Online Seminar Proceedings

Multidisciplinary National Seminar on

"Impact of Innovative Research Techniques and Approaches for Specific Research: Issues and Challenges" (IIRTASR-2023)

15th - 16th May 2023

Organised by
Shakya Muni College, Bodh-Gaya
(Affiliated to Magadh University, Bodh Gaya**)**

In Association with
International Centre for Scientific Research and Development (ICSRD)
Bengaluru, Karnataka
(Regd. under Ministry of Corporate Affairs, Govt. of India)
(ISO9001:2014 Certified Organisation)

Principal Place of Institution

3rd Floor, Padmavati Complex, #2,80 Feet Road,
Opposite NGV Indoor Stadium Koramangala,8th
Block Bengaluru, Karnataka 560095 India

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Book Version: Online Proceedings
Year: 2023
Author: Academicians
ISBN No.: 978-81-963779-1-5

"Financial Inclusion with Shadow Banking System to the Rural Economy: A Case Study of Tirhut division of Bihar."

ANAND PRAKASH*
Research Scholar
VKSU ARA, Department of Commerce & Business Management.

The term "Shadow Banking" means the financial system of unregulated activities by regulated institutions. The banking system is the group of financial intermediaries facilitating the creation of credit across the global financial system. It is also referred as market based financial system. Generally Shadow Banking is a bank like activity, mainly lending, that take place outside the traditional banking system. Example of Shadow Banking includes non-banking financial companies (NBFCs), Hedge funds, Microfinance etc. These institutions work as intermediaries between the investors and the borrowers. It provides credit through lending, so, generate liquidity in the economy. In Bihar Shadow Banking system has been increasing especially in Tirhut Division due to landlockedness with Nepal and Uttar Pradesh. Tirhut Division referred to Muzaffarpur, East Champaran, West Champaran, Sitamadhi, Sheohar and Vaishali districts. That area contains, almost 20 percent (20.56%) as per the census 2011, population of Bihar. In this area economy fully based on agriculture sector, due to this Shadow Banking plays an important role in the rural economy.

Keywords: Shadow Banking, NBFCs, Microfinance, Economy.

INTRODUCTION:

Historically, the term Shadow Bank was given by "Paul McCauley" in 2007.However the 2008th financial crisis has shown that Shadow Banking can be a source of systematic risk to the banking system, the risk can be transmitted directly and through the interconnectedness of partially regulated subject with the banking system. As we know, after the crisis including of central banks of USA, UK and many countries introduced Shadow Banking system with strong measures to control.

In context of India the problem of liquidity crisis is solved by many NBFIs or NBFCs. It was trigged by liquidity problem and IL & FS in 2018, has back the attention towards Shadow Banking system. The increased interest for the Shadow Banking system or NBFIs came into existence in the last two decades especially after banking reform 2008, in order to obtain justification to the lenders and flow of credit to the economy, especially in Rural Economy. As we know the largest part of India belongs to rural economy so, Shadow banking has given a strong pillar for the establishment of Indian economy. In India, time to time regulations related to banking system pushed Shadow banking system as well as rural economy. After world economic crisis 2008 India has also affected in the term of international credit flow, due to this Indian banking system found a great chance in the side of non-banking financial intermediates with lending. The backward Indian states like Bihar, Odisha, Jharkhand, West Bengal, Uttar Pradesh, Madhya Pradesh etc. are the beneficiaries at huge level from this side.

In Bihar Shadow Banking system has grown especially in Tirhut Region. Traditionally in these areas the main line banking system was growing very fast but it was limited to urban sectors, especially in Muzaffarpur and after it Motihari, but the total area of Tirhut Region is very large, so, the main line banking system could not achieve its objectives, that's why Shadow Banking is growing very fast in these areas since 2007.

It is argued that Shadow banking system push the rural economy with small credit flow. These credit flows regularly operate the economy and after reforms in Shadow banking it is growing very fast. The structure of rural financial market in India is dualistic with formal and informal financial intermediaries. Consequences of fast-growing Shadow banking system, the formal finance sector is effectively servicing only approx 50 percent of the rural population in the world. This is mainly because of the failure of formal finance sector in fulfilling their basic functions like production credit, financial credit and income generating activities, consumption credit to maintain and expand human productive capacity and quality saving scheme for increasing risk bearing capacities of the rural households. Lack of capital is one of the strong factors which keep the poor the poor. In rural areas of Bihar literacy rate is very low, basic social and market infrastructure is also very poor with inferior healthcare system, in context of agriculture there is a lack of good quality seeds and proper irrigation system, market access for the rural producers is also a tough task, that's why sometimes investors don't get proper return from their investment.

Bihar doesn't figure on the top of the table published by financial institutions in the term of economic development, even after launching of self-help group (SHG) bank linking program by national banks for agriculture and rural development in 1996. Bihar is fully based on rural areas economic activities through urban areas activities. Some year ago, JIVIKA program launched by government of Bihar proved milestone for rural development as well as women empowerment. After the enhancement of JIVIKA program Shadow banking system could be more successful in Bihar, especially in Tirhut division where male labor migration is very high.

In my summary Shadow banking has changed the structure of Bihar's economy, especially in rural areas because of empowering women, increasing literacy rate, growing IT sector and communicating with urban areas. It moves economy for further challenges.

Summarizing that point of study area with its objectives, significance, data methodology with hypothesis testing from primary and secondary data. In my nutshell my closing comments are Shadow Banking like a pillar of the building to the rural economy. Without it rural economy can't stand.

REVIEW OF LITERATURE:

The literature review is a most important part of research process, from the help of literature review the idea of research begins. Reviews of literature provide us the baseline concept of research problem. It also gives the idea of research problem, development, process, findings, time period, comparison, evaluation and many more.

In context of my research problem many developments has done and some is in progress. The reviews of literature are following related to my problem:

Historically, Banking system and credit flow came at broad level after great recession 1929, after that Keynesian economics became famous and investments became the main tool for production and due to this investment credit flows can measure the economy of any country and investment has taken a major role in credit flow in the rural areas. In General theory of employment interest and money (1936), Keynes J.M created profound shift in economic thought, giving macro-economics a central place in economic theory and liquidity preference became the baseline concept of credit flow for capital generation. It has equally powerful consequences in economic policy, began interpreted as providing theoretical support for the Government spending in general and for budgetary deficit, monetary intervention and counter cyclical policy in particular area.

P.Zoltan, A. Tobias, A Ashcraft and B. Hayley (2010), They presented paper 'shadow banking federal reserve of New York', their paper presents preliminary findings and is being distributed to economists. The rapid growth of market based financial system since the mid 1980 changed the nature of financial intermediation in the United State profoundly. Within the market based financial system "shadow bank particularly important institution of economy". Shadow banks are financial intermediaries that conduct maturity, credit and liquidity transformation without explicit access to central bank liquidity or public sector credit guarantee. Example of Shadow banks include finance companies, asset backed commercial Paper (ABCP), conduits limited purpose finance companies structure investment vehicles, credit hedge fund, money market mutual fund, security lenders and government sponsored enterprises.

Moe T.G (2014). In his paper Shadow banking policy challenges for central banks, Central bank responded with exceptional liquidity support during the financial crisis to prevent a systematic melt down. They broadened their toolkit and extended liquidity support to non-banks and key financial markets. Many want central banks to embrace their expanded role as 'market maker of last resort' going forward. This would provide a liquidity backstop for systematically important markets and the Shadow banking system that is deeply integrated with these markets.

Q. Stephen and R. William, their working paper responding to a Shadow banking crisis. In August 1763, northern Europe experienced a financial crisis with numerous parallels to the 2008 Lehman Brothers episode. The crisis affected merchant banks. The Central Bank at the hub of the crisis responded by broadening the range of collateral it accepted.

M. Eran and T. Anat (2016), presented his paper on the boundaries of Shadow Banking and empirical investigation, a large number of empirical studies pointed to the ongoing expansion of the Shadow economy in many countries around the globe. A robust finding in these studies is the positive association between unemployment rates and the size of the unofficial sector. However, with consistent estimates of the size of unofficial sector only available from the late 1980s.

A. Tobias (2014), this paper explores financial stability policy for the Shadow Banking system, he ties policy options to economic mechanism for Shadow Banking that has been documented in literature. He then illustrates the role of Shadow Bank policy using three examples agency mortgage real estate investment trust, leveraged lending, and captive re-insurance affiliates. The overarching theme of the analysis is that, any policy prescription for the Shadow banking system is highly specific to the particular activity.

D. Keshar (2010), "Comparative analysis of microfinance by microfinance institutions and other financial institutions in Bhagalpur district, Bihar", in his paper microfinance programs in the recent past have become one of the most promising way to use scare development fund to achieve the objectives of poverty alleviation, and attempt has been made in this study to know the microfinance facility extended to borrowers along with patterns of disbursement monitoring and recovery of loans by different financial institutions in Bihar.

OBJECTIVES OF STUDY:

The objectives of the study are following:
1. To analyze the access of Shadow Banking in study area.
2. To study about the Shadow Banking facilities provided in study area.
3. To evaluate fulfillment of the objectives of Shadow Banking in study area.
4. To analyze the consumption pattern of rural area people after engagement with Shadow Banking System.
5. To evaluate the credit flow between beneficiaries and non-beneficiaries of Tirhut Region of Bihar.

SIGNIFICANCE OF THE STUDY:

The significance of the study is associated with rural development with the help of micro and small banks. Credit flow from these banks is growing fast and smoothly. Their interest rates are regulated by RBI not only in private microfinance institutions but also in main line formal banking system. In the context of formal banking system interest rate is very low as compare to Shadow Banking system. The high interest rate controlled by the non-formal banking system from their poor client is prescribed exploitative. Shadow Banking System in Bihar is growing very fast due to their access and easy process of lending with rural clients. In context of Bihar non formal banking system is working in different areas with different institutions but one thing is common in all non-banking finance corporation is 'cooperative group' and this is the thing which made it different from formal banks. The scope of this study in rural economy with credit flow is very significant. From the help of this rural economy will circulate with purchasing capacity. The large contribution through lending money from Shadow Banks to rural clients goes to education, health, empowerment, food consumption, agriculture etc. The agricultural labors in rural economy take money from these banks and these banks play vital role in their life due to irregularity of their job opportunity. In rural areas since 2013 after food security bill they spend their income on quality growth. From shadow banks labors of rural areas can borrow little amount but in one payment through easy lending process for completion of their needs. As we know rural areas are organizing gradually and as a result, small investment areas have come into existence, in these areas rural people investing money with the help of Shadow Banks.

RESEARCH DESIGN:

It is one of the main parts of research report because it provides us the idea and way of research progress. The research design can be categorized in three parts:

(a) Hypothesis
(b) Methodology
(c) Data Analysis

HYPOTHESIS:

The hypotheses of this problem are following-

1. There is no credit flow in rural economy by Shadow Banking.
2. There is no significance of Shadow Banks in Tirhut Region.

METHODOLOGY:

In this research problem research methodology will play an important role in proceeding research. As we can see my research problem is associated with empirical and social values, so I will begin my research with the descriptive and qualitative research methodology and further my study is associated with survey study, co-relational studies and empirical study with structured enquiry mode. Longitudinal study will also help me in my study field while making attempt to critical evaluation of the material. In my study I will use many statistical tools like Co-relation, Regression, Central tendency, Dispersion, Skewness and Kurtosis, Sampling methods of data. Further I will operate my research with SPSS Software, STRATA Software and ANOVA Software.

DATA ANALYSIS:

Data is defined as the information, record to represent fact. Some important points about data are, it represents facts about hypothesis variable, consistency with prediction. The quality and validity of the output truly depends on data and data collection tools. In my research I will use both type of data primary and secondary. Primary data will operate my case study and secondary data will analyze my research problem. For primary data I will use observations and interviews with probability and non-probability sampling method. In my research I will take approx 300 samples for case study in which sample, 150 samples will belong to Shadow Banking beneficiaries and rest 150 samples I will take from non-beneficiaries. I will take 80% of sample from rural area and 20% of sample from urban area. On the other hand my secondary data sources will be economic survey of Bihar, NSSO, CSO, RBI, NGOs and local banking administration.

CHAPTERISATION:

The proposed study will be categorized into the following tentative chapters:

1. Introduction.

2. Nature, scope and prospects of Shadow Banking.
3. Role of Shadow Banking & flow of credit system.
4. Importance, Consequences and Challenges of Shadow Banking in Rural & economic development.
5. Shadow Banking and credit flow in Tirhut Region.

Conclusion and suggestions.

APPENDICES:

1. Bibliography
2. List of Questionnaires.

REFERENCES:

1. Economic Survey of Bihar, 2010 to 2020.
2. Economic Survey of India, 2010 to 2020.
3. Census 2011.
4. RBI Report for NBFCs, 2010 to 2020.
5. UGBGs Report "Non-Banking System in Muzaffarpur, Champaran, Sitamardhi and Vaishali circle." 2014 to 2019.
6. Keynes J.M. "General Theory" 1936.
7. Zoltan P., Tobias A., Ashcraft A., and Hayley B. "Shadow Banking federal reserve of Newyork." 2010.
8. Moe T.G "Shadow banking policy Challenges for central Bank." 2014.
9. Stephen Q. and William R. "responding to a Shadow Banking Crises."
10. Eran M. and Anat T. "The Boundaries of shadow Banking and Empirical Investigations." 2016.
11. Tobias A. "Financial stability policy for the Shadow Banking System." 2014.
12. Keshar D."Comparative analysis of microfinance by microfinance institutions and other financial institution in Bhagalpur district, Bihar." 2010.

Women Empowerment and Panchayati Raj: A Sociological Study in Bihar

Chandrabali Kumar (ICSSR Doctoral Fellow)
Div. of Sociology & Social Anthropology, N. Sinha Institute of Social Studies, Patna-01
Email: chandrabalichampapur86@gmail.com

Abstract

Almost 50% population of women in India but Disproportionate sex ratio and female population has been comparatively lower than male. As far as their socio-economic status is concerned, they are not treated as equal to male in all the area and places. Even today gender disabilities and discriminations are found in Bihar. Empowerment of women would mean equipping women to be economically independent, self-reliant, have positive esteem to enable them to face any difficult situation and they should be able to participate in development activities. The empowered women should be able to participate in the process of decision making. The 73rd &74th Amendments (1993) to the constitution of India have provided some special powers to women that for reservation of seats (33%); after some time 2006 Govt. of Bihar provided 50% reservation. Last few years the most positive development has been the growing involvement of women in the Panchayati Raj institutions. This article places emphasis that empowerment of women in rural areas, which is increasing its participation in the field of politics due to Panchayati Raj System.

Keyword: Empowerment, Women empowerment, Panchayati Raj, Political Participation.

Introduction

Women empowerment is the most used and discussed term today. The empowerment of women is becoming an increasingly popular term in human rights and developmental discourses. Women play significant role in all walks of life. Empowerment of women is a necessary basic condition for socioeconomic development of any society. Empowerment of women in all spheres and in particular the political sphere is crucial for their advancement and for the foundation of gender equal society. It is central to the goals of equality, development and peace. Empowerment is a multi-faceted, multi-dimensional and multi-layered concept. Women's empowerment is a process in which women gain greater share of control over resources material, human and intellectual like knowledge, information, ideas and financial resources like money and access to money and control over decision-making in the home, community, society end nation, and to gain power.

The word "empowerment" literally means "to become powerful." Empowerment improves one's positive self-image and ability to distinguish right from bad in private thoughts. Consider how to strengthen women's economic, health, and educational opportunities to empower them. All of these elements are crucial. A new social and economic order can be created on national, international and global scales as a result of encouraging women to value them, feel in charge of their life both within and outside of the home, and be capable of influencing social change. However, in the majority of cases, women in our culture are still unable to make self-reliant

decisions. According to Dodd and Gutierrez (1990), empowerment is a social act because most people in the 1960s did not have a systematized view of power. The term Shakti must be grasped. The ability to achieve one's aims is one definition of power while believing and acting following one's views is another. Those who arouse the interest of others (Parente, 1978). This relational principle manifests itself in both personal and social power. According to Bandura (1981), perceived self-efficacy believes that an influential person is deeply interested in their world and understands how to get what they want and influence others in more significant ways than their interests. When a person cannot get what they wish to or influence others in a way that benefits their interests, the powerless person is more likely to survive by avoiding challenging activities. According to Karl (1995), the term "empowerment" is commonly used but rarely defined. It has been claimed by Karl (1995) that women have long talked about taking control of their lives and participating in decisions which have an impact on their daily activities as well as the decisions that influence their communities and governments as well as international development strategies. 'Empowerment,' according to Pillai (1995), is a dynamic, multi-faceted process that helps women from all walks of life realise their full potential and reach their goals. When it comes to power, you can't buy it, sell it, or give it away as a present. Once you've acquired the skill, you'll need to put it to good use in order to preserve it.

Panchayati Raj Institutions, or grassroots local self-government institutions in rural India, have long been seen as vehicles for socioeconomic development. Getting people active at the grassroots level is the most successful technique for achieving socioeconomic growth. In India, the Panchayati Raj system, often known as democratic decentralization, institutionalizes decentralization. Distributing authority to local panchayats, according to this view, will empower and involve the people. Local governments can better respond to local demands and make better use of available resources since they are closer to their residents. For a country's democratic system to be secure, it requires widespread participation in government. Panchayati Raj, the democratic decentralization system, is known for decentralization to achieve democracy and socioeconomic reform. In India, the Ministry of Human Resource Development (MHRD- 1985) and the National Commission for Women (NCW) have been worked to safeguard the rights and legal entitlement of women. The 73rd &74th Amendments (1993) to the constitution of India have provided some special powers to women that for reservation of seats (33%), whereas the report HRD as March 2002 shows that the legislatures with the highest percentage of women are Sweden 42.7%, Denmark 38%, Finland 36% and Iceland 34.9%. In India ‘’The New Panchayati Raj‘’ is the part of the effort to empower women at least at the village level.

Objectives:

- To analyse emerging rural socio-economic and political sub-structures.
- To identify the major socio-political parameters; e.g. literacy, marriage, religion, superstitions, family planning; and political awareness, involvement-participation, and to assess the degree and nature of women empowerment.

Universe of the Study

The study was carried out in the district of Patna. Universe for the study is as follows:

1. Women headed panchayats representative of selected Gram Panchayats.
2. Non-representative women of the selected Panchayats.

Patna is the capital of Bihar. Furthermore, the district has an unbalanced gender ratio and low female literacy rates. This is particularly concerning because the district has the financial resources to encourage women's education. Women in rural areas endure discrimination due to a patriarchal culture that undermines their economic contribution even as manual labour.

Sampling unit

The sample unit for the study is

1. Representative Women, and
2. Non-representative women

Sampling Size and Method of Sampling

Patna is one of the most developed districts of Bihar in terms of socio-economic and political indicators. Impact of modernization, urbanization, level of literacy, exposure of democratic values and level of consciousness is also higher in the district. Patna district has been purposefully selected to analyse the impact of Panchayati Raj on empowerment of rural women within this development scenario. For comparative analysis two block has been selected- one developed block in terms of development indicators and another under-developed in above terms

Sources of Data

- Primary data: collected data from field
- Secondary sources: Panchayat records, voter list, documents, literature, various governmental and NGOs reports, etc

Number of Elected Panchayat Representatives at each level

Last few years the most positive development has been the growing involvement of women in the Panchayati Raj institutions. There are many elected women representatives at the village council level. At present all over India, there are total 20, 56, 882 lacs village panchayat members, out of this women members are 8,38,244 (40.48%), while total Anchalikpanchayat members are 1,09,324, out of this women members are 47, 455, (40.41%) and total Zillaparisad members are 11, 708, out of this women members are 4, 923 (42.05%). At the central and state levels too women are progressively making a difference. Today we have seen

women chief ministers, women president, different political parties leader, well establish businessmen etc.

Elections to the Panchayats in Bihar already held in May-June 2006. It is to be noted that reservations for women were enhanced to 50% and reservations have also been provided for the category of Extremely Backward Classes. As of October 18, 2006, details of elected representatives to Panchayats are as follows:

Table 1.

Numbers of Elected Panchayat Representatives at each level:Bihar(2006)					
	Unreserved	SC	ST	Total	Women
Elected members	92998 85.34%	15256 14.00%	716 0.66%	108970 100.00	59933 55.00%
Mukhiyas	6674 79.20%	1685 20.00%	68 0.80%	8427	4219 50.06%
PanchayatSamiti Members	9139 79.20%	2307 20.00%	91 0.79%	11537 100.00	5671 49.15%
ZillaParishad Members	956 82.63%	192 16.60%	09 0.77%	1157 100.00	577 49.87%
Panch Members	76710 83.05%	14776 16.00%	875 0.95%	92352 100.00	51717 56.00%
Sarpanch	7027 83.20%	1351 16.00%	68 0.80%	8446 100.00	4008 47.45%
Total no. of Elected Panchayat Representative				229732 100.00	126125 54.90%

Source: Government of Bihar, 2006

After getting 33% reservation in the Bihar Panchayati Raj Institutions, in the year 2001, as a member of the Gram Panchayat 106029, as a member of the Panchayat Samiti, 11611- and 1162-women's representative in the form of district council has been selected. In the year of 2006, Elected members59933 (55.00%), Mukhiyas 4219 (50.06%), Panchayat Samiti Members5671 (49.15%), Zilla Parishad Members 577 (49.87%), 4008 (47.45%) Sarpanchs and Panch Members are 51717 (56.00%) Women Panchayats Representatives have been elected. This is the first time in Indian history that 126125 (54.90%) out of 229732 total no of elected Representative at all levels of Panchayat. Women have been selected, which is a record.

The first step for the political empowerment of women has been initiated with 33% and second step, first of all Bihar declare the 50% of seats reserved for women in the panchayat Raj institutions in 2006 under the amended panchayat Raj Act. Already over a million women are

now functioning as elected members in the councils of panchayati Raj institutions. Fifty present of these institutions are headed by women as mukhiya, elected members, sarpanch, Panch Members, Panchayat Samiti Members, Zilla Parishad Members of Bihar PRIs.

Impact on Education

Educational attainment is one of the vital developmental indicators. It indicates quality of life, awareness and skill level in the society. Better education brings positive impact in the society and brings change in the life style of women. So, impact of education on women representative in Panchayati Raj Institutions (PRIs) has been examined. Above trend shows that due to batter economic conditions of representative women as compare to non-representative women, girl child of representative women attending schools is higher than non- representative women. That is the cornerstone of women empowerment through education.

Political Empowerment of Women

Political participation is a process to grow as citizen. Women participation show the extent to which assumed new role and its legitimization by political structure. Their participation started with social movement for equality in gender based social structure. Right to vote and reservation of political seats provided them opportunity to be the ruler of their own fate. Traditional thinking of society is essential for women safe zone and situated in the home has under gone a change among women due to panchayati raj institution (PRI) in political field. But now at a present time women are self-connecting with politics. It's a major change in social and political sub structure in rural area. Thus, concluded that majority of respondents self-connected to politics. This is a significant change of women in study area; it's a sing of women politically empowered.

Participation of Women in Family Activities and Decision-Making Process

Women are empowered when they have the authority and capability to carry out specific responsibilities. Women's participation in development activities and programmes would be considerably aided if they were provided with the necessary tools and resources. Women's empowerment is examined in this study, with particular attention paid to the authority women have over household decision-making process. In Bihar, where male heads of home are the norm, female heads of family are not acknowledged as family heads. For the first time, an attempt has been made to define what goes on within a husband's head (Alexander Amy C. 2007). On the ration card and in other family surveys, a male is classified as the head of the household, which clearly indicates that he is the primary breadwinner and decision-maker in the household. Despite the fact that the husband may earn more money, in certain circumstances it is the woman who is in charge of making the final decisions. There are many different ways to describe empowerment, but it ultimately boils down to empowering women in all aspects of their lives, including the realms of economics, social work, and politics. We will not be able to achieve sustainable development until we first empower women. It is required for the advancement of gender equity and growth. Thus, conclude that it's a good sing of women authority/responsibility and a women empowerment in the house. From above

data it can be seen that after 50% reservation in Panchayati Raj, women have started taking decisions in their family matters apart from the political field. This is a direct impact on the participation of women household in the decision-making process.

Traditionally women have been kept out of decision making process and treated as a second fiddle in the family. Without their active participation at all levels of decision-making, goals of equality and peace cannot be achieved (Karl, 1995). Further decision making is classified into five types: family decisions, income decision, children's health, children's education and children's marriage. Globally women are vastly under-represented in power corridor, which is the major barrier of development in the light of above fact; an attempt has been made to find out the role of women in family income as well as in decision making process within their family.

Contribution of women in family income has increased in non-representative women in present time compare to representative women put their contribution has declined in present time. This may be due to more alternative employment opportunities in developed Panchayats, together with strong traditional values in under-developed panchatats. Data also reveals that participation of women in decision of children health and education has increased in their representative than non-representative women. That is multiple reason are- awareness and concerning of health issues, change status in society, further information receive to PRIs etc. This change has been possible due to the Panchayati Raj. Increasing trend participation of women in economic and decision-making activities in their family show their empowerment within the family as well as in the society. During field visit and group interview it has been observed that respect of women in all community has also changed in the study area. The credit for this change in these goes to Panchayati Raj.

Impact Analysis of Panchayati Raj in Women Empowerment

Women, on the other hand, are a tremendous source of political, social, economic, and health opportunities in the United States. Women with disabilities have often received a negative portrayal in the media. Untold numbers of regulations and guidelines prevent individuals from having a role in how decisions are made. However, even though women have equal rights under the constitution and the laws of the land, they still have a long way to go in terms of equality and empowerment. It has been asserted that the success of a nation is directly tied to the success of its female citizens. Consequently, the emancipation of women is a necessary condition for societal progress (Vijayalakshmi, 2007). Thus, we can say that most of the respondents have little or no knowledge about the rules of Panchayati Raj. This information will prove helpful in their political empowerment. Overall figure of field data reflected that major governmental scheme of villager's related issues taken with the help of women in multiple scheme benefited. It means non-representative women have been direct benefited of governmental scheme related issues in study area.

Women Empowerment and Political Participation

In accordance with Thurairajah, (2010), voter support for democracy, together with a sense of communal responsibility and civic duty, are associated with well-established and stable

democracies that have a high degree of political engagement among their citizens (2005). According to Pragya (2013), improving citizen participation in local government can be accomplished through a variety of means, including frequent elections, improved access to information, and systems for deliberative decision making on the supply side of the government. Representatives and leaders of the people must take an active role in politics. In a democratic society, men and women should be treated equally, regardless of their gender. The grassroots level is where women's political equality must begin if it is to be meaningful and effective.

Thus, we can say that most of the respondents have little or no knowledge about the rules of Panchayati Raj. This information will prove helpful in their political empowerment. Thus, conclude that majority of respondents are not aware of panchayat election fee and conducting gram panchayat election. There is only one reason due to illiterate and domination of patriarchal setup in our society.

Conclusion

This study analyzes those factors which have impact on women empowerment through Panchayati Raj Institutions. The socio-economic factors are- decision-making process, political awareness and beneficiaries of government programmes; as well as masculine behaviour in the community. The trend shows that due to batter economic condition of representative women as compare to non-representative women; percentage of girl child attending private school is higher in case of representative women *vis-à-vis* non-representative women. Percentage of girl child going to school is also higher for representative women as compare to non-representative women. Thus, conclude that it's a good sing of women authority/responsibility and a women empowerment in the house. From above data it can be seen that after 50% reservation in Panchayati Raj, women have started taking decisions in their family matters apart from the political field. This is a direct impact on the participation of women household in the decision-making process. Thus, we can say that most of the respondents have little or no knowledge about the rules of Panchayati Raj. This information will prove helpful in their political empowerment. Overall figure of field data reflected that major governmental scheme of villager's related issues taken with the help of women in multiple scheme benefited. It means non-representative women have been direct benefited of governmental scheme related issues in study area.

References

1. AlexanderAmy C. (2007). *Empowering Women: Four Theories Tested on Four DifferentAspects of Gender Equality*. Conference Paper/Unpublished Manuscript, University ofCalifornia, USA.
2. Balasubramanian, T., Dhanalakshmi, N., Saravanakumar, A. R., Paranthaman, G., Manikandan, M., &Chinnappar, G. (2020). Mahatma Gandhi's life and freedom struggle. *Journal of Shanghai Jiaotong University ISSN*, 1007-1172.
3. Batliwala, Srilatha (1995), defining women's empowerment: A conceptual framework Education for women's empowerment, *Geo-journal*, vol.65, p.366.

4. Batra, Vikas (2012), “Swaranjayanti Gram SwarozgarYojana – A Study of Rural Women Beneficiaries in Haryana State”, Man & Development: September.
5. Benke, Ashok Suvarna (2011), “Women in Panchayat Raj Institutions: A Case study In Maharashtra”, Online International Interdisciplinary Research Journal, (Bi-Monthly), Volume-I, Issue-II, November-December.
6. Bhora, O.P, (1997) “women in decentralized democracy” Journal of Rural Development, vol 6.
7. Buch, Nirmala (2012), “Gram Sabha and Panchayat Raj”, Social Action, Vol. 62, January-March.
8. B.R.,Siwal (2002) “Political Empowerment of Women”, Women’s Link, Vol.8, No.2.

A Study on Innovation Research & Development for the Sustainable Progress of India

Dipak Baruah
Asst. Prof. Dept. Of History, Kalabari College, Dist. – Sonitpur, Assam
Email- baruahdipak390@gmail.com

INTRODUCTION-

Innovation is the process of using knowledge and technology to develop, improve, or improve the production or performance, of products, services and processes that have value in terms of commercial impact or social benefit. Innovation is often bundled with science and technology (STI) in discussions on economic policy. The Oslo Manual (OECD/Eurostat, 2005), defines innovation as "the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. Knowledge, learning and innovation processes are affected by economic, social, cultural, institutional and historical conditions and inheritance; Knowledge, learning and innovation processes are an integral part of economic and social development; They are key to achieving sustainable and inclusive development; Innovation is a major driver of growth and diversification; Innovation stimulates trade and investment, and long-term improvements in income and welfare; An appreciation of the developmental and macroeconomic importance of innovation is vital for policymaking; Active innovation policy is required if developing countries are to catch-up and compete with technologically advanced developed countries.

In practice, innovation mostly happens in firms and other organizations. Innovation is an important and often primary component of entrepreneurial activity. We observe innovation as a search for new or more efficient combinations of resources to better satisfy existing consumer demand or to address unmet or new needs. Therefore, innovation includes the introduction of new products, services and processes, as well as innovations that are novel in a particular market. Innovation includes new or novel processes used by firms and organizations in producing goods and providing services. Innovation happens by pushing forward the frontiers of knowledge and technology. Innovation also happens when firms learn to employ knowledge and technologies that are already used elsewhere. This is often the case in many developing countries. From a development perspective, technology acquisition, imitation and adaptation are key innovative processes and require more government policy attention than scientific research. The term innovation is often used in a similar context as invention or creation even though it has a fundamentally different meaning. Innovation is increasingly dominating discussions. Innovation, Policy and Development with regard to public policy and entrepreneurship, and is replacing invention in common use. Historically, invention has been discussed as a central factor in industrialization and the strong economic growth that resulted in todays' developed economies. The change in focus from invention to innovation was sparked by the discussions of Schumpeter (Godin, 2008). Schumpeter proposed that innovation was an economic decision: a firm applying an invention in its

products or production process. Invention on its own, on the other hand, was an act of human creativity and was of secondary importance for economic decision-making (Schumpeter, 1939). As the world continues to grapple with the pernicious Covid-19 pandemic, the role of innovation has regained importance. The pandemic was dealt with rigorous research and development (R&D) in the health domain with COVID-19 vaccines being developed, clinically tested and manufactured at unprecedented speed. Likewise, technological advancements enabled by R&D have transformed health, transportation, communication, energy, and manufacturing industries across the globe. As R&D emerges globally as one of the major drivers of socio-economic development, it will play a major role in achieving India's aspirations and goals. COVID-19 accelerated the adoption of new technologies. In India too, the pandemic led to the emergence of several path breaking ideas. Never before has the need to adapt and adopt new technologies and innovations felt more urgently. The evolution of human existence can be traced back to simple yet innovative endeavours such as invention of the wheel, to modern techniques such as rearranging of DNA. Innovation has been steering human progress globally. It is not merely technological progress. In fact, the most prominent feature of an innovation-driven society is the dynamic attitude of its people. Innovation has become intrinsic to economic development, but it took a long time for economists and policymakers to realise that. Innovation in the form of knowledge accumulation and better human capital promotes economic growth. In the same manner, increasing economic growth fosters higher levels of knowledge capacity and an improved quality of human capital. Thus, there is a bi-directional relationship between economic growth and innovation, but the direction and the strength of the relation depends on the development status of the nation. Countries with high innovation capabilities have invested heavily in human capital development at all levels. The aim has been to develop specific skills beyond technical knowledge, like imaginative thinking, devising methods to tackle complex issues and keeping pace with the times. Thus, human capital is the source of innovative ideas, knowledge, and practices. With a growing knowledge-based economy the reliance on physical inputs and natural resources reduces where more attention on a skilled workforce for advancing technical and scientific innovation is required. A post-COVID world requires a new development strategy. A conducive ecosystem that enables innovation and technological advancement needs to be built to achieve the same. Therefore, through policies that are inclusive and sensitive to the aspirations and needs of the country, an innovation-driven economy needs to be developed. India is home to 1.3 billion people, and the country accounts for a fifth of the world's youth population. We can utilise our demographic dividend to foster innovation and drive the nation towards becoming a knowledge economy. In India, the IT sector has seen considerable growth, and various major cities have been transformed into global IT hubs through substantial R&D investment in the industry. Bengaluru spearheaded the IT revolution in the country, and today, the city is a global technology innovation hub and the country's startup capital. In recent years, through public sector investment, academic collaborations and foreign direct investment (FDI), India is emerging as an R&D centre in the pharmaceuticals and telecommunications sectors. These sectors have been driving economic growth in the country. Further investment in these sectors and promoting R&D activities in other sectors can enable the bi-directional cycle of fostering innovation and economic development.

Innovation cannot be fully understood without comprehending the opportunities and challenges that it entails. Thus, it becomes imperative to deep dive into innovation with reference to Indian context and identify where our opportunities and challenges lie.

ii) Aims and Objective of the paper-

i) To mention the factors that affect innovation
ii) To highlight measures regarding R & D ecosystem development in India.
iii) To Pointout significant achievement of India in R & D Sector.

iii) Methodology

In this paper most of the information's are collected from secondary sources. Data's are collected from books, journals & Internet sources. For discussion and analysis descriptive method has been followed here.

iv) Discussion –

A) some factors that affect innovation on R&D in India.

1) Research and development (R&D): -

The global experiences of development have presented unique lessons in the importance of strengthening R&D to gain strategic advantages. R&D has played a significant role in the growth of developed countries. In India, R&D investment has been relatively low. In the past few years, R&D investment in the country has declined from 0.8 per cent of the GDP in 2008–09 to 0.7 per cent in 2017-18. This is lower than the other BRICS nations — Brazil spends about 1.2 per cent, Russia about 1.1 per cent, China just above 2 per cent, and South Africa around 0.8 per cent, with the world average being about 1.8 per cent. On the other hand, developed countries like the United States, Sweden, and Switzerland spend about 2.9 per cent, 3.2 per cent and 3.4 per cent, respectively. Among all nations, Israel spends the most, 4.5 per cent, of its GDP on R&D. One reason for the low spending on R&D in developing countries like India is that 57 investments in R&D take time to produce results. In a country like India where there are bigger issues — such as hunger, disease control, and raising the quality of life — to contend with, resources are often diverted towards tackling them. However, it can be argued that these pressing concerns shouldn't be viewed as a hindrance, rather an opportunity to widen the ambit of R&D. Research has been able to come up with solutions to such issues in the past. The government spends the most on R&D (over 60 per cent). Low private participation is one of the key hindrances in India's overall low R&D expenditure.

