PERFORMANCE FACTORS OF MANUFACTURING INDUSTRY-A REVIEW

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ABSTRACT

In modern days of the industrial era, it is very difficult to keep track of production information in manufacturing. Manufacturers frequently struggle with this due to the manufacturing metrics to track. In the brooder vision sustainability also depends on the performance of the industry. Customer satisfaction is commonly recognized as pivotal in the survival of industry in spite of competition from others. Customer satisfaction models are based on the assumption that attribute-level performance and overall satisfaction are linked in a linear and symmetric manner. For the manufacturing industry performance internal and external factors are also vital. Hence an attempt was made to discuss the success factors considered by the various manufacturing industries .

A philosophy for improvement is dependent on the type of change. When customers are vibrating and the supply-demand structure is dynamic, change is permanent.

Keywords: *Manufacturing, Key factors, Success factors, SME*

Introduction

In many countries, despite the significant support received from governments and other organizations, small businesses continue to face growth challenges, with the largest challenges being upgrading technology and issues with the management style, perspectives on management, and utilization of resources.

A large part of the operation of Indian SMEs is small scale production, which limits their ability to reduce costs.

The competitive standards are constantly changing due to consumer needs and expectations, technological developments, and globalization of markets. Over the years, SMEs have increased their competition dramatically.

SME survival is increasingly dependent on a number of factors, including their ability to refocus some of their strategies and technologies

Literature Review:

.1. Busacca, Bruno, and Giovanna Padula. "Understanding the relationship between attribute performance and overall satisfaction: Theory, measurement and implications." *Marketing Intelligence & Planning* (2005).

Authors focussed on micro vision such as on time delivery. work orders. scheduling related to to manufacturing and distribution, cycle time, capacity utilisation, scrap and others are elaborated.

Based on statistics results in intervention of human related aspects such as entrepreneurial aspects, innovativeness. Competency, sustainability in alignment with individuals as well as the firm.

2.Goswami, Priti, and Ashish Gupta. "small scale industries and factors affecting their performance in indian context: a literature reviw,

This paper discusses with respect to Indian industry factors considering internal and external factors

3. Nwosu, M. C., G. O. Ikwu, and A. C. Uzorh. "Investigation of some factors affecting manufacturing workers performance in industries in Anambra State of Nigeria."

The authors defined dependent and independent variable of manufacturing industries Anambra State of Nigeria

After a careful study of the activities, functions, and programmes of three selected plastics industries, concludes a relationship between the performance of production

workers and the six predictors. predicts are achieved using a regression model. If further improved and applied, the model will aid in addressing the issues that arise as a result of those factors' effects on worker performance.

4 Sitharam, Sharmilee, and Muhammad Hoque. "Factors affecting the performance of small and medium enterprises in KwaZulu-Natal, South Africa

The current study emphasized several internal environment factors, such as technological capabilities, managerial competence and skills, and access to finance, which have been discovered to affect SMEs in The Republic of South Africa

The external factors discussed are regulatory factors, and macroeconomic factors, such as

Competition, globalization, and crime and corruption were identified as major challenges for South African SMEs. The Republic of South Africa.The performance of SMEs in comparison to the previous year and competition.

6.Busacca, Bruno, and Giovanna Padula. "Understanding the relationship between attribute performance and overall satisfaction: Theory, measurement and implications." *Marketing Intelligence & Planning* (2005).

Busacca et al discussed about Understanding the relationship between attribute performance and overall satisfaction.it better to establish and examine the asymmetric and non-linear relationship between attribute output and overall satisfaction. This paper emphasis of customer satisfaction kano model ,satisfieng and dissatisfaction attributes .they incorporated regression analysis for the research .

7.Digalwar, Abhijeet K., And Bhimaraya A. Metri. "Performance measurement framework for world class manufacturing

The purpose of this paper is to develop a statistically reliable and valid model of GM PMs for benchmarking. First and foremost, 93 variables/indictors for GM (green manufacturing)have been identified through a review of the literature and discussions with practitioners. These indicators pertain to the organization's strategic, tactical, and operational issues.

8.Sangwan, Kuldip Singh, and Kailash Choudhary. "Benchmarking manufacturing industries based on green practices." *Benchmarking*.

9.Kumar, Ravinder, and Rajesh Kumar Singh. "Coordination and responsiveness issues in SME supply chains: a review." *Benchmarking: An International Journal* (2017).

In this study, the authors attempted to review the literature on issues related to the coordination and responsiveness of SME supply chains (as depicted in Figure 4) in a globalised market. A total of 116 research papers have been reviewed in this regard. Most studies have found that researchers have focused on a single issue, such as quality management, technology management, competitive priorities, leadership issues, and constraints and challenges, in isolation.

10.Mokhber, Mozhdeh, et al. "Succession planning and family business performance in SMEs." *Journal of Management Development* (2017).

John J, et al [2] discussed key factors for growth and tools for growth. these tools include 1) group interviews, 2) questionnaires, 3) positioning, 4) creativity checklists, 5) conception diagrams, 6) conjoint analysis, and 7) quality tables

They emphasize on successful models foe QFD which involves organization structure, data source, QFD tools and technics, product improvement and process s improvement s along with control variable.

Sharma, J. R., and A. M. Rawani[3]

As a result, the design can be more quantitative, and the customer's voice is used in the study. The research proposes a new step-by-step procedure. designers and developers with an empirical and graphical model

Engineers to assess how businesses make decisions, Thus allowing the design to be more quantitative and brings voice of the

customer in the analysis. The study suggests a new step-by-step analytical cum graphical model to assist designers and engineers to evaluate companies decision-making

Fiorenzo Franceschini & Domenico Maisano.

11.Abor, Joshua, and Peter Quartey. "Issues in SME development in Ghana and South Africa."

Authors discussed various situations of SMEs and examined their characteristics, contributions to economic development, and constraints to their development. Further .Rural and urban SMEs can be subdivided into organized and unorganized enterprises, respectively.SMEs in Ghana and South Africa have been selected

12.Subrahmanya, M. H., M. K. K. N. Mathirajan, and K. N. Krishnaswamy. *Importance of technological innovation for SME growth: Evidence from India*.

Researchers have assessed the factors that drive SMEs to innovate in the auto, electronics, and machine tool industries in Bangalore. They have also examined the differences between the growth rates of innovative SMEs and those of older ones.

Conclusion

This paper has reviewed various parameters of SMEs and also discussed the characteristics, contributions of SMEs and the constraints to SME development in few countries, In reviewing SMEs, it was concluded that there is no single, universal, uniformly acceptable SME working conditions. Several measures or indicators have been used to define the existence of SME sector. The most commonly used is the nature of the enterprise, economic conditions and sustainability.

Reference

1. F. Gomes, Carlos & Yasin, Mahmoud & Lisboa, João. (2006). Key performance factors of manufacturing effective performance: The impact of customers and employees. The TQM Magazine. 18. 323-340. 10.1108/09544780610671011.
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3. S. N. Siddique and, S.K.Ganguly, (2019), "Critical Success Factors for Manufacturing Industries in India: A Case Study Analysis, International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 8,pp. 1898-1905
4. Marcelo Battesini, Carla Schwengber ten Caten, Diego Augusto de Jesus Pacheco, "Key factors for operational performance in manufacturing systems: Conceptual model, systematic literature review and implications, Journal of Manufacturing Systems", Volume 60, Pages 265-282, https://doi.org/10.1016/j.jmsy.2021.06.005.

ROLE OF WOMEN ENTREPRENEURSHIP IN EMPLOYMENT GENERATION- A DEVELOPMENT APPROACH

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ABSTRACT

All over the world, Women Entrepreneurs provide vast opportunities by setting various Micro, Small and Medium Enterprises and various other business in national, international for uplifting the living standard of people. Over the last few years, the scenario has changed and the women have come to the forefront as not only memorable but also as inspirational women entrepreneurs globally. Women Entrepreneurship as such is not bound by the class, religion, community, gender or age and hence any women can start a business in today world.

Entrepreneurship is a best way for advancing the lives of women around the world. Global Women Entrepreneurship is those entrepreneurs who operate in a global level and also business worldwide. Global Women Entrepreneurship plays major important role in businesses in recent days and multinational corporations to assess their innovative and leadership skills. It is very important for the women entrepreneurs to understand the global nature of the business and the environment they are functioning in order to be successful in the entrepreneurship field and for the development of the world.

Being a Women entrepreneur is the major advantageous as it can provide may ways to enter the corporate know how and can get various contacts that are expertise which is available in various other countries. Different countries have their own set of ideas for their business products and marketing hence Women can enter the field of entrepreneurship globally, a women Entrepreneur who can enter the international lands to operate their business. This gives them an immense opportunity to have a good reputation in all the markets by the Women Entrepreneurs who operate their business globally. International Business gives a good opportunity for the women entrepreneurs to learn the systems, tactics, and also strategies of the foreign markets.

The study was undertaken by using secondary data. Secondary data on topics was sourced from various research articles, Global Entrepreneurship Monitor report, Power the economy with her report, survey reports and books. This study attempts to explain the role of Women entrepreneur's in employment generation and contribution for the development of economy in world wide.

Keywords: *Role, Women Entrepreneurship, Employment Generation, Development Approach*

Introduction

Entrepreneurship defined as new business which creates self employment and also new business organization or existing business is been diversified by an individual, a team of individuals. Entrepreneurship is the new business opportunities by willingness. It is an essential driver of social health, wealth and also for economic growth. It promotes the new idea and innovation required to explore new opportunities, promote productivity and which in turn create employment opportunities for the people who are in need. Presently many of the government and non government organization in the world are looking towards entrepreneurship because it is a key segment of the solution to ending the poverty, social inequity, providing opportunities to women entrepreneurship in developing economy and also contribution to the economic development.

The new generation of entrepreneurs has become inspirational to the society. Some countries have more entrepreneurs who are into their own family business and also very much associated with their social, culture and the nature of business. These types of family tradition business who are continuing are more than eight out of 10 in Poland and India, But less than in 10 in the countries like United Kingdom or Republic of Korea (Global Entrepreneurship Monitor Report 2019)

In General , as per 2019 Global Entrepreneurship Monitor research, men tend to be more financially strong, motivated their objectives and also more likely to be the ones continuing the family business compare to the women. An interesting finding in the entrepreneurship, that women are more purpose- driven than men.

Hence entrepreneurship is an important path for lifting women out of poverty and earning a living because jobs are scarce is an important motivation and for their standard of living. Entrepreneurs need to be able to grab the present opportunity. They must also explore their skills, talent, knowledge and experience to new business. opportunity perceptions for starting a business in the local area has been decreased compared earlier years especially in 2019 in most Europe and North America economies. It was likely due to pandemic perceptions to decrease.

However more than 80% of the adult population in Indonesia, India, Oman and Saudi Arabia Perceived good opportunities to start a business in order increase their reputation and increase their standard of living. This is a strong indicator of the entrepreneurial outlook and mindset for the development of the individual and economy.

Women entrepreneurs can generate transformational employment in India which generate more than 150 million jobs which is required for the entire working age population by 2030. According to Joint report by Bain & Company and Google titled "Women Entrepreneurship in India – Powering the economy with her". The report mentioned the need to accelerate efforts to grow women in the entrepreneurship field in India to solve employment challenges and poverty in the country. India women entrepreneur are contributing towards end poverty in all the forms everywhere, reduce inequality within and among the countries, providing employment opportunities to all without discrimination and also promote inclusively for the sustainable economic growth.

Global Entrepreneurship report found that the proportion of adults engaged in Total Early Stage Entrepreneurial Activity who agrees they have started their business to make a difference in the world ranges from less than two in 10 in some economies to more than seven out of 10 in South Africa, Guatemala, Panama and India. This report is a substantive evidence for the entrepreneurship activity and report shows an encouraging sign of a collective will for future entrepreneur business sustainability. More than eight out of 10 of those starting a new business in India, Iran, Qatar, Pakistan and Italy agree with the motive to build great income for the economic development of the country. These are the indicators that women entrepreneur can create wealth and women entrepreneur are the key driver for the wealth creation.

Review of Literature

Halabisky (2017) Entrepreneurship is pivotal to any economy that hopes to remain dynamic. Entrepreneurial ventures, when successful, help in the advent of technological, economic and socio-cultural environment of a society. They create employment opportunities and wealth by opening up new markets and services. New products and more efficient production processes in turn boost productivity and competition in stagnating economies, contributing to their growth and improved quality of life. For individual female entrepreneurs, it further contributes to greater economic freedom and improved agency .

Srivatsan Rajan (2019) India has 13.5–15.7 million women-owned enterprises, representing 20% of all enterprises. While large in absolute numbers, these are overwhelmingly comprised of single person enterprises, which provide direct employment for an estimated 22 to 27 million people. Further, a number of enterprises reported as women owned are not in fact controlled or run by women. A combination of financial and administrative reasons leads to women being "on paper" owners with little role to play. Benchmarks from high performing countries and Indian states provide a good yardstick for India to accelerate overall female entrepreneurship. Accelerating quantity and quality of entrepreneurship towards such benchmarks can create over 30 million

women-owned enterprises, of which 40% can be more than self-employment. This can generate potentially transformational employment in India, of 150–170 million jobs, which is more than 25% of the new jobs required for the entire working age population, from now until 2030.

Niels, Aileen, Maribel (2020) made a report on Global Entrepreneurship Monitor. As this report goes to press, entrepreneurship, defined as the process of starting and running a new business, is of primary importance. After all, in the aftermath of economic crises, entrepreneurial activity will drive economic recovery (as it did following the 2008 financial crisis). Indeed, it might be said that the world was still recovering from that crisis when along came COVID-19. In any case, individuals that are currently making the decision to start and/or to grow a business are ultimately creating jobs and incomes, adding value to society and strengthening economies. In other words, much as vaccination is the key to global health recovery, so too is women entrepreneurship the key to unlocking worldwide economic recovery.

Saipriya Salla (2020) in her article highlights about the Latest estimates from the Sixth Economic Census suggest that 13.8 percent of Indian establishments are owned by women, majority of which are microenterprises and self-financed. However, many of these women-led businesses are found in sectors like tourism, education, and beauty, which are also the ones most affected1 due to new physical distancing measures. Although we are still computing the actual economic losses, a recent survey conducted by us at the Aspen Network of Development Entrepreneurs (ANDE) shows that women-led businesses are twice as likely to consider shutting shop.

Shiney Chakraborty and Rhitabrita Mukherjee (2020) made a research on Women Entrepreneurship in India. In this paper explains that In India, as in other developing nations, nondiscriminatory social attitudes need to be fore grounded to encourage higher female participation in the labour force and growth of female-led enterprises. Quotas for female representation in state and national parliaments and even gram panchayats can help other women to gain confidence in their aspirations and economic prowess by standing up to economic biases.

Vidhya shah (2021) in her article" what India needs to do to boost women Entrepreneurship." Stakeholders across the ecosystem need to come together to transform the way women are perceived in society. Boosting women entrepreneurship cannot be achieved in silos, be it in the home where family plays an extremely pivotal role in the development of women, or with the initiatives of the government that prioritizes the agenda of empowerment. We must keep working tirelessly for all women across India, providing them with equal opportunities to make a living, develop a sense of self-worth, improve their financial and social standing, and assert their independence.

Statement of Problem

The above review of literature points to the fact that the studies are mainly related to the role of women entrepreneurship in employment generation, poverty alleviation and contributing to economic development. It focuses on the contribution of women entrepreneurship to GDP, employment, trends and growth of women entrepreneurs in different sector wise in India and also various opportunities provided by government of India for the women entrepreneur. The study has been undertaken to make an analysis of employability in women entrepreneurship which leads to contribution to the economic development in India.

Objectives of the Study

- To identify the status of women entrepreneur in India
- To study women entrepreneurs sector wise in India
- To study the initiatives and projects undertaken by the Government of India for women entrepreneurs
- To analyze the women entrepreneur contribution to the economic development in India.

Research Methodology

The study covers the role of women entrepreneurship in employment generation in India who are engaged in various types of business activities which includes small, medium, self employed women entrepreneur. Hence, for data collection women who are engaged in the women entrepreneur in India are considered. There are many women entrepreneurs who started business in India.

The study was undertaken by using secondary data. Secondary data on topics was sourced from various research articles, Global Entrepreneurship Monitor report, Power the economy with her report, survey reports and books. The data collected has been descriptively presented according to the objectives of the study

Status of women entrepreneur in India

Figure 1:

Status of Women's Employment in India from 2011–12 to 2018-19

Status of Employment	2011–12		2018–19	
	Men	Women	Men	Women
Self-employed	48.7	55.6	49.3	52.9
Own-account worker and Employer	37.3	19.6	41.3	22.2
Unpaid family helper	11.5	36	8.1	30.8
Regular wage/ salaried employee	21.2	13.4	26.1	22.9
Casual labour	30.3	31	24.6	24.2
Total	100	100	100	100

Source: Computed from NSS 68th round and PLFS (2018–19) unit level data on Employment and Unemployment.
Note: Age Group 15–59 years and usual status of employment is considered.

The Periodic Labour Force Survey indicates a lowest women's workforce participation rate in the world. In the year 2019 women's work force participation rate is 25%. The persistent decline in women's workforce participation rate has attracted many economists to for women and also industry related jobs for women. Later there was a shift from unpaid household works and also in the same year there was decline in domestic and allied activity which may be good sign for improvement of infrastructure. The proportion of self employed and casual labour reduced in the working age group (15 to 59 years) leading to an increase in the proportion of regular wage/ salaried workers.

Analysis :

The self employed classification shows that women are involved entrepreneurial activities. The proportion of male entrepreneur was more than women entrepreneur later the proportion of women entrepreneur was increased than male entrepreneur.

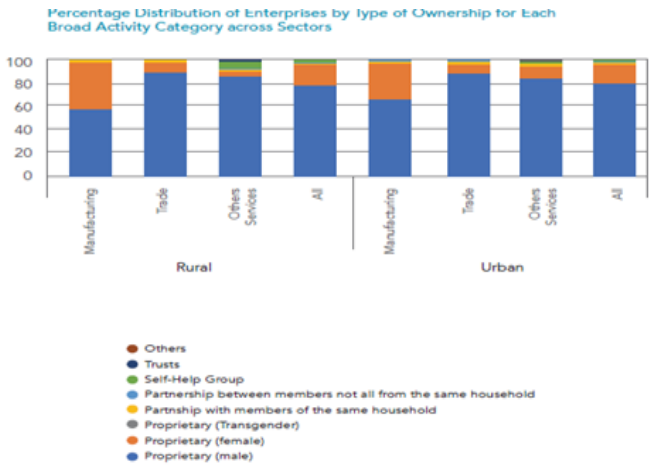
- A Research Organisations report (IWWAGE) shows, only seven of 100 entrepreneurs in India are women and of them nearly half (49.9%) get into business out of necessity rather than aspiration(November 2020)

- Nikore Associates, a policy and research group states, globally, female entrepreneurship] is a tool of empowerment since it helps the entrepreneur take decisions, lead, manage and develop skills in production and even personal leadership

- In the year 2011-12 the percentage of women engaged in entrepreneurial activities is 55.6 and in 2018-19 is 52.9 .There is a decrease in the percentage , is lack of access to finance (the first part) and the second part being, absence of support network, skewed social norms gender bias, reptapism and restricted mobility.

Women entrepreneurs different sector wise in India

Figure 2:



Analysis : Industry specific analysis of enterprises suggests some interesting findings from both the Economic Census and NSSO

surveys. According to the Economic Census, women entrepreneurs were mostly engaged in agriculture and related activities, and among the overall women-owned enterprises, almost one-third were found to be operational in agriculture. At the same time, there was a decline in women-run enterprises in the manufacturing sector from 34.9 per cent to 29.8 per cent between 2005 and 2013. But in the same period, there was an increase in women's entrepreneurship in other services sector from 2.9 per cent to 5.4 per cent, indicating the sectoral shifts for women entrepreneurs. Given the growth of the service sector and its momentous contribution to overall GDP and employment, it will not be an exaggeration to say that the service sector has immense potential to create employment opportunities. But it is already established that the informal nature of women-owned enterprises, along with their low level of operational capacity, will act as a deterrent for them not only to operate but also to grow their businesses.

A disaggregation by type of ownership across industries from the NSS 73rd round, which captures data from all unincorporated non-agricultural enterprises, shows that women's proprietary enterprises had a larger share in the manufacturing sector relative to trade and other services. Figure 2 shows that overall, the share of women's proprietary enterprises was 45 per cent in the manufacturing sector, while their share in trade and other services was 9 per cent and 7 per cent, respectively. Further, it is interesting to note that in the manufacturing sector, the share of women's proprietary enterprises was higher by 8 percentage points in rural areas compared to urban areas. It also matches with the overall finding of the NSS 68th round employment and unemployment schedule which suggested that over the period 1993–94 to 2011–12, the manufacturing sector recorded the highest increase in own-account employment among women in both rural and urban areas. It is also worthwhile to mention that the share of women's enterprises was smaller in other services sector relative to manufacturing and trade, and it was even lower in rural areas compared to urban areas.

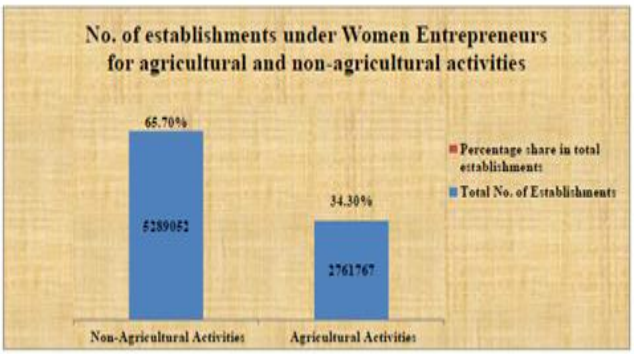
These unincorporated non-agricultural enterprises were mostly managed by household-based proprietary and partnership firms. They were dominantly informal enterprises as their nature of operation was seasonal depending on the availability of raw materials and the demand for the products/services they produced. Therefore, it is evident that in 2015–16, women not only had lower rates of entrepreneurial activity, but also, among other non-agricultural enterprises, they mostly ran small, own-account enterprises in the manufacturing industry. Women proprietors also face different structural barriers and social constraints in taking up any entrepreneurial activity, and, as a result, are mostly engaged in labour intensive and low-productive industries. (Bardasi, Sabarwal, & Terrell, 2011) explained that women choose smaller enterprises so that they can balance their unpaid domestic responsibilities at home, and also because they are averse to risk taking.

Broad Activity wise total number of Establishments under women entrepreneurship by type of establishment

Figure 3:

Broad Activity	Without Hired Workers	With at least One Hired Worker	Total	Percentage share in total establishments
01 - Activities relating to agriculture other than crop production & plantation	37294	15016	52310	0.65
02 - Livestock	2342134	204211	2546345	31.63
03 - Forestry and Logging	118365	6110	124475	1.55
04 - Fishing and aqua culture	33747	4890	38637	0.48
Sub-total : Agricultural Activities	**2531540**	**230227**	**2761767**	**34.3**
05 - Mining and quarrying	4009	3820	7829	0.1
06 - Manufacturing	2099355	300108	2399463	29.8
07 - Electricity, gas, steam and air conditioning supply	957	2366	3323	0.04
08 - Water supply, sewerage, waste management and remediation activities	5860	4284	10144	0.13
09 - Construction	33261	13764	47025	0.58
10- Whole sale trade, retail trade & repair of motor vehicles & motor cycles	14000	16237	30237	0.38
11 - Whole sale trade (not covered in item-10 above)	31581	17067	48648	0.6
12 - Retail trade (not covered in item-10 above)	1159414	272788	1432202	17.79
13 - Transportation and storage	88623	36084	124707	1.55
14 - Accommodation and Food service activities	148988	74107	223095	2.77
15 - Information & Communication	11142	8711	19853	0.25
16 - Financial and insurance activities	54578	21693	76271	0.95
17 - Real estate activities	41570	4484	46054	0.57
18 - Professional, scientific & technical activities	15080	15601	30681	0.38
19 - Administrative and support service activities	27018	18246	45264	0.56
20 - Education	113751	103723	217474	2.7
21 - Human health & social work activities	32407	42988	75395	0.94
22 - Arts entertainment, sports & amusement and recreation	9113	9439	18552	0.23
23 - Other service activities not elsewhere classified	275107	157728	432835	5.38
Sub-total : Non-Agricultural Activities	**4165814**	**1123238**	**5289052**	**65.7**
Total	**6697354**	**1353465**	**8050819**	**100.0**

Figure 4:



In agricultural sector majority of establishments i.e., 2.54 million establishments (92.20%) pertains to livestock, followed by forestry and logging (4.51%), agriculture other than crop production (1.89) and fisheries and aquaculture (1.4%).

In non-agricultural sector, about 2.4 million establishments (45.36%) were engaged in manufacturing activity. Other important activities were trading (28.57%), other services (8.18 %), accommodation and food services (4.22%) and education (4.1%).

Initiatives and projects undertaken by the government of India for women entrepreneur

Stand-Up India scheme	facilitates bank loans from INR 10 lakh to 1 crore to at least one woman per bank branch in the country to support entrepreneurship among women, SC and ST communities in enterprises in manufacturing, services and trade.
Trade Related Entrepreneurship Assistance and Development (TREAD) scheme	for women assists in the form of grants up to 30 per cent of total project cost, while the remaining 70 per cent is financed by a lending agency as a loan for undertaking activities as envisaged in an entrepreneurial venture. The grant is utilised for training, counselling and tie-ups for marketing, over and above capacity building for women.
Rashtriya Mahila Kosh	gives out multiple loans of up to INR 10 lakh under various schemes to help women from new and smaller organisations to 'start-up'.
Micro Units Development and Refinance Agency Limited (MUDRA)	Financial institution - for the purpose of refinancing small businesses, including start-ups, by providing funding to the informal, small business sector via loans in three categories based on the growth and development status of a business.
Women Entrepreneurship Platform (WEP) by NITI Aayog	accelerate female- led tech ventures by Zone Startups India to provide them with dedicated support. It helps aspiring women to connect with relevant people in their industry and fosters networking amongst female entrepreneurs themselves. The Platform also assists in fundraising, training entrepreneurs to pitch ideas, and connecting them with potential investors. The Atal Innovation Mission (AIM), also undertaken by NITI Aayog, helps promote the culture of innovation and entrepreneurship in different regions. Together, WEP and AIM are combining efforts to handhold entrepreneurs in their

	journey.
Startup India	has launched a nation-wide Women's Entrepreneurship Programme (WING) which organises both basic and advanced workshops for aspiring and existing innovators, respectively focusing on knowledge sharing and how to kick start entrepreneurial aspirations with capacity building for female entrepreneurs.

Women entrepreneur contribution to the economic development in India

Figure 5: Women-owned enterprises can generate over 50–60 million direct jobs by 2030

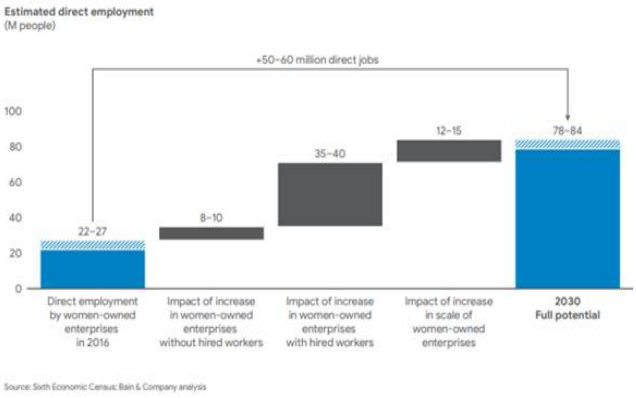


Figure 6: Direct plus indirect and induced employment impact of 150–170M jobs

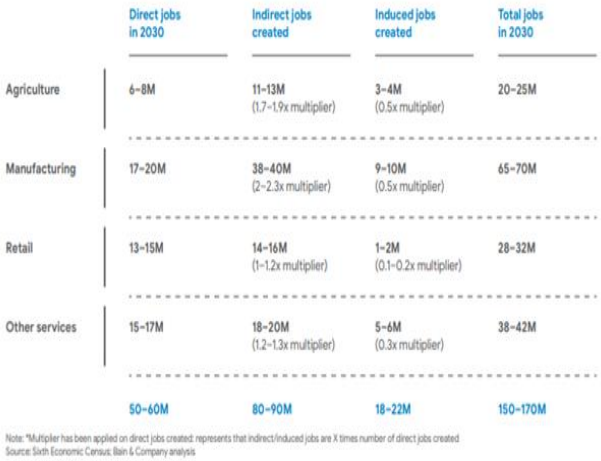
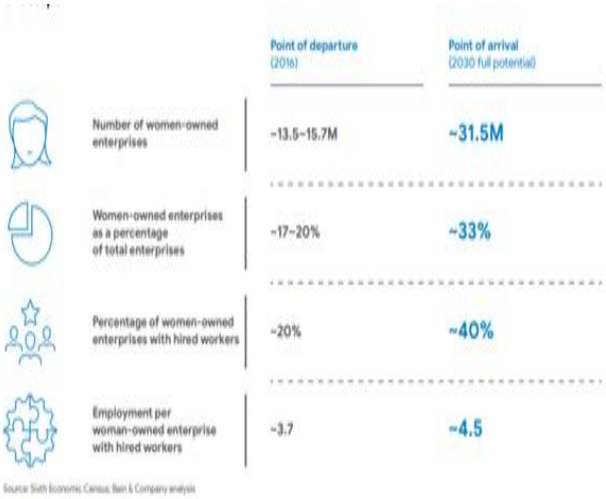


Figure 7: An acceleration today will bring about a full transformation of India's entrepreneurship landscape



This will put India at par with several emerging and advanced economies where more than 40% of all enterprises are women-owned. Further, the total employment will bridge nearly 25% of the jobs required to absorb the working-age population in 2030. Given the continued scarcity of work opportunities, entrepreneurship allows women to be self-sustaining, giving them greater flexibility and control vs. salaried employment while also creating jobs.

Analysis: women entrepreneur are described as survivalist as that manage domestic and professional life. There contribution to the economic development can be catoryzed as economic contribution and social contribution

Economic contribution: this directly contributes to the growth through capital formation, employment generation and increase in per capital income.

Social contribution: women entrepreneur contributes immensely to the societal growth through innovation, improvement in living standard and removal of regional disparity

Suggestions

The women entrepreneur in India posses high potential and with multi-pronged support can contribute a high percentage for the economic contribution. This can be through

- Enable aspiring sole entrepreneur and small business entrepreneur to upscale their businesses through financial support and training.
- Initiate mechanism for the identification of new enterprises
- Provide technical education to take up and sustain in the business

- Carry out research at intervals to have a follow up of women entrepreneur position and challenges.

Conclusion

Women Entrepreneurs should be motivated by non discriminating social attitudes and encourage higher female participation in the labour force. Positive change in female labour force participation needs to be more focused on demand side issues in all the sector wise in India by providing confidence in women. Government of India should increase the Quotes for women representation in the state and national parliaments which can help the women to gain confidence in their aspirations.

Entrepreneurship motivates the women for new business innovation and economic growth.

Entrepreneurship is one of the key sectors for driving the nation economy. It has become comprehensive of novel ideas. To promote and sustain women entrepreneurship, a substantial long term government support, extensive training, research and planning is required. Women entrepreneurship success leads to upliftment in society in term of economic growth and development of the economy.

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GROUNDWATER ARSENIC CONTAMINATION AND HUMAN HEALTH IN NORTH GUWAHATI CIRCLE, ASSAM, INDIA

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ABSTRACT

Arsenic in water is a vital problem in many countries around the world including India. In groundwater arsenic can be found through the dissolution of minerals and ores. Brahmaputra River that is originated from the Himalayas is arsenic contaminated. Arsenic can found in the groundwater of Brahmaputra valley in Assam because Assam valley is highly ferrous. The aim of this research paper is to investigate the level of arsenic contamination in groundwater and its health impact. Primary data have been collected and tested in Tezpur University laboratory to know the value of arsenic in groundwater. Many water samples were contaminated with arsenic. Arsenic affects a broad range of organs and system including skin, nervous system, respiration system, liver, kidney, immune system etc. Arsenic poisoning occurs due to the high level of arsenic in the body. Interpolation method has been use to show the spatial distribution pattern of groundwater arsenic contamination with the help of Arc GIS 10.2.1. North Guwahati circle has arsenic contaminated groundwater. Many rural people of the study area use arsenic contaminated drinking water.

