

TRANSFORMING ODISHA

Insights into Finance, Agriculture and Social Well-being

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Preface

Sustainability has emerged as a guiding principle shaping development agendas at global, national, and local levels. For a diverse and rapidly changing country like India, achieving sustainable development requires a holistic approach that balances economic growth, social equity, and environmental stewardship. In this context, the Department of Economics, MSCB University, Odisha, organized a two-day International Conference on “India’s Pathways to Sustainable Development” on 19–20 April 2025, with generous support from the R&D Cell of MSCB University and the Bank of India.

The conference served as an engaging platform for scholars, practitioners, policymakers, and students to exchange ideas, present empirical research, and discuss policy insights on India’s sustainability journey. The discussions were structured around four core themes—economic, environmental, digital, and social sustainability—reflecting the multidimensional nature of sustainable development research.

This edited volume, *Transforming Odisha: Insights into Finance, Agriculture and Social Well-being*, constitutes the third set of conference proceedings, compiling a curated selection of high-quality papers related to Odisha, presented at the event. The chapters integrate rigorous academic analysis with empirical evidence, highlighting Odisha’s diverse development experiences. The volume provides valuable insights for academics, policymakers, researchers, and students in economics, sociology, social work, public policy, development studies, and environmental sciences. It is designed to foster critical reflection and informed debate on promoting inclusive and sustainable development in India.

The editors extend their sincere gratitude to the authorities of MSCB University, all organising committee members, all contributors, resource persons, and peer reviewers, for their support and cooperation. Special thanks are also due to the internal and external review committees for their guidance, and to Bharati Publications, New Delhi, for facilitating the publication and marketing of this edited book.

Editors

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ROLE OF E-COMMERCE IN UNLOCKING MARKETING POTENTIAL FOR TRIBAL PRODUCT BY AFFECTING CONSUMER BUYING BEHAVIOUR IN ODISHA

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ABSTRACT

In an era of global challenges, India, with its fast-growing economy, envisions independence in innovation and global market expansion. With a significant tribal population, promoting tribal products empowers communities and boosts financial growth. Digital technology has transformed marketing approaches. This paper explores how e-commerce influences consumer behaviour towards tribal products and its impact on promotion and investment in tribal enterprises. This study uses primary data from a survey of Odisha's general population and tribal entrepreneurs, employing stratified multistage purposive sampling and descriptive statistics to analyse consumer behaviour and marketing trends in tribal enterprises responding to digital marketing. It is a cross-sectional study with structured questionnaires and 150 respondents. The findings suggest digital platforms significantly impact consumer buying behaviour by attracting and informing them about Odisha's tribal products. Tribal entrepreneurs report, digital marketing has driven business expansion over the past five years. Data analysis shows tribal product sales have risen by 10%-20% after adopting digital platforms, with a 31% increase in tribal enterprise investments. Most buyers prefer tribal products with eco-friendly packaging, followed by modern packaging from government-recognized tribal fairs and tribal stores with government certification and quality assurance.

The limitations of the concerned study are a small sample size and the use of purposive sampling, which does not allow access to the opinions of consumers who have never bought any tribal products. This study can be a landmark for future similar studies as a reference. It can help understand consumer behaviour and is useful to digital platforms developers to make their platforms more handy towards tribal products. It will help to escalate tribal enterprises and contribute to reforming digital platforms and policies for tribal product marketing.

Keywords: E-commerce, Entrepreneurship, Tribal product, Odisha.

1. INTRODUCTION

Entrepreneurship cannot be explained in simple words, as it is broadened by the initiatives and ideas of individual entrepreneurs. It involves a synchronization of several disciplines, so an interdisciplinary approach is required to define entrepreneurship. This has led to great variations in the definition of entrepreneurship, as concluded by authors of different backgrounds.

The most cited and well-known definition of entrepreneurship is defined by Shane & Venkataramana (2000), who defined it as “How by whom and with what effects opportunities to create future goods and services are discovered, evaluated and exploited”. This definition mainly focuses on opportunity recognition, along with focusing on discovery of new technology and markets (Ratten, 2023). Entrepreneurial endeavours can greatly enhance a nation’s Gross Domestic Product (GDP)

According to the year-end review of the Ministry of tribal affairs 2022, tribal people constitute 8.6% of the Indian population, which is around 10.4 crore. According to a report by the Schedule Caste and Schedule Tribe Training Institute (SCSTRTI), Odisha has the 3rd largest tribal population in the country, housing some ancient and endangered tribes.

Business initiatives in rural and indigenous regions can have a profoundly positive effect on the populations residing in such areas. They can foster economic progress, empowerment, and long-term development. Entrepreneurship in these regions should focus on recognizing and utilizing local prospects and assets. This may involve traditional expertise, farming, artisanal crafts, or distinctive cultural heritage that can be converted into sustainable enterprises (Prabhakar et al., 2024).

According to the 2011 census, the state has around 64 different tribal communities. It constitutes around 22.85 % of the total state tribal population and 9.17 of % tribal population of the country. The above data suggests that a large amount of economic growth of the state of Odisha, as well as the country, is dependent on the economic growth of the tribal population. Tribal entrepreneurs encounter numerous obstacles that hinder their growth and success. Limited access to capital remains a significant barrier, as traditional financial systems often exclude tribal communities.

The lack of entrepreneurial education and skill training further exacerbates the issue, leaving many without the tools to navigate competitive markets. Geographical isolation restricts market access, increasing operational costs and limiting customer reach. Additionally, socio-cultural factors, such as traditional norms and values, can sometimes conflict with modern business practices, creating resistance to change. Regulatory and institutional barriers, coupled with inadequate awareness of government policies and programs, further complicate the entrepreneurial journey. Addressing these challenges requires targeted interventions, including financial support, skill development programs, and culturally sensitive policies to empower tribal entrepreneurs and foster sustainable growth (Kumara and Sharma, 2024). For the past few years government has worked tremendously on boosting of tribal economy by encouraging and empowering tribal entrepreneurs. Many schemes are enforced to help tribal entrepreneurship thrive. Those policies not only work on helping in the production of tribal goods and services but also aim at their marketing at both local and global levels. In this regard, many tribal fairs, govt. Tribal shops have been opened by the state and central government large investments by both investors from inside and outside of the state can help in the growth of tribal entrepreneurs. But this requires marketing and promotion of the tribal product.

In the field of entrepreneurship, E-commerce and digital marketing have been proven to be an emerging medium of product promotion. The term E-Commerce was first coined and applied by Robert Jacobson, Principal Consultant to The California State Assembly's Utilities & Commerce Committee, in the title and text of California's Electronic Commerce Act, carried by the late Committee Chairwoman Gwen Moore (D-L.A.) and enacted in 1984.

E-commerce is the process of selling over the internet or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer-mediated network without using any paper document. Compared to the conventional trading method, the core distinction of e-commerce is that it depends on the expansive framework of the Internet. The digital network is established using sophisticated technological advancements, forming a dynamic and virtual e-commerce environment (Jin Pan, 2024).

Electronic commerce (or e-commerce) is the purchase or sale of goods or services over any kind of computer network. Possible networks include the internet, an extranet, which is a private platform that uses internet technology, TCP/IP, and an electronic data interchange (EDI) network. (Knight & Mann, 2017).

E-commerce platforms have contributed to considerable growth in online retail for the last decades. In 2011, according to the U.S. Census Bureau, e-commerce accounted for 5% of total retail sales. After the COVID-19 pandemic this retail sales have increased up to 16.5% and it has reduced to 15% as physical stores have opened.

The impending importance of digital marketing in joining geographical and marketing disparities has revolutionized the realm of global commerce and communication. These platforms have provided access to marketing and business empowerment. This paper studies how digital marketing influences the consumer buying behaviour of tribal products in Odisha and its effect on boosting the capital of tribal entrepreneurs. This paper will help to find the role of digital marketing for improving tribal product promotion and attracting investment towards tribal enterprises.

2. LITERATURE REVIEW

This section aims to present the insights and conclusions drawn from previous research conducted by various specialists, including their perspectives and evaluations on different aspects of the study. These findings will provide valuable information for the current research, enabling robust analysis and thoughtful interpretation.

Mondal (2024) In the article titled *“Tech-driven Entrepreneurship: Exploring the role of technology in the economic empowerment of tribal communities in Birbhum district”*, mentioned that Tech-driven entrepreneurship in Birbhum boosted tribal incomes by 25% via digital markets. However, digital literacy gaps and poor infrastructure hinder the adoption process. Policies show 60% satisfaction, but they need better support and infrastructure for broader impact.

Pravesh (2016) in his article titled *“Challenges and Opportunities for Tribal Entrepreneurship Development in India: An Analytical Study”*, examines the tribal entrepreneurship in India along with financial, technical, market, and infrastructure challenges faced by the entrepreneurs. It urges better policies, training, and support while highlighting growth areas like herbal products, handicrafts and agripreneurship, tourism, and forest products.

Nayak & Patra (2023) in the article titled *“Tribal Entrepreneurship Opportunities and Development: A Review From (2010-2021)”* mentioned the tribal entrepreneurship in India and addressed financial, educational, infrastructure, and management barriers. It highlights government schemes, SHGs, and CSR initiatives as key supports for economic and social growth. It highlights the need for better regulations and skill development to ensure sustainability and success for tribal entrepreneurs.

Naik & Panda (2023) in the article *“Empowerment of Tribal Communities through Innovation and Entrepreneurship: A Path to Sustainable Progress”* focuses on how innovation and entrepreneurship empower Rayagada’s tribal communities by preserving traditions, boosting economies, and improving education. It highlights challenges like economic vulnerability and market access while stressing the role of sustainable initiatives and government support in fostering growth and cultural preservation.

Rajendrakumar et al. (2024) through their article titled *“Native Nest: An E-Commerce Platform for Promoting Tribal Products and Culture”* explores *“Native Nest”*, an e-commerce platform supporting Ooty’s tribal artisans by providing a direct marketplace. It eliminates middlemen, preserves cultural heritage,

and boosts socio-economic growth. The study emphasizes the need for a user-friendly interface, QR code integration, and secure transactions to enhance accessibility and market reach.

Rejani. R. Nair & Thansiya N (2023) in the article *"Marketing practices and Challenges of Tribal Products in Kerala"* examines marketing challenges in Kerala's Kottoor tribal region. It also highlights low awareness, trader exploitation, and inadequate government support. Despite producing quality goods, tribal producers struggle with market reach due to limited knowledge and poor infrastructure.

Chellamy (2022) in their article titled *"Influence of India's E-commerce Sales and its initiative of tribal peoples - with special reference to TRIBES INDIA"*, examine the effect of India's e-commerce sales on tribal initiatives, focusing on "Tribes India". It highlights the growth of e-commerce sales while noting that TRIBES INDIA's online sales volume remains relatively low compared to other platforms. The study concludes that although there is a strong correlation between India's e-commerce expansion and TRIBES INDIA sales, tribal products still call for greater awareness and accessibility for broader success.

Asrafi et al. (2024) through the article titled *"A Study on Empowering Tribal Livelihoods through Digital Marketing with Special Reference to Tribal Areas at Kodaikanal, Tamil Nadu, In Accordance With Sustainable Development Goals (SDGS)"* examines digital marketing's role in improving tribal livelihoods in Kodaikanal, Tamil Nadu, aligning with SDG 1 (No Poverty) and SDG 8 (Decent Work & Economic Growth). Key findings reveal low internet access, limited digital payments, and reluctance to adopt digital tools despite recognizing future potential. Targeted interventions are required to enhance digital literacy, digital inclusion, and trust in online platforms, with recommendations for policymakers and stakeholders.

Srinivas (2021) in the article titled *"Problems and Challenges of Tribal Marketing in Telangana (Special reference to Khammam district)"* explores the tribal marketing hindrances in Telangana, especially Khammam district, focusing on poor infrastructure, low literacy, and complex agricultural and forest-based economies. It throws light on difficulties in market access, fair pricing, and institutional credit, alongside sluggish government progress in economic improvements. The study recommends better education, agricultural support, financial access, and market infrastructure to promote sustainable tribal development.

Behera (2017) through the article titled *"Women Entrepreneurship Development in Tribal Areas in Odisha: An Effective Means of Women Empowerment"* highlights the pivotal role of women entrepreneurship in Odisha's tribal areas, especially Mayurbhanj, in poverty alleviation and socio-economic empowerment. Despite challenges like low motivation, education, and credit access, tribal women entrepreneurs gain confidence, leadership, and financial stability through agriculture-based ventures. The study concludes that fostering

women entrepreneurship in tribal regions will result in uplifting economic development and ameliorating the living standards of the tribal community.

Pan (2024) through the article titled "*The Impact of E-Commerce on International Trade*" highlights how e-commerce transfigures international trade by lowering transaction costs, expanding trade opportunities, and boosting consumption. It highlights digital platforms' role in market access, SME empowerment, and global resource allocation while addressing tribulations like logistics, payment security, and data security, offering optimization strategies.

Verma (2023) in the article titled "*Prospects of Tribal Products Marketing in India*", examines the prospects of marketing tribal products in India, highlighting their economic significance and cultural heritage. It underscores the pivotal role of organizations like TRIFED in promoting these products and improving tribal livelihoods. Additionally, it discusses the obstacles faced in distribution, education, and infrastructure while emphasizing the potential of tribal products to sustain in competitive markets.

Dash (2011) in the article titled "*Marketing of Orissa handicrafts: A study on challenges & opportunities*", studies on the setbacks and prospects in marketing Odisha's handicrafts, emphasizing the artisans' reliance on middlemen due to illiteracy, poverty, and lack of institutional support. It highlights the need for modernization, consumer-oriented design, and direct market access to enhance the industry's sustainability. Additionally, the study stresses the importance of preserving traditional craftsmanship while integrating contemporary trends to boost demand in both domestic and international markets.

Gahlot et al. (2019) in their article named "*Impact of digital India on tribal ventures and its future prospects*" highlights the influence of Digital India on tribal businesses, consolidating artisans, farmers, and craftsmen into the digital economy via e-commerce. It discusses blockchain's role in fair pricing, like the Coffee Board's pilot project. Future prospects include improved livelihoods, skill development, and digital resource management to further empower indigenous communities.

Through the above-reviewed literature, it's evident that most of the studies are done in the field of tribal entrepreneurship, women empowerment through entrepreneurship-commerce and the influence of E-commerce and digitalization on entrepreneurship.

Therefore, this article aims to work on the potential gap through an initial progressive study about how e-commerce unleashes the marketing potential for tribal products by affecting consumers' buying behaviour. By this, a cause-and-effect relationship can be established between the application of e-commerce in marketing tribal products and the customer's responses towards this approach. Through this, it will be helpful for tribal entrepreneurs to identify various prospects and threats for their development, and it will ultimately boost the market capturing of tribal businesses and bring sustainability.

3. OBJECTIVES

1. To evaluate the impact of E-commerce on consumers' buying behaviour with direct allusion to tribal products of Odisha.
2. To measure the effect of E-commerce on tribal entrepreneurs and respective business undertakings.

4. METHODOLOGY

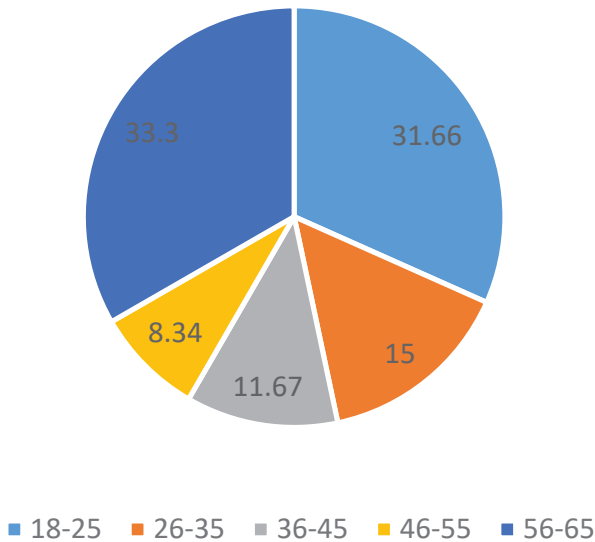
The present study employs a qualitative research design with a descriptive statistical approach to analyse data collected from 203 respondents, out of which 150 respondents were found to satisfy the inclusion criteria through a structured survey. The study focuses on summarizing and interpreting the characteristics of the collected data using numerical and graphical representations. The study is mostly based on primary data with some fractions of secondary data collected from various published and unpublished sources. In order to collect first-hand information, both simple random sampling and convenience sampling methods were used. The target population consists of consumers and tribal entrepreneurs belonging to different demographics. Primary data were collected through a structured questionnaire containing closed-ended questions using both online media, i.e. Google Form and face-to-face interviews, and focus group discussions, etc. The questionnaire was designed to gather information related to age, gender, buying behaviour, satisfaction level, business strategies used, etc., in connection with both consumers and tribal entrepreneurs in the context of the application of E-commerce on tribal products selling. The response options included Likert scale ratings, multiple-choice questions, and dichotomous (yes/no) questions, allowing for systematic data analysis. Respondents were informed about the purpose of the study and assured of confidentiality. The data collection period lasted up to 7 months. The results are represented through graphical representations such as pie-charts, histograms and bar-diagrams. The study adhered to strict ethical standards. Participants engaged willingly and offered their informed consent. Their contributions were treated with confidentiality, and no data that could personally identify them was gathered.

5. RESULTS

A total of 203 respondents were interviewed out of whom 150 respondents were found to satisfy the inclusion criteria. Out of the 150 respondents, 123 were consumers and 27 were tribal entrepreneurs. Among 150 respondents, 79 were females and 52 were males 19 were other genders. The results suggested tribal product sales have risen by 10%-20% after adopting digital platforms, with a 31% increase in tribal enterprise investments. Consumer response suggested a positive reinforcement of buying behaviour by the e-commerce platform. More no of consumers opined that E-commerce platforms have made the tribal product buying convenient and helped in making them more aware about such products.

5.1 Results of Consumer Survey

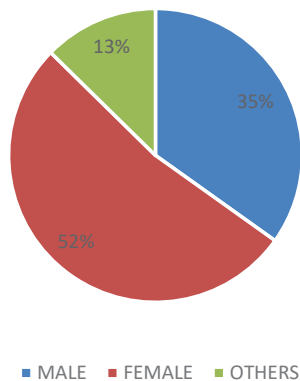
%Customer buying Tribal Product



[Figure-1]

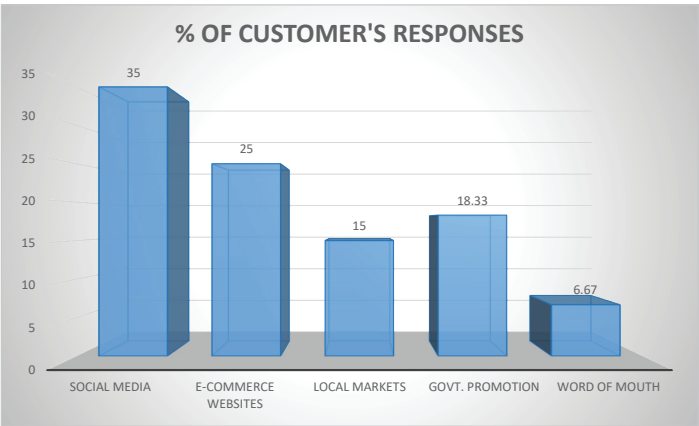
The pie chart illustrates a breakdown of total customer demographics based on age groups. Here's a detailed analysis: The largest segment of customers falls into the age group of (18-25 years), which is around "33.3%", indicating that younger individuals are the most significant consumers of tribal products. This could suggest that tribal merchandise appeals strongly to Gen Z, possibly due to their interest in unique, ethical, or culturally significant items. Close behind, the people falling in the group (26-35 years) represent Millennials, which accounts for "31.66%", that are also a substantial demographic. Their purchasing power and interest in artisanal or eco-friendly products might contribute to their engagement with tribal merchandise. A smaller share of consumers belongs to this mid-age group (26-45 years), which is around "15%". While still a relevant segment, their interest in tribal products appears more niche compared to younger groups. Customers belonging to the age group of 56-65 years, which is 11.67% show moderate engagement, suggesting limited but present interest, perhaps due to their appreciation for cultural value or quality craftsmanship. The smallest segment of the customer base belongs to the age group of 46-55 years, which is 8.34%, indicating relatively lower interest or accessibility challenges for this demographic.

% OF CUSTOMERS BELONGING TO DIFFERENT GENDERS



[Figure-2]

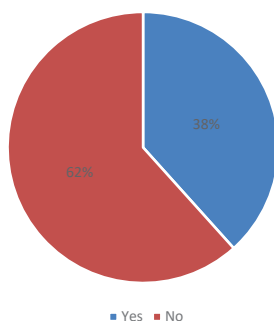
The pie chart offers insights into the gender distribution of customers purchasing tribal products. Here’s the analysis: The largest segment of buyers is female, which is “52%”, making up over half of the total customer base. This indicates that tribal products have a strong appeal among women, likely due to their connection to cultural, artisanal, or aesthetic qualities. Male customers account for a significant portion, which is “35%”, though less than females. This suggests tribal merchandise attracts male buyers, potentially driven by factors like gifting purposes, unique craftsmanship, or cultural interest. Lastly, 13% customers belong to the other genders category. While limited in size, it highlights the inclusivity of tribal products in attracting a diverse range of customers, including those not identifying within traditional gender categories. This chart provides a valuable overview for tailoring marketing strategies effectively.



[Figure-3]

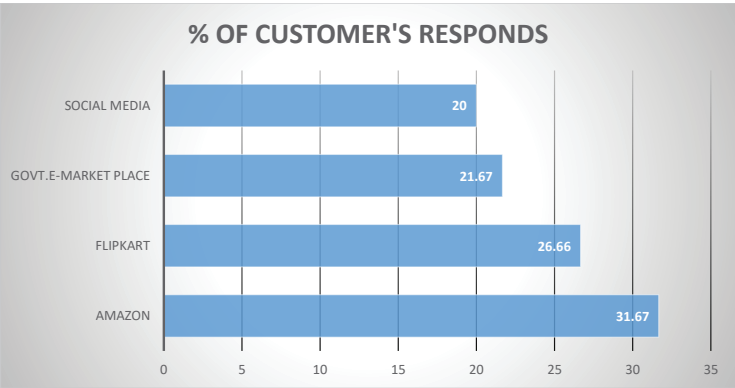
The bar diagram illustrates the effectiveness of various channels in acquiring customers for tribal entrepreneurs engaged in trading tribal products. Here's a detailed analysis of each channel: Social media leads with 35% of customer's responses as the most impactful customer acquisition channel. This highlights the power of platforms like Facebook, Instagram, or Twitter in reaching and engaging a large audience effectively-commerce websites hold the second-largest share, which is 25% of customer's responses, demonstrating the importance of dedicated online stores in driving customer acquisition. It reflects a growing trend of customers directly exploring online marketplaces. Government initiatives play a noteworthy role, possibly through campaigns or incentives targeting specific demographics or product categories, such as tribal merchandise. Approximately 18.33% responses support the concerned factor. 15% of customers opt for the local market, which still accounts for a significant share. This highlights their importance, particularly for customers who prefer traditional shopping experiences or have limited access to digital platforms. Lastly, "6.67%" of customers rely on word of mouth to buy tribal products. While the smallest contributor, word-of-mouth, remains relevant, it showcases the power of personal recommendations, especially in niche or community-driven markets. This chart clearly underscores the importance of integrating both digital and traditional approaches for effective customer acquisition.

% OF CUSTOMERS USED E-COMMERCE PLATFORM TO BUY TRIBAL PRODUCTS



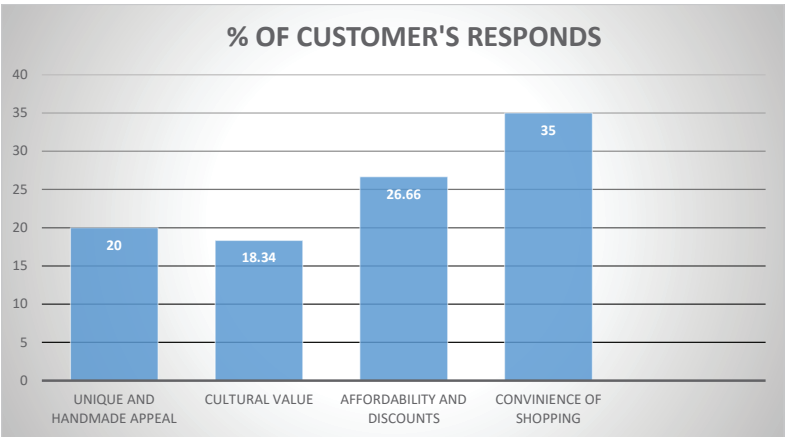
[Figure-4]

The pie chart provides insights into customer preferences regarding the purchase of tribal products via e-commerce platforms. Here's a detailed analysis: The blue section represents around 38% of customers purchasing tribal products through E-commerce platforms. This group constitutes a smaller share of customers who have opted for online platforms to buy tribal products. This highlights the growing but still limited adoption of e-commerce in this niche market. The orange section indicates that the majority of customers prefer other purchasing methods, such as local markets, government initiatives, or word-of-mouth recommendations, etc., which is supported by 62% of customer responses.



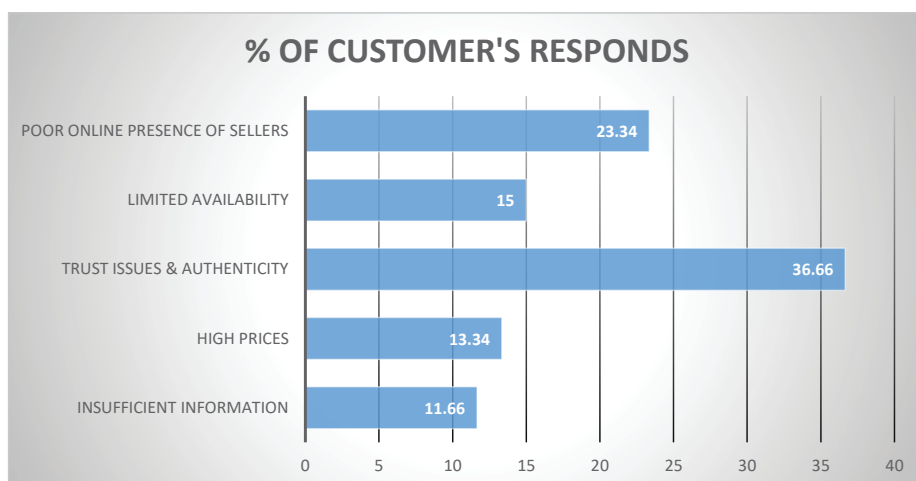
[Figure-5]

The bar diagram highlights the different E-commerce platforms that customers used for purchasing tribal products. Here's a detailed breakdown: Amazon leads with the highest response rate, which is "31.67%", indicating that it is the most engaging platform for customers. This suggests Amazon's strong market presence and effectiveness in attracting customer interest. Flipkart comes in second, showing a significant share of customer responses, which is "26.66%". It reinforces Flipkart's role as a major player in customer engagement. Next comes Govt. E-Market Place, which is supported by "21.67%" customer's responses. This platform holds a moderate share, reflecting its importance in the context of specialized or government-driven initiatives. While it is not as dominant as Amazon or Flipkart, it still plays a valuable role. Social media has the lowest percentage of customer responses, i.e. 20%, suggesting it is relatively less effective compared to the other platforms for direct customer engagement. However, it remains important for creating awareness and influencing decisions. This bar diagram provides valuable insights into customer behaviour and platform preferences.



[Figure-6]

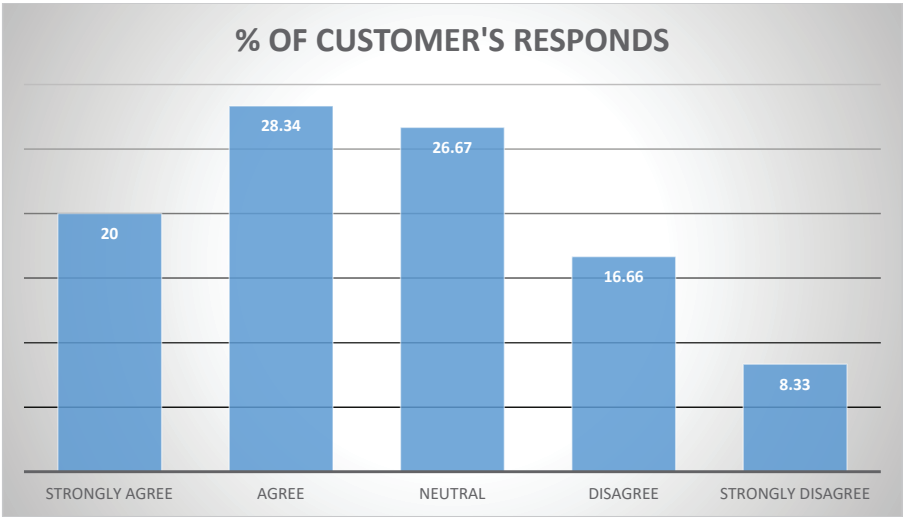
The bar diagram depicts the effect of various factors that influence customers to buy tribal products from E-commerce platforms: First one is Convenience of Online Shopping, which is supported by 35% of customer's responses, indicating that ease and accessibility are the primary drivers for customers. It highlights the importance of a seamless online shopping experience. Following closely, the second factor is Affordability & Discounts, which is approved by 26.66% of customer's responses. This factor underscores the significant impact of competitive pricing and special offers in attracting customers. Around 20% of customers responded that the originality and craftsmanship of tribal products an important consideration that motivates them to buy the unique tribal products. Lastly, around 18.34% customer's responses supported the factor "Cultural Value" as an influence on them while making purchase decisions. Although the smallest percentage, it indicates that customers still appreciate products that offer cultural significance, albeit to a lesser extent compared to the other factors. This bar chart provides clear guidance for businesses to prioritize strategies like enhancing online shopping convenience and offering competitive pricing while also tapping into niche markets through unique and culturally rich products.



[Figure-7]

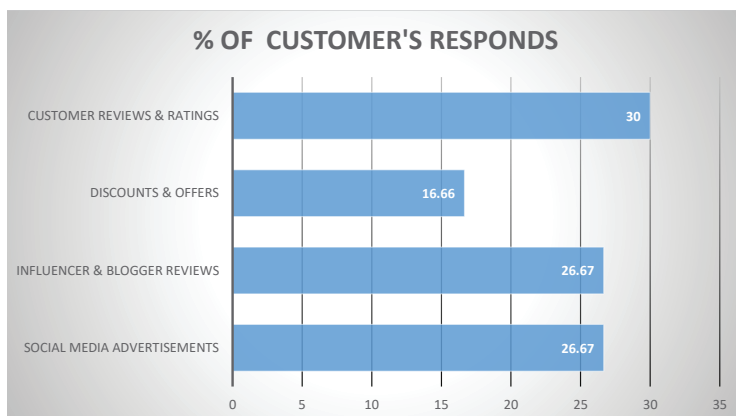
The bar diagram depicts the various challenges that customers encounter while buying tribal products through E-commerce platforms. Here's a detailed analysis: The most significant concern among customers is "Trust Issues & Authenticity", which is supported by 36.66% responses, indicating that reliability and authenticity of sellers play a critical role in influencing customer trust and satisfaction. A notable portion of customers, which is around "23.34%", find this a concern on the issue of poor online presence of sellers, suggesting that sellers need to enhance their digital presence to reach and engage with a wider audience effectively. 15% Customers highlight the issue of the availability of products, which could point to inadequate inventory

or restricted product ranges. Price sensitivity appears to be a concern for a smaller segment of customers, which occupies “13.34%”, implying the need for competitive pricing strategies. The least significant concern, though still relevant, as customers value detailed and clear product information to make informed decisions. Around 11.66% of customers suffer from this challenge while shopping tribal products through E-commerce platforms. This chart emphasizes the need for online sellers to focus on trust-building measures, bolster their online presence, and offer a wider and well-priced range of products.



[Figure-8]

The bar diagram presents the distribution of customer responses across various agreement levels on whether the E-commerce platform helps market tribal products. Here is a detailed analysis: Around “20%” of customers strongly agreed and support that promotion of tribal products through E-commerce platforms helps market those products. It reflects significant positive sentiments. Following closely, “28.34%” of the total customer segment showed that they generally agree, though perhaps with less intensity than those who strongly agree with digital promotion. The above analysis shows a predominant positive outlook. A notable proportion of respondents remain impartial, which is approximately “26.67%”, suggesting some uncertainty or lack of strong opinions on the matter. A smaller group expresses disagreement, which occupies “16%” of customers, indicating some level of opposition or dissatisfaction with the fact that promotion of tribal products through E-commerce platforms is not very helpful for marketing. Finally, around “8.33%” of customers’ responses showed limited strong disagreement with the concerned topic. This bar diagram illustrates a clear picture of customer attitudes, emphasizing a generally positive sentiment with some scope for addressing neutral or negative responses.

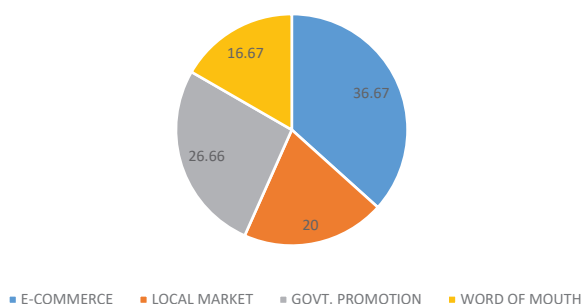


[Figure-9]

The horizontal bar diagram highlights the effectiveness of different marketing strategies in engaging customers. First and most effective strategy, which is "Customer Reviews & Ratings", received the highest response rate, i.e. "30%", demonstrating that customers value reviews and ratings significantly while making purchasing decisions. It shows the power of peer feedback in influencing buying behaviour. Followed by Influencer & Blogger Reviews and Social Media Advertisements, occupying equal responses, i.e. "26.67%". Influencers and bloggers hold strong sway over customer responses, tying with social media ads. This reflects the growing importance of personal endorsements in building trust. It underscores the importance of having a vibrant online presence to engage modern audiences. Lastly, Discounts & Offers occupy around "16.66%". Despite being a popular marketing strategy, this category lags in effectiveness compared to others. It could indicate that customers prioritize authenticity and insights over price incentives. This diagram is a helpful visualization of customer preferences, offering a clear direction for businesses aiming to tailor their marketing strategies effectively.

5.2 Results of Tribal Entrepreneurs Survey

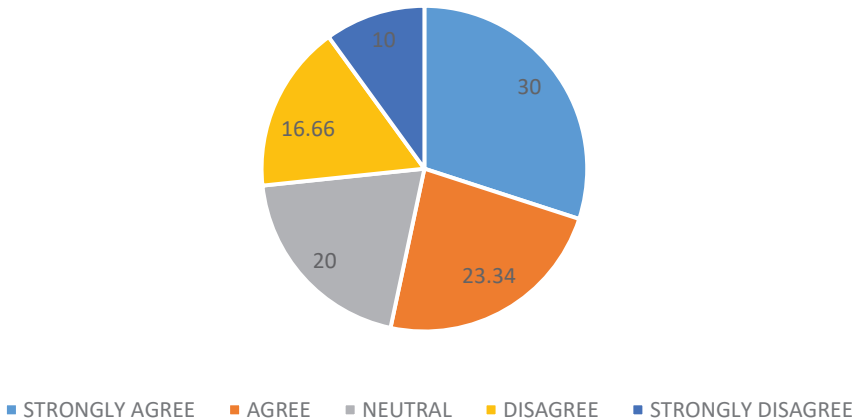
% OF ENTREPRENEUR'S RESPONDS



[Figure-10]

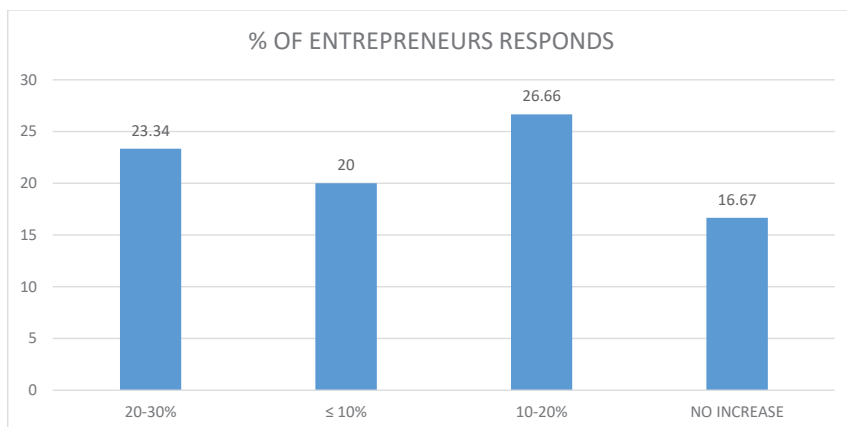
The pie chart depicts the efficacy of different platforms that aid in promoting tribal products across four distinct categories, represented by different colours: E-COMMERCE, with 36.67% made up the largest proportion of the total responses. It suggests that e-commerce platforms are the most significant media in promoting tribal products GOVT. PROMOTION, being the second largest media with “26.66%” votes, indicates a substantial impact of government initiatives to promote tribal products. LOCAL MARKET showed a contribution of “20%”, and plays a moderate role in promotion. WORD OF MOUTH, representing “16.67%”, reflected the influence of personal recommendations or informal communications as being the least efficacious in tribal product promotion.

% OF ENTREPRENEURS RESPONDS



[Figure-11]

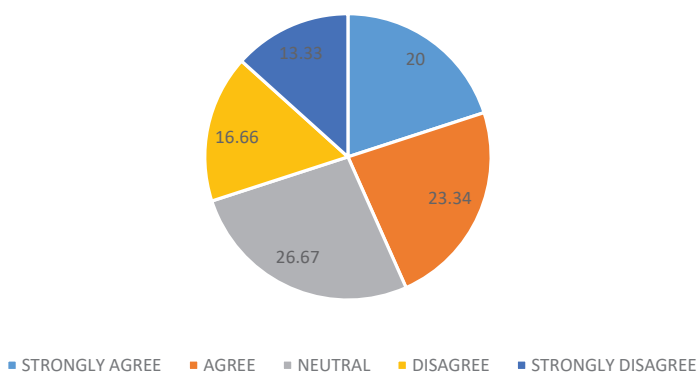
The pie chart depicts the distribution of entrepreneurs’ opinions on a given question, whether E-commerce has helped in market expansion, using a Likert scale. A significant portion of entrepreneurs (30% of total respondents) showed strong alignment or approval that the application of E-commerce has helped in market expansion for tribal products. Secondly, following closely “23.34%” entrepreneurs who generally agreed with the statement but perhaps with less intensity than those in the previous category. Thirdly, “20%” proportion remains impartial, which could suggest uncertainty or a lack of strong opinions on the matter. A small portion of the participants showed disagreement (16.66%) regarding the effectiveness of the E-commerce platform in market expansion, indicating some level of dissatisfaction or opposition. Lastly, the smallest group (10%) suggests that only a few entrepreneurs strongly oppose the statement about the efficacy of E-commerce platforms in market expansion. The pie chart provides valuable insights into the varying attitudes of entrepreneurs.



[Figure-12]

The bar graph illustrates the responses of entrepreneurs regarding the helpfulness E-commerce in growth of sales volume: Highest number of respondents gave their opinion in favour of increment of sales of about 10-20% following use of E-commerce platform occupying about 26% of total responses, indicating a significant portion of entrepreneurs experienced a moderate growth in their business due to application of E-commerce platforms. The second-largest group showed a growth of 20-30% increase represents notable growth (23%), suggesting a smaller but still substantial portion of businesses are achieving higher increases in sales volume by use of the E-commerce platform. The third group, with 20% vote, showed a $\leq 10\%$ Increase in sales, representing a noticeable percentage that experienced minimal sales growth. It shows that some businesses faced limited progress. Lastly, 17% stated no increase in sales, suggesting a smaller portion of entrepreneurs faced no growth in sales volume at all.

% OF ENTREPRENEURS RESPONDS



[Figure-13]

This pie chart reflects a spectrum of opinions, with neutrality ("26.67 %") dominating, followed by positive leanings (Agree "23.34%" and Strongly Agree "20%" combined), and a relatively smaller fraction expressed disagreement towards the effectiveness of E-commerce platforms attracting investments (Disagree 16.66% and Strongly Disagree "13.33%" combined). It provides a balanced insight into the attitudes of entrepreneurs regarding the application of E-commerce in attracting more investments for business.

6. DISCUSSION

The overall results highlight that the application of E-commerce on the marketing of tribal products shows an appreciable positive influence on customers, and customers are becoming more aware of tribal products and showing their interest towards them through their buying behaviour. Tribal entrepreneurs are also getting positive results by adopting this contemporary digitalisation.

The result shown in [Figure-1] suggests that tribal products appeal strongly to all demographics, while the people in the age groups of 18-25 and 56-65. The reasons behind this could be the sustainability trend, purchasing power, lifestyle preferences and the perception that tribal people are honest and innocent.

As per the result of [Figure-2], it's evident that the dominating customer base is the female group who shows more interest towards buying tribal products. Such of trend might be due to cultural factors or health concerns. This may provide valuable guidance to companies in tailoring their promotional efforts to align with these demographics.

The analysis done in [Figure-3] highlights that social media and E-commerce platforms are the two most prominent media that attract more customer base for entrepreneurs offering tribal products, and suggests a strategic focus on leveraging these for marketing efforts. As a result of rapid digitalization wide range of customers are using social media and other digital platforms.

In [Figure-4] the trend shows that only 38% of customers are using E-commerce platforms for purchasing tribal products 62% of customers are still falling behind. This may be due to some obstacles like poor access to technology, cultural concerns, awareness gaps and trust issues, etc.

As per the analysis shown in [Figure-5] Amazon is the most favoured E-commerce platform by customers in order to purchase tribal products, followed by Flipkart. This kind of result indicates the unique marketing, product tailoring and offering adopted by these E-commerce media, which may suit customers' expectations the most.

The [Figure-6] shows the factors that motivate customers to buy tribal products through E-commerce platforms. Through the analysis, it's evident that customers are mostly driven by the convenience of online shopping while using E-commerce media for buying tribal products, followed by affordability

and discount factors. This may be due to the effective strategic tactics followed by the E-commerce platforms.

[Figure-7] highlights that most of the customers are facing trust issues and authenticity as a challenge while using E-commerce platforms to purchase tribal products. These kinds of responses may be due to the occurrence of rising online fraud that exploits customers and hampers their interests badly.

Through the analysis shown in [Figure-8] it's clear that most of the customer segments agree with the statement that promotion of tribal products through E-commerce platforms is helpful for marketing of those products. This may highlight the reason for the unique design and crafts of the products, and sustainability also.

[Figure-9] depicts that customers are mostly relying on reviews and ratings while purchasing tribal products through E-commerce platforms. This kind of behaviour may indicate that a person, while making a purchase decision, thoroughly goes through the reviews provided by existing and past customers about the concerned product or vendor.

[Figure-10] depicts that adoption of E-commerce by tribal entrepreneurs gathers more customer base than any other platforms, which may highlight the growing significance and popularity of digitalisation among customers.

The result shown in [Figure-11] depicts that most of the tribal entrepreneurs are giving positive statements through their agreement on the subject that the application of E-commerce has helped in market expansion for the tribal merchandise. It may be due to the unique methods and technological advancements being offered by the contemporary digital platforms.

[Figure-12] signifies that the application of E-commerce to tribal business is still in its initial progression stage, as most of the entrepreneurs are experiencing a moderate sales rise due to this new adoption.

As the effect of application of E-commerce to business is at its early stage, therefore, tribal entrepreneurs are not getting many investment avenues presently, but gradually it may show a positive trend, which may be anticipated through [Figure-13].

7. CONCLUSION

The study accentuates the transformative impact of E-commerce in promoting tribal products, elevating customer awareness and interest. Through this, it's evident that due to the application of E-commerce in business undertakings of tribal entrepreneurs, customers are gradually engaging themselves in buying those indigenous products. Even though both e-commerce and social media platforms are attracting an ample amount of customer traffic towards tribal products yet they are still struggling to resolve the problems such as trust issues, cultural barriers and awareness gap among customers. Overall, the study concludes that in the contemporary business world, adoption of E-commerce

and digitalisation by tribal entrepreneurs is still at its initial progression stage, and it indicates substantial growth potential through strategic use of digital platforms to overcome challenges and build customer trust.

8. LIMITATIONS

The current research work has not incorporated a detailed statistical analysis. The sample size can be increased to draw a more reliable and valid result.

9. POLICY SUGGESTIONS

- The current work emphasizes that more focus should be given to education and training of entrepreneurs so that they can be aware of current trends brought up by E-commerce, and they should be encouraged to use more digital platforms for marketing and promotion of their products to reach both local and global consumers and investors.
- Consumers also should have awareness about the use, risk precautions while transacting with E-commerce platforms for purchasing tribal products to have a fair buying experience, which will help in extending and promoting more genuine tribal products.
- The government should come up with policies that can help both existing and new tribal entrepreneurs access technological resources to protect them from the financial burdens of using these platforms.
- This will facilitate the contemporary adoption of digitalization.

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ENERGY CONSUMPTION IN TWO-WHEELER VEHICLES AND THE ROLE OF SMART SENSORS

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ABSTRACT

This study investigates how smart sensor technologies influence energy consumption in two-wheeler vehicles in India and examines associated user perceptions, adoption barriers, and environmental implications. A quantitative, cross-sectional survey was conducted with 112 participants—primarily young adults and college students—to gauge familiarity with energy consumption, awareness of smart sensor applications, and opinions on sustainable mobility. Data were gathered through an online questionnaire comprising multiple-choice and Likert scale questions, then analysed using descriptive and inferential statistical methods. The findings reveal that fuel efficiency is a critical factor when selecting two-wheelers, with a notable proportion of respondents believing electric two-wheelers will dominate the market in the near future. Moreover, a majority view smart sensors as a significant tool for reducing pollution and improving overall energy management. Despite enthusiasm for sensor-based solutions, challenges such as battery life, charging infrastructure, and cost remain key concerns. These results suggest that integrating smart sensors can enhance vehicle efficiency, lower emissions, and meet the growing demand for sustainable transportation. Future research should focus on long-term, real-world assessments of sensor-based energy management strategies and explore supportive policy frameworks.

Keywords: Fuel Efficiency, Sensor Technology, Pollution Reduction

1. INTRODUCTION

India, as one of the world's largest markets for two-wheeler vehicles, faces significant challenges related to energy consumption and efficiency. With over 200 million registered two-wheelers, the sector contributes substantially to fuel consumption, greenhouse gas emissions, and urban pollution. The rapid urbanization and rising demand for affordable personal transport have further intensified the need for energy-efficient and sustainable mobility solutions.

Smart sensor technology has emerged as a game-changer in optimizing energy consumption in two-wheelers. Advanced sensors integrated with engine control systems, fuel injection mechanisms, and battery management systems enhance performance while reducing fuel wastage and emissions. In the case of electric two-wheelers, smart sensors help monitor battery health, regenerative braking, and power distribution, leading to improved energy efficiency and extended battery life.

This paper explores the impact of smart sensors on energy consumption in two-wheeler vehicles in India. It delves into the technological advancements, benefits, and challenges of sensor-based energy management, with a focus on fuel efficiency, environmental sustainability, and the adoption of electric vehicles (EVs). Given India's push towards clean mobility through initiatives like FAME (Faster Adoption and Manufacturing of Electric Vehicles) and stricter emission norms, the integration of smart sensors can play a crucial role in reducing fuel dependency and promoting energy-efficient transportation solutions.

2. LITERATURE REVIEW

The recent surge in research on electric two-wheeler performance underscores the necessity of developing region-specific driving cycles and innovative energy management strategies. Gurusamy & Ashok (2024) addressed this gap by constructing an electric two-wheeler driving cycle (E2WDC) tailored to the urban conditions of a Tier-2 Indian city. Their study revealed that standard driving cycles often fail to capture the dynamic variability of real-world driving, thereby necessitating localized models for accurate vehicle performance assessment.

In a complementary study, Kumaresan & Rammohan (2024) investigated the influence of ambient temperature on energy consumption in electric two-wheelers. Their findings indicate that vehicle performance significantly fluctuates with temperature, which has critical implications for both energy efficiency and driving range. Such insights emphasize the importance of integrating environmental parameters into driving cycle evaluations.

Advancing the discourse on energy optimization, Kalyankar-Narwade et al. (2021, 2022) explored neural network and fuzzy control strategies to optimize energy use in hybrid two-wheelers. Their research demonstrated that sophisticated control mechanisms can effectively reduce energy consumption

and enhance overall vehicle efficiency, although challenges remain in merging these strategies with real-world data. Meanwhile, Dutta & Mathew (2022) provided a comprehensive overview of sensor technologies in intelligent transportation systems, highlighting the potential of smart sensors to capture critical driving data in real time. Their work establishes a foundation for integrating advanced sensing into energy management frameworks.

Prajeesh & Pillai (2022) expanded the scope by discussing trends in smart mobility and the convergence of IoT and AI in urban transport, offering insights that support the adoption of sensor-based energy strategies. Safety aspects were also examined by Ugale et al. (2024), who proposed a dual-function system incorporating smart sensors to enhance rider safety through real-time monitoring. In parallel, Jaiswal et al. (2022) demonstrated how IoT and deep learning applications in intelligent parking systems can indirectly improve energy efficiency by reducing traffic congestion.

Furthermore, Nayak et al. (2023) reviewed emerging technologies in electric two-wheelers, including regenerative braking and hybrid fuel cells, highlighting both progress and ongoing challenges. Logeswari et al. (2024) also contributed by presenting an intelligent rider safety system that leverages sensor technology to promote energy efficiency alongside improved safety outcomes.

Together, these studies provide a multifaceted perspective on energy consumption in electric two-wheelers. They form an emerging theoretical framework that integrates localized driving cycles, advanced optimization techniques, and smart sensor technologies, thereby guiding future research and practical applications in sustainable urban mobility.

3. OBJECTIVES AND METHODOLOGY

This study aims to investigate multiple aspects of energy consumption in two-wheeler vehicles and the influence of smart sensor technologies on enhancing energy management. The objectives are fourfold: first, to examine current perceptions of energy consumption among riders and potential consumers; second, to assess the role of smart sensor technologies in improving fuel efficiency and overall energy management; third, to identify the primary barriers and motivators—including factors such as cost, infrastructure, and performance—that influence the adoption of energy-efficient technologies; and fourth, to evaluate the environmental implications of integrating smart sensor systems, particularly their potential to reduce pollution.

To meet these objectives, a quantitative approach was adopted using an online questionnaire. A total of 112 responses were collected, primarily from young adults aged 19–22. Data were analyzed using descriptive and inferential statistical techniques with the help of standard software tools, ensuring confidentiality and ethical compliance throughout the study.

