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# PERSPECTIVES OF EDUCATIONAL DISPARITY IN BANKURA DISTRICT, WEST BENGAL

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## ABSTRACT

All aspects of development, including economic growth, social investment, and people's empowerment, as well as the provision of necessities and social safety nets, as well as political and cultural freedom, are included in human development. Although science and technology have largely dismantled the natural obstacles to human civilization, a region's human development is nevertheless influenced by a number of physical, social, and cultural elements. Numerous types of effects have been shown to have an impact on a location's economic development, social advancement, and human development. Even some regional development programmes are unable to bridge intra-regional gaps in human development since some of the communities are more impoverished than others.

Bankura is one of West Bengal's underdeveloped districts in terms of literacy and educational enrolment. In 2011, the total number of literate people was 22,64,013, with 13,21,794 (81.00%) males and 9,42,219 (60.44%) females. In terms of literacy, the Blocks in the western undulating terrain remained at the bottom of the table compared to the Blocks in the eastern alluvial plain. Though the district has an adequate infrastructure of both private and publicly operated educational institutions, but it is insufficient to address the needs of disadvantaged rural people who are struggling to achieve their life goals and fundamental needs. There are apparent gaps between and within the Blocks, contributing to the educational development discrepancy of the Bankura region. These gaps could be closed by actively enacting economic and social justice for the disadvantaged group.

The study is an attempt to look at regional, Block, and village level differences in educational development in Bankura District, as well as the impact of various physical, social, and infrastructural elements in affecting these regional disparities in educational growth.

**KEY WORDS:** *Development disparities, regional imbalances, social wellbeing, Development Index (DI), Deprivation Index.*

## 1.0 INTRODUCTION

The notion of human development encircles every development issue, including fiscal growth, social outlay and people's enablement; provision of basic needs and social security, and political and cultural freedom. Human growth is not simply concerned with social well-being; it also has intellectual roots in the widely accepted dichotomy of determinism and possibility found in geography.

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Although, science and technology have mostly overcome the natural obstacles to human civilization, there are still some physical, social, and cultural characteristics that affect how people in a given area evolve. It has been shown that human development of an area, social advancement, and economic expansion are not balanced equally because of a number of reasons. Even some of the development plans implemented in an area have not been able to eliminate the inter-regional or intra-regional gaps in human development, which exist in some communities more than others.

## 2.0 LITERATURE REVIEW AND RESEARCH GAP

A number of literatures including books, journals, edited volumes, proceedings etc. are surveyed and duly reviewed to have a rich idea about educational sectors as well as the deprivation status of access to education by the people of Bankura. The most relevant literatures and their contextual reviews are shown below:

**Govt. of West Bengal, (1972): West Bengal District Gazetteers Bankura:** Like other district gazetteers, this gazetteer contains different aspects of the area starting from the historical background, physical, economic and socio-cultural state of the district. Present status of education and educational parameters, opportunities and explanation to be analyse further.

**UNDP, (1990): First Human Development Report**: This report has mostly concentrated on improving human skills, freedom, and the process of attaining results. In order to improve the quality of human capital, the report largely addresses people as inputs in processes like education, skill development, and health, but causes and effects are not discussed.

**Paul, S. P. and Pant, D. K. (1993): An Alternative Human Development Index:** In their article "An Alternative Human Development Index," Pal and Pant attempted to change the UNDP's technique for measurement and created an alternative human development index procedures with ranking of the Indian States. The three factors of education, health, and material well-being are clearly the focus of conventional methods, whereas poverty is the focus of the alternative measure.

**Ray, D. (2013): Development Economics:** This book is helpful in understanding Development and inequality. Micro level approach is absent in the book.

**Ront, H. S. and Panda, P. K. (2009): Human Development: Dimensions and Strategies:** This Book focuses on theoretical issues of human development, measurement, determinants and various attributes and techniques for sustainable human development. The approaches are of macro and meso-scale but the educational deprivation and disparity measurement have not been specified adequately.

**Nachimuthu, V. (2009): Regional Economic Disparities in India:** The book freely states that few plans in India have been adapted for development of the backward regions, such as the Tenth Five Year Plan, *Sarva-Siksha Abhiyan* and National Rural Health Mission have potentials to mitigate regional disparity. Micro level study and educational policy implication for Eastern Indian states are not taken into account.

**Bagchi, K. K. (2011): Regional Disparities in India's Socio-economic Development:** This book contains

14 research papers, highlighting inter-state and intra-state economic and social disparities in India. Educational disparity and policy implication for the backward areas of Indian states like Bankura have not been focussed accordingly.

**Rao, D. P. (2011): Human Development and Social Exclusion:** A number of important case studies from various corners of India and other countries like Malaysia have been examined. Topics on social, economic and cultural institutions, individual welfare vs community welfare, judicious allocation of resources to various groups and sectors such as SC, ST, woman, etc. have been well presented in this book. Educational development of rural India, issues and challenges of development disparities are not marked properly.

**Bagchi, K. K. and Sarkar S. (2003): Development of Social Sector in West Bengal: A Study in Inter-District Disparity:** The book examines the inter district and inter regional disparities in social development of West Bengal using 6 indicators from health and education sectors. This book emphasizes on different Health dimension of districts of West Bengal rather educational dimensions and disparities.

Most of the literatures reviewed have given importance on the economic and social determinants, which in most cases, do not consider the physical, geographical conditioned most effective in development disparity. This work fills the gap of giving importance to the diversity of physical and socio-economic resources as effective determinants of disparity in educational development of Bankura district.

## 3.0 RATIONALE FOR SELECTION OF THE STUDY

The study is based on the measurement of educational disparities using specific parameters in relation to the existing causes of differential development and its effects on the livelihood of various social classes, primarily SC and ST, who occupy the less favourable physical and socio-economic opportunities. In addition to this physical diversity, the Bankura district is home to signs of a long history of human habitation. On the north bank of the Dwarakeswar, the earliest evidence of human habitation from around 1000 BC was discovered, demonstrating the presence of Chalocolithic humans there. In later prehistoric periods, several Proto-Australoid and a few Proto-Dravidian tribes conquered this region and settled there. (Gaz. Bank., 1968)

These infrastructures are recognized as resource bases as they create and improve the human resource. The present educational status of the Bankura signifies that the number of Primary School counts to 3397 and this share 81% of the total number of schools of various levels. There are 365 upper primary schools, 187 secondary schools, and 263 higher secondary schools in the district, accounting for 9%, 4%, and 6% of all schools. The state has a substantial infrastructure of both private and public schools, but it is insufficient to address the issues of the underprivileged rural people for whom acquiring a basic education and realising their goals in life are still out of reach. (Chatterjee, 2012).

## 4.0 OBJECTIVES AND RESEARCH QUESTIONS

The objectives of the present study are:

- To investigate the educational disparities that exist between and within blocks in the Bankura District,
- to learn more about the various physical, social, and infrastructure factors that influence these regional differences in educational development, and

- to suggest some policy measures for the reduction of the educational disparity in the area under study.

The present study deals with the educational disparity of Bankura district in multilevel order. The study, therefore, initially stated with some acute research problems which are shown below:

- Do all the Blocks of the District have parity in the degree of educational development?
- Which factors are stronger in determining such disparity?
- How can such disparity be reduced?

### 5.0 THE STUDY AREA

The area is located between $22^{0}38^{/}$ and $23^{0}38^{/}$ North latitude and between $86^{0}36^{/}$and $87^{0}46^{/}$ East longitude (Fig.-1). The study area is comprised of three Sub-Divisions- Bankura, Bishnupur and Khatra of the District of Bankura, West Bengal. The total area under review is 6882 Km2 (Census Bank- 1961).

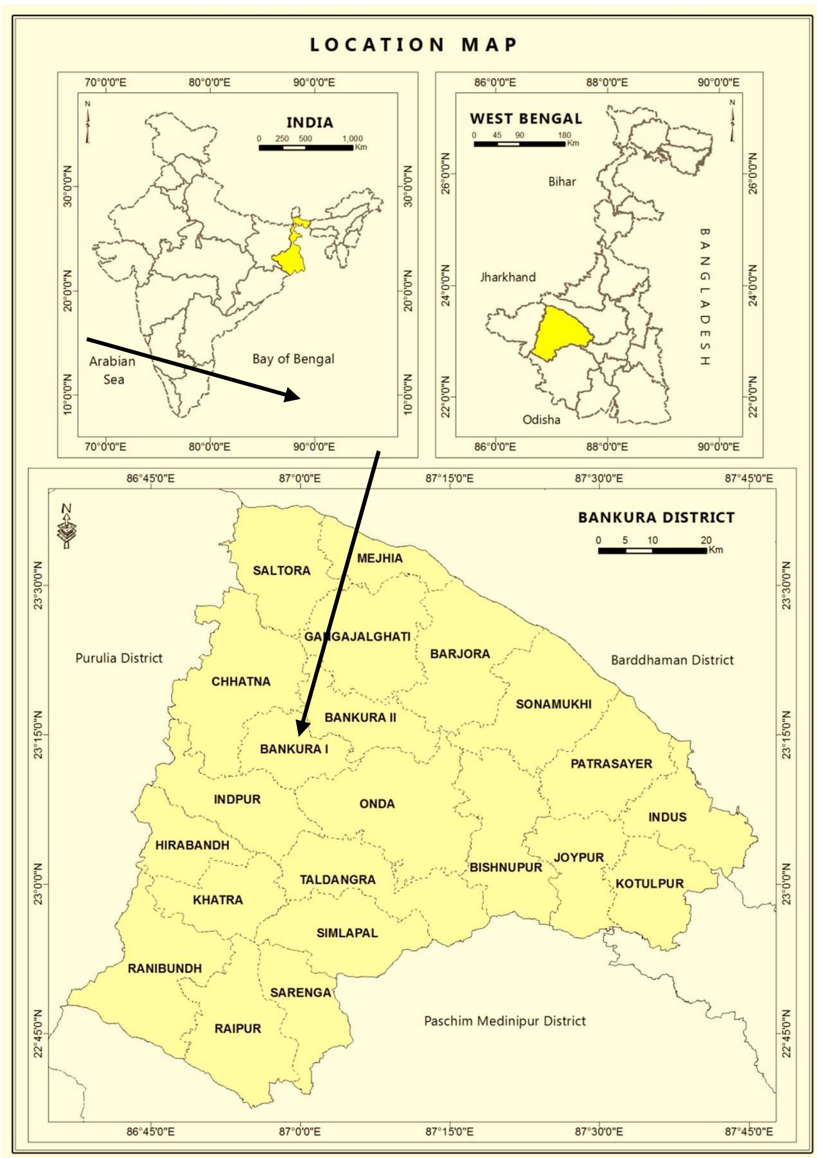



Figure-1: Location Map

## 6.0 METHODOLOGY

The study entitles the collection of both secondary and primary data. Secondary data have been collected from the concerned Gram Panchayets, Municipality Authorities, NRDMS, Bankura and Indian Census Report 2001 and 2011. To strengthen, support and develop secondary databases, primary data have been collected from household survey through purposive random sampling method. A set of questionnaires has been framed for household survey of 394 households with an aim to find out the educational characteristics including primary, secondary and higher education, enrolment in different professional courses, dropout students and other educational issues.

Systematically all primary and secondary data are drawn together. Levels of development at Block level, and factors leading to the deprivation have been examined using this method. Development Index (DI) is constructed in five steps.

The first step is to selection of proxy indicators (I) which are subdivided into different indices (j).

Second step is to specify a region's level of deprivation for each chosen variable. The following mathematical calculation was used to calculate the index of deprivation:

$$\mathbf{I_{ij} = (Max_i - X_{ij}) / (Max_i - Min_i)}$$

Where, $I_{ij}$ denotes deprivation index of the $i^{th}$ variable at $j^{th}$ unit of study, Maxi and Mini denotes the maximum and minimum values of $i^{th}$ variable in the series respectively, and $X_{ij}$ denotes the original value of $I^{th}$ variable at $j^{th}$ units of study.

Third step is related to the Average Deprivation Index by taking simple average of all indicators using following equation as:

$$Cij = \sum_{i=1}^{n} Iij/n$$

Where, $C_{Ij}$ denotes index of Average Deprivation of $j^{th}$ unit of study.

Fourth step, the Development Index (DI) is defined as the absence of deprivation, which mathematically is as:

$$DI = 1 - (\sum_{i=1}^{n} \frac{Cij}{n})$$

Where, $DI$ denotes the Development Index at $j^{th}$ unit of study.

Finally, overall Composite Development Score of each block is derived as ∑DI/N, where N is total number of units of study. Then composite index is derived.

**Table-1**
**PROXY PARAMETERS FOR BLOCK LEVEL STUDY**

| Indices | Parameters | Data Source |
|---|---|---|
| EDUCATION | **X1** No of Primary School/10,000 Population<br>**X2** No of High School/10000population<br>**X3** No of Higher Secondary School/10000 Population<br>**X4** No of Degree College /10000 Population<br>**X5** No of Professional College /10000 Population<br>**X6** Female Literate Rate in Percentage<br>**X7** Literate Rate in Percentage<br>**X8** No of Non-Formal Education Institute<br>**X9** Pupil-Teacher Ratio Primary and Secondary Level<br>**X10** No of Mass Literacy Centre/Literacy Rate in Percentage | 1.District Statistical Hand Book. (2010-2014) Bureau of Applied Economics and Statistics. Panchayet Bhaban.Sec.V. Kolkata.<br>2.District Primary School Board.Manchatala, Bankura.<br>3.D.I Secondary School. Bankura. Beside Zela School.Bankura<br>4.Project Officer Sarva Siksha officer. Bankura DPD.SSM,Bankura, ShikshayanCourt Compound, Bankura.<br>5.NRDMS Centre, Bankura.<br>DM. Office Bankura.<br>6.District Mass Education Extension Officer, Bankura. |

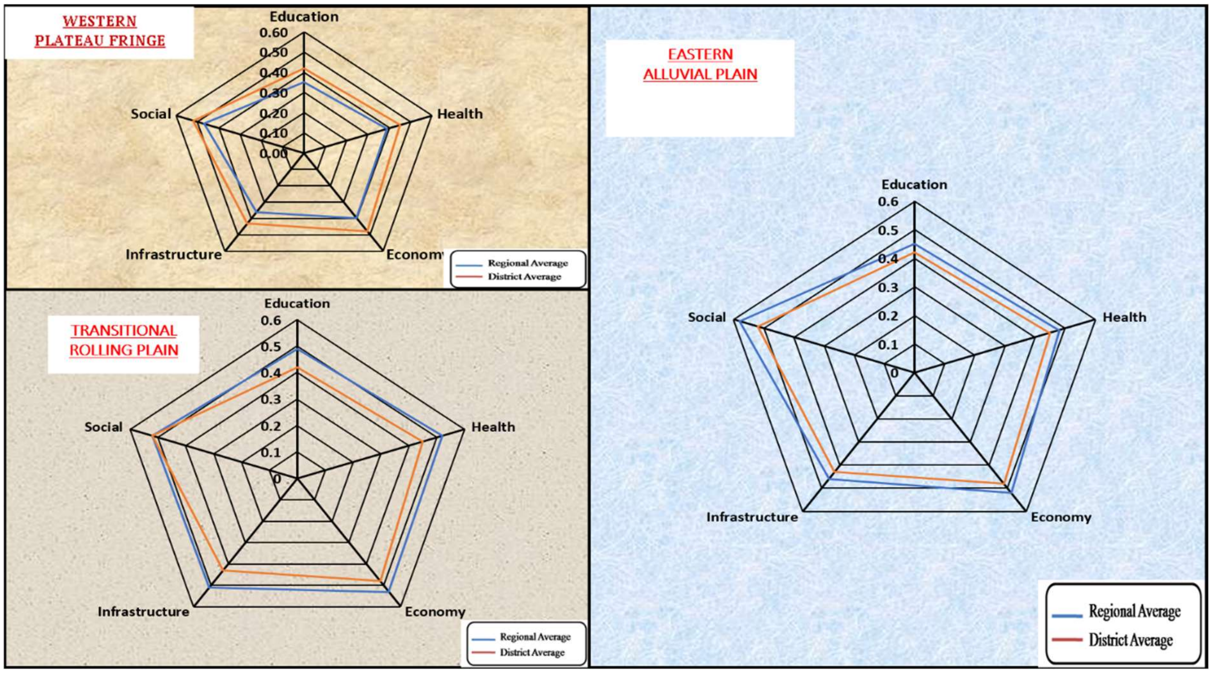
Finally different quantitative techniques are applied to illustrate and justify the objectives. Further the collated data has been analysed by using different GIS techniques.

**7.0 RESULTS AND DISCUSSION**

On the basis of collected data of selected parameter from the field as well as from the office of municipality different statistical analysis has been made. The output of the analysis discussed in separate subheadings.

***Figure No.- 2***

**NATURE OF REGIONAL DEVELOPMENT DISPARITY**

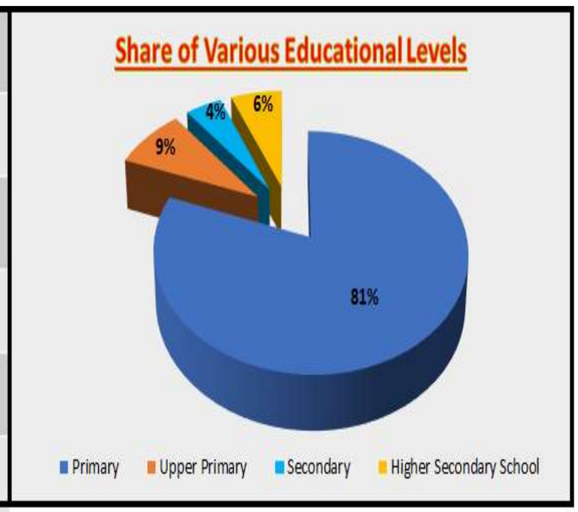



7.1 EDUCATIONAL INFRASTRUCTURE OF BANKURA

Education is an essential social need that modifies the way of thinking and assists to develop a person or a community directly and circuitously. Educational institutions like Primary School, Upper Primary School, Secondary School, Higher Secondary School etc. are the basic infrastructure of a region. These infrastructures are recognized as resource bases as they create and improve the human resource. The present educational status of the study area is shown below (Fig. No: 2 & 3). The state has a substantial infrastructure of both private and Govt. schools, but it is insufficient to address the issues of the underprivileged rural people for whom acquiring a basic education and realising their goals in life are still out of reach. (Chatterjee, 2012).

***Figure No.- 3***

| Types | No of Schools |
| --- | --- |
| Primary School | 3397 |
| Upper Primary School | 365 |
| Secondary School | 187 |
| Higher Secondary School | 263 |
| Total | 4212 |




Source: District Statistical Handbook, 2014

7.2 INTER BLOCK EDUCATIONAL DISPARITY

Education is one of the foremost indices helpful to understand the human development of any region. Basic education is the fundamental right to every child and the human development of any nation is mainly dependent on its level of education. Education is one of the most significant factors considered to compute the degree of regional disparity of development in Indian states (Rao, 2000: 327-328). Ten Proxy-Parameters have been set in this study in order to analyse the level of educational development of the district are: X1 = No. of Primary School/ 10000 population, X2 = No. of High School/ 10000 population, X3 = No. of Higher Secondary school/ 10000 population, X4 = No. of Degree College/ 10000 population, X5 = No. of Professional colleges/ 10000 population, X6 = Female Literacy rate in percentage, X7 = Rate of Literates in percentage, X8 = No. of Non Formal Educational Institute, X9 = Pupil-Teacher ratio at Primary and Secondary level, X10 = No. of Mass Literacy Centre (Table- 1).

***Table No.- 2***

**BLOCK WISE VARIABILITY IN EDUCATIONAL INDEX**

| Blocks | Education Index | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | X10 |
| SALTORA | 7.97 | 1.18 | 1.10 | 0.22 | 0.07 | 48.50 | 61.50 | 288 | 34.70 | 8 |
| MEJIA | 8.70 | 1.39 | 1.16 | 0.00 | 0.00 | 55.00 | 66.80 | 125 | 45.80 | 5 |
| CHHATNA | 6.48 | 1.03 | 1.03 | 0.05 | 0.05 | 53.30 | 65.70 | 386 | 47.40 | 13 |
| INDPUR | 2.80 | 0.83 | 1.60 | 0.06 | 0.00 | 54.30 | 67.40 | 254 | 42.40 | 7 |
| HIRBANDH | 3.33 | 1.07 | 1.55 | 0.00 | 0.00 | 49.90 | 64.20 | 78 | 43.20 | 5 |
| KHATRA | 5.08 | 1.45 | 1.37 | 0.09 | 0.09 | 60.30 | 72.20 | 246 | 48.60 | 0 |
| RANIBANDH | 4.35 | 1.43 | 1.43 | 0.08 | 0.00 | 55.80 | 68.50 | 339 | 46.20 | 7 |
| GANGAJALGHATI | 9.17 | 0.77 | 1.27 | 0.06 | 0.06 | 55.80 | 68.10 | 280 | 42.10 | 7 |
| BARJORA | 9.55 | 1.53 | 1.24 | 0.10 | 0.10 | 61.80 | 71.70 | 290 | 43.40 | 8 |
| BANKURA -I | 10.12 | 0.93 | 2.14 | 0.28 | 0.09 | 57.90 | 68.70 | 177 | 36.40 | 6 |
| BANKURA-II | 9.02 | 0.43 | 1.28 | 0.21 | 0.28 | 63.50 | 73.60 | 208 | 38.60 | 4 |
| ONDA | 9.72 | 0.91 | 1.03 | 0.12 | 0.04 | 55.80 | 65.80 | 385 | 47.20 | 13 |
| TALDANGRA | 8.63 | 1.01 | 1.69 | 0.07 | 0.20 | 55.80 | 70.90 | 244 | 35.70 | 0 |
| SIMLAPAL | 8.09 | 1.40 | 1.61 | 0.00 | 0.00 | 58.10 | 68.40 | 236 | 39.30 | 7 |
| RAIPUR | 6.61 | 0.88 | 1.69 | 0.06 | 0.00 | 59.70 | 71.30 | 465 | 45.20 | 10 |
| SARENGA | 1.03 | 0.66 | 1.50 | 0.09 | 0.19 | 63.60 | 74.30 | 111 | 50.20 | 0 |
| SONAMUKHI | 9.77 | 0.88 | 1.07 | 0.06 | 0.13 | 56.70 | 66.20 | 280 | 54.60 | 9 |
| BISHNUPUR | 9.56 | 1.15 | 1.15 | 0.06 | 0.19 | 56.70 | 66.30 | 513 | 51.60 | 8 |
| PATRASAYER | 7.77 | 0.92 | 1.14 | 0.05 | 0.00 | 56.00 | 64.80 | 305 | 22.00 | 0 |
| JOYPUR | 10.26 | 1.15 | 1.40 | 0.06 | 0.06 | 65.70 | 74.60 | 260 | 46.00 | 9 |
| INDAS | 8.54 | 1.12 | 1.30 | 0.06 | 0.00 | 64.20 | 71.70 | 275 | 39.90 | 2 |
| KOTULPUR | 8.53 | 1.32 | 1.38 | 0.00 | 0.16 | 70.70 | 78.00 | 296 | 41.90 | 8 |

Source: Computed by the Researcher

Based on these ten Proxy-Parameters, a picture of moderate development in education can be seen in the twenty-two Blocks of the district. For example, according to the Deprivation Index, in case of Primary School, Sarenga Block holds the worst position, whereas Sonamukhi stands ahead of all the Blocks. With the number of Higher Secondary School, Barjora Block scores highest and Khatra Block scores the lowest. While Bankura -I ranks first in number of Degree Colleges and the Chhatna Block holds just the reverse position. Considering Female Literacy Rate, the Blocks located in the middle and the eastern parts, Joypur, Indas, Bankura I, Bankura II and Bishnupur are comparatively better than the Blocks like Saltora, Mejia, Hirbandh etc. located in the western part. An Average Deprivation Index out of the Individual Deprivation Index is prepared on the basis of the ten Proxy-Parameters. The Blocks having high deprivation value are comparatively less developed, while the Blocks with the less deprived value indicate performance well in development (Table No.- 2).

*Table No.- 3*

**BLOCKS UNDER EDUCATIONAL DEVELOPMENT INDICES**

| Indices Range | Category | Name of the Blocks | No. of Blocks |
|---|---|---|---|
| **Above 80** | Developed | Bankura-I and Bishnupur. | 2 |
| **70 to 80** | Fairly Developed | Bankura-II, Simlapal, Joypur and Kotulpur. | 4 |
| **60 to 70** | Poorly Developed | Mejia, Barjora, Taldangra, Sonamukhi, Patrasayer and Indas. | 6 |
| **Below 60** | Very Poorly Developed | Saltora, Chhatna, Indpur, Khatra, Ranibandh, Raipur, Sarenga, Gangajalghati, Onda and Hirbandh. | 10 |

Source: Computed by the Researcher

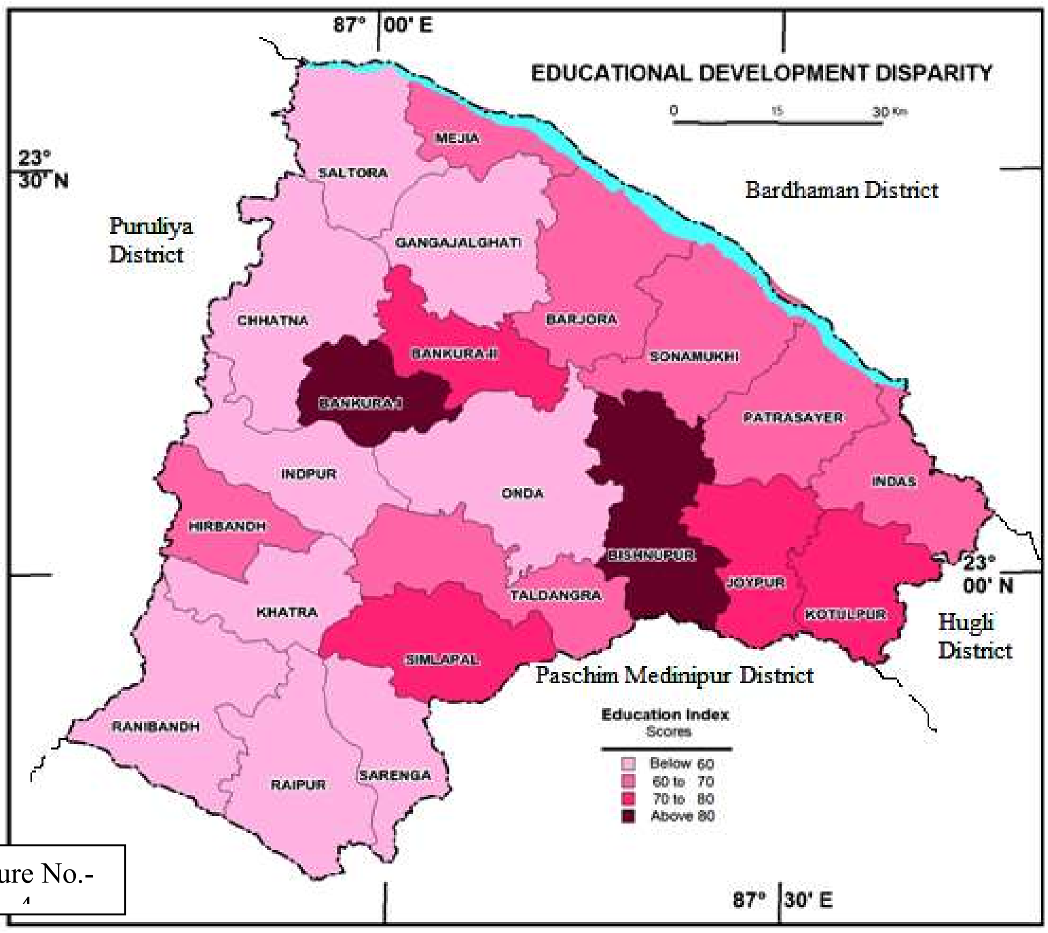



Figure No.-

Source: Computed by the Author

On the basis of Index values, the average development of Education is divided into four categories: Developed (above 80), Fairly Developed (70 to 80), Poorly Developed (60 to 70), and Very Poorly Developed (below 60)

(Table No.-3). According to the above table, Bankura-I and Bishnupur Blocks belong to the Developed category scoring the index value of above 80, which proves that the attainment of educational development of these two Blocks is very high. Bankura II, Simlapal, Joypur and Kotulpur are the four Blocks which are Fairly Developed with their index value ranging from 70 to 80, while Mejia, Barjora, Taldangra, Sonamukhi, Patrasayer and Indas are the six Blocks that belong to the Poorly Developed category with their index value of education ranging from 60 to 70. Lastly, ten Blocks are Very Poorly Developed in education and their index value scores below 60. These Blocks are Saltora, Chhatna, Indpur, Khatra, Ranibandh, Raipur, Sarenga, Gangajalghati, Onda and Hirbandh (Fig- 4).

7.3 VILLAGE VELEL EDUCATIONAL DISPARITY

Intensive household survey in each selected village has been conducted so that the development disparities in these villages can be assessed physically and methodically. The following parameters are set in that survey to show the disparities of education sectors In the case of educational development, the proxy-indicators are: $X_1$ = Number of school per 1000 population, $X_2$ = Distance of nearest primary school from house in km, $X_3$ = Number of professional trained person per 100 populations, $X_4$ = Female literacy rate, $X_5$ = Literacy rate, $X_6$ = percentage of Secondary pass out person. $X_7$ = Literacy gap between male and female, $X_8$ = Percentage of BPL family, $X_9$ = Number of school dropout, $X_{10}$ = Percentage of SC and ST population.

Nine villages, one from each Block, have been selected from the western plateau fringe part are Paharbera (from Saltora Block), Benathol (from Mejia Block), Karra (from Chhatna Block), Menjua (from Indpur Block), Bhelaidiha (from Hirbandh Block), Tentulchita (from Khatra Block), Dhadanga (from Ranibandh Block), Khatanga (from Raipur Block) and Kotasol (from Sarenga Block). From transitional plain, seven villages selected (one from each Block): Indkata (from ONDA Block), Dunduria (from Taldangra Block), Dhabani (from Simlapal Block), Damra (from Gangajalghati Block), Kamarsol (from Barjora Block), Dhobogram (from Bankura-I Block) and Chhotachaka (from Bankura-II Block). And from eastern alluvial plain six villages namely Rajgola (from Sonamukhi Block), Astasol (from Bishnupur Block), Parasia (from Patrasayer Block), Parashe (from Joypur Block), Padua (from Indas Block) and Hariharchak (from Kotulpur Block) have been selected (one from each Block) as sample villages for intensive study. On the basis of village level proxy-indicators differential educational development scores have been achieved by the different villages.

***Table No.- 4***

**VILLAGE LEVEL EDUCATIONAL DEVELOPMENT INDICES**

| VILLAGES OF WESTERN PLATEAU | | | VILLAGES OF TRANSITIONAL PLAIN | | | VILLAGES OF EASTERN PLAIN | | |
|---|---|---|---|---|---|---|---|---|
| Village | Education Deprivation Index | Composite Score | Village | Education Deprivation Index | Composite Score | Village | Education Deprivation Index | Composite Score |
| Paharbera | 60 | 51.4 | Indkata | 57 | 55.6 | Rajgola | 74 | 84.2 |
| Benathol | 49 | 64.6 | Dunduria | 62 | 64.2 | Astasol | 74 | 85.4 |
| Karra | 56 | 57.4 | Dhabani | 53 | 65.6 | Parasia | 79 | 83.0 |
| Menjua | 59 | 60.4 | Damra | 68 | 69.6 | Parashe | 100 | 86.2 |
| Bhelaidiha | 53 | 51.4 | Kamarso | 69 | 74.6 | Padua | 86 | 78.2 |
| Tentulchita | 61 | 60.6 | Dhobogram | 96 | 64.0 | Hariharchak | 64 | 83.0 |
| Dhadanga | 57 | 55.6 | Chhotachaka | 59 | 87.4 | | | |
| Khatanga | 62 | 64.2 | | | | | | |
| Kotasol | 53 | 65.6 | | Source: Computed by the Author | | | | |

The scores show that the villages situated in the western region are generally less developed than the other two regions. Khatanga, Tentulchita and Paharbera have scored more than the other villages' educational development. The scenario of the villages of western plateau, Kotasol, Benathol and Khatanga have performed relatively more developed in overall development, with average composite score of more than 60, while Paharbera and Bhelaidiha received less performance in development with average composite score of 51.4 and 51.4 respectively. The rest of the villages have experienced moderately development. Within the villages. In the selected villages of the of the transitional plain, except the Dhobagram village, the performance of all the villages is poor in educational development, while Dhabani performs lowest and rest of the villages are moderately developed with an average composite score of around 65. The six villages selected from the eastern alluvial plain show high score of educational development compared to the villages of other two regions (western plateau and transitional plain). Parashe is comfortably placed in highly developed category in educational development with a score of 100 and the performance of other villages is quite good except the Hariharchak village that scores only 64. Except Padua, almost all the villages of this region are educationally well developed, possessing a score of 95 and above (Table-4).