2) Firm size

The problem of the 'missing middle' is another area that warrants attention. India is a country where the manufacturing sector is peculiarly structured, with either a very small-sized firm (less than 50 employees) or a very large-sized firm (more than 500 employees) and a clear 'missing middle'. This structure causes a number of problems, one of them being a vast difference in productivity, whereby the large-sized firms are 10 times more productive than the small-sized firms. This difference also shows up in innovation. Large-sized firms have a greater tendency to reap the benefits of innovation than their small-sized counterparts. This could be due to economies of scale, higher costs incurred, etc. Also, R&D in small-sized firms is not so formal and visible as compared to the large-sized ones. Therefore, the small-sized firms rely on finagling around things. This is important given the relative importance of MSMEs in India. With more than 6.5 crore MSMEs contributing roughly 30 per cent to the GDP, there is no doubt that a transition to a mid-sized or large-sized firm and a shift from informal to formal R&D would further enhance the role of MSMEs and innovation in India.

3) Labour market

It is sometimes believed that adopting new and innovative technologies would displace labour from the market. In India, this belief can cause great concern due to the country's massive labour force. However, this is not always true as innovation has the capacity to generate new jobs as well. Analysing data for pharma, transport, ferrous metals, and textiles for the period 2000–01 to 2013–14, showed that there exists a positive relationship between innovation and employment. In fact, it suggested that innovation is the factor that would drive long-term growth and employment. Moreover, it is not just labour availability and the quality of labour but also labour legislations that affect innovation. A right balance between labour laws that doesn't compromise on labour standards which also promotes an environment that is conducive to nurture innovation is something that should be strived for.

4) Demographic dividend

India's young population is one of its biggest assets. Currently, more than 60 per cent of India's population is in the working age group (15–59). The energy and potential of this age group can be rightly channelised towards innovation. There is always an element of risk involved in innovation. But most Indians tend to be risk-averse, which is tied to a fear of and intolerance for failure, making it difficult to generate innovative ideas or promote existing ones. In the absence of adequate support — moral, financial, and other — our youth migrate to other countries. The numbers presented below do not decipher them into how many migrated for research purposes, but just shed light on the fact that the number of migrations from India have risen considerably over the years. Therefore, India should prevent brain drain by providing them adequate support and channelise their energy which would be salubrious for research and innovation in India.

5) Market demand

Research should also be aligned to the demands of the industry. It is observed that there is a mismatch between what is taught at the university level and what is required at the industrial level. the research agenda of these institutions. Subsequently, industrial firms can reduce their costs by outsourcing their research and collaborating with educational institutions. To resolve this, we need a working model between the two. Working with the academia and research institutions can allow firms to gain early access to research outputs and influence To better understand the potential of Indian research one need only look at the number of patents filed in the country over the years. The number of patents filed has increased at a compound annual growth of 3.63 per cent in the last decade. Lastly, funding research with a sense of obligation or to meet some targets should not be the purpose. Institutions/stakeholders should believe in its inherent importance.

6) Venture capital

Venture capital provides not only the funds necessary to run a business but also the required personnel and expertise to utilise the same. It has gained importance since banks show unwillingness to extend credit to newly established enterprises due to lack of collaterals and a high risk of default. Although microfinance provides capital for businesses, its limited scope and amount curtail the innovative capacity of an undertaking. In India, the amount of funding received through venture capital and private equity flow has risen from Rs 4 billion to Rs 1,327 billion in the last two decades. Venture capital has produced market giants in India too. However, some caveats follow. Venture capitalists' investments have moved away from early stages to later stages worldwide. This can be demotivating to a young and aspiring entrepreneur who has the innovative capacity but not the money. This is where the government can step in. It can create an ecosystem that promotes entrepreneurship and innovative thinking. This can be in the form of reducing capital gains tax, higher spending on R&D, expediting administrative processes, providing seed funding, etc.

7) Delay in acquiring patents-

Innovation leads to the creation of economically-useful knowledge, in the form of intangible assets that can be an output of a production process as well as an input into the creation of new output. These include creative works, scientific works, discoveries, inventions, computer software, and systems created within businesses. In India, intangible assets like patents and trademarks filing process are complex and face procedural delays. According to the Economic Survey 2021-22 of India, the average pendency for final decision in acquiring patents in India is 42 months as of 2020. This is much higher than 20.8, 20, 15.8 and 15 months respectively for the USA, China, Korea and Japan. India has reduced average pendency for final decisions in acquiring patents from 64 months in 2017 to 52 months in 2019 and further to 42 months in 2020. However, for intangibles to create spill-overs, it is important to encourage more

startups to file patents across India. The objective of is to develop an understanding of innovation. This is done by relating innovation to concepts such as knowledge, learning, science, technology and innovation policy, and national systems of innovation. The issue is approached from a theoretical and historical perspective and with reference to certain practical challenges that affect developing countries. Firms and entrepreneurship are central elements in this discussion.

B) MEASURES THAT BOOST R&D ECOSYSTEM IN INDIA-

Building Institutional framework: Since independence, India has established a wide network of institutions working towards research and development in varied fields Governmental ministries, departments and agencies like Ministry of Earth Sciences (MoES), Department of Science and Technology (DST), Department of Scientific and Industrial Research (DSIR), Office of the Principal Publicly funded autonomous/semi-autonomous institutions, research councils and research centres such as Bhabha Atomic Research Centre, ISRO, CSIR, ICAR, BARC etc. Public Sector Enterprises like Biotechnology Industry Research Assistance Council (BIRAC). Streamlining regulatory processes: Employing digital technologies in the processing of the research proposals involving online receipt and online processing of the proposals for review and approvals and digital transfer of the research grants. Strengthening intellectual property rights (IPR) regime by establishing dedicated body-Cell for IPR Promotion and Management (CIPAM); ensuring compliance to TRIPS (Trade Related Aspects of Intellectual Property Rights); providing incentives such as 10% rebate on online filing, 80% fee concession for Start-ups, Small Entities and educational institutions etc.; raising IPR awareness etc. Facilitating private investment in R&D: through measures like Fiscal Incentives for Scientific Research such as 100% write-off of revenue expenditure on R&D. Permitting FDI under 100% automatic route in R&D sector subject to applicable laws/regulations, security and other conditionalities. Allowing corporate sector to make R&D investments under the provision of Corporate Social Responsibility (CSR). Promoting research and innovation through Start up and entrepreneurship: Schemes like Start-up India, NIDHI (National Initiative for Developing & Harnessing Innovations), Atal Innovation Mission's Atal Tinkering Labs and Atal Incubation Centres, Innovations for Defence Excellence (iDEX) etc. are primarily aimed at promoting and supporting innovative ideas and successfully transforming them into commercial R&D ventures.

Providing infrastructural support to researchers through schemes like- SATHI (Sophisticated Analytical & Technical Help Institutes), SAIF (Sophisticated Analytical Instrument Facilities), FIST (Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions), Indian Science Technology and Engineering facilities Map (I-STEM) etc. Enhancing participation of women researchers: Schemes like KIRAN, SERB-POWER (Promoting Opportunities for Women in Exploratory Research) etc. aim to mitigate gender disparity in science and engineering research funding in Indian academic institutions and R&D laboratories. Reversing brain drain to brain gain through initiatives like- 'VAJRA' which aims to brings the best of global science and scientists to India, including NRIs.

National Post-Doctoral Fellowship Programme to encourage PhD recipients to stay in India. Scientific Adviser, Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC),
Science & Engineering Research Board (SERB), Department of Biotechnology (DBT) etc., Research Councils of India. They were established and made responsible for curving edge Research & Development activities/knowledge base in diverse areas or fields. Some prominent research councils include Space Indian Space Research Organization (ISRO) Defence Research and Development Organization (DRDO) Nuclear energy Department of Atomic energy (DAE) Industrial research Council of Scientific and Industrial Research (CSIR) Agriculture Indian Council of Agricultural Research (ICAR) Medicine Indian Council of Medical research (ICMR) SCIENCE POLICIES

PROPELLING INDIA'S S&T GROWTH: -

Largely emphasised basic research in almost every field of science. Provided the required directions to set up organisations like DRDO (1958), DST (1971), Department of Space (1972) etc. Majorly focused on achieving technological competence and self-reliance. Technology Development Fund (TDB) established to provide financial assistance to Indian industries.
Technology Information Forecasting and Assessment Council (TIFAC) established for continuous and systematic forecasting and assessment studies of emerging technologies. Majorly focused on achieving technological competence and self-reliance. Technology Development Fund (TDB) established to provide financial assistance to Indian industries. Technology Information Forecasting and Assessment Council (TIFAC) established for continuous and systematic forecasting and assessment studies of emerging technologies Laid emphasis on creating a robust environment for enhanced private sector participation in R&D. India streamlined its efforts by launching several flagship initiatives including Make in India, Atal Innovation Mission (AIM), Start-Up India, Stand-Up India, Fund of Funds for Start-ups (FFS), introduction of the Patent Box Regime, Regulatory Sandbox, etc. India increased her participation in global mega-science projects, including the Laser Interferometer Gravitational Wave Observatory (LIGO), the Large Hadron Collider (LHC-CERN), the International Thermonuclear Experimental Reactor (ITER) etc.

Policy framework:

The government is currently in the process of drafting its 5th Science, Technology and Innovation Policy, 2020. The policy by way of its decentralized, bottom-up, and inclusive design process aims to strategize priorities, sectoral focus, and methods of research and technology development for larger socio-economic welfare.
Further, Union Budget FY 2021-22 proposed an outlay of Rs 50,000 crore, spread over five years, for National Research Foundation envisioned under the National Education Policy, 2020 to enable a culture of research to permeate through our universities.

Attracting youth to research through Scholarships/grants/fellowships under schemes like Prime Minister's Research Fellowship (PMRF) scheme, Innovation of Science Pursuit for Inspire Research (INSPIRE) etc.
Dedicated Technological missions to direct R&D efforts in emerging fields, e.g., National Supercomputing Mission, National Mission on Quantum Technologies and Applications, National Mission for Deep Ocean Exploration (DOE), National Mission for Bio Science for human Health, National Mission for Artificial Intelligence, etc.
International cooperation: India cooperates bilaterally with several nations such France, USA, Israel and Germany in the field of R&D. Further, India is partnering in various international programs such as International Solar Alliance, Mission Innovation, International AIDS Vaccine Initiative etc.

In the recent decades, India has shown considerable progress in the field of R&D which is evident by its performance in the Global Innovation Index (GII) 2021 released by World Intellectual Property Organization (WIPO), where India ranked 46th among 132 economies, quite an improvement from 81st in 2015-16. India's innovation ecosystem stood 2nd among 34 lower middle-income economies and 1st among 10 Central and Southern Asian economies. Further, there have been several positive trends pointing towards growth in India's R&D sector- R&D expenditure: India's Gross Expenditure on R&D (GERD) that nearly tripled between 2007-08 to 2017-18 and per capita R&D expenditure increased 1.5 times. Patents: Filing of patents have increased more than 50% in a span of 7 years from (42763 in 2014-15 to 66440 in 2021-22). Grant of patents has increased nearly five times in 2021-22 (30,074) as compared to 2014-15 (5978). Reduction in Time of patent examination from 72 months in Dec 2016 to 5-23 months at present, for different technological areas. For the first time in the last 11 years, the number of domestic patent filing has surpassed the number of international patent filing at Indian patent office in the Quarter Jan-Mar 2022. Other prominent schemes: Manthan platform to drive collaboration between the industry and research institutes to implement technology-based social impact innovations and solutions in the country. AGNIi scheme to support the national efforts to boost the innovation ecosystem in the country by connecting innovators across industry, individuals, and the grassroots to the market and helping commercialize innovative solutions. Impacting Research Innovation and Technology (IMPRINT) programme to address the most socially relevant challenges in the field of engineering, technology, and self-reliance for translating research knowledge into viable technology products and processes. Foreign Investment: India attracted USD 343.64 million FDI equity inflow in R&D sector during C.Y. 2021 (Calendar Year) which is 516% higher as compared to previous C.Y. 2020 (USD 55.77 million). Researchers: The number of researchers per million population has more than doubled since 2000.5th largest office for trademark filing activity overtaking Japan. (WIPO report) 3RD 3rd 9TH 9TH in Number of PhDs awarded in Science and Engineering (attire the USA and China). in Number of publications (from 6th in 2013) based on National Science Foundation database, USA. in Resident Patent Filing activity in the world. (WIPO report) 3rd in Start-Up ecosystem and in terms of number of Unicorns. (Economic Survey of India 2021-22) 3Rd 5TH in the Quality of research publications (from 13th in 2013) in the world's reputed and recognised SCI Journals.

INDIA'S GLOBAL PERFORMANCE ON OTHER PARAMETER PATENTS IN INDIA -

Mars Orbiter Mission (MOM) made India the first nation in the world to reach the Martian orbit in its maiden attempt. Successfully developed indigenous Cryogenic Upper Stage engine. Launched 2 missions to the moon- Chandrayaan-1 and Chandrayaan-2. Successfully established and operationalised the Navigation with Indian Con- stellation (NavIC). Polar Satellite Launch Vehicle (PSLV) emerged as the reliable and versatile workhorse launch vehicle of India used by multiple foreign nations. Successfully, tested new technologies such as Supersonic Combustion Ramjet (SCRAMJET) engine, Reusable Launch Vehicle Technology etc. Future endeavours: Human Space Flight mission- Gaganyaan Programme, mission to study the Sun- Aditya L-1, 3rd mission to moon-Chandrayaan-3 to attempt to 'soft land' on the moon. Space Technology

R&D SECTOR NOTABLE ACHIEVEMENTS IN INDIA –

Medicine Defence Global supplier: In the global market, India is the largest supplier of generic medicines, accounting for 20% of the worldwide supply. India also caters to 60% of the global vaccine demand. Indigenously developed vaccines: ROTAVAC against rotavirus, CERVAVAC against Human Papilloma Virus (HPV), COVAXIN for Corona virus etc. Major products developed for defence use by the DRDO: Light Combat Aircraft (LCA) Tejas; Airborne Early Warning and Control (AEW&C) System Weapon Locating Radar (WLR) Swati; High Speed Heavy Weight Ship Launched Torpedo (Varunastra); Akash Weapon System; Abhay Sonar etc. With Mission Shakti, India became the fourth nation in the world to have demonstrated anti-satellite capability based on indigenous technology. India is the 5th country in the world to have developed an indigenous ballistic missile defence programme. Despite, considerable progress and numerous achievements, India's R&D ecosystem still lags behind major global economies and perform inadequately on key R&D parameters. For instance, Indian residents contribute only 36% of patents filed in India as compared to 62% on average in the top ten economies.

C) SIGNIFICANT ACHIEVEMENTS OF INDIA'S R&D ECOSYSTEM INDIA IN REALIZING ITS GROWTH POTENTIAL IN THE R&D SECTOR-

* Achieving sustained economic growth: It has been seen that R&D has been a major determinant of economic growth in developed countries around the world. R&D facilitates long term economic growth by bringing industrial transformation, increasing productivity, expanding the markets, creating employment and generating wealth and capital.

The Intellectual Property generated from R&D also brings in revenue to the economy in the form of copy rights and patents

Creating a knowledge-based economy:

As India emerges as one of the world's largest economies, it needs to gradually move from being a net consumer of knowledge to becoming a net producer. Innovation enabled by R&D

fosters positive knowledge spill overs, encouraging future technological change and other innovation activities.

Solving socio-economic challenges for sustainable growth:
In developing countries, innovation is not only associated with economic growth but also with poverty alleviation, reduction in inequality, increase in social mobility and improvements in standard of living.

Promoting self-reliance and resolving trade imbalances:
Development of indigenous technologies is crucial for fulfilling the dream of Atma-Nirbhar Bharat (Self-reliant India) and strengthening India's trade profile which has been substantially impacted by the increasing imports and decreasing exports in the hi-tech sector. E.g., R&D in the defence sector can help reduce import dependence, whereby India accounts for 11% of global arms imports, according to the Stockholm International Peace Research Institute (SIPRI). Attracting foreign investments: Access to technical competencies is one of the significant factors for attracting investments in India to expand manufacturing and production operations under the ambitious 'Make in India'. R &D and innovation play a significant role in addressing urgent developmental challenges such as providing access to clean drinking water, low cost renewable energy solutions, eradicating neglected diseases, reducing hunger, etc.

Suggestions & Conclusion –

The experiences of successful countries show that science, technology and innovation policies that are integrated into national development strategies can help raise productivity, improve competitiveness, and foster economic growth. Frontier technologies can bring enormous benefits to the lives of poor people with immense prospects in agriculture, health, education, energy and other areas of development. To reap these benefits, strategic efforts are required for stimulating the R&D ecosystem and encouraging ambidextrous, multipolar and disruptive innovations to meet the dynamic market conditions, developmental needs, and environmental sustainability.

Competency in using advanced technology is very must require to make the nation as well developed one in all fields. Morality and ethics must be given emphasis and followed scrupulously in research to present a true picture of the findings. The ethical codes of doing research must be taught to the researchers must be encouraged to focus on intuitive and objective ways of doing research to enhance the quality of their researchers.

A combination of specific conditions and resources are heeded to create outstanding universities (Altbach, 2006), which include; sustained financial support, with an appropriate mix of accountability and autonomy, Indian science needs to connect better with global efforts to address problems unique to India, but relevant in the global context, and to ensure that research capacity is built in a sustainable manner. India cannot build internationally

recognised research-oriented universities overnight, but the country has the key elements in place to begin and sustain the process. The great scientist Dr. S.S. Bhatnagar (1945) had very emotionally appealed in his presidential address for strengthening science, "I dream of the Tennessee Valley, but not without hope; for all this may happen to any river valley in India, to the Damodar, to the Ganges, to the Sutlej, to the Nurbudda, to the sone; if the people and the
Government just give science a chance."

The holistic approach of inter-disciplinary research and projects will create new inter-disciplinary courses for imparting new perspective in every subject. Sponsoring research projects has to be carried out intensively and the young researchers have to be encouraged to bring forth quality in their findings and inventions. Excellence can be realised in Indian universities only when the quality of education is improved. Improving the standard and quality of teaching, research and extension should be given utmost care and attention by all higher educational institutions and that will enhance and establish excellence in all domains of education. All possible ways and means should be explored and implemented to raise the standard and quality of teaching and research. The practical knowledge must be imparted to make students compete at the global level.

To pursue the dreams of making India the 'Innovative Capital of the World', the enterprise needs to realign itself and develop and commercialise the technologies, processes, etc. emanating from the various national R&D institutions / universities. India's scientific community has to forge strong links with the scientific and industrial community in India and abroad and develop a wide network of research institutions, academia and industry for the commercialisation of know-how developed in R&D laboratories. They have to get recognised as a large repository of a wide range of technologies spread over almost all areas of industries, viz. agriculture and agro-processing, chemicals including pesticides, drugs and pharmaceuticals, biotechnology, metallurgy, electronics and instrumentation, building materials, mechanical, electrical and electronics, etc. It will happen by licensing the indigenous technology to entrepreneurs, startups, MSMEs, etc. and helping them to establish a large number of small and medium scale industries. Promoting closer links between universities of countries and encouraging collaborative research will invariably lead to an inward flow of technology. The concept of 'sister universities' may also be applied to connect institutes, which share research goals and priorities. An extension of this measure is also fostering a strong link between the industry of a nation and foreign universities and vice versa.

Today's progress is the result of past innovations; today's innovations, in turn, sow the seeds for progress in the years to come.

References-

1. Altbach P. (2006) Higher Education in India; The Hindu
2. www.visionias.in
3. International Journal of Scientific & Innovative Research Studies vol 6 2018 P.P.-128
4. INVENTION INTELLIGENCE January-February 2021, Recent Trend in Research and innovation in higher education in India P.P.- 12

Study of Indo-Nepal Trade and Economic Relation

Dr Kameshwar Paswan
Assistant Professor, Dept. of Economics, M.K. College, Laheriasarai, Darbhanga
Email- kameshwarpaswan.1975@gmail.com

Abstract:

Trade and Economic relationship between Nepal and India is unique. There are historical, geographical, cultural, linguistic, ethnic, social and family links between people living in India and Nepal. Institutions relating to government and the economic activities are also more or less similar. Therefore, the trade and other related relationship between Nepal and India has its own significance. Trade relationship between these two countries often goes beyond the economic reason significantly influenced by the social-ethical norms and values. Research and studies reveal that both the countries have comparative cost advantages in trading amongst themselves for several reasons. Historic trade relation, geographical proximity, identical culture, similar agriculture productions are cited few examples quite repeatedly. Economical transport cost is seen as another important factor determining the volume of trade between these countries. In view of the rising energy costs, it often considered that the transport costs are likely to rise so that the transport cost advantage to both these countries trading with each other is likely to increase in future. This would further increase the potential for trade between these countries. Economic cooperation between Nepal and India is based on the movements of goods and services across Nepal-India border of about 1,600 km. The movement is free and spontaneous. This movement further accelerated by the movement of people for economic pursuits, social and marriage relations. The cultural ties and non-existence of visa system have created better environment for the conduction of free trade between the two countries.

Keywords: Economic, Trade, Social-ethical, Cooperation, Transport.

Introduction:

The Economic and trade relationship between India and Nepal has a very long history. It has been continuing since time immemorial. In the recent time too, Nepalese trade has been heavily consent rated to India making the latter as the single largest trading partner of Nepal. However, despite a long history of involvement in trade activities, the nature and composition of Nepalese exports could not have got significant shift from agro-forestry based low value added primary commodities to capital based modern manufacturing products. Even if there are a few manufactured exportable, they are incapable of providing the benefits that could have come from both the backward as well as forward link ages to the Nepalese economy. Indo-Nepal trade has its own importance for the economic development of both these countries. Trade relation with India is rather crucial to Nepal particularly due to her land-locked geographic characteristics. Trade statistics show an increasing trend of trade in both the exports and imports. However, it is noteworthy that the trade balance is not in favour of Nepal. As such, it does not present a convincing picture in the macro-economic performance

of Nepal. Both the countries have realized the significance of bilateral trade. Trade with India is likely to play further a key role in trade and industrial fronts in the future as well. Trade and transit treaties held between the two countries are continuously reflecting the fact. And, these treaties have increasingly guided the trade direction, more specifically in the case of Nepal. Taking into account these factors, this study has made an attempt to analyze some of the key issues related with Indo-Nepal trade relation and scope for improving trade relationship between these countries in the future.

India is extending economic and technical support to Nepal for almost for decades since 1951. India was the most important donor to Nepal in the early decades after the independence of India. The signing of the India-Nepal Treaty of Peace and Friendship in 1950 established the framework for the unique ties between the two countries. Since the early fifties, India has contributed significantly to the economic development of Nepal. Beginning with major irrigation projects such as the Koshi and Gandak barrages, Indian assistance has significantly contributed to the development of the economic structure in Nepal. Areas of economic relation were mainly confined to the basic infrastructure which covers; airports, irrigation, agriculture, supply of drinking water, roads, bridges, power projects, heath, industrial estates, communication, surveys, education, forestry, building construction, ex-servicemen welfare etc. Many of the projects were associated with the areas of infrastructure building. It is noteworthy that Nepal stepped into an economic liberalization in 1984. The number of aided projects gradually declined after 1985. However, the economic cooperation continues to exist. Assistance in the areas of water supply, medicine packets, financial assistance to cooperatives, scholarships and educational assistance being the other economic cooperation.

Indian assistance to Nepal has increased over the years. From the assistance of an average of IRs. 150 million in the mid-1980s, it has reached to IRs. 750 million in 2019/2020. So far over 120 agreements and letters of exchange have been concluded for Indian aided projects in Nepal totalling over IRs. 4000 million. These figures don't include the supply of subsidized commodities such as rice, sugar, cement, fertilizers, petrochemical etc., refund of excise duty levied on items exported from India, IRs 500 million stand-by credit facility etc. During the year 2019-2020, the utilization was approximately NRs. 450 million. A High Level Task Force (HLTF) has also been formed to oversees progress in Indian-assisted Projects to Nepal. A number of projects including improving physical facilities and infrastructure at important border customs stations and check-posts, pilot projects in rural and community development, small -medium hydro-power project, milk and dairy development, development of an Information Technology Institute etc. are some of the agreed projects. B. P Koirala Institute for Health Sciences at Dharan and 22 Bridges on the Mahakali-Kohalpur sector of the East-West Highway are two projects recently completed. During the SAARC summit held on January 3-6, 2002 a grant of NRs. 800 million was announced by the Prime Minister of India for developmental projects in the social sectors including health, education and rural development of Nepal. India’s other major commitments in Nepal are the setting up of an Emergency and Trauma Centre at the Bir Hospital and the Mahendranagar-Tanakpur Link Road Project. The Raxaul-Birgunj Broad Gauge Rail Link Project is another Project in this

category. Therefore, there is a clear indication that Nepal and India are having cordial economic relationship from quite a long time back.

India has been a key development partner of Nepal. The latter received strong support and solidarity from the people and Government of India in advancing its home-grown peace process as well as in the process of writing the Constitution through the elected Constituent Assembly. Following the massive earthquakes in Nepal in April and May 2015, India promptly offered helping hands. The Government of India has also been substantially supporting Nepal's reconstruction efforts. The Indian cooperation started in 1952 with the construction of an air-strip at Gaucharan. Since then, India has been assisting primarily in the areas of infrastructure development and capacity development of human resources in Nepal. Such assistance received from India has helped supplement the developmental efforts of Nepal. India's economic assistance to Nepal has grown manifold in the past few decades, particularly since the restoration of multiparty democracy in Nepal in 1990. As agreed during the State Visit to India of then Prime Minister of Nepal Mr. Pushpa Kamal Dahal 'Prachanda' in September 2016, a Nepal-India Joint Oversight Mechanism has been constituted co-chaired by the Foreign Secretary of Nepal and the Indian Ambassador to Nepal to review the progress made and resolve issues in the implementation of the projects under India's economic and development cooperation. The Mechanism meets once every two months.

The conventional economic wisdom holds that trade is beneficial to growth of a country. Although one country may have a higher productivity in the production of all goods compared to another country, the relative productivities in producing different goods will differ. Trade is based on the relative comparative advantage and increases welfare in both countries. It has been increasingly stressed in recent years that welfare would only come from increased exports. Trade liberalization, in this direction, paints a picture suitable for export promotion. On the other hand, it is also argued that the participating countries should share the benefits of free trade. Trade liberalization as a policy focus predominantly on diminishing restrictions to the free international movement of goods and services. More, in particular, it includes the diminishing of import quota and the lowering of export taxes. These policies will result in a decrease of the price of importable, and in an increase in the price of exportable. If markets work as they are expected to work, these measures lead to increases in imports and exports. And, a balance trade scenario is obtained. Trade liberalization, more often, forms a part of structural adjustment program of a country. Economic reforms programs in many countries can be seen as a consequence of this program.

It is noteworthy to note that the South Asian economies (SAEs) launched comprehensive reform programs at the beginning of the 1990s. However, some attempts were made towards the opening up of trade and investment regimes in the 1980s. The reform initiatives included, among other things, reducing the level and dispersion of tariffs and quantitative restrictions and improving regulations on domestic and improving regulations on domestic and foreign investments. Nepal and India also stepped towards economic reform process during this period. The new economic thinking involving speedy economic liberalization oriented toward free and competitive market in Nepal and India has, by and large, contributed in changing the scenario of Indo-Nepal trade relation. Steady move towards

economic liberalization undertaken by the both countries brought fundamental changes in the pattern and direction of economic exchanges between them. As such; the traditional age-old relationships between these two neighbouring countries assumed new dimensions with economic and trade liberalization regimes.

India started to deregulate her economy in the mid -1980s when the import restrictions on a number of goods were relaxed by expanding the positive OGL list, tariff rates on capital goods were brought down, and FDI policy was liberalized. In July 1991, the government initiated a comprehensive package of reforms covering trade, industrial and exchange rate policy regimes. The import licensing system has been dismantled. As non-tariff barriers (NTBs) were phased out from all tradable's except consumer goods in early years of 1990s. the quantitative restrictions on the remaining items have been phased out by March 2001, two years ahead of the original schedule. The QRs on imports of around 2300 items from SAARC countries had been removed unilaterally in 1998. The peak tariff rates have been brought down to a maximum of 50 percent from up to 355 percent and average weighted tariff rates have come down from 87 percent to just 20 percent in 2019.

The partial convertibility of rupee on the trade account was announced in the 1992-93 budgets that was subsequently broadened to full convertibility on current account by August 1994. The Capital Issues Control Act was repealed and the Securities and Exchange Board of India (SEBI) was set up as a watchdog for regulating the functioning of the capital market. SEBI has focused on the regulatory reform of the capital market as well as on market modernization. Online trading and dematerialized trading have been introduced. Companies have been allowed to buy back their own shares subject to the regulations laid down by SEBI. In September 1992, the government announced guidelines for investments by foreign institutional investors (FIIs) in the Indian capital market. FIIs are now welcome to invest in all types of securities traded on the primary and secondary market with full repatriation benefits and without restrictions on either volume of trading or lock-in-period. In January 1993, a package of financial sector reform was announced that included permission to new private sector banks including foreign joint ventures. The government has also established a policy regime for the functioning of private non-banking finance companies (NBFCs) and agencies for rating their credit worthiness.

Nepal opened up its economy in the early 1990s with the adoption of economic reform package. The reform measures have since covered almost all sectors of the economy including trade and investment, fiscal and monetary policies, financial and capital markets and other economic and social sectors. The import licensing system and quantitative restrictions were eliminated and tariff rates and structure were reduced and rationalized to make the trade sector competitive. The trade weighted nominal rate of protection declined from about 80 per cent in the early 1980s to about 31 percent in 1994. Similarly, the average rate of protection has declined from about 111 percent in 1989 to 16 percent in 1992. In a similar manner, the number of slabs subject to protection fell from more than 100 in the 1980s to 5 in 2016. Additional measures initiated to promote international trade include the introduction of a bonded warehouse, duty-drawback scheme, initiation of the multi-modal facility (dry port) and an export-processing zone.

The partnership with India in the areas of trade and transit is a matter of utmost importance to Nepal. India is Nepal's largest trading partner. India has provided transit facility to Nepal for the third country trade. Both public and private sectors of India have invested in Nepal. The trade statistics reveals phenomenal increase in the volume of bilateral trade over the years between the two countries. However, Nepal has escalating trade deficit with India. Nepal and India have concluded bilateral Treaty of Transit, Treaty of Trade and the Agreement of Cooperation to Control Unauthorized Trade. A new bilateral trade treaty signed with India in 1996 supported the trade reform program of Nepal. The treaty allows Nepal to export manufactured products to India free of customs duty and quantitative restrictions. Similarly, in order to improve the environment for investment, the Industrial Enterprise Act, 1992 and the Foreign Investment and Technology Transfer Act (1992) were enacted in line with the open, liberal and market-oriented policy. These Acts have further improved investment incentives. No license is required for the establishment, expansion and modernization of industries except for a few related with defense, public health and environment. In short, the environment was made more conducive to larger inflows of foreign direct investment (FDI).

Financial sector reforms have also been carried out to support the trade and industrial reforms. Interest rates were deregulated and joint-venture banks were allowed to open up. Nepal also included full convertibility of the Nepalese rupees on the current account. The overvalued Nepalese currency was also corrected to improve export competitiveness of the trade and industrial sectors. HMG/N has been committed towards trade liberalization through simplification of trade and tax procedures, and also through revising custom tariffs to encourage exports and ultimately attract more foreign investments. Furthermore, various sectoral strategies have been introduced to attract investment. The Hydropower Policy 1992 has opened up new avenues to develop the hydropower of the country by motivating national and foreign private investors in this sector. The liberalized aviation policy has contributed tourism industry significantly. Road, airport construction and telecommunication services have also been opened to the private sector in order to attract more domestic as well as foreign investments and to improve service delivery.

The Nepalese financial system is in the midst of great changes along with Nepal's preparation for entry into World Trade Organization (WTO). Nepal Rastra Bank (the central bank) has given priority to the financial sector reform by developing and updating necessary policies and guidelines for further consolidation of the financial system. Nepal Rastra Bank Act 2002, formulation Financial Institutions Act, Financial Intermediary Act, Debt Recovery Act, management transfer of the two largest banks, i.e. Nepal Bank Ltd. And Rastriya Banijya Bank, proposals for restructuring of the Agricultural Development Bank and Nepal Industrial Development Cooperation (NIDC) can be seen as the major initiatives undertaken in respect to the financial sector reform process. With the growing global integration, there are benefits and advantages to the domestic economy reflected in greater competition with the lower cost and higher quality goods as well as the opportunity for reaching the potential inherit in the country's comparative advantage. To capture those benefits and advantages of global trade, Nepal has commenced the accession process for membership in the World Trade Organization (WTO).

Conclusion:

From the present paper it has been concluded that the India's trade and economic co-operation with Nepal has been governed by several treaties that have been renewed and modified over the years. However, past treaties have been limited to tariff and other duty concessions. Such benefits have been transitory in nature and have not contributed to either growth of Nepal's economy or to sustainable trade between the two countries. India has been a key development partner of Nepal. The latter received strong support and solidarity from the people and Government of India in advancing its home-grown peace process as well as in the process of writing the Constitution through the elected Constituent Assembly. Trade statistics show an increasing trend of trade in both the exports and imports. However, it is noteworthy that the trade balance is not in favor of Nepal. As such, it does not present a convincing picture in the macro-economic performance of Nepal. Both the countries have realized the significance of bilateral trade.

References:

1. G. Haberler, (2017), "Dynamic Benefits of Trade" in G.M. Meier, Leading Issues in Economic Development, Oxford University Press, London. P.56
2. Neelkant (2012), Partners in Peace - A Study on Indo-Nepal Relations, Vikas Publications, New Delhi. P.45
3. S.B. Ragnekar, (2014), "Is the Indian Export Structure changing?" in J.C.Sandesara (ed.), Problems of Indian Economic Development, Bombay University, Bombay. P.87
4. Girish Mishra (2019), Contours of Indo-Nepal Economic Cooperation, Allied Publishers, New Delhi. P.98
5. R.K. Sarma, (2002) (ed.), The Economics of Indo-Nepal Trade, Allied Publishers Pvt. Ltd., New Delhi. P.36
6. Batuk Desai (2016), "25 years of Indo-Nepal Trade", Financial Express, February 16. P.14

Energy Losses in Terms of Heat Due to Wave Propagation

Dr Vishwajeet Kumar Chandel
Dept. of Physics, J P Univ. Chapra

Introduction

For the study of the parameters of the microstripline losses and thermal effects several methods are used and of which some are discussed in chapter-3. The mathematical formulation is based on the conformal transformation technique developed by H.A. Wheeler and Calculation is based on the computer programming `developed by S. K. Kaul using closed form formula of Schwartzman. This technique is too much popular now a day and provides an easy approach for the analysis and synthesis of single and coupled microstriplines and other structures useful in MIC's.