4. RESULTS

The survey results are presented objectively using numerical data and graphical representations without interpretation. Descriptive statistics reveal that 85.7% of respondents fall within the 19–22 age group, with a gender distribution of approximately 55.4% female and 43.8% male. Occupation data indicate that 94.6% of participants are college or university students, with the remaining respondents comprising professionals and researchers. Regarding awareness and perceptions, 68.8% of the respondents rated fuel efficiency as a crucial factor when selecting a two-wheeler, while 53.6% indicated a belief that electric two-wheelers will eventually dominate the market. In addition, 61.6% of participants agreed that smart sensor technologies could significantly contribute to reducing environmental pollution by enhancing energy management.

Inferential statistical analyses were conducted using chi-square tests and correlation analyses to examine the relationships between demographic factors and responses concerning energy consumption and smart sensor adoption. P-values were calculated to determine statistical significance, confirming that the observed associations are unlikely due to chance. All statistical tests were executed using standard software packages such as SPSS, R, or Excel. The results are presented in tables and figures, including pie charts and bar graphs, to clearly depict demographic distributions and survey responses. No further interpretation is provided in this section, as the focus here is solely on the objective presentation of data.

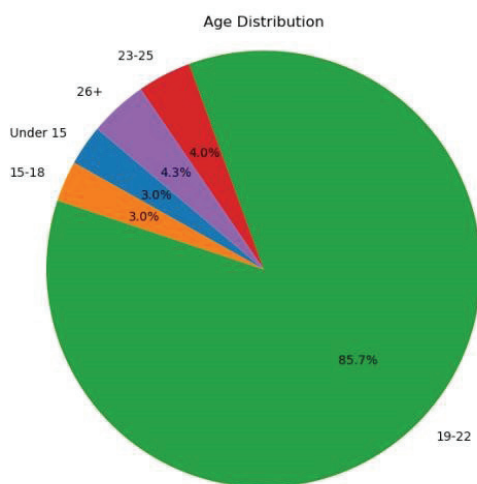


Fig 1.1: Age Distribution

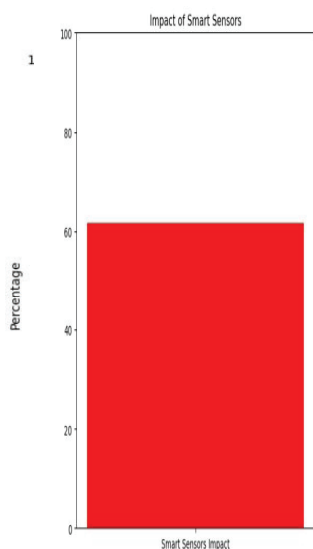


Fig 1.2: Impact of Smart Sensors

5. DISCUSSION

The present study developed an electric two-wheeler driving cycle (E2WDC) tailored for a Tier-2 urban setting by analyzing real-world driving data, with the findings vividly illustrated in the provided graphs. The graphical representations display distinct trends in acceleration, deceleration, speed variability, and overall trip duration. For instance, the cycle shows an average speed of 34.49 km/hr with a maximum of 78 km/hr, over a duration of 3271 seconds covering 31.3 km. These metrics imply that the driving behaviour in the studied urban environment is considerably more dynamic than what is depicted by traditional certification cycles, thereby affecting both energy consumption estimates and vehicle performance assessments.

When compared with the existing literature, our results align with Gurusamy and Ashok's (2024) emphasis on the importance of region-specific driving cycles. Similarly, Kumaresan and Rammohan (2024) noted the significant role of ambient conditions in influencing performance, a factor that is apparent in our speed fluctuation and deceleration patterns. The optimization approaches advanced by Kalyankar-Narwade et al. (2021) and further expanded in their 2022 study, find resonance here as our analysis supports the potential benefits of integrating advanced control strategies for energy efficiency. Furthermore, the overview provided by Dutta and Mathew (2022) on sensor integration in intelligent transportation systems validates our methodology for data collection and analysis, while Prajeesh and Pillai's (2022) insights on smart mobility underscore the transformative potential of such data-driven approaches.

The discussions by Ugale et al. (2024) and Logeswari et al. (2024) on safety enhancements are also relevant, as the graphs indicate that real-world driving behaviour necessitates adaptive safety measures that can respond to abrupt speed changes and variable driving patterns. Moreover, the real-time intelligent parking system demonstrated by Jaiswal et al. (2022) and the comprehensive review of advances in electric two-wheeler technologies by Nayak et al. (2023) complement our findings by emphasizing the need for integrated solutions that address both performance and safety.

Despite these promising results, certain limitations must be acknowledged. The dataset, while robust, is confined to a single Tier-2 city, which may limit the broader applicability of the E2WDC. Additionally, measurement biases and methodological constraints—particularly those associated with principal component analysis and k-means clustering—could affect the precision of the cycle characterization. Such factors underscore the necessity for cautious interpretation of the results.

Practically, the study's outcomes offer significant implications: they suggest that regionspecific driving cycles can enhance vehicle certification processes and inform energy management strategies. Theoretically, this research advances our understanding of urban driving dynamics. From a policy perspective,

adopting such tailored cycles could lead to more realistic performance standards. Future research should aim to expand the geographical scope of data collection, incorporate additional variables such as road gradient and traffic density, and explore more sophisticated machine learning models to further refine driving cycle predictions and optimize energy consumption strategies.

6. CONCLUSION

The findings of this study highlight the critical factors influencing energy consumption in two-wheeler vehicles and the transformative role of smart sensors in enhancing energy efficiency. The research indicates that engine efficiency is the most significant factor affecting fuel consumption in two-wheelers, followed by driving habits and vehicle weight. Furthermore, a majority of respondents acknowledge the importance of fuel efficiency when selecting a two-wheeler, reinforcing the need for advancements in energy-efficient technologies. The study also underscores the growing interest in electric two-wheelers as the future of the market, despite existing challenges such as battery life and charging infrastructure. Additionally, smart sensors are increasingly recognized for their potential in optimizing fuel efficiency, improving driving experiences, and enhancing safety. A significant proportion of respondents believe that smart sensors should become standard in modern two-wheelers and could contribute to environmental sustainability by reducing pollution. This research contributes to the ongoing discourse on sustainable transportation by emphasizing the role of advanced vehicle technologies. As the two-wheeler industry moves toward energy-efficient solutions, integrating smart sensors can lead to more intelligent and sustainable mobility. Future research may explore the long-term impact of sensor-based efficiency improvements and their cost-effectiveness in real-world applications.

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PROBLEMS AND PROSPECTS OF OPTIMUM SOCIO-ECONOMIC DEVELOPMENT AND ODISHA STATE FINANCES: EMERGING FISCAL RETICENCE

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ABSTRACT

Odisha is a state rich in natural resources, cultural heritage and human potential. Located on the eastern coast of India, it faces many problems, such as Poverty, low literacy level, huge unemployment, regional disparity and poor infrastructure. Towards the end of 1990s, there was a sharp debasement of the fiscal performance of states in India, deficits rose, the state-level debt started rising, and off-budget liabilities also grew quickly. There was a liquidity crisis at the state level. Odisha was not an exception of this trend. In response to the above situation, several steps have been taken by both the central and state governments to bring the derailed state finances into track. The medium-term fiscal reforms programme (MFRPs) targets to reduce wasteful expenditure and to improve tax collection by enhancing the efficiency of tax administration. The MFRPs require time-bound reforms in fiscal administration power and also target to reduce consolidated fiscal deficit to a sustainable level by 2005, as well as the debt/GDP and interest payment. By FRBM, Odisha worked to achieve many fiscal indicators like Fiscal Deficit, Revenue Deficit and Primary Deficit, etc, to its sustainable level, so that the government can spend more funds in all other sectors, including the social sector. the present study attempted to look into the level, trend and composition of public expenditure of Odisha and to see whether any improvement has occurred in the socio-economic condition through public expenditure reprioritization in Odisha after the initiation of various fiscal reform programs, especially the FRBM Act, which suggests rule-based public expenditure and restricts unnecessary revenue expenditure.

The secondary data from 1991-91 to 2017-18 has been analyzed, and the expenditure of different sectors, their growth rate, etc, is also analyzed to get a concrete view about Odisha's expenditure scenario. The result gives a mixed feeling, neither Odisha perform very badly nor overwhelmingly well.

Keywords: Fiscal Consolidation, Public Expenditure, Fiscal Reforms, Social Sector Expenditure.

1. INTRODUCTION

Odisha is a state rich in natural resources, cultural heritage and human potential located on the eastern coast of India. Despite its vast mineral wealth, fertile land, and strategic coastal location, the state has long grappled with socio-economic challenges which restrict its path to inclusive and sustainable growth.

Chronic natural disaster like cyclones and floods continues to pose significant barriers on its growth. Problems such as Poverty, low literacy level, high unemployment, regional disparity and poor infrastructure put it in chronic underdevelopment.

Public Expenditure plays a crucial role in the economic development of any country. Public Expenditure plays an active role in the reduction of regional imbalance and stimulates the growth of every sector of the economy. It creates social overhead capital, builds infrastructure, facilitates transport and communication, and develops education and health facilities. Without public expenditure, all these sectors cannot grow, which has an adverse impact on the overall development of the country and puts the state in a vicious circle of chronic poverty and underdevelopment. The mechanism by which government spending on public infrastructure affects the pace of economic growth depends on the size and allocation of public expenditure in economic and social development projects of an economy.

Since the Keynesian era, which rejected the classical laissez-faire policy and advocated for government intervention in the economic process to enhance investment and make autonomous investment, which ultimately leads to an increase in aggregate demand and the creation of employment in the economy. Government spending has an active role to play in curbing inflation, unemployment, balance of payment disequilibrium, and reducing instability in foreign exchange variation. The monetarist used this policy to bring the economy back on to track during the depression. Likewise, during inflation, public expenditure may be curtailed to reduce aggregate demand.

The expenditure incurred by the public authority may be its central government, the State government or local self-government for the overall socio-economic development of common people, which cannot be done in individual capacity.

Prudent fiscal measures are essential in government expenditure by avoiding unnecessary and wasteful expenditure. The rising trend of public expenditure is a common phenomenon in modern times, but debate is still going on regarding the necessity of public expenditure. The role of public expenditure differs in developed, developing and underdeveloped economies. Public expenditure plays the role of reducing inter and intra-regional disparity by creating infrastructural facilities, both social and economic, such as health and education, transport, communication, research and development, etc. In a developed economy, public expenditure plays the role of maintaining stabilization, and the public expenditure also helps in controlling inflation, unemployment and balance of payment disequilibrium.

If the public expenditure will not be spent efficiently and adequately, then it will not percolate any benefits in the economy. Public Expenditure is an important tool for the overall development of any economy; it cannot term as unproductive, rather it may be unproductive because of inefficiency in administration and public policy formulation. We can say that public expenditure is an integral element for economic development and stabilization of an economy, irrespective of the stage of development.

However, Odisha has immense prospects for socio-economic transformation. Achieving optimum socio-economic development in Odisha requires a multidimensional approach. With recent progress in Digital Governance, Agricultural Modernization, Industrial growth and Infrastructural Development, the state is gradually unlocking its potential for growth. Government initiatives aimed at improving Education, Healthcare, Skill development and rural connectivity are paving the way for more balanced development.

2. REVIEW OF LITERATURE

Rath (2005) in his article "*Fiscal Development in Odisha: Problems and Prospects*" described that there was a wide gap between revenue receipts and revenue expenditure of Odisha, which forced the state government to resort to more burden. The high borrowing led the state towards fiscal bankruptcy and a debt trap, which ultimately led to stagnation of the economy. The necessary action must be taken to overcome the vicious circle of growing revenue deficit, higher borrowing and higher interest liabilities, which consequently lead to again revenue deficit and greater borrowing. Investment must be made in socio-economic infrastructure to generate employment opportunities.

Das (2007) found in his article "*On Bringing Down the Fiscal Deficit*" that the state finance of Odisha was deteriorating during the 1980s and 1990s, which even worsened by the adoption of the fifth pay commission rewards, as a result, the capital expenditure of state reduced and had an adverse impact on growth. The state government of Odisha has implemented two main fiscal reforms such as Reduction in deficit and better spending on priority

areas. Successive natural calamities, higher interest rates, decline in output and revenue, subsidies and growth in public employment have deteriorated the state finances of Odisha. The larger devolution of the central grant by the Finance Commission recommendation has helped the state government. Prudent expenditure management and aggressive revenue modification drive improvement in the fiscal performance of the state. Significant challenges still persist as a result, and the state is resorting to borrowing, and the debt burden is gradually mounting. Rationalizing the revenue expenditure and augmenting the state revenue should be the priority of the state government. Non-tax revenue needs more policy attention. Different non-tax source has to be strengthened, administrative reform, and cost efficiency in achieving goals is needed. The state must resort to a special-purpose grant to strengthen the incentive for reform.

Ravisankar et al. (2008) in their article *"Indian States' Fiscal Correction: An Unfinished Agenda"* observed that the Hard budget constraint and reduction in administrative expenditure by reducing the number of employees, contractual employment at a lower salary than regular employees, help the state finance, especially in states like Odisha. Rationalization of subsidies in different sectors like irrigation and electricity has also helped the state Government. By studying different fiscal indicators, the author found that high-income states have not achieved a stronger fiscal correction than middle and low-income states. Odisha has managed to improve the capital expenditure despite a tight constrained capital budget. The zero-based investment review helped the state of Odisha. But instilling fiscal discipline among states is still an unfinished agenda. Recent improvements in the incentive framework for the state helped some states, but not all. Restriction in flexibility in fiscal management at the state level is a need of the hour. To achieve the objective of fiscal sustainability, monitoring end-of-year stock of debt and liabilities is important.

Mohanthly (2014) in his study *"Evolving Paradigms in Odisha State Finance: An Empirical Analysis"* found that implementation of the FRBM Act and the Medium-Term Fiscal Reforms Program has made a turnaround in management of state finance in post-2002-03. Curtailment of economically unproductive expenditure without adversely affecting capital expenditure, and restructuring of debt has helped the state's finances to be sustainable. His analysis shows that there has been a substantial improvement in the management of the state finance of Odisha in terms of a significant decline in the key deficit indicator in state finance. Effective liquidity management and prudent debt management are the keys to reforms which strengthen the state finance of Odisha.

Jena (2019), in his paper *"Living under Fiscal Rules: Fiscal Management Response and Resource Allocation Choices for the State of Odisha"*, has observed that the FRBM Act has a remarkable impact on improving Odisha state finance. Odisha maintain a very low deficit regime by limiting public spending for a long time. After a decade of controlled fiscal management as the state has started opening up by expanding public spending the sharing fiscal space,

slow growth of internal revenue and high dependence on central funds is not the scenarios of the present day.

3. OBJECTIVES

With the above background, the present paper attempts to study the primary challenges hindering Odisha's socio-economic development. An attempt has been made to study the fiscal management of Odisha after enacting several fiscal reform programs through the level, pattern and trend of public expenditure in Odisha and to find out whether there is any improvement has occurred in terms of public expenditure in Odisha after initiating rule-based fiscal policy, especially the FRBM Act. This study also focused on the prospects of socio-economic development of Odisha through expenditure prioritization, and also studied the fiscal reticence of the government in recent years.

4. DATA AND METHODOLOGY

Secondary sources of data have been used to study the above-mentioned objectives. Data are collected from different secondary sources such as state finance, a study of the budget of RBI, Odisha budget at a glance and economic survey of Odisha, FRBM documents, United District Information System for Education (U-DISE), NFHS different rounds, etc. Simple Statistical tools like Average, Growth Rate, etc, are used to analyze the data to reach a valid conclusion.

The period of study ranges from 2000-01 to 2022-23. The study is divided into 3 sections. first, we have to discuss the overall condition of the state finance of Odisha, in which we have to discuss the deficit stability of Odisha, where we have to discuss the Fiscal Deficit, Revenue Deficit and Primary Deficit of Odisha over the years. We have here tried to find out if any change happened in these indicators after implementing the FRBM Act. Here, we have also discussed the expenditure pattern of Odisha in different sectors and their growth rate over the years, with a special focus on the social sector. In the next sector, we have analyzed the outcome of the expenditure in terms of change in the indicators of the social sector, like Health and Education. In the health care indicator, we have analysed both maternal health and child health care. In maternal health care we have taken MMR as the key indicator, and in child health, we have taken IMR, CMR and U5MR as indicators. Similarly, in the education outcome, we have taken literacy rate and pupil-teacher ratio as the indicators.

Finally, we have analysed the emerging fiscal reticence of Odisha. Given the fiscal space, whether Odisha is spending an adequate amount in the social sector as well as other growth-promoting sectors or not is examined. A special discussion is held on what the government of Odisha should do to fasten its growth prospects.

5. ODISHA'S FISCAL SCENARIO IN THE ERA OF FISCAL REFORM

5.1 Public Expenditure of Odisha

In late 1990, the state finance bore the heavy burden of the 5th pay commission award. The revenue deficit, fiscal deficit and primary deficits were very high. The debt GSDP ratio also increased to an unsustainable level. The revenue expenditure of Odisha was more than the revenue receipts. The mismatch of expenditure and revenue of Odisha led to high borrowing and debt burden, which multiplied the fiscal crisis.

To tackle the above problem Odisha government. has implemented a large number of fiscal reform programmes. The Government of Odisha also implemented the FRBM Act in 2005. The FRBM Act provides a legal institutional framework for fiscal consolidation. It makes a time-bound limit for the government to maintain fiscal prudence at all times except in some emergency situation, and prohibits the government from borrowing from the Reserve Bank of India. Different targets have been given in FRBM Act to bring the fiscal deficit, revenue deficit to a sustainable level, and Odisha successfully achieved all the targets and also received central incentives for the same. Odisha can eliminate Revenue Deficit altogether, and fiscal deficit within 3 per cent of GSDP. The debt GSDP ratio is within 300 per cent, which is regarded as Odisha's debt-sustainable state.

Though in 2009, due to the recession, a negative impact was there in state finance, but it was a transitory one. The state government has amended the FRBM in 2011-12, and an independent review or monitoring system has been provided in the act. The overall fiscal scenario of the state continued to be broadly satisfactory over the years. The rule-based prudential fiscal policy of maintaining a revenue surplus to finance the capital expenditure successfully in Odisha, thereby reducing fresh debt accumulation. The overall revenue receipt of Odisha is growing. Tax collection and central transfer also increased in Odisha over the recent years.

Table 1: Deficit stability of Odisha

Year	GSDP	Fiscal Deficit	Revenue Deficit	Primary Deficit	As Percentage of GSDP		
					Fd	Rd	Pd
2000-01	42272	3330.0	1930	1040	7.88	4.57	2.46
2001-02	44931	3960.0	2830	1130	8.81	6.30	2.51
2002-03	44640	2820.0	1580	-70	6.32	3.54	-0.16
2003-04	51403	3570.0	1420	710	6.95	2.76	1.38
2004-05	77729	1,366	522	-1,966	1.76	0.67	-2.53
2005-06	82144	276	-481	-3,421	0.34	-0.59	-4.16
2006-07	92700	-823	-2,261	-4,012	-0.89	-2.44	-4.33

2007-08	102845	-1,323	-4,244	-4,493	-1.29	-4.13	-4.37
2008-09	110811	334	-3,420	-2,556	0.30	-3.09	-2.31
2009-10	115851	2,265	-1,139	-779	1.96	-0.98	-0.67
2010-11	125131	658	-3,908	-2,404	0.53	-3.12	-1.92
2011-12	230987	-622	-5,607	-3,198	-0.27	-2.43	-1.38
2012-13	243363	-4	-5,699	-2,811	0.00	-2.34	-1.16
2013-14	265891	4,634	-3,329	1,745	1.74	-1.25	0.66
2014-15	270665	5,479	-5,862	2,668	2.02	-2.17	0.99
2015-16	292228	7,063	-10,136	3,720	2.42	-3.47	1.27
2016-17	337348	9,377	-9,259	5,342	2.78	-2.74	1.58
2017-18	361116	9,359	-13,367	4,371	2.59	-3.70	1.21
2018-19	386732	10,157	-14,190	4,357	2.63	-3.67	1.13
2019-20	397530	18,819	-2,430	12,756	4.73	-0.61	3.21
2020-21	389079	9,786	-9,076	3,142	2.52	-2.33	0.81
2021-22	452947	-20,627	-43,472	-26,970	-4.55	-9.60	-5.95
2022-23	480402	21,833	-17,461	14,836	4.54	-3.63	3.09

Source: "State Finances: A Study of budgets, (different years) RBI"

The above table suggests that Odisha has made significant improvements in public finance management over the last two decades. Odisha has generally maintained a prudent fiscal deficit level, adhering to FRBM Act norms, which mandates a ceiling of 3 percent of GSDP. Post COVID-19, due to huge medical expenditure, it is slightly increased to 4.5 percent in 2021-22 and 2022-23; otherwise, it is within 3 percent of GSDP in all other years after implementation of the FRBM Act.

Odisha has shown commendable progress in reducing its revenue deficit over time. Infact in many years Odisha achieved a revenue surplus. Factor contributing to this includes royalties from mining, better tax administration under GST and fiscal devolution from the central government. Post-COVID-19 pandemic, there are some disturbances in the revenue deficit of Odisha as well.

A lower or negative primary deficit suggests that the state is capable of meeting its current expenditure needs without relying heavily on new borrowings apart from interest payments. Odisha's primary deficit has generally been under the limit due to lower debt burden and relatively less dependence on market borrowings. Rising development needs, especially in rural and tribal areas, sometimes put pressure on the state budget; however, prudent borrowing practices and efficient public debt management have helped Odisha to contain its primary deficits within sustainable limits.

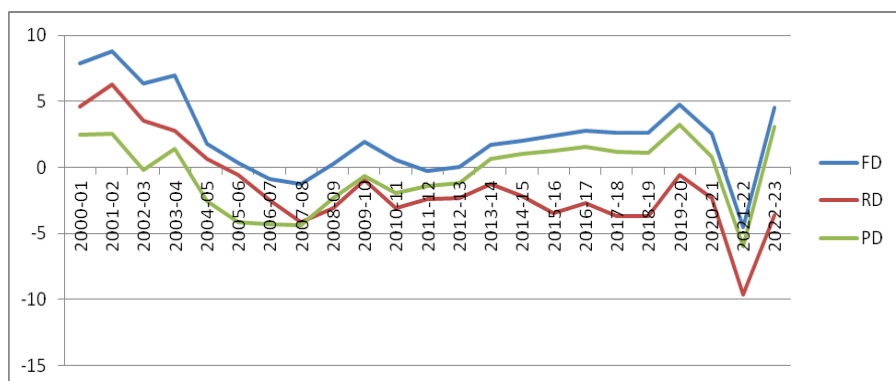


Figure 1: FD, RD & PD of Odisha

The above figure shows the FD, RD and PD of Odisha, in which FD is above all, followed by PD and RD.

5.2 Components of Aggregate Expenditure

In this section we have examined different fiscal indicators such as GSDP, Aggregate Expenditure of Odisha, Revenue Expenditure of Odisha, Capital Expenditure of Odisha, Developmental Expenditure of Odisha, Non-Developmental Expenditure of Odisha, and Expenditure on Interest Payment, Pension Expenditure, Administrative Expenditure, Social Sector Expenditure such as Health Expenditure and Education Expenditure of Odisha etc from the year 1990-91 to 2017-18. All the data are in current prices.

Table 2: Gross State Domestic Product and Aggregate Expenditure in Odisha

Year	GSDP	Growth Rate of GSDP	Aggregate Expenditure	Growth of Aggregate Exp	Aggregate Exp As % of GSDP
2000-01	42272		16207		38.34
2001-02	44931	6.29	18585	14.67	41.36
2002-03	44640	-0.65	20783	11.83	46.56
2003-04	51403	15.15	23026	10.79	44.80
2004-05	77729	51.21	17336	-24.71	22.30
2005-06	82144	5.68	15746	-9.17	19.17
2006-07	92700	12.85	19345	22.86	20.87
2007-08	102845	10.94	22844	18.09	22.21
2008-09	110811	7.75	26922	17.85	24.30
2009-10	115851	4.55	30540	13.44	26.36
2010-11	125131	8.01	36051	18.05	28.81
2011-12	230987	84.60	42105	16.79	18.23

2012-13	243363	5.36	47255	12.23	19.42
2013-14	265891	9.26	56130	18.78	21.11
2014-15	270665	1.80	66679	18.79	24.64
2015-16	292228	7.97	79114	18.65	27.07
2016-17	337348	15.44	86902	9.84	25.76
2017-18	361116	7.05	97511	12.21	27.00
2018-19	386732	7.09	113948	16.86	29.46
2019-20	397530	2.79	125167	9.85	31.49
2020-21	389079	-2.13	124109	-0.85	31.90
2021-22	452947	16.42	153796	23.92	33.95
2022-23	480402	6.06	180439	17.32	37.56

Source: "State Finances: A Study of budgets, (different years) RBI"

From the above table it is revealed that the GSDP of Odisha continuously rising over the year since 2000-01 to 2022-23 from 42272 to a level high of 480402 crores in the 22 year of study period it increased more than 11 times. If we consider the growth rate of GSDP, it is also positive most of the year, and it was 6.06 percent in 2022-23.

If we consider the aggregate expenditure of Odisha, which was 16207 crores in 2000-01, reached a maximum at the last year of the study period, that is 2022-23, and became 180439 crores. The growth rate of the same is also improving over the years, positive most of the year except the years 2004-05, 2005-06 and 2020-21 and maximum in the year 2021-22 (23 per cent). Similarly, the Aggregate Expenditure as a percentage of GSDP is showing a fluctuating trend and reached 37.56 percent in 2022-23, which was 38.34 percent in 2000-21.

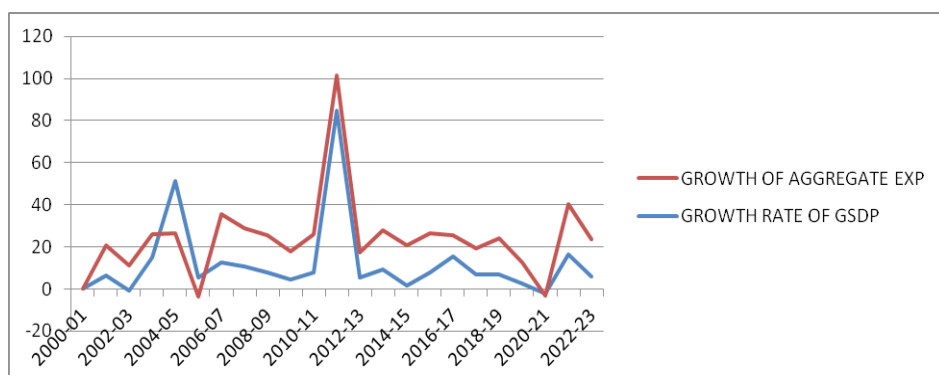


Figure 2: Growth Rate of GSDP & AE

The above figure shows the trend of GSDP of Odisha as well as Aggregate Expenditure of Odisha vis-à-vis Aggregate Expenditure as a percentage of GSDP from 1990-91 to 2017-18.

5.3 Composition of Aggregate Expenditure

Aggregate expenditure represents the total spending in an economy and is a key determinant of economic activity and growth. The composition of aggregate expenditure reflects both the structural characteristics of its economy and the priorities of its government. The primary composition of aggregate expenditure includes Revenue Expenditure versus Capital Expenditure, Developmental Expenditure versus Non-Developmental Expenditure and Plan versus Non-Plan Expenditure, etc. The table below shows the composition of aggregate expenditure of Odisha over the years.

Table 3: Composition of Aggregate Expenditure in Odisha (in percent)

Year	Revenue Expenditure	Capital Expenditure	Development Expenditure	Non-Dev. Expenditure	Plan Expenditure	Non-Plan Expenditure
2000-01	79.92	20.09	54.87	37.05	26.34	73.66
2001-02	81.87	18.13	49.38	41.74	23.02	76.98
2002-03	75.49	24.51	48.27	36.79	21.03	78.97
2003-04	69.78	30.22	50.34	33.60	25.41	74.59
2004-05	77.88	22.11	43.19	41.63	9.98	90.02
2005-06	86.40	13.61	48.57	43.91	19.64	80.36
2006-07	81.53	18.47	49.29	39.73	21.73	78.27
2007-08	77.58	22.42	57.67	32.72	30.84	69.16
2008-09	79.44	20.56	65.87	27.06	33.49	66.51
2009-10	82.81	17.19	62.78	31.01	29.15	70.85
2010-11	81.46	18.54	64.78	28.25	32.61	67.39
2011-12	82.32	17.68	65.93	26.97	34.23	65.77
2012-13	80.92	19.08	64.84	27.07	36.69	63.31
2013-14	81.27	18.73	69.04	25.29	40.90	59.10
2014-15	76.69	23.31	70.17	22.44	45.28	54.72
2015-16	74.33	25.67	75.58	19.62		
2016-17	74.84	25.16	75.73	19.70		
2017-18	73.6	24.63	73.33	22.68		
2018-19	74.3	24.83	72.25	23.15		
2019-20	79.2	20.7	75.32	24.68		
2020-21	76.7	23.2	74.17	25.83		
2021-22	71.2	28.7	74.05	25.95		
2022-23	72.6	27.3	70.06	29.94		

Source: State Finances: A Study of budgets, (different years) RBI

The above table represents the state's composition of expenditure. In which we have divided the expenditure into different categories such as Revenue Expenditure & Capital Expenditure, Developmental Expenditure & Non-Developmental Expenditure and Plan & Non-Plan Expenditure, etc.

If we consider the Revenue Expenditure of Odisha, it dominates the expenditure pattern as 73 per cent of the total expenditure of Odisha is Revenue Expenditure. After the strict implementation of different fiscal policy measures, which limit the Revenue Expenditure share and improve the capital expenditure share but it seems Odisha has not worked on that, and still the Capital Expenditure is one-third of Revenue Expenditure and one-fourth of total expenditure and hovering around 20 to 25 percent.

If we consider the scenario of developmental expenditure & non-developmental expenditure, then it gives a satisfactory trend. As developmental expenditure is 2 to 3 times that of non-developmental expenditure, and there is a rising trend of developmental expenditure and a declining trend of non-developmental expenditure, with slight fluctuation.

It seems that plan expenditure and non-plan expenditure have a high fluctuation over the year, and almost every year the non-plan expenditure is more than the plan expenditure, though the gap in different years is fluctuating. It seems the government of Odisha is spending more on populist measures and in different welfare schemes, and it also seems that the government of Odisha is spending on disaster management and natural calamities, which come under non-plan expenditure.

5.4 Expenditure towards the Social Sector in Odisha

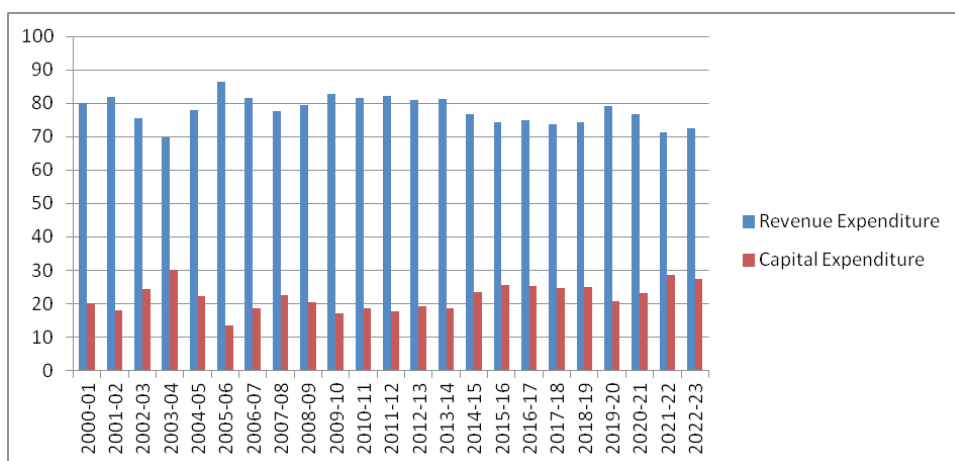


Figure 3: Revenue Expenditure vs. Capital Expenditure

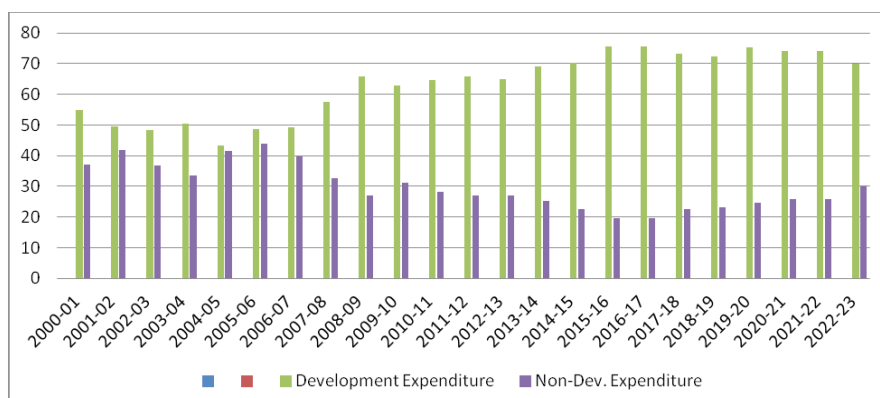


Figure 4: Developmental Expenditure vs. Non-Developmental Expenditure

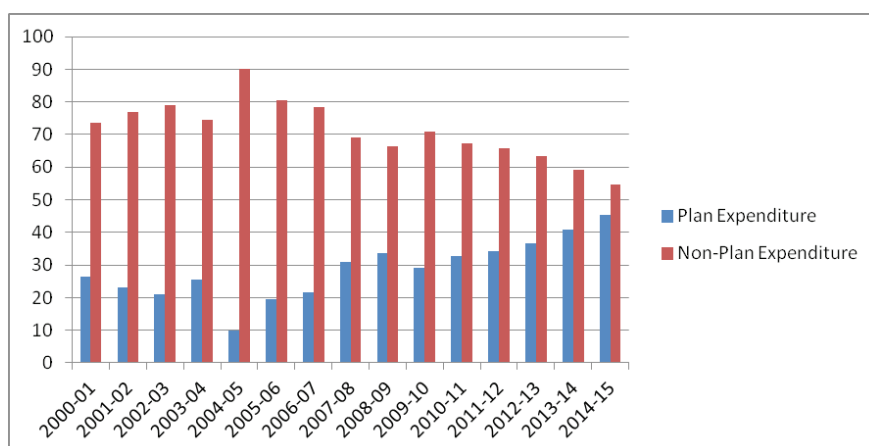


Figure 5: Plan Expenditure vs. Non-Plan Expenditure

The above figures relate to Revenue and Capital Expenditure, Development and Non- Non-Development Expenditure, Plan and Non-Plan Expenditure of Odisha.

5.5 SOCIO-ECONOMIC INDICATORS OF ODISHA

The expenditure towards Social Services like health, education, water supply, and sanitation is known as social sector expenditure. Here, we have analyzed the social sector expenditure of Odisha over the years and shown the trend of social sector expenditure of Odisha within several sectors. We have taken health & education as the indicators of the social sector and analyzed the expenditure towards this sector in Odisha. The percentage of public expenditure towards social services should be more than 40 per cent, according to the UNDP recommendation. Within that, health and education, which are known as priority sectors, should get more than 50 per cent of expenditure, and it should be about 5 per cent of GSDP. The table below depicts the expenditure in this sector of Odisha.

Table 4: Social Sector Expenditure in Odisha

Year	Social Sector Expenditure (Rs. in Cr.)	Growth Rate of SSE	SSE as Percentage of GSDP	Social Sector Expenditure as a Percentage of AE
2000-01	4065	-16.85	9.38	36.80
2001-02	4122	1.40	8.82	34.16
2002-03	4210	2.13	8.47	31.73
2003-04	4360	3.56	7.15	28.01
2004-05	4598	5.46	5.92	28.94
2005-06	5386	17.14	6.33	34.21
2006-07	6127	13.76	6.02	31.67
2007-08	8196	33.77	6.34	35.88
2008-09	11091	35.32	7.47	41.58
2009-10	12517	12.86	7.68	40.98
2010-11	15241	21.77	7.72	42.28
2011-12	18051	18.44	7.81	42.87
2012-13	19659	8.91	7.51	41.60
2013-14	24810	26.20	8.37	44.20
2014-15	29249	17.89	9.31	43.86
2015-16	36253	23.95	10.96	45.82
2016-17	39639	9.34	10.51	45.61
2017-18	49856	25.77	11.99	46.49
2018-19	54099	7.84	13.9	47.5
2019-20	61036	11.36	15.3	48.8
2020-21	58174	-4.9	14.63	46.9
2021-22	66786	12.89	14.7	43.4
2022-23	85974	22.31	17.8	47.6

Source: "State Finances: A Study of budgets, (different years) RBI"

In the above table, we have analyzed the social sector expenditure in its actual figure as well as its growth rate. Simultaneously, we have shown the social sector expenditure as a percentage of GSDP as well as social sector expenditure as a percentage of Aggregate Expenditure. The social sector expenditure shows an upward rise in the consequent year and reached a height of 85974 crore in the year 2022-23. The growth rate of social sector expenditure shows a huge fluctuation. Sometimes it is negative, such as -16.85 per cent in the year 2000-01 and a positive 35 percent per cent growth rate was recorded in the year 2008-09.

The social sector as a percentage of GSDP is almost stagnant and reached a height of 17.8 per cent in the last study year 2022-23, and social sector expenditure as a percentage of Aggregate Expenditure is nearly 47 per cent and shows little variation. From the above table, it is satisfying to note that Odisha is following the recommendation of UNDP of maintaining Social Sector Expenditure as a percentage of GSDP about 5 percent, and Odisha is doing more than that. After the implementation of the FRBM Act, which suggests diverting the expenditure towards the productive sector, Odisha worked accordingly and improved its Social Sector Expenditure as a percentage of Aggregate Expenditure and reached a high level of 47.6 per cent, which also satisfies the UNDP recommendation.

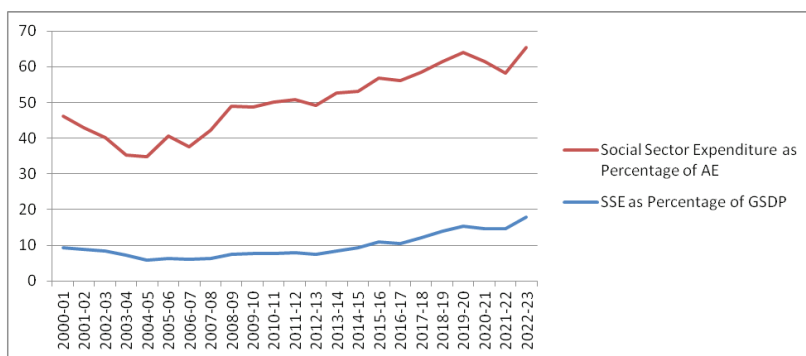


Figure 6: Social Sector Expenditure in Odisha

The above figure shows the time series data on the growth of Social Sector Expenditure, Social Sector Expenditure as percent of GSDP and SSE as percent of the Aggregate Expenditure of the state of Odisha.

Table 5: Expenditure on Health & Education in Odisha and their Growth Rate

Year	Growth Rate of Health & FW Expenditure	Growth Rate of Education Expenditure
2000-01		
2001-02	5.917963	-0.22779
2002-03	-0.65188	7.67613
2003-04	13.15682	-0.0526
2004-05	33.86895	4.759519
2005-06	5.374708	13.74244
2006-07	11.38727	6.65591
2007-08	9.864359	24.09675
2008-09	7.188817	27.45446
2009-10	4.350416	18.9559
2010-11	7.416228	15.99879

2011-12	45.82769	4.298119
2012-13	5.085407	5.394304
2013-14	8.472645	13.4392
2014-15	1.763804	17.1364
2015-16	7.378827	11.8889
2016-17	13.37491	5.029172
2017-18	6.581819	23.47503
2018-19	6.623708	-12.6648
2019-20	2.716273	7.332571
2020-21	-2.17205	-1.30768
2021-22	14.10055	8.591446
2022-23	5.715005	19.55024

Source: "State Finances: A Study of budgets, (different years) RBI"

The above table analyses the growth rate of Public Expenditure on Health Care & Education in Odisha. As we can see, Education Expenditure growth is higher compared to health expenditure growth in the above table. The health care expenditure in Odisha is expected to increase steadily. Similarly, the Education Expenditure also increased. If we consider the growth rate of health care expenditure and Education Expenditure, then it is highly fluctuating over the year. The growth of health care expenditure has shown a negative sign in the year 2002-03, at -0.65188 percent. It shows a maximum of 45.82769 per cent in the year 2011-12. Similarly, the growth rate of education also shows a negative sign in some year, such as 2001-02, 2003-04, 2018-19, and 2020-21 i.e. -0.22 per cent, -0.05 per cent, -12.6648 and -1.30768, respectively, and it also shows a maximum of 27.45 per cent in 2008-09 and the latest figure is 19.55024 per cent in 2022-23. The growth rate of both health care as well as Education Expenditure does not depict any consistency, rather it is highly fluctuating.

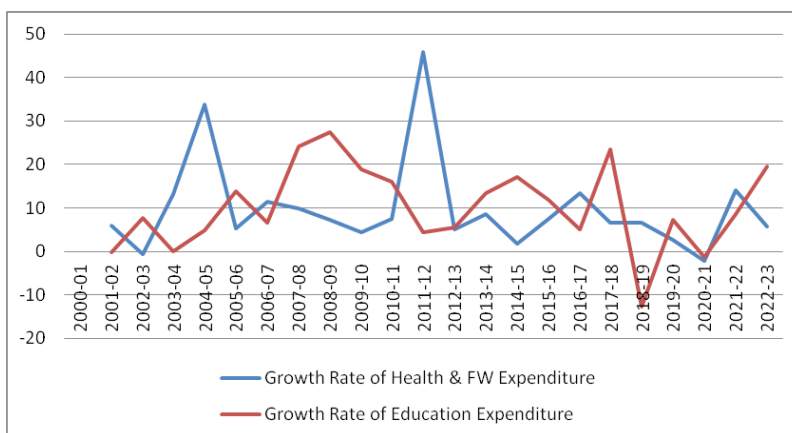


Figure 7: Growth Rate of Expenditure on Health & Family Welfare and Education Expenditure in Odisha

The above figure represents the growth rate of expenditure on Health and Family Welfare and Education in Odisha.

Table 6: Expenditure on Health and Education as a percentage of GSDP

Year	Health & FW Expenditure as percent of GSDP	Education Expenditure as percent of GSDP
2000-01	1.1	4.06
2001-02	1.0	3.75
2002-03	1.1	3.83
2003-04	1.0	3.12
2004-05	0.8	2.57
2005-06	0.6	2.72
2006-07	0.7	2.43
2007-08	0.7	2.53
2008-09	0.8	3.03
2009-10	1.0	3.41
2010-11	1.0	3.35
2011-12	0.6	2.99
2012-13	0.7	2.79
2013-14	0.8	2.85
2014-15	1.2	3.24
2015-16	1.3	3.49
2016-17	1.1	3.2
2017-18	1.4	3.8
2018-19	1.5	3.9
2019-20	1.6	3.9
2020-21	2.0	3.8
2021-22	2.2	4.2
2022-23	2.4	4.5

Source: "State Finances: A Study of budgets, (different years) RBI"

The above table studies the expenditure on health and family welfare of Odisha as a percentage of GSDP, and Education Expenditure as a percentage of GSDP. The health care expenditure as a percentage of GSDP of Odisha shows a very disappointing figure, as it is hovering around 1 per cent in some years and less than 1 per cent in many years. It increased a little to 2 percent of GSDP post-COVID-19 due to a huge medical emergency. The Education Expenditure as a percentage of GSDP of Odisha is a little better compared to the health sector, as it is 3 to 4 per cent in many years.

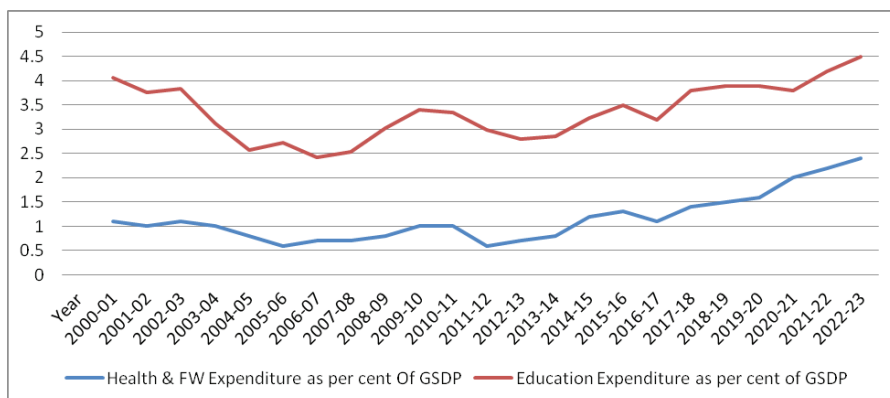


Figure 8: Health vs. Education Expenditure as Percent of GSDP

The above Figure shows that both Education Expenditure and health expenditure are quite stable at 1 percent and 4 percent of GSDP, respectively, over the years. We can see that education gets more expenditure in Odisha than health care. Health expenditure is far less compared to education expenditure in Odisha.

5.6 Condition of Education in Odisha

The social sector encompasses a broad range of public services and support systems that aim to improve individuals' quality of life, promote social justice, and ensure equitable access to basic human needs. This sector is central to human development, focusing on enhancing the capabilities and well-being of people across all demographics.

The concept of the social sector emerged prominently in the post-World War II era, when many countries began to recognize the importance of investing in human capital to foster national development. With the creation of international institutions like the United Nations and the adoption of the Universal Declaration of Human Rights (1948), access to education, healthcare, and social security became recognized as fundamental rights.

In developing countries, the expansion of the social sector became a key component of poverty reduction strategies, especially from the 1980s onwards, with the support of international agencies like UNDP, UNICEF, and the World Bank.

The role of the social sector in the transformation of economic growth into human capabilities creation is an important policy aspect since the 1990s. There are two different schools of thought the Neo-Classical view that emphasised human resource development, which is also shared by the endogenous growth model formulated by Romer (1986) and Lucas (1988). The second approach followed by the United Nations Development Programme (UNDP) is the human development approach for enlarging the range of choices of the citizens of the country. The difference of the above two approaches, as pointed

out by Streeten (1994), is that the 'human resource development' approach considers human beings as a means to an end, with the end being economic growth, whereas the 'human development' approach treats human beings as ends in themselves.

Under the 'Human Resource Development Approach', social sectors include all those sectors that contribute to the enhancement of human capital, so that the productive capabilities of the constituting human beings shall increase.

Expenditure alone cannot solve the problem of the social sector; if the social indicators have not been improved, then no purpose will be served. In order to study the condition of any sector, we have to see the outcomes in terms of the change in its indicators, and according to that, we have to reprioritize our expenditure in that sector. Here in our study, we have taken two components of the social sector, such as health and education. In health care, we have taken two indicators, such as maternal health and child health. In maternal health, we have taken the Maternal Mortality Ratio (MMR), and in child health, we have taken three indicators, such as IMR, CMR, and U5MR.

Similarly, in education, we have taken Literacy Rate as the indicator of educational attainment in Odisha and Pupil-Teacher Ratio (PTR) as the physical infrastructure within the social sector infrastructure of Odisha.

Table 7: Status of maternal health in Odisha

YEAR	MMR
2001-03	358
2004-06	303
2007-09	258
2010-12	235
2011-13	222
2014-16	180
2015-17	168
2016-18	150
2017-19	136
2018-20	119

Source: SRS Bulletin (Different Issues)

The above table shows the maternal mortality ratio of Odisha since 2001-03 to 2018-20. The MMR of Odisha shows continuous improvement over the year, and it came down to 119 in 2018-20 from a height of 358 in 2001-03, but still, it is more than the prescribed limit. As per the target number 3.1 of SDG, which targets to reduce global MMR to less than 70 per 100000 live births by 2030, Odisha has still not achieved. Odisha needs to work on the above.

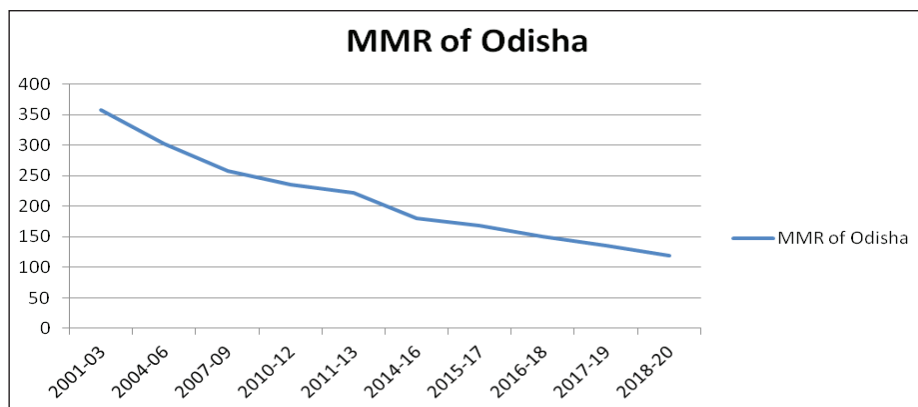


Figure 9: MMR of Odisha

The above graph shows the MMR of Odisha, which is continuously declining.

Table 8: Child health status in Odisha

NFHS ROUNDS	IMR	CMR	U5MR
NFHS I	112.1	21.3	131
NFHS II	81	25.5	104.4
NFHS III	64.7	27.6	90.6
NFHS IV	40.1	8.9	48.6
NFHS V	36.3	5	41.1

Source: Different NFHS Rounds

The above table shows the child health condition of Odisha in different NFHS rounds, 112.1 in NFHS I. If we consider the IMR of Odisha, it is continuously improving as its number continuously reduces and is at 36.3 deaths per 100 births according to NFHS V which was Globally, a good limit for IMR is considered to be below 10 deaths per 1000 live births according to WHO which Odisha has not yet achieved.

A very fluctuating number is visible in the case of CMR in Odisha. It is 5 in the latest NFHS round and was 21.3 in NFHS I. Similarly, the U5MR is the number of deaths in children under 5 years of age per 1000 live births. It is 41.1 in NFHS V, which was 131 in NFHS I. It shows a continuous improvement, but has not achieved the target of the SDGs to achieve a U5MR of 25 or fewer deaths per 1000 live births by 2030.