Keywords: *Arsenic, Contamination, Groundwater and Distribution Pattern*

Introduction

Arsenic can be found in the groundwater of North Guwahati circle. Drinking water poses greatest threat to human health from arsenic. Groundwater is one of the safe and portable water of the world. In groundwater arsenic can be found through the dissolution of minerals and ores. Arsenic is naturally occurring chemical element that found in the earth crust with symbol As raised greatly concern from environment and health perspective. According to United States Environment Protection agency arsenic is a harmful substance and a group A- carcinogen. Arsenic is a group V heavy element which atomic number 33 and its atomic weight 74.9amu, specific gravity 5.73g/cm. Drinking water is one of the main source of arsenic. According to World Health Origination the limit of arsenic in drinking water is 10 million of a gram per liter (10µg/L) of water (WHO, 1996).

Arsenic occur in the environment in several oxidation states (-3, 0,+3 and +5) in both inorganic and organic forms. Trivalent arsenic can exist as arsenous oxide (As_2O_3), arsenious acid ($HAsO_2$), arsenite ($H_2AsO_3^-$, $HAsO_3^{2-}$, AsO_3^{3-}) ions, arsenic trichlloride ($AsCl_3$) and arsenite (AsH_3). In natural waters, arsenic is mostly found in inorganic form as oxyanions of trivalent arsenite As III or pentavalent arsenic As V. both As III and As V compounds are highly soluble in water. Bureau of Indian Standards (BIS) arsenic concentration in drinking water should not exceed 50 ppb. World Health Organization value for arsenic in drinking water is 10 ppb.

Objectives

Based on the background outlined above, the objectives for the paper are:

(i) to understand the level of arsenic contamination in groundwater of North Guwahati circle of Assam

(ii) to investigate the impact of arsenic on human health in the study area.

Methodology

For spatial distribution pattern of arsenic contamination groundwater samples have been collected from different sources like private and public tube wells from different areas of North Guwahati circle. The amount of arsenic present in the water has been analyzed by using arsenic test kit. Interpolation method has been used to show the vertical distribution of groundwater arsenic contamination in the study area. Primary data regarding impact of arsenic on human health has been collected with the help of field surveys through well design schedule.

Study Area

North Guwahati circle has been selected for the study of vertical distribution of groundwater arsenic contamination. North Guwahati circle is located in Assam between $26^0 9^/$ and $26^0 20^/$ North latitude and $91^0 435^/$ and $91^0 52^/$ East longitude.

Result and Discussion

Spatial distribution pattern of Groundwater arsenic contamination in North Guwahati Circle of Kamrup, Assam

Following figure will show level of arsenic in different tube well samples (Figure 1).

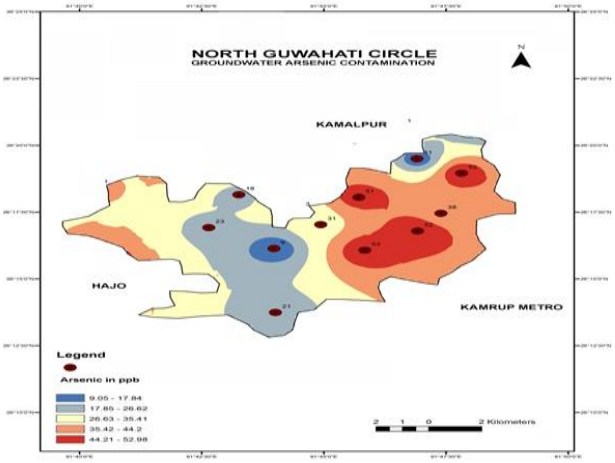

Figure 1: Spatial distribution of groundwater arsenic contamination in North Guwahati circle

Level of groundwater arsenic contamination

Level of groundwater arsenic contamination in the study area has been prepared with the help of tube well samples. Many areas of the study region have arsenic contamination in groundwater more than 10 ppb which is WHO maximum limit.

Table 1: Groundwater arsenic contamination in North Guwahati circle, Kamrup

Serial No.	Groundwater Arsenic in ppb	Area in sq km	Percentage
1	9.5-17.89	06	6.59
2	17.85-26.62	21	23.07
3	26.63-35.41	25	27.47
4	35.42-44.22	27	29.68
5	44.23-52.98	12	13.19
Total		91	100

Source: Primary survey, 2021

North Guwahati is a Tehsil or circle in Kamrup district of Assam. According to census 2011 total area of North Guwahati is 91 sq km. North Guwahati has a population of 48,227 peoples. There are 10,564 houses in that area. There are 234 villages in that area. About 11 tube well samples have been collected and tested from North Guwahati circle to analyze the groundwater arsenic contamination on that area. Out of the total geographical area 6 sq km area (6.59 per cent) has groundwater arsenic contamination less that 17.89 ppb. About 21 sq km area (23.07 per cent) has groundwater arsenic contamination between 17.85-26.62 ppb. Groundwater arsenic contamination between 26.63-35.41 ppb can found in 25 sq km area (27.47 per cent). In the study area 27sq km area (29.68 per cent) has arsenic contamination in groundwater between 35.42-44.22 ppb. Groundwater arsenic above 44.23 ppb can found in 12 sq km area (13.19 per cent).

Impact of arsenic contamination water on human health

Spatial distribution pattern of groundwater arsenic contamination in North Guwahati Tehsil or Circle have already prepared on the basis of tube well water sample. In North Guwahati circle eleven villages have arsenic level more than 50 ppb which is BIS maximum limit for drinking water.

Health effect of arsenic in North Guwahati Tehsil or Circle

Epidemiological household survey has been conducted to study the effect of arsenic on human health in North Guwahati circle. Eleven arsenic effected villages have been selected for the study and all villages have arsenic contaminated groundwater more than 50 ppb. Table 2 will show incidence of arsenic related disease in the study area.

Table 2: Incidence of arsenic related disease in North Guwahati

Sl. No.	Village	Respiratory Disease	Skin Disease	Cancer	Nervous System Disease	Heart Disease	Number of Effected people
1	Manik Nagar	02(28.57)	01(14.29)	02(28.57)	02(28.57)	00(00.00)	07(100)
2	Satgaon	05(31.25)	02(12.50)	03(18.75)	03(18.75)	03(18.75)	16(100)
3	Satgaon grant	01(16.67)	01(16.67)	00(00.00)	02(33.33)	02(33.33)	06(100)
4	Bar Nizara	05(41.67)	03(25.00)	01(8.33)	03(25.00)	00(00)	12(100)
5	Uttar Lenga	06(46.16)	02(15.38)	02(15.38)	01(7.70)	02(15.38)	13(100)
6	Dirgheswari	07(38.89)	05(27.78)	03(16.67)	02(11.11)	01(5.55)	18(100)
7	Fulung	01(9.09)	03(27.27)	02(18.18)	04(36.37))	01(9.09)	11(100)
8	Uttar Fulung	03(42.85)	02(28.57)	01(14.29)	01(14.29)	00(00)	07(100)
9	Dakshin Fulung	06(40.00)	02(13.33)	03(20.00)	03(20.00)	01(6.67)	15(100)
10	Rangmahal	01(20.00)	01(20.00)	03(60.00)	00(00.00)	00(00)	05(100)
11	Bamunigaon	01(25.00)	02(50.00)	00(00)	01(25.00)	00(00)	04(100)
	Total	38(33.34)	24(21.06)	20(17.54)	22(19.29)	10(8.77)	114(100)

Source: Primary survey, 2021(Figures in the parentheses indicate the percentage to the total number of effected people)

About 114 arsenic effected patients found in North Guwahati circle because the area has high levels of arsenic contamination in groundwater. Chronic arsenic exposure has been associated with a variety of respiratory symptoms such as chronic cough and shortness of breath, as well as the development of non-malignant respiratory diseases such as bronchiectasis and chronic and chronic obstructive pulmonary disease (COPD) in North Guwahati circle. In addition to skin cancer, long-term exposure to arsenic may also cause cancers of the bladder and lungs. Arsenic exposure leads to both central and peripheral nervous system impairments and also causes depression.

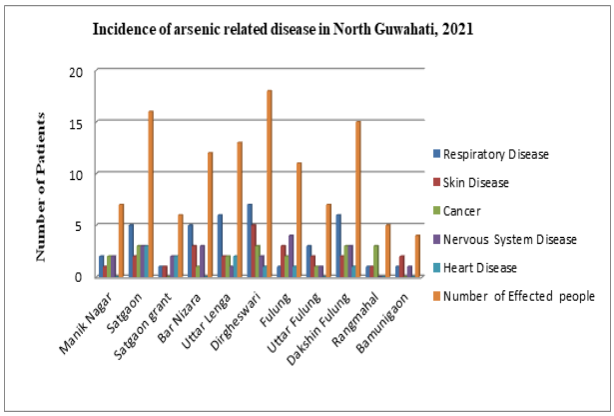

Figure 2: Incidence of arsenic related disease in North Guwahati, 2021

In North Guwahati circle 38 persons (33.34 per cent) have respiratory disease due to arsenic poisoning. About 24 individuals (21.06 per cent) have skin disease due to use of arsenic contamination water. Number of cancer patients due to arsenic poisoning in the study area is 20 (17.54 per cent). About 22 persons (19.29 per cent) have nervous system disease in the study area. About 10 patients (8.77 per cent) have heart disease in the study villages. All these are arsenic related disease patients present in the study area. In Manik Nagar village 2 persons have respiratory disease, 1 person has skin disease and 2 persons have cancer disease due to arsenic poisoning. Satgaon village have 16 arsenic patients. Among all arsenic patients 5 persons have respiratory disease, 2 persons have skin disease, three patients have cancer and three persons have nervous system disease. All these diseases are related to arsenic poisoning. In Satgaon Grant village 1 person has respiratory problem, one person has skin disease, 2 persons have heart disease and two people have nervous system disease due to arsenic poisoning. In Bar Nizara village 5 persons have respiratory disease, 3 persons have skin disease, one person has cancer and 3 patients have nervous system disease. In Uttar Lenga village 13 persons have arsenic related

diseases. Fulung, Uttar Fulung and Dakshin Fulung villages have 33 arsenic effected persons. In Rangmahal village 5 persons have arsen related disease and in Bamunigaon village 4 persons have arsenic related diseases. Most patients have respiratory disease due to use of high level arsenic contaminated drinking water All above mention disease are related to arsenic poisoning in the study area because groundwater arsenic level in very high.

Health status observed during epidemiological household survey

Health profile of the arsenic effected persons has been studied during epidemiological household survey. BMI index have been calculated to know about the nutrition of the arsenic effected person. Blood pressure monitor have been used to check BP of the arsenic effected persons. Oxygen level of the patient has been checked with the help of pulse oximeter to know about respiratory disease. Body Mass Index (BMI) is calculated with the help of height and weight of the person. Elevated blood pressure is one of the most significant symptoms of arsenic poisoning. Measurement of oxygen level is important to know about respiratory disease. Low oxygen level can found in persons which have respiratory arsenic related disease. Following table will show health profile of the arsenic effected persons in North Guwahati Circle.

Table 3 : Health profile of the arsenic effected persons in North Guwahati Circle

Village	Number of people Effected	No of Effected People with Normal BMI	No of Effected People with high/low BMI	No of People with Normal BP	No of People With high Or low BP	No of People With normal oxygen Level	No of People With low Oxygen Level in Per cent
Manik Nagar	07(100)	03(42.85)	04(57.15)	02(28.57)	05(71.43)	05(71.43)	02(28.57)
Satgaon	16(100)	06(37.50)	10(62.50)	05(31.25)	11(68.75)	12(75.00)	04(25.00)
Satgaon grant	06(100)	02(33.33)	04(66.67)	04(66.66)	02(33.34)	04(66.66)	02(33.34)
Bar Nizara	12(100)	04(33.33)	08(66.67)	05(41.66)	07(58.34)	10(83.33)	02(16.67)
Uttar Lenga	13(100)	05(38.46)	08(61.54))	06(46.15)	07(53.85)	08(61.54)	05(38.46)
Dirgheswari	18(100)	07(38.88)	11(61.12)	10(55.55)	08(44.45)	10(55.55)	08(44.45)
Fulung	11(100)	02(18.18)	09(81.82)	03(27.27)	08(72.73)	08(72.73)	03(27.27)
Uttar Fulung	07(100)	02(28.57)	05(71.43)	01(14.28)	06(85.72)	07(100)	00(00)
Dakshin Fulung	15(100)	05(33.33)	10(66.67)	05(33.33)	10(66.67)	11(73.33)	04(26.67)
Rangmahal	05(100)	02(40.00)	03(60.00)	00(00)	05(100)	05(100)	00(00)
Bamunigaon	04(100)	03(75.00)	01(25.00)	01(25.00)	03(75.00)	04(100)	00(00)
Total	114(100)	41(35.96)	73(64.04)	32(28.07)	82(71.93)	84(73.68)	30(26.32)

Source: Primary survey in North Guwahati Circle, 2021 (Figures in the parentheses indicate the percentage to the total number of effected people)

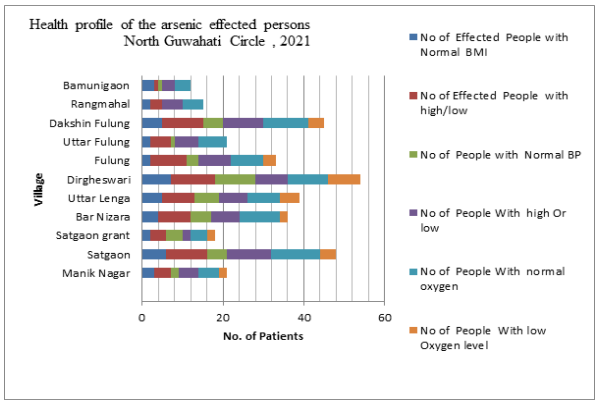

Figure 3: Health profile of arsenic effected persons of North Guwahati Circle, 2021

Health profile of the arsenic effected persons in North Guwahati Circle has been studied to know the relation between arsenic related disease and health parameters. About 114 patients have been surveyed during epidemiological household survey. Out of 114 patients 41 patients (35.96 per cent) people have normal BMI index and another 73

persons (64.04 per cent) patients have high or low BMI. Majority of the patients have high and low BMI and they have arsenic related disease due to use of arsenic contaminated drinking water. About 32 patients (28.07 per cent) normal BP level while another 73 persons (64.04 per cent) have high or low BP. Arsenic related disease patients have always low or high blood pressure. Out of all patients 84 patients (73.63 per cent) have normal oxygen level but 30 persons (26.32 per cent) have low oxygen level. Patients with respiratory disease have low oxygen level in their body. Normal oxygen level is usually 95% or higher. Pulse oximeter measures how much oxygen is in someone's body. Oxygen level is considered as important sign for respiratory disease. People who have lung or heart disease due to arsenic poisoning have always low oxygen level in their boldy. Many research carried out on people showing features of Arsenicosis due to drinking arsenic contaminated water provide evidence that arsenic is a potent respiratory toxicant. Expose to arsenic has been identified as a risk factor for elevated blood pressure and cardiovascular disease. BP was positively related with arsenic exposure.

In Nort Guwahati Circle or Tehsil 106 persons were died due to arsenic related disease. Among all 106 persons 46 persons (43.40 per cent) were died in cancer. Another 40 persons (37.73 per cent) were died in heart disease and only 20 persons (18.87 per cent) were died in other arsenic related disease such as nervous system disease. In the study area cancer of respiratory system, cancer of bladder and kidney cancer were the main cause of death of the people.

Disease burden of North Guwahati Tehsil or Circle has been calculated using Disease Burden formula. According to 2011 census North Guwahati Circle has population of 9,217 persons. Among all population 114 persons were identified as arsenic patients. Number of persons examined in North Guwahati Tehsil was 572 persons.

$$\text{Disease Burden (D.B)} = \sum_{i=1}^{17} Ni.Pi$$

Pi=Ri/ni

Ni= Total population of the circle

Ri= Number of patients identified in the circle

Ni= Number of persons examined in the circle

In

North Guwahati circle,

Ni=9217

Ri=114

Ni=572

$$D.B.= \sum_{i=1}^{17} 1836$$

$$= (17-1+1)\ (1836)$$

$$= 31228$$

Disease Burden in North Guwahati Circle is 31228. There is a strong correlation between poverty and arsenic disease in the study area. Arsenic related disease is more among the poor because they use arsenic contaminated drinking water. Majority of the victims are considered to be burden to their family and society.

Conclusion

Arsenic poisoning can occur due to arsenic contamination in dringking water. Groundwater arsenic levels is different in different places. In study area tube well depth are different in different region. In some areas of Kamrup district tube wells depth is very shallow and in another area tube well depth is very deep up to 120 meters below ground level. In the study area groundwater is contaminated with arsenic and other organic matter. The area under arsenic concentration is also changes with time. With the passage of time arsenic contamination area also increases due to pressure in the groundwater. As a result of this incident of arsenic contaminated diseases also increases. More number of people are now affected with arsenic contaminated diseases in the study area. So it is very important to study temporal change in arsenic engulfed area and incident of arsenic contaminated diseases.

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A NOVEL LEARNING VECTOR QUANTIZATION WITH HAMMING DISTANCE MEASURE FOR EFFECTIVE PREDICTION OF FAKE NEWS

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ABSTRACT

The main aim of the study is to improve the prediction rate in fake news detection. A novel Learning Vector Quantization (LVQ) with hamming distance is proposed for effective prediction of fake news. The sample size is calculated as N=10 for multigroup analysis using the G-Power calculator. ISOT dataset is used for the study and the proposed learning vector quantization algorithm is executed and compared with three existing algorithms: Passive Aggressive classifier, LSTM and LS-SVM algorithm. The obtained results are evaluated and statistically compared and proved that the proposed algorithm is significantly better than other algorithms with p<=0.005. As the result demonstrates that the novel Learning Vector Quantization algorithm is proved to be a better choice in prediction of fake news with 93.54% of precision rate.

Keywords: *Novel Learning Vector Quantization (LVQ), Fake news prediction, Passive Aggressive classifier, LSTM, LS-SVM.*

1. Introduction

False news involves intentionally distorting information to mislead readers. In order to detect information of this kind in news content, incorporating additional data, such as social engagement on social media, to help with the detection. The auxiliary information produced by fake news is also challenging to exploit on its own since the data is noisy, incomplete, and unstructured as a result of users' engagement with the stories. False news can negatively affect individuals and society. When it breaks the balance between truth and authenticity, it disrupts the news ecosystem. In the 2016 presidential election, fake news spread more rapidly and wider than credible mainstream news on Facebook. Fake news secondly aims to persuade consumers to believe inaccurate, biased information. It is often misled by politicians to further their political agendas. ("Detection of FAKE NEWS on SOCIAL MEDIA Using CLASSIFICATION Data Mining Techniques" 2019) A machine learning ensemble model based on the Decision Tree (DT) classifier, the Random Forest (RF) algorithm, and the Extra Tree (ET) algorithm is used to further classify the extracted features. As a result of this paper, we have been able to identify the most important features of fake news classification using feature extraction. Ensemble models were selected to optimize classification accuracy. The ensemble classifier trained more quickly. (Cristianini, Shawe-Taylor, and Department of Computer Science Royal Holloway John Shawe-Taylor 2000) Authors of the article used computer models for analyzing the verification of news extracted from Twitter are considered for the expository demonstrations for fake news recognition. The deep learning-based model that identifies fake news is derived from the supervised models. Using basic algorithms, the study showed that even on such an important issue as the spread of fake news worldwide, even the simplest algorithms could find a decent outcome. As a consequence, the results of this study prove even more, that systems like these might come very handy and be effectively used to deal with this critical issue. Based on well-known Twitter strings, we present an algorithm for identifying fake news. By expanding their own credibility decisions, such a model could be very valuable for a large number of social media users. (Li et al. 2021) Our research used a tree-based Ensemble Machine Learning framework (Gradient Boosting) for discovering fake news by combining content and context-based features. Recent research has derived gradient descent algorithms for adaptive boosting methods. A single objective function is optimized, which is the rationale for key elements in the methods. To classify data,

various machine learning models are applied using a multi-class dataset (FNC). Based on experimental results, the ensemble framework is more effective than existing benchmarks. For multi-class classification of fake news having four classes, we achieved an accuracy of 86% using the Gradient Boosting algorithm, an ensemble machine learning framework. (Kaliyar, Goswami, and Narang 2019) It demonstrates how fake news can be detected and categorized. Support Vector Machines were used to aggregate news, and then compare these proposed outcomes to establish whether the news was real or pure fabrication. Using the proposed model, the results are accurate up to 93.6%. (IEEE Staff, 2021) There is a tendency that conventional methods are harder to evaluate and test especially in complex environments where many factors interrelate connections and transactions. Also they might make restrictive assumptions about certain cases which limit their applicability. (Sharma et al. 2019) The main aim of this study is to propose an efficient neural network model for effective prediction of fake news.

2. Materials and Methods

A linguistic-based approach is proposed to identify textual features. This was achieved by extracting textual features. Various machine learning models were explored as an effective method of predicting fake news. The phases include preprocessing of the data, selecting features, selecting a new model, tuning hyperparameters, and training of the model. For the proposed approach, ISOT datasets that were common among fake news datasets were identified and analyzed. Preprocessing was required to remove noise from datasets. Tokenizing is done after preprocessing is completed to reduce the text into small words or lines.

In this research, the main objective is to extract the features from text and then use these features for fake news detection instead of text. After extracting the features, the model is then trained by state-of-the-art machine learning algorithms like the Learning Vector Quantization, the Aggressive classifier, LSTM, and LS-SVM. Our proposed model is evaluated using a variety of evaluation metrics.

2.1. Dataset

University of Victoria created the ISOT dataset (Ahmed, Traore, and Saad 2017) (Hakak et al. 2021). It contains 23,481 fake news articles and 21,417 true news articles. The source of news articles derived from reliable sources, such as Reuters, and the source of fake news articles, such as wikipedia and politifact.

2.2. Methodologies

The pre-processing of datasets is carried out with the following steps.

First step is tokenization. It is the process of splitting the string into the list of tokens (Asghar et al. 2021). Then, the stop words are removed from the text after tokenizing it. When used as features in text classification, stop words create noise as they are insignificant words in the language. The common words are removed such as a, about, an, are, as, at, be, by, for, from, how, in, is, of, on, or, that, the, these, this, too, was, what, when, where, who, will, and so on. Then Streaming is applied to reduce the words to its root. And the feature extraction is applied to extract more relevant features. Hence, we selected less but effective features to improve the performance.

2.3. Algorithms

2.3.1. Proposed Learning Vector Quantization (LVQ)

LVQ is an AI based neural network algorithm that uses distance measures to find the closest neuron, here in this algorithm hamming distance is used instead of Euclidean Distance. The Proposed Algorithm consists of three major steps.

Input

Number of neurons, weights for each neuron, and the corresponding labels.

Algorithm Steps

Step 1: For each input find the closest neuron (using hamming distance algorithm)

Step 2: Update the respective weights for the neurons.

Step 3: Label each neuron with the corresponding weights.

Step 4: Train the neural network' until it gets the optimized result.

Step 5: Evaluate the trained model.

Passive Aggressive classifier: (Manwani and Chandra 2020)

Most large-scale learning algorithms use passive-aggressive techniques. Machine learning algorithms that can learn online receive data sequentially, and update the machine learning model step-by-step instead of batch learning that uses the entire training dataset all at once. As passive-aggressive algorithms don't require a learning rate, they are somewhat similar to Perceptron models. Regularizers are incorporated into these algorithms.

It consists of two steps: If the prediction is correct, then step 1 is passive, which means you don't need to change the model. The second step is to be aggressive, i.e. to change the model if the forecast is incorrect.

LSTM (Long Short-Term Memory): (Nelson, Pereira, and de Oliveira 2017)

Time-series models with LSTMs are incredibly powerful. LSTMs are capable of predicting arbitrary future events. ("Long Short-Term Memory", n.d.) An LSTM module (or cell) contains 5 essential components that allow it to model both long-term and short-term data. State of the cell (CT). The state of the cell stores both short term and long-term memories HT (Hidden state) - It manipulates previous hidden state, and current cell input to make the next prediction, the hidden state can retrieve either the short-term or long-term memory stored in the cell state. The input gate (it) determines how much information from the current input flows into the cell's state. A forget gate (ft) determines how much information is published from the current input into the current cell state. Depending on the cell state, the output gate might decide how much information will be fetched from the hidden state, such that the LSTM can only access long-term memories or short-term memories and long-term memories if necessary (Bahad, Saxena, and Kamal 2019).

LS-SVM (Least squares support vector machines): (Xiang and Jiang 2009)

A set of support vector machines, including least squares versions of these machines (LS-SVM)

Methods for classifying and predicting data and patterns, such as supervised learning. As opposed to the convex quadratic programming (QP) problem for classical SVMs, this version relies on solving a set of linear equations to find the solution (Suykens et al., 2002).

A typical algorithm step involves selecting the proper inputs and layers, and covering the minimum and maximum range for displacement. Repeat until results are optimized. The model is then tested.

3. Experimental Setup

These specifications are incorporated into the entire process of conducting and evaluating experiments. New notebook creation. GPU is enabled using the menu Edit with Notebook settings as Hardware accelerator. Then Mount the development folder via the snippet, and Specific codes are to be written. The notebook is to be run with the mount-snippet. GPU specifications as Tesla K80 with 12GB VRAM, Intel Xeon Processor with two cores 2.20 GHz and 13 GB RAM. SPSS statistical tool is used for conducting ANOVA t-test with specifications of Processor with 2GHz and 4 GB RAM in windows 10.

4. Results and Discussion

The experiments are carried out for prediction of fake news using four various algorithms and the corresponding results are shown. Table 1 shows the classification report for the proposed learning vector quantization algorithm. It shows the precision as 93% and 90% for fake news and true news respectively, similarly the recall value as 92% and 91% as well, while f1-score as 93 % and 91 % respectively and support value.

Table 2 shows the comparison of precision rate obtained by four algorithms for fake news prediction. The number of samples considered for the experiment is N=10 , therefore n number test are conducted for each algorithms and the corresponding results proves that the proposed Learning Vector Quantization algorithm obtains highest precision rate of 93.54, while LS-SVM algorithm obtains 73.25

and Passive Aggressive classifier obtains 72.15. Whereas LSTM algorithm obtains the least precision rate of 58.81.

The proposed learning vector quantization algorithm, the passive accumulation classifier, the LS-SVM algorithm, and the LSTM algorithm are tested for statistical differences between their means by means of an ANOVA t-Test. By applying the Bonferroni correction, we limit the likelihood that a significant result will be obtained when testing multiple hypotheses.

Table 3 shows the significance of the four groups and it demonstrates that the significance of the proposed Learning Vector Quantization algorithm has better performance with the significance rate of .000 which is lesser than $P<0.05$.

Table 4 represents the results of Bonferroni comparison for four groups based on precision rate obtained for each sample. It also proves that the performance of the proposed model is significantly better than the other three groups considered for this experiment.

Figure 1 shows the graphical representation of the comparison of mode precision obtained among four algorithm groups (proposed Learning Vector Quantization, Passive Aggressive classifier, LSTM and LS-SVM). It is also proved that the Proposed Learning Vector Quantization technique performs better having highest mode precision rate.

Table 1. Classification Report of Proposed Model (Learning Vector Quantization)

Class	Precision	Recall	f1-Score	Support
0	0.93	**0.92**	**0.93**	**3389**
1	0.90	**0.91**	**0.91**	**2646**

Table 2. Comparison of Precision Obtained By Various Algorithms for Fake News Prediction

No. of Samples	Proposed Learning Vector Quantization (Precision in Percentage)	Passive Aggressive Classifier (Precision in Percentage)	LS-SVM Algorithm (Precision in Percentage)	LSTM Algorithm (Precision in Percentage)
1	92.68	65.74	72.23	55.93
2	92.71	67.67	71.23	50.17
3	93.04	69.27	70.20	51.20
4	93.04	72.1	69.27	54.34
5	92.4	72.03	72.11	54.00
6	93.01	64.00	71.00	56.73
7	93.01	65.22	72.00	58.67
8	92.1	72.15	69.00	53.45
9	92.36	65.74	68.20	58.81
10	93.54	67.67	73.25	52.43

Table 3. Anova T-Test between and within groups using Precision Rate, shows that proposed Learning Vector Quantization performs better with the Sig (P<=0.005) comparing to other algorithms

ANOVA					
PRECISION					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	8276.197	3	2758.732	28.539	.000
Within Groups	3479.917	36	96.664		
Total	11756.115	39			

Table 4. Multiple Comparison test of mean precision rate for four groups is shown with its significant value

Multiple Comparisons						
Dependent Variable:						
Bonferroni						
(I) Algorithm		**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
					Lower Bound	**Upper Bound**
Learning Vector Quantization	**Passive Aggressive Classifier**	31.130*	4.397	.000	18.85	43.41
	LS-SVM	21.940*	4.397	.000	9.66	34.22
	LSTM	38.216*	4.397	.000	25.94	50.49
Passive Aggressive Classifier	**Learning Vector Quantization**	-31.130*	4.397	.000	-43.41	-18.85
	LS-SVM	-9.190	4.397	.262	-21.47	3.09
	LSTM	7.086	4.397	.695	-5.19	19.36
LS-SVM	**Learning Vector Quantization**	-21.940*	4.397	.000	-34.22	-9.66
	Passive Aggressive Classifier	9.190	4.397	.262	-3.09	21.47

	LSTM	16.276*	4.397	.004	4.00	28.55
LSTM	**Learning Vector Quantization**	-38.216*	4.397	.000	-50.49	-25.94
	Passive Aggressive Classifier	-7.086	4.397	.695	-19.36	5.19
	LS-SVM	-16.276*	4.397	.004	-28.55	-4.00
***. The mean difference is significant at the 0.05 level.**						

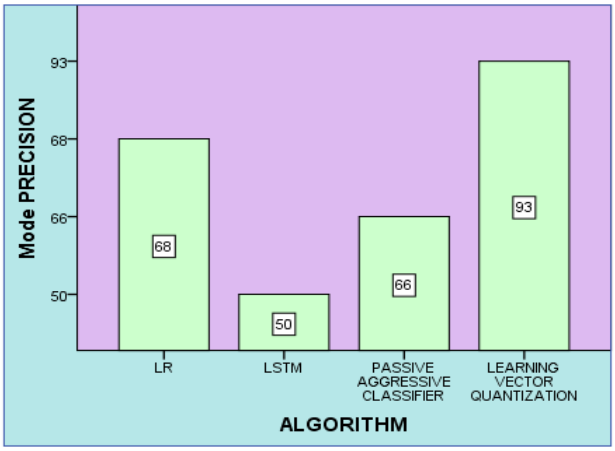

Fig.1. Graph represents the comparison of mode precision rate for four algorithms

5. Discussion

This study obtains quite interesting results when we compare sample size and accuracy. This comparison demonstrates how different algorithms perform in detecting fake news since datasets keep growing over time. With 92.8% accuracy rate, SVMs in conjunction with TF-IDF Vectorizer proved to be the most effective combination. Logistic regression also performed well at 91%. When sample size increased, neither Naive Bayes nor Decision Tree significantly improved scores, resulting in accuracy rates of 85% and 81%, respectively. In contrast, neural networks performed the worst of all and consistently yielded the lowest accuracy of 49% (Shu and Liu, 2019). The Proposed framework reveals that only a small fraction of the models achieve an AUC greater than 0.85. Based on these results, it appears that models with specific combinations of features are usually indicative of fake news detection. There can be no single solution to cope with all the types of fake news stories. Analysis like this shows the complexity of the problem. Various models of clusters based on random combinations of features are presented in this work. The ensemble technique that combines models from different clusters appears to be a promising method of investigation (Alharbi, Vu, and Thai 2021). A performance analysis is performed on three datasets to determine the effectiveness of different approaches. On a dataset comprising fewer than 100k news articles with a precision rate of Naive Bayes with n-gram can achieve similar results to neural network-based models. Data size and information provided by the user greatly influence performance of LSTM-based models. If done correctly Based on an article in the news, LSTM-based models have a greater likelihood of overcoming overfitting. Furthermore, advanced models such as the C-LSTM, Conv-HAN, and character-level C-LSTM have shown high promise in detecting fake news, and require further attention (Shu and Liu 2019). According to an evaluation of the Bidirectional LSTM model, it has been trained with a total of 10,235,010 trainable parameters. The trained result for the three epochs with a batch size of 32 is considered. Initial results show 95.69 % accuracy and a loss of 13.49% for this model. In epoch two, accuracy increased to 95.94%, with a loss of 10.53 percent. In epoch three, accuracy increased to 96.30%, and the loss was 9.65%. Therefore it is proved that 96.30% accuracy and 9.65 percent value loss using the Bidirectional LSTM model as a better result (Baishya et al. 2021). The Tf-IDF - Dense neural network (DNN) model after parameter tuning achieves an accuracy of 94.21%. The prediction accuracy of our model is good when a news article is unrelated to a headline, agreed to, or disagreed to, but low when the stance is disagreed to (44%). The second model that is

compared is based on BoW-DNN are very surprising since pre-trained word embeddings always yielded low accuracy scores. The size of the article can be a contributing factor to this phenomenon. Hence, the Word2Vec model may struggle to capture word semantic level importance if the news article length is extremely long (Sharma and Kalra, 2021). An analysis of the tweets and retweets related to fake news stories was conducted to predict how fake news will spread on Twitter. A two-stage process is described in the proposed model for the spread of fake news. To begin with, fake news is presented as one of the regular news items. The audience then realizes that the news story is false and spreads it as an alternative. By collecting two datasets of Twitter-distributed fake news items, this model has been validated. For accurately predicting how fake news items spread, our proposed model outperforms state-of-the-art approaches. A further advantage of the model is that it can infer when news stories were corrected. According to our results based on text mining, Twitter users are aware of the falsity of the news story around the inferred correction time (Murayama et al. 2021).