Several authors have developed various methods for the study of characteristics of single & coupled microstriplines. The present chapter deals with the characteristic parameters of isolated microstripline and coupled microstripline and the variations of these parameters with substrate height, strip width and spacing between two microstriplines using different type of substrates for the calculation of different types of losses and thermal effects produced in the coupled microstrip lines when the waves propagate through the structure. The aim of the present study is to calculate the characteristic impedance, phase velocity and guide wavelength for isolated and coupled microstripline and their variations with strip geometries and relative permittivity. All the parallel line couplers, whether mode of propagation is true TEM or not, have the oddand even- mode property which always results in even- mode characteristic impedance (Zoe) and odd-mode characteristic impedance (Zoo), even and odd-mode phase velocity and guide wavelengths. True TEM couplers yield equal phase velocities for each mode whereas microstrip quasi-TEM couplers yield different phase velocities for even and odd- modes.

Using computer technique characteristic impedance and effective dielectrics and their variation with geometry for different dielectric substrates will be computed.

Parallel plate striplines support pure TEM mode of propagation but microstrip cannot support pure TEM mode as it is an inhomogeneous structure and it supports quasi-TEM mode. However, at low frequency the mode of propagation closely resembles the TEM mode. Wheeler calculated capacitances, phase velocities and impedances of single and coupled strips. Following this various approximate methods have been adopted by Crystal, H. Howe [6], MAR Gunston, Policky and Stover etc. Bryant and Weis [43] used Green's function technique and calculated the even- and odd- mode impedances of the coupled microstrip lines. S. Akhatarzad, Thomas R. Rowbotham and Peter B. Johns, M.K. Krage and G.I. Haddad also calculated the even- and odd- mode characteristic impedances of coupled microstrip using different techniques. E. Yamashita and R. Mitra presented an analysis based on variation principle. These results were found in reasonable agreement amongst themselves. Banmali, Rawat and Babu using methods of images calculated the characteristic parameters and founded them in close agreement with each other. The results obtained by image method were intermediate between Wheeler's two results for wide and narrow strips The different methods

developed so far by various authors yield result in close agreement with each other. The present computer aided technique provides an easy approach for the analysis and synthesis of a single and a coupled microstrip lines. The results obtained by this method are also in good agreement with those obtained by Bryant and Weiss, Karage, Haddad, Row Bothom, Peter Johns, B. Rawat and G. R. Babu.

The present work involves the problems in quasi-static limit in lower giga hertz range of frequency. This leads to very useful design criteria especially at lower frequencies. The quasi-TEM allows the magnetic and electric fields to be considered, separately. When only the magnetic field is considered, the dielectric inhomogeneity is ignored, since the dielectric medium is treated as free space. But when considering the electric field, the inhomogeneity must be taken into account since the normal component of electric field is discontinuous at the dielectric interface. [61]

Formulation of the characteristic parameters of isolated

Microstriplines

The derivation of the characteristic impedance of the single microstrip conductor will be carried using conformal trans formal method developed by H.A.Wheeler. In this method microstripline is consider as a parallel plate capacitor. Knowing the capacitance and phase velocity of the structure the characteristic impedance can be calculated with the help of equation given as

Zo = 1/VPCP ---------- 4.2.1

Where, VP = phase velocity of the wave traveling along the
microstrip line.

CP = capacitance per unit length of the line.

The capacitance of the line is the result of the combination of different components indicated. These are:

CPP = parallel plate capacitance between lower surface of the microstrip and the ground plane and is given by

CPP = [Єreff/c.η]. (w/h)

CPPU = capacitance between the upper surface of the microstrip and the ground plane which is expressed as

CPPU = (2/3) [Єreff/c.η]. (w/h) ---------- 4.2.3

CF = the fringing capacitance at the edges of the microstrip and is expressed

CF = [Єreff/ c.η]. (2.7/Log4h/t) ---------- 4.2.4

Where,

w = microstrip width

Єreff = the effective dielectric constant of the medium

h = height of the substrate

η = free space impedance = 377

c = the velocity of light in free space

= 3.0 X 108 m/sec.
t = microstrip thickness.
Thus, the total capacitance (CP) of the isolated microstrip structure is expressed as
CP = CPP + CPPU + CF

or Cp = (Єreff / c.η) (w/h) + (2/3) (Єreff / c.η) (w/h) (Єreff / c.η).
(2.7/Log4h/t) ---------- 4.2.5
This is the expression of the capacitance of the microstrip structure in terms of its geometric parameters.

Phase velocity of the wave traveling in the
Microstripline
The phase velocity is another parameter of the microstripline which is very useful and important for the calculation of characteristic impedance. The phase velocity VP can be calculated by the formula
VP = c / √Єreff ---------- 4.2.6
For wide strip, Єreff □ Єr, and

For narrow strip, Єreff □ (Єr + 1) / 2
Where,
Єr = relative dielectric constant.
From equations (4.2.1), (4.2.5) and (4.2.6), we get
Zo = (η/√Єreff). [1/[(w/h) + (2w/3h) + (2.7/Log4h/t)]] ---------- 4.2.7 The calculations made on the basis of this expression give the characteristics impedance of a single microstrip structure.
When the second conductor is introduced close to the first one, the

field distribution gets altered. In even- mode the electric field lines follow the pattern fairly similar to that of the isolated conductor as shown in fig. 3.5.
In case of odd-mode, the two conductors are linked by the electric field lines as shown in Fig. 3.6. The form of equation 4.2.6 obtained for the isolated microstrip line are also useful in calculating the characteristic impedance of microstrip coupler in even- and odd- modes. In the even-mode CP is replaced by CPO and in the odd-mode by CPO. Since the electric field lines are distributed in air and below the conductor in the dielectric substrate, the dielectric medium now becomes inhomogeneous. Due to inhomogeneity the phase velocity (VP) for the isolated case is replaced by VPO for the even- mode and VPO for the odd- mode. Further in place of Єreff the effective dielectric constants (Єreff)e and (Єreff)o are to be used for even- and odd-modes separately. Similarly, Zoe and Zoo represent the characteristic impedances for even- and odd- modes respectively.

Guide wave length traveling through microstripline
This is also another important characteristic parameter of the microstripline and is the function of strip geometry, permittivity and operating frequency. Guide wave length is written as
λg = Vp / f = λo / √Єreff ---------- 4.2.8

Formulation of the characteristic parameters of the
coupled microstriplines
The study of microstripline coupler involves the analysis of even- and odd- modes of propagation. In the even-mode, energy traveling down, one microstrip line is coupled into a parallel line and travels in the same direction, where as in the odd-mode energy travels in the reverse direction after coupling.

Discussion and Conclusion

It has been found that variation of characteristic impedance with strip width is smaller for wider strip and larger for thinner strip. Also, it is smaller for higher permittivity than for lower permittivity. This concludes that concentration of electric flux lines and energy in wider strip is larger than for thinner strip. This idea is very useful for the study of flow of power through microstripline structure. Also, characteristic impedance shows slight variation with height of the substrate which marks the slight variation in flow of power. Further it is found that rate of variation of characteristic impedance for lower frequency is smaller than that of higher frequency. This concludes that dispersion effect on the flow of power is smaller in lower frequency and becomes larger in higher frequency.
These studies are useful for calculating the thermal losses of power flowing through microstripline structure which will be carried on in chapter 5.

Study of Variations of characteristic parameters of coupled microstripline for even and odd-mode

For the study of characteristic parameters for different strip geometry, permittivity and frequency computational works have been carried out and studies have been performed as given in following sections for coupled microstripline in case of even & odd-modes:
(i) Variation of characteristic impedance with stripwidth, spacing, permittivity
and frequency;
(ii) Variation of phase velocity and guide wavelength with strip width, spacing,
permittivity and frequency.

Study of variation of characteristic impedance for even
and odd-modes

After exhaustive computational results for different metal strip width have been obtained. These computational works have been performed using computer Pentium-III. Keeping frequency, relative and substrate height fixed and varying the width of metal strips characteristic impedance for even and odd-modes have been obtained for different spacing between metal strips.

A Theoretical Evaluation of Optical Constants of Semiconductors as a Function of Photon Energies

J.P. Mahto,
Lecturer Department of Physics, Govt. Polytechnic of Textile Technology, Bhagalpur, At-Lalmatia Chowk, PO-Nathnagar, Bhagalpur 812004 (Bihar)

Using the method of Kramers- Kronig Analysis (KKA), we have evaluated optical constants of large number of semiconductors taking the real and imaginary part of dielectric constants. Our theoretically evaluated results are in good agreement with that of the other workers and also with the experimental data

ABSTRACT

During last three decade, the considerable progress has been taken into consideration to understand the optical properties of solids by co-relating them to their band structure. The imaginary part of dielectric constant is of the special interest. The dielectric constant is determined from light refection measurements.
In the present work, we have evaluated the optical constants using the method of Kramer-Kroning Analysis of large number of semiconductors taking the real and imaginary of dielectric constants by theoretical treatment which has good agreement to that of standard data of well-known work

Keywords: Dielectric Constant, Semiconductors and Reflection measurements.

INTRODUCTION

During last two-decade considerable progress has been made in understanding the optical properties of solids by correlating them to their band structure. The calculation of the imaginary part of the dielectric constant $\varepsilon_2(\omega)$ is of the special interest since structure in $\varepsilon_2(\omega)$. corresponds to critical points in the band transition. Observations of such peaks allow comparison of experimental data, with theoretical results. The dielectric constant $\varepsilon_2(\omega)$. is determined from light reflection measurements at well prepared surface over a wide range of wave lengths. From these measurement, one can extract the dielectric constant by means of the Kramers-Kronig Analysis $(KKA)^3$. Also, other direct optical methods other than KKA are used. The methods, which are in general very accurate, may run into difficulties. The reflectivity is very sensitive to surface conditions specially in the far ultraviolet region. Therefore, existing optical determinations of $\varepsilon_2(\omega)$. are in some cases not always very $precise^4$. "The other method to determine optical constant is the energy loss measurement of electrons in thin crystal films over a wide range of photon energies (1-1000 eV). This range covers the interesting region of electronic absorption. The properties of bulk material are determined by measuring the transmission of electron beams through thin crystal films. The

intensity of electrons which have surface an energy loss ΔE and a momentum transfer q in a single collision is given by the energy loss function.

$$-\frac{1}{q^2} Im \frac{1}{\varepsilon(\Delta E)} \left(-1m \frac{1}{\varepsilon} = \frac{\varepsilon_2}{|\varepsilon|^2}\right)$$

In contrast the optical absorption depends on $\varepsilon_2(\omega)$. The loss function can be used for obtaining the of an isotopic $crystal^{6-8}$.

The incoming electron transfers besides the momentum Ћq the energy ΔE to the crystal.

The incoming electron transfer beside the momentum Ћq the energy $\Delta E$to the crystal electrons. This corresponds to an optical process to the absorbed photon energyЋω. The field acting on the crystal electrons can be represented by a longitudinal electric field of direction q. The transverse electric field of light moves the crystal electrons as a whole perpendicular to its direction of propagation without changing their density. However, the longitudinal field produced by an electron beam induces density changes of the crystal electrons in the q direction. This is the reason why the interaction of electrons with crystal electrons becomes proportional to $\varepsilon_2/ |\varepsilon|^2$. The loss function consider only the excitation of the crystal electrons electrons in the volume of the crystal and is rather simple to evaluate surface excitation, always present and the production of Cerenkov

photons which are of importance in substance of high dielectric constants in certain frequency region e.g. in the case of III/V compounds, complicate the situation. However, by measuring the energy loss spectrum not the direction of primary

beam (θ=O) but at certain scattering anglesθ, these effects can be neglected and the above relationship is established. The energy loss function -1m$\frac{1}{\varepsilon}$has been calculated for variety of semiconductor Si, Ge, InSb, GaP and GaAs from optical reflectivity measurements and energy loss mesurements.[10,12]

In this paper, using the method of KKA, we have determined the real imaginary part of the reflective index n and k. The reflection coefficient R and the absorption coefficient μ for simple semiconductors Si and Ge and III/V semiconductors compounds like Gap, GaAs and InSb. We have taken the experimental data of ε_1 andε_2 calculated from the loss function of these materials. We observe that in the case of Si, Ge and InSb the behaviour of n, k, R and μ are very much identical.

MATHEMATICAL FORMULAE USED IN THE *CALCULATIONS*[13]

To derive the dielectric constant from energy loss function Kramers-Kronig dispersion relation is used. The real part of the complex function $\frac{1}{\varepsilon} = \frac{1}{\varepsilon_{1+}\varepsilon_2}$ is related to the whole frequency spectrum of its imaginary part

$$\boldsymbol{R_e \frac{1}{\varepsilon(\omega)} - 1 = \frac{1}{\pi} P \int_{-\infty}^{\infty} I\, m \frac{1}{\varepsilon(\omega')} \times \frac{d\omega}{(\varepsilon' - \omega)}} \qquad (1)$$

where P indicates the cauchy principal part of the integral. To evaluate the contribution of negative frequencies to the integral equation (1) one used the relation ε-(ω)=$\varepsilon^*(\omega)$ and obtain

$$\boldsymbol{1m \frac{1}{\varepsilon(-\omega)} = -Im \frac{1}{\varepsilon(\omega)}} \qquad \textbf{(2)}$$

Eq. (1) can also be transformed into

$$R_e \frac{1}{\varepsilon(\omega)} - 1 = \frac{2}{\pi} P \int_0^\infty Im \int \frac{1}{\varepsilon(\omega')} \times \frac{\omega' d\omega'}{(\omega'^2 - \omega'^2)} \qquad (3)$$

For anisotropic crystal however the loss function depends on the direction of the wave vector q. For small scattering angle $\theta$of theorder of $\theta_{\Delta E}$the q direction is strongly dependent on ω (or $\Delta E = \hbar \omega$). Therefore spectra may be different for q(ω) and q(-ω).

For the integration in the region of negative frequencies, one uses the equivalence q(-ω, θ)=-q(-ω, θ) which can be derived from the relation tan$\beta\theta/\theta_{\Delta E}$ with $\theta_{\Delta E}/k_0 v$ and β is the angle between $k_0$and q. In this case two measurement at θ and-θ, on opposite sides of the undeflected electron beam have to be analysed and the corresponding loss function have to be introduced in the following relation. Neglecting the pole concentration one $gets$,[14,15]

$$R_e \frac{1}{\varepsilon(\omega,\theta)} - 1 = \left\{ \frac{Im\left[\frac{1}{\varepsilon(\omega',\theta)}\right]}{\omega' - \omega} + \frac{Im\left[\frac{1}{\varepsilon(\omega',\theta)}\right]}{\omega' - \omega} \right\} d\omega' \qquad (4)$$

Now for the limit $\omega \to 0$, one obtains

$$R_e \frac{1}{\varepsilon(0)} = 1 - \frac{2}{\pi} P \int_0^\infty Im \frac{1}{\varepsilon(\omega',\theta)} + \frac{d\omega'}{\omega} \qquad (5)$$

and

$$R_e \frac{1}{\varepsilon(0,\theta)} = 1 - \frac{1}{\pi} P \int_0^\infty \left[Im \frac{1}{\varepsilon(\omega',\theta)} + \frac{1}{\varepsilon(\omega,\theta)} \right] \frac{d\omega'}{\omega} \qquad (6)$$

for the isotropic and anisotropic case respectively. The left hand side of equation (5) and (6) can be measured theoretically for metals one obtains $\mathbf{Re}\frac{1}{\varepsilon(\omega \to 0)} = 0$, For insulator $\varepsilon(\omega \to 0)$ becomes real and can be obtained by extrapolating the refractive index from the visible region to $\omega \to 0$.

$$\mathbf{Re}\frac{1}{\varepsilon(\omega \to 0)} = \frac{1}{\varepsilon_\infty} \qquad (7)$$

The infrared contribution can be neglected to this $purpose$[16]

Making use of this additional information equation (5) can be substracted from equation (4) and one gets relations for the difference.

$$\left[Re \frac{1}{\varepsilon(\omega)} - Re \frac{1}{\varepsilon(0)} \right] = \frac{2\omega^2}{\pi} P \int_0^\infty Im \frac{1}{\varepsilon(\omega')} \frac{d\omega'}{\omega'(\omega'^2 - \omega^2)} \qquad (8)$$

$$\left[Re \frac{1}{\varepsilon(\omega,\theta)} - Re \frac{1}{\varepsilon(0,\theta)} \right] = \frac{\omega}{\pi} P \int_0^\infty \left\{ Im \frac{\frac{1}{\varepsilon(\omega',\theta)}}{\omega'(\omega' - \omega)} + Im \frac{\frac{1}{\varepsilon(\omega',-\theta)}}{\omega'(\omega' + \omega)} \right\} d\omega' \qquad (9)$$

for the isotropic and anisotropic case respectively.

The weighting function in equation (8) and (9) decrease more rapidly for large than that of equation (4). For anisotropic crystal equation (9) has been $recommended$[16].

DETERMINATION OF THE OPTICAL CONSTANTS

With the help of real and imaginary part of one calculates the complex dielectric constant $\varepsilon_1(\omega) = \varepsilon_1(\omega) + i\,\varepsilon_1(\omega)$

$$= \frac{Re\frac{1}{\varepsilon(\omega)} - i\, Im\frac{1}{\varepsilon(\omega)}}{\left[Re\frac{1}{\varepsilon(\omega)}\right]^2 + \left[Im\frac{1}{\varepsilon(\omega)}\right]^2} \qquad (10)$$

From this one gets the optical constants refractive $index$[4]

$$N=\sqrt{\varepsilon} = n+ik \qquad (11)$$

$$n = \sqrt{\frac{1}{2}\left\{\varepsilon_1 + \sqrt{\varepsilon_1^2 + \varepsilon_2^2}\right.} \qquad (12)$$

$$k= \sqrt{\frac{1}{2}\sqrt{\varepsilon_1^2 + \varepsilon_2^2 - \varepsilon_1}\Bigg\}} \qquad (13)$$

The absorption coefficient u which is obtained from optical transmission experiments

$$\mu=\frac{2\omega}{c}k \qquad (14)$$

The complex amplitude reflectivity

$$r = |r|e^{i\delta}=\sqrt{Re^{i\delta}} \qquad (15)$$

where r is the amplitude reflection coefficient, R is the intensity reflection coefficient. For normal incidence. one obtains

$$R=\frac{(n-1)^2+k^2}{(n+1)+k^2} \text{ and } \tan\delta = \frac{-2k}{n^2+k^2-1} \qquad (16)$$

RESULTS AND DISCUSSIONS

Using formulae (12), (13), (14) and (16), we have calculated the real imaginary part n, k, reflection coefficient R and Absorption coefficient u for the variety of semiconductors like Si, Ge, GaP, GaAs and InSb. We have used the data of $\varepsilon_1$andε_2, calculated from the loss function of the material. The results have been given fromt table T_2, to T_6, respectively. We observe that in the case of simple semiconductors like Si and Ge the real and imaginary part of the refraction index is less than unity for the energy range 10 to 20 eV. However, the absorption coefficient u decreases with increase of energy but reflection coefficient R has not any specific trend. In the case of GaP and GaAs the values of real and imaginary parts n and k are always greater than unity but R and u have not very specific trend. However, the value of n and k are InSb is less than unity similar like Si and Ge. In table T_1, we have given the data of plasmon energy $\hbar\omega^*_{pv}$, effective plasmon energy $\hbar\omega_{pv}$ fo which has been determined after appropriate correction for the influence of the d-band electrons on the valence electrons. Plasmon energies $[Im\ \varepsilon^{-1}]_{max}$max are calculated from optical measurements and $[Im\ \varepsilon^{-1}]_{max}$ are calculated from energy loss experiment for Si, Ge, GaP, GaAs and InSb $materials$.[17−20]

Table T_1 : Comparison of plasmon energy (eV) for various semiconductors

Semiconductor	$\hbar\omega_{pv}$	$\hbar\omega^*_{pv}$	$\varepsilon_1(\omega = 0)$	Max Im ε^{-1}(Optional)	Max Im ε^{-1}(energy loss)
Si		16.6	16.6	16.4	16.9a
Ge		15.5	16.2	16.0	16.4b
GaP		16.6	16.3	16.9	16.5
GaAs		15.5	12.3	14.7	15.7
InSb		12.7	11.0	12.0	13.0
GaSb		14.2	13.9	14.2	14.3
InAs		14.0	13.8	13.0	13.8

Table T_2: Silicon

$\Delta E(eV)$	ε_1	ε_2	n	k	R%	$\mu(10^5 cm^{-1})$
10	-1.5	1.8	0.650	0.990	33.9	3.96
12	-0.5	0.8	0.471	0.775	31.8	1.55
14	-0.05	0.5	0.476	0.610	25.3	1.22
16	0.01	0.2	0.324	0.470	34.2	0.94
18	0.02	0.1	0.247	0.378	41.8	0.756
20	0.05	0.02	0.228	0.176	40.7	0.351

Table T_3: Germanum

$\Delta E(eV)$	ε_1	ε_2	n	k	R%	$\mu(10^5 cm^{-1})$
10	-0.8	1.8	0.765	0.912	22.7	1.824
12	-0.50	1.3	0.668	0.829	23.0	1.658
14	-0.30	0.8	0.685	0.788	24.0	1.576
16	-0.05	0.5	0.476	0.610	25.3	1.220
18	0.00	0.2	0.442	0.473	22.8	0.943
20	0.50	0.18	0.718	0.300	5.5	0.60
22	0.80	0.15	0.899	0.243	1.9	0.486

Table T_4: GaP

$\Delta E(eV)$	ε_1	ε_2	n	k	R%	$\mu(10^5 cm^{-1})$
3	-0.52	16.8	2.853	1.420	32.3	2.84
5	-0.32	14.2	2.640	1.380	30.2	2.76
7	-0.14	15.6	2.780	1.408	31.6	2.816
9	-0.05	8.5	2.056	1.209	23.8	2.418
11	-0.006	3.2	1.264	0.946	16.0	1.892
13	0.06	4.6	1.533	1.034	18.8	2.068
15	0.72	2.0	0.916	0.494	6.4	0.988

Table T_5:GaAs

$\Delta E(eV)$	ε_1	ε_2	n	k	R%	$\mu(10^5 cm^{-1})$
1.0	12.6	0	3.550	8.550	84.8	17.8
2.0	13.8	2.0	3.724	0.436	33.8	0.872
3.0	16.6	5.4	5.836	1.317	42.5	1.628
5.0	20.2	8.6	4.590	0.814	42.5	1.628
7.0	12.6	15.8	4.050	1.174	40.4	2.348
9.0	-5.6	8.6	1.573	1.390	32.5	2.780
10.0	-3.0	5.4	1.260	1.231	30.6	2.462
15.0	0	3.2	1.791	1.265	26.8	2.530

Table T_6:InSb

$\Delta E(eV)$	ε_1	ε_2	n	k	R%	$\mu(10^5 cm^{-1})$
10	-0.02	1.2	0.768	0.743	16.5	1.486
12	-0.001	1.1	0.741	0.724	16.5	1.448
14	-0.002	0.8	0.640	0.668	18.3	1.336
16	0.62	0.05	0.788	0.149	20.0	0.298
18	1.25	0.55	1.133	0.451	4.6	0.902
20	1.30	0.58	1.167	0.419	4.1	0.838

REFERENCES

1. Pines, D. Elementary excitations in solids (W.A. Benjamin, Inc.) New York, (1964).
2. Noziers, P. and Pines, D., Phys. Rev. 109, 741 (1958).
3. Greenaway, D.L. & Harbeke G, Optical prop- erties and band structures of semiconductors (Pergamon Press, London) (1968).
4. Festenberg, C.V., Physik, 227, 453 (1969).
5. Reather H, Springer Tracts Mod. Phys. 38, 85 (1975).
6. La Villa T. & Mendlowitz Z. App. Opt. 6, 61 (1967).
7. Liang, W. Y. & Cundy S.L., Phil. Mag. 19, 1031 (1973).
8. Powell C.J., J. Opt. Soc. Am. 59, 738 (1978).
9. Tosatti E. & Bassani F., Nuovo Cimento B 63, 458 (1969).
10. Hass M, Semiconductors and semimentals (Academic Press, New York), Vol. 3, p. 12 (1967).
11. Whetten, NR, Appl. Phys. Letts. 8, 135 (1982).
12. Watangable M, Nakamura Y, Nakai Y & Murata, T., J. Phys. Soc. (Japan) 24, 428 (1980).
13. Ehrenerich H, optical properties and electronic structure of metals and Allys (North-Holland Amsterdam) p. 109 (1968).
14. Bassani, F. Tossati E., Phys. Lett. A 27, 446 (1968).
15. Cardona M, Semiconductors and Semimetals (Pergamon Press, London), 125 (1966).
16. Keil P.Z., Physik, 214, 251 (1968).
17. Ritchie R.H., Phys. Rev. 106, 874 (1957).
18. Taft-EA & Philipp, H.R., Phys. Rev. 138A, 197 (1965).
19. Festenberg C.V., Z. Physik 214, 464 (1968).
20. Kunstreich S.& Otto A, Optics Commun. 1, 45 (1969).

Significance of Solution of Helmholtz Equation for Single Walled Carbon Nanotube Wave Guide

Jay Shankar Kumar
Researcher, Department of Physics, Bhupendra Narayan Mandal University, Madhepura-852128, Bihar, India.
Email: jayphysics108@gmail.com

Abstract:

We have studied the significance of roots of Helmholtz equation for the single walled carbon nanotube wave guide. Single walled carbon nanotube is a hollow cylindrical wave guide in which guided waves propagates in the particular direction. The different roots of Helmholtz equation are studied and looked the significance of roots as monochromatic wave, guided wave etc. We have found the guided wave by solving the Helmholtz wave equation with cylindrical coordinate system and Basel's approach and functions. The result is found that the roots of Helmholtz equation as well as guided wave in the single walled carbon nanotube that behaves as wave guide.

Keywords: Single Walled Carbon Nanotube, Helmholtz Equation, Cylindrical Coordinate System, Basel's Function, Guided Wave.

Introduction:

L. Eisenhart [1] and P. Moon [2] use the separable method to solve the Helmholtz equation. V. Weston [3-4] has given solution and application in his thesis and, in his research paper, used the non – separable cylindrical and rotational coordinate system. Rajput [5] discussed about Helmholtz equation obtained by the wave equation. Kumar and Kumar [6] have obtained the Helmholtz equation by derivation of Maxwell's equations and solved without taking Basel's function. The solution represents the transverse monochromatic wave. They also have given the ideas for formation of single wall carbon nanotubes theoretically with chiral vector and chiral angle. They have found the dimeter numerically. Shuba et al., [7-8] have solved this equation with Basel's function and obtained guided waves. Kumar and Kumar [9-11] have studied about the propagation of surface plasmon waves taking the solution of Helmholtz equation in cylindrical coordinate system along multi wall caron nanotube. They have found waveguiding characteristics of nanotubes and propagation of the guided waves through CNTs. The surface wave propagation on a bundle of the CNTs was found to be characterized by coefficient of high attenuation.

Method:

The Helmholtz equation is derived from the wave equation using the eigen function. Let us consider the cylindrical coordinate system (r, θ, z) and the cylindrical axis parallel to z – axis of the coordinate system for solving this equation. We have used the eigen function, $\prod$, which is independent of z coordinate and hence the Helmholtz equation in cylindrical coordinate system written as

$$\frac{\partial^2}{\partial r^2}\prod_z(r,\theta)+\frac{1}{r^2}\frac{\partial^2}{\partial\theta^2}\prod_z(r,\theta)+\frac{1}{r}\frac{\partial}{\partial r}\prod_z(r,\theta)+k^2\prod_z(r,\theta)=0 \qquad (1)$$

We have assumed its solution as

$$\prod_z(r,\theta)=R(r)\Theta(\theta)=\mathrm{R}\Theta \qquad (2)$$

The equation (1) written as

$$\frac{r}{R}\left\{\frac{\partial R}{\partial r}+r\frac{\partial^2 R}{\partial r^2}\right\}+k^2r^2=-\frac{1}{\Theta}\frac{\partial^2\Theta}{\partial\theta^2} \qquad (3)$$

Let $$-\frac{1}{\Theta}\frac{\partial^2\Theta}{\partial\theta^2}=n^2$$

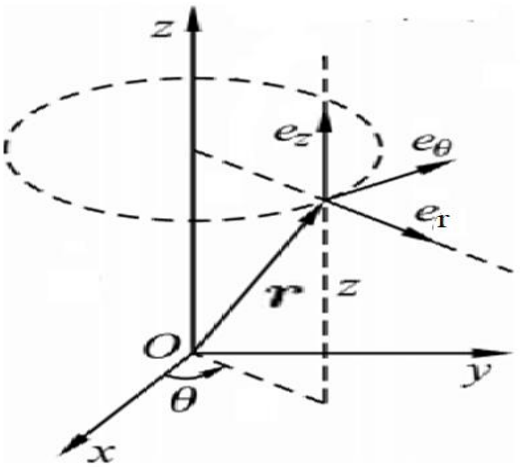


Figure 1: Cylindrical coordinate system(r,θ,z) for single walled carbon nanotube. The unit vectors are e_r, e_θ, e_z.

And $$\frac{\partial^2\Theta}{\partial\theta}=-n^2\Theta \qquad (4)$$

Root of this equation (4) is

$$\Theta=A\cos n\theta+B\sin n\theta \qquad (5)$$

Where A and B are two arbiters constants.

We can write equation (3) as

$$\frac{\partial^2 R}{\partial(kr)^2}+\frac{1}{kr}\frac{\partial R}{\partial(kr)}+\left\{1-\left(\frac{n}{kr}\right)^2\right\}R=0 \qquad (6)$$

Equation (6) is similar to the Bessel's equation and root of this as Bessel's function, so we have root of equation (6) given as

$$R=J_n(kr)=\frac{(kr)^n}{2^n\Gamma(n+1)}\left[1+\frac{(kr)^2}{2\cdot(2n+2)}+\frac{(kr)^4}{2\cdot4\cdot(2n+2)(2n+4)}+\cdots\right] \qquad (7)$$

Or, $$R = \sum_{r'=0}^{\infty} \frac{(-1)^{r'}}{r'!\,\Gamma(n+r'+1)} \left(\frac{kr}{2}\right)^{n+2r'} \quad (8)$$

Now, equation (2) can be written as

and $$\prod_z(r,\theta) = \sum_{r'=0}^{\infty} \frac{(-1)^{r'}}{r'!\,\Gamma(n+r'+1)} \left(\frac{kr}{2}\right)^{n+2r'} [A\cos n\theta + B\sin n\theta] \quad (9)$$

The equation (9) is the roots of differential equation (1).

Results Discussions:

Putting $= 0$, in equation (8) then we have

$$R = J_0(kr) = \sum \frac{(-1)^{r'}}{(r'!)^2} \left(\frac{kr}{2}\right)^{2r'} = 1 - \frac{(kr)^2}{2^2} + \frac{(kr)^4}{2^2 4^2} - \frac{(kr)^6}{2^2 4^2 6^2} + \cdots \quad (10)$$

The function of equation (10) is oscillatory with the varying period and a decreasing amplitude. The radial field distribution is explained with first kind $J_0(kr)$. The z – directed component inside the single walled carbon nanotube for guided wave shown in figure (2). This wave has transverse nature.

The single walled carbon nanotube is formed by rolling the graphene and we have armchair, chiral, and zig – zag type of nanotube as shown in figure 3. These nanotubes may be represented by chiral vector, $\vec{C}_h = m\hat{a}_1 + n\hat{a}_2$, where m and n are two integers that define the crystal structure and $\hat{a}_1$and $\hat{a}_2$ are the unit vectors. The chiral angle is between $\vec{C}_h$ and $\hat{a}_1$ represented by θ. The dimeter is calculated as $d_{cnt} = \frac{|\vec{C}_h|}{\pi}$.

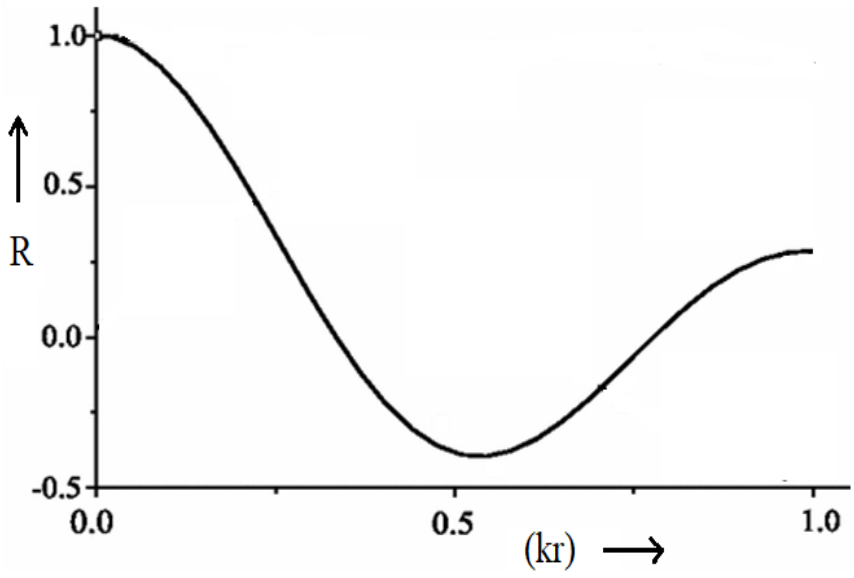


Figure 2: Plot radial distribution with product of wave number and radius of cylindrical coordinate.

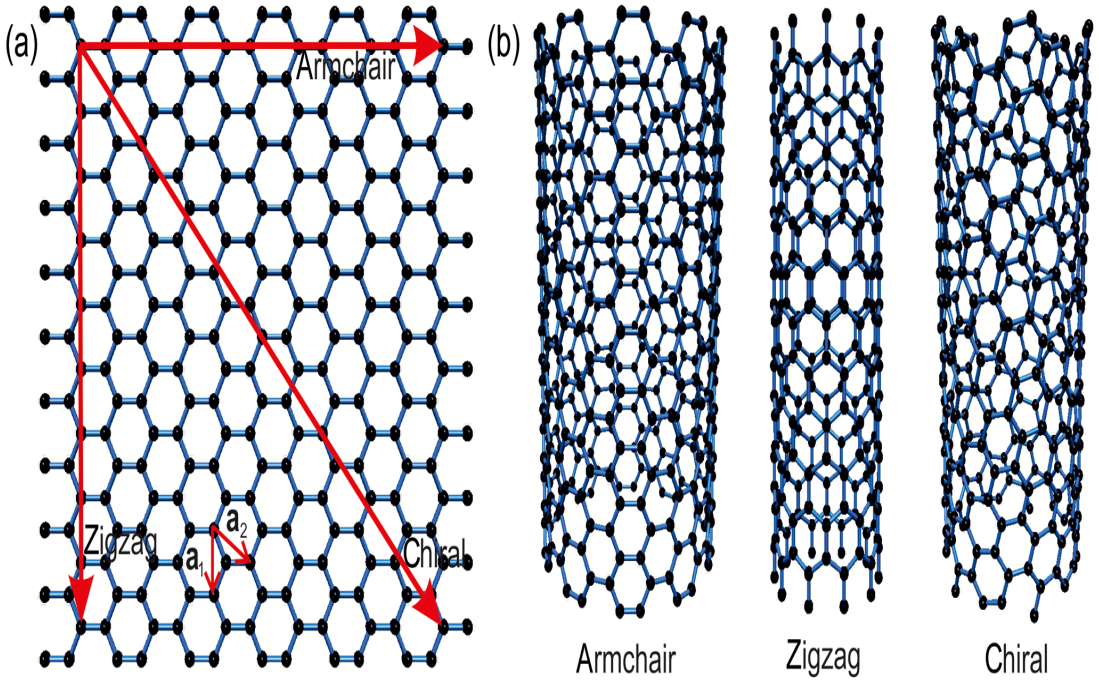


Figure 3: Graphene and single walled carbon nanotube; (a) graphene sheet with armchair, zig-zag, and chiral line and unit vector a_1 and a_2 (b) armchair tube, zig – zag tube, and chiral tube formed by rolled up of graphene.