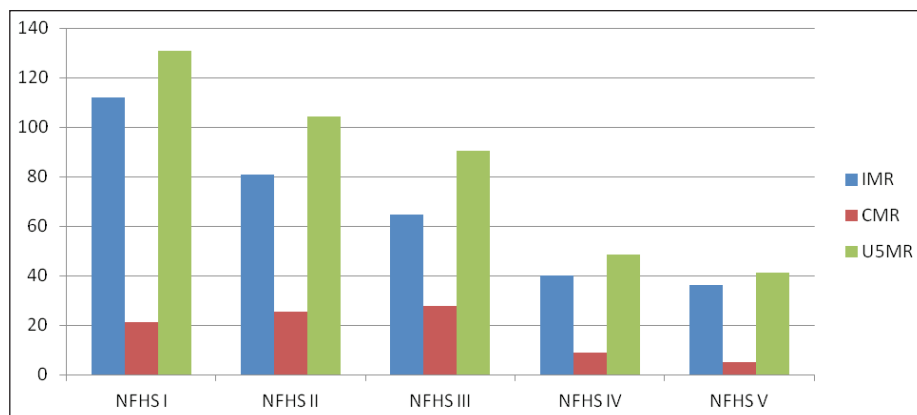


Figure 10: IMR, CMR & U5MR

A. Literacy rate of Odisha

A good literacy rate is considered to be above 90 percent, while a 100 percent literacy rate is the ideal rate. A high literacy rate, even slightly below 100 percent, significantly benefits individuals and society by enabling access to information, participation in the workforce and overall development.

Table 9: Literacy rate of Odisha as well as India

Census	India	Odisha
1951	18.32	15.8
1961	28.3	21.66
1971	34.45	26.18
1981	43.57	33.62
1991	52.21	49.09
2001	64.83	63.08
2011	74.04	73.45

The above data showed that in every census Odisha remains behind the all-India average in literacy rate. The literacy rate showing a continuous improvement from 15.8 percent in 1951 to 73.45 percent in 2011 still it is still not a good limit and also below the India average. Odisha has to work more on the education sector to achieve the 100 percent literacy rate.

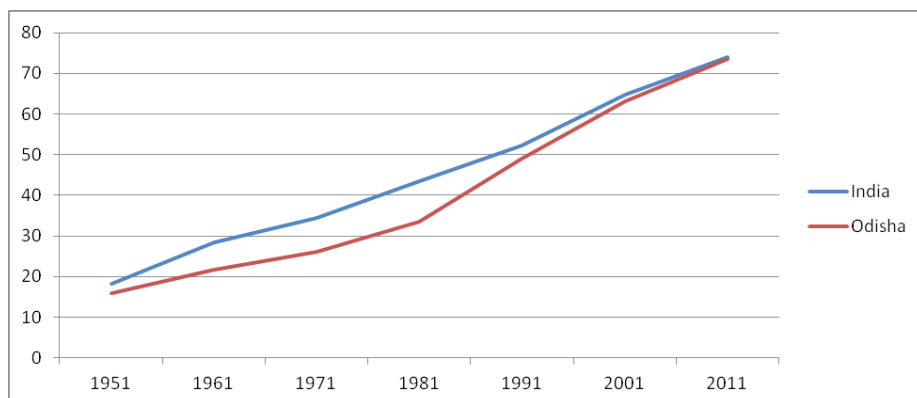


Figure 11: Literacy Rate in India & Odisha

The above figure shows the literacy rate of Odisha as well as India, in which we can clearly see that India is ahead of Odisha in literacy rate in every census.

B. Pupil-Teacher Ratio

The pupil-teacher ratio is a measure of the number of students per teacher in a school or educational institution. It is a key indicator to measure the quality of education, as it affects the level of individual attention and support students receive. A low Pupil-Teacher ratio indicates better interaction between students and teacher, leading to improved learning outcomes.

Table 10: Pupil-Teacher ratio of Odisha and India

Year	India	Odisha
2011-12	30	25
2012-13	27	24
2013-14	26	23
2014-15	25	21
2015-16	24	20
2016-17	23	19
2018-19	19.5	16
2019-20	20.5	16
2020-21	22.5	16
2021-22	22.5	15.5
2022-23	22.5	15.45

Pupil-teacher ratio of Odisha shows that it is better than the Indian average in 2011-12. The ratio of all India was 30 whereas in Odisha it was 25 in 2011-12. Both all India and Odisha are continuously improving the Pupil Teacher ratio, and the all-India average reached one teacher in every 23 students whereas in Odisha, there is one teacher for every 15 students in 2022-23. A good pupil-teacher ratio generally aims for under 30:1 at the school level, and in areas with high socio-economic disparities, it aims to be under 25:1 according to NEP 2020. The Right to Education Act 2009 also mandates a specific ratio of pupil-teacher ratio for primary and upper primary level as 30:1 and 35:1, respectively.

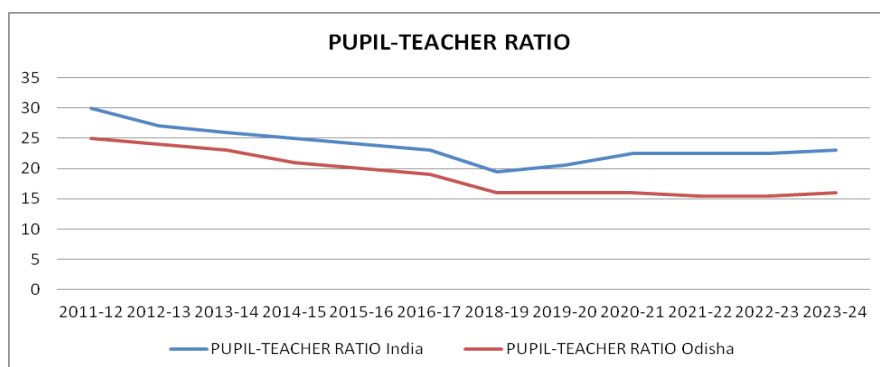


Figure 12: Pupil-Teacher Ratio

6. EMERGING FISCAL RETICENCE IN THE STATE FINANCE OF ODISHA

Fiscal reticence refers to a tendency among governments to exercise excessive caution in fiscal decisions, particularly in expenditure and investment, despite having adequate fiscal space. It often manifests through underspending, low capital formation, high cash balances, and reluctance to borrow even for growth-inducing investments. In the case of Odisha, this phenomenon has become more pronounced in the post-pandemic years or even before.

Odisha, a state once heavily reliant on central transfers and known for its fiscal stress in the early 2000s, has witnessed a remarkable turnaround in its financial management over the last two decades. The state implemented a series of reforms leading to fiscal consolidation, surplus budgets, and debt containment. However, in recent years, there has been an observable shift, a growing fiscal reticence marked by cautious public spending, underutilization of budgetary allocations, and a conservative approach to capital outlays.

Odisha has consistently maintained a revenue surplus for over a decade. The state's own tax revenue has increased due to reforms in mining and GST collections, while transfers from the Centre have remained significant. Despite this, public expenditure growth, especially in capital outlay, has lagged.

Odisha has regularly reported high cash balances in recent fiscal years. According to data from the Reserve Bank of India, these surpluses often remain

idle, indicating a disconnect between revenue mobilization and expenditure execution.

Capital expenditure, a driver of long-term economic growth and employment, has not kept pace with fiscal potential. Projects in infrastructure, irrigation, health, and industrial development have faced delays or underfunding, despite policy pronouncements.

Several interrelated factors contribute to Odisha's emerging fiscal conservatism. Odisha's experience with fiscal crisis in the early 2000s led to a deep-rooted culture of caution and restraint among policymakers. While this prudence served well in achieving stability, it now risks becoming counterproductive.

Though the state's debt-GSDP ratio is within the FRBM norms, there is an evident aversion to borrowing. This is partly ideological and partly due to a preference for debt avoidance after earlier distress. Implementation capacity remains a challenge, with delays in project approvals, land acquisition, and fund disbursement leading to underutilization of budgeted funds. With increasing unpredictability in central devolution and grants, the state has adopted a defensive posture, choosing to save rather than spend, to buffer against future shocks.

7. IMPLICATIONS OF FISCAL RETICENCE

Underinvestment in infrastructure and social sectors can undermine long-term growth, job creation, and poverty reduction, especially in a state still grappling with regional disparities and structural poverty. Areas like KBK (Kalahandi-Bolangir-Koraput) and tribal districts may continue to lag behind due to inadequate public investment, exacerbating regional imbalance. In times of economic slowdown or post-pandemic recovery, states like Odisha could have used their fiscal space more aggressively to stimulate demand and support vulnerable populations. Failure to deliver promised schemes or delayed project completion may erode public trust and hinder inclusive governance.

8. FISCAL PRUDENCE AND DEBT MANAGEMENT IN ODISHA

Odisha has made significant strides in managing its public debt, maintaining it well within the prescribed limits. As of the financial year 2022-23, the state's outstanding public debt stood at ₹97,037 crore, approximately 12.7% of its Gross State Domestic Product (GSDP), and is projected to increase to about 16.7% of GSDP by 2026-27, staying below the 25% threshold mandated by the Fiscal Responsibility and Budget Management (FRBM) Act. Notably, Odisha has refrained from open market borrowings since 2021, opting instead for low-cost loans from dedicated funds like the Odisha Mineral Bearing Areas Development Corporation (OMBADC) and the Compensatory Afforestation Fund Management and Planning Authority (CAMPA), which offer interest rates 2 to 2.5 percentage points lower than market rates.

This conservative borrowing strategy has been recognized nationally; the Reserve Bank of India reported that Odisha had the lowest outstanding

liabilities as a percentage of GSDP among all states as of March 2024. Furthermore, the state topped the Fiscal Health Index by NITI Aayog for FY 2022-23, scoring 67.8 and earning praise for its effective debt management and revenue mobilization. Despite these fiscal achievements, there are growing concerns regarding the underutilization of allocated funds. Experts have highlighted that over the past five years, approximately ₹67,000 crore allocated under various heads remained unspent, with a 10-12% gap between estimated budgets and actual expenditures. This trend raises questions about the efficiency of fund utilization and the capacity of state machinery to implement programs effectively.

Specific sectors have been notably affected. For instance, while the health sector received a substantial allocation in recent years, concerns were raised that the increase primarily funded the creation of tertiary healthcare infrastructure, such as medical colleges, rather than addressing immediate issues like staff shortages and the quality of primary healthcare services.

Similarly, the Department of Mission Shakti, dedicated to empowering women through self-help groups, saw a significant increase in its budget; however, allocations for capacity building within these groups decreased by over 56%, raising concerns about the effectiveness of these initiatives.

9. NEED FOR STRATEGIC REALLOCATION

The emerging fiscal reticence in Odisha, characterized by reduced borrowing and unspent allocations, presents a paradox. While the state's financial health has improved, the underutilization of funds may hinder the achievement of developmental goals. Experts suggest that the government should focus on capacity building within its administrative machinery to overcome systemic and procedural hurdles, ensuring that funds are effectively utilized to meet the needs of the population.

Moreover, a strategic reallocation of resources is essential. Increasing investments in critical sectors like primary healthcare and education can yield significant long-term benefits. For instance, addressing the staffing shortages in primary healthcare facilities and enhancing the quality of education can lead to improved health outcomes and educational achievements, respectively.

10. POLICIES ODISHA SHOULD ADOPT TO TACKLE ABOVE PROBLEM

Odisha should balance prudence with proactive spending, especially in capital projects, health, education, and livelihoods. A medium-term expenditure framework could help align outlays with developmental goals. Strengthening planning, procurement, and execution mechanisms is essential to translate budget allocations into outcomes. While FRBM targets are important, there is a need to reassess them in light of current developmental needs and Odisha's specific socio-economic context. Strengthening fiscal transparency, real-time expenditure tracking, and citizen feedback mechanisms can enhance accountability and responsiveness in public finance.

In recent years, the Government of Odisha has exhibited a notable shift towards fiscal prudence, characterized by a strategic reduction in public borrowing and a focus on enhancing the efficiency of public expenditure. This approach, while commendable in its intent to ensure long-term financial stability, has also led to concerns regarding potential underutilization of allocated funds and its implications on developmental outcomes. By focusing on capacity building and strategic reallocation of resources, the state can ensure that its fiscal prudence translates into tangible developmental outcomes, thereby fostering inclusive growth and improving the quality of life for its citizens.

11. CONCLUSION

The study reached the conclusion that after the implementation of the FRBM Act in 2005 Odisha government's performance in terms of public expenditure has improved a lot. Aggregate expenditure increases many times during the study period, and GSDP grow substantially between the study periods. Though more than 73 percent of aggregate expenditure is Revenue expenditure, and capital expenditure is below 30 percent, after implementing the FRBM Act, Revenue expenditure has declined, and developmental expenditure constitutes around 70 per cent of aggregate expenditure. After Odisha became a revenue surplus state in 2006, the plan expenditure started rising. Social sector expenditure, such as health expenditure and Education Expenditure, together constitute half of the total social sector expenditure. Health expenditure as a percentage of GSDP is less than 2 per cent, whereas for education it is 5 per cent of GSDP. The government of Odisha needs to spend more on these two sectors in future as these sectors create better human development, which helps in increasing productivity and efficiency in other sectors. Odisha also have to refrain from its emerging fiscal reticence and should spend more in socio socio-economic sector for better human development in future. By avoiding fiscal conservatism, Odisha can fully utilize its fiscal space for better expenditure management. The efficient fiscal and expenditure management will act with the government expenditure multiplier and deliver optimum economic growth in the state in future.

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BIO ECONOMY OF ODISHA: AN ANALYTICAL PERSPECTIVE

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ABSTRACT

The world is at the kernel of planetary crisis due to pollution, climate change and biodiversity loss contributed by the extraction of Earth's natural resources and the generation of waste amplified by excessive use of limited resources for material wellbeing. According to the recent estimation by the Global Resources Outlook 2024, the erosion of biological diversity and loss of ecosystem services are going to cost human society a lot by 2050, owing to an increase in world population to 9.7 billion. The ever-increasing desire of the less developed and developing nations to match the growth of upper and middle-income nations has further added to the woes of the environment by increasing the waste extraction of earth's natural resources over the last five decades. At this juncture, a shift towards an environmental friendly economy is the only way out, which balances the current and future needs by stressing on sustainable, circular and ecological economy which promotes 3Es, namely ecology, economy and employment. Divided into four parts, this paper is an attempt to provide a solution to the environmental challenges by stressing region-specific requirements aligned with the BioE3 policy at the national level. In particular, it is an effort to estimate the nature and scope, along with the size of the Bio economy in the state of Odisha, which has become a buzzword globally due to its maximum benefit and minimum impact. Delimiting the scope of bioeconomy without overlapping concepts is a difficult task for which the measurement of sectoral contribution in terms of value addition, employment, and growth potential by market size needs to be assessed. The present paper relies on secondary data to assess such a contribution, for which only the primary sector has been taken into consideration.

Keywords: Bio Economy, Circular Economy, Primary Sector, Agriculture, Odisha.

1. OVERVIEW

The world is in the kernel of a planetary crisis of climate change, biodiversity loss and pollution. Besides, waste extraction of the earth's natural resources has multiplied in the past five decades, due to the massive build-up of infrastructure in many parts of the world and the high levels of material consumption, especially in upper-middle and high-income countries. The continual consumption of natural resources by the global economy further takes away the possibility of achieving Sustainable Development Goals. Along with this, the expected growth of the population to the level of 9.7 billion by 2050, up from the current figure of 7.7 billion, is adding to the woes further. Extraction and processing of material resources account for over 55 percent of greenhouse gas emissions (GHG) and 40 per cent of particulate matter health-related impacts. If land use change is considered, climate impacts grow to more than 60 per cent, with biomass contributing the most (28 per cent), followed by fossil fuels (18 per cent) and then non-metallic minerals and metals (together 17 per cent). Biomass (agricultural crops and forestry) also accounts for over 90 per cent of the total land use-related biodiversity loss and water stress. Without urgent and concerted action to change the way resources are used, material resource extraction could increase by almost 60 per cent from 2020 levels by 2060, from 100 to 160 billion tonnes, far exceeding what is required to meet essential human needs. The well-being of our current and future generations depends on how these complex and interconnected socio-economic challenges are tackled by the countries.

The shift towards an environmental friendly economy is the only way out to achieve sustainable development, popularly known as the bio economy, which is gradually making sense when human activity has clearly modified the climate over the last century. A transition to a sustainable and circular bioeconomy is critical and must be based on prioritising the use of biomass for maximum well-being and minimal impact. The erosion of biological diversity and loss of the ecosystem services that it prop up can thus impose a huge cost on Indian society. Such negative accounts cast into doubt the benefits derived from the current development model, while undermining the future well-being of Indian citizens. By adopting judicious use of bio resources through the circular economy and integrating digital tools with biotechnology innovation, the bio economy offers a plethora of solutions to the problem of climate change and the environment emanating from demand-driven resource extraction. Many identify the bioeconomy as a more sustainable and environmentally friendly alternative to traditional fossil-based industries, which can help mitigate climate change and reduce greenhouse gas emissions. Additionally, the bioeconomy can be seen as a means to enhance food security, increase agricultural productivity, and develop new applications for agriculture.

This paper is an effort to assess the components of the bioeconomy of Odisha, emphasizing the role of various components such as biotechnology, bioservices, bioagriculture, etc. In particular, it is an effort

to estimate the nature and scope, along with the size of the Bio economy in the state of Odisha. This comprehensive analysis aims to provide a scientific understanding of the bio-economy, its potential for reshaping industry and its vision of sustainability and innovation. The paper has the following objectives;

1. To define bio economy based on literature and focus on the appropriate one specific to the region of Odisha.
2. To identify the bio-economic aspect prevalent in agriculture, in particular and the primary sector in general.
3. To find a methodology to find the value of bioeconomy based on the literature.
4. To suggest policy measures to promote ecology, economy and environment by promoting Bioeconomy.

With these broader ideas, the present paper has been divided into four parts. The second part gives a brief understanding of the literature prevalent in the field of measurement and definition of Bioeconomy. The third chapter gives a brief idea of various parts of the bioeconomy of Odisha and the methodology to measure it. Chapter 4 analyses the future prospects of the economy and suggests a policy framework to deal with it.

2. REVIEW OF LITERATURE: CONCEPTUAL FRAMEWORK

Bioeconomy“ is a word that was already used in the 1970s by Nicholas Georgescu-Roegen and stands for an economic system that focuses on the biological origin of economic processes in connection with the limited amount of available raw materials. In recent decades, many other definitions have been added, based either on the need to replace fossil fuels or on the use of predominantly renewable raw materials for the needs of our society, showing here a wide range of implementation possibilities between agroecological sufficiency movements and capitalist biotechnology. Authors such as Zeman and Roegen use the term “bioeconomics” to refer to the discussion about the incompatibility between unlimited economic growth and the availability of natural resources. Although the concept of bioeconomy has been used in the policy agenda and in the scientific arena from the seventies, it became more important in the last two decades (Pfau et al., 2013), especially when the European Commission launched the Bioeconomy Strategy in 2012, motivating national actions to establish prior-ities and policies to scale the bio-based sectors and to deploy local economies. Nowadays, there is a broad consensus about what bioeconomy is, and in fact, the definition provided by the Global Bioeconomy Summit in 2018 has been adopted in many scenarios. According to this definition, bioeconomy refers to *“the production, use and conservation of biological resources, including knowledge, science, technology and related innovation, for the provision of information, products and services through all economic sectors towards a more sustainable economic system”* (Aguilar et al., 2009). This definition makes clear the role of science, technology, and innovation in moving from

a production factor-oriented economy towards a more knowledge-oriented economy (Urmeter, et al., 2020). Concepts such as green economy, bio-based economy, and circular economy are quite close but have some particularities worth mentioning. A green economy is about ecosystem functioning, low-carbon type of economic activities, and even social inclusion. This concept refers to environmental risks and the scarcity signals from the ecological systems. On the other hand, the bio-based economy concept is the closest term to bioeconomy since it is defined as the production of goods and services from biological material or resources. Examples of typical bio-based products are biopolymers and bioplastics. At the same time, the bioeconomy is seen as part of the global economic growth and in that sense closer to the innovation and development perspective. Finally, the circular economy refers to a way of producing goods and services, recycling and reducing original raw materials, including biological resources.

Limiting the scope of the bioeconomy is a demanding task which requires putting up monitoring indicators in line with the objective is essential to delve into the short-term changes in the bioeconomy as well as support the design of long-term policies and programs. There is a growing literature defining relevant indicators to monitor and evaluate the impacts of the bioeconomy, which are focused on the three dimensions of sustainability and encompass the measurement of the contribution of the bioeconomy to the production, consumption, and employment, the availability and use of natural resources, and the climate footprint, among others. Country objectives and bioeconomy priorities encompass economic growth, employment, energy security, food security, fossil-fuel reduction, mitigation and adaptation to climate change, and rural development. With respect to their potential in deploying the bioeconomy vision, countries have different opportunities, which might also affect their policies. Countries can be classified as countries with: (1) an abundance of renewable biological resources, but a lack of downstream processing industries; (2) both high feedstock potential and advanced processing industries; and (3) low feedstock potential but advanced processing industries (Aguilar et al., 2009). These variations also create differences in countries' objectives for adopting a bioeconomy strategy and in the evaluation of success towards their achievement. In addressing these problems, there has been an accelerating momentum worldwide towards the development of the bioeconomy as a step towards sustainable solutions to the global challenges of resource scarcity, environmental degradation, and climate change. The concept of the bio-economy has emerged as a beacon of promise.

2.1 Definition of Bioeconomy

Bio-economy, as a multifaceted construct, defies a single definition (Bauer et al., 2018). However, at its core, it represents a transformative shift from a traditional fossil fuel-based economy to one that hinges upon the sustainable utilization of biological resources and processes (Donner & de Vries, 2021). In scholarly circles, several authors have differentiated approaches to bioeconomy

by considering the resources, processes, and effects that activities trigger in the economic and biophysical systems. Viewed as a promising avenue for economic growth, job creation, and the development of new industries and products, these approaches offer distinct strategies to achieve economic and ecological harmony. At the same time, it focuses on preserving biodiversity, empowering local communities, and safeguarding indigenous knowledge and cultural heritage.

Table 1: Components of Bio Economy as per the literature

Author	Components of bioeconomy
Bugge et al. (2020)	(i) Bioresources(Biomass) (ii) Bioecology(sustainable processes and sustainably sourced) (iii) Biotechnology(products or processes enabled by innovation)
Vivien et al. (2019)	Type I: ecological economy compatible with biosphere constraint Type II: a science-based economy driven by industrial biotechnology Type III: a biomass-based economy
Aguilar et al. (2009) & Global Bioeconomy Summit in 2018	Green economy: ecosystems functioning, low-carbon type of economic activities, and even social inclusion. Bio-based economy: production of goods and services from biological material or resources, and Circular economy: producing goods and services by recycling and reducing original raw materials, including biological resources. Knowledge-based Economy: science, technology, and innovation to move from a production factor-oriented economy towards a more knowledge-oriented economy
Leavy et al. (2024)	BmBB: Biomass-based bioeconomy BtBB: Bio technology-based bioeconomy BsBB: Biosphere-based bioeconomy

Source: Own compilation

The challenge of defining the scope of bioeconomy as well as sets up a framework to measure its development requires to consider two relevant ingredients of the bioeconomy: first, the sustainability perspective, which involves three dimensions: economy, society, and environment, and second, the use of biological knowledge, in particular the capacity of generating and implementing biotechnology, as a driving force to develop the bioeconomy. Providing relevant indicators in this regard is crucial not only to monitor the progress of national bioeconomy strategies but also to inform policymakers, society, and organizations about the impact of policies and mapping opportunities to foster communities and businesses. The classification and definition in various literatures show that a widely accepted concept of

Bioeconomy is lacking, and there is a need to link national concepts to the vision of Bioeconomy. Despite conceptual differences, stakeholders' interests exist, and there are efforts to show the economic importance of the bioeconomy and to monitor indicators to attract investment in bioeconomy-related activities. Although awareness differs between stakeholders, the economic dimension is still relevant. The measurement of the bioeconomy becomes a policy input, understanding that it reveals the capacities of the territories to generate value added in different sectors of the economy with the use of natural, renewable resources and goods provided by the primary sector. Every economy, be it national or regional, has its own requirement with respect to bioeconomy based on its input resource endowment and demand for income sustainability. However, one aspect that differentiates national strategies is the essence of the bio-economy concept considered when outlining the actions to be stimulated.

2.2 Bio-Economic concepts in the international arena

In the European Union (EU), for example, the concept was updated in 2018 to add sectors and systems that rely on biological resources in addition to those primary sectors that produce renewable biological resources. In the United States, the former President Barack Obama's National Bioeconomy Blueprint is based on three main and correlated axes: knowledge, technology, and innovation. In 2012, the European Union launched its strategy for developing a bioeconomy that connected the economy to nature for sustainable growth [EU, Brussels, 2013]. Since then, national governments worldwide have made efforts to promote bioeconomy activities and boost national economies officially. These include the Netherlands, Sweden, the United States, and Russia in 2012, Malaysia and South Africa in 2013, Germany and Finland in 2014, and France in 2016. From the North American perspective, the bioeconomy is the economic activity driven by research and innovation in life sciences and biotechnology, enabled by technological advances in engineering, computing, and information sciences. Genetic engineering, molecular biology, bioinformatics, and synthetic biology are some driving technological platforms.

The Bioeconomy Brazil Program focuses on extracting renewable resources and exploring biodiversity as a strategy for the sustainable development of smallholder and indigenous communities. Recently, the Brazilian strategy for bioeconomy has been revised based on a wider concept that includes innovations and technologies to add value and generate work and income sustainably and environmentally friendly. Similarly, India's BioEconomy showcases a comprehensive approach that integrates biotechnology across industries, driving innovation and sustainability. By capturing diverse value chains, it reflects the sector's dynamic growth and evolving role in shaping the country's economic landscape. The Bio Economy policy of India focuses on (Ecology, Economy and Employment) named as BioE3, with a strong industrial focus, with agriculture and IT sharing a small percentage (India Bioeconomy Report, 2024).

2.3 Bioeconomy and its focus areas in states of India:

Realising the importance of bioeconomy, the states of India have focused on various aspects of bioeconomy in which it has strength. Driven by innovation, a supportive ecosystem, and strategic investments, Southern India has emerged as the undisputed leader in India's BioEconomy, a sector encompassing industries reliant on biological resources and processes. The five southern states – Karnataka, Telangana, Andhra Pradesh, Tamil Nadu, and Kerala – collectively contribute a staggering 45 percent to the nation's BioEconomy, valued at \$151.4 billion in 2023. Southern India emerges as a frontrunner in the BioEconomy landscape, marking a significant milestone in the region's trajectory towards innovation and environmental stewardship.

Table 2: Bioeconomy Framework and priority areas in states of India

States	Reason
Karnatak	– Strong agricultural base with diverse crops (paddy, sugarcane, pulses, etc.) – Presence of research institutions (UAS Bangalore) and bio-pesticide companies (Biostadt India) – Government initiatives promoting organic farming and bio-pesticides – Progressive farmers are open to adopting new technologies.
Maharastra	- Major agricultural producer (cotton, fruits, vegetables) – The established industrial base for production facilities – Availability of skilled workforce in agriculture and biotechnology – Growing demand for sustainable agricultural practices.
Andhrapradesh	- Large area under agriculture (paddy, cotton, pulses) – The government focus on promoting bio-pesticides – The presence of agricultural universities and research centers – Favourable climatic conditions for bio-pesticide production.
Tamilnadu	- Leading producer of rice, pulses, and horticultural crops – Well-developed agricultural infrastructure and extension services – Increasing awareness among farmers about bio-pesticides – Presence of agri-business companies and FPOs supporting bio-control solutions
Gujrat	– Significant cotton cultivation area – Presence of established chemical pesticide industry (potential shift to bio-pesticides) – Government programs for promoting sustainable agriculture – Availability of resources and infrastructure for bio-pesticides

Source: As compiled from the state Bio economy report

Aligning local and regional endowment with global need, which in turn will match local requirements and aspirations. This is the thrust of bioeconomy policy followed by different nations. Thus, through this paper, an attempt has been made to identify and measure the bioeconomy of Odisha, realising its importance in a global perspective. The division of bioeconomy is an important step towards its measurement, which varies across the literature.

Table 3: Division of Bio Economy into different sectors

Sectors	Non-Bio-Based Sector	Bio-based Sector	Particulars of bio bio-based sector
Primary Sector	Ia Mining and Quarrying	Ib Primary production of biomass, eg, agriculture, fishery, forestry, aquaculture	Crop and animal production, hunting and related service activities
Secondary Sector	Ila Other Manufacturing Sector	Ilb Transformation of raw biomass, e.g., food industry, textiles, wood, paper	All industries that use inputs from Sector Ib are considered mixed bio-based industries
Tertiary Sector	IIla computer programming, financial services	Transformation of processed biomass, e.g., restaurants, trade and transportation of bio-products	IIlb: Transformation of processed biomass, e.g., restaurants, trade and transportation of bio-products

***As compiled from Grealis and O'Donoghue (2015)*

In the present paper, understanding the multifaceted and non mutually exclusive nature of the BIO economy, only measurement in the primary sector has been chosen.

3. MATERIALS AND METHODS

The main challenge in the measurement is that the bioeconomy is not a clearly defined industry as such, and no sector is purely bio-based; all industries use bio-based materials to some extent in their production process or as ingredients in the final products. The classic three-sector model of the economy classifies industries in three sectors referred to as the primary, secondary, and tertiary sectors. The primary sector consists of the extraction, collection and cultivation of natural resources. The secondary sector consists of the manufacture of goods. The tertiary sector refers to the production of services. Following Grealis and O'Donoghue (2015), we propose an alternative classification, analogous to the three-sector classification, to distinguish between bio-based and non-bio-based in primary, secondary, and tertiary sectors, has been done as given in Table 3. For this paper, we assess the Bio-Economy from the perspective of the primary sector, as this is the sector of primary bio-based production.

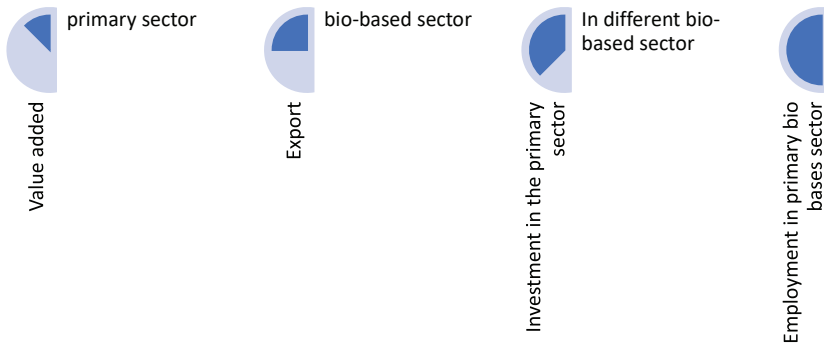


Figure 1: Bio Economy Index

In order to achieve clarity in the measurement of bioeconomy, it has been divided into two sector models, where the measurement of the bioeconomy is based on the material flow of bio-based inputs to secondary bio-based production. Thus, the economy has been classified into two broader sectors. Sector 1 is referred to as primary bio-based production, and it includes specifically agriculture, forestry, fishery, aquaculture, and veterinary services. Sector 2 includes all other sectors (Heijman, 2016). The size of the bioeconomy in sector one, known as the primary sector, is arrived at by adding the value added of agriculture, forestry, fishery, aquaculture and veterinary services.

Further, in order to calculate sectoral contribution, an attempt has been made to estimate its different components based on four parameters given in Fig. 1. The primary sector also generates a plethora of waste, which can be recycled and reused to contribute to the economy. It will also be helpful in the sustainable and judicious use of resources and achieving the objective of the circular economy, which is part of the bioeconomic concept. In this paper, we will quantify the prospective yield from the circular economy and sustainable agriculture, which is part of bioagriculture and biomass production. Biomass is defined as all organic matter produced by photosynthesis, convergence of solar energy, or primary or secondary organic matter (waste) derived from plants, animals, or microorganisms. It can be used as a renewable input to produce energy, food, fibre, or material. Measuring the BmBB (biomass-based bioeconomy), therefore, starts by identifying the primary sectors that produce biomass, which could suggest a narrow view of the bioeconomy. Studies have identified agriculture, livestock, and forestry as the primary sectors of the BmBB. However, methodological approaches may differ regarding the method, data and indicators used to measure the BmBB. The fact is that even though biomass is essentially produced in three or four economic sectors, it flows between almost all sectors of the economic system, being consumed or transformed with added value (Fig. 2). Thus, measuring the BmBB provides information on physical or monetary flows that express how large the BmBB is in terms of an economy's GDP. (Leavy et al., 2024). The BmBB is close to an economic system where bioresources and bioproducts are supplied and demanded through the value chains and market structures.

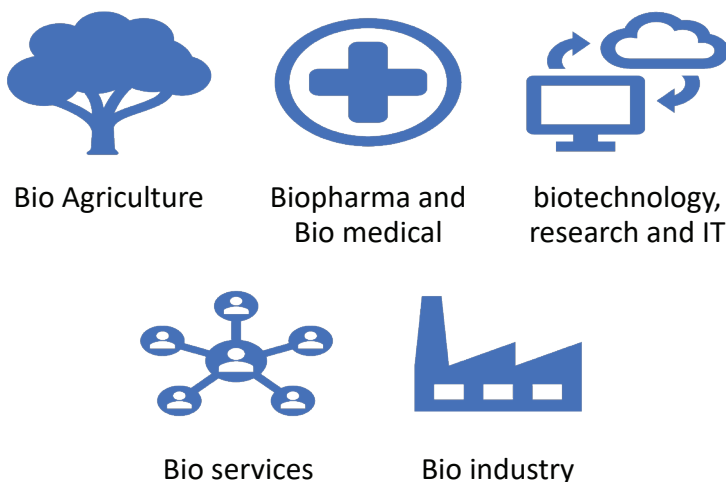


Figure 2: Parts of the Bio economy

For measurement of bioeconomy in the primary sector, gross value added is taken into consideration, thus all the gross value added in different components of the primary sector, namely Agriculture and allied activities, fishery or aquaculture, forestry and livestock are being taken into consideration. Valuation has been proposed to be done in two phases based on secondary data available in various literature and state statistical handbooks.

- In the first phase State gross value added in the agriculture and allied sector is recorded, excluding additions by the mining and Quarrying sector, since it is coming under non non-biobased industry. Bio agriculture, as a component of BIOE3 of India, includes the calculation of prospective output of bio agriculture, which includes bio-based resources and bio-based products possible out of agriculture and allied activities. It includes bio pesticide, biofertiliser, and precision agriculture, whose main thrust is to protect food security and less environmental stress.
- In the second phase money value of exports in the biobased industry is calculated, which also constitutes the bioeconomy.

The other two components, namely Employment and investment, have been left out in this paper to make it too lengthy and complex. It requires a separate analysis for which statistical modelling is required.

4. ANALYSIS AND DISCUSSION

Due to the scarcity of studies and the need to overcome methodological limitations, in this paper, the size of the bioeconomy has been measured based on the contribution of biomass-based bioeconomy by tracking the direct and indirect flow of biomass incorporated in goods and services for intermediate and final demand in the primary sector. Our analysis will focus on measuring the BmBB contributions from the gross value of production (GVP) and the

value added to biomass. Considering a high degree of interdependence in the economy within a sector, the present paper tries to track biomass from the primary sector and value its transformation in the manufacturing sector. While valuing direct contribution, the GVA in the primary sector, excluding the mineral extraction, was calculated as a direct flow of biomass. Along with this contribution of exports is also added.

4.1 Phase one

The economy of Odisha occupies 13th position in terms of total contribution to the national economy, with agriculture still a major contributor in terms of production and export. Though the contribution of the primary sector to GVA in the year 2023-24 is 21% (Fig. 4), it is a source input for many industries present in the state. An analysis of the bio-based production of agriculture, which includes agriculture and allied activities, shows an upward trend from 2021-22 to 23-24 (Fig. 5). This indicates growth of the bioeconomy based on traditional production, increasing in monetary terms. The non-bio component of the primary sector, which includes mining and quarrying, has been omitted from this account. Contribution of sub-sectors excluding the mining and quarrying sector as per the advanced estimate in 2023-24 record contribution of food crops highest in percentage terms.

Contribution of sub-sectors in Agriculture and Allied sectors GSVA in 2023-24 at current prices(Advanced Estimate)

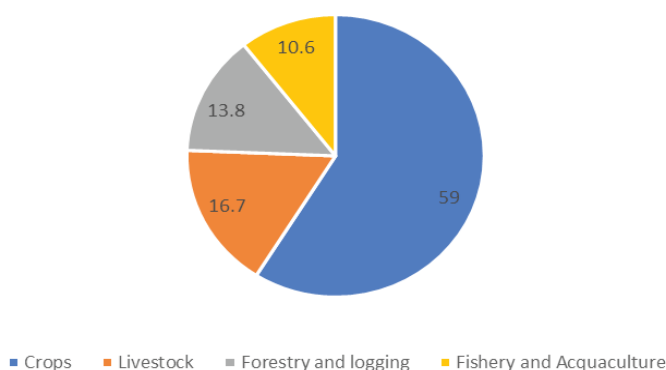


Figure 3: Contribution of subsectors in Agriculture and Allied sectors GSVA in 2023-24 at current prices

Source: Directorate of Economics & Statistics, Government of Odisha

The year-on-year decline in the growth of real GDP of the primary sector in 2023-24, as compared to 22-23 and 2021-22 (Odisha agricultural statistics 2023-24), stresses food security and alternative sources of income and employment for sustainability.

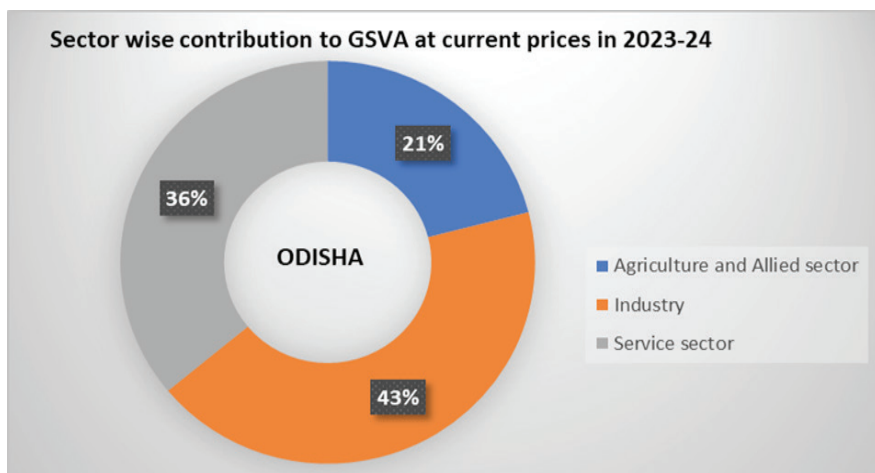


Figure 4: Contribution of different sectors to GVA in Odisha

Source: Directorate of Economics and Statistics, Government of Odisha; National Accounts, Ministry of Statistics and Programme Implementation, Government of India

Note: Odisha's GSDP estimates are the first advance estimates, and India's GDP estimates are provisional estimates.

Out of the total share of the primary sector, the contribution of agriculture and allied activities has shown a sign of marginal growth in terms of nominal value from Rs 21,70,106 cr in 2021-22 to Rs 23,04,982 crore in 2023-24

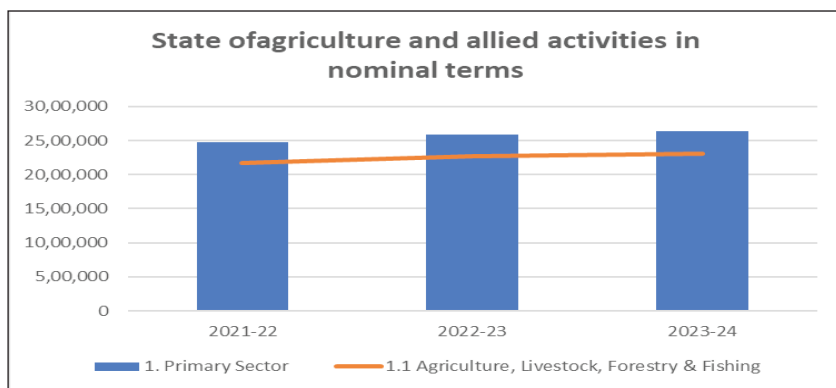


Figure 5: Growth of Primary Sector in Nominal Terms

4.2 Bio Agriculture and sub-sectors

In a state where 70% of the population is dependent on agriculture and 91 % of the farmers are small and marginal farmers, largely dependent on rainwater for irrigation, the importance of sustainable and economical agriculture is quite essential. With 61.50 lakh hectares of cultivable land, agriculture in Odisha is characterised by low

productivity on account of various factors, such as abiotic stresses which are increasing in frequency and intensity, lack of assured irrigation facilities, low seed and varietal replacement rate, non-availability of quality seed, particularly in rainfed areas, low cropping intensity, sub-optimal levels of fertilizer and pesticide applications, limited mechanization practices, and knowledge gaps among other reasons. With all these grey areas in the picture of the main source of livelihood of the major population, it is essential to focus on attaining balance between the physical, chemical nutrients and biological facets of the soil, aided by improved organic carbon content.

Thus, apart from normal agriculture, this paper stresses bioagriculture, which is based on recycling nutrients and sustainability.

- Agriculture also produces a lot of residues, which are byproducts of crop production and don't compete with agriculture for land or resources
- These byproducts are free, low-cost alternative sources of energy and promote employability and sustainability.
- Use of these residues has potential with respect to biofertiliser, which retains the natural component of soil and reduces stress on land as a resource.

In this paper, I focus on the organic farming, biofertiliser and bioenergy aspects of residues from agriculture, forestry and fishery to get a more holistic aspect of the measurement of bioeconomy in the primary sector. Apart from agriculture, forestry, animal husbandry, and fishery sectors also contribute by-products whose collection, processing and value creation can contribute towards employment generation (Fig. 6).

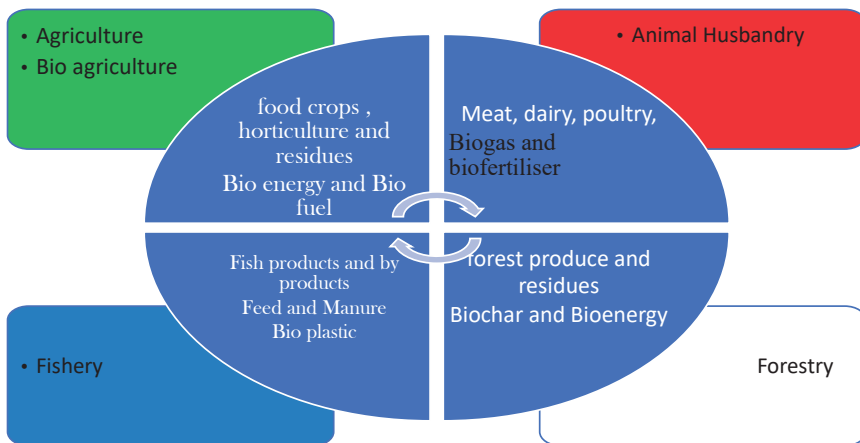


Figure 6: Agriculture and allied activities as direct and indirect producers of Biomass

4.3 Biofertiliser and manure: Indirect BiOmass

Bio agriculture, which includes organic farming and natural farming, uses either bio waste for manure and fertiliser or depends on nature solely for productivity and avoids the use of chemical manure with a criterion of zero cost. The field of bio agriculture and thus data related to it is highly volatile, and thus decisions related to net sown area under such agriculture change every year depending on the return in comparison to modern farming with chemical fertilizer and pesticide.

As per IFOAM FiBL 2019, the total absolute area under organic agriculture in Odisha is 118 thousand hectares, which is 2.6% of the total land area under cultivation. BPKP scheme as a sub-scheme of PKVY is being implemented in Odisha since 2022-23 in an area of 24,000 ha for 3 years. spreading in 15 no. of districts and 26 no. of blocks, nearly 26,833 farmers are getting benefitted and incentivized with Rs. 2000/- per ha through DBT. The scheme is being implemented in Odisha from Rabi 2024-25 in 13 blocks under 4 districts in an area of 6500 ha for 3 years. It aims at the development of sustainable models of organic farming through a mix of traditional knowledge and modern science to ensure long-term soil fertility build-up, resource conservation and help in climate change adaptation and mitigation (Activity report, Department of Agriculture and Farmers Empowerment, 2024). Organic farming stresses Biofertiliser, biomanure and biopesticide, which are mainly derived from crop and bio residue, unlike the chemical input used in standard agricultural practices (Table 7).

Biofertiliser based on biomass from agriculture and part of the bioeconomy related to agriculture needs to be assessed for which demand and supply approach has been followed. Under it cost of biofertiliser, which includes fertiiser like Rhizobium strains, Azotobacter, Azospirillum, Blue-green algae, and Azolla, Phosphate Solubilisers, etc., has been calculated based on crop type and area under cultivation. Per hectare requirement of biofertiliser per hectare was calculated at Rs 134, which is the lowest estimate per hectare if we apply biofertiliser to the entire cultivable area under legume and non-legume cultivation. The cost of bio-fertiliser has been calculated based on whether the entire area is under organic cultivation, if 70 percent and if 50 percent area is under organic cultivation.

Table 4: Requirement of Biofertiliser as per crop type & cultivable land area in million hectares

Bio-fertiliser type	Application	Quantity and impact	Price per kg/ gm	cultivated area in million hectares
Rhizobium strains	Legumes like pulses, groundnut, and soybean	10-35% yield increase, 50-200 kg N/ha	Rs 75-700 or 200- 1000 in liquid	19.47
Azotobacter	Soil treatment for non-legume crops	10-15% yield increase- adds 20-25 kg N/ha	₹258 to ₹710 per ltr, or ₹35 to ₹390 per kg.	172.34
Azospirillum	Non-legumes like maize, barley, oats, sorghum, millet, Sugarcane, rice, etc.	10-20% yield increase , 2-4 kg / hectare	₹30 to ₹110 per kg, ₹35 to ₹445 per liter.	172.335
Blue-green algae and Azolla	Rice/wetlands	20 -30 kg N/ ha,	Rs 15/kg	34.14
Phosphate Solubilizers	Soil application for all crops	250-500/hectre	Rs 160/kg	99.383

Source: Own compilation from Land use statistics 2022-23, Odisha

This represents the prospective demand for biofertiliser in Odisha, which amounts to an economy of Rs 642538.725 million (50% biofertiliser used and Rs 899554.215 million when biofertiliser is used in 7:3 ratio), as per Table 5. The production of this bioproduct from organic solid waste corrects the hazardous effects of synthetic fertilizers on the ecosystems and promotes waste management. Apart from being an economical biofertilizer, it promotes soil health, plant growth, and crop yields. Compost has been employed as biofertilizers in many agricultural applications. For instance, Altieri and Esposito (2010) valorized olive mill waste as an organic compost for the enhancement of soil fertility and reduction of CO₂ emissions.

Table 5: Biofertiliser prospective demand

Area under legume and non-legume cultivation	Kg/ hectre	Total quantity	In RS/ hectare	Rs In million	7:3 ratio	05:05	In Rupee terms 7:3	in million Rs	Rs if 1:2 biofertilier
172335000	2	344670000	30	10340.1	241269000	172335000	7238070000	7238.07	5170050000
34140000	25	853500000	15	12802.5	597450000	426750000	8961750000	8961.75	6401250000
172335000	20	3446700000	258	889248.6	2412690000	1723350000	622474020000	622474.02	444624300000
99383000	50	4969150000	75	372686.25	3478405000	2484575000	260880375000	260880.375	186343125000
30,58,58,000		9614020000		1285077.45	6729814000	4807010000	899554215000	899554.215	642538725000

Source: Own Compilation from the land use area 2022-23

In the absence of proper recorded data at the macro level, an effort has been made to quantify the biofertiliser demand based on net sown area in Odisha with respect to various crops. However, the official data records production of Bio fertiliser at 19406.64 MT. This accounts for Rs 2600.49 million, much less than the prospective figure (Table 6).

Table 6: Biofertiliser production in Odisha in comparison to India

Biofertiliser and manure	State	Odisha	Total
COMPARATIVE PRODUCTION OF ORGANIC FERTILIZERS IN ODISHA In comparison to INDIA(2020-21)	City Compost	13153.5	406876.7
	Organic manure	12102	1365508
	Vermicompost	17064.5	373360.3
	PROM	680	132772.9
	Bioenriched Organic Manure	785	53077.03
	Rural Compost	0	1869848
	Farm Yard Manure	5565	38742227
	Total Manure MT	49350	42940832
	Deoiled Cake MT	0	46543.02
PRODUCTION OF BIOFERTILISERS IN ODISHA visa vi India (2020-21)	Carrier-based (MT)	19406.64	192329.3
	Liquid-based (KL)	859.6	42239.94

Source: as per IFOAM fibl, NCOF and consolidated organic agricultural statistics for the year 2020-21 (<https://apeda.gov.in/apedawebsite/organic/data.html>),

4.4 Bio energy

In the food supply chain, a lot of food loss and waste is generated, which needs to be assessed, measured to arrive at a sustainable solution. Research on food loss and waste in India is at its early stages, and is mainly focused on the quantity of post-harvest loss. Data on food waste at the retail, household and service level is limited to a few perception studies. Data on food waste at the household level is almost nonexistent. In this paper, an effort has been made to quantify the waste generated during the process of production and movement towards the next level of the supply chain through the literature. By-products generated in agriculture, fishery, forestry, and livestock (Table 7) are good sources of manure, energy, biofuel, feedstock and animal feed too. The creation of value from waste will protect the environment from the prospective danger of environmental pollution.

Table 7. Energy and bioresources

No	Category	Resources
1	Crop Residue	Bagasse (sugarcane residue), Corn stalk, Rice hulls & Rice-straw, wheat straw, Nutshells
2	Animal Waste	Animal excrement (manure). Animal by-product from processing.
3	Food Processing Waste	Potato waste, Cheese whey waste, Fruit pits, Leftover sludge and other energy-rich FPW.
4	Wood waste	Wood waste includes any type of wood or wood-based product.

Source: IREDA; <https://www.ireda.in/biomass-power-generation>

As of March 2023, the total contracted capacity for Odisha is 8150 MW. Out of the total contracted capacity (CC), the share of non-fossil fuel-based CC is 47% (Ministry of Power Central Electricity Authority, 2022-23). As given in Fig. 6, the share of Biomass towards energy generation is only 0.24% which is 20 MW.