Associated with this problem are the limitations that any kind of prediction model can encounter, including the fact that the data is random and therefore prone to anomalies. Depending on the linguistics cues, it is necessary to design a new cue set for a specific circumstance, which makes engineering features and cue sets difficult on different topics and domains. Thus, more human input would be needed when it comes to the design, evaluation, and exploitation of these cues (Sharma et al. 2019).

6. Conclusion

An algorithm based on supervised learning is proposed here to detect fake news using machine learning. In order to train and test hamming distance measures, the Learning Vector Quantization (LVQ) approach is used. In order to achieve better performance, "precise feature selection" and "rendering hyperparameters" were crucial steps. ISOT datasets were used to test the model, leading to a 93.54% precision rating. The proposed work will be extended in the future by adding more datasets and by using various distance measure algorithms based on hyperparameter tuning.

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ONLINE LEARNING PEDAGOGY – NEED OF THE EDUCATIONAL COMMUNITY

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ABSTRACT

The year 2020 from the month of March; has seen an upside down change in the educational system. Students who were regular to school and colleges were asked to stay back at home and the young hands which were restricted to use mobile phones were freely allowed to access the mobile phones sitting at home. This tremendous change was due to Covid'19 an infectious disease caused by newly discovered coronovirus1. Due to this infectious disease one and a half billion students around the world were engaged in remote learning2.

This pandemic period has opened new pathway for the students and scholars to learn and study through online learning. The recent studies have revealed that as this platform was new to the society both the teachers and the students faced lot of problems during the learning process3. Thus an attempt has been taken to know the issues and attributes related to online learning pedagogy by the scholars in Marthandam Town of Kanyakumari District, Tamilnadu.

Keywords: *Online learning, Scholars, Pedagogy.*

1. Introduction

The entire world has seen a drastic upside down changes in all the discipline in the year 2020 from the month of March. This upside change has very much affected the educational sector too. All the educational institutions were closed due to this pandemic situation. Inmidst of this situation, the educational institutions found out a new pathway to reach students ie., with Online Teaching. The students and scholars were motivated learn through virtual learning.

Inception of online learning was in the year of 1982 when the Western Behavioral Sciences Institute in La Jolla, California opened its School of Management and Strategic Studies. The Schools made use of computer conferencing to render a distance education program to business executives[4]. In 1989 the University of Phoenix commenced providing education programs through the internet. In 1993 with the debut of the first Internet web browser, created by the University of Illinois, online learning began to flourish[5].In 1998, the first fully online programs were founded: New York University Online, Western Governor's University, the California Virtual Universityand Trident University International[6].

Pedagogy "motivates students to critically scrutinize their assumptions, tackle with social issues, and engage in social action" Five suggestions for preparing the online environment for transformative pedagogy are: "(a) make a protected and pleasing environment; (b) persuade students to ponder about their experiences, beliefs, and biases; (c) use teaching strategies that promote student engagement and participation; (d) pose real-world problems that tackle societal disparities; and (e) Assist students to execute action-oriented solutions". There are four essential characteristics that may enhance with the success of online instruction: (1) the learner should be actively engaged throughout the course; (2) group contribution can support with meeting course objectives; (3) frequent student-student and student-teacher interaction can alleviate the feelings of isolation; and (4) the course content should relate to the real world to enhance meaning for participants. However, a student's approach towards using technology and computers is directed by the teacher's ability to impact a student's values and beliefs[7].

Sandeep Shetty, Shilpa, Debhavan and Kavya in their survey revealed students favoured online learning to sustain their academic

interest and development during this pandemic. Yet, students faced many challenges during online learning like lack of face-to-face communications, lack of socialization, distraction by social media, technology related issues etc. Students also chose for a collective approach of learning in the post pandemic period[8].

The education system is one of the most impacted aspects of routine learning and daily life. The world saw a paradigm change in the education system favouring online learning during the restrain of pandemic. Yet, the effects and value of online education and the capability to successfully teach digitally is questionable. This sudden and rapid transformation from an environment of conventional learning to virtual learning has made a great impact on the attitude of the students towards learning[9].

Keeping all the reviews in mind, the objectives were framed ie., to know the problems faced by the scholars during online classes.

Methodology

The descriptive study is purely based on the Structured Google Forms were generated and circulated among the Research Scholars in Marthandam Town of Kanyakumari District of Tamilnadu.

The scholars who responed via Google Forms are 118. Hence, the Sample population for the study was finalised as 118. The structured questions in the Google Forms included questions related to the devices the scholars used for online pedagogy classes; preferred approach of learning during pandemic period and the problems faced by the scholars due to online learning.

The following tables and figures explains the opinion of the scholars towards online pedagogy classes during pandemic period.

TABLE 1: Devises used by the scholars

DEVICES	REPONDENTS	PERCENTAGE
Mobile	79	67
Laptop	19	17
Desktop	11	9
Tablets	9	7
Total	118	100

Source: via Gforms

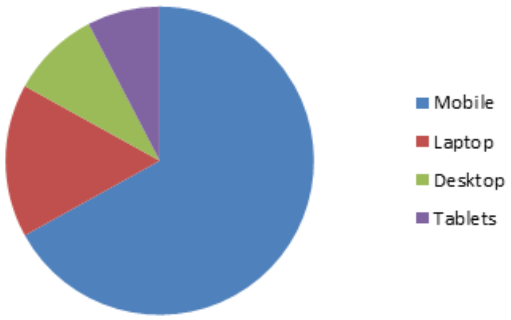

Figure 1

The above table and graph depicts that most of the research scholars are using mobile phones to attend online pedagogy classes ie., 67 percentage.

Table 2 predicts the preferred approach of learning during pandemic period.

TABLE 2: Preferred Approach of Learning during Pandemic

Preferred Approach	REPONDENTS	PERCENTAGE
Online Learning	102	86
Classroom Learning	16	14
Total	118	100

Source: via Gforms

The above table very clearly shows that 86 percentage of research scholars prefer online mode of learning because of the pandemic situation and only 14 percentage of research scholars feel that they are better with classroom learning method.

Table 3 shows the core objective of this study, ie., it shows the problems which the research scholars faced while learning through online method.

TABLE 3: Problems faced by Scholars during online sessions

Problems faced by scholars	N	Mean	Std. Deviation
Scholars encounter technical issues	118	4.116	1.136
Poor internet connectivity in their area	118	3.785	1.119
Getting distracted	118	3.718	0.896
No practical sessions during online classes	118	3.505	0.892

The quality of course module is mediocre	118	4.061	1.178
Poor time management	118	2.826	1.147
Laziness to attend classes	118	2.708	1.180
Diminished social aspect	118	4.086	1.208
Lack of teacher-scholar relationship	118	3.901	1.149
Lack of computer literacy	118	3.759	0.924

Source: via Gforms

The above table very clearly shows the reflections and feelings of scholars towards the major problems they come across during online pedagogy sessions. The scholars feel that most of the time they encounter technical issues during online sessions with a mean score of 4.116 which was followed by Poor internet connectivity in their area with a mean score of 3.785 and then another factor was great distraction which was because of the device they are using for online session ie., mobile phones with a mean score 3.718.

Conclusion

In this present day, online learning has become everyone's part and parcel of their life. As the pandemic situation is still existing proper steps should be taken by the Ministry of Education also the State Government to stabilise the onine learning process. Inorder to keep up the Education System, the Educational Institutions should strive their best to give their best to the learning community to generate healthy and potential youngminds.

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MALADAPTIVE DAYDREAMING, RUMINATION AND PSYCHOTICISM

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ABSTRACT

Previous research has indicated that dissociative people tend to maladaptively daydream more often. The purpose of this study was to learn more about the impact of maladaptive daydreaming on psychosis vulnerability, i.e the level of psychoticism in a person along with rumination. The key objectives of the study were :- (1) to study the impact of maladaptive daydreaming on rumination and psychoticism. (2) to access the relationship between psychoticism, maladaptive daydreaming and rumination. Out of the total sample taken, 167 shortlisted participants were required to complete three questionnaires: the Maladaptive Daydreaming Scale (MDS), the Rumination Responses Scale - Short Form (RRS), and the Eysenck Personality Questionnaire - Revised (short scale) (EPQ-R). The findings revealed a favorable relationship between rumination and maladaptive daydreaming, but there was no significant link between maladaptive daydreaming and a person's level of psychoticism. Both maladaptive daydreaming and rumination combined resulted in a statistically significant change in a person's degree of psychoticism. In conclusion, maladaptive daydreaming was found to be positively correlated with rumination, but no connection between maladaptive daydreaming and psychoticism was discovered. However, combining maladaptive daydreaming and rumination has an impact on a person's psychoticism levels. Maladaptive daydreaming has received less recognition in the past, and it requires further attention in both research and clinical practice.

Keywords: *Maladaptive Daydreaming, Rumination, Psychosis vulnerability, Psychoticism.*

Introduction

Daydreaming is a very natural frequent occurrence. Spontaneous, subjective thinking in a no-task, no stimulus, no response condition that includes unintended thoughts that intrude unconsciously into the execution of scheduled mental tasks and undirected ideas in awareness sampling during wakefulness, is known as daydreaming (Vaitl, et al., 2005). Daydreaming is often a beneficial cognitive function, it can help with relaxing, managing conflict, boosting creativity and accomplishing goals. People like to daydream every now and then, imagining things that could happen in their lives, such as winning an award or going to a place they've always wished to see, and other forms of wishful thinking. While daydreaming is a common occurrence, especially in children, it can become a malignant power. It is then known as Maladaptive Daydreaming.

Maladaptive Daydreaming

Eliezer Somer introduced Maladaptive Daydreaming as a term that describes prolonged, frequently compulsive, fantasy participation for several hours a day, which replaces physical affection and impairs working in a number of ways, whether it's academic, personal, or professional (Somer, 2018). When faced with trauma, abuse, or loneliness, maladaptive daydreaming is a common coping mechanism. Sufferers construct a complex inner universe in which they daydream for hours in moments of distress. Maladaptive daydreaming ultimately creates an emotional attachment to the characters and the life developed, which also replaces traumatic real-life relationships with family and friends in a vicious spiral of addiction. It also makes it difficult to read, perform, and take care of one's health and well-being, which hinders with daily functioning. The fact that the person is aware that their daydreams are not real distinguishes maladaptive daydreaming from psychosis (Tapu, 2016).

Sometimes the theme of these fantasy worlds are based on the person’s ruminating thought. Rumination, as introduced by Susan Nolen-Hoeksema, is a form of distress response that involves dwelling on the distress, repeatedly and passively (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

Rumination

According to the American Psychological Association, rumination is obsessional thinking including excessive, recurring feelings or ideas

that conflict with other types of mental functioning. Rumination, according to some theorists, is based on negative emotions and/or the situations underlying those feelings (such as the Response Style Theory or the Rumination on sadness model). Some theories of rumination concentrate on differences in one's present and ideal position (in particular the Goal Progress Theory or the conceptual evaluation model). And lastly, other models claim that the negative themes of uncertainty, inescapability and hurt are the most relevant in metacognitions (Nolen-Hoeksema , Wisco , & Lyubomirsky , 2008). Rumination has been explicitly connected with anxiety, depression and few studies have been researched in relation to psychosis.

Psychosis

The term "psychosis" refers to a state of mind that is an unusual condition characterized by major difficulties in fact checking. It is characterized by significant impairments or disturbances in the most fundamental higher brain functions, such as vision, memory, and cognitive processing, as well as emotions or affect, and manifests itself in behavioural manifestations such as illusions, hallucinations, and deeply disorganized expression/speech (Hartley, Bucci and Morrison, 2017). First-episode psychosis (FEP), also known as early psychosis, is terrifying, disturbing, and distressing for the individual who is experiencing it, as well as difficult to comprehend for their family.

Somer was the first to relate maladaptive daydreaming to dissociative disease and personality disorders. He recently divided this behavior into four groups: dissociative syndrome, attention loss, obsessive–compulsive spectrum disorder, and behavioral addiction (Somer, 2018). In a research by Longden et. al., (2020), findings results show a strong link between dissociative experiences and all psychotic symptoms. Psychosis is a term more specifically used for people who have lost complete touch with reality. The phrase Psychoticism was introduced by Hans Eysenck as one of the personality dimension for his theory of personality which is also known as the PEN model. Eysenck defines psychoticism as a personality trait that is vulnerable to taking chances, can indulge in antisocial behaviour, impulsiveness, or nonconformist behavior. According to his definition of psychoticism, a person will show certain characteristics that are typical observed among people with psychosis, and they may be more vulnerable to being diagnosed with psychosis. So the level of psychoticism in a person evaluates the person's vulnerability to psychosis to a certain extent. All of this brings us to the question, can the constant need to escape the real world make a person more vulnerable to completely detach from reality? This study aims to investigate whether people who maladaptively daydream are more vulnerable to psychosis or not by studying the correlation between maladaptive daydreaming and psychoticism.

While daydreaming is a common occurrence, especially in children, it can become a malignant power. It is known as *Maladaptive Daydreaming* which is characterized as "a fantasy practice that can be interpreted as a mental compulsion for vibrant fanciful imagery that can last for hours and can be stimulated or sustained either by evocative music or repetitive physical action, such as pacing or rocking" (Somer, Soffer-Dudek, Ross, & Halpern, 2017). Maladaptive daydreaming continues to impair basic habits and goes beyond mere daydreaming. This addiction engenders frustration, anxiety, and even sickness when not controlled. I will further explain Maladaptive Daydreaming in depth.

Researchers have shown that individuals with first episode of psychosis more likely used maladaptive coping strategies (Stramecki et. al., 2018). The findings suggest that cognitive impairments are linked to the use of maladaptive coping strategies. Lower chances of using adaptive coping strategies could be linked to more serious depressive symptoms. Another study was carried out that showed, the severely traumatized and dissociative inpatients showed increased levels of maladaptive daydreaming (Ross, Ridgway &George, 2020). There have been several studies relating maladaptive daydreaming to dissociation, and there are a sufficient number of research articles discussing the similarity

between dissociation and psychosis, which indicates that patients suffering from psychosis are likely to engage in maladaptive daydreaming. However, there is a lack of studies relating maladaptive daydreaming directly to psychosis.

Maladaptive daydreaming has also not been directly linked to Psychoticism either but, around the same time, maladaptive daydreaming has been attributed to some patterns of behavior that are also exhibited by individuals with high psychoticism. In a research conducted by Dujic, Anticevic, and Misetic, (2020) the results showed that the participants who were more prone to maladaptive daydreaming were more likely to be exposed to other psychiatric illnesses and experience risky behaviors, as well as have less effective coping mechanisms.

Maladaptive daydreaming has seen a small amount of study in recent years. Although the majority of these findings indicate a connection between maladaptive daydreaming and other severe mental health disorders, and it's also been labeled as a form of behavioral addiction, Maladaptive Daydreaming is not classified as a mental health disorder according to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5).

Methodology

The objective of the current study is to examine maladaptive daydreaming on rumination and psychoticism among non clinical sample (Young adults). The hypotheses being proposed on the basis of the review of literature are:

H1: There will be positive correlation between Maladaptive daydreaming, psychoticism and Rumination.

H2: Individuals who Maladaptive Daydream will have high Psychoticism level in comparison to individuals who do not Maladaptive Daydream.

H3: Maladaptive Daydreaming and Rumination will have an impact on Psychoticism.

Sample

The research is conducted on non clinical Indian young adults population (18 years -28 years). A total of 167 participants were shortlisted through convenient sampling method.

Inclusion criteria was to be within the required age range (18 years -28 years), being unmarried, having no past psychiatric history nor being on any psychiatric medication. Anyone who didn't meet the inclusion criteria was excluded from the study.

Measures used for data collection

- Demographic Information-Demographic information included basic details (Participant's age, gender, occupation, about past illness or treatment) and consent form.
- Maladaptive Daydreaming Scale: It is a 16-item self-report measurement that was developed in 2017 to detect anomalies in people's daydreaming. The scale was given by Eli Somer, Jayne Bigelsen, Jonathan Lehrfeld & Daniela Jopp. The MDS has a high level of criteria based validity (r=0.58,=0.01) and test-retest reliability (r=0.92) indicating that test–retest reliability is very high.
- Ruminative Responses Scale - Short Form: It is made up of ten items chosen from a list of 22 items questionnaire created by Nolen-Hoeksema and Morrow (1991). Ruminative Responses Scale - Short Form consists of two different sub scales that are, Brooding and Reflection. Treynor and her colleagues (2003) stated that all Reflection objects were "neutrally valenced," and Brooding's items had a negative connotation and were characterized as "moody pondering."
- Eysenck Personality Questionnaire - Revised (short scale): It contains 48 yes/no questions. The 3 personality dimensions that are Psychoticism, Extraversion and Neuroticism are measured using this questionnaire. It was developed by S. B. G. Eysenck, H. J. Eysenck & Paul Barrett (1984). A modified version of Eysenck Personality Questionnaire (Short scale) was created in which only the psychoticism

items were separated and taken as that is the only dimension needed to be measured for this study.

Procedure

The entire procedure was conducted online. A Google Form was created that included the selected demographic variables, RRS- short form questionnaire, MDS questionnaire and a modified version of EPQ-R short scale. The participants were then reached out individually through different social media platforms (due to the restriction of the pandemic situation). Participants were informed in brief about the study they are participating in and any and all doubts were cleared. Their consent was taken before they were sent the form and they were assured complete confidentiality and security of the data. Instructions on how to rate the scales were mentioned at the very beginning of each section for a clear understanding and easy conduction. If the participant was interested in his/her result, it was assured that the research will be willing to share it after the completion of the study. Lastly the participants were thanked for their participation in the study and feedback was also collected regarding the questionnaire. Once a satisfying amount of data was collected, it was then individually scored and further analysed.

Results and Discussion

The data included 167 responses, collected from north India (Non clinical sample). The 'mean' and 'standard deviation' of the whole sample showed that the average age was 22 years and the sample constituted of 40% males and 60% females.

The data was analysed to examine the relationship among variable for which a correlation study was performed using Pearson Product Coefficient Correlation (Table 4.1).

Table 4.1. Showing Pearson Product coefficient Correlation

		PSYCHOTICISM	MALADAPTIVE DAYDREAMING
RUMINATION	Pearson Correlation	-0.207**	0.518**
	Sig. (2-tailed)	0.007	0.000
MALADAPTIVE DAYDREAMING	Pearson Correlation	-0.103	1
	Sig. (2-tailed)	0.183	
N = 167			

The analysis showed that significant negative correlation between Rumination and Psychoticism and significantly positive correlation between Rumination and Maladaptive daydreaming. Thus, an individual fixated in the negative loop of thinking tend to have a tendency to be in maladaptive daydreaming phase. However, rumination is alone is not an indicator to lead to psychoticism directly.

In order to study the difference between maladaptive daydreamers and non maladaptive daydreamers on their Rumination and Psychoticism, Independent sample t test was carried out.

Table 4.2. (a) Showing group statistics

	MALADAPTIVE DAYDREAMING	N	Mean	Std. Deviation	Std. Error Mean
RUMINATION	People who do not MD	87	23.32	5.213	0.559
	People who do MD	80	27.59	4.783	0.535
PSYCHOTICISM	People who do not MD	87	3.61	1.787	0.192
	People who do MD	80	3.14	1.798	0.201

Table 4.2 (b) Showing Independent sample t-test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
RUMINATION	Equal variances assumed	-5.495	165	0.000
	Equal variances not assumed	-5.515	165.00	0.000
PSYCHOTICISM	Equal variances assumed	1.699	165	0.091
	Equal variances not assumed	1.698	163.657	0.091

The individuals who did have maladaptive daydreaming tendency showed more rumination (strongly significant) and were having slight bend towards psychoticism (Less significant as per the analysed data). Thus, rumination and maladaptive daydreaming is highly associated and slight connection was seen with psychoticism as well.

To study if Maladaptive Daydreaming and Rumination have an impact on Psychoticism, a regression analysis was carried out. This analysis was carried out to see predictive impact of variables on each other.

Table 4.3. (a)Showing regression Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.208a	0.043	0.031	1.774
a. Predictors: (Constant), Maladaptive Daydreaming, Rumination				

Table 4.3 (b) Showing regression ANOVA

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.228	2	11.614	3.689	.027[b]
	Residual	516.245	164	3.148		
	Total	539.473	166			

a. Dependent Variable: Psychoticism

b. Predictors: (Constant), Maladaptive Daydreaming, Rumination

4.3 (c) Showing regression Coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	(Constant)	5.128	0.657		7.802	0.000

	Rumination	-0.070	0.030	-0.210	-2.355	0.020
	Maladaptive Daydreaming	0.000	0.008	0.005	0.060	0.952

a. Dependent Variable: Psychoticism

Rumination has a p value of 0.020, which is less than 0.05 and therefore statistically significant. This suggests that at the population level, increases in Rumination (independent variable) are linked to changes in Psychoticism (dependent variable). However, there is no statistical significance for Maladaptive Daydreaming as the p = 0.952 (greater than 0.05). This indicates that there is no connection between changes in Maladaptive Daydreaming (independent variable) and changes in Psychoticism (dependent variable).

The first hypothesis drawn stated there will be a positive correlation between Maladaptive daydreaming and Rumination which was accepted through Pearson Product Coefficient Correlation analysis. This illustrates that an increase in maladaptive daydreaming will also lead to an increase in rumination or an increase in rumination can lead to an increase in maladaptive daydreaming. Brooding or reflective rumination, either or both, may serve as the foundation for maladaptive daydreaming. A study conducted by Shrimpton, McGann & Riby, in 2017 also supported these findings. They conducted their research on 33 participants to examine individual variations in rumination and self-reflection, as well as the effects certain self-focus types can have on mind-wandering experiences. The findings revealed that the propensity of the mind to wander wasconnected to ruminative self-focus.

The second hypothesis proposed, there will be a positive correlation between Maladaptive Daydreaming and Psychoticism, which after Pearson Product Coefficient Correlation analysis was rejected. According to the findings of this hypothesis, an increase in an individual's maladaptive daydreaming activity leads to no significant increase or decrease in their level of psychoticism. This also suggests that an increase in maladaptive daydreaming does not always correlate with personality characteristics like aggression, impulsivity, aloofness, or antisocial behavior. This may be due to the fact that different individuals have different maladaptive daydreaming patterns, and some of these themes may contribute to completely opposite characteristics from an individual with a high degree of psychoticism.

The analysis of the data indicated that maladaptive daydreamers have a higher tendency to ruminated as compared to those individuals who do not maladaptive daydream. In 2016, Marchetti, Koster, Klinger& Alloy conducted a study where they discussed that, in addition to its beneficial roles, spontaneous thinking, such as mind wandering and daydreaming, is a predictor of cognitive vulnerability, like rumination, in people at risk for mood disorders.

The findings also showed that individuals who Maladaptive Daydream will showhigh level of Psychoticism in comparison to individuals who do notMaladaptive Daydream. Independent sample t test, Group Statistics (Table 4.2) analysis rejected this hypothesis. This suggests that a person's degree of psychoticism has little to do with their maladaptive daydreaming habits. It's possible this is due to maladaptive daydreaming focuses more on avoiding reality by constructing a fantasy world, while psychoticism does not specifically focus on avoiding reality.

And last proposed hypothesis that Maladaptive Daydreaming and Rumination will have an impact on Psychoticism. This hypothesis was proved by using Regression ANOVA (Table 4.4.1 and Table 4.3). This indicates that when Maladaptive Daydreaming and Rumination are present together, Psychoticism levels change significantly. This may be because someone who ruminates and has maladaptive daydreaming pattern may isolate themselves from others to spend more time alone in their fantasy world. Also if they are interrupted in between maladaptive daydreaming or haven't maladaptive daydreamed in a long time, they might become aggressive. Many of these are

characteristics of people who have an increase level of psychoticism.

As each of the independent variables were individually checked to see whether they made any modifications to the dependent variable alone, only rumination showed to cause a noticeable difference in psychoticism. Maladaptive daydreaming did not display any changes in psychoticism solely. Thus, these findings can pave the way for future researches.

Conclusion

The results of this study lead to the following conclusion, Rumination and Maladaptive daydreaming have a 99% statistically significant positive correlation. Rumination has also been attributed to daydreaming and mind wandering in a number of previous studies. This study was unable to establish a connection between Psychoticism and Maladaptive Daydreaming. Although it did reveal a strong negative correlation between Rumination and Psychoticism. When Maladaptive Daydreaming and Rumination were taken conjointly the outcomes revealed that together they make a statistically significant impact on a person's degree of psychoticism.

Limitations of the study

There were a few observed limitations in the present study. It's likely that the sample size of 167 individuals was insufficient. Out of which the total number of participants shortlisted for those who maladaptively daydream and those who do not maladaptively daydream was not equal. And finally Psychoticism in relation to daydreaming has been the subject of very few studies; as a result, there is a limitation of knowledge on it.

Future Framework

Future work may explore maladaptive daydreaming in people with psychosis as there is still a knowledge void when it comes to it. One of the conclusions reached through this research was the association between Rumination and Psychoticism. These two variables have a 99% statistically significant negative correlation, which leads to a significant change in levels of psychoticism caused by Rumination. Since this study didn't hypothesise the correlation between Rumination and Psychoticism, these two variables were never specifically examined, but they, too, have the ability to be investigated further.

Implications of the study

This study will aid researchers in further understanding the relationship between maladaptive daydreaming, rumination, and psychoticism, as well as the impact these factors have on one another, for future researches. The link between rumination and maladaptive daydreaming has been established, and psychologists can use it in clinical settings to better understand the effect and devise intervention strategies.

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A STUDY OF GENDER PERSPECTIVES IN THE ENTREPRENEURIAL PROCESS WITH RESPECT TO IDEATION, PLANNING, PERFORMANCE EVALUATION AND DIFFERENTIATION MEASURES

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ABSTRACT

The concept of gender designates socially created roles, norms, behavior, expectations and activities attributed to women and men. Gender equality has always been a highpoint and one of the key endeavors for every developing nation. This equality along with a change in socio economic status has ensured that equality baton has transcended into the entrepreneurship domain. Gender equality and women entrepreneurship are key factors for economic development. Today there is a consensus among scholars that women just like men can play a key role in the entrepreneurial phenomenon. This becomes even more interesting due to the styles of leadership displayed by them, which eventually impact the area of business operations, efficacy of employee and business performance. The last 10 years have seen significant advent of women entrepreneurs in India and this coupled with technological, educational and social reforms, the future seems rather promising. However, in spite of these trophy points, we still observe a disparity between men and women entrepreneurs. This research paper tries to study this gap by understanding the attitudinal, behavioral and psychological perspectives between make and female entrepreneurs. It is observed that there are certain aspects which are perceived differently by men and women while more often then not, there is no difference in perception.

Keywords: *Entrepreneurship. Gender Perspectives, Ideation, Evaluation*

Introduction

Equality between men and women has been featured as one of the eight Millennium Development Goals, and as a vital aspect for accomplishing the other seven objectives by the (United Nations Population Fund, 2013). There is agreement among researchers that women can assume key part in the pioneering wonder. Gender disparity exists in terms of financial advancement just as the rates of entrepreneurial activity. There is a gender gap in the entrepreneurial activity across the world (Allen et al. 2008). A GEM investigation of 18 economies from 2002 to 2010 recommendsthat female enterprising action is lower than that of the males at various phases of advancement (Kelley et al. 2011). Nonetheless, the probability of ladies occupied with entrepreneurial movement is lower in the developed regions in contrast to the non-developing nations.

The emergence in the number of women entrepreneurs has increased significantly in last 10 years, and with the study conducted across 13 states in India (EdelGive Foundation Report) which statesthat women entrepreneurs in India are likely to see business growth up to 90% in the next 5 years, there is more likelihood that the disparity will soon start to disappear. Although the number of women entrepreneurs is increasing, it cannot be denied that men still continue to dominate the space. This disparity in India has more to with the societal structure and the perceived role of women in our culture.

Review of Literature:

A study (Mathew, 2012) based on the variances of motivational aspects between female and male entrepreneurs, has some interesting inferences to be drawn. According to male entrepreneurs' entrepreneurship is a means of livelihood, advancement in life and they attribute this to favorableenvironment. On the other hand, female entrepreneurs describe entrepreneurship as doing ground-breaking and useful things in life, apart from the attributes mentioned by men. Thus, the tenacity of entrepreneurship, becomes more substantial in case of women. It is also observed that fear of job loss or frustration in the current job also could thrust towards self-employment (Hughes, 2003).

The uncertainty in the job market and the reforms in the role of women coupled with the fear of job loss of a spouse, can compel them to take up entrepreneurship as an option.

Women business venture has a 'financial measurement (Mitchell, 2011), wherein the percent of women entrepreneurs is higher for the nations with low per capita pay (Pines, Lerner and Schwartz, 2010). The perception is a cross country examination concerning gender, in any case, the level of female entrepreneurs in a given setting is less contrasted with those of male business entrepreneurs. One examination (Koellinger, Minniti and Schade, 2013) including various nations, contends that the lower business proprietorship if there should arise an occurrence of ladies is a direct result of lower tendency to begin, rather than the failure rate. The examination credits low start up rate by women to a more significant level of disappointment, less trust in pioneering capacities and diverse informal organizations; and these variables appear to clarify the gender gap. The distinction in the normal level or expectation between genders has been credited to the mentality towards hazard (Dawson and Henley, 2015).

The purposeful or persuasive factor as a beginning stage of a business venture has likewise been considered (Langan-Fox and Roth, 1995). The gender role impact has been concentrated on inspirational components (Humbert and Drew, 2010), and the impact is more conspicuous by conjugal status and parenthood. It tends to be deduced that host of socio-social elements affecting women in a given setting would impact women's business venture. For instance, in India, property rights, training, socialization, family as dynamic unit, low level of familial freedom or some other inclination explicit to sex can be understood to affect business arrangement. Study somewhere else demonstrates that the incomes and profitability claimed women's firms are fundamentally lower than those of men-possessed firms. A similar report, likewise call attention to that females start their endeavor with less assets, and have higher probability of discontinuing the venture. (Carter, Williams and Reynolds, 1997). A similar report, notwithstanding, demonstrates that the asset inadequacy can be overwhelmed by differentiation technique (Carter et al., 1997).

As opposed to the perspective on Humbert and Drew (2010), an examination including an irregular and enormous example across various areas tracks down that the distinction in startup isn't in inspiration or training, rather the thing that matters is about the 'capacity to oversee representatives', 'development more than two years' and 'deals per worker'. These elements were observed to be lower if there should arise an occurrence of a female business person (Fischer, Reuber and Dyke, 1993). It can likewise be contended that in case of such contrasts in execution, a negative criticism would result making the section impeded.

Past motivation, gender contrasts have likewise been learned about innovative adequacy. Study finds that females are more averse to go into business and they are better ready to survey their own lacks (Kourilsky and Walstad, 1998). It tends to be recommended that men are audacious or take the asylum in 'obliviousness being joy'. In another exploration (Wilson, Kickul and Marlino, 2007) in a connected subject, tracks down that the effect of business schooling is more grounded on innovative self-viability for ladies when contrasted with such effect for men. Regardless, viability is one of the significant elements the business visionaries consider to begin another endeavor.