Conclusions:

We have concluded as the roots of Helmholtz equation represents the guided wave and its nature shown in figure 2. This wave propagates through hollow cylindrical single walled carbon nanotube that behaves as waveguide. The tube formation is based on chiral vector and chiral angle. The transverse guided wave has decreasing amplitude for radial distribution.

References:

1. L. Eisenhart, Separable system of släckel, Ann. Math, 35, 284 (1934).
2. P. Moon and D. E. Sprnur, Separability in a class of coordinate systems, Franklin Inst. J. 254, 227 (1952).
3. V. Weston, Solution of the toroidal wave equation and their applications, Ph. D thesis, Univ. of Toronto, (1956).
4. V. Weston, Solution of the Helmholtz equation for a class of non – separable cylindrical and rotational coordinate system, QAM, 15 (4), 420-427, (1958).
5. B. S. Raput, Mathematical Physics, (2013).
6. J. S. Kumar and A. Kumar, Theoretical Approach of the Propagation of Electromagnetic Waves through Carbon Nanotubes and Behaviour of Carbon Nanotubes as Capacitor Using Electric Hertz Potential, Intech Open, (2022).
7. Shuba et al., Electromagnetic wave propagation in an almost circular bundle of closely packed metallic carbon nanotubes, arXiv 0705.2866v1, cond-mat. mtrl-sci, (2007).

8. Shuba et al., Analysis of multiwalled carbon nanotubes as waveguides and antennas in the infrared and the visible regimes, arXiv:0806.2958v1, cond-mat.mtrl-sci, (2008).
9. J. S. kumar and A. Kumar, Surface wave propagation on carbon nanotube bundle and characteristics by high attenuation, BPAS, 40D (1), (2021).
10. J. S. kumar and A. Kumar, Propagation of surface plasmon waves along multi wall carbon nanotube with gold core, BPAS, 40D (2), (2021).
11. J. S. kumar and A. Kumar, Propagation of the plane electromagnetic wave through CNTs, Kanpur Philosophers, v(ll), lX, (2022).

Sentiment Analysis of reviews using BERT

Ms. Manisha Prasad
Research Scholar, Computer Science,
Patliputra University, Patna

Dr Krishnandan Prasad,
Associate Professor, Dept. of
Mathematics, T.P.S. College, Patliputra
University

ABSTRACT

With advancements in technology, sentiment analysis has been becoming more and more important for companies that want to gather their customers' sentiments. Nowadays, businesses use natural language processing, statistical analysis, and text analysis to identify the sentiment of customers and classify reviews into positive, negative and neutral categories for different products. Many companies/ organizations understand the importance and value ofunderstanding their customer's/ reviewer's sentiments – what they are actually saying about a particular product , what they mean and how they aresaying. We can use sentiment analysis to identify customer sentimentexpressed in text data on different social media platforms where people mention company's brand. As we all know, sentiment analysis is the domain of understanding emotions of customers using techniques like natural language processing. Therefore, we can say that the application of sentiment analysis is endless and boundless.

Sentiment analysis can be defined as analyzing the positive or negative or neutral sentiment of the customers/ reviewers in text. There are many Natural Language Processing techniques that can be used for sentiment analysis, including opinion mining, text classification, and lexical analysis. Each of these techniques has its own advantages and disadvantages. The choice of technique will depend on the type andquality of the text data that is available. In general, people often use natural language processing toolkit forsentiment analysis but in this research paper, BERT and Transformers by Hugging Face using PyTorch and Python will be used for sentiment analysis.

INTRODUCTION

With advancements in technology, sentiment analysis has been becoming more and more important for companies that want to gather their customers' sentiments. Nowadays, businesses use statistical analysis and text analysis using natural language processing, to identify the sentiment of customers. NLP began in the 1950s as the intersection of artificial intelligence and linguistics. NLP was originally distinct from text information retrieval (IR), which employs highly scalable statistics-based techniques to index and search large volumes of text efficiently[1]. NLP techniques are used to classify reviews into positive, negative, and neutral categories for different products. They understand the value of understanding their customer's sentiments – what they are actually saying about a particular product, what they mean and how they are saying. We can use sentiment analysis to identify customer sentiment expressed in text data on different social media platforms where people mention company's

brand.

Sentiment analysis can be defined as analyzing the positive or negative or neutral sentiment of the customer in text. Nowadays, social media platform provides customers a platform to express their reviews and thoughts about the brand more openly than ever before, sentiment analysis has become a powerful tool to monitor and understand online conversations of customers. Analyzing customer feedback and reviews automatically through social media different platform allows us to learn what makes our customer happy or unhappy and gain an edge in promoting the business. The rapid growth of Internet-based applications, such as social media platforms and blogs, has resulted in comments and reviews concerning day-to-day activities. Sentiment analysis is the process of gathering and analyzing people's opinions, thoughts, and impressions regarding various topics, products, subjects, and services. People's opinions can be beneficial to corporations, governments, and individuals for collecting information and making decisions based on opinion[2].

OBJECTIVE

The main objective of this research is to make people aware about what exactly sentiment are kept behind the review written by a person. In this we are using the real world amazon review. This paper presents an overall view covering the techniques and methods of sentiment analysis . Its main objective to extract opinions from the dataset and convert it into positive, negative and neutral sentiment which could prove valuable for economic or marketing research. Sentiment analysis not only helps in allowing the user to get more and relevant information about different products and services on a mouse click, but also helps in arriving at a more informed and better decision.

METHODOLOGY

Nowadays, social media has been becoming a knowledge hub for all age groups. It has become a common platform to express sentiments in the form of opinions and reviews on almost everything like movies, brands, product, social – activities and so on. In this research paper, BERT will be used instead of natural language toolkit which help computers to understand the meaning of ambiguous language in text by using surrounding text to establish context. There are five phases to analyze sentiment: -

- Data Collection

Consumers often express their sentiments on public platforms in the context of blogs, product reviews. In the research paper, reviews of almost 5k customers for different products from amazon was gathered.

- Text Preparation

In this phase of sentiment analysis, reviews of customers of amazon. have been filtered and extracted and then a dataset named as “amazon" dataset was prepared. In this dataset, we have different columns like reviewer name, overall,
reviewer text which will helped to know about polarity of customer about any product on amazon platform.

- Sentiment Detection

At this phase, each sentence of the review extracted from amazon platform was examined for subjectivity. Sentences with objective expression was be discarded and sentences with subjective expression was retained.

- Sentiment Classification

sentiments was classified into three groups: - positive, negative and neutral. At this stage of sentiment analysis, sentences which were retained in the previous phase were classified into good, bad, like, dislike, satisfied or not satisfied, etc.

- Presentation of Output

The main purpose of sentiment analysis was to convert unstructured reviews of customers into meaningful information for business purpose. After the completion of analysis of sentiment, a bar graph was generated which clearly shows positive, negative and neutral sentiment of customer.

BERT: BIDIRECTIONAL ENCODER REPRESENTATION FROM TRANSFORMER

It is published by researchers at google AI language recently. Bert model shows that a language model can have profound sense of understanding of language context in comparison to those models which are single directional. BERT model ‘s features are in contrast to previous language models which looked at sequence of text either from right to left or left to right.

Bert makes use of transformer which is an attention mechanism that understands contextual relations between words. In transformers, there are two separate mechanisms and they are as follows: -

1. An Encoder that reads the input which is in text form.
2. A Decoder that produces a prediction.

As compared to single directional models BERT is considered bidirectional because the transformer encoder reads the entire sequence of words at once and allows the encoder to read in both directions at the same time.

WORKING PRINCIPLE

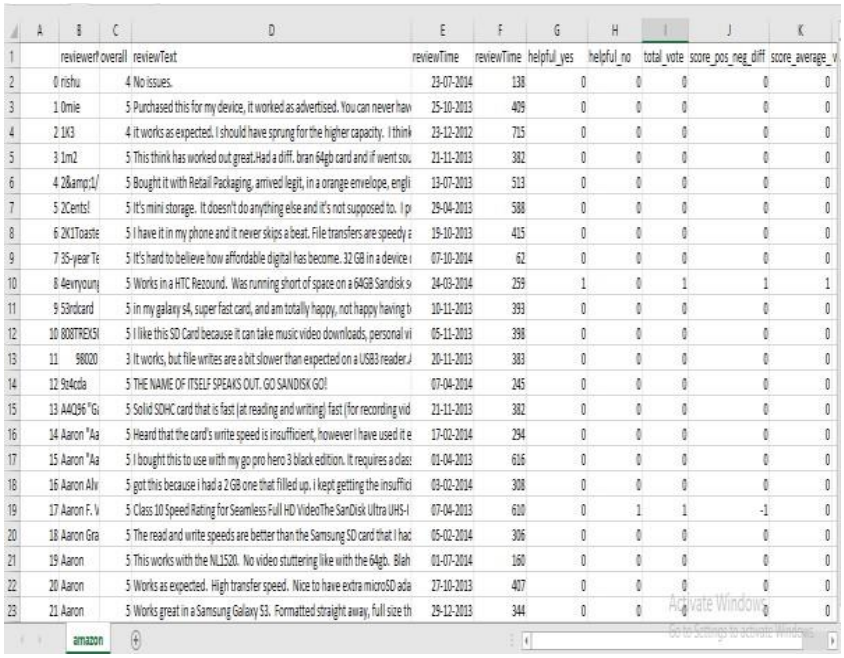
Sentiment analysis is an important task in natural language processing area. It is used to understand the polarity in the feedback of customer whether they feel positive, negative or neutral about it. BERT is a natural language processing model developed by google research in 2018. There are two methods of BERT - BERT base and BERT large. The BERT base model has 12 layers in the encoder and the BERT large model has 24 layers in the encoder. To analyze the polarity in the sentiments of user, we have followed a straightforward process and these are as follows: -

1. textual context has been broken down into tokens through Tokenization.
2. special tokens such as classifier and separator had been assigned.
3. each phrase hac been assigned an overall sentiment (0 or 1).
4. A bar graph was generated to show the polarity of customer about different product in terms of positive, negative or neutral.

BERT basically uses two strategies: -

1. Masked Language Modelling 15% of the words in each sequence are replaced with MASK token before feeding word sequences into BERT.
2. Next Sentence Prediction Before entering the model, the input is processed by token embedding, sentence embedding and positional embedding. A classifier token is inserted at the beginning of input sentence. A separator token is inserted at the end of input sentence.

DATA SET FOR SENTIMENT ANALYSIS



	A	B	C	D	E	F	G	H	I	J	K
1		reviewerN	overall	reviewText	reviewTime	reviewTime	helpful_yes	helpful_no	total_vote	score_pos_neg_diff	score_average_v
2	0	rishu	4	No issues.	23-07-2014	138	0	0	0	0	0
3	1	0mie	5	Purchased this for my device, it worked as advertised. You can never hav	25-10-2013	409	0	0	0	0	0
4	2	1K3	4	it works as expected. I should have sprung for the higher capacity. I think	23-12-2012	715	0	0	0	0	0
5	3	1m2	5	This think has worked out great.Had a diff. bran 64gb card and if went sou	21-11-2013	382	0	0	0	0	0
6	4	2&1/	5	Bought it with Retail Packaging, arrived legit, in a orange envelope, engli	13-07-2013	513	0	0	0	0	0
7	5	2Cents!	5	It's mini storage. It doesn't do anything else and it's not supposed to. I p	29-04-2013	588	0	0	0	0	0
8	6	2K1Toaste	5	I have it in my phone and it never skips a beat. File transfers are speedy a	19-10-2013	415	0	0	0	0	0
9	7	35-year Te	5	It's hard to believe how affordable digital has become. 32 GB in a device	07-10-2014	62	0	0	0	0	0
10	8	4ewryoung	5	Works in a HTC Rezound. Was running short of space on a 64GB Sandisk s	24-03-2014	259	1	0	1	1	1
11	9	53rdcard	5	in my galaxy s4, super fast card, and am totally happy, not happy having t	10-11-2013	393	0	0	0	0	0
12	10	808TREX5I	5	I like this SD Card because it can take music video downloads, personal vi	05-11-2013	398	0	0	0	0	0
13	11	98020	3	It works, but file writes are a bit slower than expected on a USB3 reader J	20-11-2013	383	0	0	0	0	0
14	12	9z4cda	5	THE NAME OF ITSELF SPEAKS OUT. GO SANDISK GO!	07-04-2014	245	0	0	0	0	0
15	13	A4Q96 "Gi	5	Solid SDHC card that is fast [at reading and writing] fast (for recording vid	21-11-2013	382	0	0	0	0	0
16	14	Aaron "Aa	5	Heard that the card's write speed is insufficient, however I have used it e	17-02-2014	294	0	0	0	0	0
17	15	Aaron "Aa	5	I bought this to use with my go pro hero 3 black edition. It requires a class	01-04-2013	616	0	0	0	0	0
18	16	Aaron Alv	5	got this because i had a 2 GB one that filled up. i kept getting the insuffici	03-02-2014	308	0	0	0	0	0
19	17	Aaron F. V	5	Class 10 Speed Rating for Seamless Full HD VideoThe SanDisk Ultra UHS-I	07-04-2013	610	0	1	1	-1	0
20	18	Aaron Gra	5	The read and write speeds are better than the Samsung SD card that I had	05-02-2014	306	0	0	0	0	0
21	19	Aaron	5	This works with the NL1520. No video stuttering like with the 64gb. Blah	01-07-2014	160	0	0	0	0	0
22	20	Aaron	5	Works as expected. High transfer speed. Nice to have extra microSD adap	17-10-2013	407	0	0	0	0	0
23	21	Aaron	5	Works great in a Samsung Galaxy S3. Formatted straight away, full size th	29-12-2013	344	0	0	0	0	0

amazon

amazon dataset has been used which is a dataset of product's reviews containing about five thousand reviews consisting of three classes- positive, negative, and neutral.

The dataset was loaded on google Collab. Most of the reviews of amazon dataset seem to contain less than 300 tokens, therefore as maximum length was taken as 400.

BERT TOKENIZER

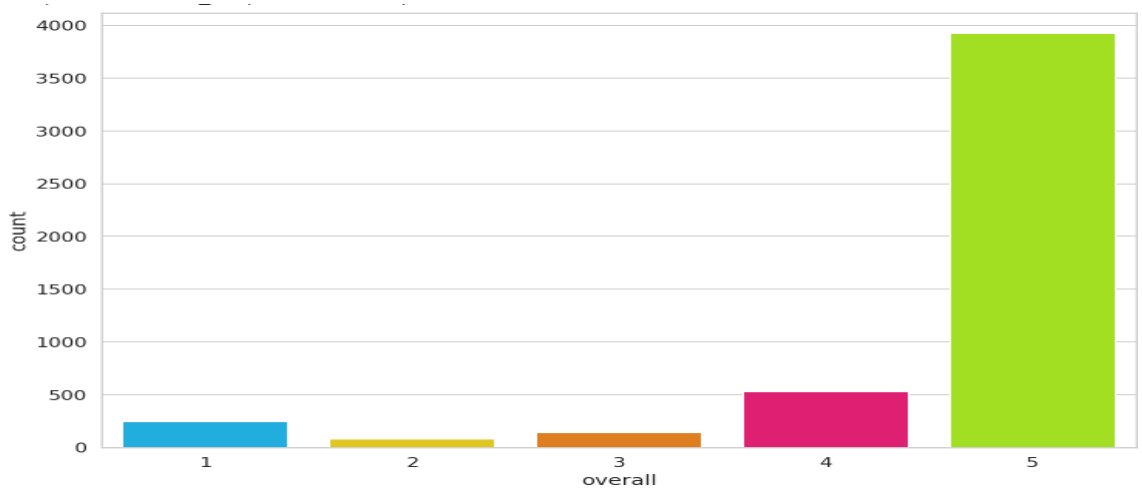
The data was prepared according to the format required to fit into the BERT model.

1.) Input IDs -These are the parameters which has to be passed in the form of input.

2.) Token type ids - We have used special tokens such as CLS (classifier)

and SEP (separator) tokens which are used to separate the sequences.

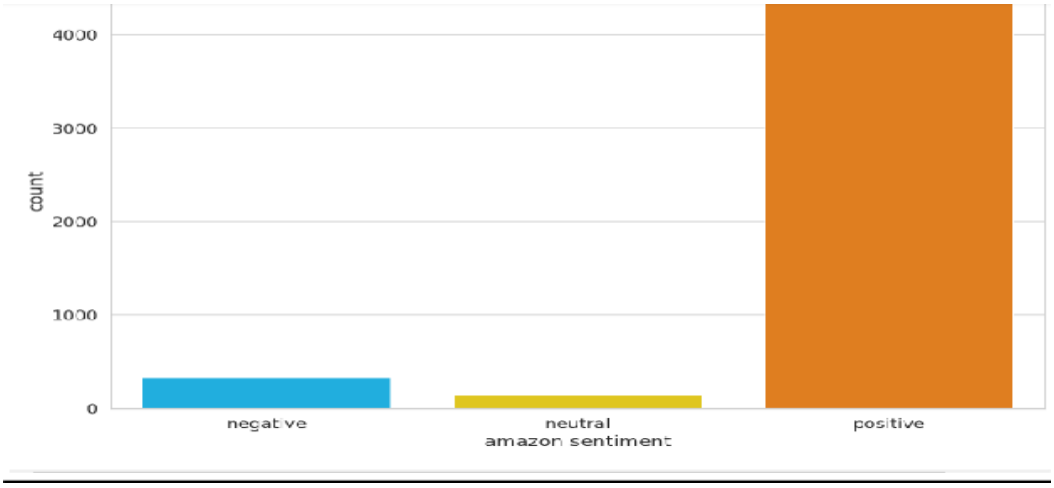
3.) Attention Mask - Mask value can be either 1 or 0. 1 is for those tokens which are not masked and 0 is for those tokens which are masked.



The encode-plus-function will tokenize the raw input and add the special tokens as well as pad the vector to a size equal to themaximum length that we have already set as 512.

FINAL OUTPUT

The bar graph shows the final output of the analysis using BERT model. The dataset had highest number of positive reviews for different products of Amazon.



CONCLUSION

In the business world, sentiment analysis can be used to track customer satisfaction levels, to gauge public opinion about a product or service. and with our application we would like this to be accessible to the masses.

REFERENCE

1. Natural language processing: an introduction, Prakash M Nadkarni, Lucila Ohno-Machado, Wendy W Chapman,Journal of the American Medical Informatics Association, Volume 18, Issue 5, September 2011, Pages 544–551, https://doi.org/10.1136/amiajnl-2011-000464
2. A survey on sentiment analysis methods, applications, and challenges Mayur Wankhade, Annavarapu Chandra Sekhara Rao & Chaitanya Kulkarni
3. BERT: a sentiment analysis odyssey, Shivaji Alaparthi & Manit Mishra Journal of Marketing Analytics volume 9, pages118–126 (2021)
4. Knowledge-enabled BERT for aspect-based sentiment analysis Anping Zhao a, Yu Yu b, Knowledge-Based Systems, Volume 227, 5 September 2021, 10722,
5. https://www.analyticsvidhya.com/blog/2021/12/fine-tune-bert-model-for-sentiment-analysis-in-google-colab/
6. https://curiousily.com/posts/sentiment-analysis-with-bert-and-hugging-face-using-pytorch-and-python/

Urbanization in India - Pattern and Planning

Mr. Ravi Shanker Singh[1]
[1]Assistant professor, Department of Economics, Vaishali Mahila College, Hajipur-844101
Mail. Id: ravisusbhu@gmail.com

Urbanization in India has become an important and irreversible process and an important determinant of national economic growth and poverty reduction. The process of urbanization may be characterized by increase in the number of large cities, but still India is in the midst of transition from a predominantly rural to a quasi-urban society. Urbanization is a natural process and is closely related with economic growth. Urbanization can also be defined as a process of concentration of population in particular territory. In demographic sense, the level of urbanization is measured by the percentage of population living in urban areas with some specific pattern of settlement. In India urban areas are define on the basis of two criteria –

i. To a settlement the state government grant municipal status – corporation, municipal council, Nagar panchayat or notified town area committee etc. Such settlements are known as statutory or municipal towns in the census definition of urban areas.
ii. If a settlement does not have such civic status, but satisfies demographic and economic criteria, like a population of more than 5000, a density of 400 persons per square kilometer and 75 percentage male workforces working in the non-agricultural sector, it can be declared as urban.

According to the census 2011, about 37.7 crore Indians comprising 31.14 % of country's population lived in urban areas. The urban population is projected to grow to about 60 crores comprising 40% by 2031 and 850 crores by (50%) by 2050.urbanisation and city growth are critical for assessing current and future needs with respect to urban growth and for setting policies priorities to promote inclusive and equitable urban and rural development. Globally more than half of the world's population (54 percentage) lives in urban areas although level of urbanization is still varying cross the countries.

While urbanization has been a mechanism of economic, social, and political progress, its immense serious socio-economic problems in the country. the rapid growth of urban population both on the basis of natural growth of population and though migration, has put immense presser on facilities like sanitization, transportation, housing, electricity, water supply health and education. Peoples moves into the cities for availing better employment opportunities, education and health facilities. Industries are mostly located in urban areas and capable to create huge job opportunities which makes people migrate to urban areas in search of these jobs. In order to reduce time and expenses in commuting and transportation people move to urban areas.

Objective

The study has been undertaken keeping in view of the following objectives:

1. To study trends of urbanization in India.
2. To study problem of urbanization.
3. To study changing environment of urbanization.
4. To study the significance and contribution of government policies and schemes.
5. To study implementation of new policies of the present government.

Research methodology

The collection of data for this paper is only from secondary that include research papers, journals, books and various websites for analyzing and techniques.

Tends in Urbanization

The office of registrar general and census commission of India Projected the urban population for the year 2011 to 358 million, and estimated that urban population growth rates would decline from 2.75% per annum observed during 2001 – 2011 (Registrar general and census commissioner 20060. Urban experts also believed that India's urbanisation would slow down because of its exclusionary nature and its inability to spur rural to urban migration (Kundu2007, 2011) however, the 2011 Census Shows some unexpected results.
According to the 2011 census, there were 377 million people living in urban areas, an increase of 2.76% year from 2001 to 2011. The overall level of urbanisation in the nation went from 27.7% in 2001 to 31.1% in 2011 — a 3.3%-point rise from 2001 to 2011 compared to a 2.1-point gain from 1991 to 2001. It should be remembered that the Indian economy grew by about 8% annually throughout the first decade of the 2000s, up from about 6% annually during the 1990s (Ahluwalia 2011). This amply demonstrates the ability of economic expansion to hasten urbanisation between 2001 and 2011.

Table No. 1 shows that India had an urban population of about 79 million in 1961,
Table No. 1: - Trends in Urbanisation in India (1961-2011)

Census Year	Urban population (in million)	Percentage Urban	Annual Exponential Urban Growth Rate (%)
1961	78.94	17.97	-----
1971	109.11	19.91	3.23
1981	159.46	23.34	3.79
1991	217.18	25.72	3.09
2001	286.12	27.86	2.75
2011	377.10	31.16	2.76

As the 1981 census was not conducted in Assam, and the 1991 census was not held in Jammu and Kashmir, the population of India includes projected figures these states in those periods.
Source: census of India various years.

Table No. 2: rural urban population growth differentials (1971- 2011)

Decade	Rural	Urban	Urban- Rural Growth Differentials (Annual Exponential growth rate, in %)
1971-1981	1.76	3.79	2.03
1981-1991	1.80	3.09	1.29
1991-2001	1.69	2.75	1.06
2001-2011	1.15	2.76	1.61

Source: census of India, various years.

Which constituted about 18% of the total population. The average growth rate of the urban population was 2.32% during 1951-61 which accelerated up to 3.79% during 1971-81. This was the highest urban growth since independence. After 1981, the urban growth rate decelerated to 3.09 during 1981- 91 and further declined to 2.75 during 1991-2001. However, the declining growth rate was slightly reversed during 2001-2011.

It is worthwhile to note that urban population growth alone cannot speed up urbanization. More importantly if urbanization has to occur, the urban population growth rate needs to be higher than the rural population growth rate. Table 2 shows that urban rural growth rate differentials increased from about 1 percentage per annum during 1991- 2001 to 1.61 percentage per annum during 2001-2011. It is also evident from table 2 that the rural population growth has declined much faster during 2001-2011 compare to earlier decades. Rural urban population growth differential is a product of the differentials in the natural increase between rural and urban areas (births-deaths), net rural urban classification and net rural urban migration. The urban rural natural increase growth differentials remained almost constant that is 4 per thousand population during 1991-2001 to 2001-2011. That means, it was the net rural urban classification and net rural urban migration that were responsible for higher urban rural growth differentials and the higher rate of urbanisation during 2001-2011.

Ranking of states/UTs by percentage of urban population to total population

Table No. 3

Ranking of states/UTs by percentage of urban population to total population, 2001- 2011				
Ranking in 2001	States/ UTs	Percentage of urban population to total population		Ranking in 2011
		2001	2011	
1	Delhi	93.18	97.50	1
2	Chandigarh	89.77	97.25	2
3	Puducherry	66.57	68.31	5
4	Goa	49.76	62.17	6
5	Mizoram	49.63	51.51	7

6	Lakshadweep	44.46	78.08	3
7	Tamilnadu	44.04	48.45	8
8	Maharashtra	42.43	45.23	11
9	Gujrat	37.36	42.58	12
10	Daman & Due	36.25	75.16	4
11	Karnataka	33.99	38.57	13
12	Punjab	33.92	37.49	14
13	Andaman Nicobar Island	32.63	35.67	15
14	Haryana	28.92	34.79	16
15	West Bengal	27.97	31.89	18
16	Andhra Pradesh	27.3	33.49	17
17	Madhya Pradesh	27.46	27.63	22
18	Kerala	25.96	47.72	9
19	Uttarakhand	25.67	30.55	19
20	Manipur	25.11	30.21	20
21	Jammu Kashmir	24.81	27.21	23
22	Rajasthan	23.39	24.89	26
23	Dadar Nagar Haveli	22.89	46.62	10
24	Jharkhand	22.24	24.05	27
25	Utter Pradesh	20.78	2.28	30
26	Arunachal Pradesh	20.75	22.67	29
27	Chhattisgarh	20.09	23.24	28
28	Meghalaya	19.58	20.08	31
29	Nagaland	17.23	28.97	21
30	Tripura	17.06	26.18	24
31	Odisha	14.99	16.68	32
32	Assam	12.9	14.08	33
33	Sikkim	11.07	24.97	25
34	Bihar	10.46	11.3	34
35	Himachal Pradesh	9.8	10.4	35

Source: Census of India 2001and 2011

In all Indian states and union territories, the proportion of urban residents to the overall population has increased between 2001 and 2011, according to Table 2. In India, Delhi is the state or union territory with the highest level of urbanization, followed by Chandigarh, which ranked first and second in both 2011 and 2001. The least urbanized state or union territory in both 2001 and 2011 was Himachal Pradesh and followed by Bihar, which placed 35th and 34th, respectively. In case of Himachal Pradesh only 9.8 and 10.4 percentage population was

urbanized in both 2001 and 2011which in list in both the years. In case of Bihar, which is second least urbanized states of India in both the census year 2001 and 2011 and percentage of urban population was 10.46 and 11.3 respectively.

At the state level, the pattern of urbanization is very diverse, but economically advanced states shows higher level of urbanization in compare to economically weaker states. All southern states, along with Punjab, Haryana, Gujrat, Maharashtra and West Bengal, have higher urbanization levels than the national level of urbanization. Some small states like Goa (62%) and Mizoram (51.5%) continue to be the top list of urbanization. Other states like Utter Pradesh, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, Bihar and Himachal Pradesh continue to have lower level of urbanization.

Urbanization – Five Year Plans

The planning commission has given more importance for urbanization during different five years plans. In fist Two five years plans focused on institution and organization hence town and country planning organizations were formed during this period. The third plan (1961-66) emphasized on importance of town and cities in balanced regional development and the need for urban land regulation, checking of urban land prices, preparation of master plan etc. the fourth plan (1969-74), continued with the theme of third plan and development plans for 72 urban areas were undertaken. In the fifth plan, urban land ceiling act was passed in 1976. Mumbai metropolitan region development authority (MMRDA) in 1974 and housing and urban development corporation in 1975were established. It also emphasized the urban and industrial decentralization. The sixth plan (1978-83) stressed the need to develop small and medium sized towns (less than 1 lakh). In the seventh plan an attempt was made to give urban local bodies a constitutional status with three tier federal structure. But it was not passed and was finally passed in 1992 as constitutional amendment act and come into force in 1993. In eighth plan, the Mega city scheme was introduced in 1993-94 covering five mega cities of Mumbai, Calcutta, Chennai, Bangalore and Hyderabad. The ninth plan continue with the schemes of eighth plan and also emphasized on decentralization and financial autonomy of local bodies. A new program Swarna Jayanti Shahari Rojgarjana (SJSRY) was started in 1997. The tenth plan (2002-2007) recognized the fact that urbanization played a vital role in accelerating the economic liberalization and also stressed to strengthen the urban local bodies.in the eleventh plan (2007-2012) introduced some innovative changes using technology as a tool for rapid urbanization. in this direction major initiative launched by central government was JNNURM (Jawaharlal Nehru National Urban Renewal mission) in 2005 for focused and integrated development of urban infrastructure and service, initially for 63 cities. Focus on JNNURM was on provision for urban poor, including housing, water supply and sanitation, urban transport, road network and development of inner/old city areas, etc. the twelfth plan (2012-17) proposed to consolidate JNNURM and envisaged its wider role in urban reforms. The plan has also highlighted the reasons which are acting as hurdles as failure to mainstream the urban planning, incomplete reform and slow progress in project implementation, delay in securing land for project and delay in getting approval from various regulators.

The planning commission was changed as NITI Ayog in 1st January 2015under the chairmanship of prime minister of India and the vice Chairman was Dr. Arvind Panagariya. NITI Ayog has launched Urban Management Programme in New Delhi on 27 April 2016. The government of India has come forward to resolve issue related to urbanization y upgrading urban operating model. Indian government initiated Swachh Bharat Programme to improve cleanliness in India's town and cities. The government focus more on solid waste management and waste water treatment and took initiative for clean city and green city and more emphasis on providing basic amenities in town and city areas. There is an urgent need to develop social mechanisms which will assist to reduce inequality and make sure basic amenities like health, sanitization, education to access those who have been underprivileged of the same.

The prime minister Mr. Narendra Modi launched the Smart City Mission on 25th June 2015. It is for boost up core infrastructure and support decent quality of life, and clean and sustainable environment to its residents. This mission will cover 100 cities for five-year time duration (financial year 2015-16 to financial year 2019-20). Atal Mission for Rejuvenation and Urban Transformation (AMRUT) programme is launched by the prime minister on 25th June 2015 for development of basic infrastructure in 500 cities. objective of this mission is to ensure access of each and every household have tap water supply and sewerage connection. The national Heritage City Development and Augmentation Yojana HRIDAY) Scheme, aims at preserving and revitalizing the soul of and unique character of the heritage cities in India. In first phase, twelve cities have been identified for implementation under this scheme. These are Ajmer, Amritsar, Amaravati, Badami, Dwarka, Gaya, Kanchipuram, Mathura, Puri, Varanasi, Velankanni, and Warangal. The first phase of the HRIDAY Scheme was launched in January, 2015 for a period of 27 months with a total outlay of Rs. 500crore, fully funded by central government. Aim of this scheme is to restoring, reviving and strengthening the soul and heritage of these cities under projects of HRIDAY.

Problems and effect of urbanization in India

Numerous issues, including overcrowding, settlements, transportation, health, sanitization, education, and unemployment are associated with urbanisation. Environmental issues, waste management, inadequate funding, ineffectiveness at urban local governments, city planning, neglect on the part of the government, lack of necessary research, maladministration, etc. This trend will intensify and worsen as the population grows, which will result in even worsening living conditions.

Some of the measures to solve the above discussed problems and to improve the condition can be discussed as

Over-Population: The Increasing level of education and need of employment drawing the youth towards cities. To overcome this, the scope of cities geographical area should be increased. Along the projects such as Smart Cities Mission, projects to make the Smart Village should also be developed.

Settlements: Overcrowding leads to development of slum areas and congestion in cities. At present, more the 40% of the urban population live in slums. Affordable housing projects, obsolete land acquisition from the government and people, smart and innovative solution for housing such as multi-storeyed buildings, clearing of illegal settlements could be some of the solutions to this.

Transportation: Lack of availability of transportation facilities and connectivity is a major issue. The Metro Rail Project, Public transport availability and frequency enhancement, better traffic rules and implementation, Roads improvement, accident insurance can be done to improve the scenario.

Health and Sanitation: Increase in Population results in deterioration in living condition and causes disease burden. Poor housing and slums create disease outbreak and make the condition even more worrisome. Availability of safe and clean drinking water, proper sanitation drills through municipalities, affordable medical facilities, and awareness generation can definitely be helpful.

Un- Employment: Overcrowding leads to reduction in employment opportunities in cities. The development should not be restrictive in terms of places and employment generation should also be done at rural areas and due consideration should be given to village economy apart from the agrarian centric development. Villages should also be developed along cities.
Waste Management and Environment: Solid waste management is one of the biggest problems as there are no proper facilities and places for the waste treatment and its disposal. Lack of availability of spaces makes the outer areas prone for disposal and accumulation of garbage. This further aggravates the situation by causing water and air pollution. An effective waste disposal and treatment policy should be formulated and implemented to get rid of this.

Finance: According to Niti Aayog, India needs around INR 400 trillion to overhaul its infrastructure but it only raises only INR 20 trillion through urban bodies, which is just around 1% of its GDP. This is far behind the economies such as South Africa and Brazil (8%), Denmark (37%). Inefficiency has increased to manifold after the GST as it had taken over some of its taxes such as octroi and local body tax. ULBs should be given with more devolution of grants and power to raise funds. Municipal bonds could be one of the options to raise funds for the cities management.

Research work and innovation: More innovative ideas should be evolved for affordable and better cities management. The Private – Public partnerships should be invited for research work. The lessons should also be learnt from the other countries to manage the cities.
The better and efficient management of cities can have multiple impacts on the economy, society and development of the country. This would lead to allocation of resources in right direction and will ease up the situation for the people and government as well.

Conclusions

The process of urbanization may be characterized by increase in the number of large cities, but still India is in the midst of transition from a predominantly rural to a quasi-urban society. Urbanization can also be defined as a process of concentration of population in particular territory. During 1980 and 1990 declining trend of urban population growth rate observed and it was reversed at the national level, and the level of urbanization increased faster during 2001-2011. The urban population grew from 286 million in 2001 to 377 million in 2011, which is larger than the rural population increment of 91 million for the first time since independence. This substantial increase in urban population is due to a net rural urban classification and rural to urban migration. Urbanization is linked to various problems such as Overcrowding, Settlements, Transportation, Health, Sanitation, Education, Un-Employment Environmental problems, Waste management, Inadequate finances, Inefficiency at Urban Local Bodies, Planning of cities, Government negligence, Lack of needed research work, etc. With the increasing population this trend is going to enhance and would lead to degradation of living conditions more. A holistic approach of urban planning and management is needed to improve living standards of urban dwellers. Sustainable urbanisation requires that cities generate better income and employment opportunities expand the necessary infrastructure for water and sanitation, energy, transportation, information and communication, ensure equal access to services, reduce the number of people living in slums and preserve the natural assets within the city and surrounding areas.