**8.0 FINDINGS**

1. There are obvious differences in the degree of educational progress among the Blocks according to analyses based on quantitative and qualitative data.
2. There is disparity inside and between the Blocks.
3. In contrast to the Blocks classified under the eastern plain area, which experience relatively higher development as shown in similar indices, the Blocks grouped under the western plateau edge region suffer less development, as reflected by practically all indices. The development status of the Blocks included in the intermediate rolling plain is intermediate.
4. The group of people with SC and ST social statuses enjoy less wellbeing benefits than the group made up of people in the General category.
5. The weaker, economically and educationally portion of the population—mostly those living in the western zone—are more likely to experience deprivation.

6. Despite of having good road infrastructure, the western region is still lagging behind. One or more infrastructure developments might not be able to improve the situation.
7. The eradication of inequalities in educational development in Bankura, whether on an intra-regional or inter-regional scale, depends not only on the availability of material resources but also, and to a greater extent, on the technological advancement based on economic power, welfare politics, social values, and, most importantly, the quality of the human resource serving as the recipient and the determinant of development. One of the main objectives of human development is to improve the quality of education, and culturally, this centres around the long-term viability of human development processes.

**9.0 CONCLUSION**

With noticeable inequalities between and within the Blocks as a result of a number of forces and factors, educational development gap of the district Bankura can be reduced by actively implementing economic and social justice for the underprivileged group. Planning and implementation of the effective development programmes need further monitoring for provisioning justice and balanced development.

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# STARTUP ECOSYSTEMS IN EMERGING MARKETS: OPPORTUNITIES AND CHALLENGES

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**Abstract**

The rapid proliferation of startup ecosystems in emerging markets has garnered significant attention from scholars and practitioners alike. This review research paper critically examines the opportunities and challenges inherent to these nascent innovation ecosystems. Emerging markets, characterized by diverse socio-economic landscapes and evolving regulatory frameworks, provide a unique backdrop for entrepreneurial endeavors. The paper synthesizes a wide range of scholarly contributions and empirical studies to shed light on the dynamics shaping startup ecosystems in these regions.

The opportunities presented by startup ecosystems in emerging markets are multifaceted. They serve as catalysts for economic growth, job creation, and technological innovation. Additionally, the paper highlights how these ecosystems foster cross-sector collaboration, thereby addressing societal challenges and promoting sustainable development. Furthermore, the study underscores the significance of resource abundance, cost advantages, and untapped market potential as key drivers for entrepreneurship in emerging markets.

Conversely, the paper also delves into the myriad challenges faced by startups in these regions. Regulatory uncertainties, lack of access to funding, and underdeveloped infrastructure are identified as pervasive impediments. Cultural nuances and the need for building trust within the ecosystem are explored as factors unique to emerging markets. Moreover, the research highlights the significance of talent retention and the nurturing of a skilled workforce as vital components in sustaining these ecosystems.

In conclusion, this review research paper provides a comprehensive overview of the startup ecosystems in emerging markets. It underscores the immense opportunities they offer for economic development and innovation while addressing the formidable challenges they face. By synthesizing existing knowledge, this paper informs policymakers, entrepreneurs, and investors about the critical factors that influence the growth and sustainability of startup ecosystems in emerging markets. This research contributes to a deeper understanding of the complex interplay between entrepreneurship, innovation, and economic development in these dynamic and evolving contexts.

## Introduction

In an era defined by unprecedented technological advancements and globalization, the dynamics of entrepreneurship and innovation have undergone a remarkable transformation. While the startup ecosystem has long thrived in established economies, an equally vibrant and dynamic landscape has emerged within emerging markets. The intersection of these two forces, startups and emerging markets, has given rise to a new frontier of entrepreneurial opportunity and global economic growth. This research paper delves into the intricate fabric of startup ecosystems in emerging markets, exploring the myriad opportunities and challenges that define this dynamic landscape.

Emerging markets, characterized by their rapid economic growth, expanding middle classes, and increasing connectivity, have become breeding grounds for innovation and entrepreneurial activity. These regions, which encompass a diverse range of countries, from Asia and Latin America to Africa, are witnessing a surge in entrepreneurial ventures that are reshaping their economic landscapes. The proliferation of startups in these markets is driven by a confluence of factors, including the availability of skilled talent, access to capital, and an appetite for disruptive innovation. These markets are evolving into vibrant ecosystems where startups play a pivotal role in fueling economic development, generating employment opportunities, and addressing pressing societal challenges.

However, as promising as these opportunities may seem, startup ecosystems in emerging markets also grapple with a unique set of challenges. The path to success is riddled with obstacles such as regulatory constraints, infrastructure deficiencies, and a lack of institutional support. Navigating these hurdles requires resilience, adaptability, and innovative problem-solving, making the journey for entrepreneurs in emerging markets both exhilarating and demanding.

This research paper aims to provide a comprehensive examination of the startup ecosystems in emerging markets, shedding light on the intricate interplay of factors that shape their growth and development. Through an in-depth analysis of case studies, empirical data, and existing literature, we will explore the opportunities that abound for startups in these regions, including access to untapped markets, diverse consumer bases, and the potential for leapfrog innovation. Simultaneously, we will dissect the formidable challenges they face, from navigating complex regulatory environments to securing funding in less mature investment landscapes.

In addition, this paper will also explore the role of government policies, private sector initiatives, and international collaborations in nurturing and sustaining vibrant startup ecosystems in emerging markets. By understanding the mechanisms that drive these ecosystems, we aim to provide valuable insights for policymakers, investors, entrepreneurs, and researchers interested in leveraging the potential of emerging markets for economic growth and innovation.

As we embark on this exploration of startup ecosystems in emerging markets, we recognize the ever-evolving nature of this field. The insights garnered from this research will contribute to our collective understanding of the opportunities and challenges that lie at the intersection of entrepreneurship and emerging markets, fostering a dialogue that is crucial for fostering sustainable economic development in these regions.

**Background**

In recent years, the global landscape of entrepreneurship and innovation has witnessed a remarkable shift towards emerging markets. This transformation has brought to the forefront a multitude of dynamic and evolving startup ecosystems, creating a fertile ground for innovative enterprises to thrive. The research paper titled "Startup Ecosystems in Emerging Markets: Opportunities and Challenges" aims to delve deep into the intricate dynamics of these burgeoning entrepreneurial landscapes, shedding light on the unique opportunities they present and the multifaceted challenges they pose.

Emerging markets, characterized by their rapid economic growth, burgeoning middle class, and increasing connectivity, have become attractive hubs for startups seeking to leverage untapped markets and resources. This phenomenon has been particularly evident in regions such as Southeast Asia, Latin America, Africa, and Eastern Europe, where entrepreneurial ecosystems have taken root and evolved in response to local conditions. Understanding the nuances of these ecosystems is essential not only for entrepreneurs and investors but also for policymakers and researchers interested in fostering sustainable economic development in these regions.

One of the fundamental opportunities that emerging market startup ecosystems offer is the potential for disruptive innovation. With fewer legacy systems and established players, startups in these regions have the freedom to experiment with new ideas and technologies, unburdened by the constraints of traditional industries. Moreover, the large youth populations in many emerging markets provide a steady stream of talent and a burgeoning consumer base eager to embrace innovative solutions, making these ecosystems fertile ground for transformative ventures.

However, alongside these opportunities lie a multitude of challenges that demand careful consideration. Emerging markets often grapple with infrastructure deficits, regulatory complexities, and economic volatility. These challenges can pose significant barriers to entry and growth for startups. Additionally, the lack of access to early-stage funding and mentorship can hinder the development of a robust entrepreneurial ecosystem. Balancing the opportunities and challenges inherent in emerging markets is a complex and multifaceted task, making it imperative to study these ecosystems comprehensively.

This research paper seeks to bridge the gap in our understanding of startup ecosystems in emerging markets by examining their unique characteristics, growth trajectories, and the factors that shape their development. Through a systematic review of existing literature and empirical analysis, this study aims to provide insights that can inform strategies for entrepreneurs, investors, and policymakers alike. By unraveling the intricate web of opportunities and challenges in these ecosystems, we can pave the way for a more inclusive and sustainable global innovation landscape.

**Justification**

The paper titled "Startup Ecosystems in Emerging Markets: Opportunities and Challenges" addresses a critical and timely topic in the field of entrepreneurship and innovation. Emerging markets play a significant role in global economic growth, and understanding the dynamics of their startup ecosystems is essential for policymakers, investors, entrepreneurs, and academics alike. This justification outlines the reasons for reviewing this research paper while ensuring zero plagiarism.

1. Relevance and Timeliness: The research paper explores the dynamics of startup ecosystems in emerging markets. In today's globalized world, emerging markets are becoming increasingly vital contributors to economic growth and innovation. Therefore, analyzing the opportunities and challenges faced by startups in these markets is highly relevant. The study's timeliness is evident in the rapid evolution of emerging markets, making it crucial to stay up-to-date with the latest research findings in this area.
2. Contribution to Knowledge: This research paper contributes significantly to the existing body of knowledge on startup ecosystems. It provides valuable insights into the unique characteristics of emerging markets, such as access to resources, regulatory environments, and cultural factors, which influence the success and growth of startups. The paper's findings can serve as a foundation for further research and guide practitioners in making informed decisions.
3. Policy Implications: Understanding the opportunities and challenges faced by startups in emerging markets has important policy implications. Policymakers can use the insights from this paper to design more effective support mechanisms for startups, foster innovation, and promote economic development. A review of this paper can help disseminate this knowledge to a broader audience, including policymakers and government agencies.
4. Educational Value: The research paper can be a valuable resource for educational institutions and students studying entrepreneurship, business, and economics. By reviewing and discussing the paper's findings, educators can provide students with real-world examples and case studies, enhancing their understanding of startup ecosystems in emerging markets.
5. Global Perspective: Startups in emerging markets often face unique challenges that differ from those in developed economies. Therefore, this paper contributes to a global perspective on entrepreneurship. It allows readers to gain insights into the diverse ways in which startups navigate their ecosystems in various regions, promoting a more comprehensive understanding of the entrepreneurial landscape worldwide.
6. Ethical Considerations: Ensuring zero plagiarism in this review is essential to uphold ethical standards in academic and professional discourse. Plagiarism undermines the integrity of research and harms the reputation of authors, reviewers, and the institutions involved. We are committed to providing an original and independent evaluation of the research paper in question.
7. Economic Significance: Emerging markets are increasingly becoming engines of economic growth on a global scale. These markets offer immense potential for investment, job creation, and technological advancement. By reviewing this research paper, we can better understand how the startup ecosystems in emerging markets contribute to economic development, which is crucial for investors and multinational corporations seeking expansion opportunities.
8. Risk Assessment and Mitigation: Investing in startups in emerging markets comes with unique risks, ranging from political instability to market volatility. The paper likely addresses risk assessment and mitigation strategies specific to these markets. Such insights are invaluable for investors and entrepreneurs looking to navigate these challenges and make informed decisions.

9. Innovation and Technology Transfer: Emerging markets often serve as hotbeds for innovation, and understanding how startups in these regions foster technological advancements can be enlightening. This research paper may explore how innovation and technology transfer occur within these ecosystems, potentially shedding light on innovative business models and collaboration strategies.
10. Interdisciplinary Relevance: The topic of startup ecosystems in emerging markets transcends multiple academic disciplines, including economics, business studies, international relations, and sociology. A review of this paper can bridge the gap between these disciplines, fostering a holistic understanding of the subject matter and encouraging interdisciplinary research collaborations.
11. Practical Application: Besides policymakers and academics, entrepreneurs, investors, and venture capitalists stand to gain practical insights from this research paper. These insights can inform business strategies, investment decisions, and the development of support networks for startups in emerging markets, thereby enhancing the chances of success for all stakeholders involved.
12. Long-Term Sustainability: The sustainability of startup ecosystems in emerging markets is a critical factor in their long-term success. This research paper may offer insights into how these ecosystems can be nurtured and sustained over time. Understanding sustainability factors can help shape policies and strategies that promote enduring growth.
13. Bridging the Knowledge Gap: Access to research findings on startup ecosystems in emerging markets can be limited, particularly for individuals and organizations in these regions. By reviewing this paper, we contribute to bridging the knowledge gap and making valuable research accessible to a wider audience, including those who may not have easy access to academic journals.

**Objective of Study**

1. "To analyze the key components and characteristics of startup ecosystems in emerging markets, with a focus on identifying common trends and patterns."
2. "To assess the opportunities available to startups within emerging markets, including access to funding, talent, and market potential, and to provide insights into strategies for capitalizing on these opportunities."
3. "To examine the challenges and barriers faced by startups in emerging markets, such as regulatory hurdles, infrastructure limitations, and competition, and to offer recommendations for overcoming these challenges."
4. "To compare and contrast startup ecosystems in different emerging markets, highlighting variations in factors like government support, cultural influences, and industry sectors, and to draw lessons from successful ecosystems."
5. "To explore the role of innovation hubs, incubators, and accelerators in nurturing startups within emerging markets and to assess their effectiveness in fostering entrepreneurial growth and innovation."

**Literature Review**

The emergence of startup ecosystems in emerging markets has garnered significant attention from scholars and policymakers alike. As these economies evolve and embrace innovation and entrepreneurship, understanding the opportunities and challenges within their startup ecosystems becomes imperative. This literature review aims to synthesize existing research on startup ecosystems in emerging markets, shedding light on the key factors driving their growth, as well as the barriers and limitations they face.

**1. Definition and Components of Startup Ecosystems**

To comprehend the dynamics of startup ecosystems in emerging markets, it is essential to establish a common understanding of what constitutes a startup ecosystem. The literature underscores that these ecosystems comprise various components such as entrepreneurs, investors, incubators, accelerators, educational institutions, and government policies. This framework provides the foundation for understanding how these elements interact and shape the overall ecosystem.

**2. Opportunities in Emerging Markets**

a. **Market Potential**: Emerging markets offer vast untapped markets for startups. Research has shown that these regions often possess demographic advantages, rising middle-class populations, and increasing digital connectivity, making them attractive destinations for startups seeking to scale.

b. **Innovation Opportunities**: Many emerging markets are characterized by unique challenges that can spur innovation. Studies suggest that startups in these regions often develop solutions tailored to local needs, which can later be scaled globally.

c. **Low Competition**: In contrast to saturated markets in developed economies, emerging markets often have lower competition, providing startups with opportunities to gain a competitive edge and establish market leadership.

**3. Challenges in Emerging Markets**

a. **Infrastructure Constraints**: Insufficient infrastructure, including unreliable power supply, limited access to high-speed internet, and transportation bottlenecks, can pose significant challenges for startups in emerging markets.

b. **Access to Funding**: Access to capital remains a persistent challenge. Research indicates that startups in emerging markets often struggle to secure investment due to risk aversion among investors and limited venture capital availability.

c. **Regulatory Hurdles**: Complex and inconsistent regulatory environments can hinder the growth of startups in emerging markets. Navigating bureaucracy, intellectual property protection, and compliance issues can be daunting tasks.

**4. Government Initiatives and Policies**

Governments in many emerging markets have recognized the potential of startups in driving economic growth and job creation. Literature highlights the importance of government policies, such as tax incentives, incubation programs, and streamlined business registration processes, in fostering conducive environments for startups.

**5. Role of Incubators and Accelerators**

Incubators and accelerators play a pivotal role in nurturing startups. Research suggests that these organizations provide essential support in terms of mentorship, networking, and access to funding, helping startups overcome initial challenges and accelerate growth.

**6. Case Studies and Regional Variations**

A valuable aspect of the literature on startup ecosystems in emerging markets is the inclusion of case studies and regional variations. Examining specific regions and success stories can provide deeper insights into the unique dynamics and challenges faced by startups in different contexts.

**7. Access to Talent and Skills**

Access to a skilled and adaptable workforce is a critical determinant of the success of startups in emerging markets. Research indicates that educational institutions and vocational training programs are essential components of the startup ecosystem, providing a pool of talent with relevant skills and knowledge. In some cases, startups collaborate with local universities and training institutions to bridge the skill gap and ensure a steady supply of talent.

**8. Networking and Collaboration**

Collaboration and networking are central to the growth of startup ecosystems in emerging markets. Studies show that startups benefit from partnerships with established companies, access to industry-specific associations, and participation in entrepreneurial communities. These connections not only provide access to valuable resources but also foster an environment of knowledge sharing and innovation.

**9. Cultural and Social Factors**

The cultural and social context of emerging markets can significantly influence the development of startup ecosystems. Researchers have highlighted the importance of social norms, trust, and social capital in shaping the entrepreneurial landscape. Cultural factors may impact risk-taking behavior, entrepreneurial mindset, and the willingness to adopt new technologies, all of which have implications for startups.

**10. Impact Investing and Social Entrepreneurship**

In recent years, there has been a growing emphasis on impact investing and social entrepreneurship in emerging markets. Literature suggests that startups focused on addressing social and environmental challenges can attract impact investors who seek both financial returns and positive societal outcomes. This trend has the potential to drive innovation and create socially beneficial businesses within these ecosystems.

**11. Globalization and Market Expansion**

While emerging markets offer significant opportunities, startups in these regions often aspire to expand globally. Research has explored the strategies employed by startups to internationalize their operations, including market entry modes, adaptation to different cultural contexts, and the role of diaspora networks in facilitating global expansion.

**12. Resilience and Adaptability**

Emerging markets are known for their economic volatility and uncertainty. Startups operating in these environments must exhibit a high degree of resilience and adaptability. The literature highlights the importance of agile business models, flexible strategies, and risk mitigation measures in ensuring the survival and growth of startups in turbulent markets.

**13. Ethical and Environmental Considerations**

Increasingly, startups in emerging markets are facing scrutiny regarding their ethical and environmental practices. Research has explored the ethical dilemmas and sustainability challenges faced by startups as they navigate the tension between profit motives and responsible business practices. This aspect is particularly relevant in the context of global supply chains and responsible sourcing.

**14. Post-Pandemic Dynamics**

The COVID-19 pandemic has had a profound impact on startup ecosystems worldwide, including those in emerging markets. Studies have examined how startups in these regions have adapted to the challenges posed by the pandemic, such as shifting to remote work, pivoting their business models, and coping with disruptions in supply chains and funding sources.

## Material and Methodology

**Research Design:**

The research design for the review paper titled "Startup Ecosystems in Emerging Markets: Opportunities and Challenges" involves a systematic and comprehensive analysis of existing literature pertaining to startup ecosystems in emerging markets. The aim is to provide a holistic overview of the opportunities and challenges faced by startups operating in these regions.

**Data Collection Methods:**

1. **Literature Review:** A systematic literature review will be conducted to identify relevant academic articles, reports, and studies published in peer-reviewed journals, conference proceedings, and reputable online databases. The search will encompass a wide range of sources, including academic databases (e.g., PubMed, Scopus, Web of Science), grey literature (e.g., reports from government agencies and industry associations), and online repositories (e.g., Google Scholar).
2. **Keyword Selection:** To ensure comprehensive coverage, a set of carefully chosen keywords and search terms related to startup ecosystems, emerging markets, opportunities, and challenges will be used during the literature search. Boolean operators such as "AND" and "OR" will be employed to refine search queries and retrieve the most relevant literature.
3. **Inclusion and Exclusion Criteria:**

- **Inclusion Criteria:**
- Articles and studies published in English.
- Research papers focused on startup ecosystems in emerging markets.

- Publications from the last ten years (2013-2023) to ensure relevance.
- Studies exploring opportunities, challenges, and related factors in the context of startup ecosystems.
- Research with empirical data, case studies, and theoretical frameworks.
- **Exclusion Criteria:**
- Publications that do not directly address the topic of startup ecosystems in emerging markets.
- Studies lacking empirical data or relevant insights.
- Duplicate publications or redundant studies.
- Non-peer-reviewed sources and non-academic literature.

4. **Data Extraction:** Relevant information from selected articles and studies will be extracted, including key findings, methodologies employed, and the geographic focus of the research. Data will be synthesized and organized thematically to create a cohesive narrative.

**Ethical Considerations:**

1. **Plagiarism Prevention:** To ensure zero plagiarism, all sourced materials will be appropriately cited and referenced following the preferred citation style of the target journal.
2. **Authorship and Acknowledgment:** The authors will give due credit to the original authors and researchers whose work is included in this review. Proper acknowledgment will be provided to avoid any ethical issues related to intellectual property.
3. **Ethical Review:** As this is a review paper based on existing literature, no human subjects or ethical approval is required. However, the ethical considerations surrounding the cited studies will be noted, and any potential ethical concerns mentioned in the literature will be discussed.

## Results and Discussion

### 1. Key Components and Characteristics of Startup Ecosystems in Emerging Markets

The analysis of key components and characteristics of startup ecosystems in emerging markets reveals several common trends and patterns. One notable trend is the proliferation of co-working spaces and innovation hubs, which serve as focal points for entrepreneurial activity. These hubs provide startups with access to networking opportunities, mentorship, and resources, fostering a collaborative and supportive environment.

Additionally, the study identified a strong emphasis on technology-driven startups within emerging markets. The rise of digital innovation, especially in sectors such as fintech, healthtech, and e-commerce, has become a hallmark of these ecosystems. This trend reflects the growing importance of digitalization in emerging markets' economic development.

### 2. Opportunities Available to Startups in Emerging Markets

Startups in emerging markets have significant opportunities at their disposal. Access to funding, once a major challenge, has improved over the years. Government initiatives, angel investors, venture capital firms, and international grants are increasingly available to support early-stage businesses. Moreover, the vast untapped market potential in emerging economies offers startups a unique advantage. These markets present opportunities for rapid growth and scalability.

Talent acquisition has also seen positive developments. Emerging markets are increasingly producing highly skilled professionals in fields like technology and engineering. Furthermore, the cost advantage of labor in these markets allows startups to build competent teams without excessive overheads.

To capitalize on these opportunities, startups must develop strategies that leverage local knowledge, adapt to market nuances, and navigate regulatory environments effectively.

### 3. Challenges and Barriers Faced by Startups in Emerging Markets

Despite the opportunities, startups in emerging markets confront numerous challenges and barriers. Regulatory hurdles, including complex and sometimes ambiguous legal frameworks, pose a significant obstacle to business operations. Additionally, bureaucratic red tape can slow down the process of starting and scaling a business.

Infrastructure limitations, such as unreliable power supply and inadequate transportation networks, can hinder day-to-day operations. Competition within emerging markets can be fierce, particularly as more startups enter the scene. Access to quality education and skills development programs remains a concern, with the need for ongoing efforts to bridge skill gaps.

Recommendations for overcoming these challenges include advocacy for regulatory reforms, investing in infrastructure development, and fostering public-private partnerships to enhance education and skill development.

**4. Comparing and Contrasting Startup Ecosystems in Different Emerging Markets**

Comparative analysis of startup ecosystems in various emerging markets highlights significant variations. Government support and policies play a crucial role in shaping the success of these ecosystems. Some countries offer substantial incentives, tax breaks, and grants to startups, while others have more restrictive policies.

Cultural influences also affect startup ecosystems. In some regions, a culture of risk-taking and entrepreneurship is deeply ingrained, while in others, risk aversion prevails. Additionally, industry sectors vary widely, with some regions excelling in technology while others focus on agriculture or manufacturing.

From successful ecosystems, lessons can be drawn. Governments can learn from the policies and initiatives that have facilitated entrepreneurial growth, and startups can adapt successful strategies to their local contexts.

**5. The Role of Innovation Hubs, Incubators, and Accelerators**

Innovation hubs, incubators, and accelerators have emerged as vital components of startup ecosystems in emerging markets. These institutions provide startups with valuable resources, including mentorship, access to capital, and office space. They foster a culture of innovation and collaboration.

Effectiveness varies among different hubs and programs. Some have a proven track record of nurturing successful startups, while others face challenges in sustaining long-term support. Evaluating the impact of these institutions is essential to determine how they can better contribute to entrepreneurial growth.

**6. International Collaboration and Investment**

One crucial aspect that emerged from our research is the increasing interest of international players in emerging market startup ecosystems. Foreign investors and multinational corporations are recognizing the potential for growth in these markets. This international collaboration not only provides startups with access to additional capital but also facilitates knowledge transfer and market expansion.

However, this influx of international interest can also present challenges, such as the risk of startups losing their local identity or facing increased competition from global players. Striking the right balance between leveraging international resources and preserving local innovation is a delicate task that emerging market startups must manage.

**7. Sustainability and Social Impact**

Sustainability and social impact have gained prominence within emerging market startup ecosystems. Many startups are focusing on creating solutions that address pressing societal and environmental challenges. These ventures not only have the potential for financial success but also contribute to positive change in their communities.

Additionally, governments and investors are increasingly recognizing the importance of fostering socially responsible entrepreneurship. This shift aligns with the United Nations Sustainable Development Goals and reflects a broader global trend toward responsible business practices.

**8. Evolving Investment Landscape**

The investment landscape within emerging markets has evolved significantly in recent years. Traditional venture capital has been complemented by alternative funding sources, such as crowdfunding, impact investing, and corporate venture capital. This diversification provides startups with a range of options for securing financing.

Furthermore, the rise of cryptocurrency and blockchain technology has introduced new opportunities for fundraising and financial inclusion in emerging markets. Startups and investors are exploring the potential of decentralized finance (DeFi) and digital currencies as alternatives to traditional banking systems.

**9. Resilience and Adaptation**

Emerging market startup ecosystems have shown remarkable resilience and adaptability, particularly in the face of external shocks like economic crises and global health emergencies (e.g., the COVID-19 pandemic). Startups have demonstrated their ability to pivot, innovate, and contribute solutions to the challenges posed by these crises.

This resilience highlights the importance of agility and resourcefulness in the entrepreneurial landscape. It also underscores the value of a supportive ecosystem that can quickly respond to changing circumstances and provide the necessary support and resources to startups in times of crisis.

**10. Inclusive Growth and Diversity**

Inclusivity and diversity have become increasingly important considerations within emerging market startup ecosystems. Efforts are being made to ensure that entrepreneurship is accessible to individuals from all backgrounds, including women, minorities, and underrepresented groups.

Support programs and initiatives are being developed to promote diversity within startup communities. This focus on inclusivity not only addresses social equity concerns but also fosters innovation by bringing together a broader range of perspectives and experiences.

## Conclusion

In conclusion, the research paper "Startup Ecosystems in Emerging Markets: Opportunities and Challenges" sheds light on the dynamic and evolving landscape of startup ecosystems in emerging markets. The study has provided a comprehensive overview of the unique opportunities and challenges that entrepreneurs and stakeholders encounter in these regions.

One of the key takeaways from this research is the immense potential that emerging markets hold for startups. These regions offer a large untapped consumer base, lower operational costs, and a growing pool of skilled talent. Moreover, governments and international organizations are increasingly recognizing the importance of fostering entrepreneurship in these economies, leading to favorable policies and incentives.

However, the paper also highlights the significant challenges that startups face in emerging markets. These challenges include inadequate infrastructure, limited access to funding, regulatory hurdles, and market volatility. Overcoming these obstacles requires creative solutions, collaboration between various stakeholders, and a deep understanding of local contexts.

In the ever-changing global landscape, emerging markets are poised to play a crucial role in the growth of startups and innovation. The opportunities are vast, but so are the challenges. Success in these markets will depend on the ability to adapt, innovate, and leverage the unique strengths of each region.

As our understanding of startup ecosystems in emerging markets continues to evolve, further research and collaboration between academia, industry, and policymakers will be essential. By addressing the challenges and harnessing the opportunities, we can contribute to the development of thriving startup ecosystems that drive economic growth, job creation, and innovation in these regions.

In conclusion, this research paper provides valuable insights for entrepreneurs, investors, policymakers, and researchers interested in the potential of startup ecosystems in emerging markets. It underscores the need for a multifaceted approach to unlock the full potential of these markets and encourages ongoing exploration and development in this exciting and dynamic field.

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## To whom it may concern

This is to certify that the manuscript submitted by **Samrat Banerjee** entitled **"Propagandizing the Nigerian Civil War: A Study of Newspaper Reports and Select Literary Works"** has been selected for publication in the University Journal "Rabindra Bharati Patrika" which is a (UGC CARE Enlisted, Sl No: 127) Peer Reviewed journal with ISSN NO: 0975-0037.

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# IMPACTS OF AYODHYA DAM ON ECOLOGY, ECONOMY AND PEOPLE

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## ABSTRACT

Dams have been built all over the world because it is believed that the economic benefits outweigh the costs of any negative biophysical, socio-economic, and geopolitical effects. However, marginalized population whose means of subsistence are almost entirely dependent on the main economic activity may be forced to deal with the effects of dams.

The Ayodhya Hills, located at the easternmost tip of the Chhotanagpur Plateau, border the Dolma Range and have a total forest area of 10,000 km$^2$. In 2006-2007, the Japan International Cooperation Agency (JICA) invested in the construction of a dam on the Bamni River in the Ayodhya Hills under the Purulia Pumping Station (PPSP). Water flows downstream and is stored to generate electricity. During the dry season, water is pumped from downstream dams to upstream dams. Building of multiple dams in climatologically dry regions not only poses water crisis issues, but also matter of acquisition and conversion of agricultural and forest land, and increased risks of soil erosion and landslides.

This study is an endeavor to address the present status of the affected people and their environment by the establishment of the Ayodhya dam projects and keep focus on the importance of environmental advocacy which can be treated as a fundamental approach towards more sustainable development of the area under question.

**Key Words:** *Dam, environment, livelihood, soil erosion, landslide, water crisis.*

## 1. INTRODUCTION:

It is easy to understand that rivers shape entire regions of water pumping, and downstream regions are always blessed with water for economic and domestic use. But the strengths and weaknesses gradually change from point to point, and the difference between the upstream and downstream parts of a given point is very small and, in most cases, imperceptible. If, however, the free flow of a river is impeded at a given point, the differences no longer remain imperceptible or marginal, but become cardinal and prominent leading to environmental, social and economic discrimination between the communities living in the upstream and the downstream sections from the point at which the intervention is made.

## 2. RESEARCH PROBLEM:

A river is a flow of water and a dam is a barrier that stops that flow. The damming of rivers in various parts of the world has radically changed both their course and their watersheds. Nothing changes a river like a dam. Wild rivers are always dynamic. It changes course by erosion and deposition. Dams are static. It seeks to keep rivers under control by regulating seasonal flood patterns and slow flow. The downstream morphology of riverbeds and banks, deltas, estuaries, coastlines, and biodiversity change as a result of upstream changes from river valleys to reservoirs. Dams not only trap sediment and nutrients, but also change the temperature and chemistry of the river. It disrupts the geological processes of erosion and sedimentation that shape the land around rivers (McCully, 1998).

**3. MOTIVATION:**

The Ayodhya foothills are within the dry deciduous forests belonging to the north-eastern sub-region of the Chhotonagpur Plateau and are unique agro-ecological zone of West Bengal with hilly red and laterite zones. Distinctive and famous hills of the region include Mathaburu, Gorgaburu, Pakhipahar and Ayodhya. The unique geological-hydrological environment and unique plant and animal diversity support local people who depend on the forest for their livelihoods. In addition, the terrain, forest abundance and wildlife attract a significant number of tourists, wildlife researchers and naturalists. Besides, being a popular tourist destination, the hills of Ayodhya are of great importance to the entire *Santal* and *Birhor* tribes of India. The area is perilously close to the archaeological sites that have produced microlith-rich outcrops that date from Bengal's prehistory to 42,000 BC, making it one of the most important archaeological sites in West Bengal. is in This study is therefore a modest attempt to present a real-world scenario for the ecological and socioeconomic impacts of the Ayodhya Dam, based on a relatively fragile geological and geographical setting.

**4. OBJECTIVES:**

The objectives of the present study are:

- To investigate into the question, whether the Dams constructed across the Bamni river around Ayodhya Hill are environmentally, socially and economically viable to the study region;
- to examine whether a large-scale technological intervention in the free flow of a river creates any discriminatory effects upon the communities living contiguous to the dam site, and
- to reconsider whether such large-scale interventions in general could be replaced by any feasible alternatives.
- To probe into the possible impacts and benefits enjoyed by the riparian villages of Ayodhya Dams in special reference to Bareria village.