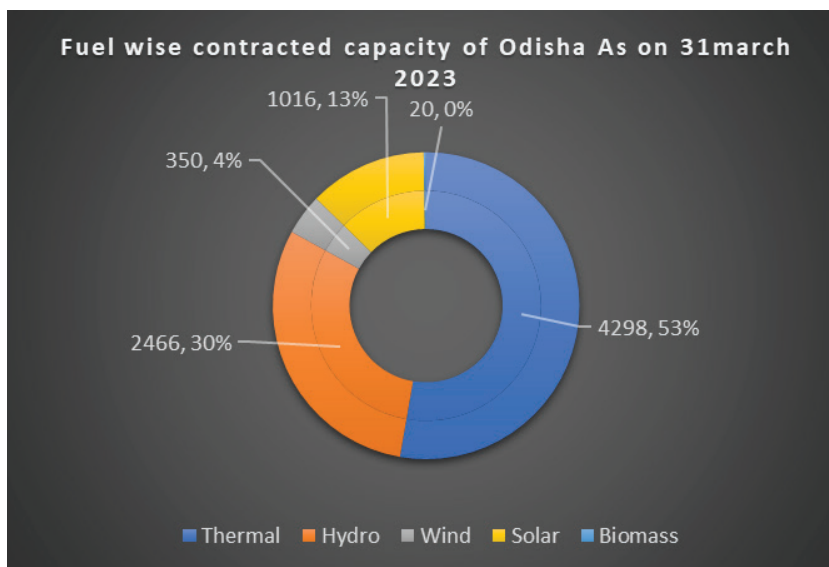


Fig. 7: Source-wise fuel generation in MW in Odisha

Source: Report On Resource Adequacy Plan For the State of Odisha, GOI, Ministry of Power Central Electricity, 2022-23

The latest Energy Statistics in India highlights the high potential for generating renewable energy from various sources such as wind, solar, biomass, small hydro, and cogeneration bagasse in India. In 2023, India ranked fourth globally in renewable energy capacity and in wind, hydrobiopower and biomass energy in the world. Within the bioenergy field, as of March 2023, the cumulative installed capacity of biomass power and cogeneration projects reached about 10.2 GW, with Maharashtra and Uttar Pradesh accounting for over 45% of the installed capacity. Additionally, the waste-to-bioenergy field contributed 0.55GW to India's Renewable energy portfolio. In Odisha the though the installed capacity of biomass energy is 59,22Mw, there is no initiative in the Waste to Energy field.

Odisha has an installed capacity of 12,322 MW, as of December 2022 (CEA), of which 9,540 MW of installed capacity is for coal-based power plants. So, emission in Odisha is largely driven by high dependence on coal (90%) as a source of power generation in the state in 2021-22. Considering this fact, the state needs to focus on alternative and green sources of energy to reduce its dependence on coal and hydro power as a source of energy. In the present paper, this aspect of the state has been given focus.

Table 8: Waste to Waste-to-energy potential of Odisha

District-wise assessment of waste availability & energy generation in four priority sectors (Fruit & Vegetable processing, Poultry, Cattle and Press Mud) across India – First Report						Rev.Gen.
State & UT	Total poultry (in '000)	Poultry waste per day (in '000 KG)	Poultry waste per year (in '000 MT)	Energy potential (MW)	Bio-CNG (T)	Market Rate per unit
Odisha	27,439.26	1,097.57	400.61	5.87	28.19	14.67Cr+ 0.23cr
Total	8,51,809.93	34,072.40	12,436.43	182.29	874.98	NA

Source: Central Electricity Regulatory Commission (CERC) RE Tariff Order 2019-20, and 20th Livestock Census 2019.

The waste generation in Odisha primarily comes from food grain production, fish and livestock residues being major contributors to biomass generation. Proper disposal is needed to reduce environmental stress and pollution. In a state like Odisha, where rice is cultivated in 69% of the cultivable land, ranging over various climatic zones, crop residue is a major source of biomass. Four-fifths of the state population lived in rural areas as of the latest census (Government of India 2011), and the primary occupation of about 63% of the rural workforce is agriculture, including livestock (Government of Odisha, 2021). Classification of livestock production systems in the three regions of the state, i.e., cattle-dominated coastal plain zone, goats and poultry-dominated region, goat and sheep-dominated hilly and mountain zones (Bahta et al., 2022), indicates Poultry and livestock rearing as the main source of livelihood of the rural population in general and the SC and ST population in particular in Odisha. This points out the generation of waste related to poultry farming, which needs proper management. Odisha experiences significant waste generation, primarily municipal solid waste, with Khordha and Ganjam districts being major contributors. Bioenergy, derived from biomass like agricultural residues and municipal waste, offers a sustainable solution for waste management and renewable energy production in Odisha. This approach addresses environmental concerns and provides a local energy source. The production of waste from poultry farming stands at 400.61 thousand kg/ per day, with a production capacity of 5.87MW of bio energy and 28.19 tonnes of Bio CNG per day. The revenue generation, if converted into monetary terms,

will amount to 14.67Cr and 0.23Cr on a daily basis, respectively.

Table 9. Waste-to-energy potential of Odisha

Vegetable processing, Poultry, Cattle and Press Mud) across India – First Report							Rev. Gen
State/UT	Total no. of Cattle (In '000)	No. of Cattle available in Cattle Farm (In '000)	Cattle Dung Production ('000 Kg/day)	Production (in'000 TPA)	Energy Potential ⁴ (MW)	Bio-CNG (T)	Mkt per unit
Odisha	6,095.57	3,047.79	30,477.87	11,124.42	95.12	456.56	Rs 237.8 + Rs 3.66cr

Source: Central Electricity Regulatory Commission (CERC) RE Tariff Order 2019-20, and the 20th Livestock Census 2019.

Similarly, the production of cow dung by cattle farms, which stands at 30,477.87 kg/day, is capable of producing 95.12 MW of bioenergy and 456.4 Tonnes of bio-CNG daily. The prospective revenue generation will be at Rs 237.8cr and Rs 3.66 Cr on a daily basis.

4.5 Export of Agriculture and Allied Produce

Calculation of bio economy through GVA does not include exports. Thus, exports are separately tracked since it is a crucial indicator of bio-economic impact through their contribution to international trade. It also suggests the competitiveness of biobased products and industry, since the analysis of export data will help us in understanding opportunities and diversification in this sector. The present paper delimits the analysis to the export of agriculture and allied activities, which are direct biobased products.

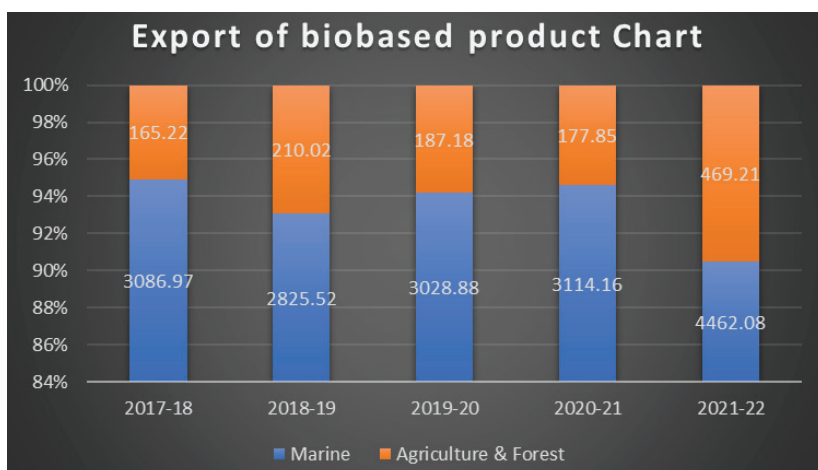


Fig.8: Export of biobased products of Odisha between 2017-2022

The export of Odisha in the primary sector includes marine and agricultural, and forest products, which increased in monetary terms from 2017 to 2022. It stood at Rs 4462.08Cr in Marine export and Rs 469.21Cr in agriculture and forest export. The total export in 2021-22 rose to Rs 4931.29Cr against Rs 3252.19Cr in 2017.

5. CONCLUSION AND POLICY SUGGESTION

In emerging economies like India, a well-developed primary sector based on a sustainable bioeconomy can provide a lot of opportunities for economic growth, industrialisation through value addition in direct and indirect biomass production. It supports economic and social objectives, such as reducing unemployment and expanding access to energy. The agriculture sector has the potential to generate productivity gains, which could result in significant improvements in the country's inclusion in international trade (Wierny et al., 2015). The present paper shows many key indicators, both at the primary and industrial sectors, in a major initiative to assess the size and value of the bioeconomy. While doing so, the direct flow of biobased value addition in the form of Gross state value addition in the agriculture allied sector and export in the same sector has been measured at Rs 2,1,75037.29 Cr in 2021-22. Apart from the direct flow, the indirect flow of biobased products includes biofertiliser, biomanure and bioenergy, which is also a source of revenue and thus value addition. However, such calculation also includes precision agriculture, weed cultivation, fish feed and various product-based approaches such as fish-based manure, biochar, etc, which have been omitted to make the paper too clumsy and lengthy. Analysis of Investment in the biobased industry, along with prospective employment generation, will provide a lot of solutions to the rural unemployment scenario, for which the assessment of the size of the Bioeconomy is the first step. Thus, the above analysis will provide a holistic approach in future research by suggesting alignment of the Economy with ecology.

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RIDE-HAILING FARE VARIATIONS: OLA & UBER PRICING ON ANDROID VS. IOS

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ABSTRACT

We investigate the extent to which fare volatility in ride-hailing service providers, i.e., Ola and Uber, varies based on the mobile operating system (Android vs. iOS) in India. Adopting a mixed-methods research strategy, we assess user experiences and real-time price signals to analyze whether ride-hailing platforms practice differential pricing based on device ecosystems. An online survey of 42 users and using a well-structured framework, captures consumers' experiences, concerns, and sentiments towards fare fairness and transparency. Additionally, systematic experimental fare estimation analysis under controlled conditions explores potential algorithmic bias in pricing mechanisms. The results indicate that price differentials are feasible, which has significant implications with regard to fairness, consumer confidence, and the need for regulatory intervention. This research meaningfully adds to the emerging literature in platform-based price-setting mechanisms, algorithmic decision-making systems, and digital market fairness. By examining the intersection of technology-consumer behaviour, this research meaningfully adds to policymakers, regulators, and researchers interested in enhancing transparency in the platform economy.

Keywords: Dynamic Pricing, Platform Economy, Algorithmic Bias, Consumer Perception.

1. INTRODUCTION

The ride-hailing sector has dramatically altered urban mobility in India, with Ola and Uber as market leaders. The industry has certainly increased convenience and access for scores of users, but issues of price variance and fare computation method transparency are still focal points. Of the many potential contributors to fare disparity, one fairly underexamined arena is the possible effect of the user's operating system namely, whether fares vary for riders who purchase rides via Android versus iOS devices.

To explore this problem, the research takes a mixed-methods stance, combining quantitative and qualitative findings. Both user surveys and comparisons of fares through experiments offer a comprehensive exploration of the subject matter. The research seeks to answer various important questions: Do users feel that there is a disparity in fares between Uber and Ola? Do they know or feel that there are fare differences based on the operating system of the device? Furthermore, the research aims to uncover what influences these beliefs, factors like platform loyalty, price mechanism clarity, and alternatives' availability all play their part.

Most importantly, the study moves beyond perception and empirically tests whether fare data observed in the real world confirm or disconfirm user perceptions. By contrasting fare estimates on Android versus iOS under systematic conditions, the work assesses the accuracy of these impressions. It also takes into account how perceived and actual pricing disparities might drive user behaviour, causing users to switch between apps, consider alternative means of travel, or look for bargains. This multi-faceted analysis helps to provide greater insight into digital price strategies and how they affect user trust and choice in the ride-hailing industry.

2. LITERATURE REVIEW

The sudden proliferation of ride-hailing services such as Ola and Uber has drastically altered the urban mobility landscape in India. As these online platforms continue to restructure commuting modes, issues relating to pricing transparency and justice have become more pertinent. This review of literature examines the confluence of user behaviour, pricing models, and platform economics, which forms the theoretical basis for examining potential fare differences on the basis of operating systems (Android vs. iOS). It integrates current literature to see how consumer attitudes, algorithmic choice, and online market architecture may together affect ride-hailing prices.

2.1 User Behaviour and Preferences in Ride-Hailing Services

Consumer behaviour is significant in the interpretation of fairness perceptions of prices and user responses to possible fare variation. Thakur and Sachdev (2025) provide a background view of consumer choice in India's ride-hailing segment, indicating the multifaceted interplay among service quality, app ease of use, vehicle supply, and experience. There is evidence that price, though

an element, is not the only driver of platform selection. Rather, consumers take into account a constellation of conditions, such as platform reliability and reactivity. This knowledge is crucial in addressing why some consumers will bear fare variations in moderation as long as other service characteristics are acceptable, while others will respond negatively to felt price discrimination.

Transparency and trust are key factors in user interaction with digital platforms. Pavlou (2003), in his own research on e-commerce, focuses on the central position of trust within consumers' decision processes, especially when price instability exists but is not transparent. Translating this to ride-hailing, users will be more inclined to stick with a platform if they trust that the pricing system is transparent and equitable—even when fares change.

2.2 Dynamic and Algorithmic Pricing

Dynamic pricing is the bedrock of ride-hailing apps, and its theoretical foundations are developed in great depth by Ögünlalp and Smith (2020). Their paper describes how prices in transport services are dynamically updated according to supply, demand, place, and time-of-day conditions. This pricing system is meant to maximize service efficiency and access; however, it also brings complexity and a lack of transparency that influence consumer attitudes. To consumers, unpredictability of dynamic pricing can lead to sentiments of distrust or unfairness if the variability is felt to be arbitrary or discriminatory across various operating systems.

Algorithmic pricing, the other core element of contemporary platform strategy, has significant ethical and legal issues. Ezrachi and Stucke (2016) caution about the threats of algorithmically informed price discrimination, which can result in latent collusion or abuse without explicit regulatory infringement. Likewise, Diakopoulos (2016) calls for more accountability in algorithmic decision-making to guarantee equity and transparency. Under the circumstances of ride-hailing, these findings imply the necessity to take a closer look at whether fare differentials observed are based on genuine operational factors or algorithmic tweaks that are not transparent but can disproportionately affect certain groups of users—like iOS users, who tend to be viewed as higher-paying customers.

2.3 Platform Economics and Regulatory Implications

Ride-hailing platforms are two-sided markets that bridge drivers and riders and balance the economic interests of both. Rochet and Tirole (2003) present an indispensable conceptualization of platform economics, highlighting the fine balance of pricing mechanisms required to ensure stability in demand and supply. These mechanisms are especially pertinent in the Indian context, where price sensitivity among consumers can have a significant impact on competitive forces.

Outside of platform-specific pricing choices, the general regulation of app ecosystems also needs to be understood. Ioannidis and Tsekeris (2023) discuss

the anti-trust effects of Apple's App Store policies and see that Apple's domination through high-rate fees and exclusion from distribution channels might pass extra costs to developers, which further could be transferred to consumers and lead to increased fares for iOS customers. Likewise, Thombre and Sannake (2021) (Survey on Ride-Hailing Fare Variations, 2025) examine Google's dominance of the Android app market and challenge the anti-competitive practices that could impact pricing and app availability.

Sari, Utomo, and Wibowo (2023) offer comparative legal insights into anti-trust regulation in platform economies. They emphasize region-based examination of technology behemoths and outline the world variation in the manner in which platform responsibility is handled. This view is critical for ride-hailing companies based in India, given that regulatory frameworks can influence the way pricing schemes are developed and perceived.

2.4 Relevance to the Current Study

The literature illustrates ride-hailing economics and interaction with users as a multifaceted phenomenon. It shows that pricing is not just a supply-demand affair but one influenced by consumer trust, platform design, and larger regulatory and economic environments. These findings are of direct applicability to the present research, which examines whether the operating system used in the device (Android or iOS) is a latent variable determining fare estimates on Uber and Ola. Combining data on user perceptions with experimental fare comparison is the approach adopted by this research to close the gap between theoretical predictions and on-ground realities of digital pricing. It ultimately aims to contribute to the overall debate on fairness, transparency, and accountability in algorithmic pricing models for the ride-hailing industry.

3. OBJECTIVES

The key goals of this study are to:

- I. Examine whether users notice fare differences between Ola and Uber.
- II. Study user opinions regarding fare differences while reserving rides using Android as compared to iOS devices.
- III. Explore the determinants of users' beliefs regarding platform-specific fares.
- IV. Measure the degree to which experimental fare differences indicate support or negation of user opinions of Android vs. iOS fare differences.
- V. Determine how differences in perceived and actual fares affect users' behaviour and decisions.
- VI. Assess customer views on price openness and equity of ride-hailing services.

4. METHODOLOGY

This research uses the mixed-methods methodology, combining quantitative survey data in a standard survey with experimental fare estimate analysis on ride-hailing applications. Through the synergy of user experience and actual price data on both Android and iOS operating systems, the research seeks to investigate whether differences in operating systems cause disparities in fares on Ola and Uber. This dual method allows for a comprehensive explanation of both the subjective and empirical aspects of the disparity in fare issue.

4.1 Survey Instrument

The survey was created with the aim of collecting both demographic details and user attitudes concerning ride-hailing fare transparency and platform-based price fluctuations. The initial part of the survey was used to collect demographic information, such as gender, age bracket, work status, residential area, major device used for reserving rides, frequency of utilizing ride-hailing apps, preferred app choice between Ola and Uber, and the principal method of payment for the user. These factors were instrumental in segmenting users and understanding behavioural patterns by demographic segment.

The second part of the survey was designed to assess user perceptions and beliefs about differences in pricing and transparency. This section consisted of a series of multiple-choice grids and Likert-scale questions aimed at determining whether users thought the fares between the two apps were different, whether they thought the OS of their device made a difference in price, and how much platform loyalty, availability of discounts, or quality of service were factors in choosing a platform. These statistics provided insight into the psychological and behavioural factors that drive user involvement with ride-hailing services.

4.2 Experimental Fare Comparison

Besides survey data, the study entailed experimental fare estimate analysis between Android and iOS operating systems. This was done by logging into a common user account on both iOS and Android devices and taking simultaneous screenshots of fare estimates of the Ola and Uber apps. Employing the same account on different devices accounted for account-related variables that could affect dynamic pricing models.

Experimental design involved three distinct ride scenarios, all departing from Lumbini Enclave, Bhubaneswar, India. The destinations chosen differed in distance: Janata Maidan was a short-distance ride(3.8km), Nexus Esplanade a medium-distance ride(9.3km), and Dhauli Shanti Stupa a long-distance ride(21km). These differing trip lengths enabled the study to check if any observed pricing difference was predictable across bands of distance. Fare screenshots were captured in five minutes to limit the effect of surge pricing or other real-time changes. Additionally, both devices were on the same internet network and set to the same configuration to limit outside factors such as location precision or network speed that could impact the fare shown.

4.3 Data Analysis Tools

The gathered survey responses were put to descriptive statistical analysis, compiling user demographics and aggregating user responses to perception-based items. This served to establish patterns and relationships between user characteristics and perceptions of price fairness, platform reliability, and OS-based distinctions. The objective was to establish if users felt fare disparities existed and if their beliefs were determined by determinants such as preferred platform or rate of app usage.

The experimental fare data was tabulated for comparison. The fares were categorized based on platform (Ola or Uber), device type (Android or iOS), and trip distance (short, medium, or long). This enabled a direct, side-by-side comparison of prices for different combinations. The fare differences were then analyzed to evaluate if there were systematic patterns that were present according to operating system, and if such empirical evidence concurred with or conflicted with the user expectations from the survey. Such comparative analysis helped bridge the gap between observable pricing actions and subjective user presumptions.

5. RESULTS AND DISCUSSION

5.1 Survey Results

The survey answers provide a broad picture of the demographics of ride-hailing users and attitudes towards fare discrepancy within platforms. There were 42 respondents to the study. The gender split was heavily male respondents, with 26 describing themselves as male, 15 female, and 1 not wishing to provide their gender. The age brackets were predominantly found in the 18–24 category, totalling 28 participants, followed by 12 participants in the 25–34 group, 1 participant in the 35–44 group, and 1 participant who was below the age of 18. No participant was more than 45 years old. From an employment perspective, the survey had a representative mix: 18 worked full-time, 5 part-time, 5 were either freelancers or self-employed, 13 were students, and 1 chose the category “other”.

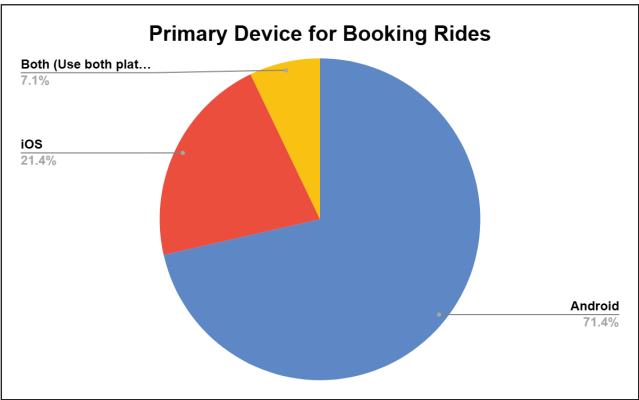


Figure 1: Primary Mobile Operating System Used for Ride Booking

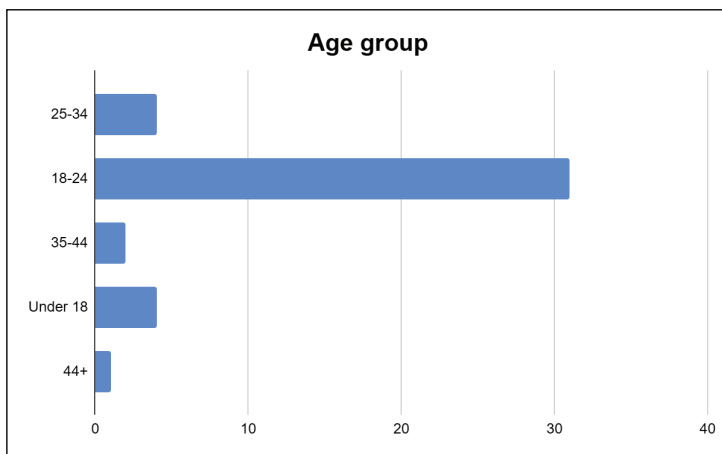


Figure 2: Age Group of Ride-Hailing App Users

As for geographical location, 19 of the respondents lived in Tier-1 cities, 18 in Tier-2, and 5 in Tier-3 cities, providing an even urban representation. On the question of the main device, they used for ride-hailing, 29 used Android devices, 10 used iOS devices, and 3 used both with equal frequency. The usage frequency of ride-hailing apps was not the same, as 16 individuals used such services every day, 19 used them occasionally a week, 6 used them occasionally a month, and 1 used them infrequently. Regarding app preference, 21 users preferred Uber, 15 liked Ola, 5 used both to the same extent, and 1 used a different service. For payment, the overwhelming majority (29) used UPI, followed by 7 using credit or debit cards, 3 using cash, 2 using Ola or Uber wallets, and 1 choosing “other.”

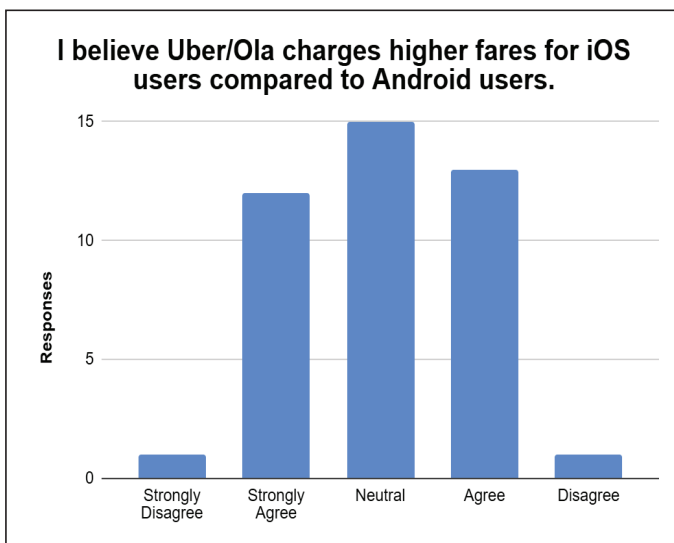


Figure 3: Perceived Fare Discrepancy for iOS Users on

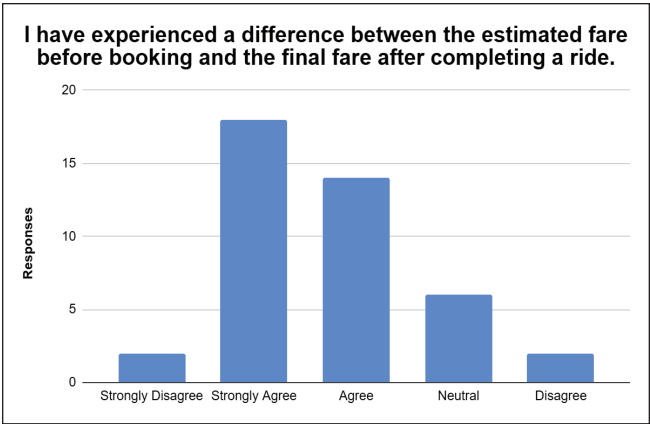


Figure 4: Fare difference between estimated and final ride fare

5.2 Ride-Hailing Platforms

Perceptions of users indicated high awareness of price gaps and fare equity concerns. About 90.5% said that they used ride-hailing apps like Ola and Uber quite frequently, and 78.6% asserted that they had ever used both apps for the same trip. A whopping 81% reported noticing discernible fare differences between Uber and Ola when pre-booking the same routes, while an identical percentage said they generally compare fares on both apps before confirming a ride. Discontentment regarding fare estimates also impacted user behaviour, with 76.2% reporting they used other ride-hailing services when not happy with Ola or Uber fares, and 69% switching to public transport or auto-rickshaws due to high fares.

Platform-based variations in pricing were also present in user experiences. Over half (59.5%) of the respondents had utilized ride-hailing applications on both Android and iOS platforms. Of them, 45.2% noticed variations in fares while booking the same trip on the two platforms. In addition, 28.6% of customers perceived that Uber or Ola charge higher fares to iOS users, possibly because of differences in perceived purchasing power. A considerable 35.7% had come across platform-specific promotional discounts, and almost half (47.6%) had mentioned altering the use of an app depending on price variations across platforms.

In addition to platform differences, the survey also uncovered larger pricing issues. A significant 85.7% of consumers had noticed a discrepancy between the initial fare estimated and the fare finally charged. Approximately 64.3% believed that the platforms jack up prices after a booking by adding hidden charges, and 42.9% felt that surge pricing patterns vary on Android versus iOS. Additionally, 73.8% reported that they were charged more even while travelling via the initial route, and 52.4% believed that Ola and Uber have different algorithms for customers on different platforms. A majority of 81% felt that the pricing practices were unjust, and 83.3% condemned the absence

of transparency in the pricing methods of Ola and Uber. Surprisingly, 35.7% felt that charging more on iOS was deliberate, premised on assumptions regarding users' financial ability.

The survey also picked up on behavioural reactions to fare irregularities. A large majority (78.6%) indicated checking out other ride-hailing apps when Ola or Uber fares were excessive, and 69% believed such alternatives provided more pricing transparency. Surprise fare increases prompted 66.7% to cut back on usage of Ola or Uber, and 54.8% said they trusted the pricing algorithms of rival apps more. Half of the participants stated they would switch between Android and iOS platforms to secure better fares if that option were feasible, while 45.2% indicated a preference for public transport due to inconsistent pricing on ride-hailing platforms. Secondly, 83.3% of them made a conscious effort to find promo codes or offers prior to making bookings, 61.9% used bike taxis or carpooling to escape overpricing, and 90.5% concurred that clear and fixed fares would improve their experience considerably. Last but not least, 85.7% of the respondents suggested that equal pricing on all platforms would make them more likely to use ride-hailing more often.

5.3 Experimental Fare Comparison Results

The experimental fare comparison revealed fare estimates for Ola on Android and iOS devices (Table 1) and for Uber on iOS and Android devices (Table 2).

Table 1: Ola Fare Estimates on Android and iOS

Trip	Origin & Destination	Device	Ride Type	Fare Estimate (₹)	Distance (km)
1	Lumbini Enclave to Janta Maidan	Android	Auto	90-95	3.8
1	Lumbini Enclave to Janta Maidan	iOS	Auto	92-97	3.8
1	Lumbini Enclave to Janta Maidan	Android	Mini,Prime Sedan	108-131	3.8
1	Lumbini Enclave to Janta Maidan	iOS	Mini,Prime Sedan	116-145	3.8
2	Lumbini Enclave to Nexus Esplanade	Android	Auto	156-163	9.3
2	Lumbini Enclave to Nexus Esplanade	iOS	Auto	156-163	9.3
2	Lumbini Enclave to Nexus Esplanade	Android	Mini,Prime Sedan	184-206	9.3
2	Lumbini Enclave to Nexus Esplanade	iOS	Mini,Prime Sedan	184-206	9.3
3	Lumbini Enclave to Dhauli Shanti Stupa	Android	Auto	258-267	21

3	Lumbini Enclave to Dhauli Shanti Stupa	iOS	Auto	258-267	21
3	Lumbini Enclave to Dhauli Shanti Stupa	Android	Mini,Prime Sedan	310-343	21
3	Lumbini Enclave to Dhauli Shanti Stupa	iOS	Mini,Prime Sedan	310-343	21

The fare comparison information gathered from both Uber and Ola on Android and iOS platforms captures minute but appreciable differences in costs, especially for shorter distances. In the case of Ola (Table 1), for Trip 1 (short-distance travel of 3.8 km from Lumbini Enclave to Janata Maidan), fare estimates for “Auto” rides varied between ₹90–₹95 on Android and ₹92–₹97 on iOS, indicating a slight iOS premium. For “Mini” trips, iOS users were quoted ₹108, whereas Android users got a higher quote of ₹116. Likewise, for “Mini, Prime Sedan” trips, Android fares fluctuated between ₹108–₹131, while iOS users were quoted between ₹116–₹145. These numbers point to the fact that iOS users faced slightly higher fares than their Android peers for journeys across shorter distances.

For Trip 2 (mid-length of 9.3 km from Lumbini Enclave to Nexus Esplanade), fare estimates between platforms were relatively in sync. For instance, the “Auto” and “Mini” ride types indicated the same fare range on both devices—₹156–₹163 for Auto and ₹184 for Mini rides. Even the “Mini, Prime Sedan” type indicated the same range of ₹184–₹206 on both platforms. Along the same lines, Trip 3 (a distance of 21 km to Dhauligiri Shanti Stupa) demonstrated consistent pricing across Android and iOS. “Auto” rides were pegged between ₹258–₹267, “Mini” rides at ₹310, and the “Mini, Prime Sedan” category at ₹310–₹343 on both platforms. This indicates fare variations are more noticeable in short-distance trips and decrease with longer travel distances.

Table 2: Uber Fare Estimates on iOS and Android

Trip	Origin & Destination	Device	Ride Type	Fare Estimate (₹)	Distance (km)
1	Lumbini Enclave to Janta Maidan	iOS	Auto	89.59	3.8
1	Lumbini Enclave to Janta Maidan	Android	Auto	89.98	3.8
1	Lumbini Enclave to Janta Maidan	iOS	Uber Go	110.11	3.8
1	Lumbini Enclave to Janta Maidan	Android	Uber Go	110.65	3.8
2	Lumbini Enclave to Nexus Esplanade	iOS	Auto	158.34	9.3
2	Lumbini Enclave to Nexus Esplanade	Android	Auto	158.73	9.3
2	Lumbini Enclave to Nexus Esplanade	iOS	Uber Go	200.79	9.3
2	Lumbini Enclave to Nexus Esplanade	Android	Premier	241.6	9.3

3	Lumbini Enclave to Dhauli Shanti Stupa	iOS	Auto	294.68	21
3	Lumbini Enclave to Dhauli Shanti Stupa	Android	Auto	295.07	21
3	Lumbini Enclave to Dhauli Shanti Stupa	iOS	Uber Go	381.33	21
3	Lumbini Enclave to Dhauli Shanti Stupa	Android	Premier	458.48	21

Focusing next on Uber (Table 2), fare estimates rose proportionally with trip distance, as would be expected. For Trip 1, the “Auto” fare on iOS was ₹89.59 and ₹89.98 on Android, while “Uber Go” was priced at ₹110.11 on iOS and ₹110.65 on Android—exhibiting scant differences. For Trip 2, Android users were offered “Auto” fares of ₹158.73 and a “Premier” fare of ₹241.6, while iOS users were quoted ₹158.34 for “Auto” and ₹200.79 for “Uber Go” (no “Premier” was offered on iOS for this trip). On Trip 3, once again “Auto” fares were almost exactly matched—₹294.68 on iOS and ₹295.07 on Android—but the “Uber Go” fare on iOS was ₹381.33 vs ₹381.45 on Android, with virtually no difference. A sole difference was witnessed in the “Premier” category, with Android having a much higher fare of ₹458.48, without any iOS equivalent to provide a direct comparison.

On the whole, the comparison of fares reveals that while Ola shows small but regular fare hikes for iOS users on short routes, these variations balance out at longer distances. Uber, however, keeps almost identical fare estimates across platforms with slight deviations, with the exception of certain premium ride categories where a direct comparison is not always feasible due to differences in availability. These results concur with user sentiments reflected in the survey, where almost half of the participants noted differences in Android and iOS fares, and over one-third opined that iOS users pay higher fares on the basis of presumed greater purchasing power.

5.4 Integration of Survey and Experimental Findings

The combination of survey data with experimental findings presents a multifaceted picture of users’ perceptions and observed pricing patterns in ride-hailing services. Although both sources of data are different in terms of approach—one measures subjective users’ experiences, and the other records observed fare differences—they complement each other in demonstrating how pricing strategies affect user trust, behaviour, and app choice.

(a) User Perceptions vs. Observed Differences: Of users polled, 45.2% said that they noticed differences in Android and iOS fares, and 28.6% specifically felt that iOS users pay a higher price. The experimental evidence partially confirms such an impression in the example of Ola. In short-distance journeys (Trip 1), iOS users always received a marginally higher fare quote compared to Android users—e.g., ₹116 on iOS versus ₹108 on Android for Ola Mini. But these platform-based fare variations

vanished in medium- and long-distance rides. Uber, on the other hand, exhibited negligible platform-based variation, with no systematic trend benefiting either OS. Hence, although user concerns are not baseless, the variations are quite small and manifest only under certain conditions, such as short-distance Ola rides.

- (b) **Fare Transparency and User Behaviour:** The sense of lack of price transparency was reinforced very strongly in the survey, with 83.3% of users expressing dissatisfaction with the transparency of fare structures. This is probably due to the dynamic and sometimes uncertain fare fluctuations observed in the experimental data. Even in a single application, various types of rides (Auto, Mini, Prime Sedan in Ola; Auto, Uber Go, Premier in Uber) have vastly different fare ranges for the same trip. The absence of standardization and the variability based on device, application, and ride type add to the impression that fare determination is not transparent. Consequently, 81% of consumers reported checking both apps before booking, highlighting the level of fare sensitivity and comparative behaviour.
- (c) **Price Sensitivity and Alternative Options:** The poll also revealed how the difference in fares affects consumer behaviour. A high percentage of users reported switching between apps or opting for cheaper transport modes depending on fare prices. The experimental results justify such behaviour, specifically for short rides where even a ₹5–₹10 disparity (as observed between Ola Auto and Uber Auto on iOS) would affect user choices. Further, the significant fare differences among ride categories (such as Uber Auto versus Uber Go or Ola Mini versus Ola Prime Sedan) also encourage users to choose the most cost-effective option on the basis of live estimates.
- (d) **Device-Based Pricing Issues:** While the experiment data failed to register consistent device-based pricing differences across all services and trips, the survey responses reveal a pervasive underlying anxiety among users. That iOS users are being systematically charged more seems to be based more on anecdotal experience and perception than on persistent empirical evidence. The small variations in Ola's short-distance pricing might be feeding into these perceptions even in the absence of general variation.
- (e) **App-Specific Pricing Patterns:** The results also indicate different pricing practices between Uber and Ola. Uber prices differ clearly between budget (Auto) and higher premium (Uber Go, Premier) services, with Uber Go consistently being more expensive. Ola has the same pattern but with greater overlap between types, such as Mini and Prime Sedan. These systematic variations probably underpin perceptions of non-transparent or unjustified fares, in particular when estimates vary considerably for what appear to be comparable rides. These app-specific fare dynamics are a main reason why users tend to compare and inspect fares on various platforms prior to booking.

In summary, the aggregation of the survey and experimental analysis identifies a sophisticated ecosystem where differential fares in actuality, pricing biases as perceived, and app-related strategies all influence user trust, decision-making, and platform loyalty.

5.5 Key Insights from Data Analysis

The joint analysis of experimental fare data and survey responses reveals some key findings on fare variability in the ride-hailing environment. Many users realize fare differences between Ola and Uber, and fewer between Android and iOS platforms. This is partly substantiated by the findings of experiments, which show that Ola shows slight but perceivable fare variations across platforms for short routes, while Uber's fares are mostly uniform on all devices. Transparency of fare computation turned out to be a chief concern of the users, with more than 83% being dissatisfied. Evidence from the experiment confirms this worry since fare differences, even when justified by variables such as ride type and app-exclusive models, are viewed by users as capricious and non-transparent. This subjective lack of transparency lowers trust and prompts users to compare fares between apps prior to reservation. In addition, the market is obviously price sensitive and competitive, with users regularly alternating between applications or modes of ride to gain cheaper prices, a justification borne out by the variation seen in the experimental data. Although the data for device pricing is sparse and inconsistent, particularly with regard to Uber, user belief clearly contradicts this, suggesting that individual experiences and prevailing opinion have an overwhelming influence on belief. Ride-hailing platforms thus need to overcome these perceptions ahead of time by articulating the equity of their pricing processes. Finally, app-based price strategies contribute significantly towards fare fluctuations. Uber tends to keep a stable price order, whereas Ola has greater fluctuation between ride types like Auto, Mini, and Prime Sedan. These app-based strategic differences not only influence fare outcomes but also tend to impact user preference and booking behaviour. Together, these observations highlight the need to strike a balance between strategic pricing and openness to ensure user trust and competitiveness.

6. CONCLUSION

The present research examined ride-hailing fare differences in terms of user attitudes and a comparison of Ola and Uber fares on Android and iOS operating systems. The survey data confirm considerable user concerns over fare transparency, fairness, and consistency. Most users have experienced estimates vs. actual fare differences and feel that there is a lack of pricing model transparency. The experimental comparison of fares showed some fare differences between Android and iOS, specifically for Ola in short-distance travel, and extreme differences between Ola and Uber. These results underscore the need for addressing user concerns regarding price transparency and the necessity for more research to fully capture the intricacies of ride-hailing prices

and their effects on user behaviour and trust.

Ride-hailing operators ought to have transparent and equitable pricing policies to maximize user satisfaction and build confidence in their services. The research further highlights the importance of having regulatory systems that provide equitable pricing and safeguard consumer interests in the fast-growing ride-hailing market.

7. LIMITATIONS

The present study is fraught with certain limitations which must be taken into account while interpreting the results. To begin with, the sample used in the survey was a mere 42 respondents, mostly youths in the 18–24 years age group belonging to Tier-1 and Tier-2 cities. Consequently, the observations made might not be entirely reflective of the overall Indian ride-hailing consumer base, particularly the elderly segments, Tier-3 cities, rural India, or diverse socio-economic classes. Secondly, the experimental component focused solely on two major ride-hailing platforms—Ola and Uber—while excluding other services available in the Indian market. Although this focus provides depth, it restricts the ability to generalize the findings to the wider ride-hailing landscape. Further, although price comparisons were done between iOS and Android platforms, the research did not factor in differences across various versions or models within these systems, which may have an effect on prices. There are a few essential limitations. The temporal constraint is an essential limitation; the experimental fare data is a snapshot in time and does not reflect variability induced by factors like time of day, day of week, demand spikes, traffic, or special events—all of which meaningfully affect dynamic pricing. In addition, the research did not analyze Ola's and Uber's internal fare-determination algorithms, which are undisclosed. Without access to these algorithms, the underlying reasons for fare fluctuation cannot be ascertained, and issues of transparency and fairness persist unresolved. Geographical coverage of the experiment is another constraint, as it was primarily carried out on trips that started from one location—Lumbini Enclave, Ward 14 North Zone. While introducing some destination diversity, a more complete analysis of multiple origins and zones within a city would help identify spatial pricing variations and trends that might not have been observed. Finally, the survey data were based on self-reported user input that could be subject to recall bias, social desirability bias, or misinterpretation of the survey questions. Even though respondent anonymity is upheld, the reliability and validity of the information could be compromised by such biases.

8. FUTURE RESEARCH DIRECTIONS

Future studies must work to overcome the limitations of this study and expand on its results through several avenues. First, increasing the diversity of samples is essential—future surveys need to sample a bigger and more diverse group of respondents by age groups, geographical locations (Tier-3 cities and rural areas), socio-economic classes, and varying usage patterns of ride-

hailing services to enhance the results' generalizability. Moreover, broadening the scope of experimental fare analysis across more trips during a wider set of times of day, days of the week, and under a variety of traffic conditions would offer a more profound and better understanding of fare variability. Longitudinal studies that track fare changes over time might also identify temporal trends and patterns in prices. Another critical research direction is algorithmic transparency. Joint efforts with industry professionals, data researchers, or regulatory bodies can reveal the fare-setting mechanisms of ride-hailing operators and inform the determinants of fare choice. Examination of user-specific and contextual factors, including trip history, loyalty program participation, payment method preference, usage behaviour of an app, and device type or model, can also contribute to understanding why people differ in their fare experiences. Moreover, understanding how contextual elements like trip purpose, group size, or luggage needs influence pricing would further enrich this analysis.

The use of qualitative or mixed-methods research methods might provide a more in-depth understanding of user experience and attitudes. Focus groups and in-depth interviews can better record the lived experience and issues of users than surveys; while mixing up qualitative and quantitative data might provide a more comprehensive understanding of the research issue. Finally, research in the future should explore the ethics and regulatory aspects of ride-hailing price practices. This involves looking at fairness issues, possible price discrimination, and consumer rights, as well as the wider implications for competition and policy within the digital transport market. Similar studies in other cities or nations would also be useful to make cross-cultural comparisons, to understand pricing strategies and user behaviour better across different economic and cultural contexts.

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AGRICULTURAL INSURANCE PROGRAM'S EFFICIENCY AS A SUSTAINABLE AGRICULTURAL DEVELOPMENT INITIATIVE

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ABSTRACT

Agriculture is essentially a risky activity because of its dependency on rainfall. Farmers diversify their crops and businesses, keep stabilisation accounts, or sell assets as a last option to reduce risk. Crop insurance is a supplemental institutional tool that helps farmers better manage risks. Given the significance of crop insurance in risk reduction, this study examines data from a comprehensive farmer survey to determine the considerations that farmers make before choosing a product. It then assesses the effects of that decision on farm income, production costs, and profitable investments in agriculture. Low crop insurance acceptance among farmers is mostly caused by a lack of knowledge about insurance products. Yet, those who incur greater crop loss and have some formal agricultural expertise are more likely to adopt insurance. The decision to purchase crop insurance is positively influenced by the premium subsidy. On the other side, the decision to purchase insurance is inversely correlated with factors including lower social status, tenant farming, and exposure to shortfall rainfall in the preceding year. The influence of insurance data does not conclusively show that insured farmers take on larger risks than uninsured farmers.

Keywords: Crop Insurance, Premium Subsidy, Drivers of Adoption

1. INTRODUCTION

Agriculture is a highly risky venture due to both uncertainty in crop production and volatility in prices. On the one hand, agricultural production depends on various climatic parameters like rainfall, humidity, sunshine and temperature; while variations in these weather indicators, from the requisite quantity needed for the plant at its various growth stages, adversely affect crop yield. The devastation caused to the agrarian economy due to the occurrence of weather-induced natural disasters such as drought, flood, hurricane, cyclone, and hailstorm is well known. Apart from weather risk, unforeseen contingencies like infestation of plant disease and pest attacks very often inflict huge crop losses. On the other hand, agriculture entails a substantial market risk due to wide variations in the input and output prices. For one, crop prices are more volatile because of difficulties in storage owing to the bulkiness and perishability of the products. For another, demand for agricultural products is relatively inelastic with respect to variations in price and income. As a result, supply shocks are manifested in wide variations in price. However, of all the risk factors affecting crop production, weather is typically the most significant.

Risks and uncertainties are common in agriculture, as there is a lag between decision-making and realising returns. There are several factors that affect the returns from farming, many of which are beyond the control of farmers. Due to climate change, the frequency of risks in farming has increased. Frequent exposure to risks makes farmers' income less predictable and affects their livelihood security. Farmers follow several ex-ante risk aversion strategies and ex-post risk coping strategies. Crop diversification, staggered sowings, self-stabilization funds, and contract farming are a few ways of reducing risk ex-ante. Once the risk is actualised, farmers follow diverse ways to cope with it. Sale of assets, borrowings (formal and non-formal) and government assistance are the traditional means of ex-post risk management. Many times, these methods fail because of the 'covariate nature' of risks. Risks affect almost all farmers of a region, and when many of them try to liquidate their assets, their prices fall. At the same time, due to increased demand, the interest rate on loans from informal sources climbs in an upward spiral. Government disaster payments, on the other hand, are uncertain and subject to many 'ifs and buts.'

Indian crop insurance schemes, to their credit, are the largest in the world in terms of farmers covered. At the same time, India also has the largest number of uninsured farmers in the world (Mahul & Verma 2010). Many earlier studies have pointed out abysmally low uptake of insurance products by farmers. Considering the importance of the insurance programme to an agrarian economy like India, the reason for its low popularity needs to be identified. One way of doing it is to characterise those who buy insurance against those who do not. At the same time, it is worth enquiring '*whether the insurance coverage makes farmers less risk-averse*', which is the expected impact of insurance.

2. REVIEW OF LITERATURE

Amarendra Reddy (2004) *"Agricultural Insurance in India – A Perspective"*, analysed the innovative techniques in agricultural insurance, which overcome some of the disadvantages of yield-based group insurance and suggests rainfall index insurance as a better alternative to the existing agricultural insurance scheme. The weather index-based insurance is also more compatible with reinsurance practices worldwide, which enables primary insurers to cover their regional risks by reinsuring themselves with international reinsurers.

S.S. Raju and Ramesh Chand (2008) *"A Study on the Performance of National Agricultural Insurance Scheme and Suggestions to Make it More Effective"*, found that different general insurance companies in the country may be assigned some reasonable targets to cover agricultural insurance, and to begin with, it could be equal to the share of agriculture in the national income.

Gurudev Singh (2010) *"Crop Insurance in India"*, found that the dependence of Indian agriculture on uncertain rains. In addition, the farmers experience other production risks as well as marketing risks related to different corrupt enterprises and for different agro-climatic regions and areas.

M. J. Bhende (2012) *"Agricultural insurance in India: Problems and prospects"*, revealed that the challenges of providing insurance to the Indian agricultural sector in a manner that is both meaningful and sustainable. A critical assessment of the existing initiative and the present possible options for improvement are presented.

Shrikrishna S. Mahajan (2012) *"Growth of NAIS: A study of crop insurance in India"*, found that nowadays, some farmers are committing suicide due to a lack of risk management. And they are selecting the option of suicide rather than crop insurance. Hence, there is a need of serious concern about this problem of sharing the risk of farmers and protecting their crops against adverse weather and natural calamities.

Daniel J. Clarke, Olivier Mahul, Kolli N. Rao & Niraj Verma (2013) *"Weather-Based Crop Insurance in India"*, concluded that the market structure for weather-based crop insurance products could better reward long-term development of improved product designs through product standardization, longer-term contracts, or separating the roles of product design and delivery.

Mukesh H. V. (2015) *"Impact of Crop Insurance on Indian Agriculture"*, analysed the issues and benefits of crop insurance. Traditional farmers are expanding their operations to include new and different options. In doing so, they are met with new liability, issues and new risk.

Aditya K, S., Md Tajuddin Khan & Avinash Kishore (2018) *"Adoption of crop insurance and impact: insights from India"*, identified the factors that influence farmers' decisions to buy crop insurance and subsequently assessed its impact on farm income, production expenses and productive investments in agriculture. Farmers' adoption of crop insurance is low, 4.80% kharif season

and 3.17% in the rabi season, mainly on account of a lack of awareness about insurance products.

Mamata Swain (2015) *“Performance of crop yield and rainfall insurance schemes in Odisha: some empirical findings”*, revealed that WBCIS performs better than NAIS because of its higher adoption rate, higher percentage of farmers benefited, lower premiums, faster claim payment, and frequent indemnity payment. Though the findings show WBCIS to be a more popular scheme than NAIS, in a frequently disaster-affected state like Odisha, the study sees a need for a multi-peril crop yield insurance scheme like NAIS.

Asis Kumar Senapati (2020) *“Do farmers value Insurance against Extreme Drought and Floods? Evidence from Odisha, India”*, highlighted several determinants of willingness to insure and empirically verifies the role of risk aversion in insurance purchase decisions. The lottery-choice experiment has been applied by the author to evaluate the risk attitudes of the sample households. Empirical results suggest that, as regards farmers’ risk preferences, risk aversion actually plays an important role, even though not directly, but in interactive terms with expected losses, which, in turn, significantly influences farmers’ willingness to purchase the insurance product.

3. OBJECTIVES

The objectives of the study are:

- (i) To study the factors influencing farmer’s crop insurance adoption decisions.
- (ii) To analyse the impact of insurance on farmer’s income, production expenses and investment in agriculture.

4. HYPOTHESIS

It is hypothesized that crop insurance would lead to less risk-averse behaviour and stabilise farmer’s income.

5. DATA AND METHODOLOGY

The study used data from the *“Situational assessment survey of farmers”* conducted by the National Sample Survey Office (NSSO) in 2019. The data set includes a sample of households spread across the villages of the districts of Odisha. The data were collected for two major agricultural seasons, namely kharif and rabi. In the ongoing insurance schemes, the state follows its own subsidy policy, and the subsidy varies across crops. Data from both the rabi and kharif seasons were merged to bring them to the household level. The household, which has insured any of the crops in either of the seasons, is considered as an adopter of crop insurance. The study uses analytical methodology and descriptive statistics, like simple statistical tools like average and percentage.