Also, another significant element of new venture creation is the capacity to uncover opportunities which can be monetarily taken advantage of. There are ideas that gender stereotyping affected people's assessment of a business opportunity in an unexpected way (Gupta, Turban and Pareek, 2013; Gupta, Goktan and Gunay, 2014). Consequently, in very similar situations, there will be various assessments about a particular chance dependent on gender of the business visionary. Men report higher freedom assessment when contrasted with ladies, study says. It is seen that entrepreneurial abilities are related with male conduct. To that degree, Marlow and McAdam (2011) demonstrated to have tracked down that female business visionaries in high

technology adventures lead to manly pioneering conduct. They require a women's activist examination of business venture as a field.

Research Objectives:

1. To study if there is a difference in perception of business challenges between men and women.
2. To study if there is difference in perception and conceptualization of the planning processbetween men and women entrepreneurs.
3. To study if there is a difference in approach of selection and evaluation of business ideas, between men and women entrepreneurs.
4. To study if women entrepreneurs plan and employ different performance measures for theirbusiness.
5. To study if business differentiation is gender biased
6. To measure the level of business satisfaction between genders.

Hypotheses

H0 : There is no difference with respect to the number of employees employed under both thegenders.

H0 : There is no difference in the conceptualization of the planning process before starting a business venture, between both the genders

H0 : There is no difference in perception of issues and challenges in doing a business, betweenboth the genders.

H0 : There is no difference in the Idea generation and evaluation process between both the gendersH0 : There is no difference in evaluation of business performance between both the genders.

H0 : There is no difference in the level of business satisfaction between the genders.

Research Methodology

This study is based on entrepreneurs in the Mumbai Region, Maharashtra, India, through a structured questionnaire which is tailored to measure selective variables and covers both qu alitative and quantitative aspects of research. The number of respondents were 213 and were randomly selected. There were a total of 53 women entrepreneurs.

Constructs and Variables

Based on the hypothesis, the constructs were divided under various heads to evaluate and achievethe primary purpose of the research.

1. Perception and conceptualization of the Planning Process

Once the entrepreneurs short list ideas, he/she begins with a cost benefit analysis of the same. Understanding the inherent risks, the costs associated with them and the outcome, helps in idea screening. This section of the questionnaire captured responses with regards to planning, fine tuning of ideas, financial forecasting, cost forecasting, profit forecasting, alternative plans, safe guarding against failure, opportunity cost calculation.

2. Generation and Evaluation of Ideas

Any business begins with the conceptualization of a business idea. An entrepreneur could generate business ideas from a variety of sources. The diversity of the source of ideas as well as the idea itself indicate the mindset and mental makeup of the entrepreneur. These sources could depend onvarious variables such as sources of media, exposure visits, work experience, background, network, resolution of issues etc. Respondents were asked to mark their responses on a Likert Scale. Once various ideas are generated, the idea evaluation process begins. Idea evaluation is also depended on various sources such as peer onions, expert opinions, Delphi technique, colleagues, industry experts etc. Eventually the entrepreneur may depend on gut feeling or external advices.

3. Perception about Issues and Challenges in doing a business

How entrepreneurs perceive the various challenges that they face in doing a business is very important in formation of a perspective. Hence if an entrepreneur believes that there are many high-level challenges in doing a business, he will refrain from undertaking an

entrepreneurship concern. Such concerns are also formed by the socio-economic and cultural background of the individual. Such perspectives of the respondents were measured on a Likert scale by taking their opinions on the following variables – Business is easy to do, Business involves a high degree of uncertainty, People who do business have little social acceptance, Business involves legal issues, Business disturbs the work life balance, Business can leap to corrupt practices for survival, Business faces pressure from competition, Lack of knowledge can be detrimental to business, Capital constraints are a hindrance to business, Lack of government initiatives and incentives is another hindrance to a business, availability of skilled and cheap labor, raw materials etc.

4. Evaluation of Business Performance

The conviction about the success of a business drives an entrepreneur in measuring performance and longevity of the business. To assess such conviction of one's own business the questionnaire included factors such as customer growth, expert opinion from people engaged in similar business, cost control measures, technological advancement, strategy formulation, network building, competitor analysis, trust in delivery process; were asked. The responses were taken on Five-point Likert scale. This also includes Self Rating or Prior Knowledge which was intended to assess how to entrepreneurs identifies himself. The combination of his behavioral and aptitude-based traits was measured. It also included Differentiation as a variable as, even though innovation is a necessary condition for success of an entrepreneurial venture, one cannot deny the role uniqueness among the ideas. Any entrepreneurial venture should have a unique proposition to offer in order to ensure sustainability. Entrepreneurs should be able to display the differentiating qualities of the organization as compared to competition. This section of the questionnaire tried to judge the degree of distinctiveness of the organization venture based on cost, quality of product or service offered, delivery timelines and price discovery mechanism.

5. Level of Business Satisfaction

Performance management of a business is difficult to undermine given the level and scale of the entrepreneurial venture. Poor record keeping and discreteness defy this purpose. Hence under this section, to measure business performance, satisfaction was used as a construct. The respondent was asked to rate their satisfaction intense of financial aspects such as income and savings, esteem, career comparison with peer groups and overall satisfaction to the level of business activity. The respondents were required to indicate this on a 5-point Likert scale.

Reliability and Validity

The questionnaire's Reliability was measured in terms of Cronbach-alpha with an alpha value of 0.762. The usable response was from 160 male and 53 males.

Data Analysis and Interpretations

Basis	Male		Female		Statistics	
	Mean	SD	Mean	SD	t stat	Significance
No of employees at the beginning of the entrepreneurial Venture	2.5	1.41	2.26	1.54	-0.345	0.67
Current strength of employees	9.23	20.9	6.95	6.02	0.69	0.491
Perception of Business Challenges	41.21	6.05	38.25	4.96	1.325	0.114
Uncertainty in Business	2.51	1	4.09	0.67	-2.712	0.023
Social acceptance of business	1.98	0.71	2.01	0.67	2.018	0.037
Apprehension of competition	4.01	0.7	2.97	1.57	2.377	0.012
Government support and incentives	3.13	1.05	2.78	1.24	2.132	0.021
Lack of skilled labor	3.16	1.01	2.58	1.06	3.011	0.001
Idea generation and evaluation	14.75	3.04	13.32	2.41	2.252	0.012

Idea Screening and Selection	10.98	2.41	9.94	2.15	3.441	0.002
Business Planning	15.71	3.15	15..08	1.86	1.279	0.202
Calculation of Opportunity Costs	3.04	1.03	2.6	0.93	2.716	0.005
Forecasting of costs and profits	35.86	4.65	34.66	3.98	1.113	0.276
Performance Measurement	15.6	2.69	14.99	3.54	1.543	0.137
Prior knowledge	16.06	2.75	14.99	3.54	1.235	0.135
Business Differentiation	13.98	2.12	13.98	1.67	2.613	0.005
Self-Evaluation	1.45	2.71	14.98	2.71	-2.174	0.034
Perception about profitability and income	3.54	0.91	3.84	0.85	-2.119	0.0126
Perception about social status	3.45	0.78	4.04	0.759	-2.1875	0.005

1. Do the number of employees working under an entrepreneur differ based on Gender From the above statistics it is observed that the significance for number of employees at the beginning of the entrepreneurial venture as well as the current staff size, under both men and women entrepreneurs, is greater than 0.05. It is 0.67 for number of employees at the beginning while it is 0.491 at the current stage of business. Hence we accept the null hypothesis that there is no significant different in the number of employees based on the gender of the entrepreneur. However if we observe the mean and SD of the Current staff size under males (Mean = 9.23 andSD = 20.9) and female entrepreneurs (Mean = 6.95 and SD = 6.02) we can comprehend that thethe number of employees are lower to begin with under females and hence they should start with a larger team size.

2. Perception and Conceptualization of the Planning Process

- **Planning**

Planning is an integral and a continuous process for any venture. Various aspects such "time allotted to planning activities", "constantly looking for more ideas", "drafting a plan" and "creation of a backup plan" were tested. The significance value of 0.202 suggests that there is no difference in the planning process and attributes considered by men and women. Thus, the null hypothesis is accepted.

- **Calculation of Opportunity Costs**

Opportunity costs are an integral part of investment in any venture or instrument. Our significance value at 0.005 indicated that there is a difference in the way the two genders calculate these costs. Men (Mean = 3.04 and SD = 1.03) seem to indicate that men are more cautious and conservative while calculating opportunity costs as compared to women (Mean = 2.6 and SD = 0.93). Infact, further probing revealed that women are less likely to consider opportunity cost calculation as an evaluation parameter for entrepreneurship.

- **Forecasting of cost and profits**

Forecasting is an integral part of business performance evaluation and hence entrepreneurs were tested on this variable. It was observed that the significance value of 0.276 is greater than 0.05 which means that there is no difference between genders in the way they use forecasting of cost and profits as a tool of business performance evaluation. The Likert scale was used to measure this variable and the data for males (Mean = 35.86 and SD = 4.65) and for females (Mean = 34.66 andSD = 5.98) was almost similar further reinforcing our null hypothesis.

3. Perception about Ideation

- **Idea Source and Evaluation**

The greatest endeavor for any entrepreneurial venture is the source of the idea. A lot of brainstorming is required to not only generate an idea but also evaluate on cost benefit perspective. The source and scalability of the idea comes from a multitude of sources raging from gut feeling to market research. Under this variable, various responses were solicited from the respondents. It was observed that the significance for this variable was 0.012 which is lower than 0.05. This indicates a rejection of

the null hypothesis and we can conclude that there is a difference in gender with respect to idea generation and evaluation. Men (Mean = 14.05 and SD = 3.04) scout for ideas more rigorously as compared to their female counterparts (Mean = 13.32 and SD = 2.41). Also, we can infer that men get their ideas from wider sources as compared to women.

- **Idea Screening and Selection**

After generating various ideas, the next task is idea screening to finally arrive upon the "would be"idea and thus beginning the planning stage. The significance value for this variable was 0.002 which means that there is a difference at this level too, between men and women. Men (Mean =

100.98 and SD = 2.41) and women (Mean = 9.94 and SD = 2.15) have significantly different ways. The research indicates that men entrepreneurs use more variety of tools to select their ideas in comparison to women. This could be due to a wider peer network and acquaintances that men may possess, in comparison to women.

4. Is the perception of issues and challenges in doing a business different across gender?

It is a known fact that if an entrepreneur perceives greater challenges in a business, the individualmay refrain from venturing into such an activity. However, if we observe our table then the significance value for this variable is 0.114 which is greater than 0.05. Thus, we accept the null hypothesis and can safely conclude that both the genders perceive issues and challenges equally and that gender has no impact on such perception. Under perception of issues and challenges it would be important to note that certain elements do show a difference of degree based on gender.One such variable was:

- **Perception that Business is uncertain**

The significance for this variable is 0.023 which is lower than 0.05. This indicates that there is difference between the way men and women perceive business uncertainty.

- **Social acceptance of business**

The significance value of this variable is 0.037 which is less than 0.05. This mean there is difference in the way men and women entrepreneurs perceive business from a social perspective. Thus, social and cultural variables influence men and women differently and hence the drive to initiative a business venture differs significant between the genders.

- **Perception of the degree of competition.**

This variable was added to determine of men and women entrepreneurs perceive the competition in a venture separately. Competition is inherent in any business. Any difference in perception can be a contributing attribute towards beginning or not beginning with an entrepreneurial venture. The significance value for this variable is at 0.012 which is lower than 0.05. Hence the there is significant difference in perception of competition across genders. Also, it can be observed that men perceive higher level of competition as compared to women.

- **Government initiative and incentives**

Government of the state and the country generally provide incentives to entrepreneurs for beginning with an entrepreneurial venture. For example, there is concessional finance, subsidies in capital investment, technological upgradation, etc. based on the type and scale of business. The idea is to encourage people to take up entrepreneurial activity which should reduce the impediments in entering a business. The variable given was "Government does not support entrepreneurs". The significance value observed is 0.021 which is less than 0.05 which means that both the genders believe that government initiatives aren't very helpful and that there is no difference of opinion regarding government support across gender.

- **Lack of skilled labor**

Availability of skilled employees or quality of employees is a pre-requisite for the success of anybusiness. Apart from skilled labor, the trust worthiness of employees also plays a major role. Availability of labor is also location specific and is affected by the location of the organization andthe people living nearby. The significance value for this variable is 0.001 which is less than 0.05. This indicates that there is a difference in the way the two genders perceive availability of quality labor.

Also, the it can be said that between Males (Mean=3.16 and SD = 1.01) and females (Mean

= 2.58 and SD = 1.06), the males believe more significantly that there is a lack of good quality employees. This can be attribute to the area of business operations and past experience.

5. Evaluation of Business Performance

- **Performance Measurement**

Taking forward the parameters related to evaluation of business performance about the tools used, it was observed that our p value of 0.137 is greater than 0.05 which means that there is a significant difference in the way men and women measure business performance. Men (Mean = 15.6 and SD

= 2.69) measure business performance is more variety of ways as compared to women (Mean

14.99 and SD = 3.54). On further probing it was observed that men employ more performance measures with respect to different business functions and area to ensure more controls and systematic measures in the organization.

- **Prior knowledge**

The respondents were tested on a Likert scale to affirm a self-rating of their prior knowledge related to various business functions such as finance, marketing, operations, employee management, network creation of suppliers, customers, and financers. It was observed that our p value at 0.135 indicates that there is no difference in the rating of prior knowledge, between me and women.

- **Business Differentiation**

The score for this construct was summed and analyzed. Our p value suggests that there is a difference between genders in the way they differentiate their entrepreneurial venture from the others. In fact, male businessmen (Mean = 13.98 and SD = 2.12) have a higher ability of differentiating their own venture as compared to their female counterparts (Mean = 13.98 and SD

= 1.67)

6. Evaluation of Satisfaction

- **Self-Evaluation**

The respondents were asked to rate their overall level of satisfaction form their business. The data suggests that male entrepreneurs (Mean = 1.45 and SD = 2.71) have a lower level of satisfaction from their business as compared to female entrepreneurs (Mean = 14.98 and SD = 2.71). Thus, the p value indicates that there is a significant difference between genders on this parameter. On probing further, we observed this more due to the higher expectation due the patriarchal structure of our society and also due to peer pressure.

- **Perception about profitability and income**

This variable was used to understand the satisfaction levels of entrepreneurs based on their profits and income. It was observed that there a significant difference in the satisfaction levels of men and women related to their business profitability. Again, Female entrepreneurs (Mean = 3.84 and SD

= 0.85) are more satisfied than male entrepreneurs (Mean = 3.84 and SD = 0.85). This again can be attributed to the fact that men are perceived to play a larger role in proving for the needs of their dependents and also the fact that they are no complacent.

- **Perception about social status**

A higher perception of social respect would foster the a more successful entrepreneurial activity. Our p value indicates that there is a significant difference in the way men and women entrepreneurs perceive social status derived from their business venture. In fact, women entrepreneurs (Mean =

4.04 and SD = 0.759) have a sense of more satisfaction from their business as compared to their male counterparts (Mean = 3.45 and SD = 0.78).

Conclusion

The team size with respect to number of employees at the beginning of the venture and at present does not have any significant difference across gender. Similarly, there is no

difference in the way men and women entrepreneurs perceive overall challenges and issues in business. In contrast to this, there are other aspects where male and female entrepreneurs perceive variables differently such as social acceptability, competition, initiatives by government, availability of quality employees, evaluation and ideation, business differentiation and social status. Thus, in a nutshell, there is indeed a difference in perception between men and women entrepreneurs which eventually impacts the area and scale of business operations. Most of the times, these choices are impacted by societal and cultural limitations and also on education and backgrounds of not only the entrepreneurs, but also the people around them. Probably more initiatives by government and self- help groups could ensure a reduction in gender disparity in entrepreneurship.

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A STUDY ON CUSTOMER SATISFACTION TOWARDS MOBILE BANKING APP OF HDFC BANK IN MUMBAI REGION

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ABSTRACT

The Banking industry is experiencing revolutionary changes. The advancement in Information Technology has made it possible for banks to adopt to various delivery channels for fulfilling the needs of the customers. It is also important to provide services to customers in a highly satisfactory way to not only sustain the existing customers but also add new customers in the highly competitive era. It is determined from the present study that HDFC Bank is able to satisfy its customers by providing a suitable application which is not only easy to use, but also has a suitable design and is also secured. The result of the study determines that the customers are satisfied by the design of the mobile banking application and also its security features.

Keywords: *Mobile Banking, customer satisfaction, security, ease of use.*

Introduction

A continuous up gradation and advancement in technology has made banks venture various possibilities for providing its banking services to the customers to gain competitive advantage and also increase in the market share. The banks have been continuously investing in the infrastructural development to have a better system that can assure customers a quick, secured and economical gateway for transacting. One of the largest advancement in technology that the financial institutions have attempted to take advantage of is the Mobile based banking (Net and Boshoff, 2014). New opportunities have been raised due to the integration of mobile networks and internet, availing banks to have more delivery channels of their services. The mobile banking services provided by the banks will further experience a significant development in their business model (Moser, 2014). Mobile Banking happens to be one such platform that provides anytime and anywhere access to the customers for completing the banking operations. Mobile Banking helps customers to perform transactions and monitor their accounts (Tiwari and Buse, 2007)

Review of Literature

A constant reference is being made by the literature to determine the factors that influence the level of satisfaction in using mobile banking by customers.

The commercial banks in India started providing the online banking system to refrain their customers from getting shifted to foreign banks (Baskar, S. & Ramesh.M, 2010). The customers who adopted internet banking found the services to be more convenient, compatible and better suited to those who were more techno savy (Gerrard, P. & Cunningham, J.B., 2003). The customers who adopted internet banking were found to be more innovative.

Technology alone cannot help a bank to have a competitive advantage in the electronic banking era. As soon as all banks start adopting the online banking system to provide services to the customers, it shall be difficult to consider technology as a point of differentiator. It shall be a need for the banks to provide a personal touch in their operational strategy along with a well-developed infrastructure of safe online banking (Kamadkodi .N. & Ahmed Khan, M.B., 2008).

It is essential that the banks identify the factors that help adoption of mobile banking among customers. The banks should emphasis on making the customers aware about the mobile banking platform and also focus on gaining customer confidence by taking an initiative of providing quality service (Laforet, S & Lo, X., 2005)

The demographic profile of the users were analysed to determine the effect on customer satisfaction of using mobile banking usage of the State Bank of India services. The study also aims to determine the concept of mobile banking services in Indian context. The results of the study showed that the customers were very positive with the mobile banking usage in the Mysore City Ms. Shilpa D. and Dr. Veena K.P (2018).

Initially the customers were required to visit the branches even to check their account balances, followed by which they could than check their balances by using the ATM services. They still were required to visit the ATM counters. Mobile banking is considered to be the best way of providing the service were the customers are not even required to visit the branches for fulfilling such requirements. The customers only need to access the mobile application and check their balances simply by using the Personal Identification Number (PIN), provided by bank at time of registering for the service Mohr, J. (2001).

Statement of Problem

The revolution in IT has put forth a tremendous competition among banks. The Indian banking industry has not only started adopting online platform but also automation for providing immediate support to the customers. The foreign and the private sector banks have an edge to overpower the public sector banks with respect to implementation of technology. The private banks are found to be the early ones to adopt the mobile banking technology. To sustain in the highly competitive sector, it becomes necessary for the banks to not only provide a well-developed infrastructure but also develop strategies in providing value service to the customers to improve their satisfaction and confidence in the bank. The present study is attempted to determine the factors influencing satisfaction of HDFC Bank customers towards use of mobile banking.

Objective of the Study

1. To identify the factors that influence customer satisfaction of HDFC Bank mobile banking users.
2. To study the level of satisfaction of the HDFC Bank customers using mobile banking.

Hypothesis of the Study

The following are the hypothesis of the study

H_0 – HDFC Bank customers are not satisfied with the ease to use mobile banking app.

H_0 – HDFC Bank customers are not satisfied with mobile banking app security.

H_0 – HDFC Bank customers are not satisfied with mobile banking app design.

Research Methodology

The study aims to fill up the significant gaps in customer satisfaction of using the mobile banking application for the HDFC Bank customers. For the purpose of analysis, data was collected from 100 respondents during the Covid-19 pandemic second lock down period using the Google form. The factors affecting the customer satisfaction were already determined through the review and specific and relevant questions indicating the factors were asked. All the responses were found valid for the use of the study.

Limitations of the study

The limitations of the current study are:

1. The study only analysis the customer satisfaction in using the mobile banking application of the HDFC Bank based on the three factors ease of use, security and the app design. There could also be other factors which may affect the satisfaction level which is not considered in the study.
2. The study is conducted during the pandemic period when the moments of the people were restricted and they were forced to adopt the online mode for fulfilling the banking requirements. It may have changed their approach to banking which may not stand true during the normal situation.

Data Analysis and Interpretation

For the purpose of analysis, data was collected from 100 respondents. The period of study was the Covid-19 pandemic second lock down period. The data was collected using the

Google form. The demographic profile of the respondents is as follows:

	Frequency	Percent
Male	41	41.0
Female	59	59.0
Total	100	100.0

Table 1 – Gender

	Frequency	Percent
HSC or Below	7	7.0
Graduate	43	43.0
PostGraduate	45	45.0
Professional	5	5.0
Total	100	100.0

Table 2 – Qualification

	Frequency	Percent
Student	14	14.0
Housewife	14	14.0
Service	46	46.0
Self Employed	24	24.0
Unemployed	1	1.0
Retired	1	1.0
Total	100	100.0

Table 3 – Occupation

	Frequency	Percent
Less than Rs 20,000	4	4.0
Rs. 20,000 to Rs. 60,000	28	28.0
Rs. 60,000 to Rs. 1,00,000	23	23.0
Above Rs. 1,00,000	45	45.0
Total	100	100.0

Table 4 – Family Income (Monthly)

It was essential to check whether the data collected was valid and appropriate for the study. The data was checked using the KMO and Bartlett's test whose results are as follows.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.883
Bartlett's Test of Sphericity	Approx. Chi-Square	849.897
	df	66
	Sig.	.000

Table 5 – KMO and Bartlett's Test

The customer satisfaction variables had a KMO measure of 0.883. A value above 0.7 is considered good for the study. The Bartletts test of Sphericity had a Chi-Square – 849.897 and $p < 0.000$ which was significant. The result of the KMO and Bartlett's test determined that the data has been appropriate for the study.

The first factor comprises of 3 variables whose mean was calculated. A Pearson Chi-Square test was used to determine the significance of the factor Ease of Use, Security and App Design on Customer Satisfaction for using mobile banking

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	201.332[a]	96	.000
Likelihood Ratio	118.583	96	.059
Linear-by-Linear Association	37.281	1	.000
N of Valid Cases	100		

Table 6 – Chi-Square Tests

The Pearson's Chi-Square value is 201.332 and the significance is less than 5% indicating that the Ease of use has a significant relationship on the customer satisfaction

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	238.469[a]	96	.000
Likelihood Ratio	125.117	96	.025
Linear-by-Linear Association	38.932	1	.000
N of Valid Cases	100		

Table 7 – Chi-Square Tests

The Pearson's Chi-Square value is 238.469 and the significance is less than 5% indicating that the Security in using mobile banking application has a significant relationship on the customer satisfaction.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	255.304[a]	96	.000
Likelihood Ratio	148.364	96	.000
Linear-by-Linear Association	46.498	1	.000
N of Valid Cases	100		

Table 8 – Chi-Square Tests

The Pearson's Chi-Square value is 255.304 and the significance is less than 5% indicating that the Application Design has a significant

relationship on the customer satisfaction for using the mobile banking application of HDFC Bank.

Major Findings

The study determines that the factors Ease of Use, Security and Application Design of the Mobile Banking Application of HDFC Bank influence the customer satisfaction. Majority of the customers using mobile banking are satisfied with the services offered. The mobile banking application is found to be suitable to furnish all the expectations of the customers. The design of the application is most suited to the requirements of the customers. The mobile application is updated regularly by the bank to ensure security of the customers while doing any transaction. HDFC Bank is trying to gain maximum customer confidence by providing reliable services to them.

Conclusion

The results of the study show that the design of the application has a significant impact on the satisfaction derived by customers in using mobile banking application. The application should be simple and provide the maximum information. It should not be too complex and need excess efforts for the customers to understand steps to complete a transaction. The Ease of Using mobile banking application also encourages customers to save time spend on visiting the branches. It is also found to be economical for the customers. The Banks provides the best security features to its customers by communicating all necessary information and updates on any technological changes. Still it becomes the responsibility of the customers also to take utmost care while performing any transactions using the mobile banking application.

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ISSUES AND CHALLENGES TO SPATIO-TEMPORAL CHARACTERISTICS OF LAND USE/LAND COVER IN KMC-BOUNDARY OF WEST BENGAL – A REMOTE SENSING-GIS APPROACH

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ABSTRACT

The present analyses will throw critical focus on spatio-temporal dynamics in a selected set of major and minor landuse categories within the urban domain of Kolkata Municipal Corporation from the year of 1990 to 2020. In this Change Detection Analyses; the prime consideration will be on gradual escalation or degeneration in total spatial extent (in Sq.Km) with special reference to forest cover, urban water-bodies and lastly to the impervious concrete surfaces or the built-up areas. Through the algorhythmic application of four different indices namely Normalized Difference Vegetation Index (NDVI), Modified Normalized Difference Vegetation Index (MNDVI), Modified Normalized Difference Water Index (MNDWI) and Normalized Difference Built-up Index (NDBI), this part of research has been accomplished and thereafter spotlight has been projected towards the identification of other minor landuse changes within the city-boundary and here open space, sparse settlement with vegetation, road-surface, canals, water bodies with sparse vegetation in and around the city etc have been given requisite weightage. Apart from that, the histogenesis of the urban unit of Kolkata has also been established with sufficient details in order to corroborate the gradual spatio-temporal changes within the core as well as periphery of the Kolkata Municipal Corporation. It has turned up in the forefront clearly from the research that due to gradual rise in the total population size in the urban arena of KMC, the total built-up area is increasing in a remarkable extent and these concrete structures are rising mainly at the cost of urban blues and urban greens. It is further noteworthy that so far the Natural Vegetation Cover (NVC) is concerned; the greenery has been decreased conspicuously during the course of last thirty years. On the other hand, the urban water bodies or the kidneys to the urban health are also shrinking conspicuously. It can thenceforth be inferred that the urban environmental health is getting compromised day by day. Some recommendations associated with proposed landuse at KMC have also been extended for upgrading the environs of the city successfully.

Keywords: *Natural Vegetation Cover, Urban Water-bodies, Change Detection Analyses, Models in RS-GIS, Urban Blues, Urban Built-up Areas.*

Introduction

Kolkata had served as the capital of India during the British Raj until 1911 and from then Kolkata has become the *Melting Pot* of modern education, science, culture, technology and politics in entire gamut of India. Kolkata witnessed economic stagnation before 1947 but thereafter economic rejuvenation has led to a spurt in the city's growth and it is continuing still now. Kolkata had to bear the brunt of the partition of India with a large chunk of refugees settling in and around Kolkata to avail the benefits of a metropolis and the impact of this on the infrastructure as well as amenities of Kolkata has been clearly visible after so many years. So still now, Kolkata is continuing to struggle with urban problems like poverty, population explosion and subsequent creation of concrete jungles, slums and shanties, traffic congestion, urban environmental pollution on account of deforestation, purposeful obliteration of water bodies and so on and so forth. So many positive steps through planning-measures have been and are being adopted to alleviate these problems. Urban rejuvenation programme has also been initiated to handle the maladies (Banerjee, 1981). Ward Redevelopment Programmes are launched in different sectors and those are getting monitored frequently from the esteemed end of GoWB and GoI. Kolkata is also noted for its revolutionary history ranging from the Indian struggle for Independence to the different movements and uprisings for the rights of common people. Hopefully the current academic input will make the readers enlightened regarding environmental justice and totalistic sustainability related to the prestigious urban panorama of Kolkata.

Study Area

Kolkata City is the area of study in this research-endeavor, the spherical coordinates of which are 22°34'N latitude and 88°22'E longitude and which is now under the jurisdiction purview of Kolkata Municipal Corporation (KMC). KMC was set up in the year of 1896 (previously known as Calcutta Municipal Corporation) with the motto of urban development or *Purashree Bibardhana* that is inscribed on its emblem (Banerjee, 1967). KMC incorporates 141 wards organized into different boroughs and is responsible for the civic infrastructural development and administration of the whole Kolkata city. The study area is located at Eastern India, on the east bank of river Hooghly with an elevation of 9m. It covers an area of 187.33 sq.km with a population of almost 4,476,869 (as per provisional census data of 2011) and an extended metropolitan population of over fourteen million, making it the third largest urban agglomeration and the fourth largest city in India. The city has recorded Negative Growth Rate of 1.88 percent in the last decade.

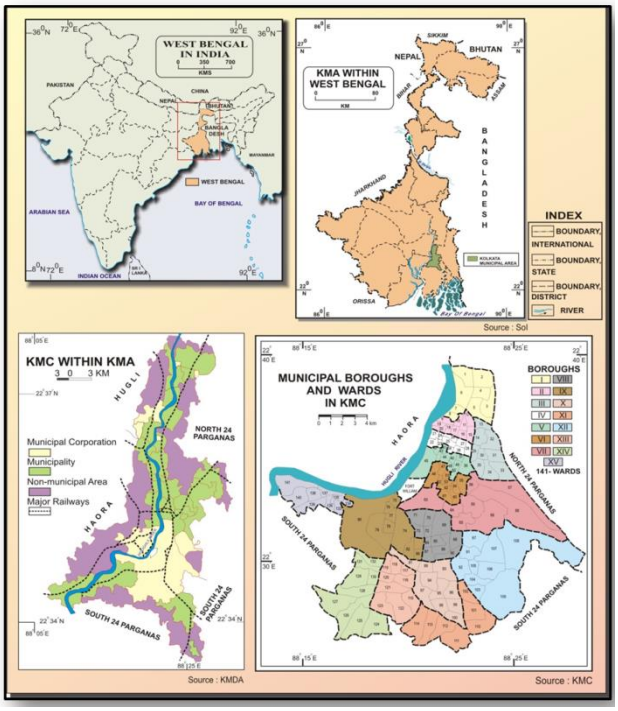


Figure No.-1:- Location Map

Birth of Kolkata

Calcutta has been studied for manifold purposes and in miscellaneous ways through the works of different erudite Urban Geographers and elite Regional Planners. The *City of Joy* i.e. Kolkata has seen the jubillious tercentenary celebration of its own. Kolkata City or previously popular Calcutta was the erstwhile second largest city of the British Empire. Without going into the controversy of the exact date of its birth, the year 1690 A.D. has been considered as the reference or base year for study of its growth as well as sprawl through the maps and literatures available of different time periods. It is a matter of great interest to examine the situation which led to the birth of this colonial town, later city. What were the forces which joined together to make it from a foothold to a stronghold of the British empire in a foreign soil, thousands miles away from Europe? Was it a part of spreading gospel or creating "Little Englands" (Black, 1891) all over the world, or it was flourished simply for trade and commerce? These questions are intricate and will require turning several hundred pages even to give a near-comprehensive answer. In Africa, all these three reasons were possible. In the case of Australia, it became *Lebensraum* for the expanding English population. In India, though towns, hill stations, railway colonies were developed during the colonial period, there was no attempt to colonize the country systematically as was done in the case of Africa or Australia or in other parts of the world. The origin of Calcutta is somewhat linked with the fate of the East India Company. On 31st December of 1600, the Company received the *Royal Charter* granting it the monopoly of Eastern trade for fifteen years. The Company sent Captain William Hawkins to India. He reached Mughal Emperor Jahangir's court in 1609, and in early 1613, the English were permitted to establish a factory in Surat in the west, permanently. This was just a beginning of the colonization process. Following this, Sir Thomas Roe, an ambassador of the King of England was sent to the Mughal Court. He succeeded in getting permission to establish factories in Agra, Ahmadabad and Broach which together were under the control of Surat. Meanwhile the Dutch East India Company (1602) and the French East India Company (1604) were formed. In 1631, Portuguese were expelled from Hugli and in 1604; the English occupied

this place as a first major step in their activity in Bengal (Ghosh, M, 1981). On the other hand, Bombay in the west was transferred to the East India Company by Charles II, who got it from Portuguese as a part of dowry. Earlier, Portuguese settlement started with *Vasco da Gama*'s discovery of India who reached Calicut in 1498 A.D. Portuguese-influence reached Bengal quickly and they virtually monopolized trade and commerce and established settlements at Hooghly and at other places. In 1687, Hooghly superseded Surat and became the principal English settlement, in India. The English establishments grew in other parts of India simultaneously, such as Masulipatam, Madras (Fort St. George), Hariharpur and Balasore. Calcutta was yet to be originated with uniqueness by then. The nearest English settlement by then was Hugli (1651) only and that was followed by Patna and Cassimbazar. In 1658, all the English settlements and factories were brought under Fort St. George in Madras.