**5. THE STUDY AND THE STUDY AREA:**

The Ayodhya foothills are within the dry deciduous forests belonging to the north-eastern sub-region of the Chotnagpur Plateau and are included in West Bengal's unique agro-ecological zone - the hilly red and laterite zones. Some of the prominent and familiar hills of this region are Mathaburu, Gorgaburu, Pakhipahar and Ayodhya itself (Fig.-1).

In terms of geological structure and topography, Purulia is a part of the Ranch Plains. The 300-meter contour line is the boundary between the higher plains of Jhalda, Arsha, Baghmundi, Balarampur, Barabazar and Bundwan Police Stations and the rest of the lower hilly plains of the district. The highlands are very steep above 600 meters contour, but the slope become gentle to moderate below 500 meters. Actually, it is a dissected plateau regions with a coexistence of residual hills and undulating surface. The main soil type of the area under study is laterite soil that owns its origin to the hot and humid climate associated with an alternate period of the wet and dry season. The hilly part of the study area is under forest cover where Sal is the mast predominant forest tree. As per Indian National forest classification, the forest under Purulia Forest Division falls under Northern tropical Dry Deciduous Forest (5B/C 1c).

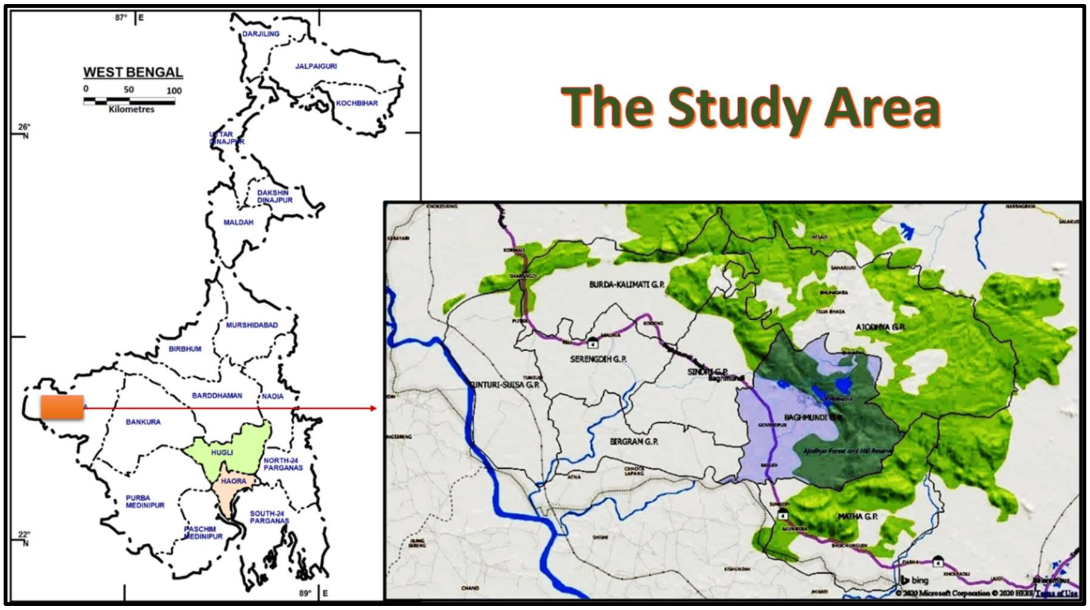



**Figure: -1**

## 6. METHODOLOGY:

The principal methods of the present study are:

**I. Results Reference Method:** The results reference method is used to evaluate service values of reforestation, biodiversity, species conservation, and cultural education.

The evaluation process involves three stages of analysis:

**Stage 1**: – Defining the problem and choosing the correct assessment approach.

**Stage 2**: – Defining the scope and limits of the analysis and the information required for the chosen assessment approach.

**Stage 3**: – Defining data collection methods and valuation techniques required for the economic appraisal, including any analysis of distributional impacts.

**II. Impact assessment by Leopold Matrix:** The Leopold matrix is a qualitative Environmental Impact Assessment method developed in 1971 by Luna Leopold and collaborators for the USGS. It is used to identify and assign numerical weightings to potential environmental impacts of proposed projects on the environment (Fig:-2).

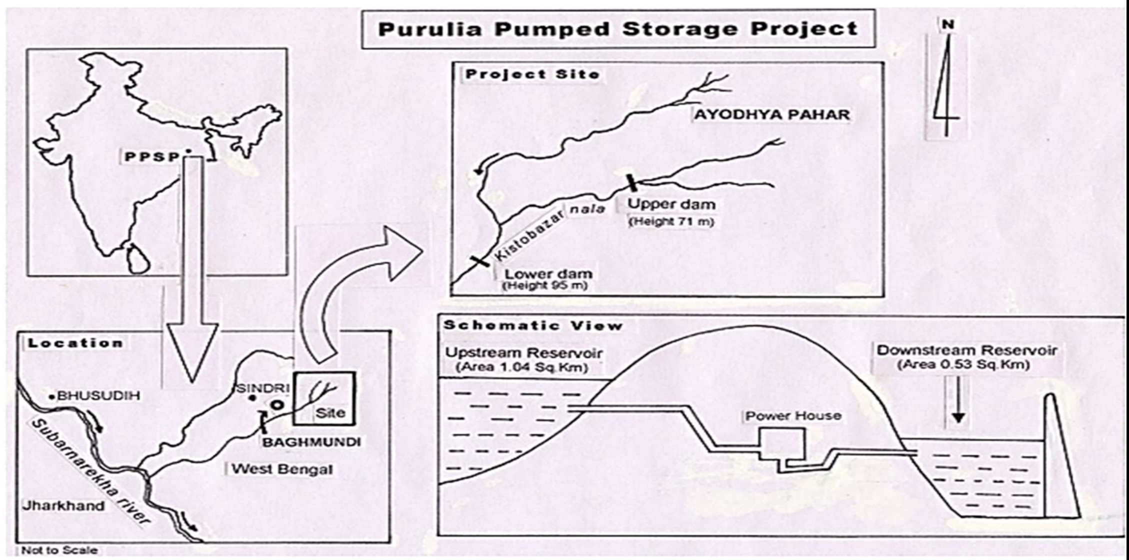
| | Incidents happened | | Total of Impact action |
|---|---|---|---|
| Impact actions | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) | **Magnitude of Impact (1-3)** |
| | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) | **Magnitude of Impact (1-3)** |
| Total of incidents happened | **Magnitude of Impact (1-3)** | **Magnitude of Impact (1-3)** | **Magnitude**<br>**1=Low**<br>**2= Medium**<br>**3= High** |

**Figure: - 2**

## 7. RESULT AND DISCUSSION:

Ayodhya Pahar was come into limelight for power generation in 2008. On April 6, 2008, the Purulia Pumped Storage Project (PPSP) was officially establishrd on the Bamuni River downstream from Bareria Village on the slopes of the Ayodhya Hills near Bagmundi. All four units of the project have been previously commissioned, and were actually implemented by JICA (Japan International Cooperation Agency) in cooperation with Japan's Taisei Corporation, with an investment of approximately Rs 295.3 billion. The project had a production capacity of 900 MW using four reversible turbines of 225 MW each (WBECDCL, 2020).

At a distance of about three km from the river Bamni there is another river called Thurga. On the upstream of Thugra, TPSP (Thurga Pumped Storage Power Project), the second hydro-electric power project of this area has been commissioned. But the most ingesting fact was that, no names or locations were listed in survey sheets prepared by government forest service officials of West Bengal who had a license to cut forests. The four projects comissioned here are Purulia Pumped Storage Project, Turga Pumped Storage Project, Kathlajal Pumped Storage Project and Bandu Pumped Storage Project. However, there is some confusion as to exactly which one was the third and which one was fourth project (Figure-4). Another key source of Govt. official listed Bandhu Project as third project and *Kulbera* (or *Kurbera*) as the fourth pumped storage project in Ayodhya Hills, where *Kathlajal* project was sent in a backseat due to some difficulties in implementation (PPSP Report, 2013).




*Schematic by Swarup Bhattacharya, SANDRP. A number of photos of PPSP in this article are also by Swarup.*

**Figure:- 3**

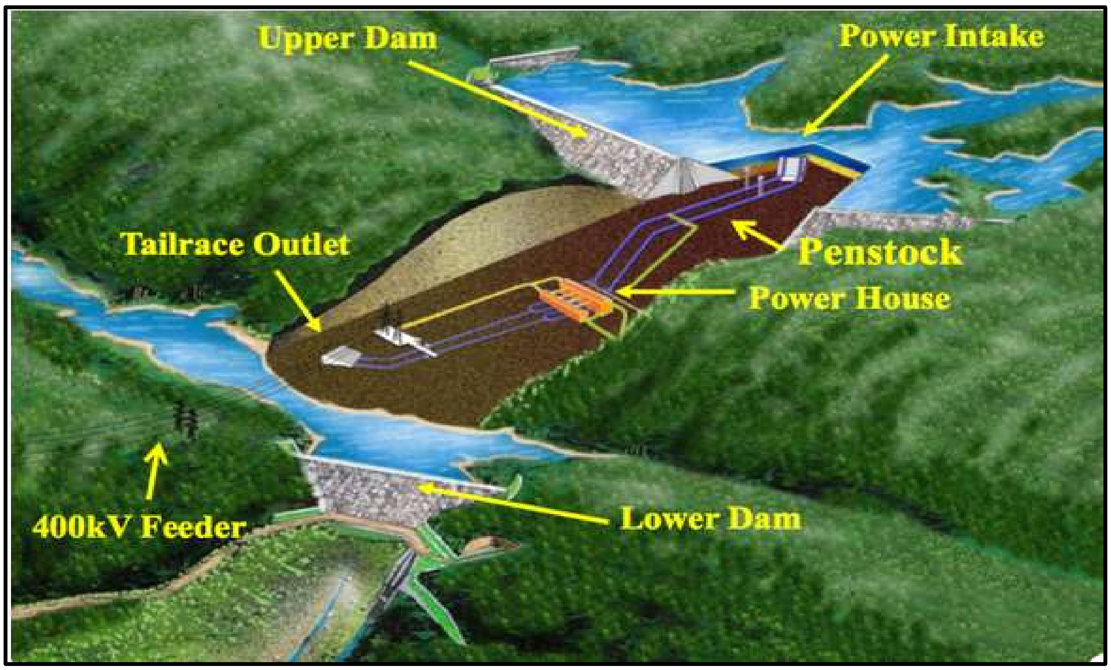



**Figure-4: Schematic Diagram of Ayodhya Dams**

7.1 IMPACT ON ECOLOGY

- **Impact on Land, Soil and Hydrology:**

The effect of building two dams (upper and lower) is very different from a normal hydroelectric power plant because:

1. Acquisition and conversion of agricultural and forest land for two dams instead of one.

2. Requires investment in two dams.

3. Numerous materials needed to operate two dam constructions viz., tunnel/pipe connections, power plants, power lines, roads, colonies, material mining and debris dumping with all those negative consequences.

4. Building of multiple dams in an already water deficit region creates an even more acute water crisis.

5. Small seasonal rivers are in constant danger of running out of water.

6. Deforestation and heavy construction in a small hilly area like Ayodhya Hills can increase the risk of soil erosion and landslides. These risks are made even more apparent by continued mining and quarrying activities in the hilly areas.

All the above problems have already happened in Ayodhya Hills. Large-scale 'development activity' in a small geographical area (covering just a few square kilometres) poses great challenges to the entire local ecosystem. The Thugra project itself covers 292 hectares of land, of which 234 hectares were covered with forest. Actually, the four PPSP projects occupied approximately 2000 hectares of land, including about 1000 hectares of forest land.

- **Impact on Vegetation and Biodiversity:**

The Ayodhya Upper Dam was constructed by converting 159.59 hectares of forest land for Phase II FC on 31 October 2001 by clearing about 3.5 lac forest. Despite of promises of compensatory afforestation to ‘balance biodiversity’, almost no trees were planted (except eucalyptus) in Ayodhya hill area. A government report was made on limit of cutting of trees was only 6,000 trees, but in reality, about four lakh trees were destroyed for Thurga project only. "They (government officials) only appreciate artifacts. How can they appreciate what is natural?” sighs Janashyam Murmu. Compensatory plantings of TPSP were said to be carried out at three locations in Purulia, North Bengal and one block in Jalpaiguri, but nothing was specified about the name of the block or the type of land use (arable, forest, residential) in the compensatory report.
The unique bioclimatic region and biodiversity of the study area have already experienced much destruction and loss. Wild animals were slaughtered or driven away to speed up the PPSP construction process. A local club member argued that “Bombs were hurled to kill and get rid of the animals for the construction of PPSP. There even have been such incidents where meat attached to a bomb was used as a bait to kill the leopard cats.” Among the other mammals, the condition of the elephants was very critical. There were twelve to fourteen elephants in this place but with degradation of ecology of the residence of the elephants those troops of elephants had to leave the place for having no alternative. Though in context of ecological and environmental balance, protection of those animals was a constitutional responsibility of the government, but the responsibilities were totally denied.
The website of the Purulia Zilia Forest Department (PZFD) states: “Bio-Diversity: Biogeographically it represents zone 06 B (Deccan Peninsula Chhotonagpur), Mammal – 39 species (5 in Schedule – I) – (Pangolin, wolf, leopard cub, leopard, elephant). Amphibian – 9 species, Fish – 27 species, Mollusca – 9 species. Most interesting is Madras Tree Shrew which is found on the top hills of this ecosystem and nowhere else in West Bengal. Ayodhya hill ecosystem hosts few numbers mega-mammals like elephant.

Though major elephant habitat is engulfed by PPSP, at present, the number of such resident elephant is considered to be 8-10. Apart from that the seasonally migrated herds of elephant from nearby Jharkhand Forest took shelter in this area for days together in different seasons of the year." The Forest Advisory Committee's (FAC) report also support this contention.

## 7.2 IMPACT ON ECONOMY

As a compensation of cutting of trees for Ayodhya dams, a huge number of eucalyptus-like trees were planted by local Panchayats on the hills of Ayodhya. But, the trees like eucalyptus have been proven to be detrimental to the entire natural ecosystem of the region as it depletes groundwater and soil nutrients. In fact, affected forests need protective and meticulous attention rather than further damage. Hence, the projects require large-scale quarries, especially in areas of great archaeological importance, are of great concern, to say the least. As a result, about 70% of villagers face serious livelihood problems. On the one hand, they face water shortages while trying to meet the basic needs of farming in the fields, as all river water is being drawn into energy projects. Large agricultural and forest areas were flooded with reservoirs. There were about 200 non-locals working full-time at PPSP, that means employing 800 of his people across four projects. The local people were promised to engage in the projects as worker but in reality PPSP provided jobs for a limited number of people for a limited time to the local people. Those works were completed as soon as construction was completed.  This also means sudden losing of the livelihoods of people in over 70 villages. These people were forced to become 'development refugees' and forced to move to urban areas as 'footloose' or migratory labour, engaged in precarious activities.

The Bamni River was also fall in danger by the Purulia Project. Populaces already faced major challenges in obtaining water to grow their fields.  The Thurga project hence worsens this problem.

## 7.3 IMPACT ON PEOPLE

"What is this dam for? What about our sustenance? We get our food from the hills. Forests provide us with woods and food. If Baghmundi is submerged, what are we supposed to eat? We will die. Think about this, and also inform the Government", exclaimed an elderly woman of Bareria village, sitting in the bank of the Lower Ayodhya dam.

When the people of the Ayodhya hills were made to sign in the No Objection Certificate, they were not given any proper information about the project. A villager informed, "They were distributing snacks in the Panchayat office. When we went to collect the food, they made us sign first". Another said, "I was made to sign when I went to collect the '*Swastha- Sathi'* (health scheme by govt. of W.B.) card". "A 'Memsahib' came for our meeting. When we went to see her, we were asked to sign". "They said that there will be a project. We demanded permanent employment, if the project commences. DM asked his people to write down all our demands. We signed only after we saw our demands on paper". This shows how fraudulent the process was.

"Both the *adivasi* (tribes) and non-*adivasi* (non-tribes) people inhabiting this place share an inseparable and inexplicable relationship with the forest. Ranging from gathering dry leaves for fuel, making structure of our homes and cultivation equipment like tiller from the wood, the *ghong* leaves that protect us from heavy showers, to the chosen trees that organically witness our marriages, the forest offers us our living. We also get to sell some of the Kendu leaves that we gather from the forest. The forest grass is the only place for our cattles to graze. They have also been deprived us of our grazing lands due to such projects. Where will we go if they cut off our sacred grove of *Marang Buru*?"- said by Arjun

Mahato, a tribal inhabitant of Bareria village. The PPSP therefore, raises a number of issues of displacement of the inhabitants, lack of rehabilitation and compensation and exerted huge mental pressure on the people therein by resulting stress and strain regarding their existence.

7.4 SAMPLE OPINION SURVEY

- **The Target Groups:**

**Table No.-1: Respondent's Profile**

| Respondent's Age | | Respondent's Caste | | Respondent's Education | |
|---|---|---|---|---|---|
| **Age Groups** | **%** | **Class** | **%** | **Educational** | **%** |
| **<30** | **23.3** | **General** | **23.4** | **Primary** | **33.7** |
| **30-50** | **50** | **OBC** | **28.3** | **Secondary** | **20.2** |
| **>50** | **26.6** | **Sc** | **25** | **Higher secondary** | **10.3** |
| **Total** | **100** | **St** | **23.3** | **Collage** | **2.3** |
| | | **Total** | **100** | **Technical** | **1.7** |
| | | | | **Uneducated** | **31.8** |
| **Source: Primary Survey, Jan-2020** | | | | **Total** | **100** |

A pilot opinion survey was taken on the people of Bareria village situated at the foothill of Ayodhya hills. The opinions are mixed (both positive and negative) in nature and the inhabitants are not satisfied by the PPSP project. They put forward their angry and anxiety of being evacuation before all the decisions made by the project authority and the Government.

The opinion survey was taken mainly on state of dams, having irrigation facility, Compensation, alternative way of occupation, level of pollution, and future prospect of the projects. Number of Sample respondent was 60 with different age-sex, caste, and educational categories.

- **Responses from the Respondents:**

**a) State of Dams:** According to the respondents, they are quite satisfied with the introduction of the dams. About 25% of the respondent are highly satisfied with the dam followed by 39% is moderately satisfied. About 22% of the people expressed their disagree on the status of dams (Fig.-5).

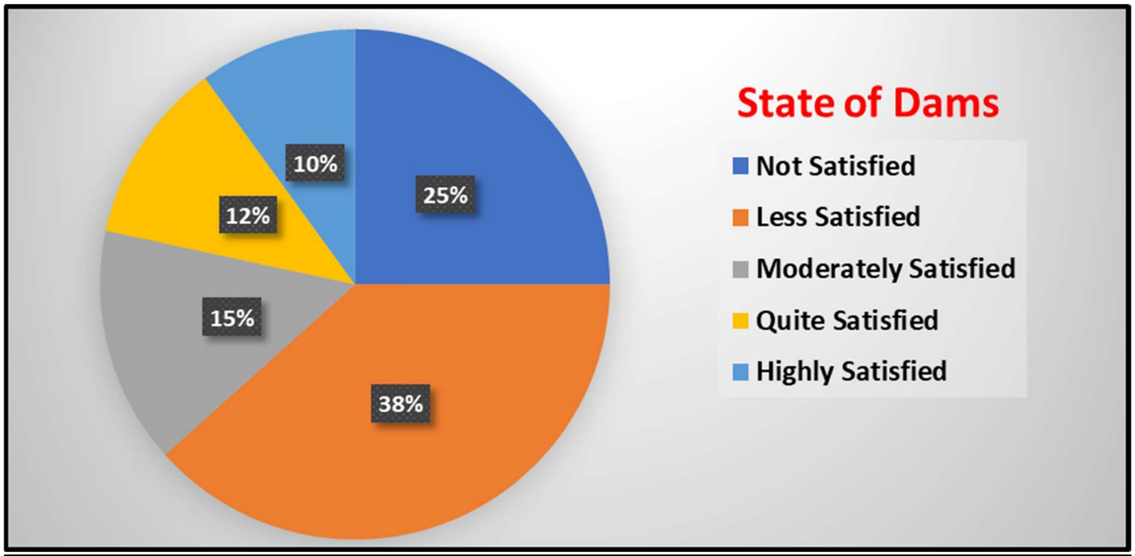



**Figure: - 5**

**b) Irrigation Facility from the Dams:** The people of the study area receive their irrigation water from both surface and sub-surface sources. Only but 46% of the farmers get irrigation water from the dam but rest of the people depends on other sources of irrigation till date. The satisfaction level regarding irrigation facility is therefore not determined at all. Here a point to be noted that, most of the farmers are marginal and poor. They have not the adequate knowledge and capability to access the PPSP authority for irrigation water from the dams. The lower percentage of dam irrigation may also be depicted for this reason (Fig.-6).

**c) Compensation, Alternative way of Occupation:** The respondents are very much deprived of the compensation and the status of alternative occupation. About 35% of the respondent stated their high unsatisfaction followed by 31.6% are unsatisfied of the compensation and rehabilitation offered by the PPSP authority and the Govt. Actually, there were many proposals of compensation and alternative occupation before the introduction of the PPSP but most of the proposals have been ignored after the work is done (Fig.-7).

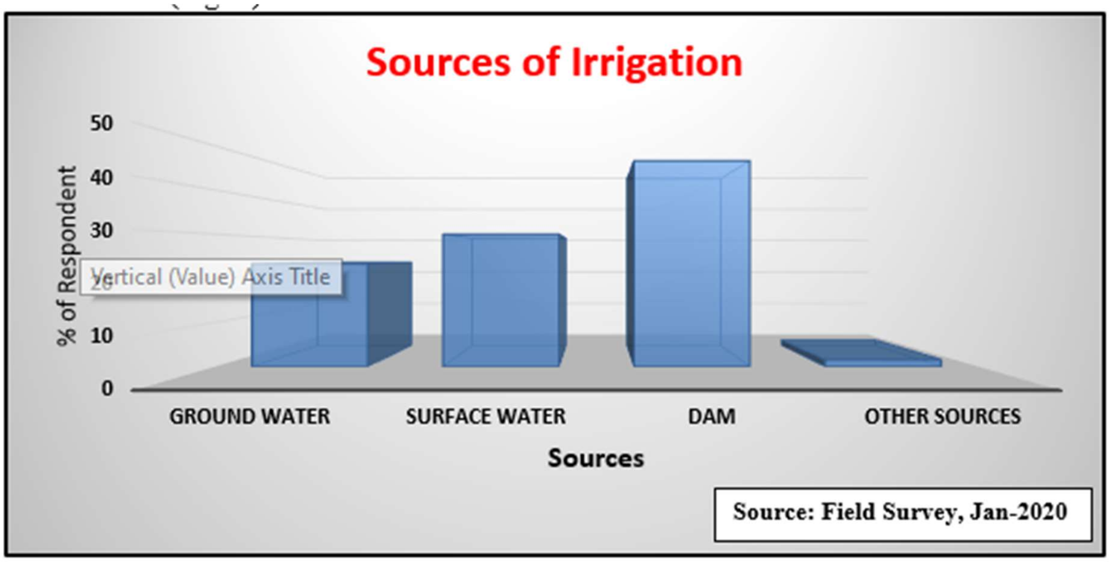
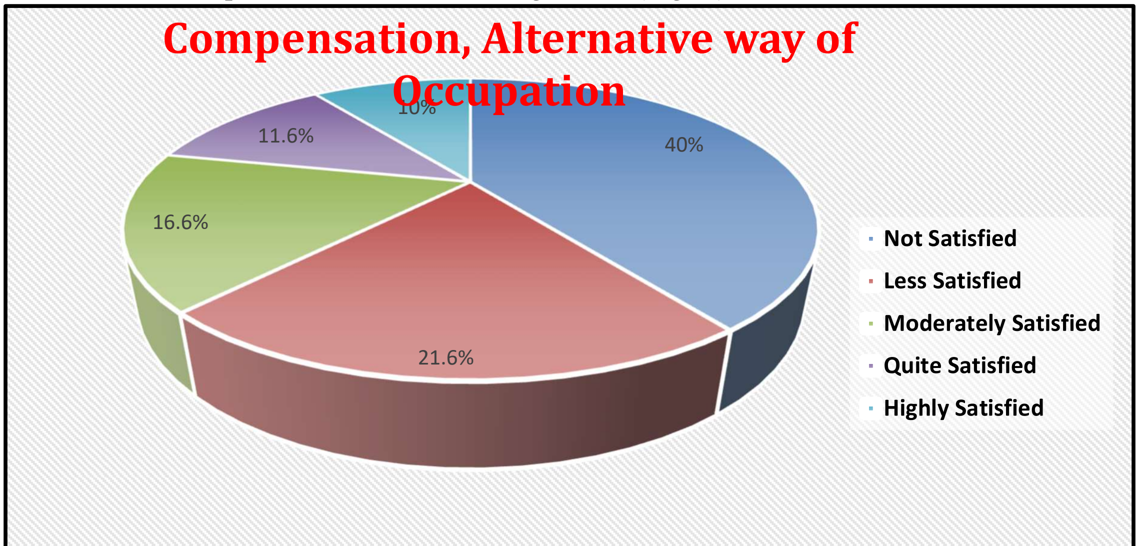



**Figure: -6**

**d) Level of Pollution:** the respondents show miscellaneous opinion on the level of pollution. Most of them (about 50%) are actually not aware of the pollution. They said that, during the construction of the dams, there was many pollution related issues but now the pollution level is quite low. They are not so worried about the pollution related issues right now (Fig.-8).




**Source: Field Survey, Jan-2020**

**Figure: -7**

**e) Future Prospect of the Dam and the Environment:** Most of the respondents are tribal people and their educational levels are also not so high. Most of the respondent, hence, are not in the state to predict the future prospect of the dams and dam induced environment (Fig-9). They also have not the proper idea of purpose and functioning of dam (about 75% response is neutral).

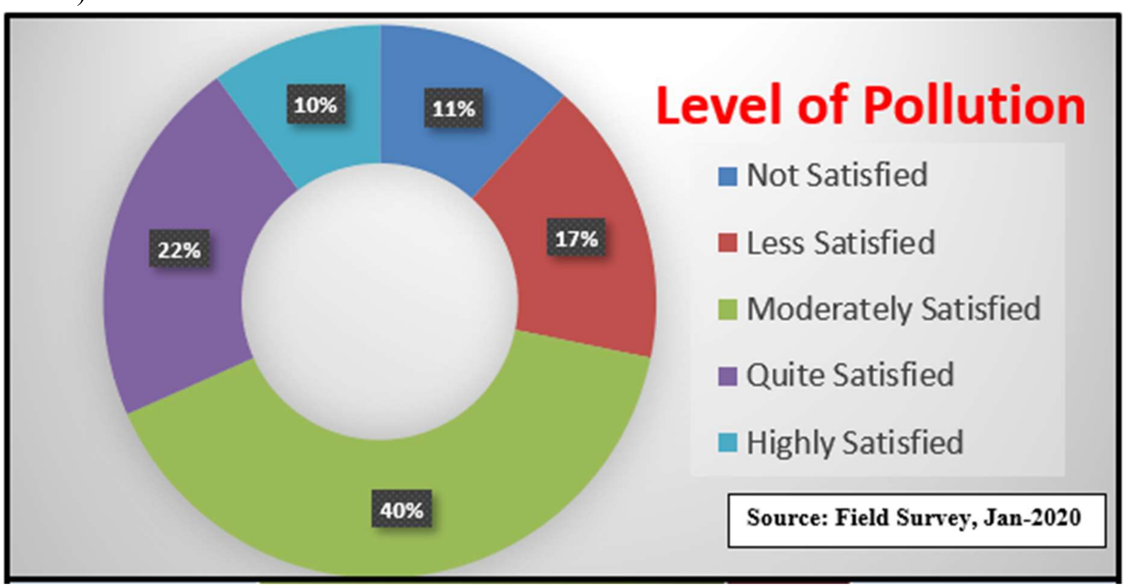



**Figure: -8**

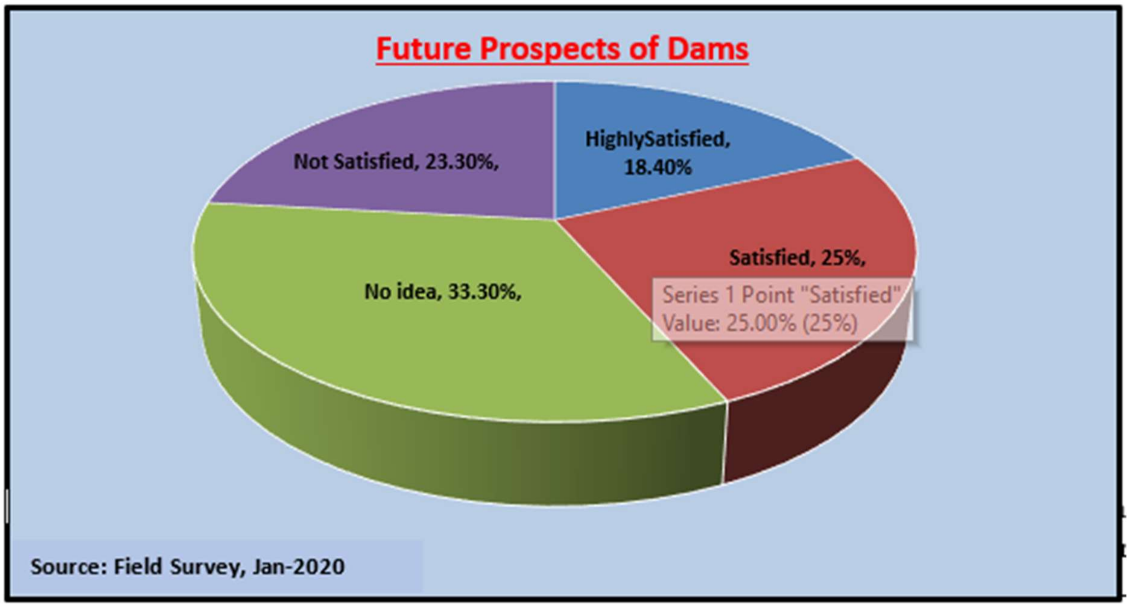



**Figure: - 9**

**7.5 QUALITY ASSESSMENT OF AYODHYA DAMS BY LEOPOLD MATRIX**

The Leopold matrix format consists of a matrix where rows represent different activities of a project or incident and columns represent different environmental factors to consider. Intersections are filled to show the magnitude and importance of each activity's impact on each environmental factor (Leopold, et al., 1971). In the current Leopold matrix form, both influence magnitude and influence range are measured on his three-point scale. For impact, 1 is low impact, 2 is medium impact, and 3 is high impact. On the other hand, for area of effect, ratings of 1, 2, and 3 represent small, medium, and large areas of coverage, respectively (Fig-2).

In the present study of quality assessment of Ayodhya Dams (PPSP) by Leopold Matrix involves seven indicators associated with dam construction (horizontal axis) and 11 environmental aspects (vertical axis) which are expected to be affected by construction of dam indicators (Fig: -10).

**Quality Assessment of Ayodhya Dams by Leopold Matrix**

| Leopold Matrix Priority Values Magnitude (1-3) Impact Area (1-3) | | Incidents Associated with Dam Construction | | | | | | | TOTAL (21/21) |
|---|---|---|---|---|---|---|---|---|---|
| | | Immigration of labour | Dam construction | Transmission link | Reservoir feeling | Heavy metal discharge | Growth of aquatic weeds | Relocation of inhabitants | |
| Environmental aspects | Health | 2 / 3 | 2 / 3 | - | 2 / 3 | 2 / 3 | 2 / 3 | 3 / 3 | 13 / 18 |
| | Spawning of fish | - | 1 / 2 | - | 2 / 2 | 3 / 3 | 3 / 2 | - | 09 / 09 |
| | Archeological artifacts | 1 / 2 | - | - | 3 / 3 | - | - | - | 04 / 05 |
| | Tourism | - | - | 3 / 2 | 3 / 2 | - | - | - | 06 / 04 |
| | Downstream water pollution | - | 3 / 3 | - | 3 / 3 | 1 / 2 | 3 / 3 | - | 10 / 11 |
| | Social and economic aspects | 3 / 2 | 2 / 1 | -- | - | - | - | 3 / 3 | 08 / 06 |
| | Forestry | - | 2 / 1 | - | 3 / 3 | - | - | - | 05 / 04 |
| | Fishery | - | 1 / 2 | - | 3 / 3 | 2 / 3 | 1 / 2 | 1 / 2 | 08 / 12 |
| | Navigation | - | - | - | - | 2 / 2 | 2 / 2 | - | 04 / 04 |
| | Aquatic lives | - | 1 / 2 | - | 3 / 3 | 2 / 3 | 1 / 2 | 1 / 2 | 08 / 12 |
| | Soil and land character | - | 3 / 3 | - | 3 / 2 | 2 / 1 | 2 / 1 | 2 / 2 | 12 / 09 |
| TOTAL (33/33) | | 06 / 07 | 15/17 | 03/02 | 25/24 | 14/ 17 | 14/16 | 10 /12 | |

**Figure: - 10**

From the quality assessment of Ayodhya Dams by Leopold Matrix it is appeared that the most dominant indicator in terms of magnitude and areal coverage is reservoir filling (Score 25/24) followed by heavy metal discharge (14/17) and aquatic weeds (14/16). On the other hand, most affected environmental aspect in terms of magnitude and areal coverage are human health (13/18), downstream water pollution (10/11), and change in soil and land character (12/09).