6. ADOPTION OF CROP INSURANCE

The information on the adoption of crop insurance by farmers is presented in Table 1. In the kharif and rabi seasons, respectively, only 4.80 and 3.17% of farmers had adopted crop insurance. Indeed, the numbers are shocking for Odisha, where small and marginal farms predominate in agriculture and more land is rainfed. Except for peanuts, soybeans, and cotton, even crop-wise examination shows that the extent of insurance is less than 10% (Table 2). The amount of insurance is less than 5% for the two most significant food crops in Odisha, rice and wheat. Even though a high percentage of farmers (more than 25% higher for most commodities) report crop losses, insurance coverage is generally inadequate. The fact that virtually no non-loanee farmers ensure their crops is another alarming statistic. For the kharif and rabi seasons, the percentage of optional crop insurance is 0.73 and 0.38%, respectively. The remaining farmers have obtained crop loans, which are coupled with crop insurance by law. Evidence suggests that the sum insured is very low, not even half of the average value of the threshold yield, implying smaller pay-outs at the event of crop loss (Damodaran 2016). In addition, 87% and 85% of the insured farmers who have also suffered crop losses report non-receipt of compensation. Even for farmers who have received the claims, it is not on time (Table 3). This highlights the need for improving the triggers in the crop insurance programmes. Cases like this, where farmers suffer the loss and yet do not receive any compensation, lead to dissatisfaction regarding the operation of the scheme.

Table 1: Adoption of crop insurance by farmers

Particulars	Type of Insurance	Kharif		Rabi	
		Number	%	Number	%
Insured	Loanee	2212	4.07	1335	2.79
	Non-loanee	398	0.73	180	0.38
	Sub total	2610	4.8	1515	3.17
Not insured	Not insured	51749	95.2	46314	96.83
	Total	54359	100	47829	100

Source: Authors' estimates based on data from 'Situational assessment survey of farmers'.

Note: The table presents insurance coverage considering the crop as a unit of analysis and not the farm as a whole.

Table 2: Crop-wise adoption of crop insurance by farmers (%)

Crop	Number of Farmers	Insurance coverage (%)	Farmers suffering crop loss (%)	Value of crop (Rs/ha)	Crop loss (Rs/ha)
Rabi					
Rice	4244	3.9	23.2	50628	19938
Sorghum	534	3.4	63.6	18594	16281
Maiz	1299	3.1	27.8	78344	24197
Wheat	10956	4.1	29.0	38900	13558
Green gram	2199	9.6	44.5	30040	19927
Red gram	496	2.8	46.2	31982	26493
Kharif					
Rice	18388	4.8	28.7	43583	16248
Sorghum	1679	7.9	49.5	17757	19598
Maize	4180	4.6	40.0	27692	15923
Green gram	132	8.9	63.6	18359	18440
Red gram	1239	8.2	40.3	30696	13258
Soybean	857	14.0	50.8	41366	33360
Cotton	1754	10.4	49.0	32419	16173
Groundnut	429	24.5	14.5	48614	16378

Source: Authors' estimates based on data from 'Situational assessment survey of farmers'

A high extent of 'basis risk', i.e., insured farmers having suffered crop loss and not given compensation, has its root in the design of schemes. Indian crop insurance schemes operate in the 'area approach'. The same rate will be used in the calculation of pay-offs for all the farmers in that area where the risk is actualised. Area-based crop insurance is effective only if a farmer's yield is correlated with area-yield, which is used for the calculation of claims (GOI, 2019b). It is not surprising that the major reason for non-adoption of the insurance scheme is the lack of awareness (Table 4). More than 70 % of the farmers chose not to insure their crops due to three reasons not unaware, not unaware of the existence of the facility and no need. The question here is, why

is there this apathy towards crop insurance? First, as noted earlier, the market on its own will not supply enough insurance as the preconditions for perfect competition cease to exist in the crop insurance market (Ahsan et al., 1982). Second, the banks, which act as a financial intermediary, have few incentives to promote insurance products. Third, the extent of basis risk is high due to poor triggers coupled with a small sum insured.

Table 3: Timeliness in settlement of claims (only for voluntary insurers who have reported losses)

Timeliness in Settlement	Kharif		Rabi	
	Number	%	Number	%
In time	15	5.9	8	7.3
Received but delayed	18	7.1	9	8.2
Not received	221	87.0	93	84.6
Total	254	100.0	110	100.0

Source: Authors' estimates based on data from 'Situational assessment survey of farmers'

Table 4: Reasons for not insuring the crop (in %)

Crop	Not aware	Not aware of the existence of the facility	Not interested	No need	Others
Rice	43.2	18.5	15.2	5.2	15.5
Wheat	20.8	13.1	19.1	5.8	15.8
Maize	46.4	18.6	12.2	4.7	16.7
Cotton	39.6	14	17.3	2.6	25.4
Red gram	41.1	16.3	14.7	3.3	24.6
Black gram	52.2	19.2	11.8	3.8	13
Soybean	44.8	16	17.6	2.8	18.8

Source: Authors' estimates based on data from 'Situational assessment survey of farmers'

However, in India, insurance is bundled with credit (mandatory insurance coverage for farmers who availed short-term credit). Hence, the observed impact of insurance can also be due to endogeneity between insurance and credit. As a check, we have used propensity score matching on voluntary insurers (for whom insurance is a choice). The treatment effect on none of the outcome variables is significant, in contrast to the earlier result. Therefore, the earlier results may be due to the simultaneous effect of credit and insurance. Hence, we conclude that no reliable empirical evidence has been found to show that insured farmers take more risk in farming. From the study of propensity score matching, the estimates do not find any evidence of crop insurance on outcome variables. In addition, it also highlights some limitations of the study.

Most of the variables included in the model are endogenous, except for deficit rainfall and subsidy. The models can best estimate the correlates, but do not reveal any causal relationship. Since the data doesn't include information on the sum insured, factors determining the depth of insurance coverage couldn't be analysed. The matching technique employed here does have inbuilt disadvantages, as we cannot control for many unobservable characteristics which might influence the allotment and impact of treatment.

7. CONCLUSION AND POLICY IMPLICATIONS

According to the report, only 4.80 and 3.17% of the sample farmers insured their crops during the kharif season, demonstrating how poorly crop insurance is being adopted by farmers. We discovered that farmers with more education and access to extension services are more inclined to insure their crops. The size of the land holding and premium subsidies were also found to improve the likelihood that farmers will purchase crop insurance. Tenants and farmers from lower castes are less likely to buy crop insurance. The study's findings regarding the effect of buying crop insurance on the value of output, crop production costs, and investments of rice growers are equivocal. Based on the findings, it is obvious that the extension mechanism must be a key component of spreading knowledge about crop insurance. To achieve widespread adoption of a financial product like insurance, awareness-building is essential. It is necessary to lower "basis risk" by enhancing the crop loss estimation triggers. When redesigning the crop insurance scheme, it is important to take tenant farmers and small farmers into account.

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IMPACT OF AGRICULTURAL TECHNOLOGY MANAGEMENT AGENCY (ATMA) ON FARMERS' INCOME AND EMPLOYMENT: A STUDY IN MAYURBHANJ DISTRICT OF ODISHA

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ABSTRACT

The Agricultural Technology Management Agency (ATMA) Play a Pivotal role in enhancing agricultural Productivity and Sustainability by promoting Modern Farming Techniques, extension services and capacity building programs. The objective of the study is to analyze how ATMA has influenced income levels and employment opportunities among farmers. This study evaluates the impact of ATMA on the income and employment of beneficiary farmers in the Mayurbhanj district of Odisha with a focus on its contribution to sustainable development. Using a sample size of 200 farmers, the research examines changes in farm income, employment opportunities and adoption of sustainable agricultural practices. The findings indicate a significant improvement in farmer's income levels and employment opportunities due to ATMA interventions, leading to greater economic stability and rural development. It was found from the study that the overall net return was increased by 46.87 percent. In the case of Kharif season, the net income and also the employment days increase compared to Rabi season.

Keywords: ATMA, Sustainable Development, Odisha, Farmers' income, Employment, Agricultural Extension.

1. INTRODUCTION

The extension system in agriculture has changed in India after the implementation of the ATMA scheme throughout India. The new institutional arrangement focused on a bottom-up approach in planning and decision-making. Farmers are now participating in planning as well as implementation of extension and research strategies at the district level. Nearly 45 percent of total money under ATMA is spent on farmer-oriented activities like organizing training programmes, conducting demonstrations, exposure visits for farmers mobilizing farmers to form FIGs/SHGs, etc. Since the inception of ATMA under support to State Extension Programmes for Extension Reforms (SSEPER) Scheme in April-2005 to December 2011, over 1,69,75,357 farmers, including 42,30,140 farm women (24.92%), had participated in farmer-oriented activities such as exposure visits, training, demonstrations and Kisan melas.

Organization of training programmes for farmers and other stakeholders is one of the most important activities of ATMA. Training is vital to induce motivation, create confidence and increase the efficiency of a farmer. It is a process by which desire, ideas, positive attitude, knowledge and skills are inculcated and reinforced. The present study is conducted to assess the impact of ATMA on the income and employment of beneficiary farmers in the Mayurbhanj district of Odisha.

2. OBJECTIVE

To study the impact of ATMA on the income and employment of beneficiary farmers in the study area.

3. METHODOLOGY

The present study was conducted in the Mayurbhanj district of Odisha, which has a larger percentage of tribal population following indigenous farming practices till today. The study covers four blocks of the Mayurbhanj district, like Shyamakhunta, Bangiriposi, Betnoti & Khunta. Out of these blocks, ten ATMA-adopted villages have been selected purposively from each block, and each selected village, again, five ATMA beneficiary farmers have been selected, so a total of 200 samples has been taken for the study. The entire numbers of beneficiaries of farmer were divided into four groups based on the magnitude of their holdings. The data was obtained utilizing the personal interview approach after the research design and interview schedule were finalized. The field survey approach was used to attain the given goals; both primary and secondary data were collected for the study.

4. RESULTS AND DISCUSSION

The socio-economic profile of ATMA beneficiaries is presented in Table 1. The family size of marginal, small, Semi-medium and medium farmers were found to be 3.91, 3.71, 3.17 and 6.33. Overall family sizes are as to be 3.75. Overall literacy percentages were found to be 87 percent.

Table 1: Socio-Economic Profile of ATMA Beneficiary Farmers

Particulars	Farm's Size of beneficiary farmers				Total
	Farm Size				
	Marginal	Small	Semi Medium	Medium	
Beneficiaries Farmer (N=200)	57	64	67	12	200
Number of family members	223	238	213	76	750
Average family size	3.91	3.71	3.17	6.33	3.75
Literacy of households (Numbers)	Marginal	Small	Semi Medium	Medium	
a. Illiterate	12 (21.05)	9 (14.06)	05 (7.46)	0 (0.00)	26
b. Primary School	18 (31.57)	11 (17.20)	09 (13.43)	04 (33.33)	42
c. Middle School	11 (19.30)	24 (37.5)	13 (19.40)	02 (16.67)	50
d. Higher Secondary School	09 (15.80)	18 (28.12)	24 (35.82)	02 (16.67)	53
e. University/College (UG/PG) and above	07 (12.28)	02 (3.12)	16 (23.89)	04 (33.33)	29
Literacy%	78.94	85.93	92.53	100.00	87
Total Literary	45	55	62	12	174
Total	57	64	67	12	200
	100.00	100.00	100.00	100.00	100.00

NOTE: Figures in parentheses indicate percentage of total.

Age-wise distributions of respondents are presented in Table 2. The majority of the respondents belong to the age group 25 to 60 years, followed by the age group above 60 years.

Table 2: Age-wise distribution of sample households in the study area

Age Group Years	Marginal (57)	Small (64)	Semi Medium (67)	Medium (12)	Total (200)
a. 18 to 25years	8	4	1	0(0.00)	13
b. 25to 60years	41	50	52	8	151
c. Above60 years	8	10	14	4	36
Percentage	100.00	100.00	100.00	100.00	100.00
Total:	57	64	67	12	200

Caste wise details of the sample household are presented in Table 3.

Table 3: Caste wise distribution of sample households in the study area

Category-wise size of Beneficiaries Farmer					
	(Below 1.00 hectare) Marginal (57)	(1.00-2.00 hectare) Small (64)	2.00-4.00 hectare, Semi- Medium(67)	4.00-10.00 hectare Medium(12)	Total in number
a. Schedule Tribe	31 (54.38)	28 (43.75)	15 (22.40)	0 (0.00)	74 (37)
b. Schedule Caste	18 (31.58)	20 (31.25)	14 (20.90)	0 (0.00)	52 (26)
c. O t h e r backward Caste	05 (8.78)	12 (18.75)	31 (46.26)	10 (83.33)	58 (29)
d. General	03 (5.26)	04 (6.25)	7 (10.44)	02 (16.67)	16 (8)
Total:-	57	64	67	12	200

NOTE- *Figures in parentheses indicate percentage of total*

The cropping pattern of selected households is presented in Table 4. It was observed that after the introduction of ATMA, the area under Paddy Crop decreased from 394 to 295 hectares, and the area under Maize, small millet, Pigeon-Pea, Groundnut, and turmeric was increased.

Table 4: Cropping pattern (Kharif crop) at sample farms in the study area (In % change) in hectares

Kharif Crop	Before ATMA(a)hectare				After ATMA (b)hectare				Before ATMA Total (a)	After ATMA Total (b)	Absolute Change (b-a)	Relative change (b-a)/ax100
	Marginal (57)	Small (64)	Semi Medium (67)	Medium (12)	Marginal (57)	Small (64)	Semi Medium (67)	Medium (12)				
Paddy area in%	47 (88.68)	107 (89.16)	138 (81.17)	102 (78.46)	32 (60.37)	86 (71.66)	108 (63.52)	69 (53.07)	394	295	-99	-25.12
Maize area in%	6 (11.32)	8 (8.66)	19 (11.17)	21 (16.15)	11 (20.75)	20 (16.66)	29 (17.05)	34 (26.15)	54	94	40	74.07
Small millet area in%	0 (0.00)	5 (4.16)	8 (4.70)	4 (3.07)	3 (5.66)	8 (6.66)	14 (8.23)	16 (12.30)	17	41	24	141.17
Pigeon Pea area in%	0 (0.00)	0 (0.00)	5 (2.94)	3 (2.30)	4 (7.54)	4 (3.33)	8 (4.70)	4 (3.07)	8	20	12	150
Ground nut area in%	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	3 (5.66)	2 (1.66)	8 (4.70)	3 (2.30)	0	16	16	16
Turmeric area in%	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	3 (1.76)	4 (3.07)	0	7	7	7
Total area (hec)	53 (100.00)	120 (100.00)	170 (100.00)	130 (100.00)	53 (100.00)	120 (100.00)	170 (100.00)	130 (100.00)	473	473	0.00	363.12
Total%	0.92	1.87	2.53	10.83	0.92	1.87	2.53	10.83	100.00	100.00	100.00	100.00
Average	0.92	1.87	2.53	10.83	0.92	1.87	2.53	10.83	2.36	2.36	0.00	1.81

Note: Figure in parentheses indicates percentage of total.

Cropping pattern of Rabi crop at sample farms in the study area is presented in Table 5. It was observed that after the introduction of ATMA, the area under Gram crop decreased from 143 hectares to 125 hectares, and the area under Mung bean also decreased from 127 hectares to 58 hectares. On the other hand, the area under Lentil, Pigeon Pea, and Cow Pea crops was increased from 127 hectares to 58 hectares. Pigeon Pea was also increased from 43 to 88 hectares. Total area under Rabi crop was increased, as it is evident from the result that there is a good and positive impact found in ATMA respondents in terms of increasing the area of Rabi Crop.

Table 5: Cropping pattern (Rabi Crop) at Sample farms in the study area (In % change) in hectares

Rabi Crop	Before ATMA (a) hectare				After ATMA (b) hectare				Before ATMA Total (a)	After ATMA Total (b)	Absolute Change (b-a)	Relative change (b-a)/ax100
	Marginal (57)	Small (64)	Semi Medium (67)	Medium (12)	Marginal (57)	Small (64)	Semi Medium (67)	Medium (12)				
Gram area in %	17 (34)	23 (34.32)	68 (48.22)	35 (30.70)	13 (20)	28 (39.43)	69 (50)	15 (15.30)	143	125	-18	-12.58
Lentil area in %	11 (22)	9 (13.43)	14 (9.92)	17 (14.91)	20 (30.76)	14 (19.71)	27 (19.56)	24 (24.48)	51	85	34	66.66
Pigeon pea area in %	4 (8)	8 (11.94)	13 (9.21)	18 (15.78)	15 (23.07)	13 (18.30)	28 (20.28)	32 (32.65)	43	88	45	104.65
Mung bean area in %	18 (36)	23 (34.32)	44 (31.20)	42 (36.84)	17 (26.15)	12 (16.90)	8 (5.79)	21 (21.42)	127	58	-69	-54.33
Cow pea area in %	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (2.81)	4 (2.89)	3 (3.06)	0	9	9	9
Mustard area in %	0 (0.00)	4 (5.97)	2 (1.41)	2 (1.75)	0 (0.00)	2 (2.81)	2 (1.44)	3 (3.06)	8	7	-1	-12.5
Total Area (Hec)	50 (100.00)	67 (100.00)	141 (100.00)	114 (100.00)	65 (100.00)	71 (100.00)	138 (100.00)	98 (100.00)	372	372	00	100.90
Total%									100.00	100.00	100.00	100.00
Average	0.87	1.04	2.10	9.5	1.14	1.11	2.05	8.16	1.86	1.86	0.00	100.90

Note: Figure in parentheses indicates percentage of total

Table 6: Net return from crop (per hectare) of sample farmers in the study area

Sl. No	Income from Crops	Before ATMA total net return (A)	After ATMA total net return (B)	B-A	% change in income increase
1.	Kharif Season	72468.06	168276.23	95808.17	56.93
2.	Rabi Season	76692.02	112503.34	35811.32	31.83
	Overall net return	149160.08	280779.57	131619.49	46.87

Net return from crop (per hec.) of sample farmers in the study area

Net return from crop (per hectare) of sample farmers in the study area is presented in table-06. Overall net return was increased by 46.89 percent. In the case of the Kharif season, the net income increased higher as compared to the Rabi season.

Table 7: Impact of ATMA on employment of beneficiary farmers (per hectare/days)

Sl. No	Employment of beneficiaries / Farmers	Before ATMA (A)	After ATMA (B)	B-A	% Change in Employment
1.	Kharif Season	51	68	17	25
2.	Rabi Season	38	50	12	24
	Overall net return	89	118	29	24.57

Impact of ATMA on the Employment of beneficiary farmers (per hectare) is presented in Table 7. Overall employment increased by 24.57 percent. In the case of the Kharif season, the employment days were higher compared to the Rabi season.

5. CONCLUSION

It was found from the study that the overall family size was 3.75; overall literacy percentages were found to be 87 percent. The majority of respondents belong to the age group of 25 to 60 years, followed by the age group above 60 years. The majority of selected farmers belong to the Scheduled Tribe, followed by Other backward Caste (OBC). The overall average size of holding was about 2.36 hectares. It was observed that, after the introduction/adoption of ATMA, the area under maize, small millet, Pigeon Pea, Groundnut, and Turmeric was increased. The total area under Rabi crop was increased, and also the cost and returns of all the crops were increased. The net return was increased in almost all the crops. Overall net return was increased by 46.87 percent. In the case of the Kharif season, the net income increased higher as compared to the Rabi season. Overall, employment increased by 24.57 percent. In the case of Kharif season, the employment days were higher compared to the Rabi season.

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PERFORMANCE OF PRIMARY AGRICULTURAL COOPERATIVE SOCIETIES IN ODISHA

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ABSTRACT

The agricultural sector plays a vital role in providing the economy with a sustained growth rate, food security and job opportunities. In a number of ways, agricultural credit contributes significantly to agricultural sustainability. In India, short-term cooperative finance is largely provided via primary agricultural cooperative societies (PACS). Currently, 97103 PACS are operational in India, despite 101636 PACS being registered, according to the National Cooperative Data Base Web Portal. Out of the 3293 registered PACS in Odisha, 3179 are currently operational. The study aims to analyse the performance of primary agricultural cooperative societies in Odisha. This study is based on secondary data from various sources. The study is analysed by taking various methods like percentage change, compound growth rate and credit deposit ratio. It has used several measures, including PACS's working capital, reserves deposits, paid-up share capital, and borrowings. A high credit deposit ratio is found. Increasing overdue is a major issue in the performance of PACS in Odisha.

Keywords: PACS, Loan Advanced, Recovery, Overdue, Odisha.

1. INTRODUCTION

Agriculture plays a pivotal role by contributing significantly to the whole economy. It continues to be the mainstay of the Indian economy as a whole, which has invigorated the overall development of all other sectors. Agriculture is an important sector of the Indian Economy as our country is an agrarian

land where 60% of its population belongs to an agricultural background and relies on agriculture as a principal source of income and contributing around 18.2% to the national GDP and a livelihood of about 42.3% of the population (Economic Survey of India 2023-24). The role of this sector is crucial as it gives job opportunities, food security and a sustained growth rate to the economy. This is where PACS play a pivotal role. Established to ensure sufficient institutional credit and paddy procurement for agriculture, PACSs have been instrumental in promoting financial inclusion and fostering agricultural growth. These are crucial for the progress of rural and underserved regions in a developing nation like India.

Co-operative credit structures have a unique structure of two types, i.e. Rural and Urban Co-operative Credit Structure. Again, Rural Co-operative Credit Structures are of two types, i.e. Long-term and Short-term. Long-term credit structure has a two-tier set-up with Primary Cooperative Agriculture and Rural Development Banks (PCARDBs) at the base and State Cooperative Agriculture and Rural Development Banks (SCARDBs) at the apex level. In contrast, short-term structure has a three-tier structure, i.e. State Co-operative Bank, District Central Cooperative Bank and Primary Agricultural Co-operative as follows:

- i) **State Co-operative Banks (SCB):** The highest tier of the short-term rural Co-operative credit structure is SCB. SCB provides refinance and subsidy of short, medium- and long-term loans for the smooth and effective function of DCCB and PACS. At present, 33 SCBs are functioning in India. In Odisha, the Odisha State Co-operative Bank Ltd has been functioning as an apex bank.
- ii) **District Central Co-operative Banks (DCCB):** A DCCB is a federation of PACS in a particular district and the middle tiers of the Co-operative Credit structure. DCCB provides refinance of short, medium and long-term loans and subsidies for the smooth and effective function of PACS and also deposits money from PACS. At present, 371 DCCBs are in operation in India, of which 17 DCCBs cater services Odisha. Bargarh District Central Co-operative Bank Ltd has its jurisdiction in the Bargarh district.
- iii) **Primary Agricultural Credit Societies (PACS):** Primary Agricultural Credit Societies (PACS) have a predominant position and the lowest tier in the rural Co-operative credit structure. Normally, a PACS is formed in a particular residential area by the members. PACS make available both short-term and medium-term loans to the members at reasonable interest rates to meet their agricultural purposes at easy terms, and also provide agricultural inputs, i.e. seed, fertilizer, pesticide, etc. Further, PACS undertake rural non-farm sector activities including cottage and small-scale industries, allied farm activities including animal husbandry, horticulture and such other business, services and activities for the development of the rural areas. According to the National Cooperative Database Web Portal, at present, 100512 PACS are registered, but 95896 PACS are functioning in India. In Odisha, there are 3293 registered PACS out of which 3179 are

running. In Bargarh district, 132 PACS are registered, of which 132 PACS are functioning, spread over different Blocks.

The Primary Agriculture Cooperative Credit Society plays an unparalleled role as far as short-term credit is concerned. Even though there are many other alternatives, which provide short-term credit to the farmers, the PACS continue to be the most preferred agency of the farming community. But the PACS are subjected to many problems like increasing overdue dues, inadequate capital base, and a lack of trained staff. So far, the studies conducted on the performance of PACSs are very limited and have not shed light on multi-facets of the problem. So, it is extremely essential to assess the past performance of PACS for formulating various financial policies and reforming the present structure.

2. LITERATURE REVIEW

Soni et al. (2012) in their article, with an objective to study the performance of cooperative banking in respect of agricultural credit & rural development and to study the role of cooperative banks in agricultural credit and to study the agricultural credit structure of the cooperative bank. Cooperative banks serve in the field of agricultural credit and rural development. The maximum number of respondents are satisfied with the functioning of the cooperative bank. The level of service of cooperative banks is very high. Cooperative banks are playing an extraordinary role in agricultural credit and rural development.

Kumar and Mehta (2018) in their study with the objective to analyze the trends and growth of Primary Agricultural Credit Societies in Haryana. For studying the trend and growth, compound annual growth rates (CAGR) were calculated for the study period, i.e. 2000-01 to 2014-15. They found that the number of Primary Agricultural Credit societies decreased at an annual compound growth rate of 11.93 per cent over the study period. Deposits have increased significantly over the study period in Haryana, but the share of deposits in working capital was small. The number of PACS in profit decreased while no of PACS in loss increased over the study period.

Sreedevi & Murugan (2018) in their study, using secondary data with an objective to analyse the overall performance of the PACCS and to analyse the performance regarding profit & loss. They found that primary Agricultural Co-operative Credit Societies are double-pronged instruments designed to fight against the contagion of rural indebtedness and to improve the lives of poor peasants. It is observed that the loss is due to the failure of beneficiaries in repaying their debts.

Singh et al. (2021) have used secondary data with an objective to analyse the performance of PACS in terms of the number of PACS, membership, share capital, reserves, deposits, borrowings and working capital and to analyse the credit disbursement pattern as well as the recovery performance of PACS. The collected data has been analysed with growth rate, percentage, compound

growth rate (CAGR) and ratio analysis. They found that the Recovery performance of disbursed loans is considered as financial performance of PACS. A high credit-deposit ratio is also found. Mounting overdue is a major issue in the performance of PACS, as debt relief schemes announced by the government make borrowers reluctant to timely repay the loan.

Dahariya et al. (2023) in their study with an objective to determine the growth in physical performance Indicator of PACS and to examine the loan disbursement by PACS, Dharampura. The objective of the study has used the data with the simple average and percentage method. The results were presented on a relative percentage change on a triennium ending average basis. Recovery of loan and limited area of operation are the major constraints in the working performance of PACS, and regarding the management part is concerned modern tools and techniques like e-banking, etc. are lacking.

Sahore (2024), in her article, with an objective to examine the financial management practices of PACCS across various Indian states, focusing on their role in delivering short-term and medium-term agricultural credit. Using financial ratios like the loan-to-deposit ratio, non-performing assets (NPA) ratio, and capital adequacy ratio, the study evaluates the efficiency of PACCS in managing its financial resources. She found that PACCS have played a crucial role in extending finance to farmers, especially those who are small and marginal. The analysis reveals a decreasing trend in the number of PACCS generating profits, along with rising losses. The fall may be ascribed to several issues, including mismanagement, insufficient financial knowledge among members, and heightened competition from other funding sources. Through the implementation of efficient management techniques, the enhancement of training programs, and the cultivation of a supportive policy framework, PACCS can maintain its crucial position in the rural economy.

Vijaya (2024) in their study examined how the integration of technology has enhanced governance within the Primary Agricultural Cooperative Societies (PACS) in Odisha. The objective of the study is to use the qualitative data collection method to explain the paper. They found that computerization of records and Aadhaar-linked services reduced corruption and manual errors, while digital tools streamlined service delivery and financial management. These changes empowered farmers by making processes more accessible and reliable. Despite initial challenges like resistance to change and infrastructure gaps, the overall impact of technology led to more efficient and trustworthy cooperative operations.

3. OBJECTIVES

The present study has been conducted with the following important objectives:

1. To study the performance in terms of the number of PACS, membership, share capital, reserves, deposits, borrowings and working capital of PACS in Odisha.
2. To examine the credit disbursement pattern of PACS in Odisha.

4. METHODOLOGY

In this study, an attempt has been made to analyse the performance of primary agricultural cooperative credit societies in Odisha. This study is based totally on secondary data collected from the National Federation of State Cooperative Banks Ltd. (NAFSCOB) and other published sources for the period from 2006-07 to 2016-17. The collected data has been studied with annual growth rate (percentage change), compound annual growth rate (CAGR) and ratio analysis.

$$\text{Percentage change} = \frac{\text{Current year value} - \text{Base year value}}{\text{Base year value}} \times 100$$

$$\text{Credit Deposit ratio} = \frac{\text{Total loan advanced}}{\text{Total deposit}}$$

$$\text{Compound annual growth rate (CAGR)} = \left(\frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{\frac{1}{n}} - 1$$

- Ending value = value at last year
- Beginning value = value at first year
- n = number of years between them

5. DATA ANALYSIS

Primary Agricultural Credit Societies (PACS) have played a crucial role in the overall agricultural development in Odisha. The performance of PACS has been analysed with various components by taking the data from 2002-03 to 2022-23 in the following tables.

Table 1 illustrates the year-wise growth rate in the number of PACS and membership of PACS in Odisha. Here, the data on the total number of PACS and total membership have been taken from 2002-03 to 2022-23. Initially, it was found that the total number of PACS and total membership were 3864 and 22117.78, but finally they were 2703 and 6973.62, respectively. The maximum total number of PACS and membership of PACS is found in 2004-05 and 2002-03 as 4036 and 22117.78, respectively. The maximum percent change is recorded in the years 2012-13 and 2015-16 were 10.15498 and 24.23802, respectively. The maximum reverse percentage change is recorded as -31.2202 and -72.4467 percent in the year 2010-11, respectively. In the context of the compound growth rate of the number of PACS and membership for a whole study period, it is found to be -1.7 percent and -5.3 percent, respectively. There is a fluctuation in the percentage changes in the number of PACS and membership over the years.

TABLE 1:Year-wise Performance of Number and Membership of PACS in ODISHA

(Membership 000 thousand)

Year	Total no of PACS	Percentage change	Total membership	Percentage change
2002-03	3864	-	22117.78	-
2003-04	3845	-0.49172	16850.93	-23.8127
2004-05	4036	4.96749	17389.93	3.198637
2005-06	3860	-4.36075	17215.99	-1.00023
2006-07	3860	0	17363.83	0.858737
2007-08	3813	-1.21762	16,349.56	-5.84128
2008-09	3564	-6.53029	16,174.02	-1.07367
2009-10	3565	0.028058	16166.06	-0.04921
2010-11	2452	-31.2202	4454.28	-72.4467
2011-12	2452	0	4316.21	-3.09972
2012-13	2701	10.15498	5281.66	22.368
2013-14	2701	0	5281.66	0
2014-15	2701	0	5281.66	0
2015-16	2701	0	6561.83	24.23802
2016-17	2701	0	6564.56	0.041604
2017-18	2701	0	6502.25	-0.94919
2018-19	2701	0	6398.34	-1.59806
2019-20	2701	0	6398.34	0
2020-21	2701	0	6478.96	1.260014
2021-22	2701	0	6478.96	0
2022-23	2703	0.074047	6973.62	7.634867
CAGR	-1.7%		-5.3%	

Source: Annually Published Reports of NAFSCOB

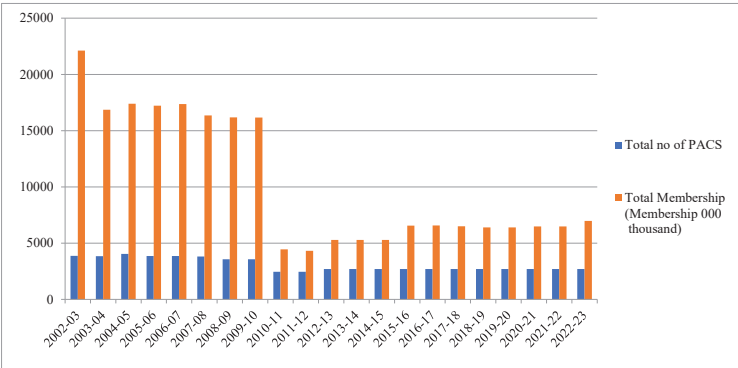


Fig. 1: Performance of the number and membership of PACS in Odisha

Table 2 illustrates the compound growth rate of share capital, reserves, deposits, borrowings, and working capital of PACS in Odisha. The maximum paid-up share capital, reserves, borrowings and working capital were 88152.38 lakhs, 177446.12 lakhs, 2064833.03 lakhs and 1145466.61 lakhs, respectively. Despite the maximum deposit being found as 237687.00 lakhs in the year 2008-09. Whereas the minimum figure of all these is found as 16166.06 lakhs, 1962.57 lakhs, 1861.87 lakhs, 240.93 lakhs and 1178.53 lakhs, respectively, in the year 2009-10. The compound growth rate of share capital, reserves, deposits, borrowings and working capital for the whole study period has been calculated as 6.4 percent, 12.2 percent, 4.7 percent, 14.2 percent and 4.7 percent, respectively, which shows an increase over the study period.

TABLE 2: Year-Wise Performance of Paid-up Share Capital, Reserves, Deposits, Borrowings and Working Capital of PACS in ODISHA

(Amount in Rs. lakhs)

Year	Paid-up share capital	Reserves	Deposits	Borrowings	Working capital
2002-03	24047.00	15857.00	215766.00	125927.00	440121.00
2003-04	25928.00	18384.00	227477.00	144329.00	482009.00
2004-05	27507.00	20114.00	227248.00	155276.00	494987.00
2005-06	27182.00	18022.00	226859.00	159120.00	496403.00
2006-07	28536.00	18125.00	228793.00	171601.00	509046.00
2007-08	32994.00	19112.00	234176.00	224081.00	574649.00
2008-09	34074.00	20085.00	237687.00	225552.00	610037.00
2009-10	16166.06	1962.57	1861.87	240.93	1178.53
2010-11	29017.00	8446.00	79821.00	262574.00	397296.00
2011-12	38334.00	6434.00	107370.00	1406804.00	388778.00
2012-13	40280.05	6681.68	118152.57	1465749	457536.01
2013-14	40280.05	6681.68	118152.57	1465749	457536.01
2014-15	40280.05	6681.68	118152.57	1465749	457536.01
2015-16	53492.62	10367.73	153178.29	1660583.46	592969.73
2016-17	58287.62	10689.86	157911.82	1687023.58	603586.92
2017-18	59541.24	9660.8	150286.32	1708368.26	605485.8
2018-19	60729.12	7439.34	153769.41	1731870.68	1023078.34
2019-20	60729.12	7439.34	153769.41	1731870.68	1023078.34
2020-21	66173.01	7995.96	152711.64	1758017.82	1070176.47
2021-22	66173.01	7995.96	152711.64	1758017.82	1070176.47
2022-23	88152.38	177446.12	568806	2064833.03	1145466.61
CAGR	6.4%	12.2%	4.7%	14.2%	4.7%

Source: Annually Published Reports of NAFSCOB

Table 3 depicts year-wise credit disbursement and outstanding credit from 2002-03 to 2022-23. The maximum amount of credit disbursement and outstanding occurred in 2022-23 as 932874.15 lakhs and 870004.27 lakhs, respectively, and the maximum percent change occurred in 2015-16 as 77.14751 percent and 78.19106 percent, respectively. And the minimum credit disbursement and outstanding occurred in 2010-11 as 251976.37 lakhs and 234810.33 lakhs, respectively. And the minimum percentage change was -30.0453 percent and -32.2765 percent, respectively, in the same 2010-11 year. Compound growth rate of loan advanced and loan outstanding for the whole study period is calculated as 6.4 percent and 5.5 percent, respectively.

TABLE 3: Year-wise Performance of Loan Disbursement and Loan Outstanding in ODISHA

(Amount in Rs. lakhs)

Year	Total disbursement	Percentage change	Total outstanding	Percentage change
2002-03	255136.09	-	280622.26	-
2003-04	278509.51	9.161158	273066.62	-2.69246
2004-05	288811.99	3.699148	289789.07	6.123945
2005-06	292859.33	1.401375	289032.50	-0.26108
2006-07	302950.80	3.445842	307639.74	6.437767
2007-08	327413.32	8.07475	355819.91	15.66123
2008-09	323481.91	-1.20075	336763.06	-5.35576
2009-10	360199.40	11.35071	346719.17	2.956414
2010-11	251976.37	-30.0453	234810.33	-32.2765
2011-12	296730.26	17.76115	278826.91	18.74559
2012-13	321589.33	8.377666	302354.73	8.438145
2013-14	321589.33	0	302354.73	0
2014-15	321589.33	0	302354.73	0
2015-16	569687.5	77.14751	538769.11	78.19106
2016-17	602563.57	5.770895	560954.19	4.117734
2017-18	618342.82	2.618686	600094.32	6.97742
2018-19	636070.5	2.866966	623767.45	3.944902
2019-20	636070.5	0	623767.45	0
2020-21	660471	3.836131	651375.13	4.425957
2021-22	660471	0	651375.13	0
2022-23	932874.15	41.24377	870004.27	33.56424
CAGR	6.4%		5.5%	

Source: Annually Published Reports of NAFSCOB

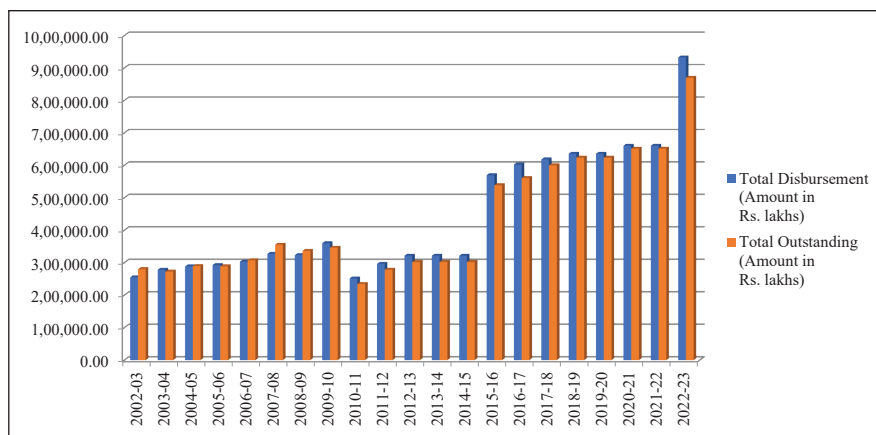


Fig 2: Performance of Loan Disbursement and Loan Outstanding in ODISHA

Table 4 illustrates the credit-deposit ratio for the period from 2002-03 to 2022-1. Credit-deposit ratio of PACS reflects the liquidity of credit institutions. A very low ratio indicates that credit institutions are not properly utilizing their resources. Alternatively, a high ratio indicates more dependence on other sources of funds besides deposits. The maximum credit deposit ratio is observed as 1.182467 in the year 2002-03, and the minimum credit deposit ratio is observed as 4.324955, which is the same in both years from 2020-21 to 2021-22.

Table 4: Year-wise Credit-Deposit Ratio of PACS in ODISHA

(Amount in Rs. lakhs)

Year	Total advances	Total deposits	C/D Ratio
2002-03	255136.09	215766.00	1.182467
2003-04	278509.51	227477.00	1.224341
2004-05	288811.99	227248.00	1.270911
2005-06	292859.33	226859.00	1.290931
2006-07	302950.80	228793.00	1.324126
2007-08	327413.32	234176.00	1.398151
2008-09	323481.91	237687.00	1.360958
2009-10	360199.40	238150.00	1.51249
2010-11	251976.37	79821.00	3.156768
2011-12	296730.26	107370.00	2.763624
2012-13	321589.33	118152.57	2.721814
2013-14	321589.33	118152.57	2.721814
2014-15	321589.33	153178.29	2.099445
2015-16	569687.5	157911.82	3.607631

2016-17	602563.57	150286.32	4.009437
2017-18	618342.82	153769.41	4.021234
2018-19	636070.5	153769.41	4.136522
2019-20	636070.5	153769.41	4.136522
2020-21	660471	152711.64	4.324955
2021-22	660471	152711.64	4.324955
2022-23	932874.15	568806	1.640057

Source: Annually Published Reports of NAFSCOB

Fig 3: Credit-Deposit Ratio of PACS in Odisha

6. RESULTS AND DISCUSSION

The results of the study have been derived from the above-stated discussion about the performance of primary agricultural cooperative societies in terms of the number of PACS and number of memberships, Year-Wise Performance of Paid-up Share Capital, Reserves, Deposits, Borrowings and Working Capital of PACS, Loan Disbursement and Loan Outstanding and Credit-Deposit Ratio of PACS in Odisha. Recovery performance of disbursed loans is considered the financial recovery performance of PACS. There is a negative compound growth rate of the total number of PACS and the total number of memberships in PACS, as the negative rate is found there. Under the study of the performance of paid-in capital, reserves, deposits, borrowings and working capital of PACS, there is found a positive growth rate is found over the years. There is a positive growth in these amounts under loan disbursement and loan outstanding amount also. The credit deposit ratios also over the years have increased, and total advances is more than the total deposit amounts.

7. POLICY SUGGESTIONS

The following suggestions are:

- It should promote transparency in decision-making in financial operations and encourage member participation in PACS.
- It should ensure timely credit recovery and proper follow-up on non-performing assets (NPAs).
- The PACS financial operations should be digitalised to ensure transparency and reduce leakages.
- Credit limit should be increased, and the amount of loan should be provided in-time to borrowers.
- There should be long-term loan provisions for the long-term financial needs of the borrowers.
- There should be provision of use of mobile apps and other online modes for better management of this whole system of communication, record keeping and farmer participations.

- g) It should encourage financial inclusion by targeting small and marginal farmers.
- h) Borrower members should be motivated for prompt repayment of the loan.
- i) PACS employees should be provided with training from time to time about the efficient operation of the societies.
- j) The staff employees should maintain cooperative behaviour with the people, and the necessary information should be provided to them.

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ECONOMIC DISPARITIES AMONG DISPLACED PEOPLE: A STUDY OF LOWER SUKTEL DAM PROJECT BOLANGIR DISTRICT, ODISHA

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ABSTRACT

Displacement caused by development, particularly by large infrastructure projects like dams, often results in long-term socioeconomic consequences for the communities that were affected. A prime instance of this is the Lower Suktel Dam Project in Odisha, India, where thousands of people, mostly from underprivileged communities, were uprooted from their ancestral lands in exchange for promises of compensation and rehabilitation. But in addition to upending traditional means of subsistence, the shift has made economic inequality worse. By concentrating on a sample of 100 displaced households from villages impacted by the Lower Suktel Dam project, this study seeks to understand the extent and character of these discrepancies. Both quantitative and qualitative data were gathered using a mixed-methods approach to evaluate post-displacement livelihood sustainability, employment trends, income changes, and access to land and services. According to the data, the majority of displaced households switched from self-sufficient farming techniques to irregular wage labour, and their incomes drastically decreased. Economic vulnerabilities have been exacerbated by land loss, poor compensation, and restricted access to public services like healthcare and education. It was shown that older family members and women were disproportionately impacted and had fewer options for economic reintegration. The report urges a change to more fair, durable, and participatory resettlement frameworks and identifies significant flaws in state-led rehabilitation initiatives. This study adds to more profound discussions on inclusive development and social justice in infrastructure design by collecting the lived experiences of displaced communities. The study underscores the need for immediate measures that actively promote economic inclusion and long-term resilience, while also mitigating loss.

Keyword: Lower Suktel Dam, Displacement, Development, Compensation, Odisha.

1. INTRODUCTION

The development of a country requires the extensive utilization of its resources. Since the end of World War II, growth has quickened to meet the rising expectations of the public, especially in third-world nations. These nations are increasingly realizing the need for development programs and the fact that raising funds and using them to improve impoverished regions requires a great deal of sacrifice, especially from the weaker segments of society. The vast majority of people in a developing country like India reside in rural regions and face widespread unemployment, ongoing poverty, subsistence farming, and inadequate basic facilities, even after large-scale development projects have been put into place. Since gaining independence in 1947, several development projects have been carried out under the various Five-Year Plans to raise the standard of living for its citizens through "*planned development*." Commercial forestry, transportation networks, dams, mining, and industrial and associated infrastructures are some examples of these projects.

The displaced people have social, economic, and environmental problems as a result of the country's development-induced relocation. When compared to other projects in the nation, the number of persons displaced and the severity of the issues caused by infrastructure projects in general and multifunctional dam projects in particular are disproportionate. In both industrialized and developing countries like India, progress has historically been accompanied by ecological shifts, environmental degradation, and forced relocation.

In light of the previously indicated problem, the unfavorable ambitious impacts that mostly stem from the development project are becoming increasingly vexing. Because of this, many development initiatives have been unpleasant, even if they have helped the nation's economy grow more quickly. More and more people are worried about what will happen to those who have to move because of different development initiatives. Unauthorized relocation is not new. Communities reorganize in response to pressures for industrialization, urbanization, modernization, and the construction of large dams; marginalization is not a recent phenomenon. In several regions of the country, the growing, vehement opposition to forcible relocation and expulsion had taken shape. Token opposition is all that such forced migration has been able to offer. Despite the efforts of governmental and non-governmental organizations, international institutions like the World Bank, and other rehabilitation and resettlement programs, the situation of individuals who have been displaced persists. Additionally, the country's experience with development initiatives shows that the lengthy migration process has had negative sociocultural and psychological repercussions that are felt by many. Additionally, it is well documented that forced transfer has resulted in "*a spiral of impoverishment*," as Michael Cernea put it, with very few exceptions.

A worldwide issue is the mass population displacement caused by the construction of big dams. The magnitude of the displacement problem can be comprehended by looking at worldwide data. There are no trustworthy global

statistics on development-related displacement. Fewer people are therefore aware of its detrimental effects on society. However, based on the available data, it is feasible to calculate that the construction of dams has resulted in the forced relocation of 80 million people globally. Evidence indicates that those affected usually face poverty and marginalization, even though the bulk of their fate is unknown (Center for Global Development, April 11, 2017). A World Bank assessment estimates that as of the end of 2015, 65 million people, or almost 1% of the world's population, were living under forced relocation. When all internally displaced people come together to form a single country, it will be the twenty-first largest in the world, on par with Thailand or the UK (Forced Displacement: Refugees, Internally Displaced and Host Communities).

Many people in developing countries are being forcibly removed from their homes and relocated to make room for development projects to be constructed in their ancestral country. The impact of Western development paradigms, which emphasize project-based economic growth, is to blame for this. Needless to say, forced population relocation and displacement have become significant worldwide challenges under the current development model. Large numbers of people, especially the underprivileged, are being uprooted from their homes and hearths as a result of numerous large-scale development programs meant to increase national economic growth. They are deprived of their means of self-sustenance and subsistence. It should go without saying that one of the development initiatives that has significantly uprooted human communities globally is the construction of huge dams. Discussing the theoretical discourse on development-induced displacement from a wider angle and connecting the theoretical understanding to the current research problem in India in general and Odisha in particular are essential in this context.

2. A THEORETICAL ANALYSIS OF DISPLACEMENT AND DEVELOPMENT

Progress and displacement have a complicated relationship; infrastructural projects, industrialization, and urbanization are some of the reasons why progress frequently leads to displacement. Even though development is essential for social advancement and economic prosperity, it frequently results in social upheaval, livelihood loss, and cultural deterioration. Scholars investigate these topics, evaluating the moral, social, and financial ramifications and promoting laws that strike a balance between environmental preservation, human rights, and development.

Involuntary dispossession has increased in the neoliberal period due to industries including mining, the construction of dams, and industry. Large-scale projects like the Sardar Sarovar Dam, for example, will force thousands of people to relocate, frequently leaving them without new means of income. Land conflicts and the strengthening of market-oriented development policies are the two outcomes of displacement. Both the displaced and the host communities are impacted by displacement.

There are two primary viewpoints among academics regarding displacement. While the “reformist-managerial” position acknowledges displacement as a necessary component of development but supports appropriate resettlement procedures, the “*radical movementist*” camp challenges the development paradigm and urges alternatives. Cernea (2003) emphasizes that while displacement is a drawback of progress, there are instances when it is required for the greater good of society.

Infrastructure projects have increased in India as a result of the neoliberal economic phase, with the federal and state governments promoting growth in spite of local worries about the effects on the environment and society. Despite being viewed as necessary for progress, the influx of both international and domestic wealth brought about by the liberalization of investment rules frequently results in the suffering of displaced inhabitants. People who are relocated suffer greatly because they lose their homes, means of subsistence, and social networks, particularly when huge dams are involved.

Since more than 3600 dams have been built and many more are being developed, India has one of the biggest displacement problems in the world. Millions of people have been displaced and habitats destroyed by dams built for irrigation and hydropower. The method frequently prioritizes commercial and technological objectives over the needs of displaced populations. For those impacted, these results in unresolved social, economic, and environmental issues.

Over time, the displacement brought on by massive dams has gotten worse, causing displaced populations to become marginalized and excluded. Many displaced persons still have social and economic difficulties in spite of rehabilitation attempts. Particularly for underprivileged groups, the effects of forced relocation, such as the loss of land and the devastation of ecosystems, have had long-lasting detrimental effects.

2.1 Dam-induced Displacement in Odisha

One of India’s least developed states is Odisha. Despite a number of development initiatives and programs, Odisha has experienced regional inequalities and disparities. Even after nearly 70 years of independence, the majority of this state’s impoverished residents come from some of its most underdeveloped areas. The vast majority of people in Odisha, nearly 85% live in rural regions and work mostly in agriculture. Agriculture has never been given priority, even though it provides 85% of the population with their main source of income and jobs.

The story of development in Odisha through massive dam projects is replete with noteworthy data that illustrate both advancement and the expense of relocation. This is demonstrated by the Hirakud structure, which spans the Mahanadi River and is the longest earthen structure in Asia. It was finished in 1957 with the intention of supplying hydroelectricity, irrigation, and flood control. It makes a significant contribution to Odisha’s energy and agricultural

sectors by producing 307.5 MW of hydroelectric power and irrigating more than 1.55 million hectares of land, but the human cost has been high. About 180,000 people, mostly from tribal tribes, were displaced as a result of the project; many of them lost their ancestral homes and farmlands (Jaysawal, 2018). Similar to this, thousands of people have been relocated and large tracts of forest and agricultural land have been drowned by the Indravati Dam, another significant project. The efforts at restoration and compensation have frequently been condemned as insufficient, despite the promise of progress. A clear image of the intricate relationship between dam construction, relocation, and development in Odisha is painted by this numerical juxtaposition, which highlights both the successes and the setbacks (Shiduqui, 2019).

The long-standing balance between the settled population and their surroundings has been upset by development efforts. Odisha's rural residents must deal with the awful reality of being relocated as a result of development projects. Many people were displaced as a result of these development endeavours, which also resulted in the submersion, excavation, or destruction of thousands of acres of common, agricultural, and forest land. Tribal people and other rural, economically disadvantaged people who depended on natural resources for their sustenance make up a significant share of the relocated population, according to the state's stunning displacement figures. Between 1951 and 1995, various projects in Odisha resulted in the displacement of almost 5,46,794 people, of whom 3,25,000 were directly tied to dam developments. According to Pandey (2008), development activities in Odisha have resulted in the relocation of an estimated 14,000 individuals, mostly Adivasis. One of India's biggest dam projects, the Hirakud dam, was built in the 1950s and had the biggest impact on Odisha. Development initiatives have disturbed the long-standing equilibrium between the settled population and their environs. Odisha has already seen a few of these large-scale initiatives, including the major transfer of its population. Biophysical and sociocultural resources were disrupted by these, including the Machhkund dam (1949), Hirakud dam (1948), Balimela dam (1963), Rengali dam (1973), Upperkolab dam (1978), and Upper Indravati (1978) (Behura, N.K., 1993).