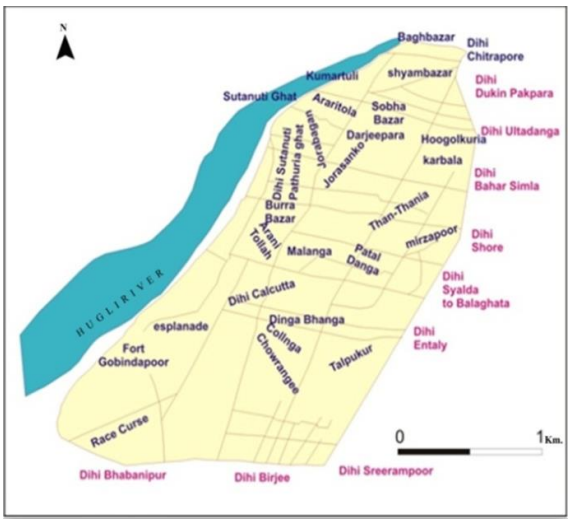


Figure 2:- Old Layout of Calcutta

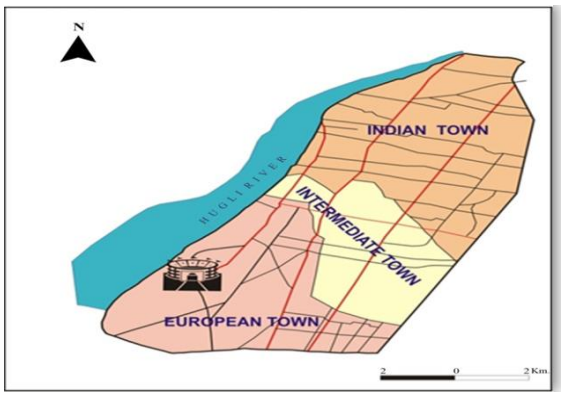


Figure No.-3:- Divisions of Old Calcutta

During this period, India was undergoing rapid genesis that had longing lingering look behind with reference to its political processes. However, such changes paved the way to the English colonization of India and establishment of Calcutta. In Delhi, Aurangzeb's reign started (1658-1707). He became emperor in the year of 1665. In the year 1666, Shah Jahan, the deposed emperor breathed his last. Sivaji became powerful in the Deccan and ultimately became independent. The French took over Pondicherry in 1673, and Guru Govind Singh formed Sikh confederacy (1676-1708). Aurangzeb's army marched southward and annexed Bijapur and Golkunda, but he died in Ahmednagar before he could completely subjugate the Marathas. The East India Company was trying to expand its commerce in Bengal. In spite of all the support from Emperor Aurangzeb, the Company faced problems and had to pay taxes and meet the demands of the local administrators and customs officers (Bose,1978). Due to the above circumstances, the Company had to take a decision to protect themselves by force for which a fortified settlement was necessary. Thus, Hooghly was selected. But hostilities broke out between the Mughals and the Company, and the latter were pushed out from this place to a site near the mouth of the river (Roy, N.R, 1979). Kalabaria, south of Howrah, and Hijli in Midnapore District, were the other abandoned sites of the English settlements in Bengal. In 1687, Job Charnock, a Company agent and chief of the English factory at Cassimbazar, initiated negotiations, and secured permission for the English to return at Sutanuti, a site on the eastern bank of the River Hooghly. Job Charnock arrived on the 23rd of December, 1686, while English settlers arrived at this village on the 20th of March 1686. This was related to the origin of this great city. However, it is claimed that, by then "Calcutta" was an important centre of production and commerce having several satellite villages preoccupied by the cloth manufacturers, when Charnock set his mind on this site. Nevertheless, the hostility between the Mughals and the Company agents persisted, which was stopped after the peace treaty signed between the President and the Council of Bombay and the Mughal Emperor in 1690

(Busteed,1972). Job Charnock returned to Bengal in the month of August in the same year, and established an English factory at Sutanuti. The exact date was 24th August, 1690 A.D. Further, following the rebellion of Sobha Singh, a zamindar in the district of Burdwan, the company got an excuse to fortify the factory in 1696 and in 1698 and ultimately the zamindari of three villages of Sutanuti, Kalikata and Govindpur was granted on a payment of 1300/- to the previous owners. This was how this great city was born in the seventeenth century by the direct initiative of the British colonial imperialists. Calcutta's growth has been very rapid thereafter. Only in last 330 years, it became one of the biggest cities or Megacities of the World (Mitra, 1951). Probably, no other city has a record of such a fast growth. Obviously, there is lots of interesting socio-economic and cultural reasons that are contributing to its growth other than those commonly understood. Its journey from a place of commerce, to the seat of administration and then to a centre of social, cultural and educational activities, is a matter of curiosity to the people who are concerned with Calcutta. So in the last analysis about the birth of this city, it can be said that the land comprising of three villages namely Sutanuti, Govindpur and Kolkata was purchased from Zamindar Sabarna Chowdhury and that land ultimately was transformed into the city of Kolkata (Chatterjee,1965) through various political phases. There are two sets of opinion regarding the nomenclature of the city .As per the first opinion, the name *Kolikata* has been derived from two words like *koli* meaning lime and *Kata* meaning rope of coconut fiber. On the other hand, the second opinion enunciates that the name of *Kalikata* is basically associated with *Kalikshetra* or *Kalighat*.

Spatio-Temporal Growth and Development at Calcutta

Calcutta's growth has been phenomenal by all considerations (Cjowdhury,1990). It is of course a matter of interest to see how a fortified nucleus, basically meant to provide protection to the English population or business, became one of the biggest cities of the world having functional category of services-cum-industry. In the process, the town, later city, underwent several stages ranging from a garrison town to a company town and then to a provincial city and then to the headquarter of the Government of British India. Its loss in the administrative hierarchy by the shift of the territorial headquarters to Delhi was quickly recompensed by the industries which were developing around Calcutta. This city got a major focus during the post World War-I phase of industrialization.

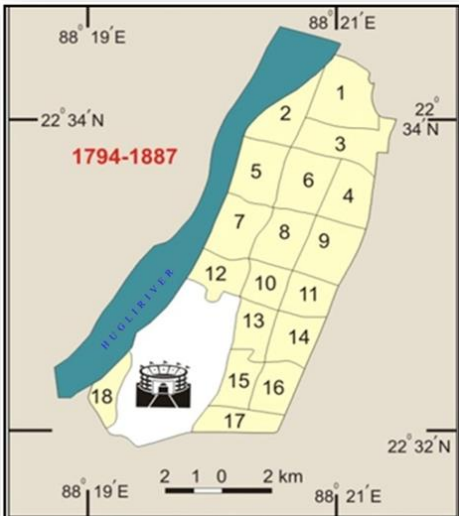


Figure No.-4:- Old Calcutta 1794-1887

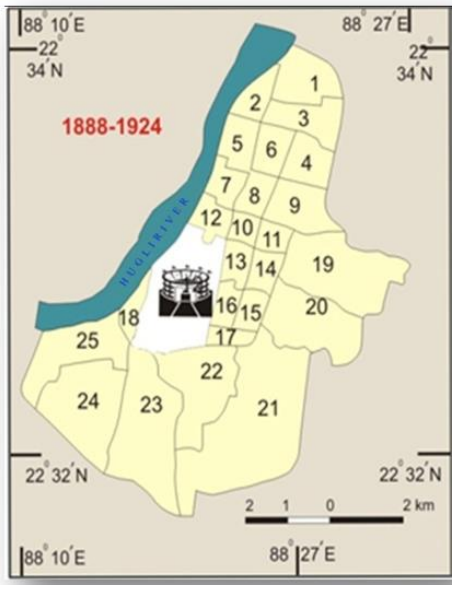


Figure No.-.5:- Old Calcutta 1888-1924

Calcutta has several other faces as well. It has been known for its poverty despite the richest people who dwell over here. It is also known nowadays, as a cynosure of culture, renaissance, films, literature, scientific surveys and other institutions. All the above features have left their marks on the city for quite a long period. Calcutta has been a

conglomeration of institutions, establishments and personalities associated with the aforesaid facets. One of the major contributing factors to the growth of this city is its ever-increasing population. The original people of the three villages namely Sutanuti, Govindpur and Kolkata were shifted to the neighboring areas. The English population and their supporters who inhabited these places were limited in number (Cotton,1980). The data about its spatio-temporal expansion have been collected from various historical accounts which may not be very comprehensive but provide some indication about its growth. Within sixteen years of its inception, (i.e. in 1706), the town had about twenty two thousand persons. In 1735 this number was estimated to be one lakh. Just before the grant of permission from the British Monarchy to administer Calcutta and four years earlier to Nawab Siraj-ud-Daula's victory over the English forces, the population increased to 1,79,917 persons.

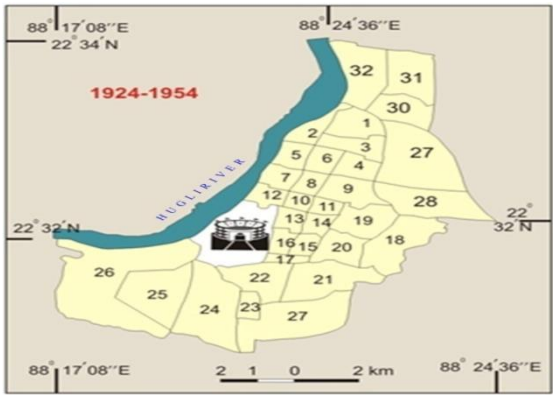


Figure No.-6:- Old Calcutta 1924 -1954

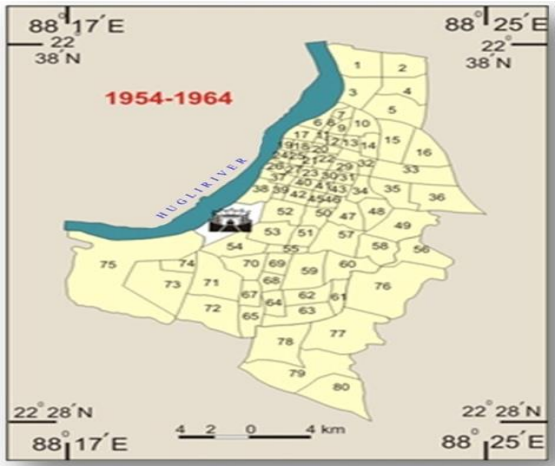


Figure No.-7:- Old Calcutta 1854-1964

The religious break-up of the population for the year 1752 is also available. There were 65.70 per cent Hindus, 26.77 per cent Muslims, and 7.30 per cent Christian .and 0.23 per cent Chinese. In other records, same figures have been mentioned for 1822 as well. From 1901, the census data are available for Calcutta proper, i.e. area under Calcutta Corporation and of the extended Calcutta Urban Agglomeration. The difference between both the figures provides the information about the suburban areas i.e. the area within the urban agglomeration but outside of the boundary of corporation. The Calcutta Municipal Corporation was formed in the year of 1961. The growth of population in Calcutta proper and its suburbs provides an interesting trend. In Calcutta proper, the number of wards has increased from 101 to 141 during the period 1971-91. On the other hand, the census towns in the suburbs increased from 72 to 129. Each of these wards had a different trend of growth but ultimately became part of Calcutta proper or of the urban agglomeration i.e., Greater Calcutta. Cossipore-Chitpur and Maniktola in 1931, Tollygunge in 1961, Garden Reach, Jadavpur and South Suburban in 1984 were merged with the Calcutta Municipal Corporation. Similarly, several towns have become a part of the Greater Calcutta. These towns were under the jurisdiction of district of Twenty-four Parganas (North and South), Hugli, Haora and Nadia in West Bengal. In course of time, some of these towns were split, merged or remained as unaltered. For example, Bally was a separate town upto 1951. In 1961, it was divided into Bally Municipality and Bally Non-Municipal Town. But in 1971, the former merged with the Haora Municipal Corporation which is a part of Calcutta Urban Agglomeration now.

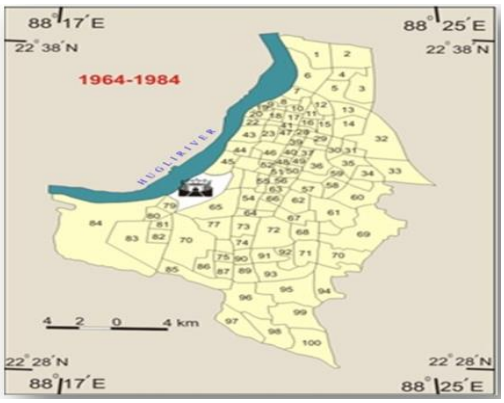


Figure No.-8:- Old Calcutta 1964- 1984

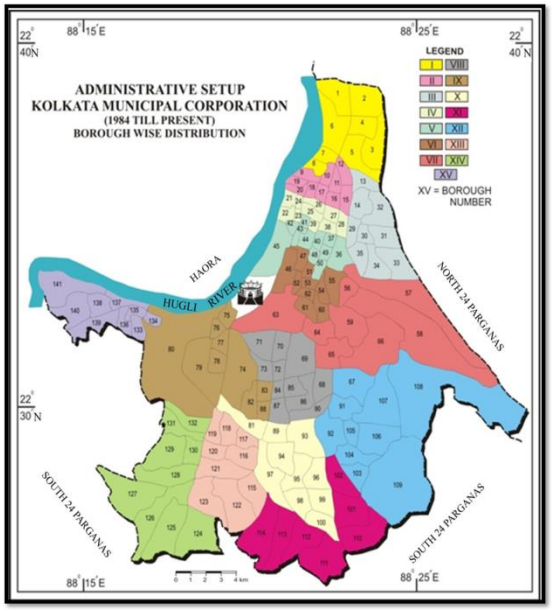


Figure No.-9:- Kolkata city as of now

Ward Development Programme in Calcutta started from the year of 1794. Between the time period from 1794 to 1887, there were only eighteen wards found in the entire territorial limit of Calcutta and thereafter from 1888 to 1924, seven new wards were incorporated within the City of Kolkata. From 1924 to 1954, the Ward Development programme continued in an uninterrupted manner and at the end of 1954, total number of wards in Calcutta was 32 (das,1981). In the next ten years, the ward development was carried on in a very fast pace and at the end of 1964, the total number of wards in Calcutta counted 75. From 1964 to 1984, there was remarkable enhancement in the number of total wards under Calcutta and after 1984; the total wards in Calcutta were 84.From 1984 to 1994, there was a sea-change in the entire cityscape of Calcutta and total 141 wards ultimately gave the recent shape of the city of Calcutta. These 141 Wards or Micro urban units are now distributed under 15 Boroughs. It is also interesting to interpret the growth of the census towns in the suburbs. Some towns follow almost similar pattern as that of Calcutta or of the overall pattern of the suburbs. The Haora Municipal Corporation has a similar trend as Calcutta proper. South Dum Dum resembles with the trend in the suburbs. But, these are exceptions.

During the first phase, i.e. before 1793, the area of the conventional town was developed and area to the east of Sealdah was extended. The other pockets were Body Guard Lines that are now in Ballygunge; a linear stretch in Tollygunge which then was meant for Europeans, a few pockets in Garden Reach and Matiabruze which was of historical importance. The other older nuclei were along the River Hugli, excepting Dum Dum which was an army base. Chitpur, Cossipore, Barranagore, Dakshineshwar, Panihati, Khardaha, Titagarh and Barrackpore are the settlements of this period on the eastern bank of the River Hugli. On the other side, Baidyabati, Serampore, Bally, Haora and other settlements were built-up gradually. Relevant map in Rennell shows several of these settlements. However, the spellings of the place names are pretty different. Fort William and Barranagore on the eastern side and Serampore on the western side of the river were sizeable. The above nuclei and other settlements are now important places and reference points for further growth and development of Kolkata city. The main settlement which was developed during this period and was confined within the River Hugli and the Mahratta Ditch forms the Calcutta district. This area has earlier been referred as the conventional city (Nag, 1986).

In the next phase, settlement had been expanded and made almost a continuum enclosing the conventional city and other nuclei on the eastern side of the river. Matiabruze, Tollygunge, Body Guard Lines in Ballygunge and Barranagore coalesced with the old Calcutta city. The Esplanade or Maidan remained as open space. The built up area increased in other directions as well. Parts of Alipore, Kalighat, Ballygunge, Narkeldanga, Ultadanga and Dum Dum were developed in this period. Linear pattern of settlement emerged along the river in the north with the older nuclei at the intervening distances. Barranagore had a sizeable settlement earlier and the development was relatively more around this definite point. Linear growth was remarkable along the B.T road that is connecting old Calcutta-Naihati Road, running almost parallel to the river. But, such linear development was not continuous. During this period, new nuclei were also developed to the eastern side of the elongated settlement. Dum

Dum Cantonment however remained isolated. On the other side of the river, the linear development was uninterrupted, starting from Botanical Garden to Champdani. The earlier nuclei were Haora, Salkia, Bally, Serampore and Baidyabati and the role of G.T Road is noteworthy here. By the end of this phase, the conurbation was getting a shape though the impact of railways.

The development after 1856 had been multi-dimensional and complex. Several new factors were introduced, such as, the rural settlements in the surroundings, merging settlements, complications in property ownership, increasing proportion of multi-storied housing complexes, transport and communication, sewage, drainage and environmental problems along with in-migrations of all sorts. Some of the above aspects are common planning problems till date. Some are peculiar to Calcutta- its over-crowded roads, frequent power-cuts and shooting land values. The topography has also come in the way of the expansion of the city in certain directions. The social and other amenities get reduced sharply as we go away from the B.B.D. Bag. This is one sort of Distance-Decay function. This is a very important factor in residential decision-making and speculation of the land values. Obviously, certain areas have been preferred to others for all types of uses, ranging from commercial, storage, administrative and even for residential purposes. In several areas, the land is used for all the above purposes. These areas are also well connected through intensive road-networks. During the day time commuters from the suburbs and other parts of Calcutta tend to converge to these well connected places of work. The movement of all types of transport, to these areas has resulted into chronic traffic jam in already limited road space. The most conspicuous event of this period is the introduction of railways on both sides of the river. The settlement started growing all along these railway lines. The railway stations, siding and halts became the new nuclei in the predominantly rural landscape, partially covered with paddy fields. Parallel to the railway lines, the road network was also developed to a mention-worthy extent, in some cases on both sides. Hence, the new, communication lines had organized the settlements with a different orientation, keeping Calcutta as a pivot. A new hierarchy of settlements was sequentially developed during this period which was a transformation as well as metamorphosis of the earlier arrangement. But, after 1947, this system was slashed. The hinterland of Calcutta due to partition of the country was reduced and confined within the new territorial limits of India.

During the first half of this period, Calcutta underwent a unique experience. This was the time when the impact of the Industrial Revolution from the west was felt here along with the renaissance of Bengal. The literary accounts of the writers of this period provide a vivid account of the social, economic and political features of this region, particularly of the rural areas. Zamindari system, revenue collection, poverty, diseases and other social aspects were some of the issues which the noted literary persons took up as their themes. In fact, the best description of the rural scenario is available in the Bengali literature of this period (Losty, 1990).

With the passage of time, particularly by the turn of the century, there was a shift of focus in the contributions. Calcutta and the urban way of life started creeping in the literature. This was the time when film industry was getting its root in Calcutta. Since then, literature, music and films have become a part of Calcutta's culture which has been so much emphasized in recent times as well. In comparison with the cultural revival, the technological impact was no less significant. Apart from having the harbour and railway, trams were introduced which ultimately became an integral part of the city life. On the other hand, new industries developed one after another in and around Calcutta. The intervening spaces were occupied by the industrial estates related to iron and steel, jute, chemicals, ship building, food processing and the like. These industrial complexes engaged labour for whom accommodation was either provided within the estate or to be found elsewhere in the city or in the neighboring arenas. Attempts to reduce pressure of population on Calcutta met with a varying degree of success. When the waterlogged areas of south Calcutta upto Garia

were reclaimed and colonized, quick transportation systems became necessary to meet the continuous demand for the commuters. Well planned Kalyani met with a partial success owing to communication problems with Calcutta proper. The projects like Salt Lake City, Baishnabghata-Patuli townships to the east of the core city, had a greater degree of success due to their proximity to Calcutta. The urban expansion has been in all directions, the exception is in the eastern wetlands. But, with the construction of the Eastern Metropolitan Bye-Pass, this area has also come under the threat of urban expansion. The properties are changing hands very fast along this road. The compulsion arising from population pressure is felt not only in the outer areas, but also in Calcutta proper. The older buildings are being replaced by multi-storied housing and marketing complexes. Such infrastructure demands more energy supply for efficient management of domestic and industrial water supply, elevators, passage-light etc. The roads have been widened to cater the needs of increasing traffic. Underground and circular railways have been introduced to lower the pressure on roads. Even with all these efforts certain parts within the Calcutta Metropolitan area are not yet well connected.

Calcutta's problems are enormous still now. Apart from overcrowded roads and occasional power-cuts, this city is encountered with the problems of water-stagnation, socio-economic marginalization in terms of slums, air, noise and water pollutions etc. Some of the pollutants present are beyond the tolerance limits, as per the opinion of the Calcutta Pollution Control Board. The tercentenary in 1990 was an occasion for retrospection. Where the things, have gone wrong? What are the factors that still attract population even across the international border? How does this city compensate to its inhabitants who undergo the ordeal every day? The answers to these questions will explain why Kolkata will still continue to grow with all its socio-geographic menaces. It has been one of the fastest growing cities in the country. Kolkata certainly has a future. The new policy of *Economic Liberalization* has shown its impact on the city and Kolkata has to take the role of a growth pole in a process of economic transformation. Its hinterland crosses the boundaries of West Bengal to diffuse innovations all over eastern and north-eastern India (Sinha, 1975). Lastly the developmental roles played by the Nodal Agencies or the Local Self-Governments in the city of Kolkata should be mentioned. In order to deal with the urban facility-utility services or governances in Kolkata, first of all, the Calcutta Improvement Trust was built up in the pre-independence period and it was continued even after 1947. And thereafter it was converted into Calcutta Metropolitan Planning Organization (CMPO) but after that to deal with the specific problems of the core city of Kolkata along with its adjacent micro urban units and focal urban areas; the CMPO was transformed into Calcutta Metropolitan Development Authority (CMDA). With passage of time, the urban morphology or the external layout of the city got transformed and therefore the jurisdiction of the Nodal Agencies also changed time to time. In the year of 1961, there were eighty wards in Kolkata city but it was increased to hundred wards plus five aldermen between 1971 and 1981 and thereafter, in the year of 1984, the recent shape of Kolkata City was formed by one hundred and forty one wards.

78.2.3 Physical Backgrounds of the Kolkata City

The city of Kolkata is expanded roughly from north to south along the eastern bank of the Hooghly River and Kolkata stands within the lower Gangetic Delta of eastern India. The city's elevation is between 1.5m–9 m (5ft–30 ft). Much of the city was originally a wetland that was reclaimed over the decades to accommodate a burgeoning population. The remaining undeveloped areas, popularly known as the East Kolkata Wetlands, were designated a "Wetland of International Importance" by the Ramsar Convention (1975). As with most of the Indo-Gangetic Plain, the soil and water are predominantly alluvial by origin at Kolkata. Underlying the city are quaternary sediments comprising of mainly clay, silt, and several grades of sand and gravel. These sediments are sandwiched between two clay beds: the lower one having a depth of 250m–650 m (820ft–2,130 ft); while the upper ones range between

10m and 40 m (30ft–130 ft) in thickness. According to the Bureau of Indian Standards, on a scale ranging from I to V in order of increasing susceptibility to earthquakes, the city falls within the seismic zone III; according to a United Nations Development Programme report, its wind and cyclone zones are of very high damage risk. Geomorphologically, the city of Kolkata is located under the zone of Deltaic Plain, but there are three other distinct geomorphologic zones also noticed in the city of Kolkata. Along the right side of river Hooghly, there is one elongated younger levee stretch and along the eastern and western corner of the city, there are some patches of intermediary marshes and bogs. In the central part of the city, there is one distinct patch of older levee.

The slope map of Kolkata elaborates that its major portion is monotonous plain the gradient of which is near about zero degree and here the elevation is below fourteen metres. The elevation rises gradually from southern part of the city towards its north-western part along the river Hooghly. The elevation riches upto thirty-four metres near the immediate eastern part of the river and as someone proceeds from this region towards the south-western portion of the city, the elevation drops gradually and a gentle slope is found from north-west to south-east.

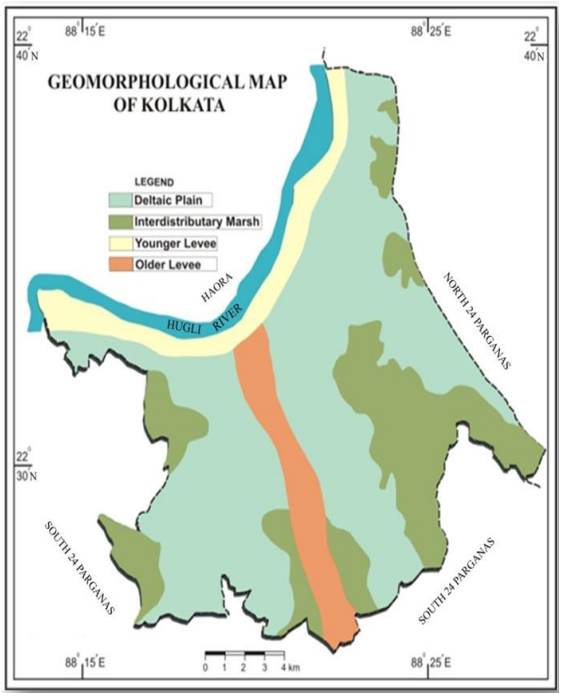


Figure No.-10:- Geomorphology of Kolkata

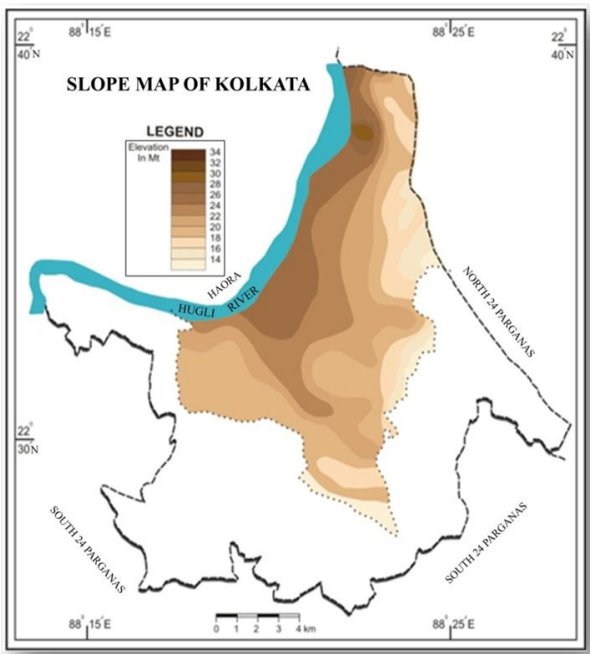


Figure No.-11:- Slope Map of Kolkata

Objectives behind the Study

The major objectives to conduct the research-work are as follows;

- To provide pen-picture on the spatio-temporal dynamics within the city of Kolkata since its inception uptil date based on rigorous literature survey and analyses of historical record.
- To find out Specific Area-based Changes between 1990 and 2020 related to some Major Urban Landuses/ Landcover within KMC and special thrust has been put forth on Urban Greens, Blues and Concrete Jungles i.e. urban browns. Through Digital Image Processing from Remote Sensing Platform, the main analyses are done and thereafter with the help of Geographic Information System, a few spatial layouts are generated.
- To decipher Probable Reasons behind such Drastic Landuse-Changes in Last Three Decades within Kolkata City.

Change Detection Analyses (CDA)

The Kolkata city, spread roughly at North and South along the East bank of river Hooghly lies within the lower deltaic plain of Ganges in Eastern India. Over a long time period, the shape and size of Kolkata have changed significantly along with its major as well as the minor landuse patterns. Gradually, the built-up area of the city is getting expanded in order to

give shelters to large chunk of its growing population and the most striking thing is that the built-up area is getting increased at the cost of greenery and water-body. If the urban greens and urban blues start lowering in their absolute occupancy within an urban spectrum then the surrounding environment of the city core and periphery will get compromised to a considerable extent. The engulfing of urban green spaces and natural water bodies by the impervious surface made up of concrete housings will surely denote urban health-problems in the short and long run. If the ecological sustainability of a specific space comes under serious threat then its all inhabitants get compelled to face its obvious consequences. Urban green is actually like the lungs of a human body. Just like the organ in a person's body, the urban forest covers also purify the adulterated air in the urban areas and in exchanges to that; the greeneries do provide fresh oxygen. The unadulterated air is a regular need of all the urbanites. It not only makes the urban arena serene in its truest sense but also at the same time, it refreshes human mind and body. On the other hand, the urban water bodies can be compared with the kidneys of a living object. Kidneys do filter the blood and keep the body toxin-free. The pure blood helps human body to stay fit and fine for a long time. Similarly, if the urban blues sustain, then the urban landscape will not only stand aesthetically superior but also at the same time, the longevity of all the biota over there, will surely be increased. Through the analyses of satellite images of three different years, it has been noted in this paper that in a sharp manner the built-up area of the city is increasing day by day and the newly added built-up areas are swallowing wetlands and greeneries of Kolkata in a ruthless manner.

Urban Green

Green spaces and other nature-based solutions do extend novel approaches to raise the quality of urban settings and it supports the enhancement of local resilience by promoting sustainable livelihood, improvising both the quality of life and the social well-being of urban residents. Eco-parks, playgrounds, urban agricultural fields, green belts of township or vegetation in public and private places are the mammoth components of these approaches and can usher the followings:

- Urban residents have adequate scopes for exposure in the lap of nature;
- Urban biodiversities in terms of genes, species and ecosystems, are maintained and preserved;
- Environmental hazards and prospective disasters such as air or noise pollution are reduced to a great amount; *f*
- The hazardous impacts of extreme weather events in terms of heat waves, torrential rainfall or devastating flood can be mitigated and the quality of urban living gets quite improved.
- Urban green spaces such as parks, sports fields, woods, lakesides, and gardens do provide people sufficient space for physical activities or exercises, meditation, physical as well as mental relaxation, placidity and a sure-shot escape from the isolated heat-islands .

Urban Blues

Urban water-bodies comprise of the areas of water that does have fresh as well as saline origin. The water bodies can be of large and small types. Urban Wetlands are either getting completely obliterated or contracted from their original shape and size due to tremendous pressures exerted from the residential sectors of the teeming millions. Unplanned urbanization has now been the main culprit for gradual shrinkage of the blue arenas. Urban wetlands and water bodies can reduce overheating of the urban environment due to unusual concentration of suspended particulate matters as well as multiple pollutants in the air. Water bodies with a complex geometric shape can reduce the magnitude of water pollution as well. Urban land use also has a direct impact on the urban microclimate which results in Urban Heat Island Effect (Ahmed 1995). Urban water bodies can play an effective role in microclimatic cooling of the urban area. Apart from the aforesaid qualities, the Urban Blues contribute to drinking of potable water, Washing, Urban Agriculture along with Gardening, Religious and Cultural practices, Ground water recharge etc. The aforementioned contributions from the urban blues in an orchestrated manner add

Midas-touches actually in the urban living. Proper channelization of water from basin may prevent flooding during rainy season. Nourishment of specific Flora and fauna can be done through Urban Blues. So due to paucity of urban blues, not only the environmental pollution will take place but also at the same time, the holistic livelihood of living organisms will face serious warnings.