Reference

1. Godfrey, R., & Julien, M. (2005). Urbanisation and health. *Clinical Medicine*, *5*(2), 137.
2. Datta, P. (2007). Urbanization in India.
3. Kundu, A. (2007): Migration and Exclusionary Urban Growth in India", *Sixth Dr C Chandrasekeran Memorial Lecture, International Institute for Population Sciences, Mumbai*.
4. Kundu, A. (2007, June). Migration and urbanisation in India in the context of poverty alleviation. In *international conference and workshop on Policy Perspectives on Growth, Economic Structures and Poverty Reduction, Beijing, China* (pp. 3-9).
5. United Nation (2009): "The World Urbanisation Prospect: The 2009 Revision*", Department of Economic and Social Affairs Population Division New York.*
6. Batra, L. (2009). A review of urbanisation and urban policy in post-independent India. *New Delhi: Centre for the Study of Law and Governance*.
7. Bhagat, R. B. (2011). Emerging pattern of urbanisation in India. *Economic and political weekly, 10-12.*
8. Ahluwalia, Montek (2011): "Prospect and Policy Challenges in The Twelfth Plan", Economic and Political Weekly,46(21):88-105.
9. Kundu, A. (2011). Trends and processes of urbanisation in India.
10. Bhagat, R. B. (2011). Emerging pattern of urbanisation in India. *Economic and political weekly*, 10-12.
11. Kundu, A., &Saraswati, L. R. (2012). Migration and exclusionary urbanisation in India. *Economic and Political Weekly*, 219-227.

12. Tripathi, S. (2013). An overview of India's urbanization, urban economic growth and urban equity.
13. Chatterjee, M. (2013). Urbanization trends and urban planning in West Bengal, India. In *ATINER'S conference paper series, (PLA), Athens* (Vol. 632).
14. Kumar, D., & Rai, A. K. (2014). Urbanization process, trend, pattern and its consequences in India. *Neo Geographia*, *3*.
15. McGranahan, G., & Satterthwaite, D. (2014). *Urbanisation concepts and trends* (Vol. 220). International Institute for Environment and Development.
16. Sood, A. (2015). Industrial townships and the policy facilitation of corporate urbanisation in India. *Urban Studies*, *52*(8), 1359-1378.
17. Ahluwalia, I. J. (2016). Challenges of urbanisation in India. *Contemporary issues in development economics*, 163-177.
18. Sadashivam, T., &Tabassu, S. (2016). Trends of urbanization in India: issues and challenges in the 21st century. *International Journal of Information Research and Review*, *3*(5), 2375-2384.

Impact of Big Data on Healthcare

Ms. Nimisha Manan
Research Scholar, Computer Science,
Patliputra University, Patna
Email id: manannimisha@gmail.com

Dr Krishnandan Prasad, Associate
Professor, Dept. of Mathematics, T.P.S.
College, Patliputra University, Patna
Email id: knpd1962@gmail.com

Abstract

Massive volumes of information, or "big data," are extremely useful. Because of the huge potential it has, during the past 20 years, it has attracted a lot of attention. Big data is produced, stored, and analysed by a variety of public and private sector industries with the intention of enhancing the services they offer. Hospital records, patient medical records, medical test findings, and internet of things-enabled gadgets are just a few examples of the big data sources used in the healthcare sector.

Additionally producing a sizable amount of big data pertinent to public healthcare is biomedical research. In order to produce relevant information, this data needs to be managed and analysed properly. Otherwise, finding a solution through big data analysis quickly resembles finding a needle in a haystack. Every step of processing big data comes with a unique set of difficulties that can only be overcome by adopting high-end computing solutions for big data analysis. Healthcare providers must be fully equipped with the necessary infrastructure to regularly create and analyse big data in order to offer pertinent solutions for enhancing public health. By creating new opportunities for contemporary healthcare, effective big data administration, analysis, and interpretation can completely alter the game. That is precisely the reason why a variety of sectors, including the healthcare sector, are acting quickly to transform this potential into better services and financial benefits.

Keywords: Healthcare, Biomedical research, Big data analytics, Internet of things, Personalized medicine, Quantum computing

Introduction: -

A needle in a haystack-like search for a solution using large data analysis otherwise quickly becomes impossible. Each phase of managing large data comes with a unique set of difficulties that can only be overcome by adopting high-end computing solutions for big data analysis. Therefore, healthcare providers must be fully furnished with the necessary infrastructure to regularly generate and analyse big data in order to offer pertinent solutions for enhancing public health. By creating new pathways for contemporary healthcare, effective big data administration, analysis, and interpretation can upend the status quo. To achieve improved services and financial benefits, a number of businesses, including the healthcare sector, are moving aggressively in this direction.

Objective: -

We can also use this information to predict future events and current trends in a variety of parameters. Healthcare organisations, like all other industries, are producing data at a great velocity that brings both many benefits and difficulties at the same time

People who work at different organisations all over the world produce a tonne of data every day. Such enormous volumes of data are quantitatively defined as the "digital universe" and are produced, reproduced, and consumed in a single year.

Massive amounts of data have been gathered and stored by internet behemoths like Google and Facebook. For example, based on our selections, Google may retain a range of information, including user location, advertisement preferences, a list of programmes used, internet browsing history, contacts, bookmarks, emails, and other required information related to the user. The amount of user-generated data that Facebook stores and analyses exceeds 30 petabytes (PB). 'Big data' refers to such vast volumes of data. The IT sector has effectively leveraged big data over the last ten years to produce vital information that can yield large profits.

BigData Definition

The most well-known and widely-accepted definition of big data was offered by Douglas Laney. Laney noted that (big) data was expanding in the three distinct dimensions of volume, velocity, and variety (together known as the 3 Vs). The 'huge' in big data refers to its substantial volume. Almost all research fields, whether they are related to business or academia, are producing and analysing big data for a variety of reasons. The management of this enormous, both organised and unorganised pile of data is the most difficult endeavour.

Big Data Analytics: A Literature Review Paper

Decision-makers now have access to vast amounts of data thanks to the information age. Big data refers to datasets that are not only large in size but also have a high level of variety and velocity, making it challenging to manage them with conventional tools and procedures. Solutions must be researched and offered in order to handle and extract value and knowledge from large datasets due to the rapid growth of such data. Decision-makers also need to be able to draw important conclusions from the wide range of fast evolving data, including information from social networks, daily transactions, and consumer contacts. Massive data analytics, or the use of sophisticated analytics techniques on massive data, can deliver this value.

Methodology And Methods

The goal of this research work, "Impact of Big Data on Healthcare," is to improve the effectiveness of the decision-making process for the healthcare system of Bihar by using

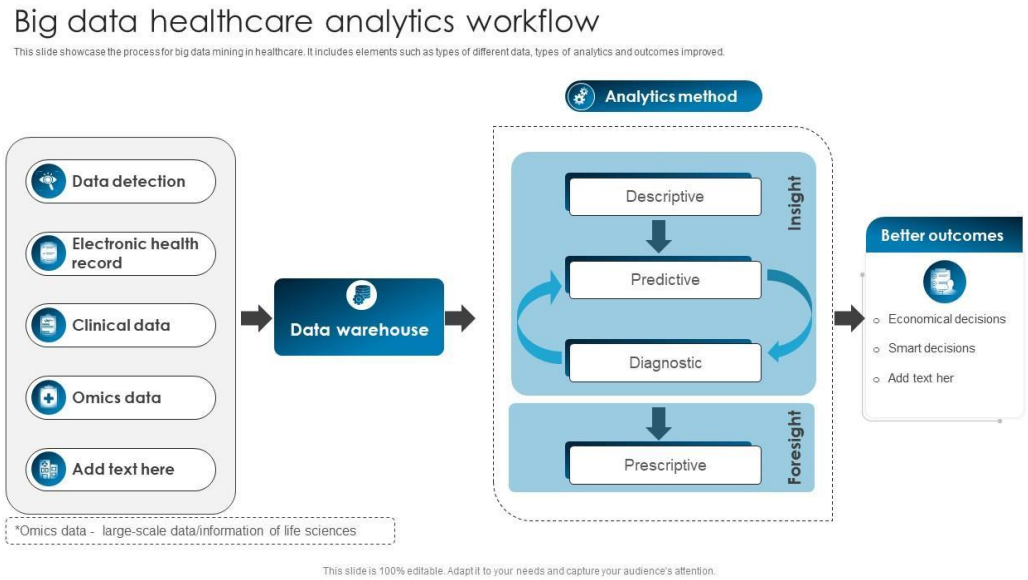
business intelligence tools to analyse the data already in existence. In order to improve the data analysis process in the current healthcare system in India, new Business Intelligence technologies will be obtained, presented, and used in this research process. The strategy is supported by scientific studies. Analysis of the most recent data gathered from different hospitals will be included in the first section. The purpose of the second section, which will be devoted to presenting the original findings from the research, is to address issues with improving decision-making with business intelligence technology, boosting the performance of business intelligence applications, and analysing the healthcare system in India as an information system. The study is crucial many reasons, one of which is that the healthcare system is India's sole system that can directly address the people of India. It is crucial to comprehend the amount of the children's service provision and determine whether the intervention results in improvement. This is something that my study aims to show.

Huge Data Storage Facility in Healthcare

Healthcare is a multifaceted system that was created with the express purpose of preventing, diagnosing, and treating human health-related problems or impairments.
The main elements of a healthcare system are the medical staff (physicians or nurses), medical facilities (clinics, hospitals for the delivery of medications and other technology for diagnosis or treatment), and a financing institution supporting the first two.

Electronic Health Records

Noteworthy is the announcement made by the National Institutes of Health (NIH) the "All of Us" effort, which seeks to gather at least one million patients' EHR, medical imaging, socio-behavioural, and environmental data over the coming several years. The primary benefit of EHRs is that they give medical professionals better access to a patient's complete medical history. The data consists of medical diagnoses, prescriptions, information on known allergies, demographics, clinical narratives, and laboratory test results. As a result of the reduction in time required for diagnosis and therapy.



Internet of Things (IOT)

Comparatively speaking to other businesses, the Internet of Things (IOT) healthcare sector has not adapted to the big data movement as quickly. Big data use in the healthcare industry is therefore still in its infancy. For instance, the big data in biomedicine and healthcare have not yet combined to improve healthcare data with molecular pathology. Biomolecular and clinical datasets must therefore be combined in order to evaluate a person's health condition. The "internet of things" (IoT) is one such source of clinical data in the healthcare industry.

Advantages of IoT in healthcare

A doctor can measure and monitor numerous parameters from his or her patients in their individual places, such as at home or the office, using the web of IoT devices. Because of this, receiving early intervention and treatment may prevent a patient from needing to be hospitalised or even see a doctor, which would significantly lower the cost of healthcare. Wearable health-tracking gadgets, biosensors, clinical equipment for monitoring vital signs, and other kinds of devices or clinical instruments are a few examples of IoT devices used in healthcare.

Mobile computing and mobile health (mHealth)

In the modern digital age, everyone seems preoccupied with tracking their fitness and using the built-in pedometer on their portable and wearable devices, such as smartphones, smartwatches, fitness trackers, or tablets, users can track their health statistics. Because we live in a society that is increasingly mobile in almost all spheres of life, healthcare infrastructure must be updated. The use of mobile devices in the practise of medicine and public health, also known as mHealth or mobile health, permeates all levels of health care, particularly for chronic diseases like cancer and diabetes. Mobile health and wellness services are being used by healthcare organisations more and more to create cutting-edge and creative approaches to caregiving and wellness coordination. Mobile platforms can enhance healthcare by fostering faster interactive patient communication.

Analysis of big data in healthcare

Due to their abundance of data, EHRs can facilitate advanced analytics and aid in clinical decision-making. The structured input options (drop-down menus, radio buttons, and tick boxes) frequently fall short of capturing data of complicated nature, which is another reason to use an unstructured format. For instance, there is no other format we may use to record non-standard information about a patient's clinical suspicions, socioeconomic statistics, patient preferences, important lifestyle aspects, and other relevant information.

Discussion on Extracting information from EHR datasets

The information processing skills of the healthcare industry are being improved by new ML or AI-based tactics. For instance, the rapidly evolving field of machine learning known as natural language processing (NLP) can recognise important grammatical patterns in free text, assist with speech recognition, and decipher the meaning of narratives. NLP tools can be used to transcribe clinical notes or create new documents, such as a summary of a clinical visit. For many NLP developers, the distinctive content and complexity of clinical documentation might be difficult.

Big data in the field of medicine has also benefited from the predictive capabilities of AI. For instance, ML algorithms can transform the automated diagnostic system of medical imaging.

Challenges associated with healthcare using big data

Storage

One of the main issues is storing a huge amount of data, yet many organisations feel safe doing it on their own property. It has a number of benefits, including control over access, uptime, and security. However, expanding and maintaining an on-site server network can be expensive. The majority of healthcare organisations have chosen cloud-based storage since it looks to be a better option with declining costs and rising reliability

Cleaning

After capture, the data needs to be cleaned or scrubbed to verify its quality, correctness, consistency, relevance, and purity. To achieve high levels of correctness and integrity, this cleaning procedure can be performed manually or automatically using logic rules.

Accuracy

According to several research, entering patient data into EMRs or EHRs is still not totally accurate. This is likely due to poor EHR utility, complicated work processes, and a lack of knowledge of why big data is so crucial to collect correctly. All of these elements may affect big data quality throughout its lifecycle.

Image preparation

Numerous physical factors that can affect data quality and cause misinterpretations of already-existing medical records have been observed in studies. Medical photographs frequently experience technical difficulties caused by various kinds of noise and artefacts.

Security

Data security is a top priority for healthcare organisations due to the numerous security breaches, hackings, phishing assaults, and ransomware outbreaks. A set of technical protections was created for the protected health information (PHI) after numerous vulnerabilities were identified.

Visualization

It can be much simpler for humans to comprehend information and put it to good use if data is presented in a clear and appealing way with charts and histograms to demonstrate contrasting figures and accurate labelling to prevent confusion.

Data exchange

Patients might or might not receive their care in different places. Data exchange with other healthcare organisations will be crucial in the first scenario.

Using big data analytics to save expenses

We must solve each of the aforementioned difficulties if we are to create a big data-based healthcare system that can interchange huge data and gives us reliable, pertinent, and useful information. Time, money, and effort would need to be invested if these obstacles were to be overcome. But like other technological advancements and improvements, it would seem that the current demands on healthcare, especially in terms of costs, would be lessened if these ambitious measures were successful.

Conclusions and future prospects

Today, a variety of biomedical and healthcare tools produce a large amount of data, including smartphone apps, mobile biometric sensors etc. As a result, it is imperative that we understand and evaluate what can be accomplished using this data. For instance, the examination of such data can offer more insights into how to enhance healthcare through procedural, technical, medical, and other means. An examination of various medical treatments suggests that patient-specific medical specialties or personalised medicine is currently being used to its full potential. EHR, EMR, and other big data analysis of medical data are continuously improving the prognostic framework. Researchers are diving into biomedical big data despite the infrastructure challenges in the hopes of uncovering fresh and useful knowledge that will advance the current state of healthcare services.

Big data in healthcare is expected to rise at an exponential rate, according to care companies.

References

1. Reisman M. EHRs: the challenge of making electronic data usable and interoperable. Pharm Ther. 2017;42(9):572–5.
2. Murphy G, Hanken MA, Waters K. Electronic health records: changing the vision. Philadelphia: Saunders W B Co; 1999. p. 627.
3. Shameer K, et al. Translational bioinformatics in the era of real-time biomedical, health care and wellness data streams. Brief Bioinform. 2017;18(1):105–24.
4. Service, R.F. The race for the $1000 genome. Science. 2006;311(5767):1544–6.
5. Stephens ZD, et al. Big data: astronomical or genomical? PLoS Biol. 2015;13(7):e1002195.
6. Yin Y, et al. The internet of things in healthcare: an overview. J Ind Inf Integr. 2016; 1:3–13.
7. Moore SK. Unhooking medicine [wireless networking]. IEEE Spectr 2001; 38(1): 107–8, 110.

8. Nasi G, Cucciniello M, Guerrazzi C. The role of mobile technologies in health care processes: the case of cancer supportive care. J Med Internet Res. 2015;17(2): e26.
9. Apple, Research Kit/Research Kit: Research Kit 1.5.3. 2017.
10. Shvachko K, et al. The hadoop distributed fle system. In: Proceedings of the 2010 IEEE 26th symposium on mass storage systems and technologies (MSST). New York: IEEE Computer Society; 2010. p. 1–10.
11. Dean J, Ghemawat S. MapReduce: simplified data processing on large clusters. Commun ACM. 2008;51(1):107–13.
12. Zaharia M, et al. Apache Spark: a unifed engine for big data processing. Commun ACM. 2016;59(11):56–65.
13. Gopalani S, Arora R. Comparing Apache Spark and Map Reduce with performance analysis using K-means; 2015.
14. Ahmed H, et al. Performance comparison of spark clusters confgured conventionally and a cloud servicE. Procedia Comput Sci. 2016; 82:99–106.
15. Saouabi M, Ezzati A. A comparative between had oopmapreduce and apache Spark on HDFS. In: Proceedings of the 1st International conference on internet of things and machine learning. Liverpool: ACM; 2017. p. 1–4.
16. Strickland NH. PACS (picture archiving and communication systems): flmless radiology. Arch Dis Child. 2000;83(1):82–6.
17. Schroeder W, Martin K, Lorensen B. The visualization toolkit. 4th ed. Clifton Park: Kitware; 2006.
18. Friston K, et al. Statistical parametric mapping. London: Academic Press; 2007. p. vii.
19. Li L, et al. Identifcation of type 2 diabetes subgroups through topological analysis of patient similarity. Sci Transl
20. Med. 2015;7(311):311ra174.
21. Valikodath NG, et al. Agreement of ocular symptom reporting between patient-reported outcomes and medical records. JAMA Ophthalmol. 2017;135(3):225–31.
22. Fromme EK, et al. How accurate is clinician reporting of chemotherapy adverse efects? A comparison with patientreported symptoms from the Quality-of-Life Questionnaire C30. J Clin Oncol. 2004;22(17):3485–90.
23. Beckles GL, et al. Agreement between self-reports and medical records was only fair in a cross-sectional study of performance of annual eye examinations among adults with diabetes in managed care. Med Care. 2007;45(9):876–83.
24. Echaiz JF, et al. Low correlation between self-report and medical record documentation of urinary tract infection symptoms. Am J Infect Control. 2015;43(9):983–6.
25. Belle A, et al. Big data analytics in healthcare. Biomed Res Int. 2015; 2015:370194.
26. Adler-Milstein J, Pfeifer E. Information blocking: is it occurring and what policy strategies can address it? Milbank Q. 2017;95(1):117–35.
27. Or-Bach, Z. A 1,000x improvement in computer systems by bridging the processor-memory gap. In: 2017 IEEE SOI3D-subthreshold microelectronics technology unifed conference (S3S). 2017.
28. Mahapatra NR, Venkatrao B. The processor-memory bottleneck: problems and solutions. XRDS. 1999;5(3es):2.

29. Voronin AA, Panchenko VY, Zheltikov AM. Supercomputations and big-data analysis in strong-feld ultrafast optical physics: flamentation of high-peak-power ultrashort laser pulses. Laser Phys Lett. 2016;13(6):065403.
30. Dollas, A. Big data processing with FPGA supercomputers: opportunities and challenges. In: 2014 IEEE computer society annual symposium on VLSI; 2014.

A Study on The Impact of "Social Computing" on Youth Between the Age-Group 15-49 in Patna.

Miss Renu Kumari
Research Scholar

Under supervisor
Dr Vijay Kumar
Head, Department of Mathematics,
College of Commerce, Arts and Science,
Patliputra University, Patna

Abstract:

Some of the foremost necessary characteristics of social computing are often summarized as user-created content wherever users will management the information, distinctive sharing of content or media. Social Computing is solely the branch of computing that focuses on analysing the link between human behaviour and computer systems. The speedy emergence of social computing applications is ever-changing the ways in which individuals connect with one another. it's supported making or recreating social conventions and social contexts through the employment of computer code and technology. We will attempt to puzzle out regarding however "Social Computing" effects the education of scholars and health of the individuals following within the specified age bracket and what are its consequences.

A questionnaire was designed to collect the data required for this research paper. The questionnaire was conducted in online mode. The responses enabled us to give the conclusion.

Keyword: Social Computing, deploying social computing (SC) tools

Introduction:

Social Computing is solely the branch of computing that focuses on analysing the link between human behaviour and computer systems. it's supported making or recreating social conventions and social contexts through the employment of computer code and technology.

Some of the foremost necessary characteristics of social computing are often summarized as user-created content wherever users will management the information, distinctive sharing of content or media. The systems that support the gathering, illustration, processing, use, and dissemination of knowledge that's distributed across social comprehensiveness like groups, communities, organizations and markets. Moreover, the knowledge isn't 'unrevealed' however is remarkably precise as a result of it's joined to individuals, United Nations agency square measure successively joined to others. The speedy emergence of social computing applications is ever-changing the ways in which individuals connect with one another. In today's world, the technology is evolving day-by-day, the employment of web and its facilities square measure a pace increasing with the pace. it's moving the individuals of each age bracket, from kids of 3-4 years older to individuals in their 80s or 90s, however the foremost established generation is of 'Youngsters' between the age bracket 15-49.

Social Computing includes sectors like social media networks or a lot of exactly to be aforesaid as social networking sites like Instagram, Facebook, YouTube, LinkedIn and a lot of those sites within which they're extremely concerned and most of the youth share each little detail regarding what square measure they doing, what they require, what they have and a lot of reasonably such queries that additionally includes their personal details.

The main aim of this analysis paper is to target 'Education' and 'Healthcare'. We will attempt to puzzle out regarding however "Social Computing" effects the education of scholars and health of the individuals following within the specified age bracket and what are its consequences.

Aims and Objectives:

Social Computing is the process that furnishes online platforms that provide individuals with an opportunity to manage their personal data and remain updated with the world. The primary objective of the present research is to find the pattern of youngsters' Simple Notification Service (SNS) usage and its influence on their personal and professional life.

To attain this aim, we are up with some major objectives, they are as follows:

1. To nurture a critical mass of researchers in a highly dynamic environment to tackle critical sector issues from the disciplines of computing, human-computer interaction, visual computing and communication between group of people via internet.

2. To provide teaching on computing and Social Responsibility which informs and educates the citizens of society.
3. To develop a curriculum for computing and Social Responsibility which can be delivered through the distributed institutions.
4. To provide a consultancy and advisory service on Computing and Social responsibility.
5. Education and Healthcare can also implement the use of Social Computing to get closer to their customers and promote their brands. It can enhance the bond between developers and users because it allows a business to follow public opinion about its brand and respond quickly to their issues.

Hypothesis:

- Social Computing can lead to a threat in the privacy of the users if not used sensibly.
- People are faced with selecting products on social networks and they seek advices from various trusted sources.
- The vast amounts of content are being created on the internet, in such case, the user finds it difficult for "whom to trust and what to trust".
- Although social computing can create socio-economic activities which could enhance the life of older citizens.
- Social networks maintain a large amount of personal information which leads to people being concerned about privacy on social networks as they are also vulnerable to information security.

Literature Review:

Cybercitizen describes a frequent user of the net or in different terms, a member of a web community or more precisely a cybercommunity. This digital house is often accustomed participate in instructional, profitable and cultural activities. Social computing is an associate approach to data Technology that produces virtual groups across completely different organizations or communities which boosts collaboration, assortment and sharing of data. It permits completely different stakeholders to return along so as to speak and share data during a simpler approach mistreatment cybercommunities. People area progressively creating use of social computing applications as health care tools. This paper describes however social computing applications are being employed as health care tools. Edges related to such use are delineated and also the risks highlighted. This data could facilitate raise awareness in terms of the advantages that people and medical professionals will reap from using social computing applications as health care tools, while additionally cautioning them to think about the risks related to such use. The tools used in Social Computing have potential to support individual of different age groups, whether they are the students of higher educational institutions or the people of different areas who are updating their skills in modern ways. Despite modernization, there is still a scarce in the deployment of social computing because of the enabling and disabling factors of research. Further analysis has to focus on geographic point learning and professional development further as on ways in which of constructing the advantages accessible to learners of all ages and backgrounds.

A large share of web users square measure causative to social networking and media sharing sites, particularly young users the need for modernising academic systems, increasing quality, equity and personalization in providing womb-to-tomb learning for all education and coaching systems want innovative modification to foster new skills for brand spanking new jobs, taking into consideration the dynamical living, operating and learning patterns in a digital society.

The ways of deploying social computing (SC) tools in higher education can be:

1. as an Institutional Tool;
2. as a Communication Tool; and
3. as a Didactic Tool.

a. Social Computing as an Institutional Tool

In terms of institution, social computing refers to the use of computer technology and other digital tools to facilitate social interaction and communication. This can include things like social media, online forums, and other digital platforms that allow people to connect and share information.

As an “Institutional Tool”, social computing can be used by organizations to facilitate collaboration and communication among employees, as well as to engage with customers and other stakeholders. It can also be used to support research and other activities, and to help organizations to make more informed decisions.

b. Social Computing as a

Communication Tool

In terms of communication, social computing is a term that refers to the use of computer technology and the Internet to support social interactions and connections among people.
As a "Communication Tool", this can include a wide range of activities, such as online communication and collaboration, social networking, and the sharing of information and ideas through social media platforms.

c. Social Computing as a Didactic Tool

In terms of didacticism, social computing refers to the use of technology and digital media to enable social interaction and collaboration.
As a "Didactic Tool", it can be used to facilitate learning and instruction by allowing people to connect and share information with each other. This can include things like online forums and discussion boards, social media platforms, and collaborative tools like Google Docs. These tools can be useful for facilitating discussions, sharing resources and information, and allowing people to learn from each other in a collaborative and engaging way.

THE USE OF EDUCATIONAL ORGANIZATIONS THROUGH SOCIAL COMPUTING.

What Is Education?

In simple language we can say that, Education refers to a field that examines how to educate and learn in classrooms or surroundings that are similar to classrooms, as opposed to using different informal and informal socialization approaches or it is a method of providing knowledge and to develop skills particularly in schools, colleges and universities. Through education, we get the abilities, know-how, information, and understanding required to identify, comprehend, and value the duties we have to our families, communities, and nation.

For the following reasons, education is crucial in life:

- It enables us to acquire and explore novel concepts.
- Education may advance both your professional and personal development.
- It allows you to gain knowledge and boost your level of self-assurance.
- Someone with education can excel as a member of society.
- One can make better decisions in their life.
- Education helps you to develop critical skills like decision-making, mental agility, problem-solving and logical thinking.
- Even our personal development can benefit from education. We may advance and do things we never thought possible by always educating ourselves, asking questions, and desiring to learn more.

Social computing applications have enjoyed an exceptional uptake over the past few years. A significant portion of internet users, especially young users, participate in social networking and media sharing websites. People of all ages utilize a variety of collaborative content tools, such as blogs and wikis, to create and share knowledge in a collaborative manner with others

in and outside of organizations and educational institutions. To develop new skills for new jobs, education and training systems need inventive transformation that takes into consideration the shifting living, working, and learning patterns in a digital world. The goal of the study on learning practices in social computing is to make recommendations for creating education and training systems that can address and take use of web-supported learning methodologies in order to facilitate lifelong learning.

In higher education, social computing tools can be used in at least three different ways:

I. Substituting or expanding the virtual learning environment (VLE) as a tool for institutions.
II. As an instrument for communication between students and between students and teachers, helping also the exchange of knowledge and material, but primarily fostering an atmosphere of understanding.
III. Having an emphasis on increasing, facilitating, and strengthening knowledge acquisition, as a methodological or didactic tool within specific disciplines, courses, and classes.

Can Social Media Sites Be Used in Education?

Teachers can also use social media Teachers can also use social media for teaching students, the use of social media platforms to improve student learning is known as "social media in education." A series of Internet-based apps known as social media are described as "allowing the creation and exchange of user-generated content" and "building on the philosophical and technological foundations of Web". Students now have more tools for research and study than ever before because to the internet. Students can also participate in active learning by using technology to contribute in their profession, as well as service learning by collaborating with other organizations to address issues and develop new projects. There is a favourable impact on student-teacher communication and digital literacy when using the internet and social media for education. Additionally, students can access learning management systems like Blackboard and Canvas via their devices. Because they can do their assignments from anywhere with internet access, students have more freedom outside of the classroom. Applications like Zoom and Microsoft Teams are being used to help students learn and give them a "classroom" feels in light of the current COVID-19 outbreak and the closure of the majority of schools. Microsoft has released other platforms in addition to the Microsoft Teams programme, which are used by millions of students worldwide, OneNote, Excel, and PowerPoint. Students frequently use Microsoft PowerPoint to produce slideshows for group projects and other significant presentations. This is referred to as “audience connectors” in a specific study that “explored education-related use of social media”. Through the Facebook and WhatsApp apps, audience connectors are demonstrated to connect students while they are studying. According to this survey, “60% (of the study's participants) felt that technology changes education for the better”. With the use of apps like Twitter, teachers may set up classroom accounts where students can study social media in a controlled environment. Students can practice leaving comments and liking tweets when teachers utilize twitter to submit assignments directly to the class account. Many social media platforms are being

incorporated into instructional systems at colleges to enhance communication with students and the overall experience of being a student. It gives universities a simple, quick means of contact and enables them to give and receive student feedback. Recent study indicates that almost all college students use some type of social networking website, and as a result, social media usage has increased dramatically over the previous ten years. According to research, 35% of college students who use Twitter and 99% of them utilize Facebook. The two main social media platforms that have successfully gained popularity are now Facebook and Twitter.

Online Learning During COVID-19 Pandemic

A hot topic that the public is currently very interested in is online education. Students have an excellent chance to practice their self-study skills through online learning, which is not only a challenge for the education sector. In the wake of the COVID-19 outbreak, "direct connection between teachers and students" in the classroom cannot guarantee students' safety. Although learning at home is a significant obstacle, it also gives children the chance to hone a crucial learning skill i.e., the ability to study alone. The teacher will be seen as the students' buddy if they see him or her as a partner on their educational journey. This way of thinking also makes it possible for teachers and students to collaborate to develop the most effective online learning strategy. Students who are given the freedom to select their own methods of learning and goal-setting increase their self-study skills. Students have more time to study independently when they learn online. Also, they can start conversations and collaborate on assignments in online groups with their classmates. As a result, they will significantly improve their ability to solve problems, think critically, and use technology.

- Students can also enhance their job skills through online learning. Online education has shown to be a productive technique to advance professional qualifications. More people are turning to distant or online learning a to obtain excellent education and training due to safety precautions and social isolation. One of the finest ways to get work skills without being constrained by geography is through online learning. Nowadays, one can get enrolled in these programs and get qualifications from recognized universities and organizations all over the world.
- **Obstacles Faced in Online Learning**

The COVID-19 has forced many colleges for online learning. There are many obstacles that occur during online learning, some of them are:

a. **Distractions Everywhere:**
   Distance learning has its drawbacks. If you're in the middle of a virtual classroom session, a delivery or even something as simple as a pet running into the home office might be distracting for everyone. Managing time becomes a bit tough which results in these diversions and may lead to distractions.

Education and coaching are additionally provided for medical professionals, which can build them improved in their field. Patients are
also given health education coaching and awareness. As much as there are these benefits, risks conjointly exist. These relate to the standard of the knowledge provided and conjointly the

well-being of the people, attainable abuse of privacy, misunderstandings from the readers of knowledge provided by healthcare suppliers, mental and health issues and conjointly information because of biasness'. The advantages of those social computing applications supply nice opportunities for the health trade even in light-weight of the risks.

Basically, social computing is an interaction between social behaviour and computational systems, which also helps to establish communication tools between people. It also provides ideas for social behaviour. Social computing is used in education field to teach the students through various web-applications platforms. Teachers can use social computing in education by using different tools such as Virtual Learning Environment (VLE), by establishing a communication platform between teachers and students, and providing importance on increasing and strengthen knowledge with specific disciplines by providing classes and courses. Education is also being provided by using various social media platforms such as Microsoft Teams, Zoom and Google Meet. Education through online learning can establish a bridge of communication between students and teachers. We can say that social media sites are very useful for teachers to provide education to students, approximately 60% students felt better or comfortable by these tools in their studies with the help of technology. As we have discussed above, online learning can enhance ones' self-study skills as they are getting more time to learn things and explore things by their self and they can communicate with their classmates to complete projects and assignments. It can also help pupils to enhance job skills without going anywhere by attaining programs of universities or any institutions all over the world.

As many obstacles can occur during online learning such as students can get distracted during online classes as they can't get a perfect environment like offline classroom and they can't get fully opportunity to deal their problems with teachers and many more which is mentioned above. So, we have to solve these obstacles by providing some techniques or tools to students.

CONCLUSION

Social Computing is solely the branch of computing that focuses on analysing the link between human behaviour and computer systems. Social Computing includes sectors like social media networks or a lot of exactly to be aforesaid as social networking sites like Instagram, Facebook, YouTube, LinkedIn and a lot of those sites within which they're extremely concerned and most of the youth share each little detail regarding what square measure they doing, what they require, what they have and a lot of reasonably such queries that additionally includes their personal details. A large share of web users square measure causative to social networking and media sharing sites, particularly young users the need for modernising academic systems, increasing quality, equity and personalization in providing womb-to-tomb learning for all education and coaching systems want innovative modification to foster new skills for brand spanking new jobs, taking into consideration the dynamical living, operating and learning patterns in a digital society.

The purpose of this paper was to spotlight risks and benefits that go together with the utilization of social computing applications as aid tools. Social computing was mentioned, giving samples of the applications. the utilization of those applications as aid tools was delineate, additionally as risks and benefits related to using social computing applications as aid tools. Future analysis includes finding ways in which to mitigate risks that significantly face social computing applications once they square measure used as aid tools.

Another main purpose of this paper was to provide spotlight on the use of social computing by providing some tools in favour of students so that they can learn efficiently and fruitfully without any arisen of obstacles in their study. By the use of social computing tools in education pupils can enhance their job skills and self-study skills, all the tools can enhance their skills.

FUTURE SCOPE

The future scope of social computing is difficult to predict with certainty, as it will depend on the advancements made in the field and the direction in which technology and society evolve. However, it is likely that social computing will continue to play an increasingly important role in our daily lives, enabling us to connect and communicate with others in new and innovative ways.

One potential direction for the future of social computing is the continued development of virtual and augmented reality technologies, which could allow us to interact with others in immersive and realistic virtual environments. This could open up new possibilities for socializing, education, and entertainment. Another area of focus for the future of social computing may be the use of machine learning and artificial intelligence to improve the accuracy and effectiveness of social media algorithms and other digital communication tools. This could help to reduce the spread of misinformation and improve the overall quality of online interactions.