Dam development is undoubtedly the primary cause of population displacement. The main negative impact of relocation for the indigenous people has been the loss of their homestead and agricultural land, as well as their traditional occupation. The indigenous people have mostly been excluded from rehabilitation benefits and reparations because they often lack the legal documentation required to prove their ownership rights to the land they have lived on and subsisted on for centuries.

This large dam development process has a greater negative influence on tribal lands. Agriculture and natural resources have historically been essential to the subsistence of a sizable portion of displaced tribal people. Their extensive migration adds a crucial additional dimension to the problem. Their traditional methods of sustenance and natural resource base have a significant impact on

the tribe's culture, ethos, and way of life. Due to the development of large dam projects, they are forced to abandon the areas where they have lived for many generations. Tribe members have perished due to their political rights, in addition to being relocated, losing their lands and means of subsistence, and experiencing other dreadful psychological and sociological repercussions. These include the disruption of trade and market ties, the dispersion of family and kinship networks, and the collapse of the production system (Mohanty, 2005). Inadequate rehabilitation efforts for displaced individuals exacerbate the situation even further.

2.2 Study Area: Balangir District's Lower Suktel Dam

Although the Lower Suktel dam, which was built across the Suktel River, was intended to prevent flooding and supply irrigation for both the Balangir and Sonapur districts, it was built 25 kilometres from Magurbeda in the Balangir district. The Balangir block is displaced by the dam. About 29 communities were impacted; of them, 16 were completely relocated and 13 were partially evacuated. The water reservoir covered both agricultural land and human settlement. As per the official documentation of the Balangir resettlement and rehabilitation office, the dam has resulted in the involuntary relocation of 4160 families, 1222 of whom are members of the scheduled tribe.

A 1,410-meter-long and 30-meter-high earth dam will be built as part of the Lower Suktel Irrigation Project to span the Suktel River in the Mahanadi basin, around 20 kilometres from Bolangir town. A 16.58-kilometre-long Left Main Canal and a 23.84-kilometre-long Right Main Canal, complete with head regulators and related distribution networks, are part of the project's substantial canal networks. The project, which has a total command area (CCA) of 23,500 hectares and mostly covers the Bolangir district, intends to greatly improve the region's socioeconomic development and agricultural output. It is also prepared to offer over 17.89 million cubic meters of drinking water to Bolangirtown, meeting its water needs. Since the late 1990s, the project has been a part of the Accelerated Irrigation Benefit Programme (AIBP), which was first approved by the Planning Commission in 1999. Notwithstanding cost increases over time, the most recent approved cost was Rs. 1041.81 crore. The project is still crucial to the KBK region's Long-Term Action Plan (LTAP), indicating its strategic significance in supporting agricultural sustainability and regional water resource management.

3. REVIEW OF LITERATURE

3.1 International Studies

One of the most often used frameworks for comprehending the socioeconomic hazards that displaced persons confront is Cernea's Impoverishment Hazards and Reconstruction (IRR) model. He highlights how development-related displacement can result in serious socioeconomic problems like marginalization, homelessness, unemployment, and landlessness. His

methodology emphasizes the significance of tackling these problems with all-encompassing rehabilitation techniques that prioritize the long-term reconstruction of displaced people's lives rather than only providing compensation. According to Cernea (2000), if these risks are not taken into account, displaced persons may become impoverished, which would increase their vulnerability and impede sustainable development.

The ethical issues of displacement brought on by development are examined by Drrien Danial (1999), especially from a justice standpoint. He criticizes the idea of "compensation" for displaced individuals, arguing that it is not enough to rebuild the impacted communities' social and economic structures. Darrian Danial also contends that authorities' and businesses' moral duties should go beyond financial reparations and concentrate on reestablishing the social cohesion and dignity of the displaced people. His work questions the morality of forced relocation in development initiatives and emphasizes the significance of social justice in resettlement strategies.

A thorough analysis of the long-term effects of dam-induced displacement on rural populations can be found in Scudder (2005). Scudder highlights how displacement frequently results in the loss of self-sufficiency, with many displaced families finding it difficult to return to their prior way of living. Scudder focuses mostly on situations in Africa and Asia. According to his research, most communities have a difficult time adjusting to new means of subsistence, especially when there is a lack of suitable land or business prospects in the resettlement locations. His results highlight the necessity of strong resettlement initiatives that give displaced communities long-term prospects in addition to compensation.

In her study of the gendered effects of displacement, McDowell (1996) focuses on how women are disproportionately impacted by forced relocation. Her research emphasizes how the economic effects of displacement frequently fall more heavily on women, especially when they lose their main source of income, such as agricultural land. The significance of gender-sensitive policies in resettlement plans is emphasized by McDowell, who suggests that resettlement strategies should take into consideration the particular needs and vulnerabilities of displaced women, such as access to healthcare, livelihood possibilities, and land.

Oliver-Smith (2009) approaches the study of displacement from a cultural perspective, emphasizing the loss of cultural legacy and identity that frequently comes with forced migration. According to his research, when people are transported to places that are far from their ancestral homes, development-induced displacement can cause community structures to become fragmented. He contends that because communities find it difficult to reestablish their former social and cultural identities in strange and new settings, this loss of cultural links may have long-term psychological and social effects.

The political aspects of displacement, particularly the power relationships between local people, companies, and governments, are examined in Kothari's (2002) research. She contends that the process of displacement entails intricate debates over power, access to resources, and land ownership and goes beyond simple population movement. Her research highlights how development programs' political goals frequently marginalize displaced communities, which exacerbates social inequality. In development planning, Kothari supports more democratic and inclusive decision-making procedures.

3.2 India-based Studies

The Lower Suktel Irrigation Project empirical study by Agnihotri (2008) sheds light on the socioeconomic difficulties that Odisha's displaced communities face. He concludes that although the project's goals were to increase agricultural output and offer irrigation advantages, the real effects on displaced families were quite detrimental. For the loss of their land and customary means of subsistence, many relocated households did not get sufficient compensation. According to Agnihotri, the relocated populations have experienced a rise in poverty, unemployment, and social marginalization since the relocation, and the rehabilitation efforts were inadequate.

The socioeconomic struggles of Odisha's displaced population, particularly those impacted by the Lower Suktel Project, are the main topic of Parida (2024). According to his research, the relocation locations frequently lacked access to basic amenities like clean water, healthcare, and education. He also emphasizes how many families that relied on agriculture lost their means of subsistence as a result of inadequate compensation policies. Parida highlights the necessity for an updated rehabilitation system that takes into account the wider social needs of displaced communities in addition to monetary compensation.

The efficacy of the Lower Suktel Irrigation Project's land acquisition and resettlement programs is investigated by Tandi et al. (2019). They contend that the displaced people's mistrust and discontent were caused by the inadequate consultation with local communities during the resettlement planning stage. According to their results, the compensation packages offered fell short of adequately compensating the impacted families for their losses, especially with regard to land and agricultural productivity. They support a collaborative approach to the design and implementation of relocation initiatives.

The socioeconomic effects of displacement brought on by dam developments in Odisha are examined by Pattanaik and Mishra (2010). They discover that displaced families frequently experience inadequate integration into the relocation areas and economic marginalization. The authors contend that the main causes of poverty among displaced communities are diminished agricultural revenue and loss of access to land. In order to provide displaced families with long-term livelihood stability, they want stronger and more lasting resettlement policies.

Rath (2015) focuses on how well India's rehabilitation plans work for displaced people, especially when it comes to major infrastructure projects. According to his research, displaced people's living situations usually worsen after transfer, demonstrating how insufficient the current rehabilitation framework is. According to Rath, legal changes are required to guarantee that displaced people receive fair compensation and that their rights are upheld during the relocation procedure.

Das (2012) examines the effects of major irrigation projects in Odisha, such as the Lower Suktel Project, on the environment and the economy. He contends that although such initiatives could benefit nearby areas in the short term, they can have disastrous long-term effects. Due to their loss of access to traditional agricultural land and forced employment in foreign fields, displaced communities frequently experience financial hardship. To guarantee that displacement is kept to a minimum and rehabilitation is successful, Das advocates for a more thorough approach to environmental and social impact assessments.

3.3 Odisha-based Studies

An early analysis of how development initiatives affect Odisha's tribal groups can be found in Dalua (1993). His research focuses on how major infrastructure projects, especially dams, cause land loss and cultural displacement, disproportionately affecting indigenous people. When it comes to development initiatives that have an impact on tribal people, Dalua promotes laws that safeguard their land rights and guarantee their full participation in decision-making.

The difficulties that Odisha's indigenous communities experience are the main topic of Nayak (2013), especially in relation to irrigation and dam developments. He examines the problem of land alienation and how it causes indigenous people to be economically marginalized. His research emphasizes the necessity of land reforms and more robust legal safeguards for tribal populations that have been uprooted. Nayak's research highlights how displacement causes long-term social and economic fragility.

With an emphasis on the Lower Suktel project, this official report from the Government of Odisha (2014) gives a thorough assessment of the state's rehabilitation and resettlement initiatives. It describes the guidelines and practices the state has put in place to compensate and relocate displaced families. Nonetheless, the research identifies a number of difficulties, such as gaps in the provision of essential services, insufficient infrastructure in resettlement zones, and delays in compensation payment. The report urges the resettlement process to be more open and effective.

4. RESEARCH GAP

Although a lot of studies have been done on displacement brought on by major infrastructure projects, little of it has been done expressly on the economic

inequalities that displaced people in Odisha confront, especially in relation to the Lower Suktel Dam Project. There is a dearth of studies that examine the distinct socioeconomic dynamics in Odisha since the majority of current studies concentrate on larger national or international contexts.

Furthermore, the majority of the work now in publication focuses on the immediate consequences of displacement, like compensation and land loss, with little attention paid to the long-term economic ramifications, such as economic mobility and livelihood restoration. For rehabilitation measures to be more successful, it is essential to comprehend how displaced households continue to cope over time.

Additionally, little is known about how displacement affects vulnerable populations like women and tribal tribes. These populations frequently have extra difficulties during resettlement, and current research does not sufficiently address their unique requirements.

Furthermore, not enough research has been done on the efficacy of compensation plans and rehabilitation initiatives, especially with regard to how well they restore livelihoods. Examining the results of these initiatives will yield important information about how to enhance further resettlement initiatives.

Last but not least, current research frequently ignores the multifaceted character of displacement in favour of focusing on particular issues, such as income loss or land tenure. To completely comprehend the inequalities experienced by displaced populations, a more thorough approach that considers economic, social, and psychological aspects collectively is required.

5. OBJECTIVES

1. To examine the economic impact of displacement on households affected by the Lower Suktel Dam Project.
2. To compare access to basic services between displaced and non-displaced communities.
3. To evaluate the effectiveness of rehabilitation and compensation measures.

6. METHODOLOGY

To investigate the economic differences among displaced households as a result of the Lower Suktel Dam Project, this study uses a descriptive research design. With an emphasis on elements like income, employment, service accessibility, and livelihood restoration, the goal is to comprehend the socioeconomic effects of displacement. A representative sample of 100 homes from 13 resettlement colonies was chosen using a stratified random selection technique. These colonies were selected at random according to factors like the number of displaced families, the timing of resettlement, and the colonies' closeness to the dam.

Households representing varying family sizes, economic circumstances, and resettlement duration were picked at random from each of the chosen colonies. This made sure that a variety of experiences were included in the sample. More households from larger colonies were included in the sample, which also took into account factors including pre-displacement property ownership, occupation, and income.

Surveys, secondary data sources, and structured interviews were used to gather data. A pre-designed questionnaire addressing important socio-economic criteria, such as income, employment, education, healthcare, and service accessibility, was used to conduct structured interviews with the heads of families. To ensure accurate responses, all interviews were conducted in Odia, the indigenous language. All 100 households also received a survey, which collected qualitative and quantitative information on employment, income, land ownership, and the sufficiency of pay.

To complement and contextualize the original data, secondary data was collected from project documents, local administration records, and government publications. A thorough examination of the economic inequalities experienced by relocated households is made possible by this combination of data sources.

7. DATA ANALYSIS

Based on a sample of 100 households from 13 resettlement colonies, the data analysis for this study aims to investigate the economic inequalities experienced by displaced households from the Lower Suktel Dam Project. Tables containing the information gathered from surveys and interviews are followed by thorough justifications of the results.

Objective 1: To assess the socio-economic conditions of displaced households.

Table 1: Socio-economic Profile of Respondents (n = 100)

Socio-economic Characteristic	Percentage
Age Group	
18-30	25%
31-45	35%
46-60	20%
60+	20%
Family Size	
1-3 Members	35%
4-6 Members	50%
7+ Members	15%

Primary Occupation	
Labour (Construction)	25%
Small Business	20%
Government/Private Employment	15%

Justification: The socioeconomic profile of displaced households is seen in Table 1. It demonstrates that 35% of the respondents are between the ages of 31 and 45, which represents a sizable share of the displaced population. Medium-sized families make up the bulk of households; 50% of them consist of four to six people. Prior to displacement, 40% of respondents were employed in agriculture, which was followed by the labour and small business sectors. These numbers include information on the respondents' principal sources of income and family structure, which aids in understanding their socioeconomic history prior to displacement.

Objective 2: To analyze the impact of displacement on household income and employment.

Table 2: Income Levels Before and After Displacement (n = 100)

Income Category	Before Displacement (%)	After Displacement (%)
Below ₹5,000	10%	30%
₹5,000 - ₹10,000	40%	35%
₹10,000 - ₹20,000	30%	20%
Above ₹20,000	20%	15%

The household income before and after displacement is compared in Table 2. 30% of households made between ₹10,000 and ₹20,000 before displacement, while 40% made between ₹5,000 and ₹10,000. With 30% of households earning less than ₹5,000 and 35% of households earning more than ₹10,000, there is a discernible movement towards lower income categories following resettlement. This implies that many displaced families have seen a drop in their income levels, indicating that their financial circumstances have gotten worse since the relocation.

Table 3: Changes in Employment Status (n = 100)

Employment Status	Before Displacement (%)	After Displacement (%)
Employed (Full-Time)	60%	40%
Employed (Part-Time)	20%	25%
Unemployed	20%	35%

Justification: Table 3 shows a notable shift in job status following relocation. Just 40% of respondents are still working full-time after being resettled, compared to 60% who were employed full-time before to displacement. Resettlement has had a detrimental impact on the employment position of relocated households, as seen by the rise in the percentage of unemployed households from 20% to 35%. Unemployment may have increased as a result of many people losing their jobs or failing to find steady employment in the new relocation regions.

Objective 3: To examine the adequacy of resettlement compensation and its role in restoring livelihoods.

Table 4: Adequacy of Compensation Received (n = 100)

Adequacy Level	Frequency (%)
Sufficient	10%
Partially Sufficient	40%
Insufficient	50%

Justification: Table 4 evaluates how adequate displaced households believe their compensation was. Only 10% of respondents thought the remuneration was adequate, according to the statistics. 50% thought the compensation was insufficient, but a bigger percentage (40%) thought it was partially sufficient. This indicates that there is a general lack of contentment with the compensation offered, as many households believe it falls short of their needs or completely makes up for the loss of their land and means of subsistence.

Table 5: Impact of Compensation on Livelihood Restoration (n = 100)

Impact Level	Frequency (%)
Positive Impact	20%
Neutral Impact	50%
Negative Impact	30%

Explanation: The effect of compensation on livelihood restoration is seen in Table 5. Just 20% of households said that receiving pay had a favorable effect on their ability to support themselves. The fact that 30% reported a negative impact and 50% reported a neutral impact suggests that many families were not greatly assisted by the compensation during their resettlement. This result highlights how inadequate the resettlement procedure is for supporting sustained livelihood recovery.

Table 6: Land Ownership Before and After Resettlement (n = 100)

Employment Status	Before Displacement (%)	After Displacement (%)
Employed (Full-Time)	60%	40%
Employed (Part-Time)	20%	25%
Unemployed	20%	35%

Justification: The change in land ownership prior to and during displacement is seen in Table 6. Only 40% of households kept their land after being resettled, compared to 70% who held it before being displaced. This increase in landlessness suggests that a sizable percentage of relocated households were unable to access the main source of income that they depended on. The financial difficulties faced by displaced families have been exacerbated by the loss of land.

Table 7: Access to Basic Services Post-Resettlement (n = 100)

Service	Access (%)
Electricity	85%
Clean Water	75%
Healthcare Facilities	60%
Education (for children)	70%

Justification: The degree of access to basic services in resettlement colonies is shown in Table 7. According to the findings, 75% of homes have access to clean water and 85% have electricity, both of which are essential for bettering living circumstances. Only 60% of families report having access to healthcare services, and 70% report having access to education, indicating somewhat poorer access to these resources. The general well-being and financial recovery of relocated households may suffer as a result of these service gaps.

Table 8: Satisfaction with Resettlement Conditions (n = 100)

Satisfaction Level	Frequency (%)
Highly Satisfied	5%
Satisfied	20%
Neutral	30%
Dissatisfied	45%

Justification: A summary of the displaced households' general contentment with their resettlement circumstances is shown in Table 8. Just 5% of respondents expressed high satisfaction with their relocation experience, while the majority (75%) are either neutral or unhappy. This illustrates the difficulties displaced people encounter and how inadequate the resettlement procedure is to satisfy their requirements and aspirations.

8. FINDINGS

Important information about the demographics and professions of the impacted population can be gleaned from the socioeconomic profile analysis of displaced households. The predominant working age group, which includes the majority of responders, is between the ages of 31 and 45. The majority

of households in the resettlement regions are medium-sized, with four to six people living there. 40% of the respondents were employed in agriculture, which made up a sizable percentage of households prior to displacement. Furthermore, local companies and construction workers were essential to maintaining household earnings. The economic background of displaced families prior to migration can be understood from this demographic and occupational data, which points to a comparatively steady source of income associated with manual labour and agriculture.

However, after being displaced, displaced households' income levels have drastically declined. The majority of households made between ₹5,000 and ₹10,000 before moving, with a smaller percentage making more than ₹10,000. The distribution of income clearly changes after resettlement. Nowadays, a sizable portion of households make less than ₹5,000, while fewer claim to make more than ₹10,000. This drop in income levels suggests that resettlement has made the economic circumstances of displaced families worse, and many households are currently dealing with financial issues that did not exist prior to displacement.

The job situation of displaced households has suffered, in addition to a drop in income. Sixty percent of households reported stable, full-time employment prior to relocation, and most respondents had full-time jobs. However, following resettlement, this percentage fell to 40%. On the other hand, the percentage of households without a job rose from 20% to 35%, suggesting that the number of unemployed people among the displaced population has significantly increased. This change emphasizes how hard it is for displaced people to find work, which makes their financial struggles in the new resettlement regions even worse.

Given the results, which show broad unhappiness with the relocation package, the sufficiency of compensation given to displaced families has been a key worry. Fifty percent of households thought their compensation was insufficient, and only ten percent thought it was enough. The ability of displaced families to rebuild their livelihoods has been hampered by the discrepancy between their requirements and the compensation. Just 20% of respondents said that compensation had a beneficial impact on livelihood recovery, indicating that it had a largely negative impact. The fact that 30% of respondents said the compensation had a negative effect and 50% said it had a neutral effect highlights how inadequate the resettlement process was in meeting the requirements of the displaced population.

Following relocation, land ownership, which had been a major source of income for many relocated households, also experienced significant losses. 70% of households owned land before to displacement, which is an essential resource for farming. Only 40% of households kept their land after resettlement, and 60% completely lost it. Since land ownership was frequently linked to their means of subsistence, this loss has had a significant impact on numerous displaced households. Since farming was a major source of income prior to the displacement, many families are finding it difficult to restore their financial foundation without access to land.

Another important aspect affecting the economic inequalities experienced by displaced families is access to basic amenities in the resettlement colonies. Essential services, including healthcare (60%) and education (70%), are still scarce, even though the majority of households have access to clean water (75%) and electricity (85%). Since healthcare and education are essential for long-term well-being and economic advancement, the difficulties faced by displaced families have been made worse by a lack of access to these services. Limited educational options impede future economic mobility, particularly for children, and restricted access to healthcare might result in greater medical costs.

Lastly, displaced households' general satisfaction with the resettlement process is a reflection of their difficulties and discontent. Thirty percent were neutral, forty-five percent were dissatisfied, and only five percent were extremely delighted with their relocation circumstances. Poor living conditions in the resettlement colonies, land loss, and insufficient compensation are the main causes of the discontent. Many families are still having difficulty recovering from the financial effects of migration, highlighting the resettlement process's shortcomings in meeting the requirements of the displaced population.

9. SUGGESTIONS

The results of this study make it abundantly evident that the requirements of displaced households have not been sufficiently met by the resettlement process. A number of actions might be suggested to lessen the financial inequalities that these families experience.

First and foremost, in order to ensure that the compensation given to displaced households accurately represents the value of the lost land, property, and livelihoods, it should be greatly raised. In addition to paying for the immediate expenses of moving, the compensation should also take into consideration the long-term revenue loss that households suffer as a result of the interruption of their customary means of subsistence, especially in the agricultural sector. The long-term prospects of displaced families would be enhanced by a more complete compensation package that covers funding for healthcare, education, and skill development.

Second, the displaced population urgently needs better access to solid employment possibilities. The financial security of many families has been severely harmed by the transition from a full-time job to unemployment following displacement. In order to create jobs in the resettlement zones, government and non-governmental groups should fund initiatives like supporting small companies, providing vocational training, and fostering local economic growth. In order to help displaced families regain their financial stability, resettlement sites should also have the infrastructure and regulations necessary to make it easier for them to access local markets.

Another important problem that requires consideration is land ownership. Many displaced people consider land to be a vital asset, so efforts should be made to give them alternative property or the money they need to buy land. Their agricultural livelihoods, which were severely damaged by displacement, will be restored in part by this. Families should be given assistance to move to alternate sources of income, including small enterprises or urban jobs, if land is not available in the resettlement regions. This will lessen their reliance on income from land.

Enhancing the general well-being of displaced households also requires giving them access to basic amenities like healthcare and education. Expanding access to healthcare services in resettlement regions would help families avoid having to pay for expensive medical care, and improving educational facilities would guarantee that children from displaced families receive a high-quality education. By providing greater possibilities for future generations, this will not only help these families live better lives, but it will also help end the cycle of poverty.

Involving displaced families in the development and execution of resettlement programs might also increase their general contentment with their new circumstances. To make sure that resettlement efforts are more in line with the expectations of displaced people, it is important to consult them about their particular needs and preferences. Because it takes into account the social, cultural, and economic circumstances of the displaced population, participatory planning can result in resettlement procedures that are more successful and long-lasting.

Lastly, in order to spot problems early and make the required corrections, the resettlement process must be continuously monitored and evaluated. Feedback channels should be established by governments and resettlement organizations so that displaced households can express their problems and get prompt assistance. With this strategy, the resettlement process will continue to adapt to the changing requirements of the displaced communities and give them the tools they need to effectively rebuild their lives.

10. CONCLUSION

The study's conclusions on the economic inequalities among displaced people in Bolangir District, Odisha, as a result of the Lower Suktel Dam Project, highlight the major difficulties that the impacted households confront. The families' socioeconomic circumstances have significantly worsened as a result of the relocation, mostly due to the loss of income, job possibilities, land, and access to basic amenities. The problem has been made worse by the inadequate compensation, which has left displaced families finding it difficult to recoup and reestablish their means of subsistence.

The displaced population's extreme economic vulnerabilities are highlighted by the transition from agriculture-based livelihoods to low-paying or unemployed employment, land loss, and little compensation. Furthermore,

these families' difficulties are made worse by the restricted access to healthcare and education in resettlement zones, which lowers their chances of future economic mobility and general well-being.

But the study also emphasizes how critical it is to address these problems with focused treatments. Improved compensation packages that take into account long-term wage loss and the unique requirements of the displaced are desperately needed in order to lessen economic inequities. Restoring displaced families' financial stability will mostly depend on establishing steady work opportunities, expanding access to land, and guaranteeing improved access to healthcare and education. The relocation process will also be more efficient and sensitive to the requirements of the displaced population if a more collaborative approach to planning is taken, as well as ongoing monitoring and assessment.

In conclusion, even though the relocation has resulted in significant financial difficulties, there are workable options that, if properly used, can support these families' long-term rehabilitation. In addition to aiding the displaced population, addressing the underlying causes of economic inequality will promote more sustainable and equitable regional development.

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SCENARIO OF ELEMENTARY EDUCATION IN ODISHA: A DISTRICT LEVEL ANALYSIS

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ABSTRACT

Everyone deserves to be educated. Good education makes an individual develop personally, socially as well as economically. Education inculcates a feeling of evenness in the minds of the people and fosters the development of a nation. The entire education system has three layers: primary and upper primary, secondary and higher education. Primary education is the foundation of all education and prepares the base of life. Despite this, elementary education remained neglected for a long time in the pre-independent period. Several steps/strategies/ plans, and policies have been undertaken by the Government of India and State Governments concerned to achieve universalisation of elementary education (UEE). These programmes include Operation Black Board (OBB) in 1978, District Primary Education Programme (DPEP) in 1994, 'Sarva Shiksha Abhiyan' (SSA) in 2000 and Right to Education (RTE) Act in 2009. India traversed a long journey during the last 70 years since independence; still, we are yet to achieve the target of UEE. Against this backdrop, in this article, we try to study Expenditure on elementary education in the state over the period 2000 to 2024, Educational development of the state as compared to the all-India situation. And the scenario of elementary education at the district level of the state. 'Borda Count Method' is used to examine the level of educational development in Odisha at the sub-state, i.e., district level.

All the educational indicators are moving in the desired direction. Literacy Rate, GER, NER, RR, Transition Rate, School Facilities, etc. are in the path of progress; on the contrary, Dropout, Student Classroom Ratio, Pupil Teacher Ratio, Schools with a single teacher, without a teacher and without a professional qualification have declined during 2011-24. In the educational sector, we have used the 'Borda Count Method' for ranking the districts. Khorda tops the list, followed by Jagatsingpur and Sambalpur. On the other hand, Gajapati is at the bottom of the ladder, preceded by Koraput.

Key Words: Elementary Education, Odisha, District-level.

1. INTRODUCTION

Everyone deserves to be educated. Good education makes an individual develop personally, socially as well as economically. Education inculcates a feeling of evenness in the minds of the people and fosters the development of a nation. The entire education system has three layers: primary and upper primary, secondary and higher education. Primary education is the foundation of all education and prepares the base of life. Similarly, secondary education paves the way for further study, and higher education shapes the future of a person. Despite this, elementary education remained neglected for a long time in the pre-independent period. In the post-independent period, the Govt. of India aimed to achieve universal and compulsory education in the next ten years, i.e., by 1960, while the Central Advisory Board of Education (CABE) drew up a 40-year timeline to do the same. In the meantime, several steps/strategies/plans and policies have been undertaken by the Government of India and State Governments concerned to achieve universal elementary education (UEE). These programmes include

Operation Black Board (OBB) in 1978, District Primary Education Programme (DPEP) in 1994, 'Sarva Shiksha Abhiyan' (SSA) in 2000, 42nd and 86th Constitutional amendments in 1976 and 2002 respectively and Right to Education (RTE) Act in 2009. India has travelled a long journey during the last 70 years since independence; still, we are yet to achieve the target of UEE.

2. REVIEW OF LITERATURE

Investment in education (human capital) promoted economic growth, social and economic equality since the days of Adam Smith. According to Schultz (1961), education plays a pivotal role in the increase of national income of a country and in the improvement of skills and productivity of the labour force. This led to unveiling the nature of investment in education and of human capital formation. Becker (1962) made an attempt to estimate the monetary rate of return of college and high school education in the USA. He observed that investment in human capital raises the earning capacity. An attempt has also been made to measure the contribution of education to economic development

quantitatively. Bowen (1968) assessed the economic contribution of education using four different approaches, namely, the simple correlation approach, the residual approach, the returns to education approach, and the forecasting man-power needs approach. The growth accounting approach was adopted by Denison and Schultz used the 'rate of return to human capital' approach. With the advent of the endogenous growth model, human capital occupies a pivotal position. Lucas (1998) asserted that with the increase in the level of education, the innovative capacity of the worker will increase, thus affecting productivity in a positive manner. Likewise, Perotti (1993) highlighted that an increase in the level of education of workers raises not only their own productivity but also other fellow workers in unison.

A good number of empirical attempts have been made by various researchers at different points in time to study the effect of Educational Outlay on Educational Outcome.

The allocation of resources from the Centre to the states and the overall union-state relations in financing education do not seem to be promoting equitable and efficient educational development (Tilak, 1995); Per student expenditure in Rajasthan, Haryana and Madhya Pradesh was more than 50 per cent of total expenditure, whereas in Odisha, Bihar it was less than 20 per cent (Dongre and Kapur, 2016) & (De and Endow, 2008); The states with higher per capita income are able spend more on higher education which is evident through the fixed effect model and generalized least square estimators (Chakrabarti and Joglekar, 2006).

Infrastructure, number of teachers, teacher training and teacher absenteeism are the main problems of low literacy in Odisha (Khora, 2005); Due to the communication gap the tribal students cannot follow their teachers which demotivate the students towards schooling in the remote tribal areas of the tribal dominated districts like Mayurbhanj, Keonjhar and Sundargarh (Maharana and Nayak, 2017); As the tribal students are considered as the most vulnerable category, the regional language to remove the language barriers in the education system of the concerned student. Multilingual Education (MLE) system has been adopted in Odisha to reduce the dropout ratio of the tribal students (Mohanty, 2017); The real problem Indian education system is not the dropout rather the non-enrolment of the students (M Venkatnarayan, 2009); The performance of MDM in Khordha district is satisfactory in encouraging children to go to school (Anima Rani Si and Naresh Kumar Sharma, 2008); The goal of universal enrolment, retention and completion in elementary and secondary education can be reached by mitigating the problem of financial constraints (Sikdar and Mukharjee, 2012); The Bonda tribe's participation in higher education has brought positive changes, including employment opportunities and economic growth. However, challenges like limited social participation and deviation from cultural traditions persist. Educated Bonda individuals contribute to their families' economies and drive socio-cultural transformation (Naik & Dansana, 2022); Odisha's government expenditure on

elementary education is insufficient, leading to issues with literacy rates and infrastructure development. Despite increased funding for backward districts, the results haven't been significant, possibly due to inefficient allocation or insufficient funds (Abinash Singh and Ranjan Aneja, 2018);

Private schools dominate 40% of the elementary market, prioritizing profit over universal education, with more presence in plain regions than hilly states (Gill, 2019).

This concise analysis explores the ongoing debate surrounding the relationship between education expenditure and educational achievement, an issue that remains unresolved. Our research aims to examine empirical evidence at the state level, providing insights that can inform policymakers in crafting targeted strategies.

3. OBJECTIVES AND HYPOTHESIS OF THE STUDY

3.1 Objectives

- This article investigates three interconnected facets of Odisha's education sector, namely:
- Expenditure on elementary education in the state over the period 2000 to 2024
- Educational development of the state as compared to all-India situations.
- The scenario of elementary education at the district level of the state.

3.2. Hypothesis of the Study

H_0 : In the field of education, coastal Odisha is far ahead of southern Odisha.

4. RESEARCH METHODOLOGY

4.1 Data, Sample Area and Time Frame

To examine the stated objectives, we have used the data collected from secondary sources, viz., Demand for Grants, Department of School and Mass Education, Demand No. 10, Ministry of Finance, Government of Odisha (different years), State Finance: A Study of Budgets, RBI (different issues), Prathama and United District Information System for Education(U-DISE). The study area is the state of Odisha, and the study period ranges from 2000-01 to 2022-23.

4.2 Methods

To decipher the exact quantitative impact of EE, SSE, AE & GSDP on ELEE Liner Regression Models have been employed. The Borda Count Method is used to examine the level of educational development in Odisha at the sub-state level, i.e., district level.

5. DATA ANALYSIS AND INTERPRETATION

5.1 Trend of Expenditure in Elementary Education

The first issue needs the analysis of data on expenditure towards elementary education in the state over the period 2000-01 to 2023-24. Here, an effort has been made to assess the trend of expenditure on elementary education (ELEE) as a percentage of different fiscal variables like Education Expenditure (EE), Social Sector Expenditure (SSE), Aggregate Expenditure (AE) and Gross State Domestic Product (GSDP) of the state. An attempt has also been made to examine the plan and non-plan distribution of elementary education. Article 45 of the Indian Constitution proclaims that, “the state shall endeavour to provide within a period of ten years from the commencement of the constitution for free and compulsory education for all children until they complete the age of fourteen years”. This implies that elementary education is free to all. The Government of India realized the ‘public good’ nature of elementary education; therefore, elementary education must be fully funded by the government. As per the recommendations of the Kothari Commission (1966) and as per the thrust laid the National Policy on Education 1968, the National Policy 1992, the government needs to invest 6 per cent of GDP in education. The percentage of expenditure in elementary education to GSDP is still lower and has declined over the period.

Table 1 portrays the share of elementary education in total education expenditure, total social sector expenditure, aggregate expenditure and Gross State Domestic Product of the state for the period

2000/01 to 2023/24. The expenditure on elementary education has grown from Rs 1026.1 crore in 2000-01 to Rs 12121.17 crore in 2023-24, representing a significant increase of over 11 times. The percentage has fluctuated over the years, indicating changes in the allocation of funds within the education sector. The percentage has ranged from a low of 43.88% in 2010-11 to a high of 64.78% in 2020-21. After a peak in 2020-21, the percentage has slightly decreased but remains relatively high. Again, this table shows the percentage of expenditure on elementary education relative to total social sector expenditure over the years from 2000-01 to 2023-24. The percentage gradually declined from 2000-01 to 2017-18. The percentage stabilized in the range of 15-17% from 2018-19 to 2021-22. The significant increase in 2023-24 suggests a renewed focus on elementary education within the social sector. The percentage of expenditure on elementary education relative to aggregate expenditure (AE) has fluctuated over the years, with no clear upward or downward trend. The percentage has ranged from a low of 5.94% in 2023-24 to a high of 9.29% in 2000-01. There’s a noticeable decline in recent years, with the percentage decreasing from 7.87% in 2019-20 to 5.94% in 2023-24. Likewise, the percentage of expenditure for elementary education to GSDP has fluctuated over the years, with an overall increase. The percentage has ranged from a low of 1.27% in 2007-08 to a high of 2.52% in 2022-23.

In order to examine the responsiveness of expenditure towards elementary education to EE, SSE, AE and GSDP, we have employed a simple regression model. The results are enumerated in Table 2. The result shows that the values of elasticity for SSE and AE are less than one, i.e., less elastic. This implies that expenditure in elementary education in Odisha is less responsive to variation of the state's social sector expenditure and aggregate expenditure, and the values of elasticity for EE and GSDP are greater than one, i.e., more elastic. This implies that expenditure in elementary education in Odisha is more responsive to variation of the state's education expenditure and GSDP.

Table 1: Expenditure on Elementary Education (in Per Cent)

Year	Expenditure on Elementary Education (Rs in Cr)	ELEE to EE	ELEE to SSE	ELEE to AE	ELEE to GSDP
2000-01	1026.10	58.30	25.24	9.29	2.37
2001-02	983.28	56.00	23.85	8.15	2.10
2002-03	1080.42	56.79	25.66	8.14	2.17
2003-04	1084.13	57.04	24.87	6.97	1.78
2004-05	1126.15	56.41	24.49	7.09	1.45
2005-06	1257.62	54.35	23.35	7.99	1.48
2006-07	1341.87	54.14	21.90	6.94	1.32
2007-08	1644.14	50.34	20.06	7.20	1.27
2008-09	2209.17	49.07	19.92	8.28	1.49
2009-10	2641.41	47.55	21.10	8.65	1.62
2010-11	2901.74	43.88	19.04	8.05	1.47
2011-12	3153.93	45.64	17.47	7.49	1.37
2012-13	3963.28	54.26	20.16	8.39	1.51
2013-14	4551.22	53.93	18.34	8.11	1.54
2014-15	5289.21	51.94	18.08	7.93	1.68
2015-16	6148.13	53.20	16.96	7.77	1.86
2016-17	6481.94	53.27	16.35	7.46	1.72
2017-18	7636.20	48.02	15.32	7.12	1.84

2018-19	8875.72	62.88	16.41	7.79	2.30
2019-20	9850.40	64.67	16.14	7.87	2.48
2020-21	9740.07	64.78	16.74	7.85	2.50
2021-22	9975.42	60.65	14.94	6.49	2.20
2022-23	12084	59.11	16.41	6.70	2.52
2023-24	12121.17	55.84	20.77	5.94	2.33

Source: Computed by Researcher from Demand for Grants, Budget Finance Department, Govt. of Odisha, different issues

Table 2: Regression result on the effect of EE, SSE, AE & GSDP on ELEE

Dependent Variable: Natural Logarithm of Expenditure on Elementary Education				
Explanatory Variable	Constant	Coefficient	Adjusted R Square	D-W Statistics
LnEE	-0.7523*	1.0164*	0.9867	0.6180
LnSSE	0.0489	0.8255*	0.9950	1.9064
LnAE	-2.0475*	0.9507*	0.9899	0.9903
LnGSDP	-4.8411*	1.0679*	0.9395	0.2907

Source- Computed by Researcher

Note: ‘*’ represents significant at the 1 per cent level

5.2 CONDITION OF ELEMENTARY EDUCATION IN ODISHA

In order to fulfil the second issue, i.e., educational development of the state vis-à-vis all India level, data on Gross Enrolment Ratio (GER), Net Enrolment Ratio (NER), Retention Rate, Transition Rate and Gender Parity Index (GPI) about Elementary Education have been analysed.

A. Literacy

Literacy is considered an important yardstick to measure the educational status of the society; accordingly, we have analysed the literacy level of Odisha against the all-India level. Table 4.3 shows Census census-wise literacy level of India and Odisha since independence to date. It is observed that Odisha lags behind India with respect to the combined literacy level for all the Census years. The same is true for both male and female literacy, though it is more pronounced for females; the only exception is that for 2001 and 2011, Odisha shows a marginal improvement over the India level in the field of male literacy level.

Table 3: Literacy Rate of India & Odisha since 1951 to 2011 census

Census	India			Odisha		
	Male	Female	Total	Male	Female	Total
1951	27.16	8.86	18.32	27.32	4.52	15.80
1961	40.40	15.35	28.30	34.68	8.65	21.66
1971	45.96	21.97	34.45	38.29	13.92	26.18
1981	56.38	29.76	43.57	46.39	20.60	33.62
1991	64.13	39.29	52.21	63.09	34.68	49.09
2001	75.26	53.67	64.83	75.35	50.51	63.08
2011	82.14	65.46	74.04	82.40	64.36	73.45

Source- Statistical Abstract of Odisha-2012

B. Access to Elementary Education

The Number of children enrolled in schools is an important pointer to the educational development of a region. Larger school enrolment not only enhances literacy in a country, but also widens its cognitive skills. Therefore, total enrolment of students in elementary education is important and is shown in Table-4. Data reveals that total enrolment in elementary education has declined over the period both in India as well as Odisha. At the All-India level, enrolment declined from 1990.1 lakh in 2011-12 to 1709.6 lakh in 2023-24, and in Odisha, the same declined from 65.19 lakh to 55.3 lakh during the corresponding period. This may be due to a reduction in the total fertility rate.

Another important indicator of access to elementary education is the Gender Parity Index (GPI). It is designed to measure the relative access to education of males and females. It is calculated as the ratio of the number of females enrolled to the number of males enrolled in a given stage/grade of education. Odisha's Gender Parity Index (GPI) has remained consistent with the national average, staying steady at 0.94 from 2001-02 to 2016-17, and then increasing to 1.02 from 2016-17 to 2023-24 nationwide, while Odisha's GPI rose to 0.98 during the latter period.

Table 4: Total Enrolment and GPI at Elementary Level

Year	Total Enrolment (Class I-VIII) (lakh)		GPI at the Elementary level	
	India	Odisha	India	Odisha
2011-12	1990.1	65.19	0.94	0.94
2012-13	1997.1	64.22	0.94	0.94
2013-14	1988.9	63.88	0.94	0.94
2014-15	1976.6	63.86	0.94	0.94
2015-16	1967.1	63.28	0.94	0.94
2016-17	1898.8	61.98	0.93	0.93
2018-19	1844.9	57.3	1.01	0.99
2019-20	1865.6	56.6	1.02	0.99
2020-21	-	-	1.02	1
2021-22	1886.3	55.9	1.02	0.99
2022-23	1758.9	55.4	1.04	0.99
2023-24	1709.6	55.3	1.02	0.98

Source- Unified District Information System for Education (U-DISE)

C. School facilities

Infrastructure facilities in the school premises influence the enrolment to a great extent. So, we shall turn our attention to that effect. Here, we shall examine the percentage of schools with three WASH facilities, like toilets, drinking water and hand washing. Table 5 portrays that both India and Odisha have shown significant improvement in providing WASH facilities in schools over the years. Odisha started with much lower percentages but caught up and even surpassed the national average in some years, achieving nearly universal coverage (99.7% in 2023-24). India's progress was steady, with a notable jump between 2016-17 (53.8%) and 2018-19 (84.1%), and eventually reaching 97.2% in 2023-24. The data indicate a positive trend in improving WASH facilities in schools across India and Odisha, with Odisha showing remarkable progress to nearly universal coverage. This improvement can contribute to better health, hygiene, and learning environments for students.

Table 5: Wash Facilities in School

Year	Percent of Schools having wash facilities	
	India	Odisha
2011-12	-	-
2012-13	27.7	3.7
2013-14	38.8	16.6
2014-15	39.3	22.1
2015-16	49.8	38.3
2016-17	53.8	45.2
2018-19	84.1	99.9
2019-20	95.2	98.2
2020-21	96.0	97.6
2021-22	96.9	97.9
2022-23	97.0	99.2

Source- Unified District Information System for Education (U-DISE)

D. Teacher

The position of a teacher in school education is very crucial. Enrolment is also influenced by the quality of the teacher and/or teaching. Hence, teaching-specific indicators like Pupil-Teacher Ratio (PTR), are important to analyse the overall performance of the school. Table 6 portrays both India and Odisha have seen a decline in PTR over the years, indicating an improvement in the teacher-student ratio. Odisha’s PTR has been lower than the national average throughout the period, suggesting better teacher availability and potentially more effective learning environments. India’s PTR has remained relatively stable or even slightly increased, while Odisha’s PTR has continued to decrease, albeit at a slower pace. A lower PTR generally indicates: Better teacher-student interaction & attention, more effective learning environments and potentially improved academic outcomes

Table 6: Teaching Specific Indicator

Year	Pupil-Teacher Ratio	
	India	Odisha
2011-12	30	25
2012-13	27	24
2013-14	26	23
2014-15	25	21
2015-16	24	20

2016-17	23	19
2018-19	19.5	16
2019-20	20.5	16
2020-21	22.5	16
2021-22	22.5	15.5
2022-23	22.5	15.45

Source- Unified District Information System for Education (U-DISE)

E. Efficiency

Efficiency is the catch phrase of the present age. Efficiency in elementary education can be gauged from the dropout rate, the Retention Rate and the Transition from Primary to Upper Primary level. High dropout is a drag on the efficiency of the educational system, whereas high retention implies school offers a quality education. High transition rates show a high level of access or transition from one level to the next level of education. Table 7 details the above indicators. The Dropout (Primary) column shows the percentage of students who dropped out of primary school. For India, the dropout rate has fluctuated, with a peak of 6.3% in 2016-17 and a low of 0.8% in 2020-21. Odisha generally has lower dropout rates compared to the national average, with rates reaching 0% in 2021-22, 2022-23, and 2023-24. Retention (Primary) column indicates the percentage of students who continued their education in primary school. For India, retention rates have generally improved over the years, from 77% in 2011-12 to 85.4% in 2023-24. Odisha started with a higher retention rate (83.7% in 2011-12) and has mostly maintained higher rates than the national average, reaching 100% in 2022-23 and 101.2% in 2023-24. Transition Primary to Upper Primary column shows the percentage of students transitioning from primary to upper primary education. For India, the transition rate has mostly increased, from 87% in 2012-13 to 88.8% in 2023-24. Odisha's transition rates have been higher than the national average, consistently above 87%, with rates reaching 98.8% in 2022-23 and 97.6% in 2023-24. Overall, Odisha seems to be performing better than the national average in these educational metrics, with lower dropout rates, higher retention rates, and higher transition rates to upper primary education.

Table 7: Dropout, Retention and Transition Rate in Odisha & India

Year	Annual Average Dropout (Primary)		Retention (Primary)		Transition Primary to Upper Primary	
	India	Odisha	India	Odisha	India	Odisha
2011-12			77.0	83.7		
2012-13	5.6	5.1	80.1	80	87.0	87.0

2013-14	4.6	3.5	82.3	84.7	89.5	88.7
2014-15	4.3	2.9	83.7	85.9	89.7	91.0
2015-16	4.1	2.8	84.2	88.6	90.1	91.3
2016-17	6.3	4.2	84.1	90.7	88.5	90.5
2018-19	4.5	3.4	86.3	88.4	90.5	93.7
2019-20	2.6	0.8	87	87.7	92.8	95.8
2020-21	0.8	0	95.3	91.4	92.1	97
2021-22	1.5	0	95.4	94.7	93.2	97.5
2022-23	7.8	0	90.9	100	87.9	98.8
2023-24	1.9	0	85.4	101.2	88.8	97.6

Source- Unified District Information System for Education (U-DISE)

F. Outcomes

The Gross Enrolment Ratio (GER) and the Net Enrolment Ratio (NER) give better accounts of the actual progress made in elementary education than absolute enrolment numbers. GER sometimes does not reflect the real picture of enrolment status as it includes over- and underage children; hence, NER depicts the real enrolment status of children in the particular age group. GER & NER at the elementary level are shown in Table 8. Both GER and NER indicate a generally high enrolment rate in elementary education in India and Odisha. Odisha's enrolment ratios have been more volatile compared to the national average. GER is consistently higher than NER for both India and Odisha

Table 8: GER and NER at the Elementary Level in Odisha

Year	GER at the Elementary level		NER at the Elementary level	
	India	Odisha	India	Odisha
2012-13	97.00	97.57	87.51	86.15
2013-14	97.00	98.44	88.31	87.18
2014-15	96.89	99.76	88.45	89.84
2015-16	96.91	100.20	88.94	91.32
2016-17	93.55	98.14	85.89	90.14
2018-19	96.1	93.9	88.46	83.18

2019-20	97.8	94	90.4	82.6
2020-21	99.1	95.8	92.1	90.3
2021-22	100.1	95.4	90.5	85.6
2022-23	93.9	95.6	85.5	87.7
2023-24	91.7	96.1	83.3	87.3

Source- Unified District Information System for Education (U-DISE)

To sum up, it may safely be concluded from the foregoing discussion that the status and performance of elementary education in Odisha are better than the Indian situation.

5.3 District-wise Educational Scenario of the State

In tune with the third issue of this chapter, we endeavoured to examine the development of elementary education at the district level over the last decade. We have chosen three reference years, viz, 2005-06, 2011-12 and 2016-17 and fifteen indicators on four components for comparison. We have used 'District Report Cards' to collect data on different variables about elementary education at the district level in Odisha. The detailed district-wise data on different variables are shown in Appendix I.C.a through I.C.c.

A. Access to Elementary Education

Access to education depends on the number of schools, the percentage of government schools and the distance of schools from habitation. Data reveals that Mayurbhanj (geographically the biggest) district tops the list with 4971 schools, and Deogarh, with 685 schools, is at the bottom of the list. There is a general trend that the number of schools in each district increases over the period; however, there are exceptions, i.e., out of 30 districts, seven districts, namely Bargarh, Deogarh, Jharsuguda, Kandhamal, Nuapada, Sonapur and Sundargarh, total number of schools declined in 2016-17 as compared to 2011-12. This may be due to the merger of nearby schools for want of a minimum number of students. So far as the percentage of government schools is concerned, the general trend is declining, if not more or less constant, over the period. Habitation Mapping of 2014 (School Education at a Glance, S&ME Department, GoO) shows that in Odisha, a total of 3003 habitations are without a Primary School, and 1761 habitations are without an Upper Primary School. Kalahandi, with 363 habitations, followed by Gajapati, with 231 habitations, do not have primary schools. Likewise, 224 habitations in Gajapati district, followed by 197 habitations in Kandhamal, do not have upper primary schools.

The Gender Parity Index (GPI) is a socio-economic index which has been formulated to measure the relative access to education of males and females. In the present analysis, it is observed that there is no consistent trend of GPI

among the districts over the period. The latest figure shows that in 16 districts, girl enrolment outstrips boys' enrolment, in 12 districts the opposite is true, and in two other districts (Boudh & Kalahandi), GPI is equal to one. The list of GPI is headed by Cuttack with a value of 1.5, and Nayagarh is at the bottom with 0.88.

B. School facilities

Here, we have covered three infrastructural facilities available at the school premises. These are percentages of schools with common toilets, schools with girls' toilets and schools with drinking water provision. With regard to toilet facilities for students, particularly girls, the situation has improved a lot. Over the period, almost all districts show a positive movement and have more than 95 percentage points. Several districts achieved 100 per cent, including the economically backward districts of Gajapati, Kandhamal, Mayurbhanj and Sundargarh. The situation is equally encouraging in the field of 'Drinking Water Facility'. Except for three districts, such as Sonepur (97.6), Nabarangapur (97.7) and Malkangiri (98.8), all other districts reached the goal of 100 per cent or very close to 100 per cent.

C. Teaching and Learning Facilities

Quality of education depends on teachers and teaching-learning facilities, so we have taken into account four parameters, viz., pupil-teacher ratio, percentage of schools with a single teacher, student-classroom ratio and percentage of schools with a single classroom. Pupil-teacher ratio has decreased over time, i.e., a larger number of teachers have been appointed by the government to look after the students. However, the situation is not so encouraging in certain districts like Kalahandi,

Nabarangapur and Rayagada. The same thing is observed from the percentage of schools having a single teacher. It is observed that schools having a single teacher decrease over time, yet a few districts, Kalahandi, Koraput and Rayagada, show a high percentage of schools with a single teacher, i.e., 9.57, 12.3 and 7.9 per cent respectively. Likewise, student-to-classroom ratio decreases over the period. This implies that more classrooms are available for students. Here, the only exception is the Nawarangapur district, where the improvement is marginal. Regarding the percentage of schools with a single teacher, the result is not so encouraging. A total of 23 out of 30 districts show a fluctuating trend; four districts, Gajapati, Koraput, Rayagada and Sonepur, depict an improvement; Nawarangapur shows a constant value; Dhenkanal and Khorda show a deteriorating trend.