Databases for the Work

In order to establish the association amongst wiping out of greens and blues from urban arena and addition of impervious surfaces in the urban gamut, rigorous image processing techniques have been used from the remote sensing platform and different models have been applied as well, through assemblages of a set of commensurate algorithms. The data sources on the basis of which, the entire project of CDA have been accomplished are enclosed herewith:-

Table 1: -The Satellite Data

Satellite	Sensor	Resolution	Band	Date of acquisition	Source
Landsat-5	TM	30 m	Multi-spectral	14-11-1990	Glcf.umd.edu/data/Landsat
Landsat-5	TM	30 m	Multi-spectral	18-11-2003	Glovis.usgs.gov
Landsat-5	TM	30 m	Multi-spectral	08-11-2011	Glovis.usgs.gov
Landsat-8	OLI	30 m	Multi-spectral	17.01.2020	Glovis.usgs.gov

Data Source: - Source:http://zulu.ssc.nasa.gov/mrsid/tutorial/Landsat%20TutorialV1.html

Band information comprises of the followings. The intimation regarding different bands of Sensors and their corresponding Electro Magnetic Radiation ranges are presented below in a tabular format.

Table 2:- Landsat-TM Band

Band	µm	Resolution	EMR Range
1	0.45-0.52	30 m	Blue
2	0.52-0.60	30 m	Green
3	0.63-0.69	30 m	Red
4	0.76-0.90	30 m	NIR
5	1.55-1.75	30 m	Mid-IR(SWIR)
6	10.4-12.5	120 m	Thermal
7	2.08-2.35	30 m	Mid-IR(SWIR)

Data Source:- http://zulu.ssc.nasa.gov/mrsid/tutorial/Landsat%20TutorialV1.html

Table 3:- Landsat-8 OLI Bands

Sensor Info: OLI - Operational Land Imager				
Spectral bands				
Band name	Band width from [µm]	Band width to [µm]	Code	Maximal resolution [m]
8 PAN	0.5	0.68	PAN	15
1	0.433	0.453	COASTAL	30
2	0.45	0.515	BLUE	30
3	0.525	0.6	GREEN	30
4	0.63	0.68	RED	30
5	0.845	0.885	NIR	30
9	1.36	1.39	SWIR	30
6	1.56	1.66	SWIR	30
7	2.1	2.3	SWIR	30
Sensor Info: TIRS - Thermal Infrared Sensor				
Spectral bands				
Band name	Band width from [µm]	Band width to [µm]	Code	Maximal resolution [m]
TIR1	10.3	11.3	TIR	100
TIR2	11.5	12.5	TIR	100

Data Source:- http://zulu.ssc.nasa.gov/mrsid/tutorial/Landsat%20TutorialV1.html

Methodology in Details

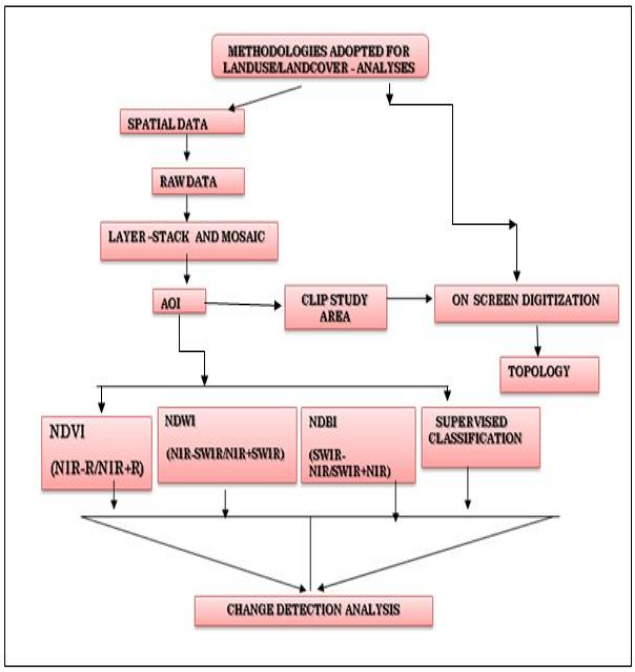
The requisite satellite imageries of study area have been downloaded first of all, from USGS website. Earth Explorer is used mainly for downloading the images of different time periods. With the help of metadata-filter, the noise-amounts are noted initially and thereafter the cloud-free datasets were downloaded. Processing of the imageries and geo-referencing has been done in Arc-GIS software. The enhanced images were classified into different classes using same software-platform. To analyze and detect the change in urban expansion and urban sprawl land use / land cover maps has been done using Arc-GIS software. To determine the changes in land cover and Land-use categories with special reference to natural vegetation, water bodies and built-up areas, three separate indices have been used and those are as follows:

- Normalized Difference Vegetation Index (NDVI)
- Normalized Difference Water Index (NDWI)
- Normalized Difference Built-up Index (NDBI)

The overall methods of model-building for the detailed oriented analyses of urban green, blue and built-up areas, conventional steps have been followed so that realistic output can be

generated for drawing scientific inferences. All the procedures that have been attempted to get the final outputs in RS-GIS Platforms, are corroborated in structured format below , for the ready referral of the inquisitive readers.

Table 4:- Overall Methodology in a Nutshell for CDA

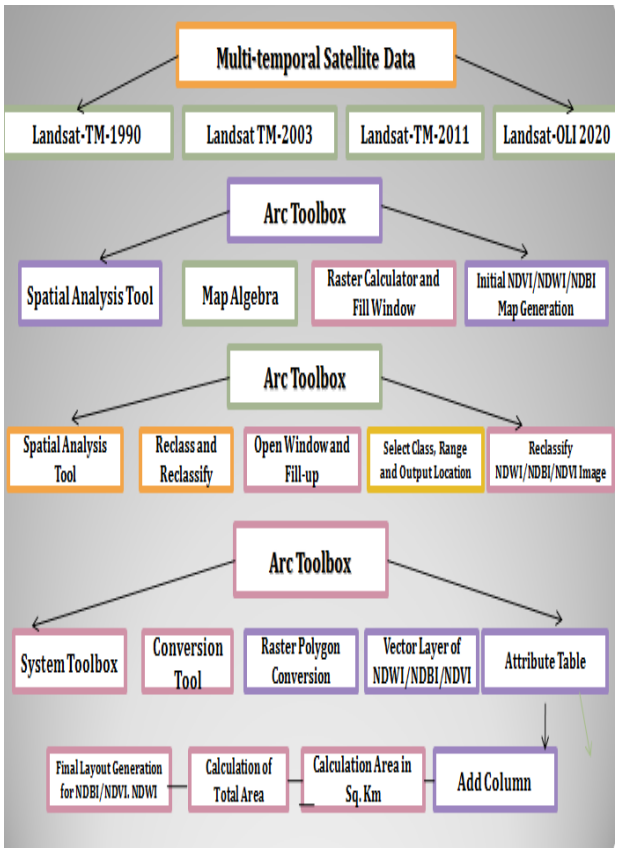


Results and Discussions:-

Normalized Difference Vegetation Index (NDVI)

Vegetation indices among other methods have been a reliable one in monitoring vegetation-coverage and associated micro-level changes as well as anthropogenic modifications into it. One of the most widely used indices for vegetation monitoring is the Normalized Difference Vegetation Index (NDVI) that is calculated on the basis of pixel. The calculation based on normalized difference between the red and near infrared (NIR) bands forms an entire image over here. Here NDVI= (NIR-Red/NIR+Red).These bands are selected because of spectral response of the vegetation which has remarkably high reflectance in near infra-red band while the red band keeps a more or less constant value. The vegetation coverage at Kolkata Municipality for the four years (1990, 2003, 2011 and 2020) using NDVI model have been shown to establish the quantitative change in green cover within KMC.

Table 5:- Stepwise Methodology for Running NDVI/NDBI/ NDWI Models



NDVI information can be utilized for the determination at the level of Chlorophyll content within the leaf-cells. Plant-Health, stress factors and their impact on greeneries and so on and so forth are determined on the basis of NDVI Model. Apart from the aforementioned parameters, harvest planning, cultivation planning, farm-plan development, analyses on manifold plant diseases etc do require intensive usage of NDVI Models and definitely through such extremely useful model, exceptional results or conclusions can be drawn in the respective domains. Canopy coverage, soil typologies, environmental threats, ripening or maturation of crop etc do have thorough reflections on the NDVI Model .As usually like the other two models namely NDWI and NDBI, NDVI model also vacillates between -1 and +1.If the value is nearest to +1, then that will denote healthiest vegetation whereas if the value marches towards 0, then that may be due to compromised vegetation health. On the other side, if the value drops below 0, then that will convey some other landuse and Land covers except greenery.

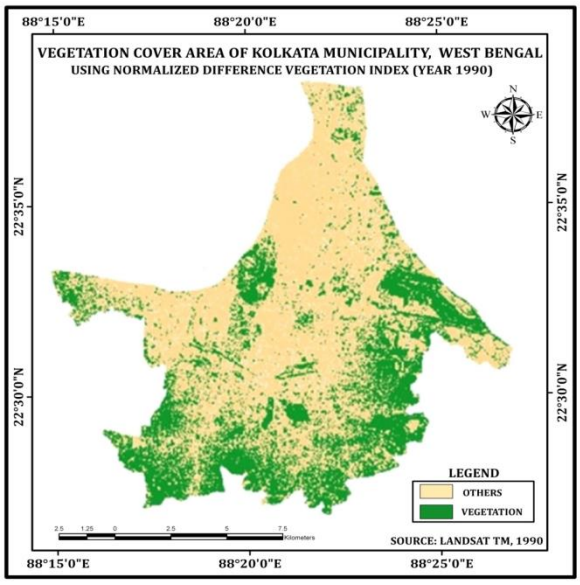


Figure No.-12:- NDVI Model- 1990

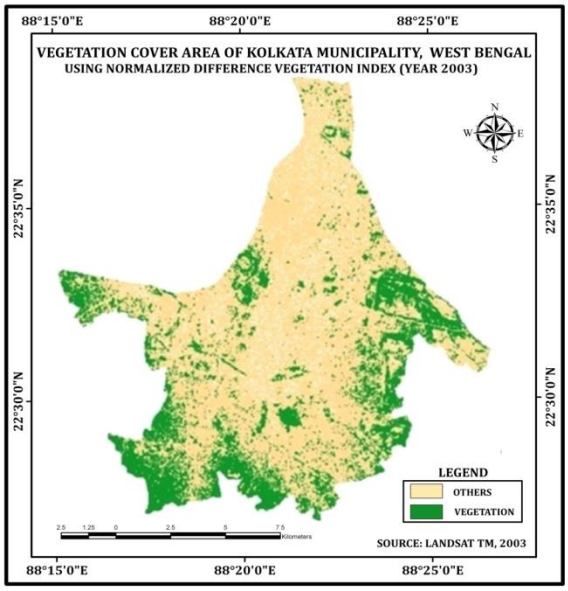


Figure No.-13:- NDVI Model- 2003

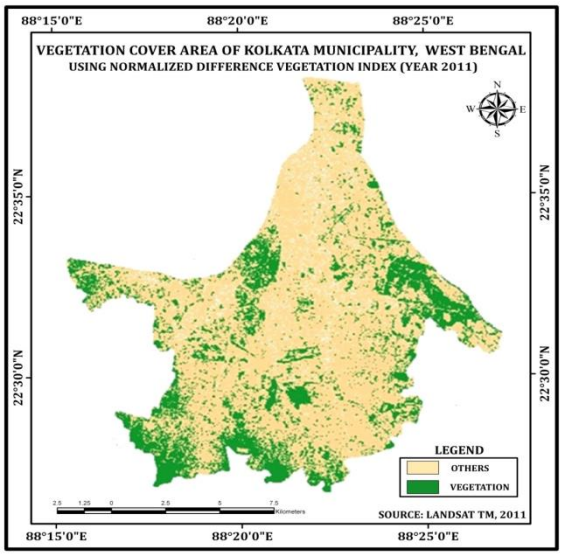


Figure No.-14:- NDVI Model- 2011

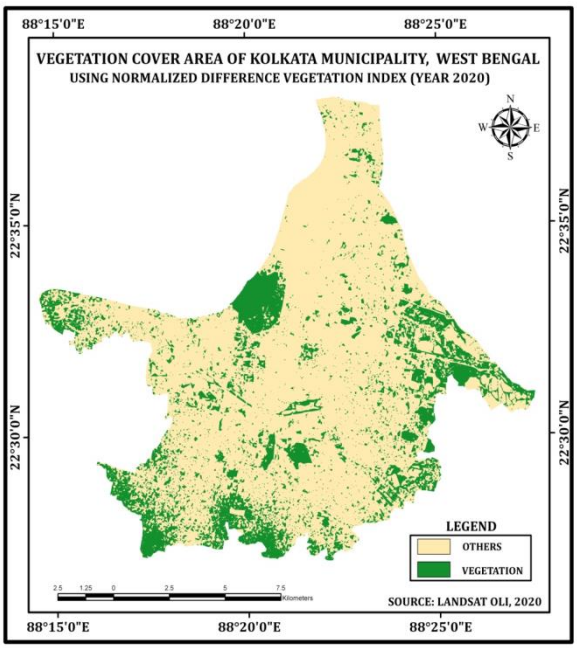


Figure No.-15:- NDVI Model -2020

Decrease in the Vegetated Area From the analyses of four maps regarding vegetation cover in Kolkata, obtained from the map algebra run on the satellite imageries of different years like1990, 2003, 2011 and 2020, it has been evident that the natural vegetation is decreasing with passage of time .With quantitative information, thematic map has also been constructed below in order to substantiate the aforesaid argument. The following figures strongly plead in favour of the decrease in vegetation cover over time and from the figure, it is clear that in the year of 1990, the areal coverage of vegetation was more or less 67.48 Sq.km and in the year of 2003, the figure has been changed into 53.29 Sq. Km in the year of 2003 and in 2011, it has been reduced to near about 44.37 Sq. Km. Lastly, in this year that is 2020, the estimated result has come to be only 38.25 Sq.Km. Definitely the decreasing trend of green resource in an important urban centre like Kolkata is matter of serious concern.

Table: 6 Variation in Area Covered By Vegetation in Sq.km of Kolkata for the Years 1990, 2003, 2011 and 2020

Year	Area Covered By Vegetation (Sq.km)
1990	67.48
2003	53.29
2011	44.37
2020	38.25

Normalized Difference Water Index (NDWI)

The particular algorithm used for this model of image processing is NDWI = (NIR-SWIR/NIR+ SWIR). For accessing the change in blue resources or water bodies over the earth, another index i.e., Normalized Difference Water Index (NDWI) is generally used. Mc Feeters in the year of 1996, set zero as the threshold limit for the ideal application of this model. That is, the cover type is water if NDWI is 0 and it is other than water, if NDWI doesn't stand as zero. In these cases, to denote the other land uses, the researchers do focus on the values that are below the threshold limit of zero. Mc Feeters' NDWI was unable initially to separate built up areas from water bodies and therefore to alleviate this problem, Xu (2006) proposed MNDWI in which SWIR band (Landsat TM band 5) was used. Following maps show the changes in the areas covered by water bodies from the year 1990 to 2020. Decrease in water-bodies gets established clearly over decades, while calculating NDWI.

Table No.-7 Variation in Area Covered By Water-Bodies in Sq.km of Kolkata for the Years 1990, 2003, 2011 and 2020

Years	1990	2003	2011	2020
Area covered by Water Bodies in Sq.Km	12.57	10.18	9.31	7.70

For the calculation of the NDWI Model, in the place of Red Band, the Infra-red ban is taken into consideration and hence the outcome gets reversed. The results from NDWI Equation shows water features that do have positive values whereas soil as well as terrestrial vegetation bears zero or negative values. When the Value will be closest to +1, it will corroborate the high quality of water body or perfect translucency in Water bodies. It actually denotes least pollution in water but if the value drops gradually and turns up towards zero, then Focus will obviously be towards impurity or Turbidity in Water.

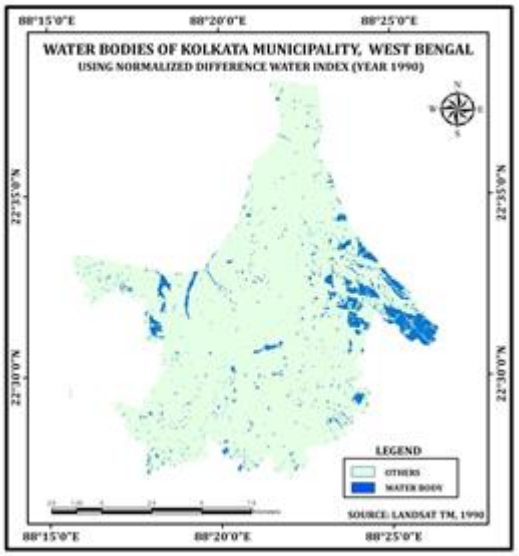


Figure No.-16:- NDWI Model -1990

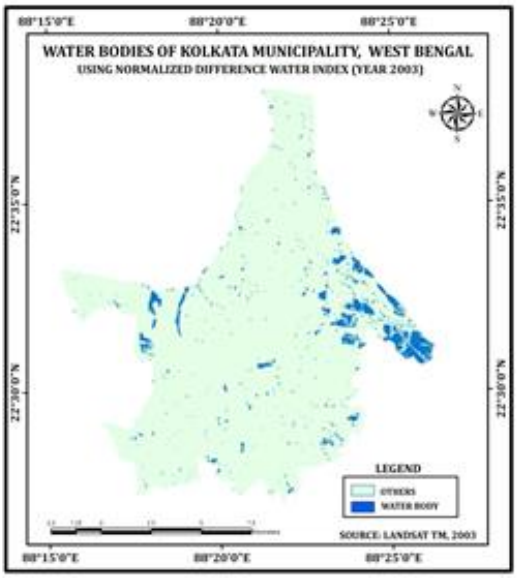


Figure No.-17:- NDWI Model -2003

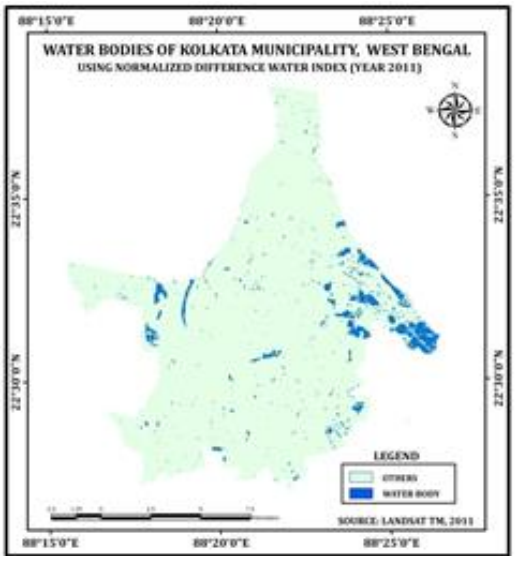


Figure No.-18:- NDWI Model -2011

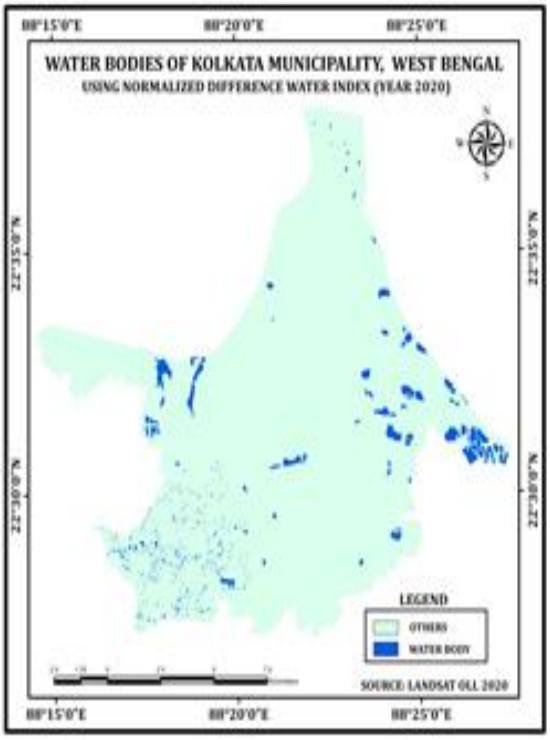


Figure No.-19:- NDWI Model -2020

Normalized Difference Built up Index (NDBI)

Remote sensing images are useful for monitoring the spatial distribution and growth of urban settlements or built-up areas because they can provide timely and synoptic views of urban land cover/landuse at different temporal scales. Although the Normalized Difference Built-Up Index (NDBI) is useful to map urban built-up areas, it still has some limitations. If the NDBI Value stands closest to +1, then definitely it will plead in favour of Intensive Concrete Jungle with almost zero intervention by any urban green and blue but if the value is akin to zero, then that will indicate greater interference by water bodies and plantations. If the value drops below o and comes to be negative then surely that will encompass land uses other than built-up areas. The development of such index was primarily based on the unique spectral response of built-up lands that has higher reflectance in MIR wavelength range than that of NIR wavelength range. This index highlights urban areas where there is typically a higher reflectance in the shortwave infrared region, compared to the near infrared belt. Its application areas incorporate proposed landuse planning predominantly.

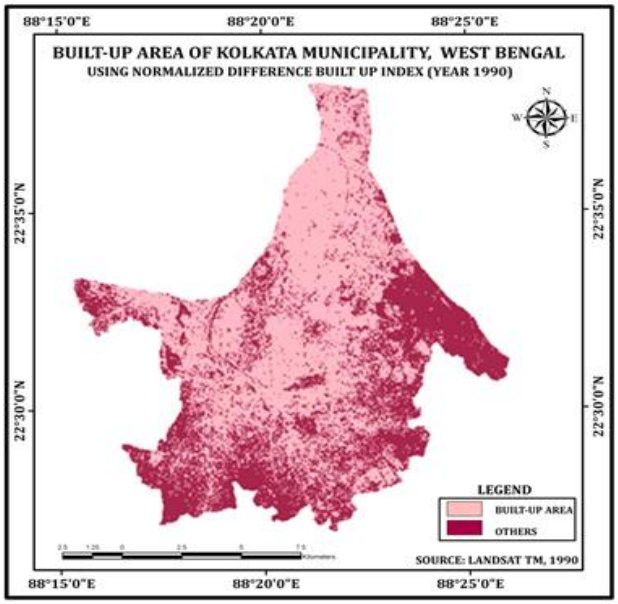


Figure No.-20:- NDBI Model -1990

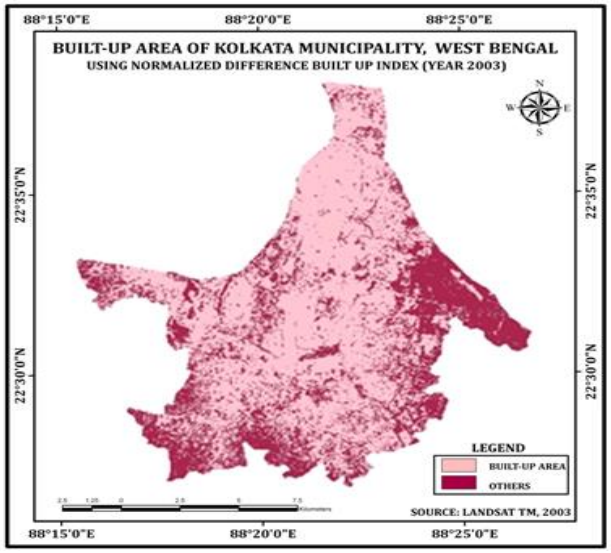


Figure No.-21:- NDBI Model -2003

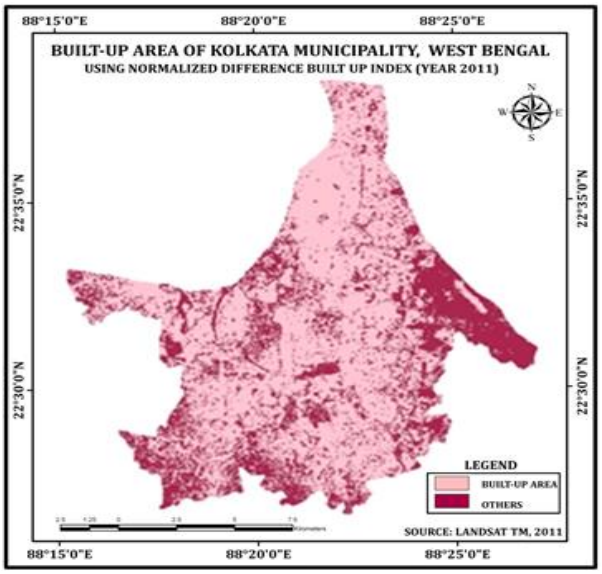


Figure No.-22:- NDBI Model -2011

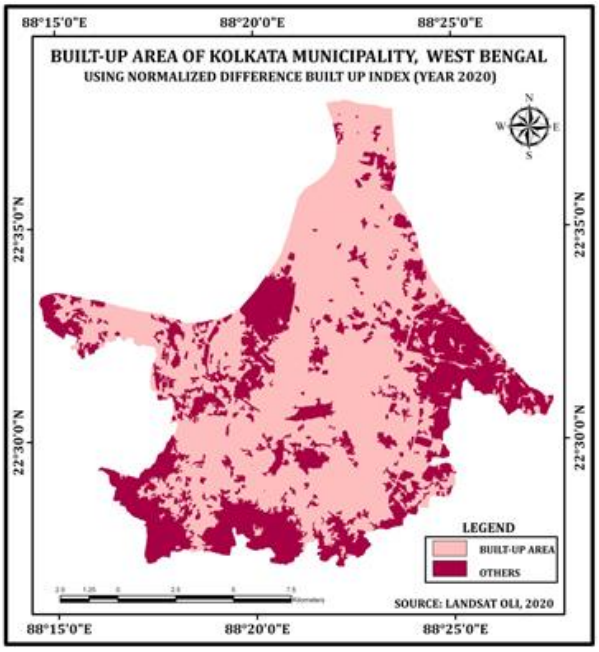


Figure No.-23:- NDBI Model -2020

The dynamics of built up area has been calculated by Normalized Difference Built-up Index (NDBI) in the present research-paper, where NDBI= (SWIR-NIR/SWIR+NIR). Following maps show the changes in the built-up areas from the year of 1990 to 2020.

Table No.-8 NDBI Index Area of Built-Up Premises

YEAR	1990	2003	2011	2020
Area Covered By Built-Up (Sq.km.)	101.84	119.71	128.95	139.79

From the above analyses, it can be assumed that the main reasons for major land use and land cover change in Kolkata municipality is population growth and escalated population has created an unpleasing situation where the existing population surpasses the carrying capacity of land. Here the normal man-land ratio gets severely hampered. The term population always refers to the relationship between the human population and its environment, if seen from the ecological perspective. Overpopulation or supra-optimum population in Kolkata is the cumulative result of numerous factors like increase in births, decline in mortality rates due to success in medical science, progress in modern surgical procedures and high influx of migrants. The rapid increase in population at KMC area over the past three centuries has become the serious issue of academic discussion and as per the environmentalists, this *Premature City* Kolkata may not be able to sustain larger numbers of its inhabitants in future.. Many environmental problems, such as high levels of atmospheric carbon dioxide, global warming and pollution have been aggravated due to the population-rise in KMC. Other problems associated with overpopulation in the city include the increasing demand for resource potentials such as fresh water and food, starvation and malnutrition, consumption of natural endowments faster than the rate of their regeneration and totaslistic deterioration in overall living conditions.

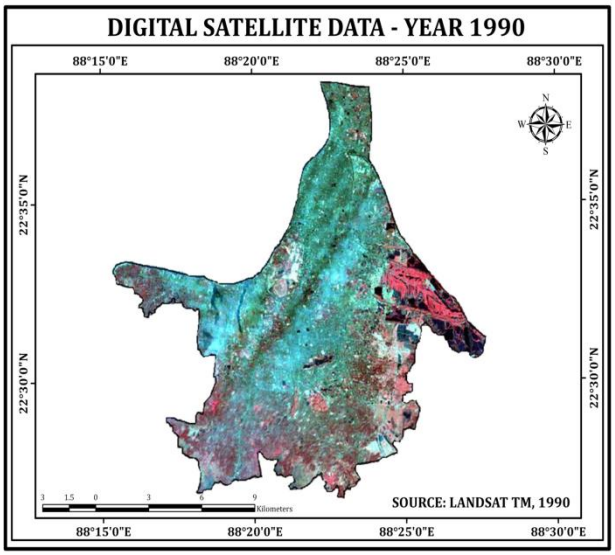


Figure No.-24:- Satellite Image 1990

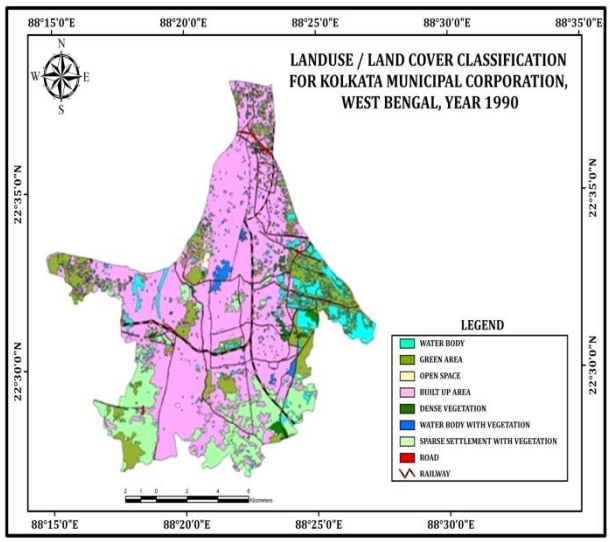


Figure No. – 25:-Land use and Land Cover Map for the Year 1990

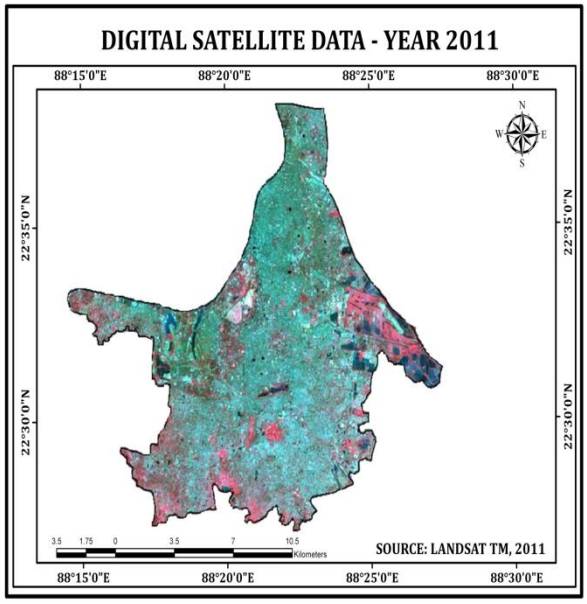


Figure No.-26:- Satellite Image 2011

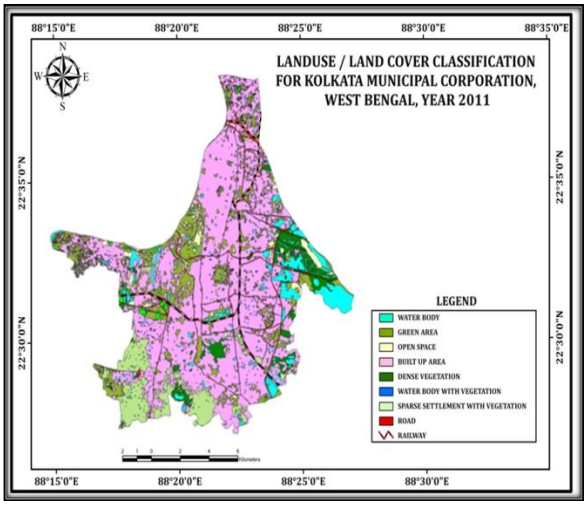


Figure No. – 27:-Land use and Land Cover Map for the Year 2011

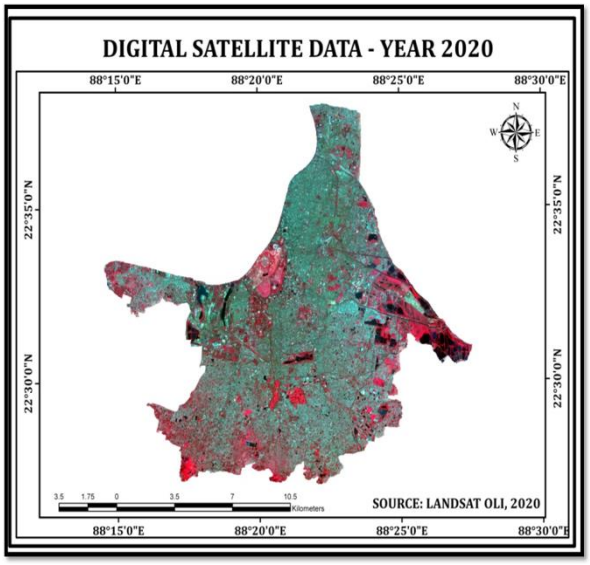


Figure No.-28:- Satellite Image 2020

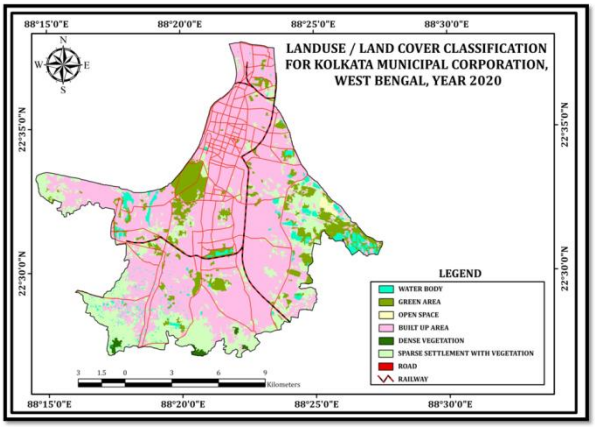


Figure No. – 29:-Land use and Land Cover Map for the Year 2011

In 1971, during Bangladesh Liberation War, it was estimated that around 10 million East Bengali refugees entered India of whom 1.5 million stayed back over here after the political independence of Bangladesh. As the refugees from East Pakistan belonged to the same cultural background of the city's intelligentsia, they demanded their rights and they settled almost forcefully in the areas akin to affluent South Kolkata and they formed a typical neighborhood that is quite different from North Kolkata. So immediately after the Independence, Government introduced careful planning intervention in order to resolve the city's unprecedented urban growth. For this reason particularly, the Basic Development Plan (1966-86) was introduced by KMDA (under the influence of Central and State Government) in an emergency basis. The Block Development Plans proposed a By-Polar model thereafter in which Kolkata in the south and Kalyani in the north were supposed to act as the main growth centers for rapid urbanization.