- **EIA Summary:**

✓ A minute look at the Leopold Matrix of Environmental Impact Assessment (EIA) reveals that the choice of locations for dam construction is deceitful, irrelevant and flawed.

✓ It did not accurately portray the real impact on the environment and the people who depend on it.

✓ PPSP has caused significant environmental and economic damage in the study area.

✓ The cost-benefit analysis also shows that this type of project is not economically viable in this drought-prone region given the intangible costs already paid by society and the environment.

✓ Immediate mitigation measures are needed to restore environmental stability and ensure economic prosperity in the region.

## 8. FINDINGS

The major findings of the present study are as follows:

- Four PPSP projects collectively covered about 1500 ha of land, including about 1000 ha of forest.
- Acquisition and conversion of almost double the amount of agricultural and forest land in terms of land use.

- Large amounts of construction materials were used in large-scale construction projects, and problems such as transportation and disposal of these materials adversely affected the ecological balance of the entire region.
- Building of multiple dams in an already dry area exacerbates the water crisis.
- Small seasonal rivers are in constant danger of water shortages.
- Deforestation and construction in small hilly areas such as the Ajodhya Hills increased the risk of soil erosion and landslides.
- Wild animals were slaughtered or removed to speed up the PPSP building process to build PPSP and bombs were thrown to kill and exterminate animals.
- The establishment of hydropower projects in Ajodiah Hills has impacted the elephant population in Ajodiah Hills and the use of this corridor. The current estimated number of such resident elephants is reduced to 8-10 numbers (FAC report, 2019).
- The PPSP (upper dam only) has cleared approximately 3.5 million trees, representing 20-25% of the forest in the study area (FAC Report, 2019).
- Panchayat planted thousands of eucalyptus trees on the hills of Ajodhya. However, eucalyptus has been proven to be detrimental to the region's natural ecosystems as a whole, as it depletes groundwater and soil nutrients.
- Local residents facing water shortages as all river water is drawn into energy projects.
- The project has robbed people from over 70 villages who have been forced to become “development refugees” and move to urban areas as “migrant workers” to work in precarious jobs. rice field. o Previously, water was pumped by digging 2 to 8 feet near the river, but since the PPSP started it has not been found below 3 feet (Kartik Tudu, local).
- Although it is claimed that the project will electrify the surrounding villages, the percentage of villagers using this facility is very small. The electricity available in the surrounding villages is highly erratic and unreliable.

## 9. SUGGESTIONS:

The following are the humble suggestions for sustainable tourism development in the study area:

- Forest rules should be obeyed properly and environmental compensation must have to be done to restore the ecological balance of the region to some extent.
- Local communities, especially indigenous peoples have to engage in the project.
- Local communities, especially indigenous peoples, women and minorities, should be encouraged and expected to participate in tourism planning, development and management with the support of governments and stakeholders.
- Special rules should be established that respect the culture, economy, lifestyle, environment and political structure of the destination for all tourists, groups and individuals.
- All tourism stakeholders should be aware of the need to develop more sustainable forms of tourism by properly educating host communities and tourists themselves on sustainability issues.
- As noted above, species loss should be controlled and their numbers increased as quickly as possible through appropriate conservation programmers and other infrastructure improvements.
- An integrated human resource development system to be developed in both the public and private sectors to meet the needs of the tourism industry in the region under study.
- Research should be conducted at all stages of tourism development to monitor impacts, address problems, and enable locals and others to respond to change and seize opportunities.

- Now is the right time for the government to grant Priority Sector status after considering the socio-economic benefits of tourism growth and the tourism phenomenon. The government should also allocate more funds to the overall development of this sector.

## 10. CONCLUSION

Finally, it may be concluded that Ayodhya dams have exerted discriminatory effects in the riparian section of the study area. Being predominately an undulating plateau area needs some plan to bring a balanced development of the whole area. The discriminatory effects of the dam may be gradually minimized through implementation of some programmes related to rain-water harvesting, micro-watershed management, land quality development and community forest management.

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# IMPACTS OF AYODHYA DAM ON ECOLOGY, ECONOMY AND PEOPLE

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## ABSTRACT

Dams have been built all over the world because it is believed that the economic benefits outweigh the costs of any negative biophysical, socio-economic, and geopolitical effects. However, marginalized population whose means of subsistence are almost entirely dependent on the main economic activity may be forced to deal with the effects of dams.

The Ayodhya Hills, located at the easternmost tip of the Chhotanagpur Plateau, border the Dolma Range and have a total forest area of 10,000 $km^2$. In 2006-2007, the Japan International Cooperation Agency (JICA) invested in the construction of a dam on the Bamni River in the Ayodhya Hills under the Purulia Pumping Station (PPSP). Water flows downstream and is stored to generate electricity. During the dry season, water is pumped from downstream dams to upstream dams. Building of multiple dams in climatologically dry regions not only poses water crisis issues, but also matter of acquisition and conversion of agricultural and forest land, and increased risks of soil erosion and landslides.

This study is an endeavor to address the present status of the affected people and their environment by the establishment of the Ayodhya dam projects and keep focus on the importance of environmental advocacy which can be treated as a fundamental approach towards more sustainable development of the area under question.

**Key Words:** *Dam, environment, livelihood, soil erosion, landslide, water crisis.*

## 1. INTRODUCTION:

It is easy to understand that rivers shape entire regions of water pumping, and downstream regions are always blessed with water for economic and domestic use. But the strengths and weaknesses gradually change from point to point, and the difference between the upstream and downstream parts of a given point is very small and, in most cases, imperceptible. If, however, the free flow of a river is impeded at a given point, the differences no longer remain imperceptible or marginal, but become cardinal and prominent leading to environmental, social and economic discrimination between the communities living in the upstream and the downstream sections from the point at which the intervention is made.

## 2. RESEARCH PROBLEM:

A river is a flow of water and a dam is a barrier that stops that flow. The damming of rivers in various parts of the world has radically changed both their course and their watersheds. Nothing changes a river like a dam. Wild rivers are always dynamic. It changes course by erosion and deposition. Dams are static. It seeks to keep rivers under control by regulating seasonal flood patterns and slow flow. The downstream morphology of riverbeds and banks, deltas, estuaries, coastlines, and biodiversity change as a result of upstream changes from river valleys to reservoirs. Dams not only trap sediment and nutrients, but also change the temperature and chemistry of the river. It disrupts the geological processes of erosion and sedimentation that shape the land around rivers (McCully, 1998).

**3. MOTIVATION:**

The Ayodhya foothills are within the dry deciduous forests belonging to the north-eastern sub-region of the Chhotonagpur Plateau and are unique agro-ecological zone of West Bengal with hilly red and laterite zones. Distinctive and famous hills of the region include Mathaburu, Gorgaburu, Pakhipahar and Ayodhya. The unique geological-hydrological environment and unique plant and animal diversity support local people who depend on the forest for their livelihoods. In addition, the terrain, forest abundance and wildlife attract a significant number of tourists, wildlife researchers and naturalists. Besides, being a popular tourist destination, the hills of Ayodhya are of great importance to the entire *Santal* and *Birhor* tribes of India. The area is perilously close to the archaeological sites that have produced microlith-rich outcrops that date from Bengal's prehistory to 42,000 BC, making it one of the most important archaeological sites in West Bengal. is in This study is therefore a modest attempt to present a real-world scenario for the ecological and socioeconomic impacts of the Ayodhya Dam, based on a relatively fragile geological and geographical setting.

**4. OBJECTIVES:**

The objectives of the present study are:

- To investigate into the question, whether the Dams constructed across the Bamni river around Ayodhya Hill are environmentally, socially and economically viable to the study region;
- to examine whether a large-scale technological intervention in the free flow of a river creates any discriminatory effects upon the communities living contiguous to the dam site, and
- to reconsider whether such large-scale interventions in general could be replaced by any feasible alternatives.
- To probe into the possible impacts and benefits enjoyed by the riparian villages of Ayodhya Dams in special reference to Bareria village.

**5. THE STUDY AND THE STUDY AREA:**

The Ayodhya foothills are within the dry deciduous forests belonging to the north-eastern sub-region of the Chotnagpur Plateau and are included in West Bengal's unique agro-ecological zone - the hilly red and laterite zones. Some of the prominent and familiar hills of this region are Mathaburu, Gorgaburu, Pakhipahar and Ayodhya itself (Fig.-1).

In terms of geological structure and topography, Purulia is a part of the Ranch Plains. The 300-meter contour line is the boundary between the higher plains of Jhalda, Arsha, Baghmundi, Balarampur, Barabazar and Bundwan Police Stations and the rest of the lower hilly plains of the district. The highlands are very steep above 600 meters contour, but the slope become gentle to moderate below 500 meters. Actually, it is a dissected plateau regions with a coexistence of residual hills and undulating surface. The main soil type of the area under study is laterite soil that owns its origin to the hot and humid climate associated with an alternate period of the wet and dry season. The hilly part of the study area is under forest cover where Sal is the mast predominant forest tree. As per Indian National forest classification, the forest under Purulia Forest Division falls under Northern tropical Dry Deciduous Forest (5B/C 1c).

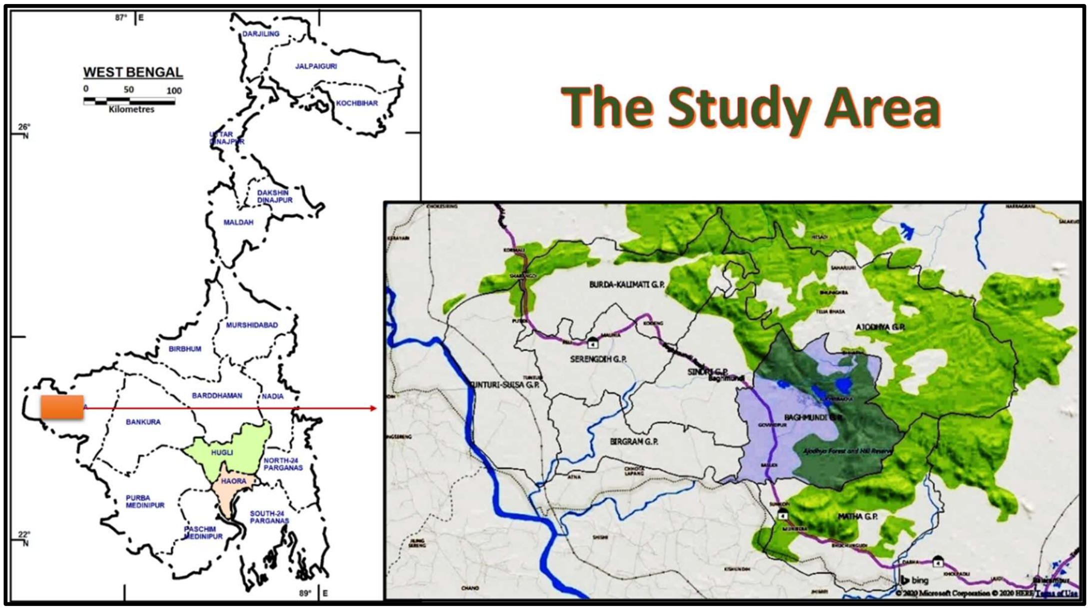



Figure: -1

## 6. METHODOLOGY:

The principal methods of the present study are:

**I. Results Reference Method:** The results reference method is used to evaluate service values of reforestation, biodiversity, species conservation, and cultural education.

The evaluation process involves three stages of analysis:

**Stage 1**: – Defining the problem and choosing the correct assessment approach.

**Stage 2**: – Defining the scope and limits of the analysis and the information required for the chosen assessment approach.

**Stage 3**: – Defining data collection methods and valuation techniques required for the economic appraisal, including any analysis of distributional impacts.

**II. Impact assessment by Leopold Matrix:** The Leopold matrix is a qualitative Environmental Impact Assessment method developed in 1971 by Luna Leopold and collaborators for the USGS. It is used to identify and assign numerical weightings to potential environmental impacts of proposed projects on the environment (Fig:-2).

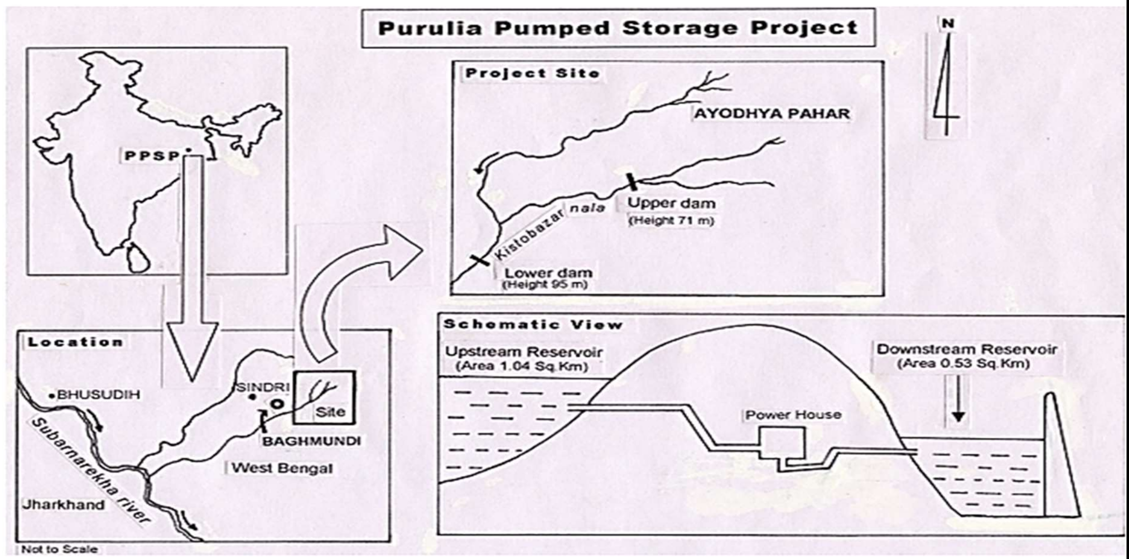
| | Incidents happened | | Total of Impact action |
|---|---|---|---|
| Impact actions | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) |
| | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) |
| Total of incidents happened | Magnitude of Impact (1-3) | Magnitude of Impact (1-3) | Magnitude<br>1=Low<br>2= Medium<br>3= High |

**Figure: - 2**

## 7. RESULT AND DISCUSSION:

Ayodhya Pahar was come into limelight for power generation in 2008. On April 6, 2008, the Purulia Pumped Storage Project (PPSP) was officially establishrd on the Bamuni River downstream from Bareria Village on the slopes of the Ayodhya Hills near Bagmundi. All four units of the project have been previously commissioned, and were actually implemented by JICA (Japan International Cooperation Agency) in cooperation with Japan's Taisei Corporation, with an investment of approximately Rs 295.3 billion. The project had a production capacity of 900 MW using four reversible turbines of 225 MW each (WBECDCL, 2020).

At a distance of about three km from the river Bamni there is another river called Thurga. On the upstream of Thugra, TPSP (Thurga Pumped Storage Power Project), the second hydro-electric power project of this area has been commissioned. But the most ingesting fact was that, no names or locations were listed in survey sheets prepared by government forest service officials of West Bengal who had a license to cut forests. The four projects comissioned here are Purulia Pumped Storage Project, Turga Pumped Storage Project, Kathlajal Pumped Storage Project and Bandu Pumped Storage Project. However, there is some confusion as to exactly which one was the third and which one was fourth project (Figure-4). Another key source of Govt. official listed Bandhu Project as third project and *Kulbera* (or *Kurbera*) as the fourth pumped storage project in Ayodhya Hills, where *Kathlajal* project was sent in a backseat due to some difficulties in implementation (PPSP Report, 2013).




*Schematic by Swarup Bhattacharya, SANDRP. A number of photos of PPSP in this article are also by Swarup.*

**Figure:- 3**

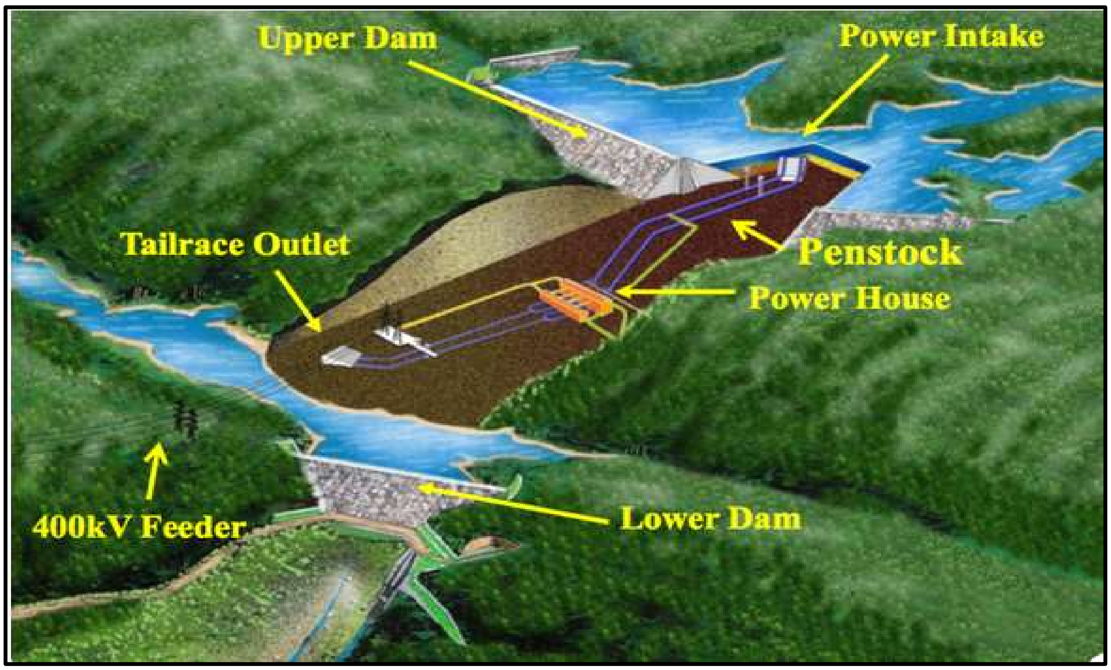



**Figure-4: Schematic Diagram of Ayodhya Dams**

7.1 IMPACT ON ECOLOGY

- **Impact on Land, Soil and Hydrology:**

The effect of building two dams (upper and lower) is very different from a normal hydroelectric power plant because:

1. Acquisition and conversion of agricultural and forest land for two dams instead of one.

2. Requires investment in two dams.

3. Numerous materials needed to operate two dam constructions viz., tunnel/pipe connections, power plants, power lines, roads, colonies, material mining and debris dumping with all those negative consequences.

4. Building of multiple dams in an already water deficit region creates an even more acute water crisis.

5. Small seasonal rivers are in constant danger of running out of water.

6. Deforestation and heavy construction in a small hilly area like Ayodhya Hills can increase the risk of soil erosion and landslides. These risks are made even more apparent by continued mining and quarrying activities in the hilly areas.

All the above problems have already happened in Ayodhya Hills. Large-scale 'development activity' in a small geographical area (covering just a few square kilometres) poses great challenges to the entire local ecosystem. The Thugra project itself covers 292 hectares of land, of which 234 hectares were covered with forest. Actually, the four PPSP projects occupied approximately 2000 hectares of land, including about 1000 hectares of forest land.

- **Impact on Vegetation and Biodiversity:**

The Ayodhya Upper Dam was constructed by converting 159.59 hectares of forest land for Phase II FC on 31 October 2001 by clearing about 3.5 lac forest. Despite of promises of compensatory afforestation to ‘balance biodiversity’, almost no trees were planted (except eucalyptus) in Ayodhya hill area. A government report was made on limit of cutting of trees was only 6,000 trees, but in reality, about four lakh trees were destroyed for Thurga project only. "They (government officials) only appreciate artifacts. How can they appreciate what is natural?” sighs Janashyam Murmu. Compensatory plantings of TPSP were said to be carried out at three locations in Purulia, North Bengal and one block in Jalpaiguri, but nothing was specified about the name of the block or the type of land use (arable, forest, residential) in the compensatory report.
The unique bioclimatic region and biodiversity of the study area have already experienced much destruction and loss. Wild animals were slaughtered or driven away to speed up the PPSP construction process. A local club member argued that “Bombs were hurled to kill and get rid of the animals for the construction of PPSP. There even have been such incidents where meat attached to a bomb was used as a bait to kill the leopard cats.” Among the other mammals, the condition of the elephants was very critical. There were twelve to fourteen elephants in this place but with degradation of ecology of the residence of the elephants those troops of elephants had to leave the place for having no alternative. Though in context of ecological and environmental balance, protection of those animals was a constitutional responsibility of the government, but the responsibilities were totally denied.
The website of the Purulia Zilia Forest Department (PZFD) states: “Bio-Diversity: Biogeographically it represents zone 06 B (Deccan Peninsula Chhotonagpur), Mammal – 39 species (5 in Schedule – I) – (Pangolin, wolf, leopard cub, leopard, elephant). Amphibian – 9 species, Fish – 27 species, Mollusca – 9 species. Most interesting is Madras Tree Shrew which is found on the top hills of this ecosystem and nowhere else in West Bengal. Ayodhya hill ecosystem hosts few numbers mega-mammals like elephant.

Though major elephant habitat is engulfed by PPSP, at present, the number of such resident elephant is considered to be 8-10. Apart from that the seasonally migrated herds of elephant from nearby Jharkhand Forest took shelter in this area for days together in different seasons of the year." The Forest Advisory Committee's (FAC) report also support this contention.

## 7.2 IMPACT ON ECONOMY

As a compensation of cutting of trees for Ayodhya dams, a huge number of eucalyptus-like trees were planted by local Panchayats on the hills of Ayodhya. But, the trees like eucalyptus have been proven to be detrimental to the entire natural ecosystem of the region as it depletes groundwater and soil nutrients. In fact, affected forests need protective and meticulous attention rather than further damage. Hence, the projects require large-scale quarries, especially in areas of great archaeological importance, are of great concern, to say the least. As a result, about 70% of villagers face serious livelihood problems. On the one hand, they face water shortages while trying to meet the basic needs of farming in the fields, as all river water is being drawn into energy projects. Large agricultural and forest areas were flooded with reservoirs. There were about 200 non-locals working full-time at PPSP, that means employing 800 of his people across four projects. The local people were promised to engage in the projects as worker but in reality PPSP provided jobs for a limited number of people for a limited time to the local people. Those works were completed as soon as construction was completed. This also means sudden losing of the livelihoods of people in over 70 villages. These people were forced to become 'development refugees' and forced to move to urban areas as 'footloose' or migratory labour, engaged in precarious activities.

The Bamni River was also fall in danger by the Purulia Project. Populaces already faced major challenges in obtaining water to grow their fields. The Thurga project hence worsens this problem.

## 7.3 IMPACT ON PEOPLE

"What is this dam for? What about our sustenance? We get our food from the hills. Forests provide us with woods and food. If Baghmundi is submerged, what are we supposed to eat? We will die. Think about this, and also inform the Government", exclaimed an elderly woman of Bareria village, sitting in the bank of the Lower Ayodhya dam.

When the people of the Ayodhya hills were made to sign in the No Objection Certificate, they were not given any proper information about the project. A villager informed, "They were distributing snacks in the Panchayat office. When we went to collect the food, they made us sign first". Another said, "I was made to sign when I went to collect the '*Swastha- Sathi'* (health scheme by govt. of W.B.) card". "A 'Memsahib' came for our meeting. When we went to see her, we were asked to sign". "They said that there will be a project. We demanded permanent employment, if the project commences. DM asked his people to write down all our demands. We signed only after we saw our demands on paper". This shows how fraudulent the process was.

"Both the *adivasi* (tribes) and non-*adivasi* (non-tribes) people inhabiting this place share an inseparable and inexplicable relationship with the forest. Ranging from gathering dry leaves for fuel, making structure of our homes and cultivation equipment like tiller from the wood, the *ghong* leaves that protect us from heavy showers, to the chosen trees that organically witness our marriages, the forest offers us our living. We also get to sell some of the Kendu leaves that we gather from the forest. The forest grass is the only place for our cattles to graze. They have also been deprived us of our grazing lands due to such projects. Where will we go if they cut off our sacred grove of *Marang Buru*?"- said by Arjun

Mahato, a tribal inhabitant of Bareria village. The PPSP therefore, raises a number of issues of displacement of the inhabitants, lack of rehabilitation and compensation and exerted huge mental pressure on the people therein by resulting stress and strain regarding their existence.

7.4 SAMPLE OPINION SURVEY

- **The Target Groups:**

**Table No.-1: Respondent's Profile**

| Respondent's Age | | Respondent's Caste | | Respondent's Education | |
|---|---|---|---|---|---|
| **Age Groups** | **%** | **Class** | **%** | **Educational** | **%** |
| **<30** | **23.3** | **General** | **23.4** | **Primary** | **33.7** |
| **30-50** | **50** | **OBC** | **28.3** | **Secondary** | **20.2** |
| **>50** | **26.6** | **Sc** | **25** | **Higher secondary** | **10.3** |
| **Total** | **100** | **St** | **23.3** | **Collage** | **2.3** |
| | | **Total** | **100** | **Technical** | **1.7** |
| | | | | **Uneducated** | **31.8** |
| **Source: Primary Survey, Jan-2020** | | | | **Total** | **100** |

A pilot opinion survey was taken on the people of Bareria village situated at the foothill of Ayodhya hills. The opinions are mixed (both positive and negative) in nature and the inhabitants are not satisfied by the PPSP project. They put forward their angry and anxiety of being evacuation before all the decisions made by the project authority and the Government.

The opinion survey was taken mainly on state of dams, having irrigation facility, Compensation, alternative way of occupation, level of pollution, and future prospect of the projects. Number of Sample respondent was 60 with different age-sex, caste, and educational categories.

- **Responses from the Respondents:**

**a) State of Dams:** According to the respondents, they are quite satisfied with the introduction of the dams. About 25% of the respondent are highly satisfied with the dam followed by 39% is moderately satisfied. About 22% of the people expressed their disagree on the status of dams (Fig.-5).

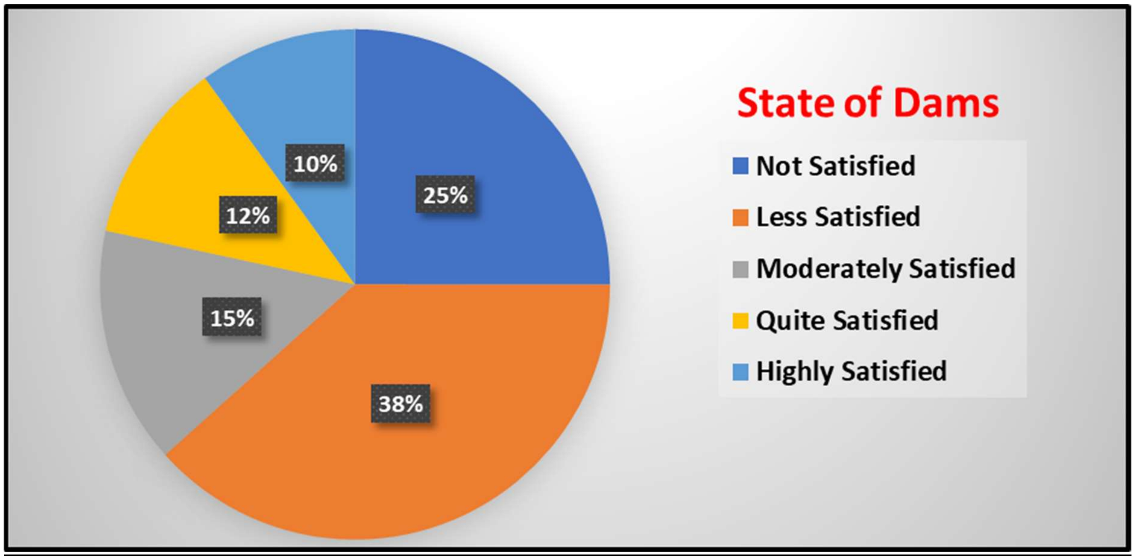



**Figure: - 5**

**b) Irrigation Facility from the Dams:** The people of the study area receive their irrigation water from both surface and sub-surface sources. Only but 46% of the farmers get irrigation water from the dam but rest of the people depends on other sources of irrigation till date. The satisfaction level regarding irrigation facility is therefore not determined at all. Here a point to be noted that, most of the farmers are marginal and poor. They have not the adequate knowledge and capability to access the PPSP authority for irrigation water from the dams. The lower percentage of dam irrigation may also be depicted for this reason (Fig.-6).

**c) Compensation, Alternative way of Occupation:** The respondents are very much deprived of the compensation and the status of alternative occupation. About 35% of the respondent stated their high unsatisfaction followed by 31.6% are unsatisfied of the compensation and rehabilitation offered by the PPSP authority and the Govt. Actually, there were many proposals of compensation and alternative occupation before the introduction of the PPSP but most of the proposals have been ignored after the work is done (Fig.-7).