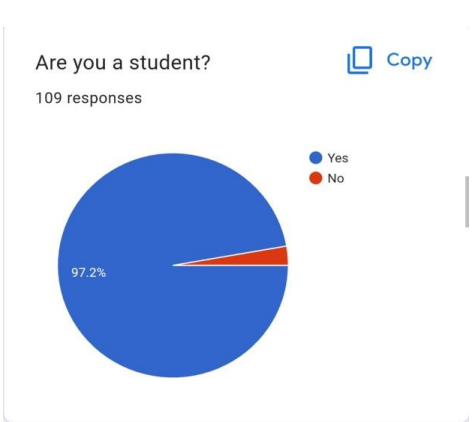
Overall, the future of social computing is likely to be characterized by continued innovation and the development of new technologies and applications that enhance our ability to connect and communicate with others. innovative and effective applications of social computing in healthcare.

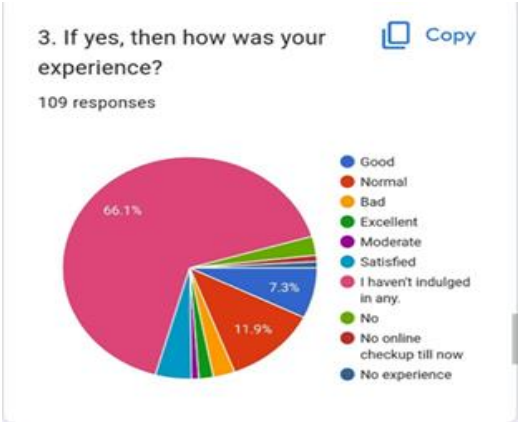
REFERENCES

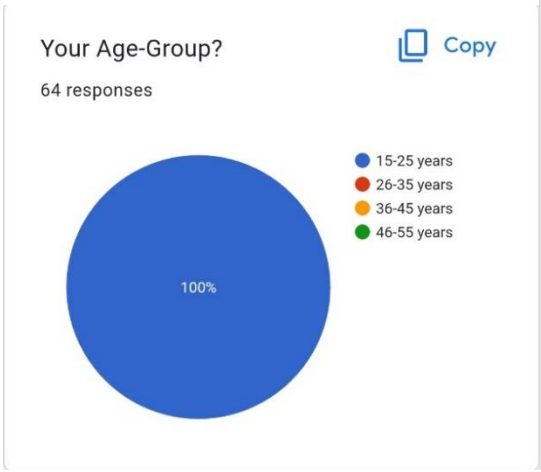
1. From "Social Computing", commencement to Social Computing edition of the Communications of the ACM, edited by Douglas Schuler, Volume 37, Issue 1 (January 1994) Pages: 28 – 108.
2. From *Social Computing* in Encyclopedia of Information Science and Technology, Third Edition. IGI Global, 2014, p. 6754.
3. Social computing, special edition of the Communications of the ACM, edited by Douglas Schuler, Volume 37, Issue 1 (January 1994), Pages: 28 – 108.

4. Parameswaran, Manoj; Whinston, Andrew B. (June 2007). "Research Issues in Social Computing". Journal of the Association for Information Sciences. 8 (6).
5. Li Yibai and K.D. Joshi (July 29, 2012). Latent Semantic Analysis Approach for a Literature Review and Synthesis of the State of Social Computing Research
6. Association for Information Systems Electronic Library. C. Coyle and H. Vaughn, Bell Labs Tech. J., vol. 13, no. 2, 2014, pp. 12–17, doi: 10.1002/bltj.
7. J. M. Mayer, R. P. Schuler, and Q. Jones, Proc. 17th ACM Int. Conf. Support. Gr. Work - Gr. '12, 2012, p. 239, doi: 10.1145/2389176.2389212.
8. I. King, J. Li, and K. T. Chan, "A short questionnaire of computational fields in Social Computing," 2009 Int. Jt. Conf. Neural Networks, 2009, pp. 1625– 1632, doi: 10.1109/IJCNN.2009.5178967.
9. F. Wang, D. Zeng, K. M. Carley, and W. Mao, IEEE Intell. Syst., 2007, pp. 79–83, doi: 10.1109/MIS.2007.41.
10. K. Ala-Mutka (2008). Study on the Use and Effects of Collaborative Content in Social Computing. IPTS Exploratory Social Computing Research. IPTS, 2008 JRC Scientific and Technical Reports (forthcoming).
11. Computers & Education (50:2), 2008, pp. 475-490.
12. Reid, A. (2008). Portable Composition: iTunes University and Networked Pedagogies, Computers and Composition (25), 2008, pp. 61–78.
13. R. Vuorikari (2005). Can social networks and managing one's own digital knowledge artefacts improve learning? European School net, Brussels. http://elgg.net/riina/files/-1/1444/social networks learning vuorikari 22 9 2005.pdf (accessed 23-8-06) (accessed 23-8-06)
14. NMC Online Conference on Social Computing, (2004), via the Internet http://nmc.org/events/social_computing_conf/index.shtm

FEEDBACK



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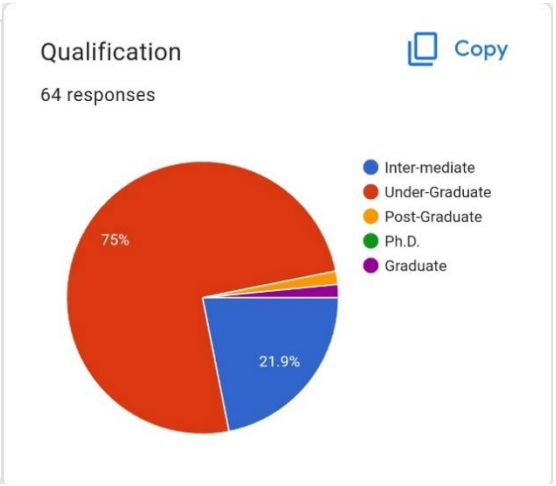
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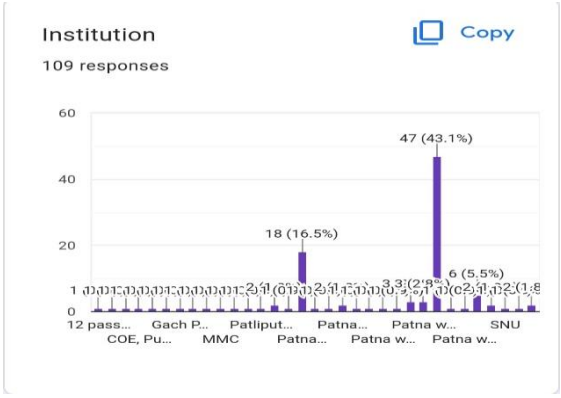
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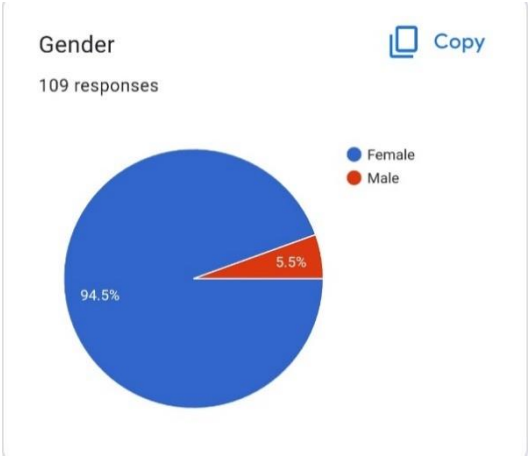
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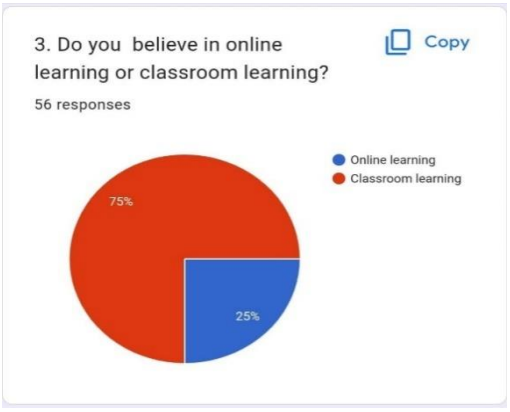
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Caste-based Employment discrimination in Indian Urban Labour Market

Smrutirekha Singhari[2]

Abstract

This paper tests the hypothesis that Scheduled Caste workers are subject to employment discrimination in the labour market, as against forward castes. The data for the study are collected from NSSO survey in 1999-00 and PLFS in 2018-19. Using Becker's concept of "Marker Discrimination Coefficient", we find that the proportion of unemployed SCs are more than that of FCs at every level of education. We observe significant variation in the value of coefficients of employment discrimination across locations and regions. The employment discrimination against SCs is found to be very high for Graduate and above degree education in urban areas. Our subsequent decomposition analysis on regular workers in urban formal sector shows that employment discrimination against SCs accounted for about 60 % of the difference in the probability of accessing regular jobs in the private-organised sector, which is much higher compared to the 29 % difference in the public sector. However, the extent of employment discrimination against SCs in public sector has shown a decline over time, and the reverse pattern observed in private-organised sector.

Keywords: Employment Discrimination; Caste; Formal sector, Non-linear Decomposition

JEL Code: J21, J23, J45, J71, J78, C54, C55

1. INTRODUCTION

Discrimination has been an important subject of study for the economists for a long time-starting from J.S. Mill and F.Y. Edgeworth. However, the credit goes to Gary S. Becker for initiating a systematic study in this area. Concern for economic discrimination is not only because it involves denial of equal opportunities in the labour market, but more importantly, due to its adverse impact on the income and poverty of the discriminated group. The prevalence of employment discrimination in the labour market results in high unemployment, low-income, and poor access to quality occupations (Thorat, Madheswaran and Vani, 2021).

In this context, this paper intends to study the nature and the size of employment discrimination against Scheduled castes, with particular focus on formal sector workers in urban India. We test the hypothesis that scheduled caste workers are subject to employment discrimination in the labour market, as against forward castes.

The paper is structured as follows: Section 2provides review of the available empirical studies on the caste discrimination in the private sector. Section 3 contains a note on the data used in the study; section 4 is devoted to presenting the methodology used for measuring employment

[2]Assistant Professor, Dept. of Economics, Rajendra University, Balangir, Odisha-767002.
Post-Doctoral Fellow, Institute for Human Development, New Delhi-110020
Email: smrutisinghari@gmail.com

discrimination; section 5 contains the empirical results and discussion; and section 6 presents the conclusion and derive policy implications.

2. Empirical Evidence on Caste Discrimination in the Private Sector

The corporate sector argues against the reservation policy on the grounds that it follows fair methods of employment, and hence, disregards the need for any anti-discrimination measures. The argument that there is no discrimination in employment in the private sector is completely contrary to the evidence available from studies on the working of Indian industrial labour markets (Papola, 2005). In fact, there is considerable evidence to show that the private sector follows exclusionary and discriminatory recruitment methods.

As Papola (2005) observed that throughout the period of modern industrial development, the various modes and mechanisms of employment practised by the private sector amply demonstrate the presence of social exclusion and discrimination.

There are studies using both direct and indirect methods, which have brought out evidence of caste discrimination in the private sector (Madheswaran & Attewell, 2007; Thorat & Attewell, 2007; Siddique; 2008; Banerjee et al., 2009; Deshpande & Newman, 2007; Jodhka & Newman, 2007; Madheswaran, S. and Singhari, S.,2016).

3. DATA SOURCES

The present study has used unit level data collected by National Sample Survey Organization (NSSO), India. The employment and unemployment surveys (EUS) were conducted during 1999-00 (July 1999-June 2000), and the Periodic Labour Force Survey (PLFS) was conducted in (July 2018-June 2019). These NSS rounds are referred to as 55^{th} round and PLFS-2, respectively. The survey provides data relating to human capital, demographic, and job characteristics of workers. The human capital characteristics include age and education; demographic characteristics include gender, social group, religion, marital status, location (rural/urban) and region; data relating to job characteristics include industry, occupation, sector and nature of employment. Employment and unemployment in the EUS are measured using alternative concepts called Usual Principal and Subsidiary Status (UPSS), Usual Principal Status (UPS), Usual Subsidiary Status (USS), Current Weekly Status (CWS) and Current Daily Status (CDS).

4. Becker (1957)'s concept of "Marker Discrimination Coefficient"

To apply this method, we initially estimate unemployment rate as per usual principal and subsidiary status of workers. Unemployment Rate (UR) is defined as the percentage of persons unemployed among the persons in the labour force (which includes both the employed and unemployed) (NSO, 2020). Symbolically, the rate of unemployment among thef^{th}group of population with k^{th} level of education is

$$u_{fk} = U_{fk}/(W_{fk} + U_{fk}) \qquad (1)$$

Where u is the rate of unemployment, U the unemployed individuals (i.e., those who did not work but was seeking and/or available for work) and $W$the total workers.

The second step is to estimate the **Coefficient of Employment Discrimination (CED)** using the concept of "Marker Discrimination Coefficient" of Becker (1957) as follows:

If u_f and u_s represent the actual rates of unemployment of two groups f and s respectively, and u_f^* , u_s^* represent the rates of unemployment of these two groups in the absence of discrimination in employment, then the CED can be defined as follows:

$CED = (u_f/u_s) - (u_f^*/u_s^*)$ (2)

If groups f and s are not perfect substitutes, the rates of unemployment may differ. But if they are (assumed to be) perfect substitutes, the difference in their rate of unemployment amounts to discrimination. In the absence of discrimination $u_f^* and u_s^*$ would be equal and equ. (2) will take the following form:

$CED = (u_f/u_s) - 1$ (3)

It should be obvious that if the CED is positive, the discrimination is in favour of group f and against group s, and vice-versa. If there is no discrimination, u_f and u_s would be equal and so the CED equals zero.

Our assumption that the two groups of population are perfect substitutes in the labour market, will be having more justification if we consider two homogeneous groups with respect to certain characteristics such as education, age etc. If we standardise for education, eqn. (3) can be rewritten as follows:

$CED = (u_{fk}/u_{sk}) - 1$ (4)

Where k refers to the educational level.

The CED may serve as a good measure of discrimination in employment.

4.1. Multivariate Decomposition for Nonlinear Response Model: Estimating Employment Discrimination

We have used nonlinear decomposition method developed by Nielsen (1998), in order to find out the extent of employment discrimination in the labour market. Here, we model the individual's incidence of getting employment using a logit model.

Let F be the logistic c.d.f., Y the dependent indicator variable, x a row vector of explanatory variables, and N the sample size. Subscript g= fc, sc indicates forward castes and scheduled castes respectively, whereas subscript *i* index individuals. The log-likelihood function is:

$$l(\beta, \delta) = \sum_{i=1}^{N_{fc}} \{y_{fci} \ln F[x_{fci}\beta] + (1 - y_{fci}) \ln(1 - F[x_{fci}\beta])\} +$$

$$\sum_{i=1}^{N_{sc}} \{y_{sci} \ln F[x_{sci}(\beta + \delta)] + (1 - y_{sci}) \ln(1 - F[x_{sci}(\beta + \delta)])\} \quad (1)$$

Maximization of Eq. (1) gives $\hat{\beta}$, which is the estimated parameter vector for forward castes (FCs) and $\hat{\delta}$, which should be added for Scheduled Castes (SCs).

The caste-based difference in getting employment in a logit model can be estimated by decomposing the difference in log-odds ratios. The log-odds ratios are linear in the parameters,

and therefore, the Oaxaca-Blinder decomposition[3] and the extension by Nielsen (1998) can be used directly. However, the difference in probabilities is easier to interpret than the difference in log-odds ratios.

The first step is to decompose the difference in probabilities into one part which is caused by discrimination (D) and another part which is explained by differences in characteristics (E) between forward castes and Scheduled Castes. Using Forward Castes as standard, we define the following probabilities:

$$\bar{P}_{fc} = \sum_{i=1}^{N_{fc}} F\left[x_{fci}\hat{\beta}\right] / N_{fc}$$

$$\bar{P}_{sc} = \sum_{i=1}^{N_{sc}} F\left[x_{sci}(\hat{\beta} + \hat{\delta})\right] / N_{sc}$$

$$\bar{P}^{0}_{sc} = \sum_{i=1}^{N_{sc}} F\left[x_{sci}\hat{\beta}\right] / N_{sc}$$

Where $\bar{P}_{fc}$and $\bar{P}_{sc}$ are the average probabilities that Y = 1 for forward castes and Scheduled Castes respectively, and $\bar{P}^{0}{}_{sc}$ is the average probability that Y=1 for SCs if they are treated like FCs. The following identity defines E and D:

$$\bar{P}_{fc} - \bar{P}_{sc} = \underbrace{\{\bar{P}_{fc} - \bar{P}^{0}_{sc}\}}_{\text{Endowment Difference}} + \underbrace{\{\bar{P}^{0}_{sc} - \bar{P}_{sc}\}}_{\text{Discrimination}}$$

The term endowment difference (E) is the average probability that Y =1 for SCs minus the average probability that Y=1 for FCs if both were treated like FCs. The term discrimination (D) is the average probability that Y=1 for SCs minus the average probability that Y=1 if SCs were treated like FCs.

The decomposition thus far has been described at the aggregate level. Understanding the unique contribution of each predictor to each component of the difference requires a detailed decomposition. That is, we can partition E and D into portions, Ek and Ck (k = 1, . . . , K), that represent the unique contribution of the kth covariate to E and D, respectively. One may attempt to compute Ek (Ck) by sequentially substituting one group's covariates (coefficients) with the other group's. For detail explanation refer Powers, Yoshioka and Yun (2011).

Measuring Employment Discrimination against SCs

We find that the unemployment rate in rural areas is higher than urban areas for higher levels of education; for SCs, the rural unemployment rate is 31.17 percent for diploma and certificate course and 23.11 percent for Graduate and above degree, while urban unemployment rate is 22.54 percent for diploma and certificate course and 21.19 percent for Graduate and above degree; on the other hand, for FCs, the rural unemployment rate is 16.47 percent for diploma

[3] See Oaxaca (1973) and Blinder (1973).

and certificate course and 16.11 percent for Graduate and above degree, while urban unemployment rate is 6.82 percent for diploma and certificate course and 9.85 percent for Graduate and above degree. In sum, the proportion of unemployed SCs are more than that of FCs at every level of education indicating that discrimination is against SCs, which is clearly indicated by the coefficients of employment discrimination, whose value is positive for all levels of education and the value is greater than 1 for diploma and certificate course (2.31)and Graduate and above degree (1.15) in urban areas. (see Table 1).

Educational Levels	**SCs**			**FCs**			**CED=** $\left(\frac{u_{sc}}{u_{fc}}\right)$**-1**
	No. of Unemployed	**Total Labour Force**	**% Rate of Unemployment** (u_{sc})	**No. of Unemployed**	**Total Labour Force**	**% Rate of Unemployment** (u_{fc})	
Rural							
Illiterate and below primary	406051	25273128	1.61	207820	13506200	1.54	0.04
Primary and middle	1107391	22626291	4.89	646281	21666153	2.98	0.64
Secondary, Higher Secondary	914597	10728353	8.53	912232	15330398	5.95	0.43
diploma and certificate course	212254	680899	31.17	154063	935268	16.47	0.89
Graduate and above	916740	3967171	23.11	1192235	7398660	16.11	0.43
Total	3557033	63275842	5.62	3112631	58836679	5.29	0.06
Urban							
Illiterate and below primary	150004	4334128	3.46	118015	4671777	2.53	0.37
Primary and middle	432757	6569826	6.59	452741	11948127	3.79	0.74
Secondary, Higher Secondary	371040	3546833	10.46	732943	11821932	6.20	0.69
diploma and certificate course	99684	442171	22.54	97084	1424325	6.82	2.31
Graduate and above	596394	2814768	21.19	1716150	17421356	9.85	1.15
Total	1649879	17707726	9.32	3116933	47287517	6.59	0.41

Table 1: Coefficients of Caste-based Employment Discrimination by Educational Level and location (SCs Vs FCs), 2018-19

Source: Calculated from unit level NSS data

We apply the non-linear decomposition method to decompose the difference in probability of access to employment between SCs and FCs. This method helps us to decompose the gross difference in employment rate between SCs and FCs into two parts, one part is attributable to discrimination and the other part is attributable to differences in human capital endowment across social groups. We find that the raw differential and employment discrimination against SCs has declined in public sector, over time; while in private-organised sector, it shows a rising trend. This implies that reservation policy acts effectively in increasing access of SCs in regular jobs in public sector of urban India; whereas there is need for Govt. intervention to increase access of SCs in private-organised sector (See Table 2).

Overall, our findings show that there exists unequal access to employment in both public and private-organised sector, and discrimination in hiring is much higher in the private-organised sector compared to the public sector

Table 2: Caste Discrimination in access to Regular Employment in urban formal non-agricultural Sector: SCs Vs FCs, 1999-00 to 2018-19

Category	1999-00		2018-19	
	PublicSector	Private-Organised Sector	Public Sector	Private-Organised Sector
Raw Differentials (Probability)	0.048***	0.244 ***	0.034***	0.061***
Differences in Endowment	0.032 (66.52)***	0.117(47.89)***	0.024 (70.89)***	0.024 (39.80)**
Employment Discrimination	0.016 (33.48)**	0.127 (52.11)***	0.010 (29.11)	0.037 (60.20)***

Percentage Share is given in parenthesis
*****, ** implies significant at 1 percent and 5 percent level, respectively.**

5. Conclusion and policy implications

Our study reveals that there is significant extent of employment discrimination against SCs in the Indian labour market. We observe significant variation in the value of coefficients of employment discrimination across location and regions. The employment discrimination against SCs is very high for Graduate and above degree education in urban areas. From the decomposition analysis for regular workers in urban formal sector, we find that employment discrimination against SCs accounted for about 60 % of the difference in the probability of accessing regular jobs in the private-organised sector, which is much higher compared to the 29 % difference in the public sector. However, the extent of employment discrimination against SCs in public sector has shown a decline over time, and the reverse pattern observed in private-organised sector. Thus, there is need for Govt. intervention in the private sector employment in this regard.

References

1. Banerjee A., Bertrand M., Datta. S., & Mullainathan S. (2009). Labour market discrimination in Delhi: Evidence from a field experiment. *Journal of Comparative Economics*, 37(1), 14-27.
2. Becker, G. S. (1957). *The economics of discrimination*, Chicago: University of Chicago Press, first edition.
3. Deshpande, A. & K. Newman (2007). Where the path leads: The role of caste in post-university employment expectations. *Economic and Political Weekly, 42*(41), 4133-4140.
4. Jodkha, S. & K. Newman (2007). Meritocracy, productivity and the hidden language of caste. Paper presented at the 'National Conference on Social Exclusion and Inclusive Policies', organised by Indian Institute of Dalit Studies (IIDS), 26-27 October, New Delhi.
5. Madheswaran, S. & Attewell, P. (2007). Caste discrimination in the Indian urban labour market: Evidence from the National Sample Survey. *Economic and Political Weekly*, 42(41), 4146-4153.
6. Madheswaran, S. and Singhari, S. (2016). Social exclusion and caste discrimination in public and private sectors in India: A decomposition analysis. *Ind. J. Labour Econ.* **59,** 175–201
7. Mehrotra S. and Parida, J.K. (2017). Why is the Labour Force Participation of Women Declining in India?, World Development, 98, (C), 360-380
8. Nielsen H.S., (1998). Discrimination and detailed decomposition in a logit model. *Economics Letters*, 61(1), 115-120.
9. NSO (2020). Periodic Labour Force Survey, Annual Report, July 2018-June 2019, National Statistical Office, Ministry of Statistics and Programme Implementation, Govt. of India, New Delhi.
10. Papola, T.S. (2005). Social exclusion and discrimination in hiring practices: The case of Indian private industry. In S.K. Thorat, *et al.* (Ed.), Reservation and private sector: Quest for Equal Opportunity and Growth, Rawat Publications, Delhi.
11. Powers, Yoshioka, & Yun (2011). Multivariate decomposition for nonlinear response model. downloaded from http://econpapers.repec.org/article/tsjstataj/v_3a11_3ay_3a2011_3ai_3a4_3ap_3a556-576.htm
12. Siddique, Z. (2008). Caste based discrimination: Evidence and Policy. Institute for the Study of Labour (IZA) Discussion Paper No. 3737.
13. Thorat, S.K., Attewell, P. (2007). The legacy of social exclusion: A correspondence study of job discrimination in India. *Economic and Political Weekly*, 42(41), 4141-4145.
14. Thorat, Madheswaran and Vani (2021). Caste and Labour Market: Employment Discrimination and its impact on poverty. *Economic and Political Weekly*, Vol. LVI, No. 21

Development of Tea Industry in Doors Region of West Bengal: A study of its impact on demography and livelihood pattern.

Mr Vikash Mandal[4]
Assistant Professor, Department of economics
T. P. Varma College, Narkatiyaganj 845455
Mail. Id: vmandal1@rediffmail.com

Abstract

First of all, the tea plantation in India was started in the Brahmaputra valley in the year 1857 by the Britishers. Later on, it spread into different parts of the country. The Dooars region of West Bengal was one of them. It was associated with the uncertainties of trade with China and the growing demand for tea in Europe. In lieu of making huge profits, they started cultivating tea in this region by clearing thick forests and undulating land surfaces. Dooars region of West Bengal became the largest producer of tea in West Bengal and the second largest producer of tea in India. Currently, it produces nearly 17 per cent of tea in India and provides direct employment to over 3.5 million people in the region. But the tea industry in this region was developed by the large-scale migration of Adivasi from the Chota Nagpur and Santhal Parganas. They not only ruined the status and opportunities of local people but also uprooted them from their motherland. This creates an employment and settlement problem in this region and also dynamically changes the demographic profile of the region. This paper attempts to highlight the changing demographic and livelihood pattern of the region.

Keywords: Demography, Livelihood, Tea plantation, Doors.

Introduction

Dooar[5] is the second largest tea-producing area of the country and the largest producing area in West Bengal and provides employment of about 3.5 million people directly or indirectly by producing 25 per cent of the country's Tea production. Its history started in the year 1974 when the first Tea Garden of this region was established in the Gazoldoba. Free simple rules of 1876 enabled the British Planters to acquire forest tracts and fertile land at a concessional rate. Within two years of the time span, 13 new Tea gardens were established. Most of the tea gardens were established during the year 1881 to 1961. In the year 1961, the number of large tea garden was 293 (Tea Statistics, 1960). For the development of the tea garden, there was an urgent need for labour who can work in the garden.

In the initial year, the region faced major challenges for the development of the Tea Garden; climate condition was not favourable, and the area was covered with thick forest and undulating land surface (Bhowmik, Sharit K.1981). "Dense forest infested with wild animals had to be cleared, the land had to be prepared, hoeing, planting, weeding, pruning, etc., had to be done, and tea leaves had to be plucked. In addition, roads had to be constructed and houses to be

[5] Jalpaiguri and Alipurduar district of West Bengal together constitute the Dooars.

built"(Ranjit Das Gupta, 1986). Local people were unwilling to work in the tea garden; therefore, British planters were forced to recruit labour outside of the state. They recruited labour from Chota Nagpur, Santhal Pargana, and Singhbhum area.
Recruitment and development of tea plantations changed the demographic profile of the region

Objective:

In the early stages of tea plantation development in the Dooars region of West Bengal, the greatest deforestation occurred at the lowest population density.
This can be expressed through the following function$y = f(l1, l2)$
Were,
Y=development of tea Plantations
L1= lour employed in the plantation industry
L2= land used for tea plantation
From the above function, we can see that the development of the Tea plantation industry is totally dependent on land and labour. It means that if the plantation industry of any area is increased at the same time, the industry consumes more land and labour. As a result, it will directly affect the ecology and society of that region. Our study will show how the increase in Tea Plantation Industry in Dooarsleads to an increase in population growth and changes in the demographic profile of the region. In this perspective, our objective of the study is concentrated on the following two areas:
I. To know the role of the tea plantation industry in changing the demographic profile of the Dooars region.
II. To know the impact of increased population on the livelihood pattern of that region.

Methodology:

In the present study, we have studied the tea gardens of the Dooars region which is located in the foothill of the Himalayas, the northern part of West Bengal. The region is located between 26^0 16N and $27^0$00'N latitude and $88^0$4'E $89^0$45'E East longitude. The district of Jalapiguri[6] came into existence in the Year 1869, by the amalgamation of the western Dooars of India which lies between the Tista and Sankos Rivers.
The study mainly depends on secondary data collected from Indian Planter's Association Report, district census handbook Report, Tea board Report, Labour enquiry committee report, books and related journals.

Finding:

A rough census was conducted by the revenue officer of Jalpaiguri during the year 1858- 59. According to this estimate population of the Dooars region was 189067 persons. But this data was only estimated therefore accuracy can be questionable. India's first census was conducted in the year 1872. According to this census, the population of the Dooars region were 169288.

[6] Entire district came under Dooars. In the year 2014, Alipurduar came into existence after bifurcating jal.

From 1872 to 1901 growth of the population was 3.5 times during the year 1872 to 1901. During the 901 to 1911 decade, there was a 21.30% population growth registered. The development of the Tea plantation industry was the main reason for enormous population growth. In the following table, we could see the decadal variation and percentage change in the population.

Growth of population during the year1901 to 1961

Year	Population	Decadal Variation	Percentage change in decade
1901	546764		
1911	663222	116458	21.3
1921	695946	32724	4.93
1931	740993	45047	6.47
1941	847841	106848	14.42
1951	916747	68906	8.13
1961	1359292	442545	48.27

Source: district census handbook Jalpaiguri 1961

The 19th century was the century of demographic shifting and Migration. The following table shows the decadal migration of the population in this region. Area registered one of the largest migrations South East Asia. In the following table of migration, we could see the decadal migration of people.

Migration during the year 1901 to 1961

year	Total no. of Migration
1901	95899
1911	152174
1921	163024
1931	158757
1941	156765
1951	278842
1961	454177

Source: district census handbook 1961

Analysis & discussion:

In the analysis discussion, we have to discuss the impact of migration on demography and livelihood pattern.

***I. Impacton demography*:**

With continuous migration and intermixing of different castes and classes, each individual community had started losing their identity. Indigenous tribes of this region were Mech, Rava,

Garo, and Khasi. The population of tribes increased dramatically, but the population of indigenous tribes who lived independently decreased gradually over time.

Again, the Development of tea plantations and the growth of the worker population in this region created a great demand for agricultural and non-agricultural products. To cater to the food grain and household demands of workers, British companies set up Railway in this region. The opening of the railway line brought migrant people like Marwari and Bihari people in this region. They started settling around the tea garden areas. They were mainly trader class. Soon and then, they became the main supplier of workers' food and daily household consumption goods.

Railway stations, cluster of gardens, garden Hat, and market together helped in developing garden town in the dooars region. Malbazar, Birpara, Kalchini, Banarhat, Madarihat, and Hamiltonganj were all developed in the same way.

IL. Impact on livelihood

Prior to the establishment of Tea Plantation in the Dooars region, there were two categories of indigenous people living in the area, one was dependent on agriculture and its allied activities, and others were dependent on the forest. These tribes were Mech, Rava Garo, Dhimal, and Khari. They have their own village community and living style. They lived in the forest and were dependent on forest products and practising Jhoom cultivation. With the development of tea gardens, they lost their traditional habitat and were forced to migrate eastward tothe region.

Migrated people were primarily dependent on tea gardens. But the wage rate of the tea garden was very low, therefore, they were forced to work outside the tea garden. They started working as a labour in agricultural fields, brickfields, river Beds, and fishing, weaving and hunting. As a result, migrated tribes became a threat to the local worker.

Limitations:

There was an annual report available on immigrant labour in Assam from 1878 to 1928. There were two additional labour enquiry Committee Report, one was the 1906 Report and the other was the 1921 Report. Besides this, the condition of workers in Assam attracted the attention of the nationalist movement Leader and the Press. They expose the horrifying state of affairs among the labour of Assam. On the other hand, Dooars was an isolated area and remained neglected by British Government and Nationalist Media. There were only two enquiry Committee Reports available, one was a 1911 report and the other was a 1936 report. but the report was also devoted and concentrated to Assam and only a few pages were given to Dooars. But no regular report on the living of tribal workers. Therefore, difficult to arrange systematic and chronological data

Recommendation and conclusion:

The unsystematic migration of people in this area systematically changed the demographic profile of the region. British planters completely uprooted the tribal population from their native place. They brought the labour to the Tea Plantation area on a false promise by the

recruiting agent and left them with the tag “a Coolie is always a Coolie whether he works in the garden or settled as an agriculturist’. At the same time, indigenous tribes of the region lost their identity. These consequences of migration could not be reversed. But at the same time, the government could take appropriate measures to mitigate the problem.

Reference: -

1. Bhowmik, Sharit K. (1981). Class formation in the plantation system. Peoples publishing house, New Delhi
2. Bose, Sanat. (1954). Capital and Labour in Indian Tea Industry. All India trade union Congress: Bombay.
3. Dalton, E. T (1882). A descriptive Ethnology of Bengal. Government Press. Culcutta.
4. Griffiths, Percival. (1969). History of Indian Tea Industry. Wiedenfeld and Nicolson. London.
5. Hunter, W. W. (1872). Statistical Account of Bengal, Jalpaiguri. Royal Printing Press.
6. Ray, B. (1969). Census of India. District census Handbook: Jalpaiguri. Government Press. Culcutta.
7. Rege, D.V. (1946). Report of an Enquiry into the condition of labour in Plantation of India and Cyeylon. Government of India Press. Delhi.
8. DPA (Dooars Planters’ Association. (1920). Detailed Report of General Committee. Jalpaiguri. Royal Printing Works.
9. Tea Board of India. (2009). Tea Statistics: 2005-06. Tea Board of India. Kolkata.
10. Tea Board of India. (1960). Tea statistics: 1960-61. Tea Board of India. Kolkata.
11. Thomposon, W. H. (1923). Census of India, 1921. Vol V: Bengal, Part 7. Government Printing Press. Culcutta.
12. Sarkar, B.C. (2017). Economic Transformation of tribal People from Primitive to Tea Garden Workers in Dooars of Jalpaiguri. International Journal of Research Culture Society, Vol-I, page-160.
13. Gupta, R. D. (1986). From Peasants and Tribesmen to Plantation Workers Colonial Capitalism, Reproduction of labour Power and Proletarianisation in North East India, 1950s to 1947. Economic and political weekly, XXI (4). 2-10.