Analyses on Major and Minor Landuses from Satellite Images of Different Time-periods

Total three of the original satellite images on the basis of which, the aforementioned analyses have been accomplished, are given below and along with these images, the entire land use and land cover maps for the city of Kolkata in different time-periods have also been presented. From these holistic analyses, the fact will become unveiled once again that the growing population in Kolkata is

responsible for the gradual obliteration of the natural endowments within the city in terms of water body and urban green. In order to get rid of this severe natural imbalance, several planning initiatives have been undertaken by Government in the city that encompass afforestation programmes, creation of green belts of the township, designing of community-parks and gardens, clearing of the choked water bodies, excavation of canals and beautification through greeneries along their two sides and so on and so forth.

Especially the western and south-western parts of the map of Kolkata for the year of 2011 show dense greenery than that of the map of 2003. But so far the natural vegetation cover is concerned, the greenery has been decreased from 2003 to 2011 and the quantitative figure is also shown above. The newly grown vegetation is planted manually to upgrade the environmental quality of the city and this afforestation programme was undertaken in public and private partnership. It added man-made greens in some parts of the city. After the introduction of the concept of urban green in the urban studies, this type of plantation programme has got special relevance to the urban planners. Apart from the three major land uses, there stand significant changes in other minor land uses. Open space has also been reduced to a large extend between 1990 and 2020. In land use planning, urban open space connotes the areas for parks, green spaces etc and other open areas in addition to that. The landscape of urban open spaces can range from playing fields to highly maintained environs. They are commonly open to public access, however, urban open spaces may be privately owned as well. Areas outside the city boundaries, such as state and national parks as well as open space in the countryside, are not considered as urban open spaces. Streets, plazas and urban squares are not generally defined as urban open space in land use planning. As the built-up areas in KMC are climbing in leaps and bounds, therefore it's quite natural that the total extent of this land use will go down gradually over decades in the Kolkata city. Canals, roads and other anthropogenic land uses that are pretty akin to urban constructions have also been increased at Kolkata from 1990 uptil date. Sparse settlement with vegetation and water body with vegetation are also diminishing within the boundary of KMC day by day. Here also the reason is quite clear. As the developers are making built-up areas for accommodation of larger population, therefore the vegetation cover needs to be cleared and water bodies require to be filled up. Now in a comprehensive manner, the landuse and Landcover change in the urban scenery at Kolkata has been enunciated below. Not only have the quantitative changes been pointed out beneath but also at the same time, the scientific explanation behind the same has been enumerated clearly.

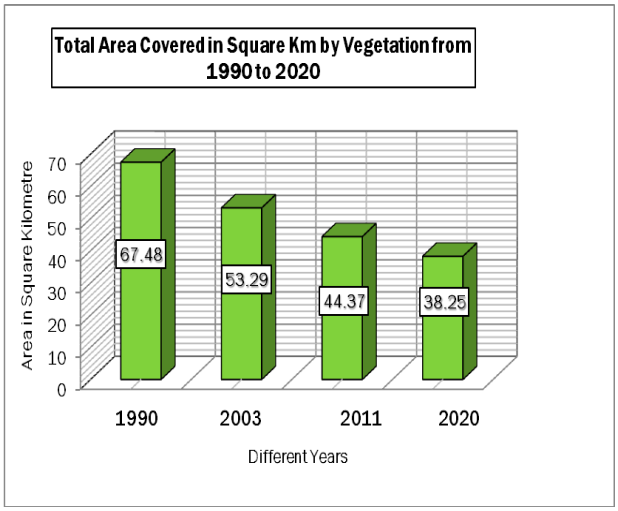


Figure No. – 30:- Change in Vegetation-cover

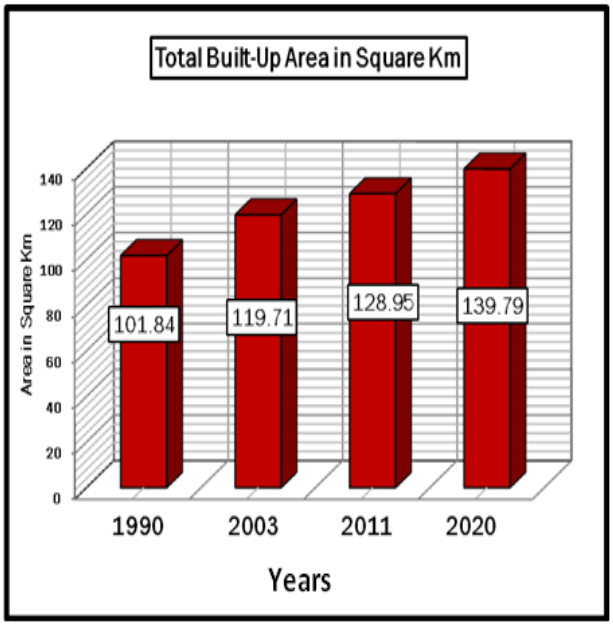


Figure No. – 31:- Change in Built-up Area

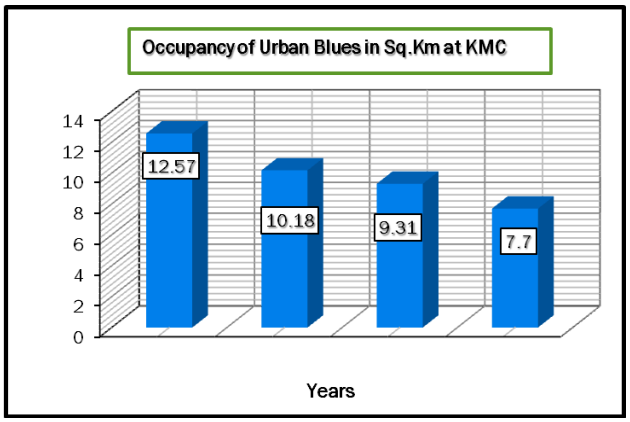


Figure No. – 32:- Change in Urban Water-bodies

Table No.-9 Overall [illegible] 1990 2003 2011 2020 Platform

Landuse Categories	Occupancy in Sq.Km for1990	Occupancy in Sq.Km for 2020	Escalating or Diminishing	Reasons behind such Occurrences
Built-up Area	101.84	139.79	Escalating (+37.26 %)	Shrinkage in Urban Greens and Urban Blues
Green-Area	67.48	38.25	Diminishing (-43.44%)	Expansion of Built-up Areas
Urban Blue	12.57	7.70	Diminishing (-38.74%)	Expansion of Urban Concrete Jungles

Conclusion

Kolkata is the Cultural Capital of India. This urban unit is popularly known as the City of Processions or the City of Palaces. This city of joy has also been the home to luminaries such as, Subhash Chandra Bose, Mother Teresa and Satyajit Ray and so on and so forth. Urban planners are concerned always about proposed landuse planning within this city. After the launching of different programmes of urban renewal and urban redevelopment, this type of discussion has been encouraged. Renewals and renovations connected to transport networks; commercial places, apartments or residencies, rejuvenation of the historically significant places etc are of paramount significance nowadays. From that point of view, this definite research will make the academic fraternity in Geo-Environmental studies, pretty enlightened.

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EFFICACY OF ADAPTED SIMPLIFIED ACTIVITY BASED LEARNING (SABL) IN MATHEMATICS FOR THE CHILDREN WITH VISUAL IMPAIRMENT AND HEARING IMPAIRMENT

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ABSTRACT

The children get their first opportunity to meet people from different religious societies, statures and also children with disabilities. Students are taught basic lifetime skills like reading, writing, spelling, interpersonal communication and concentration, good study habits and the academic careers of the children gets shaped through the primary education. When a child with a disability enters into the main stream education, it is the responsibility of the school to empower itself to satisfy the educational needs of all the children. A research was carried out to find out the difficulties faced by the hearing impaired and the visually impaired students in the primary schools undergoing instruction through 'Simplified Activity Based Learning' in Coimbatore District of Tamil Nadu, India. The system has been adapted and the efficacy tested. The results reveal that the adaptations ensured equal educational opportunities to the children with hearing impairment and visual impairment.

Keywords: *SABL, Activity Based Learning, Hearing Impaired, Visually Impaired, Inclusion, Math Achievement of Hearing Impaired, Hard of Hearing, Profound Hearing Loss, Math Achievement of Visually Impaired, Low Vision Children, Totally Blind, Adapted Math Instruction, Sign Language instruction, Adapted Mathematics, Math instruction in Braille*

Introduction

A man can function effectively in a society id and only if he undergoes education. It acts as an agent of social change. All round development is ensured through education. It is rather an indispensible component of human lives. It also serves on a tool for national development.

Education of children with special needs is called special education. The unique needs of these children are addressed through this individualized educational plans (IEPs), adaptive equipments, access, adapted teaching aids and a systematic plan and management of resources are involved in special education. The intervention are developed to elevate the learners achieve self-sufficiency and become independent in their school, home and society. The special education ensures elevation in the quality outcomes than that of the typical classroom education for children with special needs.

Rationale of the Study

The key feature of the ABL method is that it uses child-friendly educational aids to foster self-learning and allows a child to study according to his or her aptitude and skill; it hopes to change the face of primary education. Through innovative teaching methods and by actively involving the children in the learning process, this initiative has caught the imagination of both teachers and students alike. The UNICEF-supported ABL venture, first undertaken by the Chennai Corporation in 13 schools on a trial basis in 2003, has been adopted by all the 270 primary schools in the district, transforming the way thousands of children are taught every day. Under the Government of India's Sarva Shiksha Abhiyan (SSA) scheme - which envisages universal elementary education for children in the 6-14 age group. Schools in Tamil Nadu have been included in the system, bringing the total number of schools using Activity Based Learning to 4,000. Under the system, the curriculum is divided into small units, each a group of Self Learning Materials (SLM) comprising attractively designed study cards for English, Tamil, Maths, Science and Social Science. When a child finishes a group of cards, he completes one `milestone'. Activities in each milestone include games, rhymes, drawing, and songs to teach a letter or a word,

form a sentence, do maths and science, or understand a concept. The multi sensory approach ensures learning. The challenges of the children with special needs require different stimuli than that of the non disabled children. This important aspect is neglected in the ABL system. It has to be revamped to accommodate the needs of these children with special needs. There are different needs of adaptation for different type of disabilities. Hence a study is planned in this direction and intends to bring conducive atmosphere for the affected learners.

OBJECTIVE

To find out the efficacy of the adapted SABL in Mathematics for Children with Visual Impairment and Hearing Impairment

METHODOLOGY

The difficulties faced by the students with hearing impairment and visual impairment in accessing the SABL system in Mathematics have been identified and respectively adaptations were made. The SABL cards were adapted and the teachers were sensitized towards the use of the adaptations. Through Quasi Experimental design, 40 hearing impaired students and 40 visually impaired students undergoing primary education from 1st to 4th standard in and around Coimbatore district were randomly selected.

Different strategies were followed for the visually impaired and the hearing impaired children. Adapted SABL cards were prepared and the teachers were sensitized towards the specific needs of the sample and were explained in detail about their role in utilizing the adapted cards and facilitating Math learning. The non disabled peers were also motivated to support the children with special needs. The formative and summative assessments pronounced in the SABL system were considered for checking the Math achievement among the sample. The first test (formative assessment) of the term was considered as the pre test and the last test of the term was considered as the post test of the term..

RESULTS AND DISCUSSIONS

The Table below presents pre and post tests of all the 3 terms of the sample.

Table 1 : Pre post analysis of Math achievement of the sample

Disability- all-All STDs	Pre test FA(a+b) 1		Post test FA(a+b) 4		t value	Level of significance
	M	SD	M	SD		
Term I	10.15	0.36	13.33	0.9	31.18	*
Term II	10.61	0.49	15.38	1.05	38.151	*
Term III	14.76	1.38	18.81	0.94	20.45	*

The investigator felt the need for adaptation of the existing Math SABL cards for the children with hearing impairment and visual impairment. A total of 80 samples were drawn consisting of children with low vision, total blindness, hard of hearing and profound deafness from the grades I, II, III & IV. Separate adaptations were carried out based on the requirements observed. The adapted SABL cards were supplied to the schools of the selected sample with due instructions and demonstrations to the special and regular teachers. The progress of the children were duly monitored and supported. The concepts were arranged in an order and each concept is introduced, and strengthened through drill and practice with the help of child friendly activities. The SABL system spells out a system of evaluation that consists of 4 tests for each term. The first and the last tests of the term were considered as pre and post tests. On the whole, all the children could greatly benefit from the adaptations carried out. The results further reveal that even with the level of difficulty increasing from term to term, the children could withstand the academic pressure with the support of the adapted SABL cards and progress. Looking at the pre & post test means, we shall conclude that the Math achievement of the sample was improving drastically and thus the adapted SABL system in Math is found to be effective.

Pre Post Test Analysis for CWVI for all Grades - Term wise

The pre test of the CWVI is compared with

post test in table 2 to check the difference

Table 2: Pre Post Test Analysis for CWVI for all Grades - Term wise

CWVI - All Grades		Pre test FA(a+b) 1 (out of 20)		Post test FA(a+b) 4 (out of 20)		t value
		M	SD	M	SD	
Term I	TB (19)	10.26	0.45	13.95	0.91	15.93*
	LV(21)	10.24	0.44	13.62	0.50	23.50*
Term II	TB(19)	10.74	0.45	15.21	0.63	25.25*
	LV(21)	10.67	0.48	15.48	1.12	18.08*
Term III	TB(19)	14.47	1.17	19.79	0.42	18.67*
	LV(21)	14.67	1.24	18.57	0.98	11.30*

*** - Significant at 5 per cent level**

The investigator felt the need for adaptation of the existing MathSABL cards for the children with visual impairment. A total of 40 samples were drawn consisting of CWLV & CWTB from the grades I, II, III & IV. On the whole, all the children could greatly benefit from the adaptations carried out. The results further reveal that even with the level of difficulty increasing from term to term, the children could withstand the academic pressure with the support of the adapted SABL cards and progress. Looking at the pre & post test means, we shall conclude that the Math achievement of the CWVI was improving significantly.

The pre post test analysis is carried out for each term in the table above to find out the efficacy of the usage of the adapted Math SABL cards for the CWVI. In all the three terms the performances of the CWVI have progressed considerably with a statistical significance of 95% confidence levels. This pronounces the efficacy of the adapted Math SABL cards for the CWVI.

Hence the null hypothesis stated as **"there is no significant difference between the achievement in Math of CWVI before and after the introduction of adapted Math SABL cards"** is rejected denoting that the adapted Math SABL cards had an impact on Math achievement of the sample.

Pre Post Test Analysis for CWHI

The table 3 presents pre and post tests of all the 3 terms of the CWHI.

Table 3 Pre Post Test Analysis for CWHI

CWHI - All Grades		Pre test FA(a+b) 1(out of 20)		Post test A(a+b) 4 (out of 20)		t value
		M	SD	M	SD	
Term I	HOH (23)	10.09	0.29	12.91	0.79	16.11*
	CWD (17)	10	0	12.82	0.88	13.18*
Term II	HOH (23)	10.52	0.51	15.13	1.18	17.20*
	CWD (17)	10.53	0.51	15.76	1.09	17.91*
Term III	HOH (23)	15.17	1.27	18.39	0.89	9.97*
	CWD (17)	14.65	1.84	18.59	0.62	8.37*

*** - Significant at 5 per cent level**

Most of the Math SABL cards were supported with pictures. Hence most of the Math SABL cards were HI friendly. Only a few cards were in need of adaptation in terms of picture support and fragmentation of sentences. The mental math and life math sums were to be supported with the step construction. Apart from these, the linguistic limitations due to loss of hearing were preventing them from acquiring the mathematical concepts even with the help of the materials provided with the SABL system.

Therefore, the investigator prepared a list of key words supporting the concept attainment for the CWHI from grade Ito IV. This list was transferred to sign language cards. These cards were containing signs for the specific key word with the relevant English and Tamil captions. The key words were provided in Tamil and the

explanations on making the signs were in English, only to support the teachers to facilitate the children with proper instruction and usage of the cards. Both CWHOH &CWD were given same adaptations, but their performances were analysed separately since their amount of loss varied greatly.

Irrespective of the amount of loss, all the children could progress well from the pre test to the post test and the difference were of statistically significant.

Hence the null hypothesis stated as **"there is no significant difference between the achievement in Math of CWHI before and after the introduction of adapted Math SABL cards"** is rejected denoting that the adapted Math SABL cards had an impact on Math achievement of the sample.

This result concludes with a report by Mani,M.N.G (2007) that the use of Activity Based Learning materials such as picture cards, are boon to children with hearing impairment. The gap in the existing system is thus bridged through the preparation of picture cards for word problems to foster fullest possible achievement in Math through inclusive classrooms.

CONCLUSION

The adapted SABL is of great use for the children with hearing impairment and visual impairment in progressing with the term portions with due understanding and speed. This spells out that the adapted SABL cards in Math could really bridge the gap raised due to disability and help in the real academic inclusion by the provision of equal educational opportunities.

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A COMPARATIVE STUDY TO ASSESS THE EFFECT OF BALLOON THERAPY VERSES INCENTIVE SPIROMETRY IN PROMOTION OF RESPIRATORY FUNCTION IN CHILDREN WITH BRONCHOPNEUMONIA ADMITTED IN PRH LONI (BK)

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ABSTRACT

Respiratory diseases are very common in children, especially the bronchopneumonia. It's one of the leading causes of morbidity and mortality in young children. In India acute respiratory infection is one of the major causes of childhood death. This study is to assess effect of balloon therapy v/s incentive spirometry in promotion of respiratory function among children with bronchopneumonia thus the investigator intended to conduct the study with the objective of promotion of respiratory function of children with bronchopneumonia admitted at Pravara Rural Hospital, Loni Bk.

The study design quasi experimental two group pre-test and post-test design was used. 30 children from the age group of 6-12 years with bronchopneumonia were the samples in this study. In both interventions the pulmonary function got improved along with routine treatment admitted at Pravara Rural Hospital, Loni (Bk). The sample consisted of 30 children with bronchopneumonia. Sampling techniques used for the present study was Non probability method, purposive sampling technique. A proforma was prepared to collect the data. Descriptive statistics were used to analyze the data according to objectives.

The results of the study revealed that majority (67%) of them had bronchopneumonia common in the preschooler age group (up to 6 year). It is commonly among male (60%) than female (40%).Highest percentage (53 and 80%) of patients founded commonly in rural area. Nearly half 13(87 and 93%) of the patients under study had acute type of bronchopneumonia.

The researchers found balloon therapy seems more effective in reducing respiratory symptoms in children with respiratory problems in comparison with spirometry. As the data supports balloon therapy is more effective than spirometry. During the data collection process, the researcher experienced that balloon therapy was more acceptable among children as it is a part of their normal routine play activity and excitement to explore blowing balloons and few children expressed anxiety and fear towards spirometry. So, the researcher strongly suggests approaching the hospitalized sick children with acceptable form of innovative therapeutic regimen for their complete participation in their health care.

Keywords: *Balloon therapy, Incentive spirometry, Bronchopneumonia.*

Introduction

A child is unique individual, he or she is not a miniature adult, not a little man or women. The childhood period is vital because of socialization process by the transmission of attitude, customs and behaviour through the influence of the family and community. Family's cultural and religious belief, educational level and ways of living influences the promotion and maintenance of child health. Children are major consumers of health care. In India about 35 per cent of total population are children below 15 years of age. Good health of these precious members of the society should be ensured as prime importance in all countries. As said by Karl Menninger "What is done to children they will do the society "Children are the wealth of tomorrow. [1]

Infection of the respiratory tract are described according to the anatomic area of involvement. The upper respiratory tract, or upper airway consist of the or nasopharynx, the pharynx, the larynx and the upper part of the trachea. The lower respiratory tract consists of the lower trachea, main stem bronchi, segmental bronchi, sub segmental bronchioles, terminal bronchioles and the alveoli. Information of the child's respiratory status is obtained from observation of physical signs and behaviour. Respiration, the configuration of the chest, the pattern of respiratory movement depth effort expended in respiration and use of accessory

muscle of respiration should be assessed. Respiration is best determined when the child is sleeping or quietly awake. [2]

Acute infections of the lower respiratory tract may be diagnosed in children of all ages; they tend to occur most frequently in young children who have not yet developed resistance to infectious disease. The infections that occur during the childhood include asthma, bronchitis and pneumonia. Infection and inflammation of the lungs is particularly troublesome and is seen in many different forms in children. Other illnesses that occur in the lower respiratory tract, such as wheezing associated lower respiratory infections, asthma and pneumonia[3].

Statement of problem

A comparative study to assess the effect of balloon therapy verses incentive spirometry in promotion of respiratory function in children with bronchopneumonia admitted in PRH Loni (Bk)

OBJECTIVES

1. Assess the pulmonary function before implementing balloon therapy and incentive spirometry
2. Assess effect of balloon therapy v/s incentive spirometry in promotion of respiratory function among children with bronchopneumonia
3. Compare the effect of balloon therapy and incentive spirometry among children with bronchopneumonia with the selected demographic variable

MATERIALS AND METHODS

Research design and approach

The design and approach used for the study was a quasi-experimental study where pretest and posttest only design with control age group approach

Study variables

- **Independent variables:**

In this present study, the independent variable was balloon therapy and Incentive spirometry

- **Dependent variables:**

In the dependent variable is physiological parameters such as respiratory rate, respiratory sound, air entry, chest expansion, SPO2, capillary refill time (CRT), type of breathing, cough and sputum

- **Extraneous variable**

Demographic variables like Age, gender, schooling, type of family, residence, birth order, immunization status.

Clinical characteristics like Previous history of hospitalization, Duration of hospitalization, Associated illness, Immunization status for pneumonia, Type of bronchopneumonia, Treatment of bronchopneumonia.

Setting of the study

The site for the present study was pediatrics ward (No:16 &17) of Pravara Rural Hospital, Loni which has 30 each bedded unit located at second floor of Pravara Rural Hospital, Loni(Bk).

Sample

Samples for the present study was the patients who were undergoing treatment in bronchopneumonia and admitted in pediatrics ward of Pravara Rural Hospital, Loni BK.

Sample size

Sample size was comprised of total 30 bronchopneumonia patients in which 15 mothers were in balloon therapy group and 15 mothers were in incentive spirometry group.

Sampling techniques

Non probability Purposive sampling was used in the study.

Criteria for selection of sample

Inclusion criteria: The study includes children

1. Both male and female children between the age group of 6 to 12 years.
2. Who are admitted with bronchopneumonia.
3. Whose parents are permitting to participate their children in the study.

Exclusion criteria: The study excludes the children

1. The children with Bronchopneumonia who are actually ill unable to participate
2. Those who have high risk of infection
3. With any oral surgery.

Method of data collection

Structured questionnaire was prepared to collect data from undergoing treatment of bronchopneumonia while considering study objectives.

Development of the tool and technique

The tool was prepared in the form of Structured questionnaire is to assess the effectiveness of balloon therapy verses incentive spirometry in promotion of respiratory function in children with bronchopneumonia. The steps used for preparing tool.

A) Preparation of blue print

The blue print of items pertaining to the Assessment of physiological parameters and before and after therapy was prepared as per the objective and theoretical framework.

B) Consultation of experts

The tool was given to the expert in various fields such as department of pediatrics nursing, language experts and statics.

C) Preparation of final draft

Description of the tool

The tool consists of the following sections

Section A: Part-I: - Demographic Performa of child with bronchopneumonia includes age, gender, schooling, type of family, residence, birth order, immunization status.

Section A: Part-II: - Includes clinical profile of childlike Previous history of hospitalization, Duration of hospitalization, Associated illness, Immunization status for pneumonia, Type of bronchopneumonia, Treatment of bronchopneumonia.

Section A: Part-III: - Socio Demographic Profile of Parent like age in years, gender, socioeconomic status.

Section B: physiological parameters such as respiratory rate, respiratory sound, air entry, chest expansion, SPO2, capillary refill time(CRT), type of breathing, cough and sputum

Validity

Content validity of the observational checklist and intervention was established by consultation with expert like department of obstetrics and gynecology, statistics and language expert. the tool was modified according to suggestion and recommendation of expert.

Reliability

Reliability of the tool were be established by using inter rater reliability method, on Bronchopneumonia children's who were admitted in Pravara Rural Hospital Loni B.K other than sample area.

Pilot study

After the approval from the concerned authority. Pilot study was conducted on 10 bronchopneumonia child admitted in pediatric ward of Pravara Rural Hospital Loni B.K other than sample who fulfil the inclusion criteria's. It was carried to identity the practical difficulties and technical flaws in the research methodology and dada collection procedure. After completion of pilot testing there were no difficulties found.

DATA COLLECTION

Ethical consideration

The written approval by the institutional ethics committee (IEC) Institutional research committee (IRC) of Pravara Institute of Medical Science (DU), Loni The Written permission was obtain from the medical superintendent, HOD of pediatric department of Pravara Rural Hospital. PIMS/CIN/ 2016/ 04/01/2018). prior to collection of data written permission was obtained from undergoing treatment of bronchopneumonia patient before participated in the scientific work.

Data collection procedure

1) **Pre test** –The informed consent will be obtaining from the samples, followed by the pre test will be conducted on the first day admission of patient in the pediatric wards with the help of physiological parameters of

pediatric patient between balloon therapy and incentive spirometry.

Implementation of balloon therapy:

A Balloon is a small, thin, rubber bag that you blow air into so becomes larger and rounder or longer. Identify patient, wash hand, sit on the edge of your bed if possible, or sit up as far as you can bed, hold the balloon loosen the balloon by stretching it in all directions. fixed attach to small pipe (children can easy to handle balloon and proper breath as long as possible) in an upright position., place the mouthpiece in your mouth and seal your lips tightly around it, breathe in slowly and as deeply as possible, hold your breath as long as possible. Then exhale slowly, Rest for a few seconds and repeat steps one to five at least 10 times every four hour, after each set of 10 deep breaths, cough to be sure your lungs are clear, after completing the procedure replace the article

Implementation of incentive spirometry:

An incentive spirometer is a device used to help improve lung function and prevent atelectasis, identify patient, wash hand, sit on the edge of your bed if possible, or sit up as far as you can bed, hold the incentive spirometer in an upright position, place the mouthpiece in your mouth and seal your lips tightly around it, breathe in slowly and as deeply as possible. Notice the first cylinder rising toward the top of the column. The yellow indicator should reach the blue outlined area, hold your breath as long as possible. Then exhale slowly and allow the piston to fall to the bottom of the column, rest for a few seconds and repeat steps one to five at least 10 times every four hour, position the boll indicator on the left side of the spirometer to show your best effort. Use the indicator as a goal to work toward during each slow deep breath, after each set of 10 deep breaths, cough to be sure your lungs are clear, after completing the procedure replace the article.

3) **Post test**- The post test was conducted on the day of discharge for both the groups with the help of physiological parameters of pediatric patient.

RESULTS

Socio demographic data of child: Percentage wise distribution of bronchopneumonia children according to their age group about 10 (67%) samples were in the age group of preschooler (up to 6 year) belonging to both therapies,5(33%) sample was in the age group of schooler (7 to 12 years) belonging to both therapies, hence it can be interpreted that the Preschooler age groups were commonly affected with the bronchopneumonia.

Percentage wise distribution of bronchopneumonia patients according to their gender depicts that 9(60%) samples were in the male belonging to both therapies group, 6(40%) sample was in the female belonging to both therapies group, it interprets that the bronchopneumonia is common among males than the females.

Percentage wise distribution of bronchopneumonia patients according to Schooling depicts that 11(73%) samples were in the yes belonging to balloon therapy group, 8 (27%) samples were in the yes belonging to incentive spirometry group, 4(53%) sample was in the no belonging to balloon therapy group, 7(47%) sample was in the no belonging to incentive spirometry group, it interprets that the maximum bronchopneumonia child having present schooling status.

Percentage wise distribution of bronchopneumonia patients according to residence depicts that 8(53%) samples were in the rural belonging to balloon therapy group, 12 (80%) samples were in the rural belonging to incentive spirometry group, 7(47%) sample was in the urban belonging to balloon therapy group, 3(20%) sample was in the urban belonging to incentive spirometry group, it interprets that the bronchopneumonia children's belonging to rural area.

Percentage wise distribution of bronchopneumonia patients according to immunization status depicts that 13(87%) samples were in the complete immunization belonging to balloon therapy group, 15 (100%) samples were in the complete immunization belonging to incentive spirometry group, 2(13%) sample was in the incomplete

immunization belonging to balloon therapy group, it interprets that the immunization status complete in bronchopneumonia children.

Table No-1: Pretest assessment of physiological parameters of balloon therapy and incentive spirometry among children with bronchopneumonia

SR	PHYSIOLOGICAL PARAMETERS		Balloon therapy	Incentive spirometry
1.	Respiratory rate	<18	15	15
		18-28	0	0
		>28	0	0
2.	Respiratory sound	Wheezing	6	8
		Rales	3	3
		Rhonchi	4	3
		Stridor	2	1
		Normal	0	0
3.	Air entry	Bilaterally equal	6	8
		Unilaterally equal	9	5
		Not Equal	0	2
4.	Chest expansion	2-5 cm	0	1
		< 2 cm	15	14

The above mention table depicts that in balloon therapy group maximum respiratory rate is 18-28 on day of discharge (14 children), maximum respiratory sound is normal is on day of discharge (14 children) in balloon therapy, maximum air entry is Bilaterally equal on day of discharge (14 children) in balloon therapy, maximum chest expansion is 2-5 cm on day of discharge (14 children) in both therapies.

Table No-2: Pretest assessment of physiological parameters of balloon therapy and incentive spirometry among children with bronchopneumonia

SR	PHYSIOLOGICAL PARAMETERS		Balloon therapy	Incentive spirometry
1.	SPO2	<90%	1	1
		90-99%	14	14
2.	Capillary refill time (CRT)	<5 second	14	13
		>5 second	1	2
3.	Type of breathing	Apical	1	1
		Base (full)	14	14
4.	Cough	Wet/productive	3	1
		Dry	11	12
5.	Sputum	Green	0	0
		Mucopurulent	0	0
		Hemoptysis	0	1
		No sputum	12	12

The above mention table depicts that in balloon therapy group maximum oxygen saturation 90-99% on day of discharge (14 children) in balloon therapy, maximum capillary refill time (CRT) <5 second on day of discharge (14 children) in both therapy, maximum type of breathing is Base (full) on day of discharge (14 children) in both therapy, maximum cough on day of admission (12 children) in spirometry, maximum hemoptysis sputum on day of admission (12) in both therapies.

Table No-3: Findings related to assessment of effect of balloon therapy and incentive spirometry on physiological parameters and comparison of pre-test result of balloon therapy and incentive spirometry.