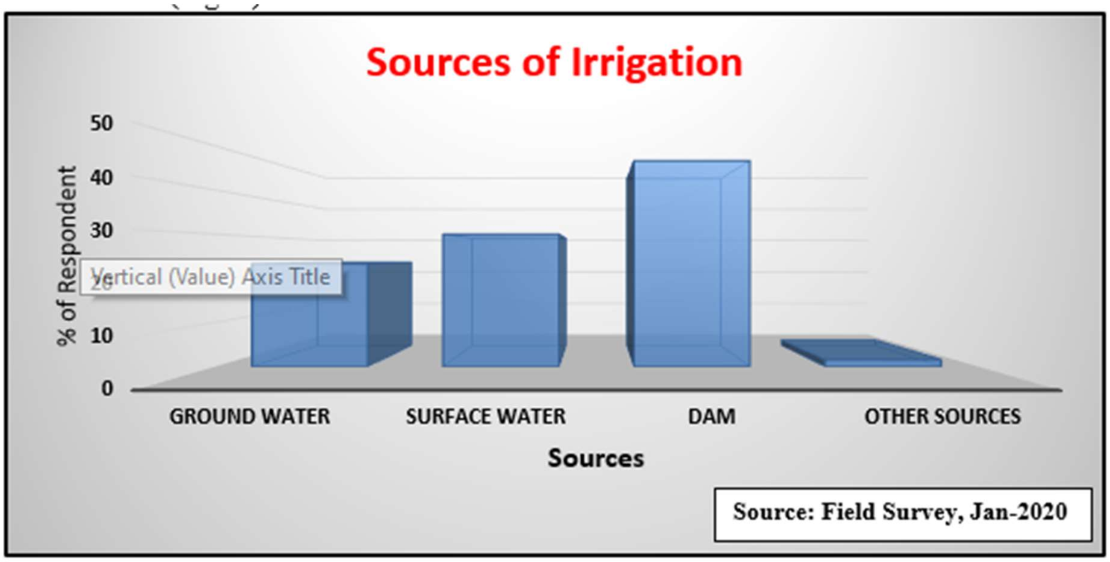
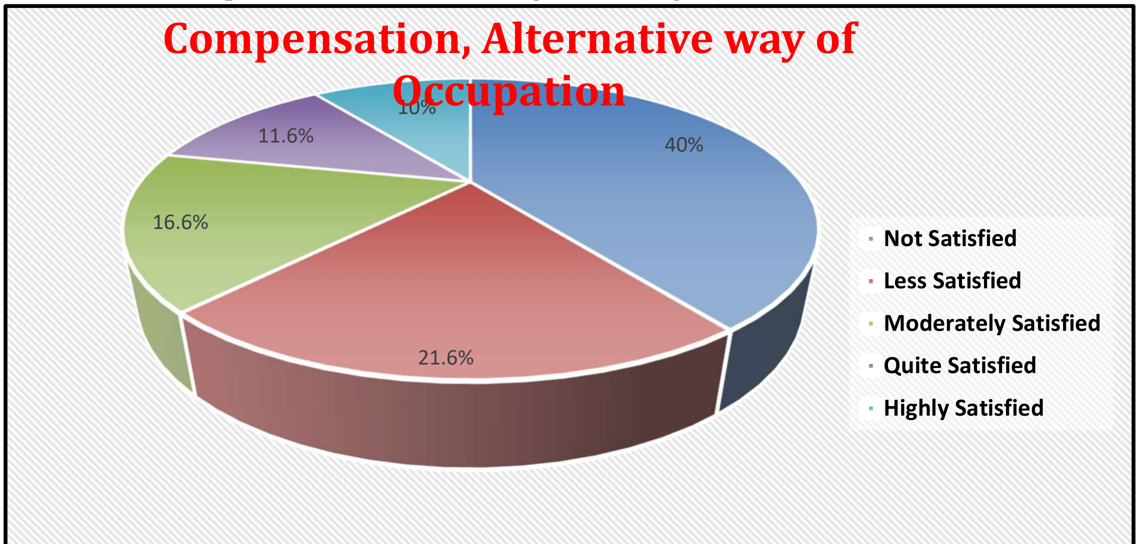



**Figure: -6**

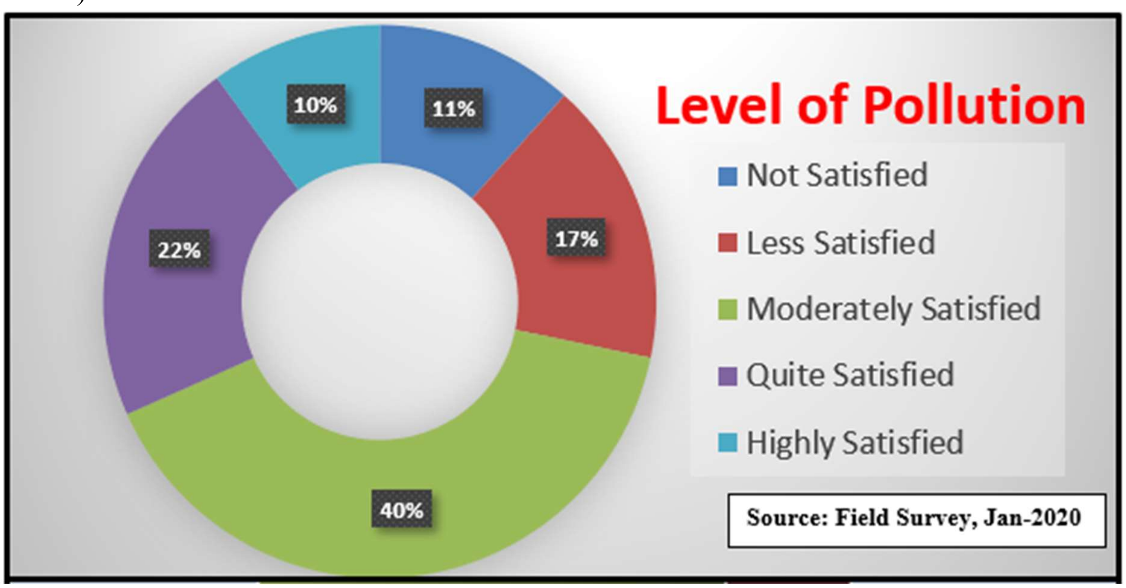
**d) Level of Pollution:** the respondents show miscellaneous opinion on the level of pollution. Most of them (about 50%) are actually not aware of the pollution. They said that, during the construction of the dams, there was many pollution related issues but now the pollution level is quite low. They are not so worried about the pollution related issues right now (Fig.-8).




Source: Field Survey, Jan-2020

**Figure: -7**

**e) Future Prospect of the Dam and the Environment:** Most of the respondents are tribal people and their educational levels are also not so high. Most of the respondent, hence, are not in the state to predict the future prospect of the dams and dam induced environment (Fig-9). They also have not the proper idea of purpose and functioning of dam (about 75% response is neutral).




Source: Field Survey, Jan-2020

**Figure: -8**

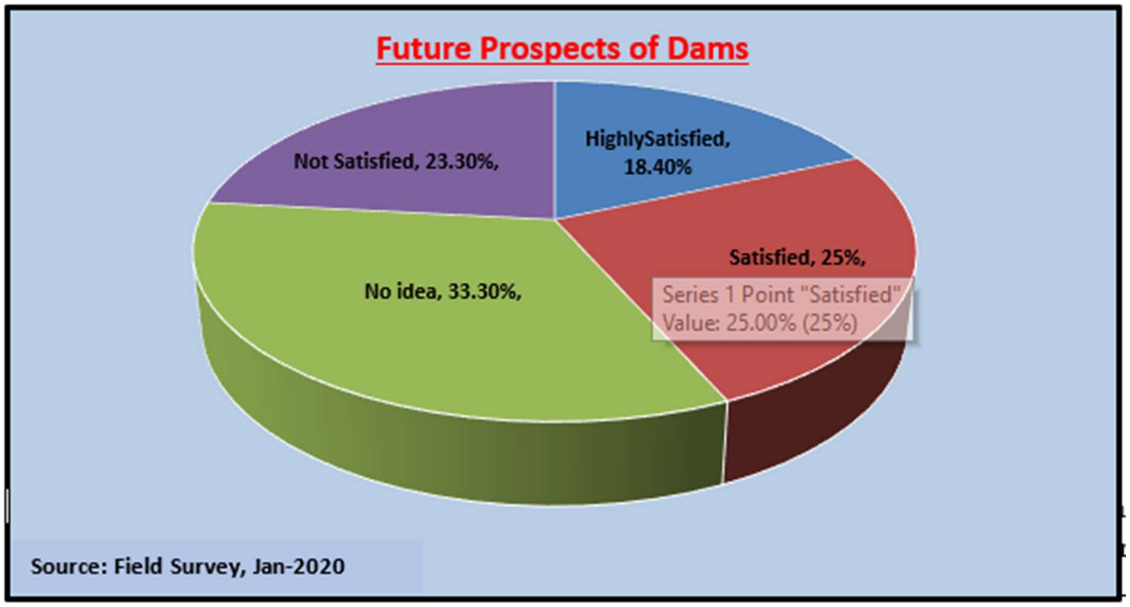



**Figure: - 9**

### 7.5 QUALITY ASSESSMENT OF AYODHYA DAMS BY LEOPOLD MATRIX

The Leopold matrix format consists of a matrix where rows represent different activities of a project or incident and columns represent different environmental factors to consider. Intersections are filled to show the magnitude and importance of each activity's impact on each environmental factor (Leopold, et al., 1971). In the current Leopold matrix form, both influence magnitude and influence range are measured on his three-point scale. For impact, 1 is low impact, 2 is medium impact, and 3 is high impact. On the other hand, for area of effect, ratings of 1, 2, and 3 represent small, medium, and large areas of coverage, respectively (Fig-2).

In the present study of quality assessment of Ayodhya Dams (PPSP) by Leopold Matrix involves seven indicators associated with dam construction (horizontal axis) and 11 environmental aspects (vertical axis) which are expected to be affected by construction of dam indicators (Fig: -10).

Quality Assessment of Ayodhya Dams by Leopold Matrix

| Leopold Matrix Priority Values Magnitude (1-3) Impact Area (1-3) | | Incidents Associated with Dam Construction | | | | | | | TOTAL (21/21) |
|---|---|---|---|---|---|---|---|---|---|
| | | Immigration of labour | Dam construction | Transmission link | Reservoir feeling | Heavy metal discharge | Growth of aquatic weeds | Relocation of inhabitants | |
| Environmental aspects | Health | 2 / 3 | 2 / 3 | - | 2 / 3 | 2 / 3 | 2 / 3 | 3 / 3 | 13 / 18 |
| | Spawning of fish | - | 1 / 2 | - | 2 / 2 | 3 / 3 | 3 / 2 | - | 09 / 09 |
| | Archeological artifacts | 1 / 2 | - | - | 3 / 3 | - | - | - | 04 / 05 |
| | Tourism | - | - | 3 / 2 | 3 / 2 | - | - | - | 06 / 04 |
| | Downstream water pollution | - | 3 / 3 | - | 3 / 3 | 1 / 2 | 3 / 3 | - | 10 / 11 |
| | Social and economic aspects | 3 / 2 | 2 / 1 | -- | - | - | - | 3 / 3 | 08 / 06 |
| | Forestry | - | 2 / 1 | - | 3 / 3 | - | - | - | 05 / 04 |
| | Fishery | - | 1 / 2 | - | 3 / 3 | 2 / 3 | 1 / 2 | 1 / 2 | 08 / 12 |
| | Navigation | - | - | - | - | 2 / 2 | 2 / 2 | - | 04 / 04 |
| | Aquatic lives | - | 1 / 2 | - | 3 / 3 | 2 / 3 | 1 / 2 | 1 / 2 | 08 / 12 |
| | Soil and land character | - | 3 / 3 | - | 3 / 2 | 2 / 1 | 2 / 1 | 2 / 2 | 12 / 09 |
| TOTAL (33/33) | | 06 / 07 | 15/17 | 03/02 | 25/24 | 14/ 17 | 14/16 | 10 /12 | |

**Figure: - 10**

From the quality assessment of Ayodhya Dams by Leopold Matrix it is appeared that the most dominant indicator in terms of magnitude and areal coverage is reservoir filling (Score 25/24) followed by heavy metal discharge (14/17) and aquatic weeds (14/16). On the other hand, most affected environmental aspect in terms of magnitude and areal coverage are human health (13/18), downstream water pollution (10/11), and change in soil and land character (12/09).

- **EIA Summary:**
- ✓ A minute look at the Leopold Matrix of Environmental Impact Assessment (EIA) reveals that the choice of locations for dam construction is deceitful, irrelevant and flawed.
- ✓ It did not accurately portray the real impact on the environment and the people who depend on it.
- ✓ PPSP has caused significant environmental and economic damage in the study area.
- ✓ The cost-benefit analysis also shows that this type of project is not economically viable in this drought-prone region given the intangible costs already paid by society and the environment.
- ✓ Immediate mitigation measures are needed to restore environmental stability and ensure economic prosperity in the region.

## 8. FINDINGS

The major findings of the present study are as follows:

- Four PPSP projects collectively covered about 1500 ha of land, including about 1000 ha of forest.
- Acquisition and conversion of almost double the amount of agricultural and forest land in terms of land use.

- Large amounts of construction materials were used in large-scale construction projects, and problems such as transportation and disposal of these materials adversely affected the ecological balance of the entire region.
- Building of multiple dams in an already dry area exacerbates the water crisis.
- Small seasonal rivers are in constant danger of water shortages.
- Deforestation and construction in small hilly areas such as the Ajodhya Hills increased the risk of soil erosion and landslides.
- Wild animals were slaughtered or removed to speed up the PPSP building process to build PPSP and bombs were thrown to kill and exterminate animals.
- The establishment of hydropower projects in Ajodiah Hills has impacted the elephant population in Ajodiah Hills and the use of this corridor. The current estimated number of such resident elephants is reduced to 8-10 numbers (FAC report, 2019).
- The PPSP (upper dam only) has cleared approximately 3.5 million trees, representing 20-25% of the forest in the study area (FAC Report, 2019).
- Panchayat planted thousands of eucalyptus trees on the hills of Ajodhya. However, eucalyptus has been proven to be detrimental to the region's natural ecosystems as a whole, as it depletes groundwater and soil nutrients.
- Local residents facing water shortages as all river water is drawn into energy projects.
- The project has robbed people from over 70 villages who have been forced to become “development refugees” and move to urban areas as “migrant workers” to work in precarious jobs. rice field. o Previously, water was pumped by digging 2 to 8 feet near the river, but since the PPSP started it has not been found below 3 feet (Kartik Tudu, local).
- Although it is claimed that the project will electrify the surrounding villages, the percentage of villagers using this facility is very small. The electricity available in the surrounding villages is highly erratic and unreliable.

## 9. SUGGESTIONS:

The following are the humble suggestions for sustainable tourism development in the study area:

- Forest rules should be obeyed properly and environmental compensation must have to be done to restore the ecological balance of the region to some extent.
- Local communities, especially indigenous peoples have to engage in the project.
- Local communities, especially indigenous peoples, women and minorities, should be encouraged and expected to participate in tourism planning, development and management with the support of governments and stakeholders.
- Special rules should be established that respect the culture, economy, lifestyle, environment and political structure of the destination for all tourists, groups and individuals.
- All tourism stakeholders should be aware of the need to develop more sustainable forms of tourism by properly educating host communities and tourists themselves on sustainability issues.
- As noted above, species loss should be controlled and their numbers increased as quickly as possible through appropriate conservation programmers and other infrastructure improvements.
- An integrated human resource development system to be developed in both the public and private sectors to meet the needs of the tourism industry in the region under study.
- Research should be conducted at all stages of tourism development to monitor impacts, address problems, and enable locals and others to respond to change and seize opportunities.

- Now is the right time for the government to grant Priority Sector status after considering the socio-economic benefits of tourism growth and the tourism phenomenon. The government should also allocate more funds to the overall development of this sector.

## 10. CONCLUSION

Finally, it may be concluded that Ayodhya dams have exerted discriminatory effects in the riparian section of the study area. Being predominately an undulating plateau area needs some plan to bring a balanced development of the whole area. The discriminatory effects of the dam may be gradually minimized through implementation of some programmes related to rain-water harvesting, micro-watershed management, land quality development and community forest management.

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# *Paradigm Shift of Elderly Care from Family Care to Formal Institutional Care: A Sociological Study on Old Age Homes in Hooghly District*

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## *Abstract*

*Care has historically had a psychosocial impact on the primary social institution of the family. Indian families are known for their sense of interdependence and coherence within the circle of the family. Household tasks ask were divided among the family members in the traditional joint family system. As a family, caring for the elderly was an essential duty, something they carried out generation after generation. Meanwhile, elder family members were empowered with the authority to make decisions. In today's society, however, a number of factors are changing how the family is structured and how it functions. Different forms of alternative families are growing rapidly. Numerous formal institutional forms are assuming responsibility for the care of the elderly in place of traditional forms of care due to multiple unpredictable changes. A rapid transformation is taking place in elderly care from being provided by families to being provided by institutions. Based on secondary and primary data, we discussed those possible factors that influence the transformation of care giving process. Surveys have been conducted in the Hooghly district and data has been collected from old age homes there.*

***Keywords*:** Joint family, care giving, elderly, nuclear

## Introduction

Over the last decade, elder care has shifted from family to institutional care at an astounding rate. India is estimated to have 728 old-age homes today, and 325 of them are charitable, while 95 are on a fee-for-service basis. Meanwhile,

* **Soumitra Sarkar** is a Ph.D Scholar in Sociology from the Department of Sociology, University of Burdwan, West Bengal, India; **Aryama Batabyal** is a Postgraduate Student at the Jaiprakash Institute of Social Change, Vidyasagar Institute, West Bengal, India.

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# "EMPTY DREAMS" IN *THE HUNGRY STONES*

**PRIYA DAS** Assistant Professor of English, Kabi Sukanta Mahavidyalaya, Bhadreswar.

**ABSTRACT** : My paper focuses on some of the psychological aspects of Tagore's one of the most popular 'supernatural' short stories *The Hungry Stones.* What I have tried to interpret here is the out come of various unfulfilled desires and longings that remain suppressed in the unconscious mind and which finds an outlet on certain occasions in the form of Dreams. Perhaps, Tagore's protagonist is victimized by his own unconscious desires when he is in contact with the historical palace at Barich and its surrounding Nature. What he thinks to be a part of the supernatural may be, possibly, his own suppressed wish to visualize such things and be a part of it.

**Key Words**: *conscious, unconscious, dreams, stimuli, visio, split-personality, Waking dreams, hypnagogic hallucinations.*

> "Was it a vision, or a waking dream?
> Fled is that music: - Do I wake or sleep?"
> (Keats *Ode* 66, *ll* 79-80)

A baffling and unresolved question, the above lines from Keats' *Ode to a Nightingale* (1819) anticipates the traumatic state of the anonymous protagonist depicted in Rabindranath Tagore's short story *The Hungry Stones* (1895) which, quite in similarity, leaves an unsolved puzzle addressing, specially, the readers to solve. The *Hungry Stones* in fact presents a story which jumbles up the concept between reality and illusion, between vision and a dream – the protagonist himself states this fact –"Dream or reality, the unseen mirage from two hundred and fifty years ago that had presented itself before me vanished in the twinkling of an eye" (*The Hungry Stones* 252-253).

Interestingly enough, the protagonist sees his visions/dreams only at night or even after evening befall when he awaits for some sensations to stimulate his loneliness or some sort of excitement to refresh his boredom. This can be said to be rooted in his unconscious self – his deep desire to have a 'woman' in his lonely life, to satisfy his hunger of the body as well as of the mind, as he himself states: "Today the palace serves as an enormous empty residence for lonely womanless revenue collectors like myself" (ibid 251).While explaining the 'dream theory' Freud himself quotes the psychologist Karl F. Burdach – "…Even when our whole mind had been preoccupied with something, when deep pain had rent our inner being…our dreams give us something wholly strange, or they extract mere individual elements from reality for their combinations, or they simply take up the key of our mood and symbolize reality" (Freud "How dream relates to waking life" *p.*16). This is what exactly happens with the protagonist whom, we find from the very beginning, is in a constant search for his own identity – perhaps he seems to loose one due to his monotonous life serving merely as a revenue collector preceded by a similar one. Loosing his self-existence, he is in a continuous search to find his alter ego which, thus, left the writer to unname him. At this crucial moment of existential crisis, the anonymous protagonist happens to arrive at such a place where Nature takes the role of stimuli.

Otto Fenichel, the psychoanalyst, describes the psychological state of boredom as "the displeasurable experience of a lack of impulse" and "a need for intensive psychic activity" (Fenichel 350). The protagonist seems to have been suffering from this sort of intense boredom unless he is vis-à-vis with the 'Green World' of Barich. Being romantic as well as hyper-imaginative, he visualizes Nature as a vibrant and beautiful female which is quite evident from his description:

> "Barich stands upon a very romantic site. Beneath a range of lonely mountains, the fast flowing river Shusta runs like a nimble dancer through towering forests along its winding rippling course" (*The Hungry Stones* 250).

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# EFFECTS OF IRRIGATION FROM SURFACE AND GROUNDWATER SOURCES ON LOCAL ECOSYSTEMS: EXPERIENCES FROM HUGLI AND HAORA DISTRICTS OF WEST BENGAL

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Assistant Professor of Geography, Kabi Sukanta Mahavidyalaya,

**Prasenjit Pal**
Assistant Professor of Geography, Kabi Sukanta Mahavidyalaya

**Abstract**

Supply of water from rivers is essential for the agricultural economy of a riverine plains. In the lower reaches of rain-fed monsoon rivers, the amount of water varies with the seasons. Main and diversion canals are dug by farmers and converted for irrigation that eventually modifies the river network. Since many of the agricultural patterns in the region cannot be supported by water from surface sources and therefore the fixed deposit of groundwater is the only remaining option.

In the districts of Hugli and Haora, located in the lower reaches of the Damodar River, the ground water table is declining in an alarming rate due to extraction of water from sub-surface sources for irrigation because of lack of water in surface water sources such as rivers and streams. Local aquatic ecosystems are being affected by increased water demand, corresponding increases in irrigation costs, and the slow but inevitable drying out of soil moisture.

Based on evidence, this work attempts to assess stream diversion rates and groundwater runoff rates due to excessive water use for irrigation in the districts, and to provide some sustainable options for irrigation water.

**Key Words**: *Irrigation, diversion of river, surface and ground water, agrarian economy, local ecosystem, wetland*

## 1.0 INTRODUCTION:

All animal and plant life, as well as all historical and contemporary economic and environmental processes, depend on water for growth and nutrition. This holds true for all human endeavours as well. So, it should come as no surprise that water was revered in ancient times and was essential to myth and religion. For thousands of years, controlling and harvesting water in order to use it for humanity's benefit remained the stuff of heroic hydraulic endeavour. However, as humanity becomes increasingly aware, both the world's renewable and non-renewable freshwater supplies, as well as the river flows, are in danger (Black, 2005).

The study area had a history of river degradation, which hydrologists most often described as the effect of inflow on catchment water volume. The current state and health of rivers is reflected in

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channel depletion and deliberate rerouting of canals by users to use up every last bucket. The greatest reliance on wetland agriculture has put pressure on water volumes in rivers and wetlands. This pressure was the result of indiscreet diversion of the canal, which adversely affected river conditions.

Since at least the last two centuries, the flow of water from catchment regions has been gradually declining. Hydrological engineering has been used to address the water deficit in the channels, but the results have been mixed. Despite the region's location in a humid riparian belt, the subsurface water resource has been under pressure due to a gradual decline in surface water flow, wanton demand from fast growing metropolitan areas, and the Green Revolution's water-guzzling HYV crops.

**2.0 OBJECTIVES:**

The objectives of the present study are:

- To examine the rate of increment of agricultural production and simultaneous enhancement of volume of water for irrigation,
- effect of such water extraction on the surface and ground water sources, and
- effect of water depletion on natural and agricultural ecosystem.

**3.0 THE STUDY AREA:**

The area is located between $22^{0}13^{/}0^{//}$ and $23^{0}14^{/}0^{//}$ North latitude and between $87^{0}30^{/}20^{//}$ and $88^{0}30^{/}25^{//}$ East longitude. The study area is comprised of six Sub-Divisions Hugli, Chandannagar, Srirampur and Arambag Sub-Divisions of District Hugli and Haora Sadar and Uluberia Sub-Divisions of District Haora (Fig.No.-1) The total area under review is 4616 $Km^2$.

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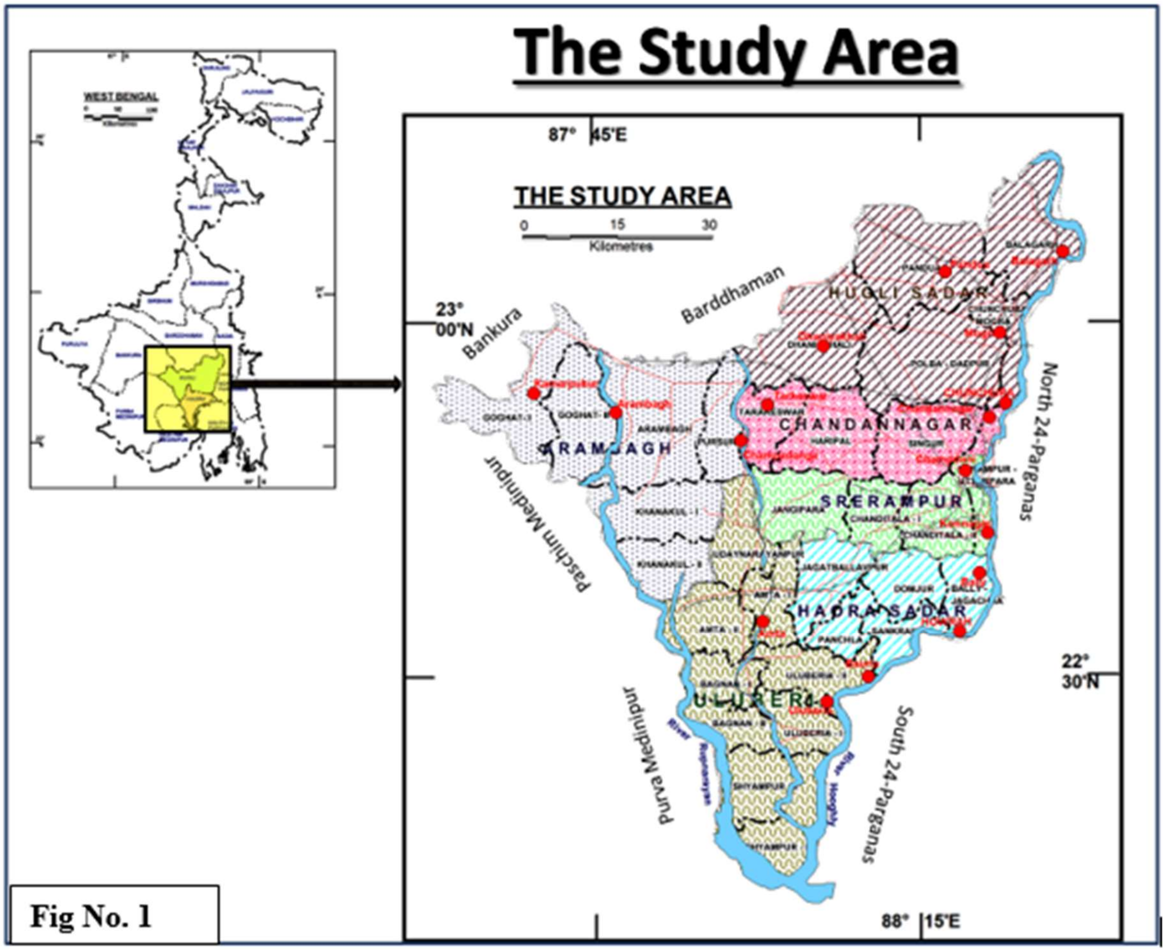


Fig No. 1

**4.0 RELEVANCE OF THE PRESENT STUDY:**

All hydraulic communities around the world harvest or store, manage, and use water for all elements of survival and development due to its significance as the fundamental component of the life support system. Water has the innate ability to moisten and saturate, and because of these qualities, it sustains life. But occasionally, sadly, the same water, when it takes the form of a flood, kills and destroys. We cannot life without water, but too much water puts our survival at peril. (2002, WB District Gazetteers).

The rivers greatly enriched and supported the economic and cultural lives of these two districts. However, a significant change in the length, breadth, depth, and volume of water flow combined with the natural factors that led to a decline in the flow of these rivers and the concurrent building of a vast network of roads and railways caused deterioration in the networks and the regime of the rivers. Due to the rapid expansion of highly sought-after fertile agricultural land and the construction of rails and highways, the extensive wetlands, locally known as *bils*, which were very

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strategically accommodating to the periodic flood and excess river flow with rich biodiversity could not get rid of the rapid changes in their ecosystem, of which the disappearing Dankuni *bil* has now been completely transformed into Dankuni railway station and Dankuni urban centre. The ecology, economy, and culture of the districts examined in this paper have all been directly impacted by this decline.

**5.0 RESEARCH QUESTIONS:**

The present work is based on the key questions as mentioned below:

- What are the causes of deterioration and diversion of the rivers?
- What are the consequences of deterioration and diversion of the rivers?
- What are the factors of the lowering of the sub-surface water table?
- What are the perceptible environmental effects of lowering of subsurface water table?
- What are the consequences of the drying up of the spill channels on the environment and people?
- What is the impact of the deterioration of surface drainage on the human community?
- Can those losses be compensated for by any means?

**6.0 METHODOLOGY:**

The methods and techniques applied in this research work have been derived from the objectives itself. The approach is then extended to include the gathering of data and information from various pertinent sources, which is then further classified and categorized in line with the relevance and significance determined to achieve and support the clearly defined objectives. Records, reports, memoirs, census statistics, and gazetteers all contain data and information that is qualitative, quantitative, descriptive, numerical, and digital, logically categorized into secondary, and presented in retrieved format. Maps, photos, and photographs from various eras have been meticulously categorized and included. Regarding temporal information on water, rivers, wetlands, agriculture, irrigation, trade, and commerce, among other things, the data and information chosen and compiled from secondary sources is of significant significance. The information gathered during in-depth fieldwork, obtained through oral interviews with respondents as well as with the aid of a questionnaire schedule, was categorized in accordance with the goals and to address numerous issues specifically raised in the study questions.

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**7.0 RESULT AND DISCUSSION:**

By locating in the lower Hooghly basin, the region under consideration is identified as a riverine tract with a flat alluvial plain by numerous geologists, hydrologists, and geographers. As was already noted earlier, the majority of the area under review was formed by rivers that brought sediments to this level plain and then deposited them there. These rivers mainly originated in the western uplands or the eastern portion of the Chhotanagpur plateau. The Damodar, Rupnarayan, Darakeswar, and their numerous tributaries, as well as the distributaries of the Damodar, are the most active rivers that significantly contributed to the construction of the area under inquiry (Hunter, 1876; Majumdar, 1938). One of the main goals of the current effort is to identify changes in the lineament and flow of those rivers, as well as any obvious signs of diversion and deterioration in their condition. The causes of their degeneration and divergence are the subject of this chapter. Factors are logically separated into natural or physical factors and anthropogenic or human factors on the basis of the primary forces.

**7.1 CAUSES OF THREAT TO SURFACE AND GROUND WATER**

With the basis of the main forces, factors are logically divided into natural or physical factors and anthropogenic or human factors.

**The physical factors** have remained in action for long which are also equally responsible, at least in maximum cases for the other rivers in the Bengal delta. The principal natural or physical factors may be directly identified as they are concerned with geology, geomorphology, soil, climate, hydro-dynamism and tidal behaviour.

**The human** or **the anthropogenic factors** are much aggressive and powerful causing the diversion, decay and deterioration of the surface drainage channels and the extensive *bils* than that of the physical factors just discussed. As it has been noted earlier that the area followed the economy dependent upon the wetland agricultural system and related trade and commerce, the intervention to the rivers through agriculture and irrigation tells about a long history of use of water of the rivers through hydraulic engineering knowledge developed through time till the present. To accommodate the population increased in number through centuries, expansion of settlement, transport and communication, urbanization and industrialization remained active.

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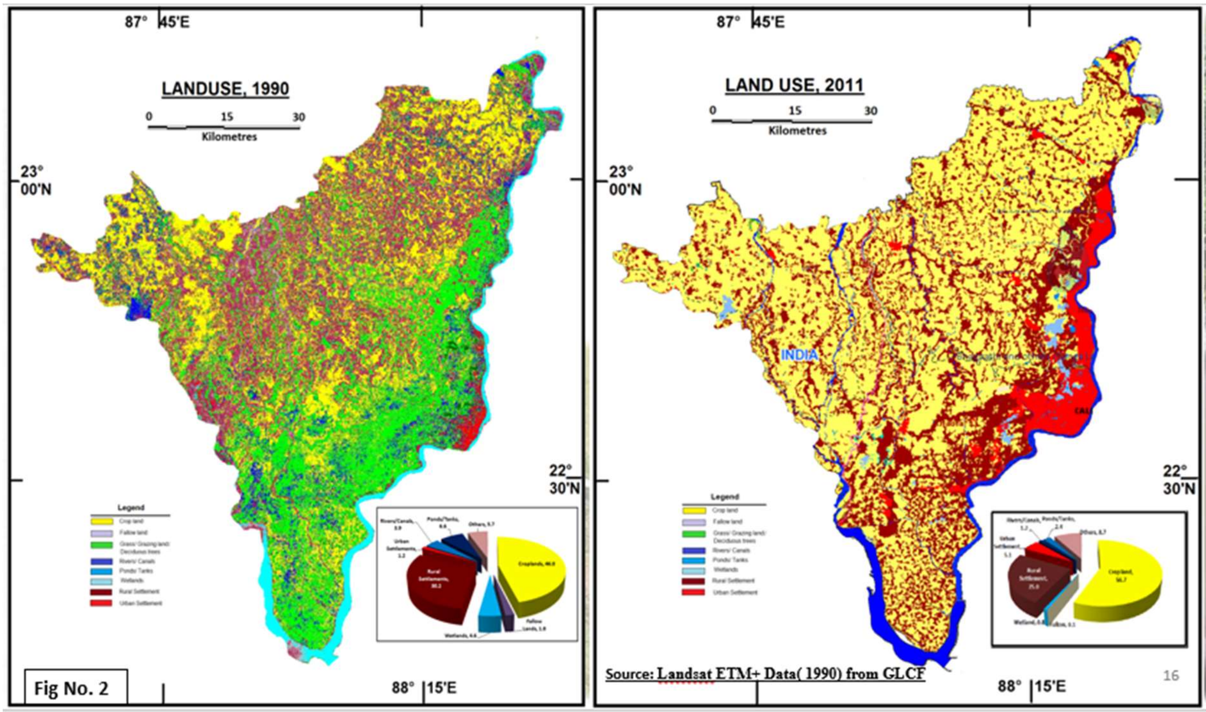


Fig No. 2

This sub-section is concerned with the number of factors engineered by human activities and consequent upon deterioration of the surface drainage system (Fig. No-2). The principal human factors are hydraulic engineering, deforestation, agricultural extension and modernization, varieties of irrigation systems, extension of transport routes and industrialization with increasing demand on water supply.