21वीं सदी के परिप्रेक्ष्य में लैंगिक असमानता का समाजशास्त्रीय अध्ययन

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सहायक अध्यापक
समाजशास्त्र विभागए राजकीय स्नातकोत्तर महाविद्यालय,
गोपेश्वर जिला चमोली।

प्रस्तावना :–

पुरूष एवं स्त्री एक जैविकीय तथ्य है एवं जैण्डर एक समाजिक तथ्य है। इस तथ्य के साथ किसी प्रकार की असमानता जोड़ दी जाती है तो उसे लैंगिक असमानता कहा जाता है।

21वीं शताब्दी को विकास के दृष्टिकोण से एक क्रान्तिकारी सदी बताया जाता है परन्तु जहाँ तक सामाजिक ढाँचे का प्रश्न है। इसमें कोई मूलभूत परिवर्तन नजर नहीं आता है। यदि हम महिलाओं की सामाजिक स्थिति का प्रश्न ले तो आज भी विश्व के अधिकांश देशों में स्त्री–पुरूष में भेदभाव किया जाता है। विश्व का कोई भी समाज ऐसा नहीं है जिसमें सभी लोग– एक दूसरे के समान हो। असमानता सामाजिक, आर्थिक, राजनीतिक, धार्मिक एवं जैविक आदि सभी क्षेत्रों में स्पष्ट रूप से देखने को मिलती है।

हमारे देश में पितृसत्तात्मक व रूढिवादिता होने के कारण महिलाओं के साथ सभी क्षेत्रो मे असमानतापूर्ण व्यवहार किया जाता है। स्त्रियों को पुरूषों के मुकाबले कमजोर व असहाय समझा जाता है। समाज का जो वर्ग जितना ज्यादा परम्परावादी व रूढिवादी और अशिक्षित है उसमे महिलाओ की स्थिति उतनी ही दयनीय है। महिलाओ को भारतीय समाज में कामवासना की पूर्ति एवं बच्चों का पालन–पोषण करने वाली एक सेविका के रूप में ज्यादा जाना जाता है। उनकी स्वयं की कोई पहचान नहीं होती है उनका समाजीकरण पुरूष प्रधानता को ध्यान में रखकर ही किया जाता है। महिलाओं को सम्पति, शिक्षा एवं अन्य कार्यों में पूरी तरह से आजादी प्रदान नहीं की गयी है।

भारतीय संविधान भारत के प्रत्येक नागरिक को सामाजिक न्याय, समता एवं प्रतिष्ठा बिना किसी भेदभाव के प्रदान करता है। भारतीय संविधान में कहा गया है कि राज्य किसी भी नागरिक के साथ मूल, वंश, जाति, लिंग स्थान आदि के आधार पर विभेद नहीं करेगा। परन्तु वास्तविकता यह है कि स्त्री का वह सम्मान प्राप्त नहीं है जो होना चाहिए। महिलाओं के साथ सामाजिक, आर्थिक, राजनीतिक व धार्मिक क्षेत्रों में भी असमानता का व्यवहार किया जाता है।

अध्ययन का उद्देश्य :–

1. लैंगिक असमानता का महिलाओं पर प्रभाव का विश्लेषण करना।
2. लैंगिक असमानता के लिए उत्तरदायी कारकों को ज्ञात करना।

अध्ययन क्षेत्र व शोध प्रविधि :–

प्रस्तुत शोध वर्णनात्मक शोध प्रणाली व द्वितीयक आंकडों पर आधारित है जिसमें भारतीय समाज की महिलाएं हैं।

लैंगिक असमानता का महिलाओं पर प्रभाव :–

सामाजिक क्षेत्र में असमानता–भारतीय समाज जो कि एक पुरूष प्रधान समाज के रूप में जाना व पहचाना जाता है वहाँ पुरूषों को ज्यादा से ज्यादा अधिकार प्राप्त हैं जिससे भारतीय समाज में महिलाओं की मनोदशा भी पुरूषों के अधीन है। इसके साथ ही उन्हें सम्पति, शिक्षा व अन्य कार्यों में पूरी तरह से आजादी प्रदान नहीं की गयी है। सामाजिक क्षेत्रों में निम्न प्रकार की असमानता देखने को मिलती है।
जनांकिकी के आधार पर असमानता–

भारत में विभिन्न तरीकों द्वारा महिलाओं का शोषण जैसे– हीनता की शिकार, दहेज से मृत्यु, कन्या भ्रूण हत्या, कुपोषण, अशिक्षा स्वास्थ्य के प्रति लापरवाही, आदि कारकों से स्त्री–पुरूष असन्तुलन हो रहा है।

जनांकिकी दृष्टि से देखें तो वर्ष 1901 में कुल जनसंख्या 23.84 करोड़ थी, जिसमें महिलाओं की जनसंख्या लगभग 46 प्रतिशत थी। वहीं 2011 में यह जनसंख्या 47 प्रतिशत के आसपास थी। स्त्री–पुरूष लिंगानुपात की बात की जाये तो जहां 1911 में यहां अनुपात 100/964 तथा 2011 में 940 ही रह गया है। पुरूषों की तुलना में महिलाओं के कम अनुपात का कारण उनकी अधिक संख्या में मृत्यु होना माना गया है। महिलाओं के साथ किए जाने वाले भेदभाव के कारण ऐसा प्रतीत होता है (गोपालन सरला, 2001, 38 : 142)

जन्म के समय असमानता –

लैंगिक असमानता के कारण प्रत्येक पितृसत्तात्मक परिवार का यह लक्षण है कि वहां पुरूष की प्रधानता होती है और नारी का अवमूल्यन होता है। भारतीय समाज में इसका रूप अत्यन्त कठोर है नारी का जन्म ही अपने आप में अभिशाप है। पुत्र मुक्तिदाता, बुढापे का सहारा और घर की पूंजी है जबकि पुत्री का जन्म एक दायित्व और कर्ज है इसलिए जन्म से ही लिंग भेदभाव शुरू हो जाता है। इसके लालन–पालन के तौर तरीके बिल्कुल अलग–अलग हैं। (पाण्डेय तेजस्कर 2009 : 273)

खानपान सम्बन्धी असमानता :–

बालिकाओं को स्तनपान कराने तथा भोजन खिलाने में लड़कों की तुलना में उनके साथ भेदभाव किया जाता है। 1980 के दशक के अध्ययन से पता चला है कि जीवन के शुरू के दो सालों में खाना देने में तथा चिकित्सा देखभाल में सबसे ज्यादा भेदभाव किया जाता है। परिवार में पुरूषों के खाने के बाद महिलाओं का खाना एक भेदभाव का मामला है। (गोपालन, सरला, 2001 :84–85)

शिक्षा में असमानता –

शिक्षा के द्वारा मनुष्य का मानसिक विकास होता है। शिक्षा ही सफलता की कुंजी है। शिक्षित व्यक्ति आत्म निर्भर एवं आत्मविश्वासी होने के साथ जीवन के हर पलू को समझने एवं सोचने की क्षमता रखता है। (शर्मा, रमा एवं मिश्रा, एम0केख् 2016 : 148) भारतीय नारी आज भी अधिक संख्या में अशिक्षित है उसे पढ़ने–लिखने की स्वतन्त्रता नहीं है। वह रूढ़िवादी मानसिकता वाले परिवारों से जुड़ी है। चाहकर भी पढ़ नहीं पाती है। (तिवारी, आर0पी. एवं शुक्ला, डी0पी. 205 :138)

परम्परागत समाज में बालिकाओं के प्रवेश अध्ययन तथा विकास पर उचित ध्यान नहीं दिया जाता है। स्त्री शिक्षा से सम्बन्धित प्रथम समस्या यह है कि प्राथमिक तथा माध्यमिक स्तर पर साक्षरता दर में स्त्री–पुरूषों के मध्य काफी अन्तर दिखाई देता ह। गरीब मां–बाप लड़कियों को आगे पढ़ा नहीं पाते। दूसरी समस्या है कि परम्परागत रूप में लड़कियों का पढ़ना अपव्यय समझाा जाता है क्योंकि अन्ततः उसका विवाह हो जाता है। तीसरे आने–जाने की समस्या, सुरक्षा की समस्य, अन्तिम उनकी शिक्षा का पाठ्यक्रम भी लैंगिक असमानता के आधार बनाया गया है। जिससे स्त्री शिक्षा के क्षेत्र में पुरूषों से पीछे रह जाती है।

वैवाहिक असमानता–

वैवाहिक क्षेत्रों में भी पुरूषों एवं महिलाओं में असमानता देखने को मिलती है। एक ओर जहां पुरूषों को अपने जीवन साथी को चुनने का पूरी तरह से अधिकार प्राप्त है वहीं महिलाओं को अपने परिवार के सदस्यों के निर्णय पर निर्भर रहना पड़ता है।

आर्थिक क्षेत्र में असमानता –

महिलाओं के विकास में व्यक्तिगत तथा सामाजिक स्वतन्त्रता के साथ–साथ आर्थिक स्वतन्त्रता भी महत्वपूर्ण पहलू है। अर्थिक स्वतन्त्रता के बिना महिलाओं का विकास असम्भव है। महिलाओं की आर्थिक कमजोरी के कारण ही पुरूष वर्ग ने उस पर अधिकार जमाया है।

सामान्य महिलाएं घरेलू, पारिवारिक उद्योग–धन्धों, कृषि कार्यों में अनुमानतः 10 से 16 घण्टे कार्य करती है परन्तु दुर्भाग्य है कि उनके इन घरेलू कार्यों का अर्थिक मूल्यांकन नहीं किया जाता है। विभिन्न असंगठित क्षेत्रों में लगभग 94 प्रतिशत महिलाएं कार्य करती है। इन सबके बावजूद वे आर्थिक रूप से कमजोर है और अपने पालन–पोषण, स्वास्थ्य, शिक्षा, मनोरंजन, आदि के लिए पुरूषों पर आश्रित हैं। यहां तक कि जो महिलाएं कार्यशील हैं वे भी अपनी आय को इच्छानुसार व्यय करने में स्वतन्त्र नहीं होती हैं। (तिवारी, आर0पी. एवं शुक्ला जी0पी0 2015 :47)

राजनीतिक क्षेत्र में असमानता –

वर्तमान समय में महिलाएं राजनीति में प्रतिभाग करने लगी हैं परन्तु महिलाएं प्रतिनिधित्व का प्रतिशत उत्साहवर्धक नहीं है। राजनीति में वर्चस्व पुरूष प्रधान व्यवस्था का ही है। भारत में महिलाएं सांसदों की लोकसभा तथा राज्यसभा में अब तक की स्थिति इसका प्रमाण है। (शर्मा प्रभुदत्त, 2012 : 162)

वर्तमान समय में अधिकांश पंच, सरपंच तथा जिला पंचायतों की पदाधिकारी बनी महिलाएं अपने पति, पिता या पुत्र द्वारा लिए गए निर्णय के अनुसार कार्य करती हैं। वे स्वयं किसी भी राजनीति कार्य में निर्णय नहीं ले पाती हैं जिससे उन पर पुरूष प्रधान व्यवस्था का प्रभाव दिखाई पड़ता है। (तिवारी, आर0पी0 एवं शुक्ला डी0पी0, 2015 :84)।

धार्मिक क्षेत्र में असमानता –

महिलाओं को अपेक्षा धार्मिक क्रिया–कलापों में पुरूषों को अधिक महत्व दिया जाता है। कोई भी धार्मिक क्रिया पहले पुरूषों द्वारा की जाती है उसके बाद महिलाओं द्वारा। धर्म ने भी महिलाओं की स्थिति को प्रभावित किया है।

लैंगिक असमानता के उत्तरदायी कारण–

1. पुरूष प्रधान सामाजिक व्यवस्था।
2. स्त्रियों में शिक्षा का अभाव
3. सामाजिक कुप्रथाएं– जैसे बाल–विवाह, प्रर्दा प्रथा, दहेज प्रथा इत्यादि।
4. ग्रामीण अर्थव्यवस्था (पाठक, रामचन्द्र, 2008 : 290–292)

निष्कर्ष–

महिला और पुरूष सृष्टि निर्माण और मानव समाज के आधार हैं। दोनो एक दूसरे के पूरक हैं ये जीवन रूपी रथ के ऐसे पहिए हैं जिनसे यात्रा सुचारू रूप से संचालित होती है। परिवार और समाज में स्थायित्व के लिए दोनों की भूमिका समान रूप से महत्वपूर्ण रही है। किसी भी समाज का परिवर्तन और विकास का आधार पुरूषों और महिलाओं के पारस्परिक मेलजोल कदम से कदम मिलाकर चलने और दोनों की समान गतिशीलता पर निर्भर है। किसी भी एक पक्ष के पिछडने पर सामाजिक जीवन में अराजक स्थिति निर्मित होती है। आज महिलाओं को आर्थिक, राजनीतिक, सामाजिक और सांस्कृतिक क्षेत्रों में पुरूषों के समान ही प्रवेश कर कन्धे से कन्धा मिलाकर चलना होगा। तभी पूर्ण रूप से स्त्रियों के व्यक्तित्व का विकास हो पायेगा और राज्य व देश का भी विकास हो पायेगा जिससे 21वीं शताब्दी की महिला शताब्दी का गौरव प्रदान किया जा सकता है।

सुक्षाव

1. महिलाओं की स्थिति में पूर्ण सुधार लाने एवं पूर्ण समानता की स्थापना के लिए लिए स्त्रियों की शिक्षा, प्रशिक्षण रोजगार एवं स्वास्थ्य के सम्बन्ध में ठोस कदम उठाने की आवश्यकता है।
2. आर्थिक क्षेत्र में रोजगार प्रशिक्षण, संसाधन उपलब्ध कराकर महिलाओं को आत्मनिर्भर बनाया जा सकता है।
3. विवाहोपरान्त पति या पत्नी के द्वारा विकसित सम्पति में दोनों का अधिकार पंजीकृत होना चाहिए।
4. पितृ गृह में पुत्री को यातना दण्डनीय अपराध होना चाहिए।

सन्दर्भ ग्रन्थ सूची

1. पाठक रामचन्द्र, 2008 ''सामाजिक समस्याएं'' प्रकाशन, विजय प्रकाशन मन्दिर वाराणसी।
2. पाण्डेय, तेस्कर एवं ओजस्कर, पाण्डेय, 2009 ''समाज कार्य– सम्पादक डा0 उपेन्द्र भारत बुक सेन्टर लखनऊ।
3. सिंह, वी0एन0 एवं सिंह जन्मेजय, 2010 ''आधुनिक एवं नारीवाद सशक्तिकरण'' प्रकाशन रावत पब्लिकेशन जयपुर।
4. शर्मा, प्रभुदत्त एवं त्रिपाठी, डी0सी0 2012 ''भारतीय शासन एवं राजनीति'' प्रकाशक– कॉलेज बुक डिपो जयपुर, विश्व भारती पब्लिकेशन नई दिल्ली।
5. तिवारी, आर0पी0 एवं शुक्ला, डी0पी0 2015 ''भारतीय नारी वर्तमान समस्यायें और समाधान'' प्रकाशन ए0पी0एच0 पब्लिषिंग कारपोरेशन, असांरी रोड दरियागंज, नई दिल्ली– 110002
6. गोपालन, सरला 2001, समानता की ओर अपूर्ण कार्य भारत मं महिलाओं की स्थिति, राष्ट्रीय महिला, भारत सरकार।

इतिहास में आकस्मिकताः एक अध्ययन

डॉ0 उमेश मल्लिक
अतिथि सहायक प्राध्यापक, इतिहास विभाग
राजकीय डिग्री महाविद्यालय (मधुवन) पकड़ीदयाल
बी0आर0 अम्बेदकर बिहार विश्वविद्यालय, मुजफ्फरपुर, बिहार

ज्ञान–विज्ञान के विकास के साथ ही मानव–चिन्तन और अधिक गहन होता जा रहा है। वह सूक्ष्म विषयों पर भी चिन्तन करने लगा है और उनके अवधारणाओं पर अध्ययन–विचार प्रस्तुत करने लगा है। आकस्मिकता अथवा संयोग का अध्ययन कुछ इसी अभिप्राय से प्रस्तुत है।

घटना के कारणों की व्याख्या में यह प्रश्न सामने आता है कि इतिहास में सब कुछ स्वाभाविक और सामान्य रूप से हुआ है अथवा वह सब एक संयोग की बात रही है। सब कुछ आकस्मिक रूप से हुआ है या उसके पीछे विशेष कारण रहा है। इसके उत्तर में हम यह पाते है कि सब कुछ संयोग से ही नहीं अपितु कुछ विशेष कारणों से हुआ है। यह उत्तर हमें दो तरफ आकृष्ट करता है–पहले तरफ में हम यह स्वीकार करते हैं कि सब कुछ संयोग से ही होता है, जबकि दूसरी तरफ हम यह पाते हैं कि संयोग के अतिरिक्त कुछ अन्य कारण भी होते हैं, जो घटना के कारण हैं।

आकस्मिकता के चिन्तन में भी ऐसे ही दो तरह के मत मिलते हैं–जिसमें एक मत स्वीकार करता है कि आकस्मिकता होती है, जबकि दूसरा मत उसे अस्वीकार करता है। एक तरफ से व्याख्या करें, तो हमें संयोग का होना मिलता है, और जब दूसरे से उसी की व्याख्या करते हैं तो संयोग का न होना ज्ञात होता है। दूसरी बात यह भी हमें मिलती है कि एक इतिहासकार कभी संयोग को मानता है तो दूसरे तर्क से अपने विचारो का खण्डन करता है।

लोगों ने घटना विशेष का जब प्रत्यक्षीकरण किया तो पाया कि उसके परिणाम अमुक प्रकार के होंगे, किन्तु तभी अचानक कुछ ऐसी घटना घटी कि परिणाम भिन्न हो गया, तो लोगों का ध्यान उस आकस्मिकता की ओर गया।

संयोग को आंग्लभाषा में 'चांस' कहते हैं। यह नियतिवाद की एक मान्यता है। इस पर प्रायः भाग्यवादी और आस्थावान् (धार्मिक) विश्वास करते हैं। इतिहास संयोग–भावना की मनोवैज्ञानिकता पर सर्वप्रथम माण्टरक् का ध्यान गया था और उसी ने बतलाया कि जिन्हें लोग संयोग के नाम से जानते हैं वह संयोग मात्र न होकर कार्य और कारण की सुश्रृंखलित परम्परा है। यह कभी भी परिणामस्वरूप नहीं कही जा सकती, अपितु इसे कारणस्वरूप ही माना जाना उत्तम होगा। इसे परिणामस्वरूप में लने की भूल वे ही करते जो असफलता को अपने पुरूषार्थ की

कमी न मानकर भाग्य, भगवान् और संयोग के मत्थे डाल देते हैं। इतिहास में संयोग का प्रश्न सर्वप्रथम पालीविम्स ने उभारा, गिबन ने इसे विद्वानों के सम्मुख रखा और मान्टेरकू ने इसके वैज्ञानिक अध्ययन पर ध्यान दिलाया।

यह सच है कि कभी–कभी आकस्मिक घटनाओं ने इतिहास में भारी उलट–फेर किया है, जो कि संयोग की ही बात कही जायेगी। इस आधार पर नियतिवादी, भाग्यवादी–आस्थावान् आस्तिक धर्मान्ध लोग भी यह मानते हैं कि इतिहास में जो कुछ भी हुआ है वह एक संयोग का ही परिणाम है। ये लोग ही कहते हैं कि इतिहास और कुछ नहीं, अपितु आकस्मिकता (संयोग) का ही परिणाम है।

रोमन इतिहासकार पोलिबियस ने जिसे कहीं–कहीं पालिविम्स भी लिखा गया है, संयोग के निर्णायक प्रभाव को सबके सम्मुख विचार हेतु रखा और उसे स्वीकार भी किया। गिबन ने पालीविम्स के इस ध्यानाकर्षक विचार को उभारा और रोमन साम्राज्य के उदय को संयोग का परिणाम माना। उसने कहा कि 'जब ग्रीस एक प्रान्त के रूप में हो गया, तो उन्होंने रोम के उत्थान को एक कारणबद्ध घटना न मानकर एक संयोग का ही परिणाम माना। रोमन साम्राज्य के विघटन पर इतिहासकार टेसीटस ने संयोग के प्रभाव पर विस्तृत विचारा किया था। टेसाटस को कहीं–कहीं टैसिप्स भी लिखा गया है। बेरी ने 'डारविनिज्म इन हिस्ट्री' नामक अपने लेख में संयोग के महत्व पर प्रकाश डालते हुए कहा कि–सामाजिक क्रांतियों में संयोग एक अत्यधिक महत्वपूर्ण कार्य करता है। एच0ए0एल0 फिर शर ने इतिहास में असम्भाविता तथा अदृष्ट की सक्रियता को स्वीकार किया है कि इतिहास निश्चित रूप से दुर्घटनाओं का एक अध्याय है। जर्मनी के अनुभवी इतिहासकार मानेक भी इतिहास में संयोग की भूमिका से प्रभावित हुए थे। संयोग के अध्ययन को वैज्ञानिक का स्वरूप प्रदान करते हुए मान्टेरकू ने कहा कि जिन्हें लोग संयोग के नाम से पुकारना चाहते हैं, वह संयोगमात्र न होकर कार्य और कारण की सुश्रृंखलित परम्परा है।

कार्ल मार्क्स ने संयोग की व्याख्या इस प्रकार की है–'विश्व इतिहास में यदि संयोग के लिय स्थान न होता तो इसका चरित्र बहुत ही रहस्यवादी होता। यह संयोग अपने आप में स्वाभाविक रूप से विकास की सामान्य प्रवृत्ति का भाग बन जाता है और अन्य तरह से संयोग द्वारा प्रदत्त होता है। परन्तु प्रगति या बाधा जैसी दुर्घटनाओं पर आधृत होते है जिनमें उन व्यक्तियां का संयोग चरित्र सम्मिलित होता है, जो आरम्भ में एक आन्दोलन का नेतृत्व करते है। मार्क्स ने इतिहास में संयोग की तीन श्रेणी मानी हैं।

1. संयोग घटना को गति दे सकता है या बाधा पहुँचा सकता है, परन्तु उसमें क्रांतिकारी परिवर्तन नहीं ला सकता।
2. एक संयोग दूसरे द्वारा प्रदत्त होता है। इस प्रकार संयोग अपने आपमें नष्ट होकर दूसरे को स्थान को देता है।
3. संयोग का विशेष प्रदर्शन व्यक्तियों के चरित्र में होता है।

ट्राटस्की ने मार्क्स के उक्त सिद्धान्त को समर्थन देते हुए कहा है–'आकस्मिक दुर्घटनाएँ किसी कमी को पूरा नहीं करती हैं और स्वयं मे रद्द होती रहती हैं। पूरी ऐतिहासिक प्रक्रिया दुर्घटनात्मकता के माध्यम से ऐतिहासिक नियमों का परिवर्तन हैं। दुर्घटनाओं के स्वाभाविक चयन के माध्यम से ऐतिहासिक नियमों को समझा जा सकता है।

ई0एच0 कार ने भी एक स्थान पर कहा है कि 'इतिहास कम अथवा अधिक संयोग का एक अध्याय है। घटनाओं का ऐसा क्रम जिसका निर्णय संयोग करते हैं, उनका कारण सामान्य होता है।

इतिहास में संयोग अथवा आकस्मिकता (चांस) पायी जाती है के उपर्युक्त समर्थकों ने अपनी बात की पुष्टि में निम्नलिखित उदाहरण दिये हैं–

1. एक्टियम (अक्रीथम) का युद्ध क्लियोपेट्रा के रूप–सौन्दर्य पर मुग्ध होने वाले एंटोनी के कारण नहीं, अपितु संयोगवश आशा के विपरीत परिणामवाला सिद्ध हुआ था।
2. बजाजेट जब मध्य यूरोप पर आक्रमण करने वाला था, तभी उसे गठिया हो जाना केवल संयोग की बात थी, न कि कोई और कारण था।
3. सन् 1527 में खानवा के निर्णायक युद्ध में बाबर और राणा संग्राम सिंह में से विजय बाबर की हुई, क्योंकि संयोग से राणा की आँख में तीर लगने से उसे युद्ध–स्थल छोड़ना पड़ा था और उसके सैनिकों ने युद्ध स्थल से उसके चले जाने का गलत अर्थ यह लगाया कि वह मारा गया अथवा पराजय स्वीकार कर ली, इसलिए युद्ध–भूमि से चला गया। संयोग से यदि तीर न लगा होता तो राणा हटा न होता और जब राजपूत शक्ति के आगे बाबर के थोड़े से सिपाही युद्ध हार भी गये होते। अतः बाबर की संयोग से हुई जीत ने क्षणभर में घटना का रूख बदल दिया था।
4. सन् 1545 में कालिंजर के घेरे के समय अफगान शक्ति का उदीयमान सितारा शेरशाह सूरी संयोग से ही हथगोले के विस्फोट से मृत्यु को प्राप्त हो गया और इस आकस्मिक घटना ने सूरी साम्राज्य को पतनोन्मुख बना दिया।
5. सन् 1556 में पानीपत के द्वितीय युद्ध में 22 युद्धों का विजता हेमू सैनिक दृष्टि से बहुत सुदृढ़ था और जीत भी गया होता, किन्तु संयोगवश वह घायल हो गया और निश्चित विजय को पराजय में बदलना पड़ा। इस तरह उसके घायल होने की आकस्मिक घटना ने इतिहास का रूख पलट दिया।

6. सन् 1920 की शरदऋतु में यूनान के सम्राट् एलेक्जेण्डर को उसके पालतू बन्दर ने काट लिया, जिसके चलते वह अकस्मात् मर गया और उसके साथ ही वहाँ लगभग ढ़ाई लाख लोग मारे गये। यदि वह आकस्मिक घटना न घटी होती तो ढ़ाई लाख लोग करने से बच सकते थे।
7. सन् 1923 में जब सत्ता पाने के लिये स्टालिन और ट्राटस्की में संघर्ष चल ही रहा था कि शरदऋतु की परवाह किये बिना ट्राटस्की बत्तखों का शिकार करने जंगल में चला गया और शीत–ज्वर से पीड़ित हो गया। इस आकस्मिक घटना के कारण ट्राटस्की को बाध्य होकर उस समय राजनीति से पृथक् होना पड़ा था।
8. जोधाबाई से अकबर का वैवाहिक सम्बन्ध होने के कारण जोधाबाई का भाई मानसिंह अकबर का सेनापति बन गया और इसके साथ ही प्रायः सभी राजपूत शक्ति अकबर के हाथ लगी और सभी क्षेत्रों में हिन्दुओं ने विरोध के बदले सहयोग ही दिया, जिससे वह एक महान् शासकों की श्रेणी में आ सका। अबकर के लिए यह संयोग ही कहा जायेगा।
9. आगरा के समीप दारा और औरंगजेब की सेना से घनघोर युद्ध हो रहा था, जिसमें दारा की विजय सुनिश्चित हो चली थी और औरंगजेब की सेना दबाव अनुभव कर रही थी तभी दारा के एक सरदार ने सलाह दी कि दारा हाथी से उतरकर घोड पर चढ़े और भागती हुई औरंगजेब की सेना का पीछा करे। दारा के ऐसा करना मान लेना काफी महँगा पड़ा। उसको हाथी पर न देखकर सैनिकों ने समझा कि वह मारा गया अथवा भाग गया, इसलिए वे भी भाग चले और इस तरह दारा जीतते–जीतते हार गया और औरंगजेब हारते–हारते जीत गया। यह घटना संयोगमात्र ही थी।
10. कैसर–हिटलर का पतन और दो विश्वयुद्धों का कारण भी संयोग ही बताया गया है। उक्त उदाहरणों से यह बात बिल्कुल स्पष्ट हो जाती है कि इतिहास में आकस्मिकता अथवा संयोग होता है। जो लोग इसे नहीं मानते, उनके विचार व उदाहरण–साक्ष्य आगे द्रष्टव्य है।

इतिहास में संयोग नहीं होता–इस संबंध में मार्क्स और ट्राटस्की के उपर्युक्त कथन हम देख चुके हैं। ओकशाट ने इतिहास में किसी अदृश्य शक्ति को स्वीकार करने को अनुचित ठहराया है। उसने कहा है कि ऐतिहासिक घटना के क्रम का विवरण बिना किसो अवरोध के स्वयं स्पष्ट होता रहता है, इसलिये न कोई दुर्घटना होती है और न कोई हस्तक्षेप करता है। ओकशाट के इस तर्कसंगत कथन को वाल्श ने भी स्वीकार किया है और कहा है कि इतिहास में कोई भी जगह संयोग अथवा आकस्मिकता के लिये नहीं होनी चाहिये। संयोग का तात्पर्य एक या अधिक

कारणों के टकराव से किसी अन्य कारण को उत्पन्न होना होता है, जिसे इतिहासकार संयोग की संज्ञा देता है, वह कारणों को क्रमबद्धता, एक कारण हो सकता है। अतः स्पष्ट है कि संयोग का सम्बन्ध इतिहास से नहीं है।

पी0 गार्डिनर ने भी इस तथ्य को स्वीकार किया है। उसने कहा है कि इतिहास में संयोग का तात्पर्य दो स्वतंत्र कारणों के टकराव से उत्पन्न किसी तीसरे कारण की उत्पत्ति है। इतिहासकार को कारणों की क्रमबद्धता में नियमविहीन तत्वों के प्रभाव को स्वीकार नहीं करना चाहिये। क्योंकि जब कोई इतिहासकार संयोग की चर्चा करते हुए अदृष्ट शक्ति के हस्तक्षेप को बनाने का प्रयास करता है, तो घटना को समझने के लिये जटिल समस्या बन जाती है। इस तरह गार्डिनर ने संयोग को अस्वीकार तो किया है किन्तु एक जगह वह इसकी स्वीकृति में भी लिखते दीखते हैं–'सम्पूर्ण इतिहास संयोग के ईश्वर से प्रभावित है या विश्व के लौह नियमों द्वारा शासित है।' हो सकता है कि वह ऐसा व्यंग्य में लिख गये हों अथवा आक्रोश में।

इतिहास को संयोगों का इतिहास कहनेवाले ई0 एच0 कार भी अन्यत्र संयोग को अमान्य करते हुए मिलते हैं, ठीक पी0 गार्डिनर की तरह।' उनके अनुसार संयोग के महत्व को मान्यता देने का तात्पर्य इतिहासकार के मस्तिष्क को दिवालियापन है।' वे लिखते है कि इतिहास को दुर्घटना का एक अध्याय कह कर इतिहासकार अपने को कायर तथा अक्षम स्वीकार करता है। इतिहास में दुर्घटना या संयोग की समस्या का संयोग कारणों की खोज में होना चाहिए।

अपने कथनों के सन्दर्भ में पूर्वोक्त उदाहरणों को विद्यानों ने इस तरह से प्रस्तुत किया है–

1. एक्टियम युद्ध का परिणाम यथोचित कारणों का परिणाम नहीं, अपितु क्ल्योपेट्रा के प्रति एंटोनी का आकर्षण था, जो कि स्त्री–सौन्दर्य के प्रति पुरूष की आसक्ति के स्वाभाविक व्यवहार का परिचायक था। उसे संयोग नहीं कह सकते। अपितु एंटोनी की पराजय के अन्य कारणों की खोज करनी चाहिये।
2. गठियाग्रस्त होने के कारण जब बजाजेट मध्य यूरोप पर आक्रमण करने में असमर्थ रहा तो उसका कारण संयोग नहीं अपितु त्रिदोष रोग उसका कारण था। इसके अतिरिक्त भी और कारण रहे होंगे, जिनकी खोज की आवश्यकता है।

3. राणा की पराजय का कारण केवल संयोगवश तीर लगना ही नहीं था, अपितु अन्य कारण भी रहे होंगे, जिसकी खोज करना एक अच्छे इतिहासकार का कार्य है।
4. शेरशाह की मृत्यु हथगोला फटने से हुइ, जिसे संयोग की संज्ञा देने वालों को यह भी सोचना चाहिये कि कहीं वह हथगोला किसी दूसरे ने किसी षडयंत्र के अन्तर्गत तो नहीं फेंका अथवा फेंकवाया था।
5. हेमू की पराजय केवल उसका घायल होना ही नहीं था, अपितु अकबर के साथ जो प्रभावशाली सहायक थे वे भी कारण थे।
6. बन्दर के काटने से एलेक्जेंडर की मृत्यु हुई के विषय में सर विंसटन चर्चिल ने लिखा है कि मृत्यु सबकी होती है, जिसके कारण भिन्न–भिन्न होते हैं। यह एक कारण है कि एलेक्जेण्डर की मृत्यु उसके पालतू बन्दर के काटने से हुई। किन्तु ढ़ाई लाख लोगों के मारे जाने के कुछ और भी कारण हो सकते हैं, इसे इतिहासकारों को ढूँढ़ना चाहिये, न कि संयोग कहकर टाल देना चाहिए।
7. बत्तख के शिकार के संयोग को कार ने यों लिखा है कि ट्राट्स्की की निष्क्रियता और स्टालिन का व्यक्तित्व तथा अन्य कारण भी रहे होंगे, संयोगमात्र ही नहीं।
8. अकबर की ख्याति में केवल मानसिंह ही नहीं अपितु और भी कारण सहायक रहे होंगे। मानसिंह का उससे मेल कोई संयोग नहीं हो सकता, यह सच है।
9. दारा के न जीत सकने के और भी अनेक कारण हो सकते हैं, जिनकी खोज की जानी चाहिए।
10. कैसर–हिटलर पतन का कारण उनका नाजी होना भी था तथा दो विश्वयुद्धों के भी अनेक कारण थे, अतएव इनको संयोग मात्र कहना ठीक नहीं है, क्योंकि यह सच है कि इतिहास में कभी–कभी अकस्मिक घटनाओं ने भारी उलट–फेर किया है।

निष्कर्ष : वास्तव में संयोग का तात्पर्य एक या अधिक कारणों के टकराव से किसी अन्य कारण का उत्पन्न होना होता है, जिसके आधार पर हम कह सकते हैं कि संयोग का इतिहास में संबंध नहीं है, परन्तु जिज्ञासु स्वभाव के कारण इतिहासकार इसका अध्ययन जानकारी के लिये किया करते हैं।

संदर्भ सूची :

1. डाक्टर परमानन्द सिंह, इतिहास दर्शन, जैनेन्द्र प्रकाशन, 2005, पृ.सं.–292 व 293.

