S$ satisfying the following conditions:

- (1) $a = a + x_a + a$
- (2) $a + x_a = x_a + a$
- (3) $a(a + x_a) = a + x_a$

Example 2.6. Any zero-symmetric near-ring is a generalized left as well as generalized right completely regular seminearring.

Lemma 2.7. In a generalized left completely regular seminearring H^+ is a right congruence.

Proof. Let aH^+b . Then $a = x + b = b + y$ and $b = s + a = a + t$ for some $x, y, s, t \in S$. Let $c \in S$. Then $ac = (x + b)c = xc + bc$. Also $bc = (s + a)c = sc + ac$. This implies that $ac L^+ bc$. Similarly, we have $ac R^+ bc$ and so $ac H^+ bc$. Therefore H^+ is a right congruence.

Lemma 2.8. In a generalized left completely regular seminearring a^2H^+a for all $a \in S$.

Proof. Let $a \in S$. Then

$$\begin{aligned} a &= a + x_a + a \\ &= a + (a + x_a) \\ &= a + (a + x_a) a \\ &= a + (x_a + a) a \\ &= (a + x_a a) + a^2 \end{aligned}$$

and

$$\begin{aligned} a^2 &= (a + x_a + a) a \\ &= a^2 + (x_a + a) a \\ &= a^2 + (a + x_a) a \\ &= a^2 + a + x_a \\ &= (a^2 + x_a) + a \end{aligned}$$

This implies $a^2 L^+ a$. Again,

$$\begin{aligned} a &= a + x_a + a \\ &= (a + x_a) a + a \\ &= a^2 + (x_a a + a) \end{aligned}$$

also,

$$\begin{aligned} a^2 &= (a + x_a + a)a \\ &= (a + x_a) a + a^2 \\ &= a + (x_a + a^2) \end{aligned}$$

so, $a^2 R^+ a$. Consequently, $a^2 H^+ a$.

Lemma 2.9. *Let S be a generalized left completely regular and $a \in S$. Then for each $y \in H^+$ there exists a unique element $y^* \in H_a^+$ such that $y + y^* + y = y$, $y + y^* = y^* + y$ and $(y + y^*)y = y + y^*$.*

Proof. Let $y \in H^+$. Since H^+ is a group, there exists a unique $y^* \in H^+$ such that $y + y^* = y^* + y = 0_{H_a^+} = e$, say and $y + y^* + y = y$, where e is the unique additive idempotent of the group H_a^+ . Now, $(y + y^*)y = ey$ where $ey \in E^+(S)$ (since $ey + ey = ey$). Now yH^+e . As H^+ is a right congruence (cf. Lemma 2.7), y^2H^+ey . Since H^+ is equivalence relation and y^2H^+y (cf. Lemma 2.8), yH^+ey . ey is an additive idempotent which is an element of H_a^+ . This implies, $ey = e$, so $(y + y^*)y = e = y + y^*$.

Theorem 2.10. *Let $(S, +, \cdot)$ be a generalized left completely regular seminearring then every H^+ -class is a near-rings.*

Proof. Consider H^+ on S . Clearly H^+ is a equivalence relation on S such that each H_a^+ is a group for all $a \in S$. Let $b, c \in H^+$. Then

$$\begin{aligned} bc &= (b + b^* + b)c \\ &= (b + b^*)c + bc \\ &= (c + c^*)c + bc \\ &= c + (c^* + bc) \end{aligned}$$

and

$$\begin{aligned} c &= (c + c^* + c) \\ &= (c + c^*)c + c \\ &= (b + b^*)c + c \\ &= bc + (b^*c + c). \end{aligned}$$

Hence $bc R^+ c$. Again,

$$\begin{aligned} bc &= (b + b^* + b)c \\ &= bc + (b + b^*)c \\ &= bc + (c + c^*)c \\ &= bc + c + c^* \\ &= (bc + c^*) + c \end{aligned}$$

also,

$$\begin{aligned} c &= (c + c^* + c) \\ &= c + c + c^* \end{aligned}$$

$$\begin{aligned}
&= c + (c + c^*)c \\
&= c + (b + b^*)c \\
&= c + (b^* + b)c \\
&= (c + b^*c) + bc.
\end{aligned}$$

Hence $bc \in L^+c$. So $bc \in H^+c$. Since H^+ is an equivalence relation on S , $bc \in H^+c$ and $c \in H^+a$ implies $bc \in H^+a$. This shows that (H_a^+, \cdot) is a semigroup. Consequently, (H_a^+, \cdot) is a near-ring.

Theorem 2.11. *If S is union of near-rings then S is generalized left completely regular.*

Proof. Let S be a union of near-rings $\{N_\alpha : \alpha \in \Lambda\}$. Then for each $a \in S$, $a \in N_\alpha$ for some $\alpha \in \Lambda$. Let x_a be the unique additive inverse of a within the near-ring $(N_\alpha, +, \cdot)$. Then it is clear that $a + x_a + a = a$, $a + x_a = x_a + a$ and $(a + x_a)a = a + x_a$. So S is generalized left completely regular.

Combining above results we get the following theorem:

Theorem 2.12. *Let S be a seminearring. Then the following statements are equivalent:*

- (1) S is generalized left completely regular;
- (2) Every H^+ -class is a near-ring;
- (3) S is a union (disjoint) of near-rings.

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