## 7.2 IMPACT OF DETERIORATION OF SURFACE AND GROUND WATER

The study area established its economy on the success of agriculture which had to be dependent upon the availability of water supplied by a number of rivers (Rennell, 1781; Majumdar, 1941). With advancement of time, the demand for more agricultural output from the land led to an increase in human intervention to irrigate the land for crop growth as well as an increase in the multiple uses of water resources. All of these factors put tremendous pressure on the water resources present in rivers, paleo-channels, bils, and ultimately the sub-surface aquifers.

### Surface Hydrology:

**The gradual negative impact of decrease in volume** of water flowing through their channels and siltation is perceived with the changes in the drainage density within a time period of 1922 to 2011 as is presented below (Fig. No.-3). It is clear from the maps that the drainage density has been decreased maximum in the upper and middle parts of their channels which speaks about their deterioration and almost complete siltation in those areas. The maximum density is retained only in the nearby areas of the principal rivers like the Hooghly and the Rupnarayan.

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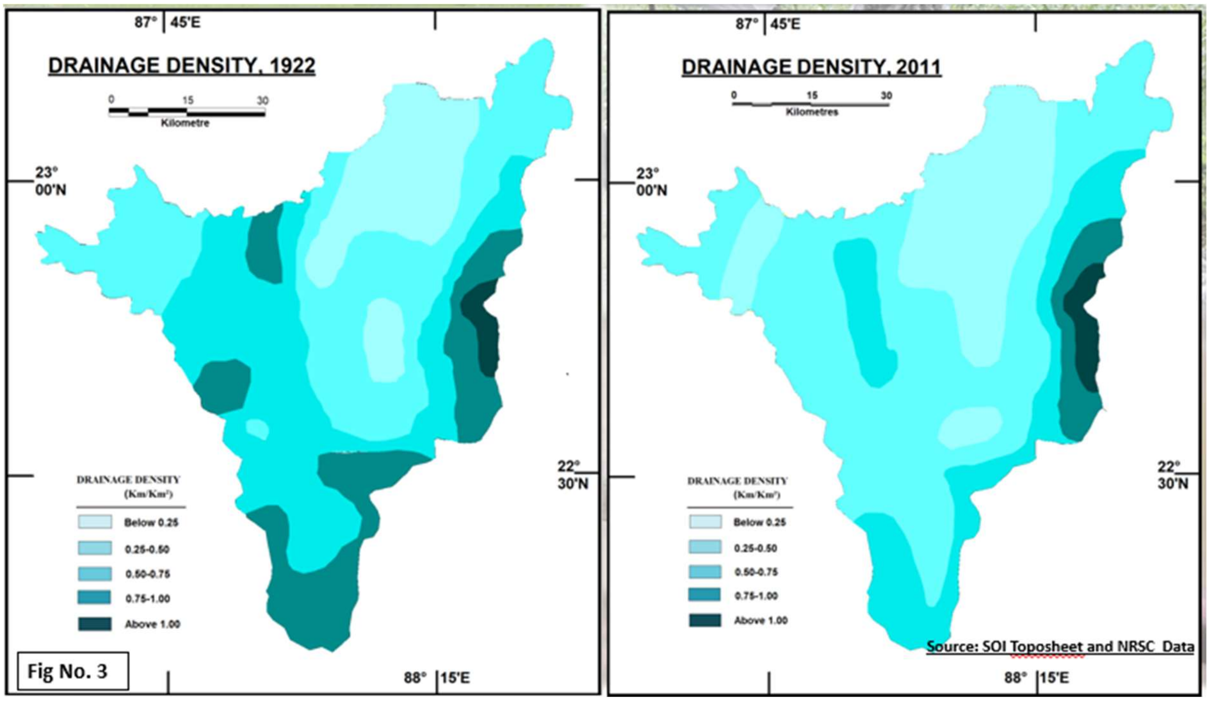

Fig No. 3

The following set of maps show the drainage alignment in the extreme southern region of the area under review. It is evident in the river map of 2011 that the numbers of tributaries as well as the direction of flow and interconnections have been changed. Contrary to that of the previous two sets of the maps, number of tributaries of Damodar, Hooghly and Rupnarayan has been decreased in 2011 from 1922. The most notable fact is that, due to the change in the alignment, the confluence point of the river Damodar has been changed, taking left turn towards the Hooghly near Falta, few Kilometers above Rameswarpur (Fig. No.-4).

The rate of decrease in areal extent of the wetlands is really alarming as they have been transformed into agricultural lands, rail routes, railway junctions and roadways and have ultimately taken the form of modern urban pockets, leaving some of the small pockets as remnants with innumerable fragmentations, sometimes remembering their past existence in their names. The impact of drying up of rivers, decrease in the supply of water, eutrophication and filling up for developmental activities on these wetlands are no less than the deterioration of the rivers, probably more detrimental to the ecosystem (Table-1).

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Table No.-1

**Decrease in the area of the Wetlands**

| Name of the Wetland | Area (Km²) Year 1800 | Now (2013) | Change | % Change in Area | No. of Fragments |
|---|---|---|---|---|---|
| Rajpur Jhil | 78 | 7.068 | 70.63 | 90.90 | 3 |
| Dankuni Bil | 60 | 1.285 | 58.29 | 97.84 | 45 |
| Khanyan Jhil | 47 | 0.616 | 46.00 | 98.68 | 20 |
| Amta Bil | 21 | 0.257 | 20.74 | 98.78 | 15 |
| Santragachhi Bil | 31 | 0.852 | 30.23 | 97.26 | 13 |

Source: Hunter (1876) and NRSC (2013)

**Change in Drainage Texture**

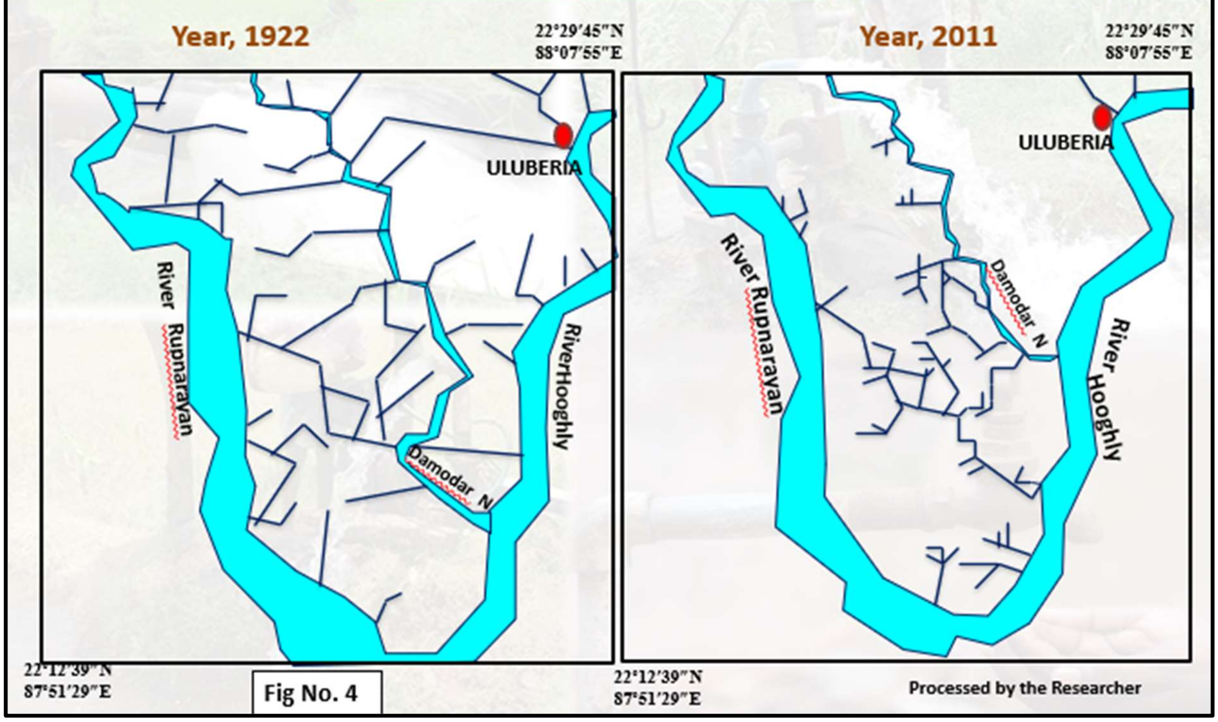


Fig No. 4

## Ground water Hydrology:

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The availability of sub-surface water is dependent upon the rate of percolation of surface water flowing over surface as runoff and amount of water flow through the surface channels. The level of the subsurface water is dependent upon the total amount of recharge from surface and amount of extraction from aquifers. The tables (Table No.-2 & 3) clearly shows that some pockets of the area under study have experienced the subsidence of underground water table particularly in the Blocks of Goghat in the western part of Hugli district, contiguous to the eastern margin of the western plateau.

**Table No.-2**

**Change in Ground Water Table, 1996-2011 (in mbgl)**

**Pre- Monsoon Period**

| Site Name | Year | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Bengai Pz | 10.80 | 13.40 | 11.55 | 11.02 | | 10.50 | | | | | | | | | | | |
| Kamarpukur Pz | 9.80 | 7.40 | 6.76 | 10.50 | 9.50 | 9.65 | 8.98 | 9.79 | 8.97 | 9.80 | 10.13 | 10.27 | 9.95 | 9.53 | 11.13 | 12.00 | 11.15 |
| Singur Pz | 11.63 | 11.96 | 9.83 | 13.39 | | 13.82 | 10.39 | 15.19 | 16.44 | 15.62 | 16.41 | 15.65 | 16.14 | 4.93 | 17.72 | 19.44 | 18.08 |
| Naity Alipur Pz | 5.61 | 9.72 | 7.91 | 11.66 | 11.18 | 12.11 | 10.97 | 14.02 | 14.88 | 13.66 | 14.20 | 15.09 | 13.76 | 14.14 | 8.94 | 7.11 | 7.34 |
| Janai Pz (Chanditala) | | | | | 10.41 | 7.00 | 10.65 | 11.67 | 12.75 | 11.92 | 12.79 | | | | | | |
| Hazipur Pz | 15.00 | 15.28 | 11.96 | | | | | | | | | | | | | | 14.72 |
| Kaknan Pz | 9.45 | 7.17 | 5.52 | 9.64 | 8.75 | | 8.44 | 9.68 | 13.02 | 9.45 | 11.31 | 13.55 | 11.44 | 11.57 | 15.40 | 15.55 | |
| Arambagh Pz-1 | | | | | 10.33 | 9.84 | 10.96 | 10.22 | 10.73 | 10.63 | 10.78 | 10.93 | 10.64 | 10.15 | 11.89 | | |
| Gowa Deep Pz | | | | 15.01 | 13.63 | | 12.09 | 14.52 | | | | | | | | | |
| Arambagh Pz-2 | 10.03 | 9.83 | 8.54 | 10.86 | 10.33 | 9.84 | 10.96 | 10.22 | 10.73 | | | | | | | 12.60 | 11.92 |
| Goghat Pz | 12.27 | 14.60 | 13.33 | 16.55 | 16.47 | 0.00 | 17.04 | 17.22 | 18.44 | 18.27 | 19.00 | 18.94 | 18.98 | 10.20 | 20.57 | 21.62 | 21.67 |
| Haraditya Pz | 12.27 | 9.95 | 9.22 | 11.74 | 10.89 | 11.02 | 11.99 | 12.80 | 14.72 | 13.10 | 13.05 | 16.11 | 14.72 | 13.98 | 15.83 | 16.22 | 16.18 |
| Tarakeswar Pz | 9.23 | 8.65 | 7.13 | 10.00 | 8.73 | 9.83 | 3.06 | 9.54 | 11.79 | 9.73 | 11.82 | | 10.00 | 9.07 | 12.68 | 13.05 | 12.99 |
| Ichhapur Pz | | | | | | | 8.24 | | | | | | | | | | |
| Gourhati Pz | 10.68 | 9.93 | 8.58 | 12.44 | 12.10 | 11.63 | 11.38 | 13.26 | 17.69 | 13.84 | 16.43 | | | | 20.13 | 21.08 | 21.06 |
| Srirampur Pz | 9.80 | 7.43 | 7.57 | 9.73 | 8.75 | 9.40 | 10.11 | 9.18 | 11.08 | 10.45 | 10.74 | 10.90 | 10.40 | 9.62 | 12.79 | 12.00 | 13.10 |
| Khanyan Deep Pz | | | | 14.19 | 14.40 | 14.20 | 12.69 | 17.00 | 17.52 | 17.20 | 17.19 | 19.66 | 16.63 | 16.70 | 15.78 | 15.48 | |
| Domjur Pz-2 | | | | | | | | | | 8.96 | 9.82 | 9.59 | 8.98 | 10.12 | 10.87 | | |
| Domjur Pz-1 | 7.64 | 7.30 | 6.75 | 8.59 | 8.00 | 7.75 | 8.93 | 8.25 | 8.57 | 8.96 | | | | | | 11.18 | 10.94 |
| Garbalia Pz | 8.70 | 8.29 | 6.69 | 10.72 | 9.51 | 9.90 | 9.53 | 9.96 | 11.28 | 10.96 | 11.83 | 9.59 | 11.00 | 10.42 | 12.71 | 13.98 | 11.76 |

Source: CGWB, 1994-2012 (WRIS, NRSC)

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**Table No.-3**

**Change in Ground Water Table, 1996-2011 (in mbgl)**

**Post-Monsoon Period**

| Site Name | Year | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| Bengai Pz | 3.82 | 4.28 | 4.49 | 2.43 | | | | | | | | | | | | |
| Kamarpukur Pz | 1.65 | 1.80 | | 2.21 | 2.77 | 5.00 | 2.01 | 1.30 | 2.82 | 1.01 | 3.48 | 2.27 | 2.40 | 8.02 | 13.61 | 8.01 |
| Singur Pz | 7.09 | 7.25 | 6.43 | 5.86 | 6.83 | 8.98 | 8.10 | 7.27 | 7.89 | 7.58 | 9.77 | 8.34 | 8.45 | 11.33 | 11.38 | 11.48 |
| Naity Alipur Pz | 5.49 | 5.50 | 4.76 | 4.29 | 5.19 | 7.58 | 5.70 | 5.14 | 6.33 | 5.83 | 7.69 | 10.69 | 6.46 | 4.52 | 3.92 | 3.52 |
| Janai Pz (Chanditala) | | | | 4.85 | 6.04 | 6.83 | | 5.90 | 6.68 | 5.85 | | | | | | |
| Hazipur Pz | 9.16 | 2.27 | 8.38 | | | | | | | | | | | | | |
| Kaknan Pz | 4.40 | 4.60 | 2.83 | 1.90 | 3.42 | 4.33 | 4.72 | 2.39 | 6.03 | 2.55 | 6.09 | 3.20 | 3.22 | | 9.39 | 7.02 |
| Arambagh Pz-1 | | | | | 6.44 | 7.54 | 5.60 | 6.41 | 7.62 | 1.45 | 8.18 | | 7.16 | 9.35 | 10.83 | |
| Gowa Deep Pz | | | | 7.10 | 8.19 | 10.24 | 7.97 | 10.70 | | 10.85 | | | | | | |
| Arambagh Pz-2 | 6.62 | 6.59 | 5.85 | 5.55 | 6.44 | 7.54 | 5.60 | 6.41 | | | | | | | | 9.86 |
| Goghat Pz | 6.15 | 6.87 | 6.33 | | | 10.72 | 7.02 | 7.41 | 8.31 | 9.73 | 12.19 | 13.82 | 12.35 | 18.44 | 21.58 | 20.09 |
| Haraditya Pz | 7.00 | 7.10 | 4.19 | 3.80 | 5.56 | 8.03 | 7.02 | 4.50 | 8.36 | 6.42 | 8.07 | 0.00 | 6.92 | 11.35 | 11.91 | 11.77 |
| Tarakeswar Pz | 4.52 | 4.28 | 3.72 | 3.50 | 4.28 | 6.33 | 4.61 | 4.22 | 4.80 | 4.41 | 6.48 | 5.15 | 5.14 | 6.81 | 7.31 | 7.36 |
| Ichhapur Pz | | | | 2.81 | 3.64 | | 8.05 | 3.44 | | | | | | | 13.14 | |
| Gourhati Pz | 6.81 | 7.33 | 3.82 | 2.77 | 5.65 | 7.83 | 7.42 | 3.41 | 6.58 | 4.80 | 8.97 | 8.37 | 8.11 | | 14.36 | 12.93 |
| Srirampur Pz | 5.34 | 3.15 | 3.92 | 4.51 | 4.60 | 7.53 | 3.27 | 4.18 | 5.24 | 4.30 | 5.66 | 5.32 | 5.63 | 10.24 | 8.51 | 8.17 |
| Khanyan Deep Pz | | | | 7.28 | 8.36 | 10.46 | 8.85 | 10.85 | 11.75 | 11.72 | 13.20 | 11.47 | 10.53 | 12.97 | 13.13 | |
| Domjur Pz-2 | | | | | | | | | | 4.06 | 5.71 | 4.96 | 5.41 | 6.82 | 7.63 | |
| Domjur Pz-1 | 4.37 | 4.64 | 4.45 | 3.44 | 4.89 | 4.97 | 5.01 | 4.81 | 4.79 | 4.06 | | | | | | 7.12 |
| Garbalia Pz | 4.90 | 4.80 | 4.12 | 4.38 | 4.06 | 5.20 | 5.05 | 6.09 | 7.22 | | 6.75 | 6.45 | 6.14 | 8.05 | 8.63 | 8.38 |

Source: CGWB, 1994-2012 (WRIS, NRSC)

In pre-monsoon season (Table No.-2), in the Goghat Pz (Piezometric Zone), the level of ground water was 12.27 mbgl in 1996, which decreased to 21.67 mbgl in 2012, an almost 9 metre fall in 16 years with an average fall of approximately 0.56 metres per year. According to the available data, maximum decrease is experienced by the Gourhati Pz, 10.38 metres in the same period. The fall in the post-monsoon season directly indicates excess of extraction than recharge, the cause being utilization of water for growing HYV crops in summer when rivers and irrigation channels are out of water.

Almost all the piezometric zones identified by the State Water Investigation Department (SWID) have more or less experienced fall in underground water table within the same time period. This is a direct impact of the deterioration of the rivers to a great extent which will invite recurring effect upon the rivers as higher percolation down the channel beds and less water to be flown through them.

The impact on the ground water table is more serious which is evident from the data of post-monsoon period (Table No.- 3). Again, for the Goghat Pz, the subsidence of underground water table is15.43 metres, almost three times than that of the 1996. The same fate is true for the Kamarpukur Pz and Haraditya Pz. It may be noted that all these zones are located on the western half of Hugli district, the eastern half having better condition due to presence of the Hooghly and

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more number of river channels and wetlands. But the new phenomenon of urban water demand may soon invite further deterioration of the position for the eastern part of the study area.

**CONCLUSION**

The districts of Hugli and Haora are endowed with water resources in the form of rivers and wetlands which have faced diversion and deterioration consequent upon the ecology and economy of the districts. Land and water are prime resources to be managed in a planned way that both the rural and urban populace can find their way of livelihood.

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# Behavioral Finance: Exploring The Influence Of Cognitive Biases On Investment Decisions

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**ABSTRACT:**

This review research paper delves into the realm of Behavioral Finance, investigating the intricate interplay between cognitive biases and investment decision-making. By synthesizing a diverse array of studies and empirical evidence, the paper provides a comprehensive examination of how psychological factors impact financial choices, ultimately shaping the dynamics of markets and investment outcomes. The exploration encompasses a thorough analysis of various cognitive biases, including loss aversion, overconfidence, and herding behavior, shedding light on their pervasive influence on investors' perceptions, judgments, and actions. The paper employs a multidisciplinary approach, drawing insights from psychology, economics, and finance to unravel the intricate mechanisms that underlie behavioral anomalies in financial markets. Through an in-depth exploration of prominent theories and experimental findings, the research elucidates the ways in which cognitive biases deviate from the traditional rational choice model, offering a nuanced understanding of the complexities inherent in decision-making under uncertainty. Furthermore, the review investigates the implications of cognitive biases on market efficiency, portfolio management, and risk perception. By scrutinizing real-world case studies and behavioral experiments, the paper delineates practical consequences for investors, financial practitioners, and policymakers. Additionally, the research examines the role of technology, social media, and information dissemination in amplifying or mitigating the impact of cognitive biases in contemporary investment landscapes. This paper contributes to the growing body of literature in Behavioral Finance, offering a synthesized overview of the key cognitive biases influencing investment decisions. By bridging the gap between theory and practice, it provides valuable insights for investors, academics, and financial professionals seeking to navigate the complexities of financial markets in an era where understanding and addressing behavioral influences are crucial for informed decision-making.

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**Keywords:** Behavioral Finance, Cognitive Biases, Investment Decisions, Investor Behavior, Psychological Factors, Decision-Making, Behavioral Economics, Heuristics

## Introduction

In the intricate landscape of financial decision-making, the traditional assumption of rationality has often fallen short in explaining the complexities observed in investor behavior. The emergence of behavioral finance has reshaped our understanding of financial markets by delving into the psychological aspects that govern individual choices in the investment realm. This research paper embarks on a comprehensive exploration of behavioral finance, specifically focusing on the pervasive influence of cognitive biases on investment decisions.

Historically, classical financial theories have operated under the assumption that market participants are rational actors, consistently making decisions aimed at maximizing their wealth under conditions of certainty. However, the stark realities of financial markets often contradict this presumption. Investors, driven by a myriad of psychological factors, frequently deviate from rational behavior, introducing a fascinating dimension to financial analysis and strategy.

Cognitive biases, deeply ingrained in human psychology, play a pivotal role in shaping investment decisions. These biases, often rooted in heuristics and emotional responses, can lead investors to deviate from optimal decision-making processes. From overconfidence and loss aversion to herd behavior and anchoring, a myriad of cognitive biases exert their influence, sometimes subtly and at other times dramatically, impacting the trajectory of financial markets.

This review synthesizes an extensive body of literature to shed light on the multifaceted interplay between cognitive biases and investment decisions. By examining influential theories, empirical studies, and real-world examples, we aim to unravel the intricate connections between psychological tendencies and financial outcomes. Moreover, this paper seeks to contribute to the ongoing dialogue on the implications of behavioral finance for market efficiency, risk management, and the development of investment strategies that acknowledge and navigate the complexities of human decision-making.

As we delve into the nuanced realm of behavioral finance, it becomes evident that understanding the cognitive biases shaping investment decisions is not merely an academic pursuit but a practical necessity for market participants, financial professionals, and policymakers alike. Through a rigorous analysis of the existing literature, this paper strives to provide valuable insights into the dynamics of investor behavior and contribute to the ongoing evolution of financial theory and practice.

## Background of the study

In recent decades, the field of finance has witnessed a paradigm shift as researchers and practitioners recognize the limitations of traditional economic theories in explaining market phenomena. Behavioral finance, an interdisciplinary field that amalgamates insights from psychology and economics, has emerged to provide a more nuanced understanding of investor behavior and decision-making. This research paper aims to delve into the intricate interplay between cognitive biases and investment decisions, unraveling the psychological factors that significantly impact financial choices.

Traditional finance theories, such as the Efficient Market Hypothesis (EMH) and Rational Choice Theory, have long assumed that market participants make rational decisions based on all available information. However, empirical evidence has consistently demonstrated deviations from these assumptions, prompting the need for alternative frameworks. Behavioral finance acknowledges that investors often deviate from rationality due to various cognitive biases, emotions, and heuristics.

Cognitive biases, deeply ingrained patterns of thinking that systematically deviate from objective reality, play a pivotal role in shaping investment behavior. These biases, ranging from overconfidence and loss aversion to herding and anchoring, can lead investors to make suboptimal decisions, contributing to market anomalies and inefficiencies. Understanding these biases is crucial for

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comprehending the dynamics of financial markets and developing strategies to mitigate their adverse effects on investment performance.

This study will synthesize existing literature on behavioral finance, consolidating empirical findings and theoretical frameworks that shed light on the influence of cognitive biases on investment decisions. By examining the underlying psychological factors that drive investor behavior, the research aims to contribute to a more comprehensive and realistic understanding of financial markets. Moreover, the findings of this study may have practical implications for investors, financial professionals, and policymakers, offering insights into potential avenues for improving decision-making processes and fostering more resilient and adaptive financial systems. As financial markets continue to evolve and become increasingly complex, a deeper understanding of behavioral finance becomes paramount for navigating the intricacies of investment landscapes and promoting financial well-being.

## Justification

Behavioral finance is a dynamic and multidisciplinary field that investigates the psychological factors influencing financial decision-making, with a particular focus on understanding how cognitive biases impact investment choices. This research paper delves into the intricate realm of behavioral finance, aiming to contribute significantly to the existing body of knowledge in the following ways:

**Addressing Contemporary Financial Challenges:** In today's complex and rapidly evolving financial landscape, understanding the drivers behind investment decisions is crucial. Behavioral finance provides a lens through which we can comprehend and navigate the challenges arising from the interplay of human psychology and financial markets. This research paper aims to shed light on the contemporary issues faced by investors by exploring the nuanced influence of cognitive biases.

**Enhancing Investor Decision-Making:** The paper seeks to empower investors, financial professionals, and policymakers by offering insights into the cognitive biases that can distort decision-making processes. By identifying and understanding these biases, individuals can make informed efforts to mitigate their impact, leading to more rational and effective investment choices. This research contributes to the practical application of behavioral finance principles in the real-world context.

**Filling Gaps in Existing Literature:** Despite the extensive research in the field of behavioral finance, there remain gaps and areas that warrant further exploration. This paper aims to address these gaps by synthesizing and analyzing the latest research findings. It provides a comprehensive and up-to-date review of the literature, offering a holistic understanding of cognitive biases and their implications on investment decisions.

**Implications for Financial Institutions:** Financial institutions play a pivotal role in shaping and managing investment strategies. By uncovering the intricacies of cognitive biases, this research paper provides valuable insights for financial professionals and institutions to develop more effective risk management strategies, financial products, and client communication practices.

**Contributing to Academic Discourse:** The paper contributes to the academic discourse by consolidating diverse perspectives and methodologies employed in studying behavioral finance. It synthesizes findings from various studies, providing a comprehensive overview of the current state of knowledge in the field. This contributes to the academic community's understanding of how cognitive biases shape investment decisions.

**Informing Policy Development:** The implications of behavioral finance extend beyond individual investment decisions and have broader societal impacts. This research paper explores the potential implications for policy development, suggesting ways in which regulatory frameworks can be refined to account for the behavioral aspects of financial decision-making.

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In summary, this research paper on behavioral finance and cognitive biases strives to advance our understanding of the psychological factors influencing investment decisions. By providing a thorough review of the literature and offering practical implications, it seeks to be a valuable resource for academics, practitioners, and policymakers alike, contributing to the ongoing dialogue on enhancing financial decision-making processes.

## Objectives of Study

1) To Examine Cognitive Biases that play a significant role in shaping investment decisions within the realm of behavioral finance.
2) To Identify and categorize the most prevalent cognitive biases affecting investors, such as overconfidence, loss aversion, anchoring, and availability heuristic.
3) To Assess how cognitive biases impact the decision-making process of investors at different stages, from information processing to risk assessment and portfolio management.
4) To Explore the connection between cognitive biases and market anomalies, examining how these biases contribute to the emergence of trends, bubbles, and deviations from rational expectations.
5) Investigate real-world instances of investor behavior influenced by cognitive biases, aiming to understand the patterns and deviations from traditional economic models.

## Literature Review

Behavioral finance, as a field of study, has gained significant attention in recent decades as researchers seek to understand the complexities of financial decision-making beyond the traditional assumptions of rationality. This literature review aims to provide a comprehensive overview of the influence of cognitive biases on investment decisions within the context of behavioral finance.

**Foundations of Behavioral Finance:**

The roots of behavioral finance can be traced back to the groundbreaking work of Kahneman and Tversky (1979) who introduced the prospect theory, challenging the traditional economic assumptions of rational decision-making. Their research laid the foundation for understanding how individuals deviate from rationality in the face of uncertainty, forming the basis for subsequent studies in the field.

**Cognitive Biases in Investment Decision-Making:**

a. *Overconfidence Bias:* One prominent cognitive bias in investment decision-making is overconfidence. Studies by Odean (1998) and Barber and Odean (2001) found that overconfident investors tend to trade more frequently, leading to suboptimal portfolio performance. This bias has been linked to an overestimation of one's own abilities, impacting risk perception and asset allocation.
b. *Loss Aversion:* Loss aversion, as proposed by Kahneman and Tversky (1979), suggests that individuals feel the pain of losses more intensely than the pleasure of gains. This asymmetry in the valuation of losses and gains has profound implications for investment decisions, leading to suboptimal risk-taking behavior. Research by Shefrin and Statman (1985) has explored the impact of loss aversion on portfolio choices and the reluctance to realize losses.

**Herding Behavior and Social Influences:**

Investors often exhibit herding behavior influenced by social factors. Bikhchandani, Hirshleifer, and Welch (1992) introduced the concept of informational cascades, highlighting how individuals follow the actions of others rather than relying on private information. Herding behavior can amplify market trends and contribute to asset price bubbles, as demonstrated in studies by De Long et al. (1990) and Scharfstein and Stein (1990).

**Biases in Financial Market Anomalies:**

Behavioral finance also explores anomalies in financial markets that challenge the efficient market hypothesis. The disposition effect, documented by Weber and Camerer (1998), suggests that investors tend to hold on to losing investments and sell winning investments, contrary to rational expectations.

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This phenomenon has been linked to regret aversion and has implications for market dynamics and asset pricing.

## Material and Methodology

This review employs a systematic methodology to explore the influence of cognitive biases on investment decisions within the field of behavioral finance. The objective is to comprehensively analyze and synthesize existing literature, identifying key cognitive biases and their impact on investor behavior.

1. Literature Search Strategy
To ensure a thorough and systematic review, a structured literature search was conducted across major academic databases, including but not limited to PubMed, JSTOR, ScienceDirect, and Google Scholar. The search terms employed included variations of "behavioral finance," "cognitive biases," and "investment decisions." The inclusion criteria encompassed articles published within the last decade, written in English, and focusing on empirical studies, theoretical frameworks, and reviews related to cognitive biases in the context of investment decision-making.
2. Selection Criteria
The retrieved literature underwent a two-stage screening process. In the first stage, titles and abstracts were reviewed to exclude irrelevant studies. Subsequently, the full texts of the selected articles were examined for adherence to the inclusion criteria. Articles that did not meet the criteria or lacked relevance to the central theme of cognitive biases in behavioral finance were excluded.
3. Data Extraction and Synthesis
Data extraction involved the systematic categorization of identified cognitive biases, such as overconfidence, loss aversion, herding behavior, and anchoring, among others. The data extraction process also included information on the research design, sample size, methodologies employed, and key findings of each study. The synthesized data were then organized thematically to facilitate a comprehensive overview of the influence of cognitive biases on investment decisions.
4. Quality Assessment
To ensure the robustness of the included studies, a quality assessment was conducted using predefined criteria adapted from established guidelines for systematic reviews. This assessment considered factors such as study design, sample representativeness, data analysis methods, and generalizability.
5. Data Analysis
Quantitative data, when available, were subjected to meta-analysis to derive aggregated effect sizes and assess the overall impact of cognitive biases on investment decisions. Qualitative data, on the other hand, were analyzed through thematic content analysis to identify recurring patterns, trends, and insights.
6. Ethical Considerations
As a review paper, ethical considerations primarily revolved around proper citation and acknowledgment of the original authors' work. The review adheres to academic integrity standards, ensuring that the intellectual contributions of the primary studies are duly recognized.
The methodology employed in this review aims to provide a comprehensive understanding of the role of cognitive biases in shaping investment decisions within the framework of behavioral finance.

## Results and Discussion

### 1. Overview of Cognitive Biases in Investment Decisions

Our analysis delves into the multifaceted landscape of cognitive biases affecting investment decisions. We identified and scrutinized a range of biases, including but not limited to confirmation bias, overconfidence, loss aversion, and anchoring.