2. गिबन पृ.सं.–395 व ई0 एच0 कार, पृ.सं.–105
3. बेरी–हारविनिज्म इन हिस्ट्री, पृ.सं.–50
4. मानेक, ए0 मैकियावेलिज्म, पृ.सं.–39
5. कार्लमार्क्स एण्ड एंजेल, पृ.सं.–108
6. गिबन : डिक्लाइन एण्ड फॉल ऑफ दि रोमन एम्पायर, अध्याय–1, पृ.सं.–94
7. आ0 पी0 त्रिपाठी, राइज एण्ड फॉल ऑफ दि मुगल एम्पायर, पृ.सं.–43

''गोराचाँद टुडूवाक् जियोन चरित आर काˌमी काˌसनी''
जोग हˌाटिञ– ''गोराचाँद टुडूवाक ओˌनोˌड़हें रे दाड़ेवानाक् रासा

निर्मल मुर्मू
षोधार्थी, संताली विभाग
सिदो कान्हु मुर्मू विष्वविद्यालय,दुमका
E-mail ID:nirmalmurmu570@gmail.com

Abstract/ झारतेत्

''गोराचाँद टुडूवाक् जियोन चरित आर काˌमी काˌसनी'' रेयाक् जोग हˌाटिञ– ''गोराचाँद टुडूवाक ओˌनोˌड़हें रे दाड़ेवानाक् रासा रेयाक् झारतेत् दˌो इञाक् हुदिस आर विचार लेकाते नोंका बोन मेन दाड़ेयाक्आ, चेत् लेका जोमाक् ञुँवाक् रे चेत् लेका रासा ताहेंन खान सेबेल बुझˌाक्आ, ठीक ओनका गे साँवहेंत् रेहों रासा रेयाक् जˌारूड़ पाड़ाक् काना। एन्ते साँवहेंत् रे रासा बाङ ताहेंन खान ओना रेयाक् जाहांन ओकाज गे बाङ ताहेंन काना। संताली साँवहेंत् रेहों रासा रेयाक् बेवहार दˌो मेनाक् गेया। ओका दो संताली साँवहेंत् चेतान सेच् सेपेञ राकाब रे आˌडी माराङ गˌोड़ोय एमोक् काना।

ओनोड़हियˌा दˌो नाहाक् पिड़ही चेतान रे नोंकानाक् दोहो काते जुवˌान कोय चेताव लाहायेत् कोआ। मोने रे उद्गˌाव एमावाको लˌागित् ए मेतावाको काना। होड़मो रे मित् ठˌोप हों मायाम मेनाक्आ खान हापड़ाम को रेन आम दोम दिलगˌारियˌा काना आर खˌाटी गे ओनकान होड़ दˌो तायोम रेदो बाङ लाहा रे को ताहेंना। गुती काड़मी दˌो बाङ मˌालिक रे को ताहेंना आर चापो जोड़ो दˌो बाङ सˌाड़िम जोड़ो को पाडाक्आ।

गोराचॉद टुडू दˌो मित्टेन नोंकान ओनोड़हियˌा ताहेंकाना। ओका दˌो संताली सॉवहेत् रेयाक् आयमा हिसˌाय टˌामडˌाव तियˌाक् लेत् आर ओंनका लेकाते संताली सॉवहेत् रे ओनोड़हें रूप रे नावांनाक् होड़, कुनदˌाव आर गुजाव काते ए सोदˌोराक् कोआ। ओना को मुद खˌोन दाड़ेवानाक् रासा चेतान रे नुई दˌो आˌडी तˌारकी ताहेंकान ताया। सिदो कान्हू हुल,तिलका मांझी हुल, षाम परगनावाक् हुल रेयाक् एनेम एमान तियाक् जिनीस आयाक् साबाद रे गाथाव काते ओनोड़हें रूप रे सोदˌोराक् कोआ। उनीयाक् ओनोड़हे पाड़हाव ते बोहोक् रिसरिसीक्, मायांम लोलोक्, आर सिर केटेजोक् ते बˌायरी को सॉव ते लाड़हाई लˌागित् नावांनाक् दाड़े ञामोक् आ।

जोमाक् ञुँवाक् रे चेत् लेका रासा ताहेंन खान सेबेल बुझा़क्आ, ठीक ओनका गे साँवहेंत् रेहों रासा रेयाक् जा़रूड़ पाड़ाक् काना। एन्ते साँवहेंत् रे रासा बाङ ताहेंन खान ओना रेयाक् जाहांन ओकाज गे बाङ ताहेंन काना। संताली साँवहेंत् रेहों रासा रेयाक् बेवहार दो़ मेनाक् गेया। ओका दो संताली साँवहेंत् चेतान सेच् सेपेञ राकाब रे आ़डी माराङ गो़ड़ोय एमोक् काना।

गोराचाँद टुडू हों आ़डी आयमा ओ़नो़ड़हें कोय ओ़ल सोदो़राकादा। ओ़नो़ड़हें पुथी रूप रेदो एकेन बारया गे छापावाकान ताया बाखरा आर चाँद माला। बारया रे आ़डी आयमा ओ़नो़ड़हें मेनाक्आ आर जोतो ओ़नो़ड़हें रे आपान–आ़पिन रासा मेनाक्आ। ओना ओ़नो़ड़हें को मुद खो़न दाड़ेवानाक् रासा हों आयमा मेनाक्आ। नुई ओ़ल ओ़नो़ड़हें रेदो सोमाज ला़गित् भाबना दिसोम ला़गित् भाबना आर आसोकायते संताल हुल रे को मायांम गोहायेना परिवार रेन होड़ कोवाक् भाबना ञेल ञामोक् काना। उनी ओ़ल ओ़नो़ड़हें आर ओना रे मेनाक् दुपूलाड़ रासा रेयाक् आ़रीबांदी दो़ लातार रे ओ़ल मेनाक्आ।

गोराचाँद टुडूवाक् ओनोड़हें रे दाड़ेवानाक् रासा

दाड़ेवानाक् रासा (वीर रस)– ओकाटाक् ओनोड़हें से सेरेञ रे उद्गा़व रेयाक ढेव (भाव) ओडोकोक् कान ओना दो़ दाड़ेवानाक् (वीर रस) को मेताक् काना।

मानोतान गोराचाँद टुडू दो़ बिर रोस से दाड़ेवानाक् रासा रेन लाकेर ओनोड़हिया़ कानाय। मा नाहाक् ओनोड़हें पुथी चाँद माला रेयाक् नोआ का़ली बोन ञेल ताया–

मायाम कुंडी रे मित् छो़प मायाम,
सारेच् मेनाक् खान हापड़ाम कोवाक्,
दिल आर दाड़े तेम पुरून गेया,
आपनार ला़या़गो़क् सोड़ा संताल।

चाँद माला पृ.संख्या–37

आम मा चोम दिलगा़यिा़ रेन होपोन कान, आम मा चोम हुलगा़रिया़ रेन होपोन कान, आम मा चो नोआ धा़रती रेन पा़हिल आर आसोल होपोन कान आर आम रेन हापड़ाम मा साफा सोड़ा आर रिला़–माला फा़रिया़ ओन्तोर ताहेंकान ताको। तोबे चेदाक् तेहेञ दो़ गांये–मांये गा़युर–टा़पुर आर निधान दो़ मेनामां चेदाक् नुना़क् तायोम रे आर बा़पुड़िच् रे दोम ताहेंन काना। चेदाक् तेहेञ आम दोम एड़े लुपूक् चाबा ओचोवाकाना। चेदाक् तेहेञ दो़ सा़ड़िम जोड़ो बाङ काते चापो जोड़ो रेगे कुसी मेनामा? मासे हुदिस में आर कोयोक् आ़चुर में बेड़हाय ते आम दोम ओकोय काना आर आमरेन हापड़ाम दो़ चेले को ताहेंकाना गु़ानो़क् में।

ओनोड़हिया दो नाहाक् पिड़ही चेतान रे नोंकानाक् दोहो काते चेताव लाहायेत् कोआ। इना काते मोने रे उद्गाव एमावाको लागित् ए मेतावाको काना। जुदि आमाक् होड़मो रे मित् ठोप हों मायाम मेनाक्आ हापड़ाम कोवाक् आम दोम दिलगारिया कान आम रेदो जोतो लेकानाक् गुन–पुन पेरेच् मेनाक्आ। ओने ओका दो मितटेन सारी आर सोड़ा संताल रे होयोक् जारूड़ काना। आर खाटी गे ओनकान होड़ दो तायोम रेदो बाङ लाहा रे को ताहेंना। गुती काड़मी दो बाङ मालिक रे को ताहेंना आर चापो जोड़ो दो बाङ साड़िम जोड़ो को पाड़ाक्आ।
आरहों नाहाक् नोंका गे देव दोरसोन आरे आड़ाङ जुतुमान ओनोड़हें रेयाक् मित् काली बोन जेल लेगे–

देव दाड़े ते चापोड़ेन चोड़ोमेन बार संताल
आड़ाङ दोरसोन ते एसेरेन ओसरावेन,
दिबेन दिड़होयेनकिन बारते केदा.....
हुल हुल संताल हुल गुहाराते।

चाँद माला पृ.संख्या–55

ओते आंजोमोक् कान देव दोरसोनाक् आड़ाङ आर आड़ाङ ते गोटा चोड़ाडेन आर बारया जुवान कोड़ाकिन उपेल आकाना। मेनेक् नुकिन दो माराङ ठाकुर गेय कोल आकात्किना। सुबा ठाकुर कानाकिन। धारती रेन मानवाँ ओवार किन हेच् आकाना। धारती` मेनाक् को आदिवासी होपोन को हारखेत् सासेत् आर गांजोन खोन ओवार को लागित् गे किन उपेल आकाना। मानवाँ बांचाव को लागित् दिब आकानाकिन। दिड़हो आकानाकिन। जाहांनाक् गे होयोक् तायोम सेच् दो बाकिन पाचलाक्आ। ओना इयाते देला उनकिनाक् ताल रे ताल बोन मिलावा। होहो केदा किन उनकिन जुवान तारास केदा किन बुरू रेन कुल लेका । आबोवाक् दिसोम आबोवाक् राज लागित् पुरजाताक् राज पाटुप् गिडी काक् लागित् आक्–सार कापी तारवाड़ी आर खाण्डा फिरीयानते देला बोन हुल हुल संताल हुल रे।
मानोतान ओनोडहिया कोलोम रे नुनाक् दाड़े मेनाक्अ ओने ओका दो जापित् होड़ ए एभेन दाड़ेयाको, थिर होड़ ए बुसकू दाड़ेयाको आर रेयाड़ मायाम ए लोलो दाड़ेयाक्। दाड़ेवानाक् रोस रेयाक् नुई ओल ओनोड़हें पाड़हाव रे ओका तिरपित बुझाक्आ, ओना दो पाड़हाव होड़े गेय लाय दाड़ेयाक्आ। मा नाहाक् आरहों ओनोड़हें रेयाक् नोआ काली बोन जेल लेगे–

बार संताल सिदो–कान्हू बिरबांटा,
भोगनाडीह बिलान रे बुसकू कुल बाराग,
माताव मेत् आर रोकोतपुटी चाँद तिरे,
जाति सिक कुम्भीर कोड़ाम रे चाड़धा दिल,

गानगानाव कान फुटा़व पाकपाकावक् काना।

चाँद माला पृ.संख्या–53

ओते आंजोम केदाम बार संताल सिदो कान्हू बिरबांटा,भोगनाडीह बिला़न रे बुसकू कुल बाराग मेनेक् नित दो़ बा़किन इका़या आर बा़किन दुडूप थिरूक्आ। तिन हा़बिच् दो़ एटाक् बिर खो़न हेच् आकान पोचरा जानवार को बा़किन लागा गिडी कोआ। बाडाय गेयाबो, जे कुल दो़ बिर रेन राजा काना को आर थिराकान बिर रेन राजा दो तेहेञ को बुसकु आकात् किना़। ओना हांडरा़व दोकिन एहोप् केदा आर उनकिनाक् हांडरा़व आंजोम ते पोचरा को दो चांडबाल तुल काते दादाड़ होयोक् ताकोआ आर जुदि बाको दा़ड़ा तोबे बांचावक् रेयाक् उपा़ई दो़ बा़नुक् ताकोआ। मेनेक् नुकिन दो़ संताल रेन राजा कानाकिन। बाम ञेलेत् कान ञेलेत् कान माताव मेंतहां आर नुकिनाक् सामाङ रे मेनाय चाँद ठेन रोकोट–पुटी खा़टी गे पुरजात दो़ दा़दाड़ होयोक् ताकोआ। संताल जा़ति ला़गित् गा़हिर आर गुम्भीर हुदिस मेनाक्आ। ओना तेगे बाङ जा़ति आर हासा बांचाव ला़गित् कोड़ाम दो़ चेड़धावाक् ता़किना आर उनकिनाक् मायांम दो़ नोआ धा़रती हेडेजोक् कान ताकिना। पुरजा़त विरूद्व रे मोन आर ओन्तोर रे लागाव आकान इदरी रेयाक् सेंगेल दो़ गानगानाव बाडाय काना,पाक–पाकाव बाडाय काना। मेनेक् धा़रती बांचाव बाबोत लाड़हा़ई रे आरदो पासेच् बिला़म बाङ होयोक्आ। एन्ते ओन्तोर सेंगेल रे चोंदा सेंगेल दो़ खाबाड़–खाबाड़ोक् काना। जुवा़न को दो़ नोंकान जिनीस ञेलते आर आंजोम खा़टी गे नोआ धा़रती गोगो रूखिया़य ला़गित् ओन्तोर रे सेंगेल लागावाको काना आर कोड़ाम चेंड़धाक् कान ताकोआ धा़रती दुला़ड़ ला़गित्।

ओनोड़हिया़ दो़ दोसार पीढ़ी रेन जुवा़न को उद्गा़व एमाको ला़गित् आयाक् कोलोम चालाव रे थोड़ागान हों बाय कंजुसी लेदा। मा नाहांक् आरहों '' हुल रेयाक् पा़हिल हुबा़क्'' रेयाक् नोअ का़ली बोन ञेला–

दोफांड फांद खा़ली तालारे,
सुबा ठा़कुरकिन थापनावाकान,
दोरसोन तेको धिपाव आकाना,
रोसाव माताव होड़मो रे मायांम,
खिचीड़–खिचीड़ोक् कान ताकोआ,
होड़ होपोन रेन दुष्मान महाजोन,
मा़टी रे तेहेञ मिला़व काया को,
खालास काको ला़गित् खाटोक् तोल दोल,
दिबेन दोड़होवाकानाको,
संताल सा़धिनको मानान आकावाना।

बाखरा पृ.संख्या–14

हजार–हजार होड़ ताला बारया संताल किन उपेल आकाना। सुबा़ ठा़कुर रूप रे बारया होड़ किन थापना आकानां होड़–होपोन दो़ गांजोन–गांजोन तेको लांगा चाबावाकाना। दुख आर साासेत् तेको लांगा चाबावाकाना। दुख रेयाक् लोलो सुनुम रेको़ हेडेजो़क् काना। होड़ ओवार को ला़गित् सेपेञ को ला़गित् आर आ़युर को ला़गित् ओकोय हों बाको ताहेंकाना। उन ओ़क्ते गे देव तुली बारया संताल किन उपेलो़क् काना। सुबा़ ठा़कुर रूप रेकिन थापनाक् काना। आर उनकिन दो़ भोगनाडीह आतो रेन चुनू मुर्मू रेन होपोन सिदो मुर्मू आर कान्हू मुर्मू किन ताहेंकाना। सिदो आर कान्हू दो़ नोंकान ओ़क्ते किन उपेल लेना, ओने ओका ओ़क्ते दो़ हो़ड़ होपोन बेहिरला़ आर हाले–ढाले को ताहेंकाना। होड़ होपोन आ़युर को आर ओवार को ओकोय हों बाको ताहेंकाना। पुरजा़ताक् गुला़म रेको रोडोजोक् कान ताहेंन। पुरजा़ताक् षोसोन को ओडोकोक् आर बाहेरो़क् ला़गित्े को मिरमिरा़व बाडाय कान ताहेंन। इदरी आर रांगाव तेको लांगा चाबावाकान ताहेंन। ओनकान ओ़क्ते बारया ओवारकिन आर दोदो़क्किन सिदो–का़न्हू किन उपेलेन खान होड़ होपोन दो़ चातोम ते उमूलकेत् को लेका को बुझाव केदा। होड़ दो़ उनकिन ठेन आपामोक् आर नकिन दोरसोन किन ला़गित् को उमरावेना। गादेल–गादेल होड़ उनकिनाक् दोरसोन ञेल ला़गित् सेटेरो़क् का एहोप् लेना। उनकिन ञेल काते आस आर भोरसा सेतेञेना। मेनखान इदरी रेयाक् सेंगेल दो़ आरहों ढा़व राकाप् एना। होड़–होपोनाक् ओन्तोर रे सेंगेल आर होड़मो रे दाड़े जानामोक् एहोप् एना। सिदो कान्हूवाक् दोरसोन ञेल काते होड़ होपोन उद्गाव को आम केदा। ओनका लेकाते सा़धिनो़क् रेयाक् साना दो़ आर गे ढेर इदियेन ताकोआ। आर नोआ धुड़ी धा़रती ला़गित् जीवि आलाय ला़गित् हों सापड़ाक् को एहोप् एना। भाला सा़धिनोक् रेयाक् रेंगेच् सामाङ रे लाच् रेयाक् रेंगेच् ओकोर? भाला सा़धिनोक् रेयाक् रेंगेच् सामाङ रे गो–बाबा ओड़ाक् दुवा़र रेयाक् माया ओकोर? नितोक् दो़ सिदो–का़न्हूवाक् हुदिस गे दिसोम होड़ाक् मायां रे हेडेजो़क् काना आर नितोक् दो़ दिसोम सा़धिन ला़गित् को मानान उता़राकानां बिना़ दिसोम सा़धिन ते जिवेत् बाको ताहेंना।

सा़री गे ओनोड़हिया़वाक् कोलोम रे ओना ताकोत मेनाक्आ ओका दो़ हिजुक् कान पीढ़ी उद्गा़व एमाको को ला़गित् आयमा काना। उनी ओ़ल ओनोड़हें जिवेत् रासा साँव–साँवते आ़तुक् कानां मा नाहांक् आरहों नोआ ओनोड़हें रेयाक् मित् का़ली बोन आंजोमा–

मोतो दामगी रेये देच्एन रोहोयेनाय,
सार–साप् ती लुजकाते गुहा़र ते हुकूमे लिला़येदा,
तेराङ पे दा़मगी हानासा बैरी थार तेराङ पे,
सार जाड़ी नालोपे नासोड़ा उना़क् ओलोगे पे आ़सीदा,
हेनोस्ता तोपाग आ़खिर फाण्डा काना,
मोरोन चाहे जियोन जाहांटाक् झुटया़व पे,

मोरोद पे सा़बुद खान सा़बिक् संताल,
तेहेञ ताक् कान तापेया।

बाखरा पृ.संख्या–26

नुन माराङ खेमोता दो़ भाला ओकोयाक् काना। ओकोय उन माराङ ब्रिटीष राजा विरूद्व रे होड़ दो़य लिलकारेत् कोआ। ओकोये मेतावाको काना, मा तेराङ पे आर सार आड़ाग पे, आक् दो़ हाबूक् खो़न आलोपे आ़सित् ओचोवाक्आ। ओकोये मेनेत् काना जिवा़दो़क् बाङ खान मोरोन झुटवा़य जोङ पे।

उनी दो़ ओकोय हों बाय ताहेंकाना। सिदो आर कान्हूवाक् जापारावाक् रेय सेटेर लेन बिरबांटा बा़जा़ल कानाय। सिदो–कान्हूवाक् जापारवा रे सेन कातेय ञेलकेत् कोआ गादेल–गादेल होड़ को जारवा आकाना। गादेल–गादेल होड़ ताला रे बारया जुवा़न कोड़ा बुरू रेन बुसक् कुल बाराग किन हांडरा़वक् काना। उनकिनाक् काथा आंजोम काते जोतो होड़ाक् ओन्तोर रे रांसका राकाप् एना आर को आटकार केदा नित दो सा़ना़धिन आ़डी सांगिञ रे बा़नुक्आ। आ़डी उसा़रा गे ञामोक्आ। मेनखान एमनी तेदो बाङ ञामोक्आ। ला़ड़हा़ई काते ञामोक्आ। मायांम बूहेल काते ञामोक्आ आर ओना ला़गित् दो़ होड़ सापड़ाव को होयोक्आ। खाण्डा–भाण्डा सापड़ाव होयोक्आ आर फा़द तेयार को होयोक्आ। सिदो कान्हूवाक् काथा आंजोम काते बा़जा़ल रेहों बिरबांटा हेच् एना। मोने रे उद्गा़व जानाम आदिया आर हाड़मो़ रे दाड़े हों हेच् एना। ओनाते नितोक् दो़ फा़द ए सापड़ाव केत् कोआ आर दा़मगी चो़ट रेयाक् हुडूप् धिरी खो़न ब्रिटीष ए लिलका़रेत् कोआ आर नोते आच् रेन फा़द थारे–थार सार आड़ाक् लागित् ए हुकूमाको काना। मेतावाको कानाय सार आड़ाग पे आर उन हा़बिच् तेराङ पे तिन हा़बिच् दो़ दुष्मान बाको सुमा़र चाबाक्आ। सार दो़ थारे–थार चालाक् आर आक् दो़ जेमोन आलो आ़सिदोक्।

बा़जा़लाक् नोआ काथा रेयाक् दाड़े गे ताहेंकाना जे होड़ होपोन जियोन आर मोरोन ताला रेकको खादलीयेना। ब्रिटीषे साँव घाटामा़र को ला़ड़हा़ई एना। चाहे दोम गुजुक् आर चाहे दो़म जिवेदो़क्। सा़धिनो़क् रेयाक् साना खो़न आर ला़टू दुला़ड़ दो़ बा़नुक्आ।

नोंका गे आरहों नाहांक् मित्टेन ओनोड़हें बोन आतेन लेगे–
तिरे सिकड़ी जांगा रे बीड़ी,
हेलाव केदेयाको धिरी पा़चरी का़द खानाते,
ओना देयाल धिरी भितरी खो़न लिलिया़व रावाँवक् काना,
हानको हजार बा़जा़ल एका़ बा़जा़ल खो़न,
होड़ होपोन लाहान आलोपे ताहाव़क् आ,

साद ते संताल दो पे बाङ काना,
ओको दानाङ खो़न देला बाहेर पे
आर.....
कोचलोङ–का़हिल हेनोस्ता रे हापे हेनाकृ पे,
मानवाँ नाता गे आ़पूस को पे,
आपे पारोम चाँक् पे,
एहोप् आक् सा़त ले,
सुमा़र ले,
फेर पे हियखा़लासोक् आ।

बाखरा पृ. संख्या–32

जाहांय होड़ेम तोल दोहो दाड़ियाया, हाजोत दोहो दाड़ियाया, धा़रती रेन होड़ खो़नेम बेगार दाड़ियाया से इदरी ते पासी बाबेर रेम आका दाड़ियाया मेनखान, उनीय जोल आकात् सेंगेल,उनीय बेनाव आकात् हिमालय से उनीय इर आकात् हुदिस आर विचा़र रेयाक् इता़ दो़ चेकातेम माराव दाड़ियाक्आ। मित्टेन सिदोम पा़सीयी खान हजार गो़टेन सिदो को जानामोक्आ आर मित्टेन बा़जा़लेम हाजोत ए खान हजार गो़टेन बा़जा़ल सोड़ोक्–सोड़ोक् तेको दा़ड़ां बाडाया। भाला तिना़क् सिदा़म पा़सी कोआ आर तिना़क् बा़जा़लेम जेहेल कोआ। चेत् लेका महात्मा गाँधी दिनांम दिन को गोजे काना। ओकोय दो़ सोषल मीडिया ते ओकोय दो़ मोचो–मोचो ते, ओकोय दो़ कोलोम ते आर ओकोय दो़ उनीयाक् पुतला़ रे बांदूक् चालाक् काते से छुरी आर तालवार चालाव काते गे मेनखान तिना़क् गे गाँधी गोजे रेयाक् को कुरूमुटूयेत् उना़क् गे गाधी जी दो़ दोबड़ा तेय बेरेत् रूवा़डो़क् काना। आर उना़क् ता़पिस तेगे होड़ को ताला रेय फायलाक् काना। ठीक ओनका गे सा़ना़धिन रेयाक् राँत सागाड़ रे देच् आकान जोतो होड़ को ला़गित् पा़सी आर जेहेलखाना जाहान ला़टू जिनीस दो़ बाङ काना।

तेहेञ बा़जा़लाक् ती रे हाथका़ड़ी लागाव एना, जांगा रेहों बेड़ी लागावेना आर हाजोत रेयाक् पा़चरी भीतरी रेको भोराव केदेया। दुनिया़ रेन होड़ सामाङ खो़न को दानाङ केदेया। जेमोन होड़ ताला रे बाय हेच् दाड़ियाक् बाय ञापाम दाड़ियाक् से बाय एर दाड़ियाक् सा़ना़धिन रेयाक् इता़ आर हुल रेयाक् सेंगेल आलोय जोल दाड़ियाक्आ। मेनखान बिरबाँव ज्वालामुखी भुकंप आर डुबा़ दाक् दो़म रोकाव दाड़ियाक्आ। पासेच् बाङ ठीक ओनका सिदो आर का़न्हूकिन लागावाकात् सा़ना़धिन रेयाक् सेंगेल इंड़िच् दो़ मुष्किल गेया। पा़सी बाबेर खो़न हों जोल ओडोकोक्आ आर हाजोत खो़न दोंहगाव ओडोकोक्आ।

तेहेञ दो ओना हालोत गे होयाकाना। मित्टेन हुलगारियावाक् ती रे हाथकाड़ी लागावाकाना आर जांगा रेहों छान्दा। मेनखान एन रेहों हुल सेंगेल दो बाचो दोमडावआकान। होड़ होपोन ताला र बुरसी सेंगेल लेका जोलोक् रेगे मेनाक्आ। मोंडोक्–मोंडोक्। मित्टेन बाजाल बोदोल ते हजार गोटेच् बाजाल बारहे रेको दाड़ां बाड़ाय काना। जेहेल भीतरी खोन गे बिरबांटा बाजाल दो बारहे रे दाड़ां बाड़ाय कान हजार बाजाल ए मेतावाको काना। होड होपोन आलो पे बोतोरोक्आ आलोपे तायोमोक्आ आर आलोपे पाचाक्आ। साद ते संताल दो पे बाङ काना आर आपेयाक् जोनोम एमने तेदो बाङ होयाकाना। आपे दो पे दिलगारिया को रेन बोंषो काना, नोआ हासा रेन होपोन काना पे। धारती रे ओका कामी ञुतुम पे हेच् आकाना। ओना दो कामी काते गे चालाक् पे। अंग्रेज को ञेल काते पोचरा सेता लेका भागवा तेपेञ काते दो आलो पे दाड़ां। ओको दानाङ खोन सोदोरोक् पे। कोचलोन काहिल रे जुदि मेनाक् पे बारहे ते ओडोकोक् पे, सापड़ाक् पे आर लाड़हाई लागित् पाठे केटेजोक् पे। एन्ते संताल जात रे मित्टेन मानवाँ रूप रे जोनोमाकाना आर ती जांगा होड़मो लेकाते पे केटेच् गेया एन्हों पोचरा सेता लेका चांडबोल गाड़पूच् काते पे ताहेंना,तोबे संताल जाताक् ओपोमान होयोक्आ।
खाटी गे नोंकानाक् आनोड़हें होड़ाक् उप्ए किड़बित ओचोया। उद्गाव ओडोकोक् ते नावाँनाक् दाड़े सारेड़ोक्आ। भाला नोंका काथा साबाद ते गाबान राकाप् रेयाक् तारकी जोतो होड़ाक् होय दाड़ियक्आ। उहुँक् मा नाहांक् नोंका गे ओनोड़हें रेयाक् मित् काली बोन रेला लेगे–

षेश सुबा ठाकुर तिलका माँझी,
बांड़ती हुल बाय आपूस रूवाड़ लेदा,
दिबेन दिड़होयेनाय दिलगारिया,
सोदोर दानाङ रेन उफादिया।

बाखरा पृ. संख्या–38

चेत् आदोम मेनेदा,तिलका दोय लिलकाक्आ आर ब्रिटीष सोरकार बोतोर ते हुल दोय दोम्बाडाव रूवाड़ा, एकाल गे बाङ। पुरजात को दो नासे हो चो बाय बोतोराको कान। बिचकोम उलटाव ते आरहों चोय लिलकारेत् को। देला हिजुक् पे लाड़हाई लेन गेबोन।

तिलकपुर आतो,सुन्दरा मुर्मू रेन कोड़ा तिलका मुर्मू तेहेञ दोय बिरबांटा तिलका मांझी कानां अंग्रेज सोरकार विरूद्व रे लाड़हाई ए एहोप् आकादा आर जीवि चालाक् चुपी चालाक् लाड़हाई तेगेञ ताहेंना। तेहेञ नुयाक् लाड़हाई सामाङ रे अंग्रेज दो आडी निसड़ाव को आटकारेत् काना। ओनाते उनी ब्रिटीष सामाङ रे सापाप् दोहोय लागित् ढारवाक् को जारी केदा आर हुल थुकुम रेयाक् काथा को मेतावादेया।

मेनखान हुलगा़रिया़ दो ओका रे आछा सापाप् दोहो दोय ञेल आकात् कोआ। बिरबांटा तिलका़ मांझी बाङ दो़ हुल ए दोबड़ाव लेत् आर बाङ दो सापाप् गेय दोहोलेत् उलटा़वते आरहों मित् धाव दिबेनाय,दिड़हायेनाय आरहों हासा रयाक् किरया़य जोम केदा,बाङ मा होड़ाक् जांगा लातार रे ताहेंन बाला होड़ होपोन दो़ ले बाङ काना। आरहों ता़पिस ते ला़ड़हा़ई ए एहोप् केदा। ला़ड़हा़ई सेंगेल दो़ आरहों मित् धाव दांहगा़व रूवा़ड़ेना। हुल सेंगेल रेयाक् लेप दो़ सेरमा टुगांव जोल राकाप् एना।

ठीक गेको मेनेत् काना आदोम होड़ दो़ जे गोराचाँद टुडू दो़ संताली साँवहेंत् रेयाक् मित् पाहटा दो़ आच् मोतो तेगेय जाक् तिया़क् आकादा। ओना दो़ उनीयाक् ओ़ल कोरे गे ञेल ठीकोक् कान ताया। मा नाहाक् आरहों मित् का़ली बोन आटकार कात् रेगे–

निज दो़ आदोगोक्आ,गोबोलोक् रे,
पांचा जिबोनेम जिवेदोक्आ,
सिबाड़ोक् रे दोगोक् दोश कान खान,
पा़सी सा़जा़ई सोना माला काना।

बाखरा पृ.संख्या–40

मेनाको दिना़म दिन गुजुक् खो़न भागेया मित् दिन गे जिवा़दोक् में मेनखान बुरू रेन कुल लेका जिवा़दाक् में। हिन्दी तेहों को मेन आकादा– ''रोज रोज मरने से बेहतर है मर जाना'' मेताक् में दिना़म हिलोक् गुजुक् खो़न दो मोजा गोच् उता़रो़क्। दिना़म दिन संताव ओचोक् खो़न दो भागेया गोच् उता़रो़क् मे आर आर बाङखान तापाम रूवा़डो़क् में। जुदि थिर हापे गे मेनामा तोबे पापेम लादे जोङ काना। नोआ पाप खोन बांचावक् रेयाक् मित्टेन गे उपा़ई मेनाक्आ का़फारिया़।

नोआ का़ली रेहों मानोतान गोराचाँद टुडू दो ओना गेय मेनेत् काना जे सिबड़ोक् रे दोगोक् दोश कान खाच् पा़सी बाबेर हों सोना रेयाक् माला काना। आर कुसी रा़सकाते होरोक् जा़रूड़ काना। एन्ते गोबोल रेम ताहेंन खान सा़री गे आमेम ओकोय काना ओना दो चाबा उता़रो़क्आ। आम दो़ आम ला़गित् दो बाङ बिचको़म एटाक् होड़ ला़गित् एम जिवा़दो़क्आ। मित् लेकातेम मेन केया आम दो़ बेंगाड़ गोडा रे तिंगू आकात् को बुसुप् रेन होड़ कानाम। चांड़ियाव बाबेर तिन रेको तिया़गा उन रे उन रे लाड़ाक् होयोक् तामा। मेन रेयाक् मोतलोब दो़ एटाक् होड़ चेत् लेका को मेतामा,ओनका गे का़मी होयोक् तामां ओना खोन बांचाक् ला़गित् दो़ एकेन मित्टेन गे राड़ आर मित्टेन गे होर जे सा़रीयाक् रे ताड़ाम काते सा़रीयाक् आर होक रेयाक् काथा राकाब। आर जुदि हो़क रेयाक् काथा रोरोड़ बा़ड़िच् गे खान तोबे बा़ड़िच् ओचोवा। हो़क आर अधिकार रेयाक् ला़ड़हा़ई रे जुदि जीवि चालाक्, चुपी चालाक् जाहांन बा़ड़िच् दो़ बाङ काना से पा़सी बाबेर रेयाक् माला होरोग हों

जाहान बाड़िच् दो बाङ काना। एन्ते नोआ ते दो सोमाज रे लागित् मोज संदेष चालाक्आ आर हिजुक् कान दिन लागित् मुर्ति लेका को पुजावामा। तेहेञ पारतुल लेकाते सिदो कान्हू,चाँद,भैरव,महात्मा गाँधी,सुभाश चन्द्र बोस, बिरसो मुण्डा एमान बोन ञेल दाड़ियाकोआ। सोमाज लागित् को आलायेना। ओनाते सोमाज रेन होड़ तेहेञे उनको को मान मानोतएत् कोआ आर उनको उदुक् आकात् होर आर डाहार रेको ताड़ामेत् काना।

आरहों नाहाक् नोंका ओनोड़हें रेयाक् मित् काली बोन ञेल लेगे–

षासोनिया को दो ढिलमालिया,
धोनान दलाल मा सिबोड़िया,
सापो संताल को कावलावेना,
हुल ते दोगोक् को आवलावेना।

बाखरा पृ.संख्या–64

मेनाको गुंगड़ा होड़ होंम ठोके खान दोय आं,ऊंक् गेया, काड़ां होड़ होम एड़ेयि खान दो ञेञेल गेया आर कारिनांगिञ होंम बुसकूयी खान दोय गेगेर गेया। ठीक ओनका गे अंग्रेजाक् षासोन रे कुसी रासका आर सुलुक् ते ताहेंन सोड़ा संताल दो को बुसकू आकात् कोआ। एन्ते ताल दो बुरू रेन बुरूम आकान कुल काना को जुदिम बुसकू केदे तोबे दोय लाकूम उतार मेया। आर तेहेञ ओना कारोन ते जिराव आकान ओन्तोर रे दाड़े हेच् आत् कोआ आर नितोक् दो खाण्डा–भाण्डा साना–फाना को सापड़ाव जोङ काना। एन्ते कुंपानी सोरकार दो आयाक् गुबलीय भोराव जोङ काना। होड़ होपोन दो काटबिजा आर सिबाड़िया महाजोन आर कुरमूताहा अंग्रेज पुलिस दारोगावाक् षासोन रे सिटनावाकान टेकोस–टेकोस को साहेंत् जोङ काना। आदो चेदाक् भाला जिवी ती रे चुपुत् काते साधिनोक् रेयाक् होर बाको पांजाया। ओनाते गे बाङ उन माराङ दिसोम रे माराङ संताल हुल को जोल राकाप केदा। नोआ दो बेगोर उद्गाव साहोसा आर दाड़े तेदो ओहो तेत् ओहने गे होय लेना। नोंकानाक् जिनीस ओनोड़हिया दो आयाक् कोलोम तेय साजाव राकाप् आकादा। ओका दो जुग चेतान जुग हाबिच् हुल जिवात ए दोहोया आर होड़ाक् ओन्तोर रे उद्गाव रेयाक् बेरेल दाक् ए सेतेञ ओचोया।

झारतेत्

चेतान रे ओलाकान ओनोड़हें को दो ओना रेयाक् आरीबांधी को ते बाडायोक् काना जे गोराचाँद टुडूवाक् ओनोड़हें रे दाड़ेवानाक् रासा रेयाक् बेवहार दो आडी मोज होयाकाना। नुई दो नोकानाक् ओल रेन गाखुड़ ओनोलिया ताहेंकाना। पाड़हाविच् दो पाड़हावकाते खाटी गे रासका आर भाबना जानामाया आर मोने–मोने ते मेत्दाक् जोरोक् ताया। नुयाक् ओनोड़हें रे ओका साबाद रेयाक् बेवहार मेनाक्आ, ओना

रेयाक् दो चेत् जोबाब गे बा़नुक्आ। नुई दो आयाक् ओ़नो़ड़हें रे जुरी आखोर से जोड़ा साबाद रेयाक् बेवहार आ़डी मोंज ते होय आकाना। ओका दो़ ओनो़ड़हें रेयाक् दारजा आ़ड़ी चेतान दारजा हा़बिच् ए बाड़हावेत् काना। नोंकाते मेन गानोक्आ, नुई दो़ दाड़ेवानाक् रासा ओ़लो़क्इच् गा़खुड़ ओ़नाड़हिया़ कानाय आर नुयाक् ओ़नो़ड़हें रेदो दाड़ेवानाक् रासा रेयाक् झलक आ़डी नापाय ते जेल ओरोमोक् काना।

गो़क्डो पुथी

- टुडू गोराचाँद– चाँद माला/1957 श्री जी.सी. टुडू मिषन हाउस कैराबनी दुमका (एसपी) झारखण्ड 814166 साकाम –37,55,53
- टुडू गोराचाँद–बाखरा/1986 बेनागाड़िया मिषन प्रेस संताल परगना झारखंड साकाम–14,26,32,38,40,64