	Mean	SD
Balloon therapy	4.69	4.90
Incentive spirometry	4.73	4.59

Paired t value - 2.073873, P value- 0.78838

The above mention table depicts that in balloon therapy mean ±SD (4.69±4.90) and incentive spirometry mean ±SD (4.73±4.59)

Table No-4: Findings related to assessment of effect of balloon therapy and incentive spirometry on physiological parameters and comparison of post-test result of balloon therapy and incentive spirometry.

Therapy	Mean	SD
Balloon therapy	5.13	6.40
Incentive spirometry	5.08	6.13

P value- 0.78838

The above mention table depicts that in balloon therapy mean ±SD (5.13±6.40) and incentive spirometry mean ±SD (5.08±6.13)

DISCUSSION

Description of socio demographic data of bronchopneumonia child

A higher number of male subjects (60 or 57.7%) than female patients (44 or 42.3%). It was consistent with the study conducted by Zec SL, Selmanovic K who aslo noted that majority (37.5 %) of the bronchopneumonia child are seen in the age group of Preschloor (upto 6 years) of age.[4]

Most (26% and 46%) of child not started schooling.it was concurrent with the study carried out by Das SM, Nayak GR Who also noted that (23% and 35%) of the patients under study had educational experience.[5]

In both group higher percentage (73% and 53%) were belongs to nuclear family, these finding were well supported with the finding of Sreeletha S. who also observed in both group (75% and 90%) were belongs to nuclear family.[6]

Most (86% and 100%) of the patients were complete immunization, these finding were well supported with the finding of Das SM, Nayak GR who also observed in both group (90 and 100%) were complete immunization.[5]

Description of clinical profile of bronchopneumonia child

Higher percentage (73% and 73%) of were present previous history of hospitalisation, it was consistent with the study conducted by Das SM, Nayak GR who also observed in both group (95% and 97%) were present previous history of hospitalisation.[5]

In both group (73% and 70%) of were admitted <5 days, it was consistent with the study conducted by Das SM, Nayak GR who also observed in both group (70% and 75%) of were admitted <5 days.[5]

Description socio demographic profile of parent

Higher percentage (80% and 80%) of were lower<5 socio-economic status, these finding were well supported with the finding of Das SM who also observed in both group (90%and 94%) were lower<5 socio-economic status.[5]

Assessment of physiological parameters of balloon therapy and spirometry

In balloon therapy pre and post treatment differences are found statistically significant. Pre and posttest of respiration rate, respiratory sound, chest expansion (27.43 ± 01.98) and p value were 0.0001. This is well supported study conducted by Rafaqat A et al. to compare between Balloon Blowing Exercise and Incentive Spirometry in Patients with Chest Intubation after Trauma.[7]

Most (73% and 67%) were oxygen saturation, these finding were well supported with the finding of Ginsburg AS who also observed in both group (80% and 84%) were oxygen saturation.[8]

The present study also supported to the study finding of Renuka K. et al. to assess effectiveness of balloon therapy on respiratory status of the patient with lower respiratory tract disorders. There was a highly significant improvement in the pretest and posttest respiratory rate (P <0.001).[9]

This present study finding (50%) supported to the study finding of Arunima Sreeletha the study finding reveals that after giving balloon therapy there was a reduction of (45.0%) in abnormal breath sound and (57.9%) in use of accessory muscles during coughing. It shows that there was a significant improvement in respiratory status of children with lower

respiratory tract infection after balloon therapy.[6]

CONCLUSION

The conclusion drown from this study is that the effect of balloon therapy verses incentive spirometry in promotion of respiratory function in children with bronchopneumonia. The result highlight that the balloon therapy was effective in promotion of respiratory function in bronchopneumonia children which was stastically significant. It was evident that there was significant positive relationship was excited between the respiratory rate, respiratory sound. It was emphasized that the promotion of respiratory function.

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ACUTE PHASE REACTANT C REACTIVE PROTEIN AND ITS ROLE IN INFLAMMATORY DISORDERS

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ABSTRACT

C-reactive protein (CRP) is a marker for inflammation. CRP is produced in the liver and is measured through blood test. CRP is classified as an acute phase reactant because its levels will rise in response to inflammatory process. Other common acute phase reactants include the erythrocyte sedimentation rate (ESR) and blood platelet count. The reference range for C-reactive protein is CRP: 0-10mg/L and High-sensitivity CRP (hs-CRP): < 3 mg/L. The main causes of increased CRP and other markers of inflammation observed in burns, trauma, infections (pneumonia or tuberculosis), heart attack, chronic inflammatory diseases (lupus, vasculitis, or rheumatoid arthritis), inflammatory bowel disease and certain cancers. More importantly, the CRP level can provide additional information about an individual's cardiovascular risk in conjunction with other known cardiac risk factors, such as, diabetes mellitus, hypertension, hyperlipidemia, hyper triglyceridemia, obesity, advanced age and smoking cigarettes. The elevation of CRP is linked to atherosclerosis and heart disease. Hs CRP appear within one to two days of acute myocardial infarction, peak at 3 days and become negative after seven days. CRP decreased in exercise, weight loss, moderate alcohol consumption, medications like statins, niacin and fibrates. CRP may remain high for at least three months following acute myocardial infarction. Failure of CRP to return to normal signifies tissue damage in the cardiac or other tissues.

Keywords: *Immune system activation; hypertension; endothelial dysfunction inflammation process, C-reactive protein*

Introduction

Inflammation is the immune system's natural response to illness and injury. Our body protect from foreign invaders like bacteria and viruses in bloodstream by inflammatory chemicals. In the healing process a localized inflammatory response play a critical role, when you are injured. Inflammation is two types namely acute and chronic. It is predicted by some that acute inflammatory process is the "good" kind because it helps us heal while chronic inflammation is bad process because of its association with chronic disease. Researcher has show that chronic inflammation plays a role in several health conditions, including heart disease; type 2 diabetes, cancer, and Alzheimer's disease [1]. CRP (C-reactive protein) is an acute inflammatory protein that increases up to 1,000-fold at sites of inflammation or infection. Inflammation can be classified as either *acute* or *chronic*. Acute inflammation is the initial response of the body to harmful stimuli, and is achieved by the increased movement of leukocytes (in particular granulocytes) and plasma from the blood into the injured tissues. A series of biochemical events propagates and matures the inflammatory response, involving the local vascular system, the immune system, and various cells within the injured tissue.[2] Cells in innate immune system produce reactive oxygen species (ROS), such as Hydrogen peroxide and superoxide and, which aimed at killing pathogens. ROS production increases during long-term inflammatory process, which causing oxidative stress, which leads to endothelial dysfunction.. C-reactive protein is initially discovered in 1930 by Francis and Tillet while investigating the sera of patients suffering from the Pneumococcus infection in acute stage and was named for its reaction with the capsular (C)-polysaccharide of *Pneumococcus*.[3] In the presence of calcium, C - reactive protein binds to polysaccharides such as phosphocholine (PCh) on micro-organisms and activates C1q which triggers the classical complement pathway of innate immunity.[4] It

is a homopentameric acute-phase inflammatory protein, a highly conserved plasma protein.

Meaning of inflammation-

Localized reactions namely redness, warmth, swelling and pain as a result of infection, irritation, or injury.

Types of Inflammation –

Chronic and Acute inflammation have different symptoms, causes, fate and outcomes.

Chronic Inflammation-

Chronic, long- term inflammation can last for year or even an entire lifetime. It often begins when there is no illness or injury present and lasts far longer than it should. Scientists know that over time chronic inflammation causes major changes to the body's organs, tissues and cells. But they don't know why chronic inflammation happens, as it doesn't seem to serve a purpose like acute inflammation. Research has found as association between wide variety of serious condition and a chronic inflammation. [5] Keep in mind that there is a major difference between two things being one thing causing another and associated. Chronic inflammation is one of several contributing factors in progression and disease onset. So far, the strongest link between heart disease and chronic inflammation and disease has been seen in type 2 diabetes.

Other conditions associated with chronic inflammation associated with other condition including:-

- High blood pressure
- Kidney disease
- High cholesterol
- Various type cancer
- Osteoporosis
- Fatty liver disease
- Autoimmune disorders

This type inflammation (chronic inflammation) often progresses quietly, with few independent symptoms. Chronic inflammation represents a major threat to the longevity and health of a large population of individuals.

Acute Inflammation-

Acute inflammation is typically caused by injuries, like an illness, or by sprained ankle, like common viruses and bacterial infection. The acute inflammation happens quickly and may develop severe reactions.

Major common signs of inflammation following an injury include:-

- Redness
- Swelling, bumps, or puffiness
- Pain and tenderness
- Warmth at the injury site
- Bruising
- Stiffness
- Loss of mobility

Depending on the severity of the wound and cause, acute inflammation can last anywhere from a few days to a few months. Sometimes acute inflammation is systemic and sometimes it is localized to one area. When body identifies harmful invaders like a virus, bacteria, fungi, parasites etc body initiates immunological reactions to fight against the causative agents. White blood cells (WBC) trigger the release of several inflammatory chemicals. The acute inflammation causes lethargy, general malaise and fatigue because body puts all its energy toward fighting off infection. [6]

Several signs and symptoms of acute inflammation:-

- Fever
- Nausea
- Lethargy
- Sleeping
- Irritability
- Runny nose
- Sore throat
- Stuffy nose
- Headache

Symptoms and signs may be present for a few days or weeks, or possibly longer in more serious causes. Some acute inflammation

infections are caused by more localized inflammation. Like most condition caused by inflammation.

Some examples include:-

1. Acute bronchitis
2. Tonsillitis
3. Acute appendicitis
4. Infective meningitis

Cause of chronic inflammation include:-

Researchers have identified several common cause of chronic systemic inflammation, many of which are closely associated with aging and erratic life style and faulty dietary habits.

Obesity- Fat tissue, especially visceral fat (around the abdominal organs which are deep layer of fat), actually produce pro-inflammatory chemicals.

Physical inactivity- When your muscles are in motion the anti-inflammatory chemical process occurs in the bloodstream. People who don't meet the minimum activity recommendations for optimal health have an increased risk of age-related diseases. [1]

Diet- Diets high in saturated fat, refined sugar and trans-fat are associated with increased inflammation, especially in overweight people.

Smoking- Smoking cigarettes lower the production of anti- inflammatory molecules and increases inflammation.

Sleep disorders- People who get a regular eight hours a night have no any marker of markers of inflammation than people with irregular sleep. [5, 3]

Age- Chronic inflammation gets worse as we age.

Autoimmune Diseases

In autoimmune diseases, the immune system attacks its own tissues, abnormal or mistaking them as foreign. In some diseases, the inflammatory process can be triggered even when there are no foreign invaders. Researchers don't know exactly what causes autoimmune disorders, but they suspect a combination of environmental factors and genetic. There are 80 different autoimmune diseases affecting different parts of the body.[6,3] An autoimmune disorder does different types of damage to different parts of the body which caused inflammation.

Common autoimmune diseases include:-

- Rheumatoid arthritis
- Psoriasis
- Graves' disease
- Myasthenia gravis
- Inflammatory bowel disease
- Celia disease
- Multiple sclerosis(MS)

Arthritis is a common term describing the inflammation of the joints.

Some autoimmune diseases that cause joint inflammation are:-

- Rheumatoid arthritis(RA)
- Ankylosing spondylitis
- Juvenile idiopathic arthritis (JIA)

Autoimmune diseases treatments are varies but often focuses on reducing the over activity of the immune system.

Diagnosing Inflammation-

There is no single test that can diagnose the conditions associated with inflammation. Complete medical history followed by physical examination is the key to advice investigations.

Blood Test-

Certain blood biological markers that indicate inflammatory process inside the body are as follows:

Erythrocyte sedimentation rate-

Erythrocyte sedimentation rate (ESR) indicates acute phase reactions inside the body.

C-reactive protein- CRP is a protein naturally produced in the liver in response to inflammation. In chronic inflammation & other inflammatory diseases CRP is raised remarkably.

Imaging investigations:

Imaging modalities that can detect inflammation include-

- Ultrasound with power Doppler
- MRI with gadolinium enhancement
- FDG PET-CT
- Nuclear imaging

Treatment-

Treatment will depend on the ailment and severity of system or specific disease.

Aims for treatment of inflammatory conditions are to reduce inflammation throughout the body to prevent serious complications & progression of the conditions.

Acute Inflammation-

The following treatment modalities help to reduce the effect of acute inflammation

Corticosteroids-

Corticosteroids are produced in the adrenal gland located above the kidney. These hormones include aldosterone, which helps regulate sodium concentration in the body, and cortisol, which plays many roles in the body, including serving as part of the body's stress response system to decrease inflammation. Commonly prescribed corticosteroid medications, like prednisone, prednisolone and dexamethasone, and are available to be taken by mouth, intravenously, or by intramuscular injection and may be used to treat diseases like asthma, inflammatory bowel disease, and systemic lupus erythematosus, as well as many others, in which inflammation is part of the disease process.[16]

Non-steroidal anti-inflammatory drugs-

Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used medications associated with nephrotoxicity, especially when used chronically. Factors such as advanced age and comorbidities, which in themselves already lead to a decrease in glomerular filtration rate, increase the risk of NSAID-related nephrotoxicity. Non-steroidal anti-inflammatory drugs (NSAIDs), often prescribed in medical practice as analgesic, anti-inflammatory agent and antipyretic, are among the most widely used drug classes worldwide.[17] Based on the classification of these enzymes, NSAIDs can be classified into non-target NSAIDs (ketoprofen, naproxen, flunixin, aspirin, meglumine and others), COX-2 preferential inhibitors (meloxican, etodolac, nimesulide) and highly selective COX-2 inhibitors (coxib). Most of the side effects are related to COX-1 inhibition, due to its action in several systems associated with cleansing of cell. In the kidneys, they are in greater quantities acting in glomerular filtration maintenance.[21] The main mechanism of NSAID action is the cyclooxygenase (COX) enzyme inhibition, both peripherally and centrally, thus interfering with the conversion of arachidonic acid into E2 prostaglandins, prostacyclins and thromboxanes . COX-2 is activated by inflammation and pro-inflammatory cytokines. **[19]**

Topical medication- Topicals, including steroids and analgesics, can help with chronic and acute pain and inflammation of the skin and joints without the side effects of oral treatment. They are also helpful for managing long-term inflammation when they contain NSAIDs, such as ibuprofen or diclofenac.

Chronic Inflammation-

In addition to treating inflammation and joint pain, medication for inflammatory disease can help to minimize disease progression or prevent.

Medication may include:-

- **Disease- modifying anti- rheumatic drugs (DMRDs)-**Including Azulfidine(sulfasalazine) and Arava (leflunomide)
- **Biologic drugs-** such as Humira (adalimumab), and Orencia (abatacept).
- Anti- malarial drugs, such as hydroxychloroquine.
- Statins
- Diabetes medication

Preventing Chronic Inflammation-There are a number of lifestyle changes you can make to reverse chronic inflammation and prevent, these include:

- Losing weight
- Getting 150 minute diet rich in fruits, whole grains, vegetables, and lean proteins.
- Incorporate a muscle-strengthening activity at least twice a week.
- Spending less time sitting down
- Walking more
- Getting enough sleep
- Employing stress reduction technique like yoga and meditation.
- Seeing your doctor regularly.

CRP AND INFLAMMATION

C-reactive protein (CRP) is an acute inflammatory protein that increases up to 1,000-fold at sites of inflammation or infection. CRP is produced as a homopentameric protein, termed native CRP (nCRP), which can irreversibly dissociate at sites of inflammation and infection into five separate monomers, termed monomeric CRP (mCRP). Primarily CRP synthesized in liver hepatocytes but also by smooth muscle cells, endothelial cells, macrophages, lymphocytes, and adipocytes. C-reactive protein is the principal downstream mediator of the acute-phase response following an inflammatory event and is primarily synthesized by IL-6-dependent hepatic biosynthesis.[8,9]

CRP play main role in inflammation tends to focus around the activation of the C1q molecule in the complement pathway leading to the opsonization of pathogens. Although CRP activating the complement pathway and can initiate the fluid phase pathways of the host defense, it can also initiate cell-mediated pathways by activating complement as well as to binding to Fc receptors of IgG.[8] CRP binds to Fc receptors with the resulting interaction leadings to the release of pro-inflammatory cytokines.[9] CRP also has the ability to recognize foreign and self molecules based on the pattern recognition, something that other activators of complement such as IgG cannot achieve because these molecules only recognize distinct antigenic epitopes.[8]

Evidence suggests that CRP is also plays an active role in the inflammatory process not only just a marker of inflammation. It is well established that CRP is an acute marker of inflammation and that its concentration increases in circulation during inflammatory events. CRP is deposited at sites of inflammation and tissue damage in both naturally occurring and experimental conditions.[19] However, most early research in the literature only refers to CRP and does not distinguish between the two isoforms. Thus, unlike more recent publications, the findings of early work on CRP can seem somewhat unclear and at times conflicting since it was often not specified which CRP isoform was measured or utilized in experiments, whether responses attributed to nCRP (native C-reactive protein) were in fact possibly due to partial/full dissociation into mCRP or if lipopolysaccharide (LPS) contamination could be present. CRP is deposited at sites of inflammation and tissue damage in both experimental conditions and naturally occurring.[9] However, there is a raft of published data investigating CRP that does not consider its two different isoforms. Another issue with published data is that CRP localization is often investigated in only a tissue type and narrow range of inflammatory conditions. Although the monomeric CRP (Mcrp) isoform has been shown to be insoluble in plasma, it becomes localized in inflamed tissues and amplifies a pro-inflammatory response by a positive feedback loop.[15] CRP binds to damaged cell membranes and contributes to the inflammatory response, with CRP molecules becoming associated with terminal complement complexes, especially in atherosclerotic lesions.[11] Lagrand et al provided evidence that CRP promotes local complement activation, triggering further damage to the heart tissue and CRP localizes to infracted heart tissue.[13] However, other studies indicate no significant localization of CRP in a number of pathologies, suggesting that CRP is found predominantly in the fluid phase rather than becoming deposited in tissues at sites of inflammation or injury.

CONCLUSION

C-reactive protein is a homopentameric acute-phase inflammatory protein that exhibits elevated expression during inflammatory conditions such as rheumatoid arthritis, infection and some cardiovascular diseases. Key areas of inflammation and host responses to infection mediated by CRP include the complement pathway, phagocytosis, apoptosis and cytokine production. However, most research to date has investigated the role of CRP in the vascular tissues, highlighting the need to conduct further work to determine the precise role of CRP in peripheral tissues. The nCRP isoform activates the classical complement pathway, promotes apoptosis and induce phagocytosis. On the other hand, mCRP promotes the chemotaxis and recruitment of circulating leukocytes to areas of inflammation and can delay apoptosis. CRP can also induce IL-6 and TNF-α production at sites of inflammation, again suggesting probable involvement of mCRP from the dissociation of nCRP.

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ENHANCING COMPETENCY IN LEARNING CONTRACTED BRAILLE AMONG STUDENT TEACHERS

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ABSTRACT

Education system needs to nurture the 21st century skills in the student teachers to prepare them as competent and responsible global citizens. The teacher is no more the sole transformer of information. In fact, he/ she is more of a co-learner, motivator and director of students' learning endeavors (Patil and Baviskar,2019).The teacher for the new era needs to be a facilitative teacher to promote enquiry, reflection, experimentation as well as problem solving and creativity among the learners. Hence professional development of Student Teacher needs to be upheld through Teacher Education Program. Teachers of Visually Impaired Students now-a-days have minimal training in braille in the teacher training program. Hence in this study the authors adopted Braille Premier Manual to teach Contracted Braille among Student Teachers. To study the impact of training in Contracted Braille, Student Teachers (104) specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city .The design adopted in the study is Quasi experimental study. Here Pre test and Post test were done besides treatment. Analysis of Performance of scores revealed that there was a significant impact of learning of Contracted Braille among Student Teachers.

Keywords: *Braille literacy, Contracted Braille, Special teachers ,Student Teachers, Learners with Visual Impairment*

Introduction

Education system needs to nurture the 21st century skills in the student teachers to prepare them as competent and responsible global citizens. The teacher is no more the sole transformer of information. In fact, he/ she is more of a co-learner, motivator and director of students' learning endeavors (Patil and Baviskar,2019). The teacher for the new era needs to be a facilitative teacher to promote enquiry, reflection, experimentation as well as problem solving and creativity among the learners. Hence professional development of Student Teacher needs to be upheld through Teacher Education Program.Braille is not a code to be deciphered but it is a method of reading and writing that is equal in value to print for sighted people. The way in which blind and partially sighted people develop literacy skills may differ, but the goal is the same: to use reading, writing, and other literacy tools to gather and understand important information and to convey important information to themselves and to others.Teachers of Visually Impaired students now-a-days have minimal training in braille in the teacher training program. They may not have hands-on-training using slate and stylus in today's context. This lack of training directly impacts the braille learning of visually impaired students. Globally it is addressed that braille teaching has not been given significance on the paradigm of using tactile mode that has been shifted to audio mode with technology addition.But discussions and questions have raised about the level of proficiency teachers in Braille.In the teacher training program there is no uniformity on teaching braille proficiency. Hence in this study the authors adopted Braille Premier Manual to teach Contracted Braille among Student Teachers.To study the impact of training in Contracted Braille, Student Teachers (104) specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city .The design adopted in the study is Quasi experimental study. Here Pre test and Post test were done besides treatment.Analysisof Performance of scores revealed that there was a significant impact of learning of Contracted Braille among Student Teachers.

REVIEW OF LITERATURE

Wittenstein, S. H. (1994)in his study on**"Braille literacy: Preservice training and teachers'**attitudessurveyed a national sample of 1,663 teachers of blind and visually impaired students to know about their perceptions of their competence in braille and

in teaching braille, their attitudes toward braille, and their training in braille. The majority of the teachers were confident in their braille abilities, clearly recognized the importance of braille, and strongly supported the use of braille with their students. Ss' type of braille training was related to feelings of competence in their braille skills, to ability to teach braille, and to attitudes toward braille as a learning medium for students. Further, preservice programs that placed greater emphasis on methodology of teaching braille reading produced teachers who were more likely to feel competent in their braille skills and in their ability to teach braille. So this training alsohad more positive attitudes toward braille.

NavinkumarJadamali and etal., in their study on "**Electronic Progressive Braille Learning Kit for Blind" (**Low Cost, All Languages and Multiline Braille Screen) stated thatLearning the Braille script is not an easy task for Visually Impaired students. Visually Impaired students have to memorize/remember various patterns of keys of Braille matrix assigned for different letters/words/symbols in Braille script to read and write effectively. The electronic Braille kit is for helping them out with the more difficult stages of learning Braille to expand their knowledge and assistance in orientation and mobility. Braille Keypad, which can be used to help users learn Braille by tactile signals, and also hearing it read out to them. The keypad allows visually impaired users to enter Braille characters into the system easily for different use and works. The integration of physical activity and hearing can facilitate easy learning of Braille Script (all languages).It consists of a keypad same as Braille Cell which is based on the Braille matrix (3*2 matrixes) with two extra control keys. The user first listens to the instructions and gets the training from the kit, then enters the combination of keys in compliance with internationally accepted Braille matrix/script, the device in turn pronounces corresponding output of letter/word/symbols/contractions (flexible for all languages). The study is an attempt to utilize technology to educate the visually impaired students.

Mehak Khuranaand andJyotikaPruth in their study on "A **New Multimedia Approach to CombatIlliteracy in blind Children**" stated that Less than 3% of the 145 million blind people living in developing countries are literate. This low literacy rate is partly due to the lack of trained teachers and the challenges associated with learning Braille on a traditional slate and stylus. The solution to this problem is to develop a prototype of a cost effective and user friendly device, capable of facilitating Braille tutoring among the blind. The proposed device aims to incorporate tactile, audio and visual output for the user that can be used for both self and peer-to-peer learning. The prime feature of this -system is 3D pattern formation in Braille language for different alphabets and numbers to facilitate Braille learning through a sense of touch. This device opens up the possibility of an adult who does not have formal Braille training but can assist and help the blind student to learn Braille and also assess their learning levels. This paper provides an overall survey about problems faced using conventional methods for teaching and an insight into developing an effective tutor system for the blind

Sheila Amato in the study on "**Standards for Competence in Braille Literacy Skills in Teacher Preparation Programs"** reports on a descriptive study of standards and criteria for competence in braille literacy within teacher preparation programs and the specific role played in the achievement of proficiency in braille literacy by university teacher preparation programs in blindness and visual impairment. It contains a summary of the need for such research, historical background, research methods, and a discussion of standards and implications for personnel preparation.Abstract

Vaijayanthi,R and Victoria Naomi in their study on**" Teachers'and Parents' Perceptions on challenges in Learning Braille for Learners with Visual Impairment**" reports that Braille is vital to all visually impaired individuals and it's the only system through which visually impaired children can learn to read and write, yet the rate of Braille literacy among visually impaired people belonging to developing countries

including Tamil Nadu is alarmingly low. Visually impaired child also needs educational support from the parents and it is the responsibility of the parents to always keep the morale up of their visually impaired child in all situations and provide him/her a barrier free environment. Keeping these points in view an attempt was done to know the teachers' and parents' perception on challenges in learning Braille for learners with visual impairment. The objectives of the study were to analyze special teachers' perceptions and parents' perception on challenges in Braille instruction for learners with visual impairment in Inclusive and Special schools and to find out the use of Braille and assistive technology for learners with visual impairment. Survey method was used to gather the details. The study was carried out with thirty five Special teachers and twenty Parents of learners with visual impairment. Qualitative and quantitative analysis was done to analyze the perception of special teachers and parents of learners with visual impairment. Results revealed that the Special teachers expressed that learners with visual impairment use print as an easier solution than attempting to provide Braille instruction and Braille material and highly dependent on technology as the main challenge faced by the learners with visual impairment. The Parents expressed that learner with visual impairment access to many of the same visual materials as her /his peers. The second challenge is that the parents felt that Braille is a valuable tool but needs to be taught during the early grades and deciding to teach Braille to a learner should be based on the individual needs of the child.

Need for the Study

Literacy has become a high priority for all school systems. The educational options for students who are blind and visually impaired also reflect this increased concern for the educational competence of our school-age population .Though it is obvious that literacy is a key factor in determining success in life, including employment, it would appear that Braille literacy has declined dramatically in the past few decades and is now at a critically low level worldwide.States are becoming concerned about the competence of Braille teachers and the depth of their knowledge of the Grade 2 Braille code, their ability to teach Braille competently, and their ability to acquire or produce instructional materials in Braille. Yet in spite of all this, Braille will remain relevant so long as print is relevant and is unlikely to be replaced by other technologies for the foreseeable future, since it is a foundational skill for literacy, numeracy and information access for people who are blind (Vision Australia, July, 2011).The review of researches revealed that there are no such specific researches yet regarding the training of contracted braille through online mode of studentteachers through teacher education programe. Hence this research holds unique significance inexperimenting the trainingprograme for student teachers. The present study was therefore conceptualized to enhance competency in learning contracted Braille among student teachers. Since Braille literacy in schools for learners with Visual impairment is of paramount importance in addressing concerns about the decline in Braille in Tamil Nadu and beyond.Hence, an attempt was made to know the status of Braille literacy instructionamong student teachers and to enhance the quality of literacy through training in Contracted Braille and promise higher prospects for Student Teachers and learners with Visual Impairment.

Objectives of the study were to

1. To analyze the knowledge and skill of Contracted Braille among Student Teachers
2. To find out the impact of Online instruction using Braille Premier Module in learning Contracted Braille among Student Teachers.

Method of Study

To study the impact of training in Contracted Braille, Student Teachers specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city.The sample consisted of 104 student teachers .The design adopted in the study is Quasi experimental study. Here Pre test and Post test were administered besides treatment.

Administration of Tool

1. A Personal data bank was developed to know the general information of the Student Teachers
2. Preparation of Training Modules on Contracted Braille for Student Teachers

Contractions have the categories such as Alphabet word signs, Strong word, Lower word, Dot 5 initial letter, Dot 4-5 initial letter, Dot 4-5-6 initial letter, Final letter, Short form words, Indicators, Punctuation and Grouping punctuation. About 12 modules were prepared based on the Training Manual on BRAILLE PRIMER with exercises published by Royal institute for the Blind. The Student Teachers were trained with Contracted Braille in sessions with 40 hours of instruction(Table-1).Pre test and Post test were done besides treatment.

Table1: Grade 2 Braille Contractions

S.No	Grade 2 Braille Contractions	Number
1.	Alphabet Whole word contractions	23
2.	Special word signs	06
3.	Simple upper group signs & Word signs	11
4.	Lower Group signs	10
5.	Punctuation	17
6	Compound Signs-Initial Word signs With Dot 5	22
7.	Initial Word signs With Dot 4 5	05
8.	Initial Word signs With Dot 4 5 6	06
9.	Final group signs	12
10.	Composite punctuation signs	08
11.	Short forms	75
12.	Indicators	25
	Total	220

Analysis and Interpretation

The sample comprised of One hundred and four student teachers. Qualitative and QuantitativeAnalysis were used and tabulated as follows.

1. Demographic details of the sample

Cent percent of the sample were female Student Teachers holding an Undergraduate degree.About sixty one percentage of Student Teachers were from rural areas as against 39% of them were from urban areas. Cent percent of the Student Teachers were specialized in Visual Impairment.

2. Analysis of Overall Performance of Contracted Braille among Student teachers

Table 2: Testing wise Mean, SD, df and correlated t-value of Overall Scores

	Test	N	df	Mean	SD	t-Value
Overall Scores	Pre	104	103	70.05	59.98	2.83**
	Post			50.22	45.49	

***** Significant at 0.01 level***

From the above table, it is evident that the t-value is 2.83 with df=103 for the overall scoreswhich is significant at 0.01 level. It indicates that pre and posttest score of all components differ significantly. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Contracted BrailleWords among Student Teachers. In the light of the null hypothesis that **"there is no significant difference in mean of Overall Scoresof Contracted Braille among Students teachers"** is rejected. It may therefore be said that trainingenhanced the performance of Contracted Braille among Student Teachers.

3.Analysis of Performance of Lower Signs among Student Teachers

Table 3: Testing wise Mean, SD, df and correlated t-value of Lower Signs

	Test	N	df	Mean	SD	t-Value
Lower Signs	Pre	104	103	2.52	2.91	3.24**
	Post			3.88	3.48	

***** Significant at 0.01 level***

From the table 3 it is evident that the t-value is 3.24 with df=103 for the Lower Signs is significant at 0.01 level. It indicates that pre and posttest score of Lower Signs differ significantly. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Lower Signs among Student Teachers. In the light of the null hypothesis that **"there is no**

significant difference in mean scores of Lower Signs amongStudent Teachers" is rejected. It may therefore be said that the training enhanced the Performance of Lower sign words among Student Teachers.

4. Analysis of Performance of Short forms among Student teachers

Table 4: Testing wise Mean, SD, df and correlated t-value of Short Forms

	Test	N	df	Mean	SD	t-Value
Short Forms	Pre	104	103	18.00	19.86	2.69**
	Post			26.56	25.10	

***** Significant at 0.01 level***

From the table 4, it is evident that the t-value is 2.69 with df=103 for the Short Formswhich is significant at 0.01 level. It indicates that pre and posttest score of Short forms differ significantly.It means that there was asignificant impact of Online Instruction using Braille Premier Manual in learning Short form Contracted Braille words among Student Teachers. In the light of the null hypothesis that **"there is no significant difference in mean of Short FormContracted Braille words among Student teachers"** is rejected. It may therefore be said that the training enhanced the performance of Short formsamong Student teachers.

RESULTS AND FINDINGS

The major results and findings of the study are as follows:

1. Cent percent of the sample were female student teachers holding an undergraduate degree. About sixty one percentage of student teachers were from rural areas as against 39% of them were from urban areas. Cent percent of the teachers were specialized in Visual Impairment
2. It is evident that the t-value is 2.83 with df=103 for the overall scores is significant at 0.01 level which indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning Contracted Braille words among Student Teachers .
3. Analysis of Performance of Lower Signs among Student teachers indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning Lower sign Braille words among Student Teachers (t-value is 3.24).
4. Analysis of Performance of Short forms among Student teachers indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning short form Contracted Braille words among Student Teachers (t-value is 2.69).

CONCLUSION

The study revealed that there was a significant impact of knowledge gained in the acquisition of contracted braille concepts after training. The Student Teachers were able to enhance their knowledge in Contracted Braille through Online Instruction using Braille Premier Manual and thereby gain the expertise over Braille script.

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