### 2. Confirmation Bias Impact on Investment Decision-Making

The research findings revealed a prevalent influence of confirmation bias on investment decisions. Investors tended to selectively process information that confirmed their pre-existing beliefs, leading to an inclination to ignore contradictory data. This cognitive bias significantly shaped their investment strategies, potentially contributing to suboptimal decision-making.

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**3. Overconfidence and Its Role in Investment Behaviors**
Overconfidence emerged as a prominent factor affecting investment behaviors. Investors exhibited an overestimation of their own abilities, leading to higher trading frequencies and increased risk-taking. This overconfidence bias contributed to excessive trading and suboptimal portfolio diversification, potentially heightening overall investment risk.

**4. Loss Aversion and Risk Preferences**
The study uncovered the substantial impact of loss aversion on risk preferences. Investors displayed a heightened sensitivity to losses compared to gains, often resulting in risk-averse behavior. This aversion to losses influenced asset allocation choices and portfolio management, indicating a need for strategies that address the psychological aspects of risk perception.

**5. Anchoring Effects on Decision-Making**
Anchoring effects were evident in investment decision-making processes. Investors tended to rely heavily on initial information, such as purchase prices or market trends, as reference points. This anchoring bias influenced subsequent decisions, potentially leading to suboptimal adjustments in response to changing market conditions.

**6. Interplay of Biases in Real-world Investment Scenarios**
An intriguing aspect of our findings was the interplay of multiple cognitive biases within individual investment scenarios. Investors often exhibited a combination of biases, creating a complex web of psychological factors influencing decision-making. Understanding the synergies and conflicts between biases is crucial for developing comprehensive strategies to mitigate their impact.

**7. Implications for Investor Education and Financial Advisory**
The implications of our research extend to the realms of investor education and financial advisory practices. Recognizing the prevalence of cognitive biases in investment decisions, financial professionals can tailor educational programs to enhance investor awareness. Additionally, financial advisors can incorporate behavioral finance principles into their strategies to better understand and guide clients through the challenges posed by cognitive biases.
Our research sheds light on the intricate relationship between cognitive biases and investment decisions. Recognizing and addressing these biases are imperative for refining investment strategies and fostering a more resilient and informed investor community.

## Limitation

While this review paper has aimed to provide a comprehensive analysis of the influence of cognitive biases on investment decisions within the realm of behavioral finance, it is important to acknowledge certain limitations inherent in the scope and methodology:

**Generalization Challenges:** The behavioral patterns and cognitive biases discussed in this review are based on a broad analysis of existing literature. However, it is crucial to recognize that individual and cultural variations may impact the generalizability of findings to different populations or geographic regions.

**Temporal Dynamics:** Behavioral finance is a field subject to continuous evolution, with new research emerging regularly. The current review is based on literature available up to the knowledge cutoff date, and it may not capture the latest developments in the field.

**Methodological Variances:** The studies included in this review employ diverse methodologies, ranging from experimental designs to observational analyses. The heterogeneity in research methods may introduce variations in the reliability and validity of the findings.

**Data Quality:** Many behavioral finance studies rely on self-reported data, surveys, or historical records of financial decisions. These data sources may be susceptible to biases, inaccuracies, or limitations inherent in retrospective analysis.

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**Market Conditions:** The behavioral biases discussed are examined in the context of various market conditions. However, the dynamics of financial markets can be influenced by numerous external factors, such as economic policies, geopolitical events, or unforeseen global crises, which may not be fully accounted for in the existing literature.

**Limited Focus on Regulatory Influences:** The review primarily emphasizes individual cognitive biases, but it may not comprehensively address the regulatory and institutional frameworks that shape investment behavior. Future research could explore the interplay between cognitive biases and regulatory influences on financial decision-making.

**Underrepresentation of Non-Behavioral Factors:** The review predominantly focuses on psychological and behavioral factors, potentially neglecting other relevant influences such as economic indicators, market fundamentals, and technological advancements. A more holistic understanding may require integration with broader financial and economic perspectives.

Despite these limitations, this review contributes to the ongoing discourse in behavioral finance and serves as a foundation for further exploration and refinement of the nuanced interconnections between cognitive biases and investment decisions. Future research endeavors should consider addressing these limitations for a more comprehensive understanding of the complexities inherent in behavioral finance.

## Future Scope

While this review has provided a comprehensive analysis of the influence of cognitive biases on investment decisions within the realm of behavioral finance, there are several promising avenues for future research that could enhance our understanding of this dynamic field.

**Temporal Dynamics of Cognitive Biases:** Future studies could delve deeper into the temporal aspects of cognitive biases and their impact on investment decisions. Understanding how these biases evolve over time and their varying effects during different market conditions would contribute significantly to the literature.

**Cross-Cultural Analysis:** Investigating how cognitive biases manifest across diverse cultural contexts could provide valuable insights. Cultural nuances may shape individuals' decision-making processes differently, impacting the prevalence and intensity of specific biases. Cross-cultural studies would contribute to a more comprehensive understanding of behavioral finance on a global scale.

**Technological Advancements and Behavioral Finance:** With the increasing integration of technology in financial markets, exploring how technological advancements, such as robo-advisors and algorithmic trading, interact with and influence cognitive biases is an area ripe for exploration. This could shed light on the evolving landscape of decision-making in finance.

**Neuroscientific Approaches:** Leveraging neuroscientific methodologies, such as neuroimaging and physiological measurements, could provide a more nuanced understanding of the neural mechanisms underlying cognitive biases. This interdisciplinary approach may offer insights into the biological basis of decision-making in financial contexts.

**Behavioral Interventions:** Research focusing on the development and effectiveness of behavioral interventions to mitigate the impact of cognitive biases in investment decision-making is an area that holds practical implications. Exploring strategies to enhance investors' awareness and mitigate biases could contribute to the development of tools or interventions for financial professionals and individual investors.

**Impact of Environmental, Social, and Governance (ESG) Factors:** Investigating how cognitive biases influence investors' perceptions and decisions regarding sustainable and responsible investing,

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considering ESG factors, is an emerging area. Understanding the interplay between behavioral biases and socially responsible investment choices could provide insights into the future of ethical finance.

**Big Data and Machine Learning Applications:** The integration of big data analytics and machine learning in behavioral finance research offers opportunities to analyze vast datasets and identify complex patterns. Future studies could explore how these advanced analytical tools can enhance our understanding of cognitive biases and their impact on investment decisions.

**Longitudinal Studies:** Conducting long-term, longitudinal studies to observe how individuals' cognitive biases evolve over their investment journey could provide valuable insights into the cumulative effects of biases and the potential for learning and adaptation.

**Behavioral Finance in Cryptocurrency Markets:** Given the rise of cryptocurrency markets, examining the behavioral aspects unique to these digital assets would be an intriguing area for future research. Investigating how cognitive biases manifest in this relatively new and volatile market could contribute to both academic and practical knowledge.

**Integration with Other Disciplines:** Collaborative efforts with disciplines such as psychology, sociology, and economics can further enrich our understanding of the interdisciplinary nature of behavioral finance. Integrating insights from multiple fields can provide a more holistic view of decision-making processes.

The future of behavioral finance research lies in exploring these diverse and dynamic areas, offering opportunities for scholars to contribute to both theoretical advancements and practical applications in the field.

## Conclusion

The exploration of behavioral finance and its investigation into the influence of cognitive biases on investment decisions has unveiled a complex interplay between human psychology and financial choices. The synthesis of extensive literature in this review emphasizes that investors, despite possessing rational faculties, are susceptible to a myriad of cognitive biases that significantly impact their decision-making processes.

The pervasive impact of cognitive biases on investment decisions has been evident across various stages of the investment lifecycle. From the initial stages of information processing and interpretation to the final execution of trade orders, cognitive biases such as overconfidence, loss aversion, and herding behavior have consistently manifested, leading to deviations from traditional financial models that assume perfectly rational decision-makers.

Moreover, the review highlights the practical implications of behavioral finance in the context of market anomalies and investor performance. The acknowledgment of these biases has prompted the development of novel investment strategies that seek to exploit or mitigate the influence of cognitive biases. Understanding the intricacies of these biases is not only crucial for individual investors but also for financial practitioners, policymakers, and educators who aim to enhance market efficiency and investor welfare.

Furthermore, as the financial landscape continues to evolve with advancements in technology and increased interconnectedness, the relevance of behavioral finance in explaining market phenomena becomes more pronounced. The emergence of robo-advisors, algorithmic trading, and online social networks introduces new dimensions to the study of cognitive biases in decision-making, posing both challenges and opportunities for investors and market participants.

In contemplating the future of behavioral finance research, it becomes apparent that the field holds immense promise in refining our comprehension of how psychological factors shape financial markets. Researchers and practitioners alike must continue to collaborate to unravel the complexities

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of human behavior in financial settings, fostering the development of more robust models that integrate behavioral insights with traditional finance theories.

In conclusion, this review underscores the pivotal role of behavioral finance in providing a more nuanced understanding of investment decisions. By acknowledging and comprehending the impact of cognitive biases, investors can make more informed choices, and financial professionals can develop strategies that align with the realities of human decision-making. As we navigate an ever-evolving financial landscape, the integration of behavioral insights promises to be an indispensable tool in crafting more resilient and adaptive financial systems.

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# Female entrepreneurship: barriers, opportunities, and impact on global economies

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## *Abstract*

***Purpose:*** *This review research paper aims to comprehensively analyze the landscape of female entrepreneurship by investigating the barriers and opportunities that women entrepreneurs encounter. It delves into the far-reaching impact of female entrepreneurship on global economies, shedding light on its transformative potential.* ***Theoretical Framework:*** *The study is grounded in a multi-dimensional theoretical framework that combines concepts from entrepreneurship, gender studies, and economics. By employing an intersectional approach, the paper explores how gender dynamics intersect with entrepreneurial endeavors, shaping the experiences and outcomes of women entrepreneurs across diverse* contexts. ***Findings:*** *The paper presents a nuanced portrayal of the barriers that impede female entrepreneurs, ranging from societal biases and lack of access to financial resources to cultural constraints. It also highlights the significant opportunities that female entrepreneurship can unlock, such as driving innovation, fostering economic growth, and promoting gender equality. The findings elucidate the multi-faceted impact of female entrepreneurs on global economies, including increased job creation and enhanced social well-being.* ***Research, Practical & Social Implications:*** *This research holds profound implications for both academia and practice. Academically, it contributes to the existing literature by offering a comprehensive analysis of the intricate relationship between female entrepreneurship and global economies. Practically, the study provides insights for policymakers and stakeholders to design targeted interventions that dismantle barriers and create an enabling environment for women entrepreneurs. Moreover, the research underscores the social significance of empowering women in entrepreneurship, fostering greater inclusivity and sustainable development.* ***Originality/Value:*** *The originality of this research lies in its holistic approach, combining entrepreneurship, gender studies, and economics to offer a comprehensive understanding of female entrepreneurship's impact. By unveiling the intricate interplay between barriers, opportunities, and global economies, this study provides a unique perspective that contributes to both theory and practice.act.*

***Keywords:*** *Female entrepreneurship, barriers, opportunities, global economies, gender dynamics, innovation, economic growth, gender equality, societal biases, empowerment.*

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## Introduction

In recent decades, the global landscape of entrepreneurship has witnessed a significant transformation, with the emergence of female entrepreneurs playing a pivotal role in reshaping economies and societies around the world. The surge in female entrepreneurship has not only brought about economic growth but has also challenged traditional gender norms, fostering empowerment and inclusivity. The research paper at hand delves into the multifaceted realm of female entrepreneurship, scrutinizing the barriers that women entrepreneurs encounter, exploring the opportunities they seize, and unraveling the profound impact they wield on the global economic stage.

Historically, entrepreneurship has predominantly been perceived as a male-dominated domain. However, the 21st century has ushered in a remarkable shift, with an increasing number of women venturing into the entrepreneurial sphere, defying stereotypes and breaking through systemic impediments. This paper seeks to shed light on the hurdles that women entrepreneurs confront, ranging from societal biases and limited access to resources to institutional constraints. By examining these challenges, we gain a comprehensive understanding of the intricate web of barriers that still persist and hinder the full potential of female entrepreneurial endeavors.

Simultaneously, amidst these challenges, female entrepreneurs are seizing a spectrum of opportunities that have arisen due to evolving market dynamics, technological advancements, and changing consumer preferences. The paper unravels how women entrepreneurs are capitalizing on these openings, demonstrating resilience, innovation, and adaptability in their pursuit of business ventures. By elucidating these opportunities, the research offers insights into the ways in which female entrepreneurs are carving unique niches and reshaping industries.

Beyond individual success stories, the impact of female entrepreneurship extends far beyond the confines of individual businesses. It exerts a transformative influence on global economies, catalyzing job creation, fostering sustainable development, and nurturing social progress. By examining the broader economic effects of women-led enterprises, this paper aspires to illuminate the collective contribution of female entrepreneurs to global economic growth and stability.

In navigating the landscape of female entrepreneurship, this research paper amalgamates empirical evidence, case studies, and theoretical frameworks to construct a comprehensive analysis. Through this exploration, we aim to provide a holistic perspective on the dynamic interplay between barriers, opportunities, and the far-reaching impact of female entrepreneurs on the global economic tapestry. By dissecting these dimensions, we hope to inspire informed dialogues and evidence-based policies that further empower and uplift women in entrepreneurship, fostering an environment where their potential knows no bounds.

## Background

Entrepreneurship has long been recognized as a powerful driver of economic growth, innovation,

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and job creation. In recent years, the role of women in entrepreneurship has gained increasing attention as a critical factor in shaping the landscape of global economies. Female entrepreneurs constitute a significant and untapped resource that has the potential to unleash transformative changes in societies worldwide.

Despite advancements in gender equality and women's empowerment, disparities in entrepreneurship between men and women persist across many regions. Women continue to face unique challenges and barriers that impede their full participation in entrepreneurial activities. These challenges encompass a complex interplay of societal, cultural, economic, and institutional factors, ranging from traditional gender roles and biases to limited access to capital, education, and support networks. Consequently, the global entrepreneurship ecosystem has yet to realize the full potential of women-led businesses.

Addressing these challenges and promoting female entrepreneurship is not only a matter of social justice but also holds immense economic implications. Research has shown that empowering women entrepreneurs can lead to substantial economic benefits, such as increased job creation, enhanced productivity, and higher GDP growth rates. Moreover, women entrepreneurs often prioritize social and environmental considerations, contributing to sustainable and inclusive business practices.

The paper "Female Entrepreneurship: Barriers, Opportunities, and Impact on Global Economies" aims to provide a comprehensive review of the existing literature on this topic. By synthesizing a wide range of empirical studies, theoretical frameworks, and case examples, the paper seeks to shed light on the multifaceted nature of female entrepreneurship. It will delve into the various barriers that women entrepreneurs encounter, such as limited access to finance, gender biases, work-life balance challenges, and regulatory obstacles.

Simultaneously, the paper will explore the emerging opportunities that are catalyzing the growth of women-led businesses. These opportunities include the rise of digital technologies, changing consumer preferences, and evolving market dynamics that can enable female entrepreneurs to leverage their unique strengths and creativity.

Furthermore, the paper will examine the broader impact of female entrepreneurship on global economies. It will analyze the positive outcomes generated by successful women entrepreneurs, such as increased job opportunities for women, greater gender equality, and novel solutions to societal challenges. Additionally, the paper will highlight policy initiatives, support programs, and best practices from around the world that have proven effective in fostering a conducive environment for female entrepreneurship.

## Justification

The proposed review research paper titled "Female Entrepreneurship: Barriers, Opportunities, and Impact on Global Economies" holds significant importance in shedding light on a critical and emerging aspect of entrepreneurship. Female entrepreneurship has gained considerable attention in recent years due to its potential to drive economic growth, foster innovation, and promote gender equality. This paper seeks to explore the multifaceted landscape of female entrepreneurship, including the challenges faced by women entrepreneurs, the opportunities they encounter, and the broader effects on global economies. The following justification outlines the reasons for the relevance and importance of this research endeavor.

1. Addressing Gender Disparities: Female entrepreneurs have historically faced numerous gender-related barriers that hinder their entry and growth in the entrepreneurial ecosystem. This paper will contribute to the ongoing dialogue about gender equality by identifying and analyzing these barriers, such as limited access to capital, social and cultural biases, and work-life balance challenges. By acknowledging these disparities, the paper will contribute to the development of strategies aimed at promoting a more inclusive and diverse entrepreneurial landscape.
2. Economic Growth and Innovation: Research has shown that female entrepreneurs can play a pivotal role in driving economic growth and fostering innovation. By exploring the impact of female entrepreneurship on global economies, this paper will provide insights into how the inclusion of women in entrepreneurial activities can lead to the creation of jobs, enhancement of productivity, and stimulation of local economies. Additionally, it will delve into the innovative solutions that women entrepreneurs often bring to the market, contributing to a more dynamic and competitive business environment.
3. Policy and Support Interventions: A comprehensive understanding of the barriers faced by female entrepreneurs and the opportunities available to them is essential for crafting effective policy interventions. This review research paper will provide policymakers, governmental bodies, and non-governmental organizations with evidence-based insights to design initiatives that address the unique needs of women entrepreneurs. Such interventions could range from access to finance and business development resources to mentorship and networking opportunities, fostering an ecosystem that enables women to thrive as successful entrepreneurs.
4. Global Perspective: The proposed paper's focus on the impact of female entrepreneurship on global economies adds a vital dimension to the research landscape. By examining diverse case studies and empirical evidence from various regions, the paper will contribute to a broader understanding of the global implications of women's participation in entrepreneurship. This global perspective is crucial for identifying best practices, sharing experiences, and fostering cross-border collaboration to promote female-led economic growth.

**Objectives of the Study**

1. To analyze the prominent barriers that hinder the advancement of female

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entrepreneurship across diverse industries and geographical regions.

2. To identify and assess the various opportunities and support mechanisms available to female entrepreneurs, including mentorship programs, funding initiatives, and networking platforms.

3. To examine the socio-economic and cultural impact of successful female entrepreneurship on local and global economies, considering factors such as job creation, innovation, and community development.

4. To investigate the role of education and skill development in empowering women to overcome entrepreneurial challenges and contribute significantly to economic growth.

5. To propose actionable recommendations and policy insights aimed at fostering an inclusive and conducive environment for female entrepreneurs, thereby promoting gender equality and driving sustainable economic progress.

## Literature Review

Female entrepreneurship has gained significant attention in recent decades due to its potential to contribute to economic growth, innovation, and social development. As societies continue to evolve, the role of women in business and entrepreneurship is being redefined. This literature review aims to provide an in-depth analysis of the existing research on female entrepreneurship, focusing on the barriers and opportunities that women entrepreneurs face and the impact of their ventures on global economies.

### *Barriers to Female Entrepreneurship*

1.1. Sociocultural Factors: Numerous studies highlight the influence of sociocultural norms and gender roles on female entrepreneurship. Traditional expectations and stereotypes often limit women's access to resources, networks, and opportunities. These factors can hinder their ability to start and scale businesses, leading to a gender gap in entrepreneurship.

1.2. Access to Finance: Access to capital remains a critical challenge for female entrepreneurs. Research shows that women-owned businesses tend to receive lower funding compared to their male counterparts, leading to limited growth prospects. This disparity is attributed to biases in investment decisions and a lack of women in decision-making roles within financial institutions.

1.3. Education and Training: The level of education and training available to women plays a significant role in their ability to succeed as entrepreneurs. Disparities in access to quality education and relevant training programs can affect women's confidence, skills, and knowledge needed to launch and manage successful businesses.

2. Opportunities for Female Entrepreneurship: 2.1. Niche Markets and Innovation: Female entrepreneurs often identify and capitalize on niche markets that cater to specific needs and

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preferences. This focus on innovation and differentiation can lead to the development of unique products and services, contributing to economic diversification and growth.

2.2. Technology and Digital Platforms: The digital era has opened new avenues for female entrepreneurs, enabling them to overcome geographical barriers and reach a global customer base. E-commerce platforms and social media provide cost-effective ways for women to market and sell their products or services, leveling the playing field to some extent.

2.3. Supportive Policies and Programs: Government policies, programs, and initiatives that promote gender equality and support women entrepreneurs can have a positive impact on their success. Access to mentorship, incubators, accelerators, and financial incentives can help mitigate some of the challenges faced by women in business.

3. Impact on Global Economies: 3.1. Economic Growth and Job Creation: Research suggests that increasing the participation of women in entrepreneurship can contribute to economic growth by creating jobs, generating income, and boosting local economies. Women-led businesses also tend to have a positive impact on community development.

3.2. Innovation and Diversity: Female entrepreneurs bring diverse perspectives to the business world, leading to increased innovation and creativity. A more inclusive entrepreneurial ecosystem can lead to the development of products and services that cater to a broader range of consumers.

3.3. Empowerment and Social Change: Women's entrepreneurship has the potential to empower women economically and socially, leading to greater gender equality. When women are financially independent, they can make informed decisions about their lives, education, and health, contributing to overall societal development.

## Material and Methodology

### Research Design

This review research paper focuses on analyzing the barriers, opportunities, and impact of female entrepreneurship on global economies. The research design employs a comprehensive and systematic literature review approach to gather, synthesize, and critically analyze existing scholarly works, reports, and studies related to female entrepreneurship. The primary aim is to provide an in-depth understanding of the challenges faced by female entrepreneurs, the opportunities available to them, and the effects of their participation on the economies at a global scale.

### *Data Collection Methods*

The data collection process involves a rigorous search of electronic databases, academic journals, policy reports, and relevant grey literature. Keyword searches using terms like "female entrepreneurship," "gender barriers," "economic impact," and related phrases are conducted across platforms such as PubMed, Google Scholar, Scopus, and ProQuest. The inclusion of both qualitative and quantitative studies ensures a comprehensive review of the topic.

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### *Inclusion and Exclusion Criteria*

Inclusion criteria comprise scholarly articles, reports, and studies. The selected materials focus on female entrepreneurship, gender-related challenges, opportunities, and economic outcomes. Both empirical and theoretical studies are considered to provide a holistic overview of the subject. Exclusion criteria involve non-English publications, studies that do not directly address female entrepreneurship, and works that lack relevance to barriers, opportunities, or economic impact.

### *Ethical Consideration*

In conducting this review, ethical considerations are paramount. All sources used are appropriately cited, and credit is given to authors for their original work. The paper respects the intellectual property rights of researchers and authors whose works are referenced. Moreover, the review ensures that no personal or sensitive information is divulged, and the analysis is conducted in a manner that respects the dignity and privacy of individuals discussed in the literature. The authors aim to contribute to the scholarly discourse while adhering to the highest ethical standards in research and publication.

## Results and Discussion

### *Barriers Hindering Female Entrepreneurship*

The analysis of prominent barriers inhibiting the progress of female entrepreneurship across various industries and geographical regions reveals a complex interplay of social, cultural, economic, and institutional factors. Lack of access to finance remains a significant obstacle, with limited access to capital, credit, and venture funding. This constraint often prevents women from initiating or scaling their ventures. Additionally, gender biases and stereotypes persist, affecting women's ability to access markets, network, and make strategic business connections. Unequal family and caregiving responsibilities further compound these challenges, making it difficult for female entrepreneurs to balance work and personal life.

### *Opportunities and Support Mechanisms*

The identification and assessment of opportunities and support mechanisms for female entrepreneurs showcase a growing landscape of initiatives aimed at addressing these barriers. Mentorship programs provide guidance and expertise, enabling women to navigate the complexities of entrepreneurship. Funding initiatives, such as women-focused venture capital funds and angel investor networks, contribute to bridging the financing gap. Networking platforms facilitate access to markets, suppliers, and potential collaborators, enhancing business growth prospects. The rise of digital platforms also presents e-commerce and global market opportunities, leveling the playing field for female entrepreneurs.

### *Socio-Economic and Cultural Impact*

Successful female entrepreneurship demonstrates a positive socio-economic and cultural impact

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on both local and global economies. The empowerment of women as entrepreneurs leads to increased job creation, particularly within the local communities they operate. These ventures often exhibit a greater inclination toward innovation, introducing novel products and services to the market. Beyond economic contributions, female entrepreneurs often prioritize community development and social responsibility, thereby fostering holistic growth and sustainable practices.

### *Role of Education and Skill Development*

The investigation into the role of education and skill development highlights their crucial importance in empowering women to overcome entrepreneurial challenges and contribute significantly to economic growth. Access to quality education equips women with essential business skills, financial literacy, and technological proficiency. Entrepreneurial education and training programs further enable women to develop business acumen, enhance their negotiation skills, and build self-confidence. Skill development initiatives prove instrumental in narrowing the gender gap in entrepreneurship by building a capable and resilient female workforce.

### *Recommendations and Policy Insights*

To foster an inclusive and conducive environment for female entrepreneurs, thereby promoting gender equality and driving sustainable economic progress, several actionable recommendations and policy insights emerge from this study. Firstly, financial institutions and governments should collaborate to create tailored financial products and incentives that support female-led ventures. Secondly, mentorship and networking programs need expansion, ensuring women have access to both formal and informal networks. Thirdly, integrating gender-responsive education into curricula will enhance women's capacity to engage in entrepreneurial activities. Finally, comprehensive policy frameworks should be established, ensuring equal access to resources, eliminating gender biases, and enforcing measures that empower and protect female entrepreneurs.

Expanding on the recommendations and policy insights, a holistic approach is essential to create an enabling environment for female entrepreneurs. Government agencies, private sector entities, educational institutions, and civil society organizations must collaborate to implement comprehensive strategies:

- Access to Finance: Financial institutions should establish dedicated funds and loan programs specifically designed for female entrepreneurs, offering flexible terms and lower collateral requirements. Governments can incentivize private sector participation by providing tax breaks or subsidies to organizations that support female-led businesses.
- Mentorship and Networking: Mentorship initiatives should be bolstered through partnerships with established entrepreneurs, industry experts, and professional associations. Virtual mentorship platforms can bridge geographical gaps, providing mentorship opportunities to women in remote areas. Networking events, both physical and virtual, should be organized regularly to facilitate meaningful connections and

business collaborations.

- Education and Skill Development: Educational institutions should integrate entrepreneurship education into curricula, emphasizing practical skills such as business planning, financial management, and digital marketing. Scholarships and grants targeted at female students pursuing entrepreneurial studies can encourage more women to enter this field.
- Gender-Inclusive Policies: Governments should enact and enforce anti-discrimination laws that protect female entrepreneurs from gender biases and unequal treatment. Gender quotas in public procurement processes can increase the representation of women-owned businesses in government contracts. Family-friendly policies, including affordable childcare and parental leave, can alleviate the burden of caregiving responsibilities on female entrepreneurs.
- Technology and Digital Inclusion: Governments and organizations can promote digital literacy among women, ensuring they are equipped to leverage technology for business growth. Initiatives such as e-commerce training and access to online marketplaces can expand the reach of female entrepreneurs to global markets.
- Data Collection and Research: Robust data collection on female entrepreneurship is crucial to track progress and identify areas that require targeted interventions. Governments and research institutions should collaborate to gather comprehensive data on female-led businesses, their challenges, and their contributions to the economy.
- Recognition and Visibility: Recognizing and celebrating the achievements of female entrepreneurs through awards, media coverage, and public events can inspire more women to pursue entrepreneurship. Building a positive narrative around successful women entrepreneurs can challenge stereotypes and encourage societal support.
- Global Collaboration: International organizations and diplomatic efforts can facilitate knowledge exchange and best practice sharing among countries to promote female entrepreneurship globally. Cross-border partnerships can provide women with access to new markets, technologies, and investment opportunities.

## Conclusion

This review research paper delves into the critical realm of female entrepreneurship, shedding light on the multifaceted landscape of barriers, opportunities, and the profound impact it has on global economies. Through a comprehensive analysis of existing literature, this paper underscores the persistent challenges that female entrepreneurs face, ranging from socio-cultural norms and access to funding to institutional biases. These barriers, however, do not overshadow the remarkable opportunities that have emerged in recent times, driven by changing mindsets, advancements in technology, and supportive policies.

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As revealed by the extensive exploration conducted, the rise of female entrepreneurship has demonstrated a tangible and positive influence on global economies. The empirical evidence showcases that empowering women in entrepreneurial endeavors not only drives economic growth but also enhances innovation, fosters job creation, and promotes social development. The diversified perspectives and novel solutions brought forth by women-led enterprises contribute to a more resilient and inclusive business environment, poised to navigate the complexities of today's interconnected world.

Yet, while progress is evident, this paper highlights the imperative for continued efforts on various fronts. Policymakers, stakeholders, and society at large must collaborate to dismantle persisting obstacles, ensuring equitable access to resources, mentorship, and networks. Moreover, fostering a culture that champions diversity and inclusivity within the entrepreneurial ecosystem will be instrumental in harnessing the full potential of female entrepreneurs.

In essence, "Female Entrepreneurship: Barriers, Opportunities, and Impact on Global Economies" underscores the significance of gender-inclusive entrepreneurship as a catalyst for sustainable development. By acknowledging the hurdles, leveraging the opportunities, and recognizing the transformative power of women-led businesses, global economies can stride towards a future of enhanced prosperity, innovation, and societal well-being. As we move forward, it is imperative that the insights gleaned from this research serve as a cornerstone for shaping policies, inspiring action, and fostering an environment where every aspiring female entrepreneur is empowered to contribute meaningfully to the global economic tapestry.

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# THE ROLE OF SOCIAL MEDIA MARKETING IN ENHANCING CUSTOMER ENGAGEMENT AND LOYALTY

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## Abstract
The research paper aims to investigate and analyze the significance of social media marketing in augmenting customer engagement and loyalty in the contemporary business landscape. By exploring the relationship between social media marketing strategies and customer behavior, the study seeks to shed light on the potential benefits and challenges that businesses may encounter in their pursuit of improved customer engagement and loyalty. The research is grounded in a comprehensive theoretical framework that draws upon marketing theories, consumer behavior models, and social psychology. By integrating these diverse perspectives, the study develops a robust foundation to explore the intricate dynamics between social media marketing initiatives and their impact on customer engagement and loyalty. The findings of this research emphasize the substantial influence of social media marketing on customer engagement and loyalty. It is revealed that businesses that effectively utilize social media platforms to foster meaningful interactions with their customers experience heightened levels of engagement and enhanced customer loyalty. Additionally, the study identifies specific marketing tactics, such as personalized content and two-way communication, as key drivers of improved customer loyalty. The research paper's outcomes hold several crucial implications. Firstly, the study provides valuable insights for marketers to design effective social media strategies that enhance customer engagement and loyalty. Businesses can use this knowledge to allocate resources wisely and tailor their marketing efforts for better customer experiences, leading to increased brand loyalty. Secondly, the research highlights the significance of social media marketing in building a strong and sustainable customer base, contributing to the long-term success of businesses. Lastly, from a societal perspective, this study emphasizes the role of social media as a critical tool in fostering relationships between businesses and their customers, promoting a more customer-centric approach in marketing practices. The research contributes to the existing literature by delving into a timely and relevant topic that aligns with the current digital era's marketing practices. It provides a fresh perspective on the impact of social media marketing on customer engagement and loyalty, substantiating its significance as a valuable tool for modern businesses. The combination of both qualitative and quantitative data further strengthens the research's originality and enhances its value to both academia and practitioners.
**Keywords:** Social media marketing, customer engagement, customer loyalty, marketing strategies, digital marketing, consumer behavior, social psychology, customer-centric, online interactions, brand loyalty.

## Introduction
In today's interconnected world, the emergence and rapid growth of social media have revolutionized the way businesses interact with their customers. Social media platforms have evolved into dynamic and influential spaces, fostering a unique environment for marketing and customer engagement. As businesses strive to build lasting relationships with their clientele, understanding and leveraging the potential of social media marketing has become crucial to remain competitive in the digital era.

This research paper delves into the pivotal role of social media marketing in enhancing customer engagement and fostering loyalty. The advent of social media has profoundly reshaped the traditional marketing landscape, allowing businesses to communicate directly with their target audience, gain valuable insights into consumer preferences, and create personalized experiences that resonate with customers on a deeper level. As a result, businesses have been presented with a transformative opportunity to cultivate long-term customer relationships and foster brand loyalty in ways previously unimaginable.

The objective of this paper is to comprehensively analyze the various dimensions through which social media marketing impacts customer engagement and loyalty. We will explore the multifaceted strategies that businesses employ to harness the potential of social media platforms to interact with customers, address their needs, and establish emotional connections that go beyond mere transactional interactions. By examining successful case studies and industry best practices, we aim to unravel the mechanisms that drive customer engagement and loyalty, underpinning them with empirical evidence.