D. Outcomes

The outcome of the education sector can be judged from GER (primary), NER (primary), Retention Rate (primary) and Transition Rate from primary to Upper Primary level. Higher GER generally reflects a high degree of participation in academic activity. GER exceeding 100 per cent shows that a state/region

in principle, able to accommodate its entire school-age pupil. However, its meaningful interpretation needs additional information on repetition and late entrants. In the present analysis, for most of the district, GER is above 100 per cent. Eight out of thirty districts of Odisha depict GER less than 100 per cent. These districts are Baragarh, Boudh, Cuttack, Deogarh, Dhenkanal, Ganjam, Nayagarh and Sonepur. Another alternative ratio is NER. A high NER indicates a high degree of coverage for the official school-age population. Half of the districts of Odisha indicate an increasing trend in NER. Mayurbhanj and Nuapada, with 100 per cent NER, top the list, whereas Nayagarh is at the tail end with NER 77.8 per cent.

Retention rate is the percentage of first-year students who continue their studies and enrol in a programme the following year as a second-year student. Overall situation in the field of retention rate is quite impressive. Four districts record very good results, like Puri (99.5), Khorda (99), Jagatsinghapur (97) and Cuttack (97), but Gajapati (72), Malkangiri (77) and Rayagada (78.6) perform badly. Regarding the Transition Rate from primary to Upper Primary level, the situation improves in general, the only exception is Balasore. Certain districts like Koraput, Malkangiri, Nabarangapur and Rayagada, though they improved their position, yet a lot of students left the education system in mid-way.

E. Ranking of Districts

In the present Section, we have prepared the rank of districts of Odisha on the basis of performance of primary education for the latest time period for which data are available, i.e., for the year 2016-17. Three outcome indicators are chosen for the ranking of the districts. These are Gross Enrolment Ratio, Retention Rate and Transition Rate.

The Count Method is used for ranking the districts. The Borda Rule is an ordinal measurement. It is attributed to Jean-Charles de Borda (1733- 1799). The rule says that the lowest-ranking district is given 1 point, the second lowest is given 2 points, and so on, and the top-ranking district is given points equal to the number of districts present in the list in each indicator. The points given to each district are summed across all rounds or indicators and then ranked on the basis of the aggregate score. The result is depicted in Table 9.

It is observed from Table 9 that the ranking of the districts on primary education in Odisha, Khorda, tops the list, followed by Jagatsingpur and Sambalpur. On the other hand, Gajapati is at the bottom of the ladder, preceded by Koraput. The coastal districts, in general, depict good results, whereas the tribal-dominated southern districts have a dismal picture.

Table 9: Ranking of Districts as per Borda Count Method, 2016-17

District	Point Assignment			Total Score	Rank
	Gross Enrolment Ratio	Retention Rate	Transition Rate		
Angul	19	11	19	49	13
Balangir	20	27	9	56	7
Balasore	5	15	24	44	18
Bargarh	22	14	11	47	14
Bhadrak	9	17	16	42	19
Boudh	2	13	23	38	21
Cuttack	8	26	19	53	10
Debagarh	1	4	22	27	28
Dhenkanal	6	19	25	50	11
Gajapati	10	1	5	16	30
Ganjam	6	28	12	46	16
Jagatsinghpur	24	25	26	75	2
Jajpur	27	23	10	60	4
Jharsuguda	13	16	27	56	7
Kalahandi	16	11	8	35	25
Kandhamal	29	5	6	40	20
Kendrapara	23	20	13	56	7
Keonjhar	21	8	7	36	23
Khordha	25	29	29	83	1
Koraput	12	7	3	22	29
Malkanagiri	28	2	1	31	26
Mayurbhanj	30	5	15	50	11
Nabarangapur	15	18	4	37	22
Nayagarh	4	22	21	47	14
Nuapada	18	10	17	45	17

Puri	11	30	18	59	5
Rayagada	26	3	2	31	26
Sambalpur	17	20	28	65	3
Sonepur	3	24	30	57	6
Sundargarh	14	9	13	36	23

Source: Computed by the researcher

6. RESULTS AND DISCUSSION

In tune with the three objectives of the paper, we endeavoured to study the level of educational development in Odisha. Elementary education is considered the foundation of the education system, so we have examined the outlay on this and the resultant outcome. Results are given underneath.

The expenditure on elementary education has grown from Rs 1026.1 crore in 2000-01 to Rs 12121.17 crore in 2023-24, representing a significant increase of over 11 times. The percentage has fluctuated over the years, indicating changes in the allocation of funds within the education sector. The percentage has ranged from a low of 43.88% in 2010-11 to a high of 64.78% in 2020-21. After a peak in 2020-21, the percentage has slightly decreased but remains relatively high. Again, this table shows the percentage of expenditure on elementary education relative to total social sector expenditure over the years from 2000-01 to 2023-24. The percentage gradually declined from 2000-01 to 2017-18. The percentage stabilized in the range of 15-17% from 2018-19 to 2021-22. The significant increase in 2023-24 suggests a renewed focus on elementary education within the social sector. The percentage of expenditure on elementary education relative to aggregate expenditure (AE) has fluctuated over the years, with no clear upward or downward trend. The percentage has ranged from a low of 5.94% in 2023-24 to a high of 9.29% in 2000-01.

There's a noticeable decline in recent years, with the percentage decreasing from 7.87% in 2019-20 to 5.94% in 2023-24. Likewise, the percentage of expenditure for elementary education to GSDP has fluctuated over the years, with an overall increase. The percentage has ranged from a low of 1.27% in 2007-08 to a high of 2.52% in 2022-23.

The values of elasticity for SSE and AE are less than one, and the values of elasticity for EE and GSDP are more than one.

It is observed that Odisha lags behind India with respect to the combined literacy level for all the Census years. The same is true for both male and female literacy, though it is more pronounced for females. Odisha's Gender Parity Index (GPI) has remained consistent with the national average, staying steady at 0.94 from 2001-02 to 2016-17, and then increasing to 1.02 from 2016-17 to 2023-24 nationwide, while Odisha's GPI rose to 0.98 during the latter period. Both India and Odisha have shown significant improvement in providing

WASH facilities in schools over the years. Odisha started with much lower percentages but caught up and even surpassed the national average in some years, achieving nearly universal coverage (99.7% in 2023-24). India's progress was steady, with a notable jump between 2016-17 (53.8%) and 2018-19 (84.1%), and eventually reaching 97.2% in 2023-24. The data indicate a positive trend in improving WASH facilities in schools across India and Odisha, with Odisha showing remarkable progress to nearly universal coverage. Both India and Odisha have seen a decline in PTR over the years, indicating an improvement in the teacher-student ratio. Odisha's PTR has been lower than the national average throughout the period. Overall, Odisha seems to be performing better than the national average in these Dropout rate, Dropout rate, Transition Rate from Primary to Upper-Primary level educational metrics, with lower dropout rates, higher retention rates, and higher transition rates to upper primary education.

Both India and Odisha have shown fluctuations in GER over the years. Odisha's GER has generally been higher than the national average, except for a few years like 2018-19 and 2019-20. By 2023-24, Odisha's GER is higher than the national average.

The district-wise picture in elementary education reveals that there is a general trend that the number of schools in each district increases during the period from 2005-06 to 2016-17; however, the number of government schools is declining, and there is no consistent trend of GPI among the districts during the corresponding period. With regard to toilet facilities for students, particularly girls, the situation has improved a lot. In the period mentioned above all almost all districts show a positive movement and have more than 95 percentage points. The situation is equally encouraging in the field of 'Drinking Water Facility'. Pupil-teacher ratio, schools having a single teacher have decreased from 2005 -2016. Likewise, decreases over time. Student classroom ratio falls with the passage of time, which implies more classrooms are available for students. But regarding the percentage of schools with a single teacher, the result is not so encouraging. Eight out of thirty districts of Odisha depict GER less than 100 per cent. Half of the districts of Odisha indicate an increasing trend in NER. Mayurbhanj and Nuapada, with 100 percent NER, top the list, whereas Nayagarh is at the tail end with NER 77.8 per cent. Overall situation in the field of retention rate is quite impressive. Four districts like Puri (99.5), Khorda (99), Jagatsinghapur (97) and Cuttack (97) record very good results, although Gajapati (72), Malkangiri (77) and Rayagada (78.6) perform badly. Regarding the Transition Rate from primary to Upper Primary level, the situation improves in general, the only exception is Balasore. It is observed that ranking of the districts in Odisha on primary education, Khorda tops the list, followed by Jagatsingpur and Sambalpur. On the other hand, Gajapati is at the bottom of the ladder, preceded by Koraput. The coastal districts, in general, depict good results, whereas the tribal-dominated southern districts have a dismal picture.

7. CONCLUSION

Discussion on the status and performance of elementary education in Odisha shows that it is better than the Indian situation, yet the southern districts are lagging behind their coastal counterparts. So far as outlay is concerned, education expenditure on elementary education is about 2.3 per cent of GSDP. In any respect, it is not a decent level of spending. In any respect, it is not a decent level of spending. All the above sets are in demand for immediate attention, action and resolution at the administrative level.

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Appendix: I.C.a District-wise Picture of Elementary Education Indicators in Odisha for the year 2005-06																
District	Number of Percentage of		Gender Parity Index	% of Schools with Common Toilet	% of Schools with Girls' Toilet	% of Schools with Drinking Water	Student gte Class			% of Single Teacher Schools	GER Primary	NER Primary	Retention Primary	Transition Rate (PRI to UP)		
	schools	government schools					Class Room Ratio	RoomStudent-	Teacher Ratio							
ANGUL	1501	92.6	0.93	25.3	9.1	86.0	34.4	4.4	35.4	13.9	121.4	99.8	73.2	86.6		
BALASORE	2504	85.6	0.92	62.2	20.9	82.6	39.2	3.6	39.2	3.4	120.0	98.0	79.7	94.0		
BARGARH	1807	95.6	0.95	30.8	13.4	86.8	30.6	3.4	33.0	8.5	101.7	83.9	93.1	82.6		
BHADRAK	1581	91.8	0.94	45.4	11.3	72.4	44.2	5.3	45.8	7.6	132.9	100.0	76.7	86.5		
BOLANGIR	2133	97.9	0.97	38.3	11.2	84.5	36.3	15.4	34.5	11.2	121.1	93.9	70.7	71.0		
BOUDH	700	97.9	0.96	10.6	2.6	84.1	36.6	12.6	28.2	2.9	137.1	100.0	69.3	89.4		
CUTTACK	2499	90.0	0.94	28.1	8.2	86.0	35.4	6.0	34.0	7.4	96.2	78.0	85.2	82.3		
DEOGARH	537	94.2	0.94	18.2	7.8	79.9	30.1	6.7	29.7	12.1	126.3	100.0	56.1	87.3		
DHENKANAL	1432	89.4	0.92	31.8	20.1	89.3	32.6	2.1	34.5	7.4	111.4	90.1	86.7	87.6		
GAJAPATI	1265	98.7	0.87	13.8	7.6	81.8	30.3	25.6	29.1	25.6	141.7	100.0	37.6	65.3		
GANJAM	3554	93.0	0.94	51.2	25.0	83.7	42.3	6.9	43.8	12.7	127.7	100.0	100.0	73.2		
JAGATSINGHPUR	1496	84.0	0.93	34.0	11.3	86.6	31.1	4.9	33.7	11.4	112.8	93.4	75.5	88.1		
JAIPUR	2059	85.9	0.93	27.6	10.7	82.4	42.7	5.9	39.9	8.1	132.3	100.0	82.4	87.5		
JHARSUGUDA	724	96.4	0.94	34.8	12.7	83.4	28.2	8.4	30.6	13.5	108.3	86.4	80.1	94.0		
KALAHANDI	1963	96.4	0.94	28.1	8.8	88.1	32.3	3.5	34.5	12.1	119.3	91.3	86.7	84.6		
KANDHAMAL	1650	97.1	0.93	29.2	10.6	81.2	26.2	6.3	25.0	11.7	153.2	100.0	46.3	77.9		
KENDRAPARA	1814	89.1	0.95	33.5	14.4	71.3	39.1	11.4	35.0	11.5	118.5	99.5	82.9	88.9		
KEONJHAR	2389	92.7	0.91	27.1	7.6	79.7	34.6	4.5	35.5	8.2	124.5	97.1	81.3	84.2		
KHORDHA	1763	88.6	0.92	42.7	19.5	85.4	37.0	3.5	32.7	12.0	91.1	75.1	84.7	83.0		

KORAPUT	2183	95.8	0.93	18.1	12.1	77.0	32.8	11.7	30.7	18.9	133.4	100.0	63.4	58.8
MALKANGIRI	1056	97.7	0.87	19.7	5.9	83.0	32.0	8.0	30.0	15.8	138.4	100.0	44.3	46.0
MAYURBHANJ	3485	98.4	0.88	20.1	4.9	84.3	32.1	5.9	32.0	11.3	120.4	92.5	51.3	81.3
NAWARANGAPUR	1387	97.5	0.93	22.0	7.4	86.7	37.5	5.6	38.2	7.6	129.1	99.6	61.6	59.9
NAYAGARH	1082	92.2	0.91	36.0	15.1	87.2	34.2	4.0	31.0	8.4	102.9	84.5	87.6	80.5
NUAPADA	931	96.1	0.97	24.7	5.4	88.8	32.1	4.3	29.9	5.7	140.4	100.0	73.3	69.9
PURI	1940	91.2	0.94	30.1	14.1	76.3	38.1	7.3	37.1	9.7	111.7	92.1	79.8	93.2
RAYAGADA	1757	96.4	0.89	30.4	14.2	79.2	28.6	15.8	27.1	15.5	126.6	98.6	82.4	55.6
SAMBALPUR	1480	93.9	0.97	28.5	11.1	86.5	27.4	5.0	28.9	17.9	94.4	76.2	80.1	82.3
SONEPUR	965	96.4	0.96	15.1	6.2	84.2	35.3	17.9	32.1	24.8	108.9	87.8	97.1	81.2
SUNDARGARH	2244	94.6	0.95	55.3	15.3	82.4	29.3	2.7	33.3	14.1	96.5	75.7	43.2	82.8

Appendix: I.C.b District-wise Picture of Elementary Education Indicators in Odisha for the year 2011-12														
District	Number of schools	Percentage of government schools	Gender Parity Index	% of Schools with Common Toilet	% of Schools with Girls' Toilet	% of Schools with Drinking Water	Student Class Room Ratio	% of Single Class Room School	Student Teacher Ratio	% of Single Teacher Schools	GER Primary	NER Primary	Retention Primary	Transition Rate (PRI to UP)
ANGUL	1856	89.7	1.01	75.1	87.5	99.9	24.1	2.7	23.9	6.3	106.3	84.9	80.6	87.8
BALASORE	3240	80.8	1.00	78.5	84.8	92.7	29.8	3.3	25.8	1.2	102.4	85.1	85.4	91.4
BARGARH	2061	88.3	1.04	79.9	87.8	93.2	22.9	3.0	24.6	4.5	110.4	158.6	96.7	99.2
BHADRAK	2145	85.5	1.00	80.2	88.6	92.4	30.5	1.3	26.8	4.3	115.4	97.8	91.6	88.3
BOLANGIR	2597	91.6	0.96	78.7	85.0	100.0	29.4	10.8	26.1	12.4	114.8	94.7	73.2	88.8
BOUDH	888	99.3	1.04	68.0	80.1	90.6	27.7	12.5	27.3	10.4	105.7	86.0	86.7	87.0
CUTTACK	2800	89.1	1.25	96.5	94.4	93.6	22.7	4.4	22.5	2.8	93.1	76.0	100.0	98.1

DEOGARH	711	90.3	1.00	40.6	62.6	83.7	21.0	3.5	19.2	2.4	112.5	99.1	72.7	91.7
DHENKANAL	1807	86.3	0.95	62.7	86.2	96.8	23.1	3.3	20.9	2.0	100.7	80.6	86.8	91.4
GAJAPATI	1441	95.1	0.93	63.7	72.6	100.0	23.8	11.7	22.2	12.4	116.9	179.0	79.1	76.7
GANJAM	4269	86.3	0.95	68.3	77.2	100.0	31.9	3.9	31.8	4.8	104.8	87.5	94.2	87.5
JAGATSINGHPUR	1743	86.8	1.20	74.9	85.1	95.6	17.6	2.8	17.6	1.2	106.6	85.5	100.0	89.5
JAIPUR	2720	81.9	0.97	72.0	87.4	100.0	26.4	2.9	23.4	4.3	113.0	92.0	88.8	87.5
JHARSUGUDA	873	89.8	1.08	68.2	83.0	89.3	19.6	4.2	20.8	9.3	108.3	88.0	84.0	91.0
KALAHANDI	2686	92.3	0.96	43.1	53.6	92.7	30.9	2.9	29.1	5.2	115.8	94.9	77.7	86.2
KANDHAMAL	2076	94.7	0.97	26.5	47.9	89.6	21.1	11.4	22.2	7.9	120.1	195.5	72.1	81.3
KENDRAPARA	2321	84.8	1.00	70.7	88.4	99.9	24.9	6.3	21.5	4.3	104.8	88.4	96.9	89.9
KEONJHAR	3139	85.0	0.96	69.7	89.1	95.6	26.9	3.8	25.5	14.3	107.0	90.0	67.4	81.2
KHORDHA	1970	83.9	1.40	103.6	98.7	98.4	23.1	3.5	26.2	5.1	103.2	84.3	100.0	93.7
KORAPUT	2653	95.7	0.94	73.4	85.5	92.0	27.9	10.9	28.8	22.5	101.4	87.8	69.9	52.3
MALKANGIRI	1429	95.9	0.91	80.9	83.1	78.9	30.1	9.9	31.1	20.2	111.3	93.8	68.5	52.4
MAYURBHANJ	4742	92.2	0.96	54.6	77.2	92.9	26.6	4.0	23.5	5.4	153.8	132.9	65.8	85.8
NAWARANGAPUR	1988	95.9	0.98	63.4	78.3	91.8	33.0	5.1	34.3	11.4	104.4	89.4	78.0	74.2
NAYAGARH	1412	87.3	0.91	43.7	70.2	97.8	24.2	2.1	22.1	1.2	101.9	84.4	90.4	91.6
NUAPADA	1200	90.5	1.01	69.8	80.8	96.9	27.0	2.3	27.5	3.0	132.0	109.6	77.8	87.4
PURI	2414	85.7	0.99	31.2	47.0	85.2	24.1	3.2	21.9	4.1	103.7	88.8	91.4	93.4
RAYAGADA	2186	95.9	0.91	52.3	58.0	80.9	25.5	12.7	25.7	33.0	106.4	89.7	69.0	70.5
SAMBALPUR	1660	90.1	1.05	73.2	90.5	95.6	21.1	2.7	20.9	4.9	106.6	89.8	87.8	87.4
SONEPUR	1113	90.3	0.98	65.3	88.0	97.4	25.4	12.1	24.1	15.2	103.4	84.2	96.2	95.9
SUNDARGARH	3085	85.5	1.08	76.2	87.9	100.0	22.5	2.1	22.7	11.0	105.8	88.0	80.4	95.7

Appendix: I.C.c District-wise Picture of Elementary Education Indicators in Odisha for the year 2016-17																	
District	Number of schools	Percentage of government schools	Gender Parity Index	% of Schools with Common Toilet	% of Schools with Girls Toilet	% of Schools with Drinking Water	Student Class Room Ratio	% of Single Class Room School	Student Teacher Ratio	% of Single Teacher Schools	GER Primary	NER Primary	Retention Primary	Transition Rate(PRI to UP)	% of habitations without primary school		
ANGUL	1912	84.9	0.97	100.0	100.0	100.0	20.8	6.2	19.1	1.9	105.8	100.0	89.0	94.1	5.1		
BALASORE	3324	79.3	1.08	99.5	96.2	99.7	26.8	14.3	20.3	1.6	106.3	92.7	97.6	88.2	1.9		
BARGARH	2037	87.1	1.05	82.6	99.6	99.0	20.7	10.4	19.8	2.6	96.8	80.1	91.3	96.4	1.3		
BHADRAK	2269	82.4	1.02	99.6	86.9	100.0	24.1	9.6	19.1	1.1	106.5	96.7	91.0	92.0	0.8		
BOLANGIR	2648	89.3	0.97	99.7	99.2	100.0	26.5	11.9	22.9	1.5	101.1	86.1	92.1	92.8	1.9		
BOUDH	891	92.7	1.00	100.0	99.6	100.0	22.7	8.4	19.2	1.8	92.4	80.5	89.8	95.9	11.9		
CUTTACK	2816	86.3	1.50	98.7	97.0	100.0	17.7	10.9	17.1	1.9	98.7	80.1	97.4	94.1	0.0		
DEOGARH	685	88.8	0.99	98.4	97.5	100.0	16.2	11.2	13.5	0.0	90.0	89.7	79.4	95.5	7.1		
DHENKANAL	1816	85.9	1.01	98.8	95.6	100.0	20.4	14.2	16.5	0.8	98.5	85.1	93.3	96.8	6.4		
GAJAPATI	1482	95.1	0.98	100.0	100.0	100.0	18.9	8.0	17.9	2.9	102.3	99.1	72.9	83.9	10.1		
GANJAM	4340	84.7	0.94	99.9	99.7	100.0	24.6	7.5	22.1	1.5	98.5	83.3	98.1	92.1	2.1		
JAGATSINGHPUR	1837	81.9	1.15	98.8	95.0	99.1	15.7	12.1	13.2	1.0	108.0	90.5	97.0	97.1	0.6		
JAIPUR	2822	79.2	0.97	96.6	86.6	99.6	23.7	11.5	19.0	2.1	113.0	95.3	95.1	90.6	2.2		
JHARSUGUDA	819	87.5	1.19	99.6	98.6	100.0	18.9	11.8	16.5	0.7	103.1	88.9	92.0	97.2	6.2		
KALAHANDI	2707	91.5	1.00	99.6	96.1	99.6	25.5	7.7	24.5	9.6	104.0	94.4	89.0	87.3	9.4		
KANDHAMAL	2053	94.3	1.01	100.0	100.0	100.0	18.6	7.7	17.4	0.7	121.9	95.9	80.8	85.3	3.2		
KENDRAPARA	2354	82.2	1.02	99.2	97.5	99.9	21.5	10.8	18.5	2.6	106.8	95.0	93.6	92.2	0.3		
KEONJHAR	3279	85.0	1.03	99.0	91.2	100.0	24.9	13.0	19.8	1.0	106.5	98.2	83.5	86.4	3.7		
KHORDHA	2115	77.0	1.17	98.3	96.2	99.7	22.7	9.5	18.2	0.6	111.2	93.5	99.1	98.5	2.3		

KORAPUT	2832	95.1	0.93	97.9	95.8	100.0	24.4	10.2	22.7	12.4	102.8	95.1	81.1	80.0	4.4
MALKANGIRI	1442	95.3	0.90	99.8	99.8	98.8	26.6	7.8	21.6	0.7	116.2	99.0	77.8	73.3	5.9
MAYURBHANJ	4971	88.6	0.97	100.0	100.0	100.0	23.5	8.1	20.0	1.0	142.2	100.0	80.8	92.5	3.3
NAWARANGAPUR	2061	94.3	0.96	99.3	96.8	97.7	32.0	5.6	27.5	1.7	103.3	95.5	92.4	83.3	2.3
NAYAGARH	1432	84.8	0.88	99.2	92.4	99.9	20.4	8.8	15.9	0.4	94.3	77.9	94.2	95.3	8.0
NUAPADA	1179	88.5	1.01	100.0	98.7	100.0	23.8	7.4	20.2	0.4	104.5	100.0	87.3	93.6	1.8
PURI	2492	83.0	1.03	96.5	95.7	100.0	21.8	8.3	15.5	0.4	102.5	87.4	99.5	94.0	2.2
RAYAGADA	2229	95.0	0.91	100.0	99.5	99.9	22.7	12.2	21.4	7.9	111.6	97.4	78.6	76.2	1.4
SAMBALPUR	1621	88.0	1.07	100.0	86.1	100.0	18.4	6.2	17.7	1.0	104.4	87.7	93.6	97.4	6.1
SONEPUR	1082	88.4	1.05	100.0	98.8	97.6	19.9	10.4	17.2	1.8	93.6	78.8	96.1	99.8	4.1
SUNDARGARH	2991	84.5	1.06	100.0	100.0	100.0	22.3	5.5	20.5	3.5	103.2	93.0	86.9	92.2	1.2

THE PREVALENCE OF MALNUTRITION IN THE RAYAGADA DISTRICT OF KBK REGION: A CASE STUDY OF TWO VILLAGES

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ABSTRACT

Good health is an important and crucial indicator and dimension of human development in society. An attempt has been made here to examine the status of malnutrition in the KBK Region and particularly two tribal villages of Kashipur Block in Rayagada District. There are reports of severe undernutrition, hunger, and starvation deaths being reported in the various newspapers, articles and reports in the infamous Kashipur block of Rayagada District. Moreover, more than 80 percent of people are reeling under poverty, 85 percent of people are malnourished in this block. The following are the objectives of the paper such as (i) The study sought to examine physical access to food in terms of food availability, (ii) To analyze the economic access to food in terms of nutritional security, (iii) To examine the intra-household food distribution system in the study area using the household level data. It is a complete case study method using the interview schedule method and the personal interview method for understanding the nutritional status of tribal people. The major findings of the paper are, 100 percent of people are tribal people living with abject poverty and hunger and also more than 80 percent of people are undernourished in the Bhitrapadamajhi and Tikarpadar villages of Rayagada District. The state should take initiatives and actions towards finding the solution to undernutrition and the resultant outcomes in this region. The article tracks the level of undernutrition at the KBK Region, at the district level, and at the village level. The two principal policy initiatives, like ICDS and MDMS, provide much-needed good nutritional status to both the children and women in the state.

The paper concludes by creating awareness about the bad impact and consequences of malnutrition on the health status of the poor tribal people, about child caring, child feeding, and issues related to women in the two remote villages of Rayagada District of KBK Region in Odisha.

Key Words: Food Insecurity, Malnutrition, Health, Welfare, Tribal, Rayagada District, KBK Region.

1. INTRODUCTION

Despite steady economic growth and development in many parts of the world, a significant proportion of the global population continues to suffer from food insecurity and malnutrition (World Bank, 2009). The United Nation's MDG-1 recognizes that hunger and food insecurity are the core afflictions of poor people, and specifically sets out to halve the proportion of extremely poor and hungry people across the globe by 2030. India, with nearly 195 million undernourished people across the country it shares a quarter of the global hunger burden (UN, 2020). The State of Food Security and Nutrition in the World 2018 Report found that there are 195.9 million undernourished people in the country (World Food Report, 2018). That means, 51.5 percent of women (15-49 years of age) are anaemic, and more than 14.5 percent of the total population are undernourished in the country.

Attaining food and nutrition security is a matter of great significance for Odisha, where the majority (42 percent) of people suffer from undernutrition and more than 32 percent of people live below the poverty line even after the implementation of various welfare schemes and action plans in the state (Panda, 2017). Nevertheless, and most importantly, more than 55 percent of Scheduled Castes (SCs) and Scheduled Tribes (STs) are found poor in the state (Economic Survey, 2015-16). Furthermore, the latest report of NFHS-IV mentioned that Odisha ranked second from the bottom after Bihar in severely food-insecure states in the country. The Report NFHS-IV also shows that there are 45.7 percent underweight children in the state. Moreover, the NFHS-IV figure is a significant improvement in undernutrition (about ten percent points increase) over the NFHS-III (Patra, 2018). According to the NFHS-IV Report, still 38.9 percent of children below three years old are stunted, 18.5 percent are wasted, and 44 percent are underweighted in the state. Nevertheless, malnutrition continues to be a widespread problem, generally among the poor people and particularly among indigenous people throughout the state and even after there has been substantial progress in the production of foodgrains and advancement in science and technology for the last twenty years (Dalabehera, 2017). Despite all social security measures, malnutrition, hunger, starvation deaths, and poverty among the poor in general and tribal people, in particular, are very much prevalent in the state (Nayak, 2015).

The problem of food insecurity is not found in all sections of the people; rather, it is mostly confined to certain marginalized sections. As Prof V. S. Vyas (2004) pointed out, the classes where food insecurity is highest are the agricultural labourers, marginal farmers and the tribal people. The two main groups that are socially and economically disadvantaged in India are the scheduled castes (SCs) and the scheduled tribes (STs). The STs have been socially and economically disadvantaged due to their isolation both geographically as well as culturally from the mainstream population. Habitat in remote, difficult terrains and corporatization of forest lands, and also the lack of alternative investment opportunities in their communities, have led the tribes to depend on wage labour and subsistence agriculture (Chakravorty and Dand, 2006).

2. THE BROAD OBJECTIVES OF THE PAPER

- The study sought to examine physical access to food in terms of food availability.
- The study tried analyze the economic access to food in terms of nutritional security.
- The paper examined the intra-household food distribution system in the study area using the household level data.

3. DATA SOURCES AND METHODOLOGY

The current research has used both primary and secondary data sources, and the results and outcomes of the study mostly depended on the primary data analysis. It is entirely a case study method where each household member is surveyed in the sample villages. The study has used both simple random and purposive sampling methods for selecting the two tribal villages in Rayagada District of the KBK Region. The study collected the primary data from the household members through a structured questionnaire and interview schedule method. Furthermore, the present study has taken Bhitrapadamajhi and Tikarpadar villages in Rayagada District as the study area. Apart from the household survey, the researcher interviewed government officials at the block level of the districts for secondary information. It comprises questions regarding the various aspects such as size of the household, literacy rate, occupational status, landholding, consumption, employment, targeting errors, poverty level, food and nutritional status, drinking water, hygiene, sanitation, livestock, housing conditions, and others. The study has particularly focused on the measurement of both food and nutrition security status of both tribal and other social groups in the surveyed area. Firstly, the study used the Calorie Intake Method of (National Institute of Nutrition), i.e. taking the daily calorie intake of the household member for measuring the food security status. For that, the consumption of various food grains from every household member has been collected the calorie intake per day per person using the Calorie Food Chart of NIN for measurement of food security status has been calculated. Secondly, Body Mass Index (BMI) measures, i.e. the weight in kg per height

in meters in squares, for children (4-14 years of age) and adults (15-49 years of age) have been used for measuring nutritional status. The Weight Machine and Measurement Tape for measuring the weight and height of both children and adults have been used in the two villages of Rayagada District.

4. RESULTS

In the third world, including India, a sizeable proportion of the population is starving. The most vulnerable are poorer sections of the population in the state, like Odisha and more particularly the Scheduled Caste (SC) and Scheduled Tribe (STs) in the KBK Region of the state. The tribal people mostly suffer from poverty, hunger, low income, illiteracy, starvation, death, undernutrition and lack of development and also exploitation in the KBK Region of the state (Sahoo, 2018). Attaining food and nutrition security is a matter of great significance for Odisha, where the majority (42 percent) of people suffer from undernutrition, and more than 32 percent of people live below the poverty line even after the implementation of various welfare schemes and action plans. Nevertheless, most importantly, more than 55 percent Scheduled Castes (SCs) and the Scheduled Tribes (STs) are found poor in the state (Economic Survey, 2015-16). The persistence of undernutrition and the reported incidence of starvation deaths in the different districts of the KBK Region together describe the nature of the current problem of food insecurity within a situation of the adequate overall availability of food grains in the state. Moreover, an analysis of the regional patterns of development reveals that the benefits of development have not been evenly spread throughout the state, and there have been pockets of underdevelopment in the different regions, where the southern part, known as the KBK Region, consists of eight districts (such as Koraput, Malkanagiri, Nawarangpur, Rayagada, Balangir, Sonepur, Kalahandi and Nuapada) that are underdeveloped and most backwards compared to other areas of Odisha. The study found two broad research questions in this particular study, such as (i) why hunger and starvation are so prevalent and rampant in the KBK Region, (ii) Why Undernutrition and starvation deaths are so prevalent, particularly among the Jhodia Kondha tribe in the Rayagada District. Based on the above research questions, the study formulated three broad objectives in order to address the problem the particularly in the Rayagada District, where more than 65 percent of people are undernourished.

Odisha is one of the most underdeveloped states in the country and recognizes the need for addressing health and nutritional problems existing in the state (Orissa Post, 2007). The state has a maximum percentage of the socio-economically disadvantaged population, particularly the tribal people in the KBK Region (Pattnaik, 2011). And, a significant proportion of the tribal people of the total population continue to suffer from food insecurity and undernutrition in that region (Sarap and Mahamalik, 20015). However, despite steady economic growth and development for the last two decades in the state, still, the majority of the population still suffers from hunger and malnutrition due to policy implementation problems and other socio-economic factors

(Nayak, 2013). The percentage of underweight children below the age of three is lower in the state (45.7 percent) than for rural India as a whole (49 percent).

Table 1.1: The Socio-Economic and Health Status of KBK Region in Odisha (in Percent)

KBK Districts	Agri cultural Laborers	Urbanization	Rural Literacy	Rural Female Literacy	STs	Child Mortality	Under weight Children	Anaemia among Children
Sonepur	46.4	7.4	61.7	44.7	10.2	120	47.8	55.6
Balangir	43.3	11.5	52.7	35.8	22.6	157	40.6	39.8
Nuapada	47.8	5.7	40.3	23.8	36.3	153	43.5	49.4
Kalahandi	52.5	7.5	43.5	26.5	30.4	158	56.1	48.4
Rayagada	49.9	13.9	29.9	18.3	62.8	166	33.4	47.2
Nabarangapur	54.1	5.8	31.3	18	57.8	136	57	24.9
Koraput	44.9	16.8	27.3	15.6	56.5	163	50.6	47.8
Malkangiri	26.8	6.9	27.9	18.4	60.6	110	58.2	44.9
KBK Region	45.71	9.4	39.3	25.1	42.2	142	48.4	44.8
Rest of the State	32.14	14.8	64.2	51.2	22.9	128	39.7	41.8
Odisha	39.1	15	59.8	46.7	24.6	66	34.4	22.7

Source: NFHS-IV, and Odisha Economic Survey, 2019-20

The above table speaks about the socio-economic status that includes agricultural labour, urbanization, rural literacy, rural female literacy and scheduled tribes of the KBK Region, the rest of the state and at the state level in 2015-16. It tried to explain only about the socio-economic status of the Rayagada District. It shows that Rayagada District has close to 50 percent of agricultural labourers. The rural literacy is very low, with only 29 percent of people being literate in the rural areas of the Rayagada District. Apart from that, only 18.3 percent are female literacy in the district. More than 62 percent people are ST people of the total district's population. There are 33.4 percent of people who are underweight in the Rayagada District, and also 47.2 percent of children suffer from anaemia in the Rayagada District of the KBK Region in Odisha state.

Table 1.2: Children and Adult's Nutritional Status in KBK Region (In Percent)

KBK Districts	Adults 15-49 Years of Age		Children Under-5 Years of Age			
	Low BMI-Women	Low BMI-Men	Stunted	Wasted	Severely Wasted	Under Weight
Balangir	19.9	15.2	32.4	17.4	4.5	33.7
Sonepur	32.2	18	47.5	22.3	5.4	43

Nuapada	36.1	26.4	45.8	36	11.6	51
Nawarangpur	34	27.4	37.6	26.4	9.2	40
Koraput	37.4	34.5	40.3	28.5	8.3	44.4
Kalahandi	34.2	30.4	36.6	24.8	9	39.7
Malkanagiri	45.9	26	45.7	32.5	8.4	51.8
Rayagada	33.1	30.4	43.5	23.1	6	42.4
KBK Districts	34.1	26.03	41.17	26.37	7.8	48.8

Source: Author's Calculation from Economic Survey, 2019-20, and NFHS-IV

Table 1.2 explains children's and adult's nutritional status in the KBK Region of Odisha based on the NFHS-IV Data. It shows that the Malkanagiri District has the highest (45 percent) of men are having low BMI, whereas the Balangir District has the lowest (19.9 percent) of women. Likewise, the Koraput District has the highest (34.5 percent) of men the low BMI, whereas the Balangir District has the lowest (15.2 percent) of men. Furthermore, the Sonepur District has the highest (47.5 percent) number of stunted children, whereas Balangir District has the lowest 32.4 percent, stunted children. The Malkanagiri district has the highest (32.5 percent) wasted children, whereas the Balangir District has the most moderate 17.4 percent. The Nuapada District has the highest percentage of children who are severely wasted, whereas the Balangir District has the lowest at 4.5 percent. The Malkanagiri District has the highest 51.8 percent of underweight children, whereas the Balangir District has the smallest 33.7 per cent. There are 34.1 percent women and 26.03 per cent men are having low BMI, whereas there are 41.17 per cent stunted children, 26.37 per cent wasted children, 7.8 per cent severely wasted, and finally, 43.25 per cent are underweight in the whole KBK Region in the state, according to the NFHS-IV Report.

Different reports are talking about the undernourished children in the Majurulendi village of Malkanagiri district of the KBK Region in the state. There are children who are seemingly undernourished due to a lack of adequate quantity and quality of food, along with clean drinking water and primary health care benefits (Dharitri Newspaper, 05/05/2017). The one article of Odia Dharitri Newspaper stated that they do not even avail any primary health care facilities at all due to various reasons, such as long distances, residing in the hilly terrains. The government schemes like PDS, ICDS, MDMS, MGNREGA and other welfare schemes have failed in providing any support to the poor tribal people in the villages. The main and critical problem for accessing food and nutrition security is the lack of adequate accessibility to food grains and low buying capability, which leads to hunger and starvation deaths among the tribal people in that region. Therefore, due to a lack of nutritious food, children are suffering from undernutrition and hunger and many more problems in that particular village of the district. The government should provide not only essential food grains but also basic health care benefits and provide clean drinking water facilities to the indigenous poor people, so that it will improve their food and nutritional status.

5. SOCIO-ECONOMIC CONDITION OF TRIBAL PEOPLE IN THE SAMPLE VILLAGES

The tribal people in this region are popularly named as *Vanavasi* (inhabitants of the forest), *Vanajati* (castes of the forest), *Janjati* (folk people), *Adimjati* (primitive people), and *Anusuchit Janjati* (Scheduled Tribe). Moreover, they dwell in the dense forests, hills, mountains, jungle, and primarily remote areas of the country. Tribal people have an indigenous culture, living style, tradition, vernacular dialect, and food habits (Sanjit Sarkar, 2017). However, in the conventional *Varna vyavastha* (caste system), our society is divided into four groups based on different professions (Sanjit Sarakar, 2017). However, there are two other important groups or communities, such as the scheduled caste (SCs) and scheduled tribe (STs) in the contemporary Indian societal structure (Kapputhai and Mallika, 2010). And nowadays, both communities are facing a wider range of issues and problems than other communities. However, most importantly, these communities are backwards, politically and socially ignorant, geographically inaccessible, economically very deprived, politically apathetic, traditionally and customarily rich, and living their lives in the remote and forest areas of the districts. In the context of food and nutritional security status, factors like less availability of food grains and proper functioning of various safety net programmes are the main factors responsible for the poor nutritional status of these communities in the two districts of the KBK Region. And also, other important factors like poor quality of food intake, lack of awareness, lack of hygiene and lack of literacy among those communities are responsible for low food and nutritional status in those villages (Mittal and Srivastava, 2006). The study has already mentioned the selection of two districts and blocks in the KBK Region in the methodology section. Moreover, the study selected two villages (Bhitarapadamajhi village and Tikarpadar village) in Rayagada District through simple random and purposive sampling. Moreover, it has taken a thorough study of two villages of the Rayagada District in the KBK Region of Odisha.

This session discusses both the socio-economic conditions and food and nutrition security status of both tribal and non-tribal households of Bhitarapadamajhi and Tikarpadar village of Rayagada District in KBK Region. The information is collected through a primary household survey with a structured questionnaire using the interview schedule method. The study has been done on the complete case study of two villages of Rayagada District. To understand the socio-economic condition, and food and nutrition security status of different social groups, the information about number of person in households, their educational and occupational status, landholding status, income and saving status, wage status, major crops, production and its cost, consumption status, types of households, targeting errors, number of undernourished persons, drinking water facilities, structure of houses have been collected from 150 households in Rayagada District respectively and is analyzed accordingly.

Table 1.3: Socio-religious Status of the Households in the Sample Villages

Type of Family	Rayagada District		
	Bhitarapadamajhi	Tikarpadar	Total
Nuclear	72 (90)	66 (94.28)	138 (92)
Joint	8 (10)	4 (5.72)	12 (8)
Total	80 (100)	70 (100)	150 (100)
Hindu	60 (75)	65 (92.85)	125 (83.34)
Christian	20 (25)	5 (7.15)	25 (16.66)
Total	80 (100)	70 (100)	150 (100)
ST	78 (97.5)	16 (22.85)	94 (62.66)
SC	2 (2.5)	54 (77.15)	56 (37.34)
OBC	-	-	-
General	-	-	-
Total	80 (100)	70 (100)	150 (100)
Populations	Rayagada District		
	Bhitarapadamajhi	Tikarpadar	Total
Male	70 (20.58)	48 (18.6)	118 (19.74)
Female	75 (22.06)	56 (21.7)	131 (21.9)
Boys	90 (26.48)	76 (29.46)	166 (27.76)
Girls	105 (30.88)	78 (30.24)	183 (30.6)
Total	340 (100)	258 (100)	598 (100)

Source: Author's calculation from Field Survey, January-February 2019

Note: The figures in the brackets indicate the percent of the Total Households

Table 1.3 explains the socio-religious status of the two villages of the Rayagada District. It shows that 90 percent of households have a nuclear status in both villages due to factors like the inconvenience of managing households and family disputes that led to a smaller size among the households. About the religion part, the majority of households are Hindus (above 80 percent) in all two villages of the district, and a few households are Christians in the other two villages of Rayagada District due to conversion from Hinduism to Christianity. The caste composition of the two sample villages gives very contradictory figures, where SCs dominate (77.15 per cent) in Tikarpadar village, while the STs dominate in the Bhitarapadamajhi Village, which is above 97 percent of Rayagada District. Moreover, the Bhitarapadamajhi village has more families belonging to the Scheduled Tribe (97.5 per cent) and a few SC households. There are no other castes in the two villages of Rayagada District. The population composition of both villages depicts a fascinating scenario, where the female ratio is more compared to the male ratio in the two villages of Rayagada district. However, it is seen in the two villages of Rayagada District.

As it shows, the percentage of females, including girl child (over 52 percent), is more than the male ratio in both these villages due to a greater preference of girl child in the tribal societies.

Table 1.4: Sex-wise Educational Status of the Household Members in the Sample Villages

Sex-wise Education -Rayagada District							
	Gender	Illiterate	Primary	B e l o w Matric	Intermediate	Graduation	Total
Bhitarapadamajhi Village	Male	59 (36.88)	92 (57.5)	7 (4.38)	2 (1.25)	-	160 (52.35)
	Female	122 (67.78)	55 (30.56)	2 (1.12)	1 (0.56)	-	180 (47.65)
	Total	181 (53.24)	147 (43.24)	9 (2.65)	3 (0.88)		340 (100)
Tikarpadar Village	Male	55 (48.25)	53 (46.5)	5 (4.38)	1 (0.88)	-	114 (44.18)
	Female	113 (78.48)	30 (20.84)	1 (0.7)	-	-	144 (55.82)
	Total	168 (65.11)	83 (32.18)	6 (2.31)	1 (0.37)	-	258 (100)
Grand Total		347 (58.02)	230 (38.46)	17 (2.84)	4 (0.66)	-	598 (100)

Source: Author's calculation from Field Survey, January-February 2019

Note: Figures in the brackets indicate the percent of the Total Population

The development of any nation is dependent on the quality of education. And the quality of education is the most important precondition for the overall progress and improvement of any human being in society. Therefore, education plays an essential role in humans' lives, and it usually leads to a better job, higher income and improved social status. Therefore, to understand the educational status of tribal and non-tribal people in the surveyed villages, information about the level of education has been collected. Table 1.4 explains the deplorable educational status of the population in the two villages of Rayagada District. Nevertheless, male literacy is higher than the female literacy rate. On the other hand, the two villages (Bhitarapadamajhi and Tikarpadar) of Rayagada District show a very gloomy picture; educational backwardness among the tribal people is high, even after 73 years of independence. 54 percent of the population in Bhitarapadamajhi is illiterate, and the figure is 65 percent in the case of the Tikarpadar village. Furthermore, female literacy is low, 32 percent in Bhitarapadamajhi and 21 percent in Tikarpadar village of Rayagada District of KBK Region. Furthermore, no one has been able to go to college in both those villages due to a lack of ignorance, awareness, superstition beliefs and government apathy towards those sections.

Table 1.5: Caste-wise Land Holding Status of the Households in the Sample Villages

Land Holding Size	Different Social Groups						Grand Total
	Bhitarapadamajhi Village			Tikarpadar Village			
	SC	ST	Total	SC	ST	Total	
Less than 1 Acres	1 (50)	26 (33.34)	27 (33.75)	6 (11.12)	3 (18.75)	9 (12.85)	36 (24)
1-2 Acres	1(50)	5 (6.41)	6 (7.5)	4 (7.4)	2 (12.5)	6 (8.58)	12 (8)
2-3 Acres	-	2 (2.56)	2 (2.5)	2 (3.7)	1 (6.25)	3 (4.28)	5 (3.34)
Above 3 Acres	-	1 (1.28)	1 (1.25)	1(1.86)	-	1 (1.42)	2 (1.34)
Landless	-	44 (55.13)	44 (55)	41(75.92)	10 (62.5)	51 (72.86)	95 (63.34)
Total H.Hs	2 (2.5)	78 (97.5)	80	54 (77.14)	16 (22.86)	70	150

Source: Author's Calculation from Field Survey, January- February 2019

Note: The figures are in percent of Total Households

It is obviously true that the ownership of land has important implications for the economic well-being and social condition of the rural households in particularly for the underprivileged sections of the society (Rawal, 2008). The caste-wise land holding status among the various social groups is explained in the above Table 1.5. It describes the low holding and landless status among the tribal households (only two communities, like SC and ST, live) in the two villages of Rayagada District. In Bhitarapadamajhi, it can be seen that only two households belong to the SC category, where one household owns less than 1 acre and the other holds 1-2 acres of land. The majority of households owning less than one acre of land belong to the ST community (33.34 percent). In the case of 1-2 acres of land, 6.41 percent of households belong to the ST community. 55.13 percent of households of the ST community are landless in the Bhitarapadamajhi village. The land holding status among the SC and ST is poor due to the low availability of land in their area. In Tikarpadar, 11.12 percent of SC households and 18.75 percent ST households own less than one acre of land. A higher percentage of landless are found among the SC (75.92 percent) than the ST households (62.5 percent). The land status among both SC and ST households is better in Bhitarapadamajhi village in comparison to Tikarpadar village of Rayagada District in KBK Region. Hilly and rocky terrain, mountainous regions are the main reasons for the low land status among these two communities in the district. The overall land status talks about the pathetic socio-economic condition among the tribal communities in the Rayagada District.

Table 1.6: Caste and Sex-wise Occupational Structure of the Households in the Two Villages

Bhitarapadamajhi Village									
Occupational Structure	SC			ST			Grand Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agri. Cultivators	1 (16.67)		1 (20)	2 (18.18)		13 (13.26)	10 (10.87)		23 (12.1)
Agri. Labourer	1 (16.67)		1 (20)	2 (18.18)		15 (15.3)	13 (14.13)		28 (14.73)
Wage Labourer	3 (50)		2 (40)	5 (45.46)		36 (36.74)	33 (35.87)		69 (36.31)
Business	-	-	-			7 (7.14)	6 (6.52)		13 (6.85)
Services	-	-	-	-	-	-	-	-	-
Other Occupations	1 (1.66)		1 (20)	2 (18.18)		27 (27.56)	30 (32.6)		57 (30)
Total	6 (54.55)		5(45.45)	11 (5.48)		98 (51.58)	92 (49.42)		190 (94.52)

Tikarpadar Village									
Occupational Structure	SC			ST			Grand Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agri. Cultivators	12 (17.91)		6 (12)	3 (15.79)		18 (15.38)	5 (12.5)		15 (17.42)
Agri. Labourer	15 (22.39)		8 (16)	2 (10.53)		23 (19.66)	5 (12.5)		17 (19.76)
Wage Labourer	19 (38.35)		13 (26)	4 (21.05)		32 (27.35)	7 (17.5)		23 (26.75)
Business	3 (4.48)		2 (4)	3 (15.79)		5 (4.27)	1 (4.77)		6 (6.98)
Services	-	-	-	-	-	-	-	-	-
Other Occupations	18 (26.87)		21 (42)	7 (36.84)		39 (33.34)	19 (47.5)		25 (29.06)
Total	67 (57.26)		50 (42.74)	19 (47.5)		117 (74.52)	40 (25.48)		86 (54.78)

Source: Author's calculation from Field Survey, January-February 2019

Note: Wage Labourers*- Stone cutting workers, construction workers, service holders, and businessmen

Other occupations- Forest products collectors and making plates

Other Castes- OBC and General Castes

Figures in the brackets indicate the percent of the Total Working Population.

The economic development of a country is very much associated with the occupational structure. The country's per capita income level and economic

progress rise as more and more workforce moves from agricultural sectors to industrial and service sectors. The two villages, Bhitrapadamajhi and Tikarpadar, are showing contrasting figures. In the two villages, the majority of the people are engaged in other occupations like hunting, collecting forest products, rather than being cultivators and wage labourers due to low land holdings and decreased occupational opportunities. The above Table 1.6 shows the various occupational structures among both SC and ST households in Bhitrapadamajhi and Tikarpadar villages of Rayagada District. People belonging to only the SC and ST tribal communities live in both these villages. It was found that more agricultural cultivators are present among the SC households (18.18 percent) than ST households (12.1 percent) for both male and female members. Likewise, agricultural labourers show the same figures, where more SC households (19.66 percent) are engaged in this occupation than the ST households (12.5 percent). However, the maximum households are engaged as wage labourers in both communities (27.35 percent for SC members and 17.5 percent for ST household members). Very few SC and ST households delve into business activities. Furthermore, 18.18 percent SC and 30 percent ST households find work in other occupations in the Bhitrapadamajhi village of Rayagada District. In the case of Tikarpadar village, where agricultural cultivators are higher for SC (15.38 percent) than ST households (12.5 percent), followed by agricultural and wage labourers. Very few households are found in the business activities (for both male and female members), and none of the family members are employed in services. The highest percentage, 33.34 percent of SC households and 47.5 percent ST households, is found in other occupations. It can be clearly seen from the above table that both males and females are employed in different occupational activities in both of these villages. The majority of the population is unable to do cultivation due to a lack of irrigation facilities, which leads to low production and food insecurity among the tribal people in both villages. Both males and females are running small businesses, like selling forest products in the weekly market in the two villages of Rayagada District.