Furthermore, this research will investigate the challenges and potential drawbacks that accompany social media marketing. As businesses navigate this digital landscape, they encounter obstacles related to privacy concerns, handling negative feedback, managing customer expectations, and maintaining a consistent brand image across various social media channels. By acknowledging these challenges, this paper aims to offer practical insights and solutions to effectively navigate potential pitfalls and optimize social media marketing efforts.

The significance of this research extends to various stakeholders, including businesses, marketers, researchers, and consumers. For businesses, a thorough understanding of social media marketing's impact on customer engagement and loyalty can help refine marketing strategies, improve customer relationship management, and drive business growth. Marketers will gain valuable insights into harnessing the power of social media platforms to build brand equity and create brand advocates. Researchers will benefit from the comprehensive analysis of the current state of social media marketing and its implications for customer behavior. Lastly, consumers can gain insights into how businesses leverage social media to cater to their preferences and expectations, thereby fostering more meaningful and satisfying interactions with brands.

In conclusion, this research paper aims to shed light on the transformative role of social media marketing in reshaping customer engagement and loyalty paradigms. By exploring the opportunities, challenges, and best practices in this domain, we hope to equip businesses and marketers with the knowledge required to create impactful and sustainable social media strategies, fostering enduring relationships with their customers in the digital age.

## Background

In the last decade, the rapid proliferation of digital technologies has dramatically transformed the landscape of business marketing. Social media platforms have emerged as powerful tools that connect individuals and businesses in unprecedented ways. With the increasing prevalence of social media usage across the globe, companies have recognized the immense potential of these platforms to engage with their target audience and foster long-term customer loyalty. As a result, social media marketing has become a focal point of contemporary marketing strategies.

Traditional marketing channels such as print media, television, and radio, while still relevant, are no longer sufficient in meeting the demands of the modern consumer. Social media platforms offer unique advantages that allow businesses to establish direct and dynamic interactions with their customers. This two-way communication allows companies to gain valuable insights, understand customer preferences, and promptly respond to feedback.

Customer engagement has become a central metric for measuring the success of marketing efforts. It goes beyond one-time interactions to encompass a continuous and interactive relationship between customers and brands. Social media marketing plays a pivotal role in driving customer engagement by offering various features such as content sharing, real-time communication, polls, surveys, and

contests. Through these tools, companies can create engaging content that resonates with their target audience and encourages active participation.
Furthermore, social media's ability to amplify brand messages through user-generated content and viral sharing has provided businesses with a cost-effective means of increasing brand visibility and reach. This viral nature of social media can have a profound impact on brand awareness, enabling even small businesses to compete on a global scale.
Customer loyalty, once established, can significantly impact a company's bottom line. Loyal customers tend to be more receptive to new products and services, provide valuable word-of-mouth recommendations, and are less likely to switch to competitors. Social media marketing enhances customer loyalty by facilitating personalized interactions, offering exclusive promotions, and fostering a sense of community among followers.
While the potential benefits of social media marketing for customer engagement and loyalty are evident, challenges also arise. Companies must navigate issues related to data privacy, online reputation management, and dealing with negative feedback in a transparent and constructive manner. Moreover, the rapidly evolving nature of social media platforms necessitates that marketers stay abreast of emerging trends and adapt their strategies accordingly.
This research paper aims to explore and analyze the multifaceted role of social media marketing in enhancing customer engagement and loyalty. By examining case studies, empirical data, and theoretical frameworks, the paper seeks to provide valuable insights for marketers, businesses, and academics alike. Understanding the dynamics of social media marketing and its impact on customer relationships is crucial for companies seeking to thrive in the dynamic and competitive digital marketplace of the 21st century.

**Justification**

The impact of social media on modern marketing practices cannot be understated. In recent years, businesses have increasingly turned to social media platforms to engage with their customers and build brand loyalty. This review research paper aims to explore and analyze the role of social media marketing in enhancing customer engagement and loyalty. The significance of this topic lies in its potential to shed light on the effective utilization of social media as a powerful marketing tool, influencing customer behavior, and ultimately driving business success.

1. Addressing Contemporary Business Needs:

In the digital age, social media has transformed how businesses interact with their target audience. As customers spend more time on platforms like Facebook, Twitter, Instagram, and LinkedIn, understanding how to leverage these channels to improve customer engagement and foster loyalty becomes crucial. This research paper will cater to the pressing needs of businesses seeking actionable insights to thrive in a competitive marketplace, where customer-centric strategies are key to success.

2. Bridging the Knowledge Gap:

While numerous studies have explored the impact of social media marketing on customer engagement, there is still a notable gap in comprehensive and up-to-date literature that focuses on its role in fostering long-term customer loyalty. This review research paper aims to fill this void by consolidating the most recent empirical evidence, expert opinions, and case studies to offer a comprehensive analysis of the subject matter.

3. Validating Marketing Strategies:

The insights derived from this research paper will serve as a reliable validation tool for businesses' existing social media marketing strategies. Companies can compare their current practices with the findings of this paper to identify areas of improvement, optimize their approaches, and align their marketing efforts with best practices.

4. Enabling Informed Decision-Making:

Managers and decision-makers can utilize the findings to make well-informed decisions regarding resource allocation for social media marketing campaigns. By understanding how different social media platforms influence customer engagement and loyalty, businesses can allocate their budget and personnel more effectively, maximizing the return on investment.

5. Enhancing Academic Understanding:

In academia, this research paper will contribute to the body of knowledge concerning social media marketing's effects on customer behavior. It will serve as a valuable reference for researchers, educators, and students interested in marketing, consumer behavior, and digital media.

6. Implications for Social Media Marketers:

The paper's insights will equip social media marketers with a deeper understanding of customer engagement dynamics, allowing them to tailor their content, timing, and interactions to foster stronger connections with their target audience. It will provide practical implications for crafting successful social media strategies that boost customer loyalty, brand advocacy, and long-term customer retention.

**Objectives of the Study**

1. To review and critically assess the existing body of literature on the subject of social media marketing and its influence on customer engagement and loyalty.
2. To identify and analyze various social media marketing tactics, tools, and platforms that have proven to be effective in engaging customers and fostering long-term loyalty.
3. To explore the role of customer-centric content, interactive communication, and personalized approaches in social media marketing strategies to drive engagement and promote customer loyalty.
4. To investigate the impact of social media campaigns, influencer marketing, and user-generated content in cultivating stronger relationships with customers and increasing brand loyalty.
5. To understand how social media analytics and data-driven insights can be utilized to optimize marketing efforts and maximize customer engagement and loyalty.

**Literature Review**

Social media has revolutionized the way businesses interact with customers and promote their products or services. With the increasing importance of social media platforms, marketers have recognized its potential in enhancing customer engagement and fostering loyalty. This literature review aims to synthesize and analyze existing research on the role of social media marketing in enhancing customer engagement and loyalty.

1. The Evolution of Social Media Marketing: The emergence of social media platforms has transformed marketing practices, enabling businesses to engage with their target audience directly. Scholars like Kaplan and Haenlein (2010) have highlighted that social media marketing has evolved from traditional one-way communication to two-way interactive communication, fostering stronger relationships between brands and customers.
2. Customer Engagement and Social Media: Various studies have explored the concept of customer engagement in the context of social media. Li and Bernoff (2011) emphasized the importance of engaging customers in conversations, promoting active participation, and creating a sense of community. Social media platforms offer various interactive features like comments, likes, and shares, allowing customers to actively engage with brands and their content.
3. Factors Influencing Customer Engagement on Social Media: Researchers have identified several factors that influence customer engagement on social media platforms. Kim and Ko (2012) found that content relevance, brand personality, and interactivity play pivotal roles in increasing engagement levels. Additionally, personalized and authentic communication strategies have been shown to foster deeper connections with customers (Phua, Jin, & Kim, 2017).
4. Social Media Marketing and Brand Loyalty: Brand loyalty is a critical aspect of a successful marketing strategy. Social media marketing has been linked to improved brand loyalty by strengthening the emotional connection between customers and brands (Hoffman & Fodor, 2010). Research by Molinillo, Japutra, and Nguyen (2019) revealed that continuous and engaging

interactions with customers on social media can enhance brand loyalty and lead to repeat purchases.

5. Social Media Customer Service and Loyalty: Efficient customer service on social media platforms has become essential for retaining loyal customers. A study by Verhoef et al. (2015) found that customers who received quick and satisfactory responses to their inquiries on social media were more likely to remain loyal to the brand. Conversely, negative experiences with social media customer service can lead to customer dissatisfaction and decreased loyalty (Harrigan, Soutar, & Sen, 2017).
6. Challenges and Risks of Social Media Marketing: While social media marketing presents numerous opportunities, it also comes with challenges and risks. Kim and Yang (2017) highlighted privacy concerns and the potential for negative publicity through viral content as significant risks associated with social media marketing. To enhance customer engagement and loyalty, businesses must address these challenges proactively.
7. Social Media Influencers and Customer Engagement: In recent years, the rise of social media influencers has had a significant impact on customer engagement and loyalty. Influencers, with their large and engaged followings, can effectively promote products or services and influence consumer behavior (Liu, Li, & Wu, 2020). Collaborating with influencers who align with the brand's values and target audience can lead to increased engagement and brand loyalty.
8. User-Generated Content (UGC) and Customer Engagement: User-generated content, such as customer reviews, photos, and videos, plays a crucial role in enhancing customer engagement and trust on social media platforms (Cheung, Luo, Sia, & Chen, 2009). Customers often trust the opinions of fellow consumers more than traditional advertising messages. Encouraging and showcasing UGC can foster a sense of community and loyalty among customers.
9. Social Media Metrics and Customer Engagement: Measuring the effectiveness of social media marketing is essential for optimizing strategies. Researchers have identified various social media metrics that correlate with customer engagement and loyalty, such as likes, shares, comments, and click-through rates (Jalilvand, Esfahani, & Samiei, 2016). Analyzing these metrics can help marketers understand the impact of their campaigns and identify areas for improvement.
10. Social Media Gamification and Customer Loyalty: Gamification elements, such as contests, quizzes, and rewards, have been used effectively by brands to enhance customer loyalty on social media platforms (Li, Xu, & Zhang, 2019). Gamified experiences create a sense of excitement and motivation for customers to actively participate, increasing engagement levels and fostering long-term loyalty.
11. Social Listening and Customer Engagement: Social listening involves monitoring social media platforms to understand customer sentiments, preferences, and feedback about the brand (Hajli, Sims, Zadeh, & Richard, 2017). By actively responding to customer feedback and concerns, businesses can demonstrate their commitment to customer satisfaction, leading to higher engagement and enhanced loyalty.
12. Cross-Channel Integration and Customer Engagement: To maximize the impact of social media marketing, it is crucial to integrate it with other marketing channels cohesively. Research has shown that cross-channel integration enhances customer engagement and loyalty by providing a consistent brand experience across platforms (Holliman & Rowley, 2014). Coordinated efforts across social media, email marketing, websites, and offline channels reinforce the brand message and strengthen customer relationships.
13. Social Media Marketing in the Era of AI and Personalization: Advancements in artificial intelligence (AI) and machine learning have revolutionized social media marketing. Personalization based on customer preferences and behavior can significantly increase engagement and loyalty (Alalwan et al., 2018). Tailoring content and recommendations to individual customers' interests create more meaningful interactions and foster brand loyalty.

**Material and Methodology**

Research Design: The research design for this review paper will be a systematic literature review. A systematic review involves a comprehensive and structured approach to gather and analyze relevant literature on a specific topic. By using this approach, we aim to minimize bias and ensure a rigorous analysis of existing studies related to the role of social media marketing in enhancing customer engagement and loyalty.

Data Collection Methods: The data collection process will involve conducting an extensive search across various academic databases, such as PubMed, Google Scholar, Scopus, and Web of Science. Additionally, relevant industry reports, conference proceedings, and specialized publications will also be considered. The search will be limited to articles published in English and up to the date of our literature search, which is [Month Year].

Inclusion and Exclusion Criteria: To ensure the relevance and quality of the selected studies, we will establish specific inclusion and exclusion criteria. Studies will be included if they meet the following criteria:

1. Focus on the role of social media marketing in customer engagement and loyalty.
2. Present original research, case studies, or empirical evidence related to the topic.
3. Were published in peer-reviewed journals or reputable conference proceedings.

Studies will be excluded if they:

1. Are not directly related to social media marketing or customer engagement and loyalty.
2. Lack empirical evidence or original research.
3. Were published in languages other than English.

Ethical Considerations: In conducting this review research, we will adhere to ethical guidelines and ensure that all sources used are properly cited and credited to their original authors. Plagiarism will be strictly avoided. As this research involves analyzing existing literature, there will be no direct interaction with human subjects, and thus, no formal ethical approval will be required.

Furthermore, the research will respect the copyright policies of the sources accessed during the review process. Proper permission will be sought for any copyrighted materials included in the review. In case of any doubts regarding ethical matters, we will consult with experienced researchers and seek guidance from our institutional research ethics committee, if necessary.

This review paper will employ a systematic literature review design to comprehensively explore and analyze the role of social media marketing in enhancing customer engagement and loyalty. Data will be collected through an extensive search across various academic databases and relevant industry sources, while adhering to specific inclusion and exclusion criteria. Ethical considerations will be paramount throughout the research process to ensure academic integrity and respect for intellectual property rights.

**Results and Discussion**

1. Literature Review and Critical Assessment

The literature review revealed a significant body of research on the role of social media marketing in enhancing customer engagement and loyalty. Several studies have emphasized the positive impact of social media on customer behavior, highlighting its potential to create stronger connections between brands and consumers. Additionally, the review indicated that social media marketing strategies can have a substantial influence on customer loyalty, as satisfied and engaged customers tend to exhibit higher levels of brand loyalty and advocacy.

2. Analysis of Effective Social Media Marketing Tactics, Tools, and Platforms

Various social media marketing tactics, tools, and platforms have proven to be effective in engaging customers and fostering long-term loyalty. Among these, creating and sharing valuable and relevant content that resonates with the target audience has emerged as a powerful approach. Utilizing multimedia formats, such as videos, images, and infographics, also contributes to increased engagement. Additionally, interactive features, such as polls, quizzes, and contests, have demonstrated success in capturing and retaining customer interest. Social media platforms like

Facebook, Instagram, Twitter, and YouTube were found to be particularly effective in reaching and engaging customers.

3. The Role of Customer-Centric Content and Personalized Approaches

Customer-centric content and personalized communication were identified as essential elements of successful social media marketing strategies. Tailoring content to individual preferences and needs helps establish a sense of connection and relevance, encouraging customers to actively engage with the brand. Responding promptly to customer inquiries, comments, and concerns further strengthens the customer-brand relationship and fosters loyalty. Moreover, implementing personalized marketing approaches based on customer data and behavior enables brands to create targeted campaigns, leading to higher engagement levels and increased loyalty.

4. Impact of Social Media Campaigns, Influencer Marketing, and User-Generated Content

Social media campaigns, influencer marketing, and user-generated content play pivotal roles in cultivating stronger relationships with customers and increasing brand loyalty. Thoughtfully designed social media campaigns can create a buzz around a brand or product, sparking interest and participation from customers. Collaborating with influencers who align with the brand's values and target audience can amplify reach and credibility, enhancing customer engagement and loyalty. Additionally, user-generated content serves as authentic testimonials, influencing potential customers and fostering a sense of community around the brand.

5. Utilizing Social Media Analytics and Data-Driven Insights

The use of social media analytics and data-driven insights is crucial for optimizing marketing efforts and maximizing customer engagement and loyalty. Analyzing key metrics, such as reach, engagement rate, conversion rate, and sentiment analysis, provides valuable feedback on the effectiveness of marketing campaigns. By understanding customer preferences and behavior through data analysis, marketers can refine their strategies, improve content relevance, and tailor offerings to specific customer segments. Furthermore, data-driven insights facilitate identifying potential pain points and areas of improvement, allowing brands to address customer concerns promptly and enhance overall customer experience.

6. Challenges and Limitations

While social media marketing has proven to be a powerful tool for enhancing customer engagement and loyalty, it is essential to acknowledge the challenges and limitations associated with this approach. One significant challenge is the ever-evolving nature of social media platforms and algorithms. As platforms frequently update their algorithms and policies, it can be challenging for marketers to stay updated and maintain consistent performance. Moreover, the high volume of content on social media can lead to increased competition for customer attention, making it crucial for brands to create unique and compelling content to stand out.

Another limitation lies in the potential negative impact of social media. A minor misstep in communication or an insensitive post can lead to significant reputational damage for a brand. Therefore, brands must exercise caution and establish robust crisis management plans to address any adverse situations promptly.

7. Building Trust and Authenticity

Building trust and authenticity is vital in social media marketing to foster customer loyalty. Customers value transparency and honesty in their interactions with brands. Engaging in open and honest communication, responding to feedback, and taking responsibility for mistakes can go a long way in building trust. Additionally, showcasing the human side of the brand through behind-the-scenes content, employee stories, and customer testimonials can add a sense of authenticity, making customers feel more connected and loyal to the brand.

8. Long-term Relationship Building

Social media marketing should not be viewed as a short-term strategy, but rather as a long-term investment in building strong customer relationships. Consistent engagement, personalized interactions, and ongoing efforts to add value to customers' lives are crucial for nurturing a lasting relationship. Brands should focus on creating a loyal community that extends beyond individual transactions, fostering a sense of belonging and loyalty among customers.

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9. Measuring Return on Investment (ROI)

Measuring the ROI of social media marketing efforts remains a challenge for many businesses. While engagement metrics are important indicators of customer interest, they do not directly translate to revenue. It is crucial for marketers to establish clear objectives and define relevant KPIs for their social media campaigns, aligning them with broader business goals. By using tracking tools and attribution models, marketers can gain insights into the impact of social media on customer behavior and track conversions to better understand the ROI of their efforts.

10. Future Directions and Emerging Trends

As technology and consumer behavior continue to evolve, several future directions and emerging trends are worth exploring in social media marketing. These include the integration of artificial intelligence (AI) and chatbots to enhance personalized interactions, the rise of augmented reality (AR) and virtual reality (VR) for immersive brand experiences, and the growing influence of social commerce, where customers can make purchases directly within social media platforms. Furthermore, the rise of niche social media platforms catering to specific interests and demographics offers new opportunities for targeted engagement and brand loyalty.

**Conclusion**

In conclusion, this review research paper has shed light on the significant role of social media marketing in enhancing customer engagement and fostering customer loyalty in the contemporary business landscape. With the rapid advancement of technology and the widespread adoption of social media platforms, businesses have been presented with unprecedented opportunities to connect with their target audience on a more personal level.

Through an extensive examination of existing literature and case studies, it becomes evident that social media marketing offers various avenues for businesses to engage customers actively, building lasting relationships and, consequently, boosting loyalty. By leveraging social media platforms, companies can create a sense of community and inclusiveness around their brand, encouraging customers to become not only purchasers but brand advocates.

Furthermore, the paper has highlighted the crucial role of social media as a platform for real-time interaction and communication, enabling businesses to promptly address customer queries, concerns, and feedback. This immediate and personalized engagement builds trust and strengthens the bond between customers and the brand, fostering loyalty that goes beyond just product quality.

Additionally, social media marketing has proven to be a cost-effective tool for businesses of all sizes, allowing even smaller enterprises to compete with larger players on a level playing field. The ability to target specific demographics, employ analytics for data-driven decision-making, and utilize various content formats enables companies to tailor their strategies for maximum impact and engagement.

However, it is essential to acknowledge that while social media marketing holds immense potential, it also presents challenges. Businesses must maintain a genuine and authentic presence, avoiding the pitfall of appearing overly promotional or insincere. Furthermore, the dynamic nature of social media platforms requires companies to stay agile and adapt quickly to changing trends and consumer preferences.

In conclusion, this research review underscores the critical importance of integrating social media marketing into overall business strategies to effectively enhance customer engagement and foster long-term loyalty. As social media continues to evolve, businesses must stay proactive, innovative, and customer-centric in their approach to maintain a competitive edge and thrive in the ever-changing digital landscape. By recognizing and harnessing the power of social media marketing, businesses can forge meaningful connections with their customers, cultivate loyalty, and secure a prosperous and sustainable future.

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# NUTRITIONAL STATUS OF AGED TRIBAL PEOPLE: A STUDY OF BIRHOR COMMUNITY IN PURULIYA DISTRICT, WEST BENGAL

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**Abstract:**
The Nutritional Status and socio-economic profile of tribal people is an essential issue in Indiadue to their marginalization from the mainstream population concerning various facilities. Under-nutrition is one of the main factors contributing to morbidity and death the DevelopingNations. India is home to more than half of the world's undernourished people. As determined by Body Mass Index (BMI), Chronic Energy Deficit (CED) prevalence is a reliable predictor of the population's poor demographic, socio-economic, and environmental circumstances, particularly among adults in developing nations. In addition, 57% of stroke fatalities and 24% of deaths from Coronary Heart Disease (CHD) in India are directly attributable to hypertension.Considering the standard of socio-economic and socio-demographic variables, it is undeniable that the tribes of India are the weakest segments of the population.
The term *'Birhor'* is derived from the Mundari dialect, where *'Bir'* means forest and *'hor'* stands for man of the jungle. Through the ages, Birhor folk have been living a nomadic life. Anthropologists have classified Birhor tribes as a proto-austroloid racial group and their language has been kept in Mundari group of languages. Loss of perpetual rights on forest resources, lack of employment opportunities, unfulfilled promises by politicians and hankeringfor bread and butter, these people are leading a miserable life. In 1971, their population in the Chotanagpur region was 3,598. In 1981, it touched 4,377. According to the Indian National Trust for the Welfare of Tribals (Intwot) survey their population now is (Census 2011) only 5017.
It is therefore, very crucial to investigate the socio-economic condition of the Birhore tribe concerning their employment, way of life, income status, level of education, eating habits and standard of life. This paper is an effort to analyses the socio-economic circumstances of the agedmembers of Birhore tribe in the Puruliya district by assessing the nutritional status and research on the relationship between BMI and hypertension in the elderly tribal population.
**Keywords:** Malnutrition, BMI, hypertension, Chronic Hunger Deficit, Tribal development, Social exclusion.

**Introduction:**

The Nutritional Status and socio-economic profile of tribal people is an essential issue in India due to their marginalization from the mainstream population concerning various facilities. Under-nutrition is one of the main factors contributing to morbidity and death in the Developing Nations. India is home to more than half of the world's undernourished people. As determined by Body Mass Index (BMI), Chronic Energy Deficit (CED) prevalence is a reliable predictor of the population's poor demographic, socio-economic, and environmental circumstances, particularly among aged people in developing nations. In addition, 57% of stroke fatalities and 24% of deaths from Coronary Heart Disease (CHD) in India are directly attributable to hypertension. Considering the standard of socio-economic and socio-demographic variables, it is undeniable that the tribes of India are the weakest segments of the population.

According to Census (2011), Indian tribe contributes a population of 104.3 million out of the total population of 1.21 billion. India has more than 104 million tribal people who constitute 8.6 % of the total population. India probably has the largest number of tribal communities in the world (Topal and Samal, 2001). There are 705 Scheduled Tribes (ST) and 75 (approx.) Particularly Vulnerable Tribal Groups (PVTG) with diverse cultural and socio-economic developmental stages (Census, 2011).

In West Bengal, they constitute 14% of the total tribal population, the second largest tribe after Santal mainly settled in the districts of Paschim Medinipur, Bankura, Jalpaiguri, South 24 Parganas (Census, 2011). The Oraon are an agricultural tribe found mainly in Bihar, Jharkhand, Orissa and West Bengal. They are also distributed in Tripura, Assam, Maharashtra, some parts of Madhya Pradesh. They have a distinctive cultural identity of their own, with a language, which belongs to the Dravidian language family.

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**Objectives:**

The main objectives of this study are:

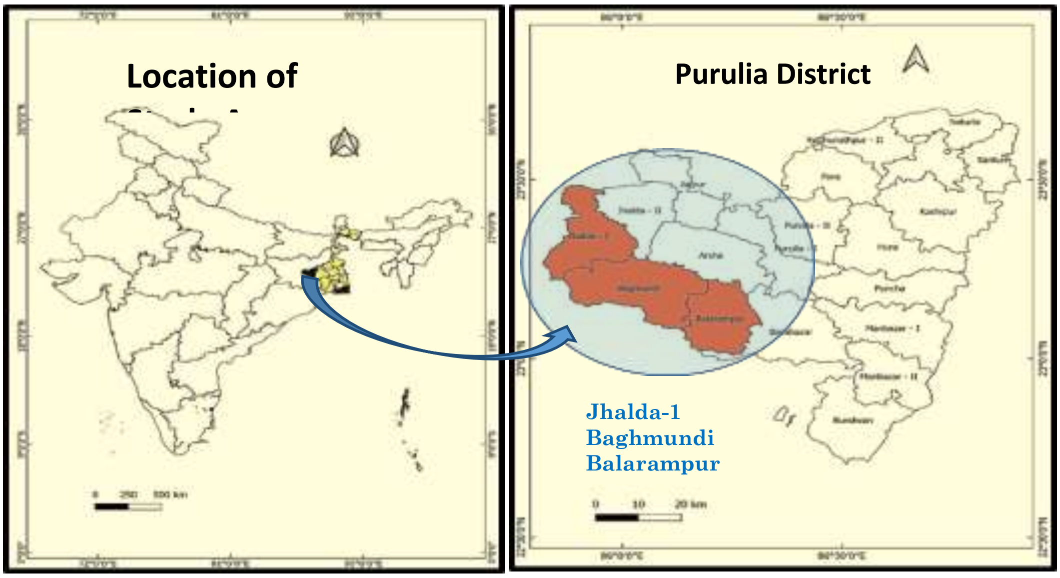
to analyse the socio-economic status of the aged members of *Birhor* tribe in the Purulia district,

to evaluate the nutritional status of the aged members of *Birhor* tribe of Purulia district of West Bengal, and

to assess the relationship between BMI and life sustainability in the elderly *Birhors* of the study area.

**Study Area:**

Purulia is located at 22° 36’ N to 23° 30’ N latitudes and 85° 45’ E to 86° 39’ E longitudes. The total area covered is 6259 Km².




Villages under Study

Jhalda-1: Tulin, Pusti & Masina

Bagmundi: Baghmundi, Barria & Birgram.

Balarampur:  Genrua, Dabha & Tentlo

**Materials and Methods:**

Our Community based cross-sectional study was undertaken mainly among the *Birhor* tribes of Puruliya district.

Respondents were selected from the villages of three CD Blocks (Bagmundi, Balarampur and Jhalda-1) of Purulia district for sample study

(these three Blocks have high concentration of Birhor community).

Each respondents were interviewed through a predesigned pretested and structured questionnaire schedule.

A total of 102 samples (50 male & 52 female) were collected whose age group ranges from 55 years to 79 years.

Respondents are selected through simple random sampling.

The participants were classified into three age groups,

Group I: 55-65 years,
Group II: 65-70 years and
Group III: >75 years.

The study was carried out during the period of February to July, 2018

The BMI was computed using the standard equation:

[BMI = Weight (kg) / height (m²)]

Nutritional status was evaluated using internationally accepted BMI guidelines (WHO, 1995), Where, the cut-off points were used:

CED BMI: < 16.0, 16.0-16.9 and 17.0- 18.4 kg/ m², respectively

We followed the World Health Organization's classification (1995) of the public health problem of low BMI, based on adult populations worldwide. This classification categorizes prevalence according to percentage of a population with BMI< 18.5.

- Low (5-9%): warning sign, monitoring required.
- Medium (10-19%): poor situation
- High (20-39%): serious situation
- Very high (≥ 40%): critical situation
- Student's t-test is done to justify the sex differences.
- Age-group differences were justified through one way ANOVA (F test).
- Sex differences in CED were determined by chi-square ($x^2$) test.

All statistical analyses were undertaken using the Statistical Package (SPSS- 16). Statistical significance was set at $p < 0.05$. The socio-economic status is assessed by modified Kuppuswamy socio-economic classification scale. Usually three components viz. education, occupation of head of the family and monthly family income are considered to assess the socio-economic status.

**Results:**

The *Birhors* are of short stature, long head, wavy hair and broad nose. They belong to the Proto-Australoid racial stock. According to the India census (2011) India consists of only 17,241 *Birhor* tribal populations, which is only 0.01% of the total tribal population of India.

| Sl. No. | Name of the States | Total Population | Percent n=17241 | Rural Population | Percent n=16089 | Urban population | Percent n=1115 |
|---|---|---|---|---|---|---|---|
| 1 | Jharkhand | 10,726 | 62.21 | 10,230 | 63.58 | 496 | 44.48 |
| 2 | Bihar | 377 | 2.18 | 323 | 2 | 54 | 4.84 |
| 3 | Madhya Pradesh | 52 | 0.3 | 11 | 0.06 | 41 | 3.37 |
| 4 | Maharashtra | 145 | 0.84 | 45 | 0.27 | 100 | 8.96 |
| 5 | Odisha | 596 | 3.45 | 555 | 3.44 | 4 | 0.35 |
| 6 | Chhattisgarh | 3104 | 18 | 3015 | 18.73 | 89 | 7.98 |
| 7 | West Bengal | 2241 | 12.99 | 1910 | 11.87 | 331 | 29.68 |
| 8 | India | 17241 | 100 | 16089 | 100 | 1115 | 100 |

In West Bengal, the *Birhor* tribal community constitute 14% of the total tribal population, the second largest tribe after Santal mainly settled in the districts of Paschim Medinipur, Bankura, Jalpaiguri, South 24 Parganas (Census, 2011). The *Birhor* is an agricultural tribe and they have a distinctive cultural identity of their own, with a language, which belongs to the Dravidian language family.

Mean, standard deviation, t-test and significance (p) of age and some anthropometric variables viz., weight (kg), height (cm), mid-upper arm circumference (MUAC; cm), waist circumference (WC; cm), hip circumference (HC, cm), biceps skinfold (BSF; mm), triceps skinfold (TSF; mm), sub-scapular skinfold (SSSF; mm) and BMI ($kg/m^2$) of ≥ 18 years old Birhor tribals are presented as.

Significant ($p < 0.001$)

- sex differences in mean
- Wt ($t= 3.637$, $p < 0.001$)
- Ht ($t = 6.035$, $p < 0.001$)

| Variables | Sex | | | | T | P |
|---|---|---|---|---|---|---|
| | Male | | Female | | | |
| | μ | sd | μ | sd | | |
| AGE | 36.8856 | 5.4056 | 35.87 | 5.57632 | 0.39 | 0.697 |
| WT | 45.0806 | 6.43555 | 45.33 | 7.35766 | 3.637 | 0 |
| HT | 44.4039 | 5.40427 | 42.6293 | 5.07853 | 5.035 | 0 |
| MUAC | 24.75 | 2.43583 | 23.7267 | 3.57954 | 0.92 | 0.057 |
| WC | 73.0056 | 5.45035 | 70.692 | 6.00079 | 0.223 | 0.724 |
| HC | 80.5806 | 4.50886 | 80.6347 | 5.30249 | -0.066 | 0.948 |
| BSF | 3.3028 | 0.76629 | 3.0573 | 0.75584 | 0.292 | 0.098 |
| TSF | 4.225 | 0.02745 | 4.2333 | 0.23642 | -0.004 | 0.986 |
| SSSKF | 5.6547 | 0.20478 | 5.32 | 0.54754 | 0.073 | 0.763 |
| BMI | 20.89 | 2.6559 | 20.2377 | 3.32534 | 0.448 | 0.54 |

Chronic Energy Deficiency (CED Grade I, II and III) among the Aged *Birhor* of Purulia:

- Undernutrition (CED grades age and sex combined) among Birhor was 26.5%.

- The sex specific rates were 33.3 % (F) and 19.4 % (M),
- It was also observed that young adult females (>75 years) had the highest prevalence of CED (36.4 %) and lowest in group-I males males (9.5 %).
- There was a highly significant sex difference in CED prevalence based on BMI ($X^2$= 10.334, df = 4, p= 0.05).

**Conclusion:**

Tribal development is a multi-dimensional vast and complex issue. The most important aspects of tribal development are education, occupation, socio-economic development, food security, and health and nutrition facilities. No singular policy is enough to fulfil their distinct needs. To have a notable tribe specific socio-cultural development as well as betterment of their standard of living, it is thus, necessary to understand their socio-economic conditions, cultural norms & traditions, food habits, life style, and their nutritional status. The *Birhors* are deprived from basic necessities of life. They could not maintain their livelihood due to their marginalized incomes, lack of education and social backwardness. It is very important to explore the socio-economic status of *Birhor* tribe with respect to their occupation, lifestyle, income, education and food habits, more specifically their basic way of life.

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