Table 1.7: Yearly Income Distribution of Households in the Sample Villages

Income Groups (in Rupees)	Rayagada District		
	Bhitrapadamajhi	Tikarpadar	Total
Below 10000	62 (77.5)	57 (81.42)	119 (79.34)
10000-15000	7 (8.75)	6 (8.58)	13 (8.66)
15000-20000	6 (7.5)	4 (5.72)	10 (6.66)
20000 & above	5 (6.25)	3 (4.28)	8 (5.34)
Total	80 (100)	70 (100)	150 (100)

Source: Author's calculation from Field Survey, January-February 2019

Note: The figures in the brackets indicate the percent of the Total Households

The above Table 1.7 discusses the distribution of households based on the level of income in the sample villages of two districts. Household income is one of the major factors that determines the standard of living of the family. The data collected for an annual income of individual households shows that those two villages in Rayagada District, Bhitrapadamajhi and Tikarpadar, show a very alarming and low-income status of the households, where 77.5 percent and 81.42 percent of households, respectively, earn less than 15000 rupees per year. The overall picture of the two villages tells that Bhitrapadamajhi village has a better income status due to access to better land holdings, higher wages and a well-functioning social safety net, whereas the income status of the Tikarpadar village is very low due to low land holdings, low wages and malfunctioning of social welfare schemes in the Rayagada District.

Table 1.8: Type of Households in the Sample Villages

Type of Households	Bhitrapadamajhi	Tikarpadar	Total
Poor	63 (78.75)	58 (82.85)	121 (80.66)
Non- poor	17 (21.25)	12 (17.25)	29 (19.34)
Total	80 (100)	70 (100)	150 (100)

Source: Author's calculation from Field Survey, January-February 2019

Note: The figures in the brackets indicate the percent of the Total Households

The numbers of poor and non-deserving families in the two villages of Rayagada District are explained in the above table. The study surveyed 150 households in the two villages, 80 percent of families in the Bhitrapadamajhi and 70 percent of families in Tikarpadar. In the village of Bhitrapadamajhi, out of 80 households, 63 households, that means 78.75 percent are poor households, and 17 households are non-poor, which means that 21.25 percent of households are non-poor. In the case of the second village of Tikarpadar, out of 70 households, 58 households belong to the low-income family; it means that 82.85 percent of households are poor households and the rest 12 households belong to non-poor households, which means that 17.25 percent of households under non-poor.

Table 1.9: Ration Cards possessed by the Households in Sample Villages

Type of Ration Cards	Bhitrapadamajhi	Tikarpadar	Total
BPL	18 (22.5)	10 (14.28)	28 (18.66)
APL	13 (16.25)	8 (11.43)	21 (14)
No Cards	49 (61.25)	52 (74.29)	101(67.34)
Total	80 (100)	70 (100)	150 (100)

Source: Author's calculation from Field Survey, January-February 2019

Note: The figures in the brackets indicate the percentage of the Total Households

Here BPL includes Annapurna and Antodaya = $12 \text{ (BPL)} + 2 \text{ (Antodaya)} + 4 \text{ (Annapurna)} = 18 \text{ (Village-1)}$

Here BPL includes Annapurna and Antodaya = $7 \text{ (BPL)} + 2 \text{ (Antodaya)} + 1 \text{ (Annapurna)} = 10 \text{ (Village-2)}$

The above table details the type of ration cards possessed by the families of surveyed villages in the Rayagada District. And the study surveyed 150 households in the two villages, 80 households in the village, where 18 households (22.5 percent) are BPL cardholders, including two households that are Antodaya, four households are Annapurna cardholders, 13 households (16.25 percent) are APL cardholders, and the remaining 49 households (61.25 percent) do not have cards at all. They are genuinely poor people and have been denied the allotment of ration cards. In the case of the second village, in which the study surveyed 70 households, there are 10 (14.28 percent) BPL cardholders, including 2 Antodaya cardholders, 1 Annapurna cardholder and 8 households (11.43 percent) are APL cardholders, and the remaining 52 households (74.29 percent) do not have cards at all, they were excluded from the scheme. By and large, it tells that poor tribal people in the two villages are excluded from the system due to various reasons.

6. THE FOOD AND NUTRITIONAL STATUS OF THE TRIBAL PEOPLE IN THE SAMPLE VILLAGES

The persistence of undernutrition and the reported incidence of starvation deaths in the different districts of the KBK Region together describe the nature of the current problem of food insecurity within a situation of the adequate overall availability of food grains in the state (Mahamalik, 2013). Moreover, an analysis of (Behera, 2016) the regional patterns of development reveals that the benefits of development have not been evenly spread throughout the state, and there have been pockets of underdevelopment in the different regions, where the southern part known as KBK Region consists of eight districts (such as Koraput, Malkanagiri, Nawarangpur, Rayagada, Balangir, Sonepur, Kalahandi and Nuapada) are underdeveloped and most backward in compared to other areas of Odisha. In order to develop that region, the government has been implementing a plethora of welfare schemes and programmes to reduce poverty, hunger and starvation deaths (Parida, 2016). In this region, 59.7 percent of people are illiterate, and 70 percent of people are living below the poverty line (Economic Survey, Govt. of Odisha, 2019-20).

The individual's lifestyle is profoundly determined by the choice of food and the food pattern he/she live. Moreover, there are different factors like religion, education, economic factors, traditions, beliefs, notions, thoughts, and taboos which significantly influence the food habits of a particular person in society. It is also observed that the food consumption of tribal communities such as Damba and Jhodia Kandha depends mainly upon their socio-economic condition (Pingle, 1972). However, the choice of food and pattern of food habits of tribal communities are determined by the economic status, cultural

practices and also ethnic deep-rooted practices in the country (Mahadevan, 1962). The current research attempts to analyze the consumption pattern and food habits of tribal households in their socio-cultural system in the surveyed villages of two districts. The indigenous people are more vulnerable to various diseases, but the primitive tribal communities are highly susceptible to food and nutrition insecurity in the Rayagada District. Those communities mostly consume rice, Mandia, grams, and forest products. The study discovered that the indigenous communities suffer from low-income level, low standard of living, high illiteracy, high poverty, poor sanitation, orthodox and blind beliefs and most importantly are unable to fulfil three square meals a day in the studied villages of Rayagada District of KBK Region in Odisha.

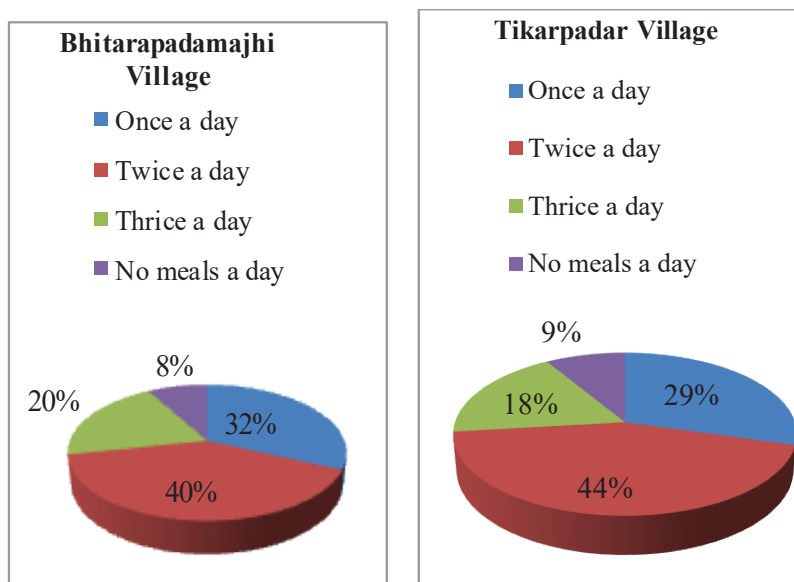


Figure 1.1: Household Members Take the Number of Meals a Day in the Villages (Per Month)

Source: Author's calculation from Field Survey, January-February 2019

Historically and most importantly, food is one of the utmost indispensable necessities for every person and also their growth and development. Not only is the amount and quality of food important, but also the number of times a person takes a meal in a day is very crucial, as it provides a very much required amount of intake for that person. The number of meals a person depends on the availability of food in particular households, getting essential items from ration shops and buying capacity. The above Figure 1.1 deals with the number of meals taken by the household members in the two villages of Rayagada district. Bhitrapadamajhi and Tikarpadar villages show a very bad and negative picture of the number of meals taken among the household members in the Rayagada District. It shows that only 20 percent of household

members take three square meals a day in Bhitrapadamajhi and 16 percent in Tikarpadar village. Moreover, 34 percent and 27 percent of members take one square meal a day in both these villages. However, most importantly, 8 percent and 9 percent of the total do not take a meal at all in the respective villages. And most importantly, maximum household members only take two square meals a day because of food unavailability and access to food grains in both these villages. The overall broad pictures of all villages show that food consumption among the tribal households is very low due to the above-mentioned factors in the Rayagada District of the KBK Region.

Table 1.10: Household Members have fulfilled and not fulfilled the Required Calorie Norms in the Villages

Gender	Bhitrapadamajhi Village						
	Adults attained	The adults do not attain	Total	Gender	Children attained	Children do not attain	Total
Male	32 (45.72)	38 (54.28)	70 (48.28)	Boys	38 (42.22)	52 (57.78)	90 (46.15)
Female	29 (38.67)	46 (61.33)	75 (51.72)	Girls	44 (41.90)	61(58.09)	105 (53.85)
Total	61 (38.62)	84 (61.38)	145	Total	82 (42.05)	113 (57.95)	195
Gender	Tikarpadar Village						
	Adults attained	The adults do not attain	Total	Gender	Children attained	Children do not attain	Total
Male	18 (37.5)	30 (62.5)	48 (46.15)	Boys	28 (36.84)	48 (63.16)	76 (49.35)
Female	19 (33.93)	37 (66.07)	56 (53.85)	Girls	26 (33.34)	52 (66.66)	78 (50.65)
Total	37 (35.58)	67 (64.42)	104	Total	54 (35.06)	100 (64.94)	154

Source: Author's calculation from Field Survey, January-February 2019

Note: The figures in the brackets indicate the percent of the Total Population

The above table explains the household members those able to meet the required calorie norms and those who are not able to meet in Bhitrapadamajhi village. In Bhitrapadamajhi village, the percentage of people who attained the calorie, protein, and fat norms is 45.72 per cent male and 38.67 percent female, while 42.22 percent boys and 41.90 percent girls have attained calorie norms. On the other side, 54.28 percent of males and 61.33 percent of females in Bhitrapadamajhi village and 57.78 percent of boys, 58.09 per cent of girls in Tikarpadar village do not meet calorie norms. And 33.93 percent females and 37.5 percent males can attain calorie norms, while 33.34 percent girls and 36.84 percent boys can attain calorie norms in Bhitrapadamajhi village. The

negative side shows 66.07 percent of females and 62.5 percent of males in Tikarpadar village are not able to meet the required calorie norms. And also, 66.66 percent of girls and 63.16 percent of boys in Bhitrapadamajhi village are not able to meet calorie norms. The pathetic and worst situation of food insecurity in both villages shows the worst reality existing in the district. The first and most important reasons for food insecurity among the tribal people are lack of adequate food grains, and lack of buying capacity, and also the malfunctioning of various welfare schemes. The overall picture tells that the Food intake by the tribal communities is extremely low, which leads to severe food insecurity in the Rayagada District of the KBK region in Odisha.

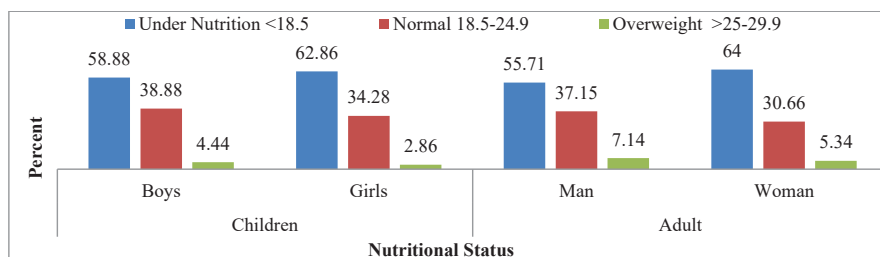


Figure 1.2: Nutritional Status of Children and Adults in Bhitrapadamajhi Village

Source: Author's calculation from Field Survey, January-February 2019

The above figure explains the nutritional status of the people in Bhitrapadamajhi village. The blue bar indicates the under-nutritional status for boys and adult males, whereas the red bar indicates the normal body for both children and adults (male and female). Under-nutrition is high among both girls and females compared to boys and males. The overall nutritional position of the people, including the children, is the worst in the sample village. It signifies not only inadequate and less nutritious food consumption of the people but also a lack of safe drinking water, sanitation and lack of primary health care facilities. All the above factors have impacted the nutritional status among the poor tribal people in Bhitrapadamajhi village of Rayagada District in the KBK Region.

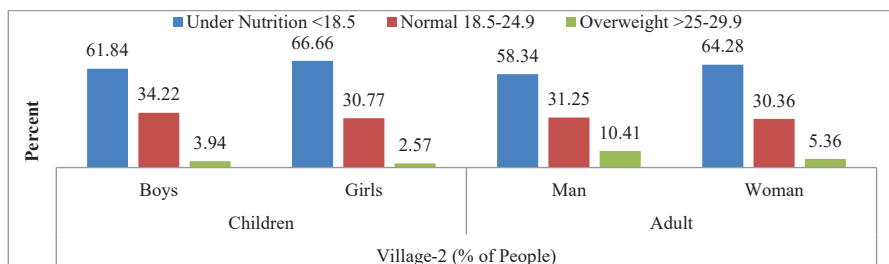


Figure 1.3: Nutritional Status of Children and Adults in Tikarpadar Village

Source: Author's calculation from Field Survey, January-February 2019

The above figure explains the percentage of people, including children, who are suffering from undernutrition in Tikarpadar village. From the figure, the blue colour bar represents the percentage of undernutrition; the red bar represents the healthy, and the green bar represents the overweight. From the figure, undernutrition is very high among both children and adults due to various socio-economic and health factors. In other words, girls and adult females are higher compared to the boys and males due to less consumption of food grains by the female members in a particular household. Other factors like biological reasons, consumption of unhygienic foods and lack of adequate health services seem to influence undernutrition in the Tikarpadar village. The lack of adequate food grains and poor quality of foodgrains in their household signifies that they are unable to take three square meals in a day, let alone the nutritious food, and apart from that, there is no access to safe drinking water, no sanitation facilities, lack of proper feeding practices, lack of hygienic food and no nutritious food at all. Moreover, they mostly consume rice, mandia, various roots, mango kernel, and green leaves most of the time in their day-to-day consumption. This leads to undernutrition among the poor tribal people in the village.

7. CONCLUSION

To sum up, providing food security and improving nutritional and health status is a great task for the state and the whole country. The state government should implement different welfare schemes for reducing undernutrition and hunger among the people to enhance food and nutrition security in the marginalized communities of the state in general, and the KBK Region in particular. The state government and other organizations must take various initiatives, like public health policy, creating awareness, training programmes, sanitation drives and other outreach programmes for the poor people in the two villages of Rayagada district in the KBK Region of Odisha.

8. MAJOR FINDINGS OF THE STUDY

- Above 60 per cent blocks are backward and underdeveloped in the KBK Region.
- There is only 25 per cent female literacy in the KBK Region of Odisha.
- There are 48.4 per cent stunted children in the KBK Region of Odisha.
- 44.4 percent of children are underweighted in the Rayagada District of the KBK Region.
- 75 percent people are illiterate in both these villages of Rayagada District.
- 80 per cent of people are living below the poverty line.
- Only 30 percent of people take three square meals a day in both villages.
- 59 percent of people are underweighted in both villages of Rayagada District.

9. POLICY SUGGESTIONS FOR IMPROVING NUTRITIONAL STATUS

- The government must take an initiative to distribute the land to the landless poor tribal people in the state, particularly in the KBK Region.
- The state government must improve the functioning of various welfare schemes for increasing the standard of living of the poor tribal people in the KBK Region.
- The state government should fix the problem in the functioning of the PDS programme, ICDS, MDMS and various employment schemes to enhance the food and nutritional security of the poor tribal people in the Rayagada District of the KBK Region.
- The state government must provide the Indira Awas Yojana and Biju Pakka Awas, along with providing clean drinking water and basic health care facilities to the poor tribal people in the district.
- The government should take various steps regarding the marketing of forest produce by tribals, as the existing middlemen and traders exploit them. Such intervention would help them to get a better price for their products; in turn, it will help them in increasing their economic status of the poor tribal people in the state.

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TRANSFORMATIVE POTENTIAL OF EDUCATION FROM DISPARITY TO SOCIAL INCLUSION THROUGH EQUITY AND EQUALITY

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ABSTRACT

The National Education Policy (NEIP 2020) emphasizes the five pillars to remove differences and bring inclusiveness through Access, Equity, Quality, Affordability, and Accountability. The paradigm shifts in education brought significant revolutionary changes in ensuring inclusive and accessible education to the students of diverse cultural and socio-economic backgrounds with their individual differences. This paper is an attempt to explore the Potential capacity of Education to eradicate the myths of disparity. The current situation requires increased attention to equity, which has amplified the importance of equity and inclusion – a cornerstone of several of the Sustainable Development Goals (SDGs). At its heart, equity in education means giving equal access to top-notch learning opportunities to all students by removing barriers and creating a level equal field, no matter of background, abilities, or circumstances, where fair education means each learner has unique needs and aims to support them in the best way possible. Furthermore, this paper is an attempt to address the various disparities and exclusions that have been a hurdle in the path of achieving the Gross Enrolment Ratio as well as social well-being. It also includes students with special education needs, different sexual orientations, gender identities and much more, that diversity creates a diverse set of challenges. Inclusion goes hand in hand with equity by promoting empathy, respect, and understanding among students. It prepares learners to thrive in a diverse, interconnected world, and supports disabled and disadvantaged students by creating an environment where they can fully participate and reach

their potential. This paper is also an attempt to identify the social exclusion factors that Students with disabilities face, including multiple discrimination, a negative attitude, social avoidance, negative stereotyping, discrimination, condescension, unfair treatment, embarrassment, violence, lack of opportunity, helplessness, unable to do their work freely, and unable to think and express freely. Social stigma is a major barrier to social inclusion; stigma is a negative set of beliefs about students with dissimilarities. The findings of this paper highlight that Education as a catalyst has the potential to facilitate all required assistance to foster an inclusive culture and feeling of global citizenship among the learners. With a flexible and responsive education system fulfilling the individual needs of students in collaboration with governments and education policy makers, increasingly concerned with equity and inclusion in education due to several major global trends such as demographic shifts, migration, rising inequalities, and societal exclusion. Moreover, the paper, through a detailed review, revealed that mostly female students, disabled students, students with illiterate parents, low socio-economic status, and disadvantaged groups, and unaware individuals face numerous challenges that keep them very far from equity and equality.

Keywords: Social Inclusion, Accessibility, Social Stigma, Social Exclusion, Discrimination, Equity, Equality.

1. INTRODUCTION

Education is universally recognized as a powerful tool for social transformation, capable of breaking cycles of poverty, marginalization, and inequality. Its transformative potential lies not merely in the dissemination of knowledge, but in its capacity to foster inclusive societies rooted in the values of equity, justice, and human dignity (UNESCO, 2020). As global communities continue to grapple with the enduring challenges of disparity and exclusion, education emerges as a vital mechanism for cultivating social inclusion by addressing systemic inequalities and empowering all learners, regardless of their socio-economic background, ability, gender, or identity.

The National Education Policy (NEP) 2020 of India represents a significant milestone in this regard. It emphasizes five foundational pillars—Access, Equity, Quality, Affordability, and Accountability—as crucial levers for reimagining an inclusive education system that nurtures the diverse needs of learners and bridges historical gaps in participation and achievement (Ministry of Education, 2020). By focusing on equity and inclusion, the policy aligns with the broader goals of Sustainable Development Goal 4 (SDG 4), which calls for “inclusive and equitable quality education and lifelong learning opportunities for all” (United Nations, 2015).

Despite policy advancements, deep-rooted disparities persist, particularly for learners from marginalized communities, including students with disabilities, those from low socio-economic strata, gender and sexual minorities, and

children of illiterate parents. These groups often face multiple layers of discrimination, social stigma, and systemic barriers that hinder their full participation in the educational process (OECD, 2018). Equity in education, therefore, does not imply identical treatment for all; rather, it entails providing differentiated support that ensures each learner has the opportunity to succeed according to their unique circumstances and potential (Ainscow, Booth, & Dyson, 2006).

Inclusion focuses on the question of 'who' achieves learning outcomes. It is about access to education and the opportunities to learn and succeed in safe and enriching environments. Inclusion is also concerned with the distribution of resources to enhance the capabilities of all current and future learners (Rangarajan et. al., 2023). Inclusion goes beyond physical access to schooling—it involves fostering empathy, respect, and belonging among all students. A truly inclusive education system promotes shared experiences, nurtures diversity, and prepares learners to navigate and contribute to an interconnected and pluralistic world (Slee, 2011). This paper explores how educational frameworks can act as catalysts in dismantling entrenched disparities and advancing a culture of social inclusion, with a particular focus on the structural, attitudinal, and cultural barriers that impede equity and equality in educational access and outcomes. Scholars have long acknowledged the transformative power of education in shaping equitable and inclusive societies. Freire (1970), in his seminal work *Pedagogy of the Oppressed*, argued that education must be dialogical and liberating, empowering the oppressed to challenge social injustices and transform their realities. Education, therefore, is not a neutral process; it is inherently political and holds the potential to address structural disparities.

Sen (1999) emphasized education as a basic capability that enhances freedom and human development. His capabilities approach views education not merely as a means to economic development, but as a central mechanism for expanding human freedoms and ensuring justice. UNESCO's *Global Education Monitoring Report* (2020) stresses that inclusion in education is not only about addressing disabilities but also about embracing all forms of diversity, including gender, socio-economic background, ethnicity, and language. Inclusive education fosters empathy, respect, and cooperation among students, preparing them to thrive in pluralistic societies.

Inclusion is a multi-dimensional concept that extends beyond integrating students with disabilities into mainstream classrooms. Slee (2011) criticizes tokenistic inclusion and emphasizes the need for genuine systemic transformation to create truly inclusive environments that respect diversity.

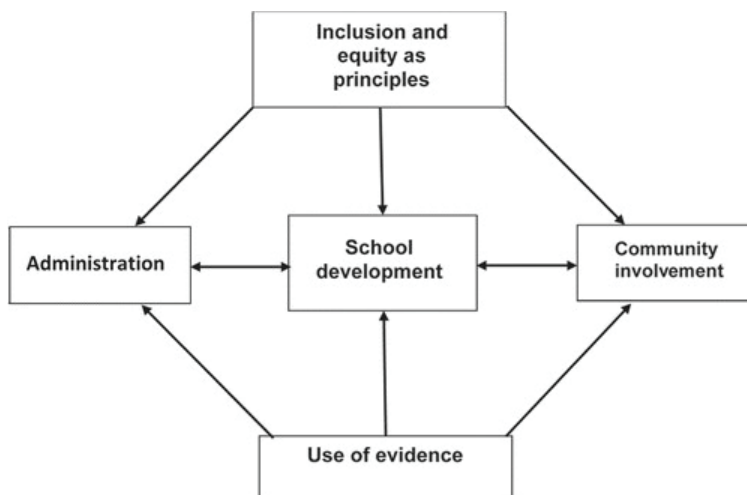


Figure 1: School Development

2. REVIEW OF RELATED LITERATURE

This paper examines how transformative education can empower social justice by bridging the gap between knowledge and action. It presents a theoretical framework for transformative education, which is grounded in critical reflection, dialogue, and action. By fostering critical consciousness, transformative education enables students to challenge the systemic issues that perpetuate inequality and injustice. This study will be based on a literature review of the existing research on transformative education and its relationship with social justice. The paper adopts a qualitative approach to analyse and synthesize the literature on transformative education and uses thematic analysis to identify key themes and concepts. The findings are presented in a narrative format and related illustration in the topic's case study, which is organized around the theoretical framework of transformative education. The paper also includes case studies and examples from different educational settings to illustrate the transformative potential of education in promoting social justice.

Liasidou (2012) *"Inclusive Education, Politics and Policymaking"*. The objective of the study was to investigate how negative attitudes among educators and institutions hinder the implementation of inclusive education. The study uses qualitative methods, including interviews with teachers and policymakers, as well as critical discourse analysis of policy documents and teacher narratives. Researchers found that entrenched biases, low expectations, and deficit-based perspectives among teachers obstruct inclusive practices. The study stresses the need for critical reflection, professional development, and policy revision to dismantle attitudinal barriers.

OECD (2018) conducted a study on *"Equity in Education: Breaking Down Barriers to Social Mobility"*. The objective of the study was to analyse the links

between equitable education systems and broader socio-economic outcomes, particularly resilience, mobility, and national development. The report uses longitudinal studies, statistical data from PISA (Programme for International Student Assessment), and policy evaluations across OECD countries to identify patterns and correlations between educational equity and economic success. The OECD report reveals that reducing disparities in educational outcomes leads to improved social mobility and economic productivity. It urges governments to focus on early interventions, fair resource allocation, and targeted support for at-risk learners. Equity, it argues, is both a social and economic necessity. UNICEF identifies those multiple forms of disadvantage—such as poverty, caste, gender discrimination, disability, and geographic remoteness—that interact to deepen exclusion. Systemic barriers like poor infrastructure, undertrained teachers, and inadequate policy implementation worsen the situation for vulnerable groups, particularly girls and indigenous populations.

UNICEF (2019) conducted a study on *“The State of the World’s Children: Children, Food and Nutrition”* (Education Section). The objective of the study was to highlight the multifaceted barriers marginalized children face in accessing quality education, with a particular focus on intersectional disadvantages. The report is based on global statistical data, national surveys, policy reviews, and field-based case studies in low- and middle-income countries. UNICEF identifies those multiple forms of disadvantage, such as poverty, caste, gender discrimination, disability, and geographic remoteness interact to deepen exclusion. Systemic barriers like poor infrastructure, undertrained teachers, and inadequate policy implementation worsen the situation for vulnerable groups, particularly girls and indigenous populations.

UNESCO (2020) conducted a study on *“Global Education Monitoring Report: Inclusion and Education”*. The objective of the study was to expand the concept of inclusive education beyond a narrow focus on disability, encompassing a broad spectrum of diversity, including gender, socio-economic background, ethnicity, language, and migration status. This report is based on a comprehensive global literature review, policy analysis across 180 countries, case studies, and comparative data from international organizations such as the World Bank, OECD, and national education systems. The report concludes that inclusive education fosters social cohesion by promoting empathy, respect, and mutual understanding in diverse societies. It advocates for a whole-system approach—integrating policy, pedagogy, and community engagement to achieve inclusive education that contributes to social transformation and equity.

Ainscow (2020) researched *“Inclusion and Equity in Education: Making Sense of Global Challenges”*. The objective of the study was to provide a framework for understanding and addressing global challenges related to inclusion and equity in education. The article offers a research-based framework for contextual analyses, drawing on international experiences and emphasizing

the importance of understanding local contexts in promoting inclusive education. The study found that inclusion should be viewed as an ongoing process aimed at responding to diversity and eliminating social exclusion. It highlights the necessity of identifying and removing barriers to learning, advocating for education systems that are responsive to the diverse needs of all learners.

Ainscow (2020) studied *"Promoting inclusion and equity in education: lessons from international experiences"*. The objective of the study was to find the major challenge facing education systems around the world, which of finding ways to include all children in schools. The study found that Policies should be based on clear and widely understood definitions of what the terms Inclusion and equity mean, and Strategies should be informed by evidence regarding the impact of current practices on the presence, participation and achievement of all students.

Owa-Onire (2023) conducted a study on *"How Transformative Education Empowers Social Justice: Bridging the Gap between Knowledge and Action"*. This paper examines how transformative education can empower social justice by bridging the gap between knowledge and action. The paper adopts a qualitative approach to analyse and synthesize the literature on transformative education and uses thematic analysis to identify key themes and concepts. The study found that Transformative education has the potential to empower social justice by bridging the gap between knowledge and action. By fostering critical reflection, dialogue, and action, transformative education enables students to challenge the systemic issues that perpetuate inequality and injustice.

Elfaizi & Aouri (2024) conducted a study on *"Inclusion between Equality and Equity: A Balance Model to an Equitable Quality Education for All"*, to provide a balanced model for an equitable quality education for all students regardless of their learning impairments or disabilities. The study found that a balanced model for an equitable quality education for all is devised to balance education equality and education equity in every mainstream school environment following and respecting all the adaptations, which include actual involvement of allied health professionals and parents of students as equal partners in this educational project, adequate training of school staff and parents of students with disabilities, placement of students according to their disabilities in inclusive classes, and adaptation of school practices and materials to the special needs of these students with disabilities which would effectively have a positive impact on ensuring an equitable quality education of all learners alike.

Dastyari & Jose (2024) conducted a study on *"Achieving Inclusive and Equitable Quality Education for All: The Importance of Digital Inclusion"*. The objective of the study was to examine how digital inclusion is essential for achieving Sustainable Development Goal 4 (SDG4) by ensuring equitable access to quality education. The study conducts a comprehensive analysis of Australia's digital infrastructure, focusing on access, affordability, and digital literacy.

The findings of the study were that the digital inequalities exacerbate existing educational disparities, hindering progress toward inclusive education. It emphasizes the need for policies that ensure all students have meaningful access to digital technologies, both in schools and at home, to bridge the digital divide and promote equity in education.

Biswas (2024) conducted a study on *“Promoting Social Equity and Justice Through Education: A Pathway to Sustainable Development of India”*. The objective of the study was to explore how education in India can advance social equity and justice, contributing to sustainable development. The research analyses existing literature, policy frameworks like the Right to Education Act, and empirical evidence to assess education’s role in reducing socioeconomic disparities. The study concludes that education significantly impacts health, poverty reduction, and social cohesion. It underscores the importance of inclusive practices and empowering individuals through education to foster tolerance, diversity, and active citizenship, thereby promoting a more equitable society.

3. RESEARCH GAP

Despite a growing body of literature emphasizing the importance of equity and inclusion in education, several critical gaps remain in both theory and practice, particularly within the context of developing nations like India. While global frameworks such as the UN Sustainable Development Goals (SDG 4) and national policies like the National Education Policy (NEP) 2020 highlight inclusive and equitable education as a priority, a closer examination reveals substantial discrepancies between policy aspirations and ground-level realities (UNESCO, 2020; Ministry of Education, 2020).

Much of the existing literature on inclusive and equitable education is based on Western contexts, where education systems, resources, and societal attitudes differ significantly from those in developing countries (Miles & Singal, 2010). There is a lack of localized, empirical studies that assess the implementation and effectiveness of inclusion frameworks in diverse, multilingual, and socio-economically stratified settings like India (Singal, 2006). This limits the applicability and adaptability of global models to indigenous contexts.

Many studies tend to treat inclusion narrowly—often focused only on learners with disabilities—and fail to address intersectional exclusion based on gender, caste, economic background, language, and sexual orientation (Slee, 2011).

Existing quantitative data often captures enrolment and dropout rates but lacks qualitative insights into the lived experiences of students from marginalized backgrounds. There is a significant research gap in understanding how factors like peer interaction, teacher behaviour, curriculum content, and school climate affect their sense of belonging and academic success (Florian & Black-Hawkins, 2011).

Research consistently shows that teachers are pivotal in shaping inclusive classrooms, yet few studies assess teacher preparedness, bias, and ongoing

professional development in diverse Indian classrooms (Booth & Ainscow, 2002). The lack of focus on teachers' beliefs and competencies creates a critical blind spot in advancing inclusion.

4. RESEARCH OBJECTIVES

1. To examine how education mitigates socio-economic and cultural disparities affecting inclusive access.
2. To assess the implementation and impact of NEP 2020 in fostering equity and inclusion in education.
3. To explore systemic and attitudinal barriers to equitable and inclusive learning, especially for marginalized groups.
4. To propose inclusive strategies and pedagogies that support diversity and promote global citizenship.

Research Questions

1. How does education contribute to reducing socio-economic and cultural disparities that affect access to inclusive learning opportunities?
2. To what extent has the National Education Policy (NEP) 2020 been implemented, and how effectively does it promote equity and social inclusion in educational institutions?
3. What are the key systemic and attitudinal barriers faced by marginalized groups, including students with disabilities, diverse identities, and socio-economically disadvantaged backgrounds, in accessing equitable and inclusive education?
4. What inclusive strategies and pedagogical approaches can be adopted to create student-centred learning environments that foster diversity, empathy, and global citizenship?

Delimitations of the Study

The present study is delimited to the Mayurbhanj district, Odisha.

The present study is delimited to only the Baripada block of Mayurbhanj district.

The study is delimited to only the Primary and Secondary levels.

The study is further delimited to only 100 samples.

5. RESEARCH METHODOLOGY

5.1 Research Design

The study adopts a mixed-method research design, combining both quantitative and qualitative approaches. This dual approach enables a comprehensive exploration of the transformative role of education in reducing disparities and promoting inclusion by integrating statistical trends with personal experiences and institutional perspectives.

5.2 Methodological Approach

a) Qualitative Method

- An open-ended questionnaire has been used to collect in-depth data.
- Focus Group Discussions (FGDs)

b) Quantitative Method

- Used to collect numerical data from structured questionnaires.
- Helps in identifying patterns, correlations, and statistical relationships related to access, equity, and inclusion.

5.3 Population

The population for this study comprises Primary and Secondary level students, teachers, and educational administrators from diverse socio-economic and cultural backgrounds across selected educational institutions of Baripada Block. It also includes both government and private institutions, with a focus on active engagement with inclusive practices or are in the process of implementing the National Education Policy (NEP) 2020. The population represents individuals who are directly impacted by educational disparities and those responsible for implementing equity and inclusion strategies, such as students from marginalized groups (including those with disabilities, from low-income families, and underrepresented communities), as well as educators involved in shaping inclusive environments.

5.4 Sample and Sample Size

The sample for the present study includes students, teachers and administrators of Baripada block only. The study employed a stratified random sampling technique. A sample size of 100 respondents has been chosen for manageability and depth of analysis, and the sample includes approximately:

- 40 students (from various socio-economic and cultural backgrounds)
- 40 teachers, and
- 20 administrators or policy implementers

Table 1: Tools and Techniques

Tool	Purpose	Target Group
Structured Questionnaires	To collect data on accessibility, educational experiences, and policy awareness	Students
Likert Scale Surveys	To measure perceptions on inclusion, bias, and attitudes	Teachers, Students
1. Focus Group Discussions 2. In-depth Interviews	1. To explore challenges faced by marginalized learners 2. To gather insights on policy implementation and pedagogical strategies	Teachers, Administrators

6. RESEARCH FINDINGS

Table 2: Demographic Profile of Respondents

Category	Subcategory	Frequency	Percentage
Gender	Male	52	52%
	Female	48	48%
Role	Student	40	40%
	Teacher	40	40%
	Administrator	20	20%
Location	Urban	58	58%
	Rural	42	42%
Special Needs	Yes	12	12%
	No	88	88%

Table 3: Access to Inclusive Education

Response	Frequency	Percentage
Strongly Agree	25	25%
Agree	42	42%
Neutral	18	18%
Disagree	10	10%
Strongly Disagree	5	5%

Table no: 3

Interpretation: 67% agreed or strongly agreed that their institution ensures equal access, though 15% expressed disagreement, indicating room for improvement.

Table 4: Awareness of NEP 2020 and Inclusion Policies

Response	Frequency	Percentage
Strongly Agree	18	18%
Agree	36	36%
Neutral	28	28%
Disagree	12	12%
Strongly Disagree	6	6%

Interpretation: Only 54% of respondents were aware of NEP 2020's inclusion goals, showing a gap in policy dissemination.

Table 5: Perception of Barriers to Equity

Response	Frequency	Percentage
Strongly Agree	35	35%
Agree	40	40%
Neutral	10	10%
Disagree	10	10%
Strongly Disagree	5	5%

Interpretation: 75% acknowledged existing barriers, which validates the objective.

Research Question 1: How does education contribute to reducing socio-economic and cultural disparities that affect access to inclusive learning opportunities?

Findings:

- Participants from underprivileged and rural backgrounds emphasized that education is a critical vehicle for breaking the cycle of poverty and marginalization.
- However, infrastructural inequalities (e.g., poor school facilities, lack of digital resources) still disproportionately affect students from lower socio-economic strata.
- Teachers shared that multilingual approaches and culturally contextual teaching helped improve participation among diverse learners.

Interpretation: Education has the potential to reduce disparities when supported by equitable infrastructure and culturally responsive teaching, but challenges persist in resource allocation.

Research Question 2: To what extent has the NEP 2020 been implemented, and how effectively does it promote equity and social inclusion in educational institutions?

Findings:

- 54% of educators were familiar with NEP 2020 provisions on inclusion, but only a few institutions had begun implementation in meaningful ways.
- Students were mostly unaware of the policy, indicating a communication and application gap.
- Administrative staff shared that training and resources to support NEP goals are still limited.

Interpretation: While NEP 2020 offers a progressive blueprint for inclusive education, implementation remains inconsistent, and awareness among learners is low.

Research Question 3: What are the key systemic and attitudinal barriers faced by marginalized groups in accessing equitable and inclusive education?

Findings:

- Students with disabilities reported feeling excluded due to physical inaccessibility and a lack of support systems.
- LGBTQ+ students and those from tribal communities mentioned facing stereotypes, microaggressions, and being overlooked in academic discussions.
- Teachers admitted that institutional training on diversity and inclusion is minimal, and there's still a tendency to label or underestimate learners.

Interpretation: Barriers are both structural (infrastructure, curriculum) and attitudinal (bias, ignorance), severely affecting full inclusion for marginalized students.

Research Question 4: What inclusive strategies and pedagogical approaches can be adopted to create student-centred learning environments that foster diversity, empathy, and global citizenship?

Findings:

- Educators noted that group discussions, collaborative projects, and real-world problem-solving foster greater student interaction across differences.
- Students highlighted how inclusive classrooms made them feel safe and valued, especially when diversity was acknowledged and celebrated.
- Teachers using visual aids, UDL (Universal Design for Learning), and peer mentoring reported better academic and emotional engagement.

Interpretation: Inclusive pedagogy that values student voice, differentiates learning styles, and cultivates empathy significantly enhances engagement and promotes global citizenship values.

7. CONCLUSION

The findings of this study highlight the significant yet uneven role of education in addressing socio-economic and cultural disparities. While participants acknowledged education as a transformative tool for empowerment, gaps in access, resource distribution, and policy implementation remain evident. The NEP 2020 has laid a progressive foundation for inclusive education, but its practical impact is still limited by institutional readiness and awareness. Systemic and attitudinal barriers continue to hinder equitable participation, particularly for students with disabilities, diverse identities, and from disadvantaged backgrounds. However, inclusive pedagogical strategies—such as collaborative learning, culturally responsive teaching, and universal design—have shown promise in fostering engagement, empathy, and respect for diversity. These insights affirm that creating truly inclusive educational spaces requires a combination of policy execution, teacher training, and student-centred approaches that value every learner. Moving forward, a

collaborative effort among stakeholders is essential to turn inclusive education from a vision into a sustained reality.

8. SUGGESTIONS FOR FUTURE IMPLICATION

Policy Interventions

- Affirmative action in admissions and scholarships
- Inclusive education policies (e.g., UN Sustainable Development Goal 4: Quality Education)
- Universal access to early childhood education

Inclusive Pedagogy

- Differentiated instruction that meets diverse learning needs
- Culturally responsive teaching methods
- Use of local languages and contexts in curricula

Teacher Training and Capacity Building

- Professional development focused on inclusion, anti-bias, and equitable practices
- Recruitment from diverse communities to reflect student populations

Community Engagement

- Partnerships between schools and local communities
- Parent education and participation in school governance

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SOCIAL SUSTAINABILITY AND JOB CONTENTMENT: A COMPARATIVE EVALUATION OF HIGHER EDUCATION LECTURERS IN ODISHA, INDIA

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ABSTRACT

Faculty job satisfaction is a crucial factor influencing teaching quality, institutional success, and the overall educational experience. This study examines the job satisfaction levels of lecturers in government-aided and self-financed colleges in Odisha, emphasizing social sustainability. A structured questionnaire was administered to 405 lecturers, and the collected data were analysed using statistical techniques such as regression analysis, correlation analysis, and factor analysis. The findings reveal that salary, institutional infrastructure, and career growth opportunities significantly impact job satisfaction. To promote a more fulfilling academic environment, this study suggests policy recommendations such as standardized salaries, professional development programs, and infrastructure improvements.

Keywords: Job Contentment, Higher Education, Lecturers, Odisha, Social Sustainability.

1. INTRODUCTION

Job contentment among higher education faculty members has become a crucial factor influencing institutional output, student learning outcomes, and the long-term sustainability of academic systems (Singh & Gupta, 2023). In contemporary higher education, faculty serve not only as transmitters of knowledge but also as mentors, researchers, and agents of social change (Anderson & Clark, 2021). Their contentment levels directly affect motivation, teaching quality, retention rates, and institutional stability (Patel, 2022).

The concept of social sustainability—defined as the creation of equitable, inclusive, and supportive work environments—has gained prominence in the discourse on higher education (UNESCO, 2022). Social sustainability emphasises fair remuneration, professional growth, work–life balance, and institutional backing, which collectively shape job contentment (Anderson & Clark, 2021). Roberts In regions where higher education systems work with varied funding and governance models, such as government-aided and self-financed institutions in India, these elements assume particular significance.

In the Indian state of Odisha, higher education comprises a diverse mix of government-aided colleges, which enjoy structured pay scales and state back, and self-financed institutions, which often work with more resource-constrained conditions (Kumar, 2020; Mishra & Banerjee, 2019). This divergence creates disparities in faculty remuneration, career advancement prospects, and infrastructure. Such variations can lead to notable differences in job contentment, which may affect institutional output and broader educational equity. Although studies on faculty job contentment in India have examined elements such as salary, job security, and work environment (Singh, 2020), there remains a gap in research that integrates these determinants with the framework of social sustainability and professional growth prospects in shaping lecturers' overall contentment. Furthermore, limited attention has been paid to the combined effects of socio-demographic variables (e.g., gender, marital status), institutional type, with a focus on social sustainability. This study focuses on these gaps by conducting a comparative evaluation of job contentment among government-aided and self-financed institution lecturers in Odisha. By employing a robust quantitative approach, the research aims to identify the key determinants of contentment, assess their relative impact, and provide evidence-based recommendations for policy and institutional practice.

The findings of this study are expected to inform educational policymakers, institutional leaders, and growth planners seeking to create sustainable and equitable higher education systems that support faculty well-being, lower turnover, and enhance academic quality.

2. LITERATURE REVIEW

2.1 Working Conditions

Herzberg's two-factor theory continues to affect job contentment research, distinguishing between intrinsic motivators (e.g., recognition, career advancement, meaningful work) and extrinsic elements (e.g., salary). Recent mathematical modelling in educational contexts has confirmed that promotions and managerial support are among the strongest motivators for faculty (Bhatia & Williams, 2023).

2.2 Salary and Job Security

Salary remains a primary determinant of job contentment. Kumar (2020) found that government-aided institution lecturers reported higher contentment than self-financed faculty because of structured pay scales and job stability.

2.3 Workload, Stress, and Work–Family Conflict

Kim et al. (2023) demonstrated that excessive workload and work–family conflict negatively affect academic staff contentment. Likewise, Kim (2024) identified stress and burnout as critical challenges in sustaining faculty engagement in higher education settings.

2.4 Institutional Support and Fairness

Institutional justice—encompassing distributive, procedural, and interactional fairness—has a notable effect on job contentment (Greenberg, 1987). Recent studies emphasise that social sustainability practices, such as equitable workloads, transparent policies, and inclusive governance, improve faculty morale (Wiyono et al., 2025).

2.5 Cultural Openness and Leadership

Wijaya et al. (2025) found that cultural openness in institutions significantly boosts job contentment, while servant leadership and burnout showed more complex and context-dependent effects.

2.6 Socio-Demographic Influences

Findings on demographic factors remain mixed. Singh (2020) reported minimal gender differences in job contentment, while Mishra and Banerjee (2021) found that female faculty often experience lower contentment because of workload inequities and discrimination. In Odisha, Jayasingh et al. (2022) identified poor infrastructure and lack of housing as barriers to contentment.

2.7 Career Growth and Professional Development

Roberts (2020) showed that clear promotion pathways and skill growth initiatives enhance faculty engagement. Sustains academic productivity. Doğan (2024) further noted that intrinsic motivation, combined with career growth prospects

2.8 Relevance to Social Sustainability

Social sustainability in higher education focuses on creating equitable, supportive environments that promote long-term faculty well-being (Anderson & Clark, 2021). Aligning institutional policies with this framework supports SDG 4 (Quality Education), SDG 8 (Decent Work), and SDG 10 (Reduced Inequalities).

3. METHODOLOGY

3.1 Research Design

This study adopted a descriptive survey research design to compare job contentment among lecturers in government-aided and self-financed colleges in Odisha. This design was selected to facilitate quantitative measurement of relationships between socio-demographic elements, institutional characteristics, and job contentment levels (Creswell, 2018).

3.2 Population and Sampling

The population consisted of lecturers in higher education institutions across Odisha. A stratified random sampling approach ensured proportional representation from both institutional types and varied geographical locations. The final sample included 405 lecturers from 20 government-aided and 40 self-financed colleges.

3.3 Instrumentation

The data collection tool comprised:

1. Demographic Section – gender, marital status, educational qualification, institutional type, location, and spousal occupation.
2. Job Contentment Scale – 25 items rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), adapted from previously validated instruments (Roberts, 2020).

3.4 Data Collection

Data we collected via both physical questionnaires and online forms over three months. Participation was optional with assurances of confidentiality and anonymity.

3.5 Data Analysis

Data we analysed using SPSS v26. Software included:

- Descriptive statistics (mean, standard deviation)
- Independent sample t-tests
- One-way ANOVA
- Pearson correlation

- Multiple regression analysis
- Factor analysis to identify underlying determinants

Statistical significance was set at $p < .05$.

3.6 Ethical Considerations

The research protocol received approval from the Institutional Review Board (IRB) of Siksha 'O' Anusandhan University. Informed consent was obtained from all participants before data collection.

Table 1: Demographic Profile of Respondents (N = 405)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	218	53.8
	Female	187	46.2
Marital Status	Married	262	64.7
	Unmarried	143	35.3
Educational Qualification	Master's Degree	289	71.4
	M.Phil./Ph.D.	116	28.6
Institutional Type	Government-aided	135	33.3
	Self-financed	270	66.7
College Location	Urban	168	41.5
	Rural	237	58.5
Spousal Occupation	Employed	196	48.4
	Unemployed/Not applicable	209	51.6

Note. Percentages may not total exactly 100 because of rounding.

4. RESULTS

4.1 Multiple Regression Analysis

A multiple linear regression took place to examine the effect of salary, institutional type, institution location, spousal occupation, gender, and marital status, indicating that 56.3% of the variance in job contentment was explained by the predictors. — The model was statistically notable, $F(6, 398) = 87.80$, $p < .001$, with an adjusted $R^2 = .563$

Table 2: Multiple Regression Results Predicting Job Contentment

Predictor	B	SE B	β	<i>t</i>	<i>p</i>	95% CI for B
Constant	2.4546	0.069	—	35.55	<.001	[2.319, 2.590]
Salary	1.05E-05	1.06E-06	.412	9.93	<.001	[8.41E-06, 1.26E-05]
Institutional Type	0.3122	0.031	.326	10.02	<.001	[0.251, 0.373]
College Location	-0.2238	0.031	-.235	-7.22	<.001	[-0.285, -0.163]

Spousal Occupation	0.4059	0.031	.401	13.01	<.001	[0.345, 0.467]
Gender	-0.0943	0.031	-.102	-3.03	.003	[-0.156, -0.033]
Marital Status	0.2082	0.031	.212	6.70	<.001	[0.147, 0.269]

Note. $R^2 = .570$; Adjusted $R^2 = .563$.

4.2 Correlation Analysis

Pearson's correlation coefficients revealed a strong positive relationship between salary and job contentment ($r = .72$, $p < .001$), and between career growth and job contentment ($r = .65$). Institutional type showed a moderate positive relationship with job contentment ($r = .48$, $p < .01$).

Table 3: Pearson Correlation Matrix for Key Variables

Variable	1	2	3	4
1. Job Satisfaction	—			
2. Salary	.72***	—		
3. Career Growth	.65***	.58***	—	
4. Institutional Type	.48**	.52***	.41***	—

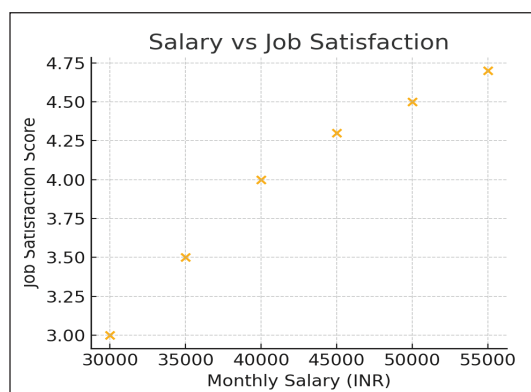
Note. $p < .001$ (*). — $p < .01$ ()

4.3 Descriptive Statistics by Institutional Type

Table 4: Descriptive Statistics of Job Contentment by Institutional Type

Institutional Type	<i>M</i>	<i>SD</i>	<i>n</i>
Government-aided	4.12	0.46	135
Self-financed	3.68	0.54	270

Figure I: Scatter Plot



In Figure 1, the Scatter plot shows the positive linear relationship between salary and job contentment. Higher salaries are associated with higher contentment levels.

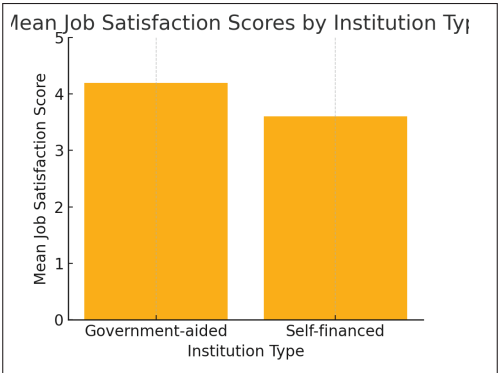


Figure 2: Bar Diagram

The bar diagram in Figure 2 compares mean job contentment scores for government-aided and self-financed lecturers, indicating higher contentment in government-aided institutions.

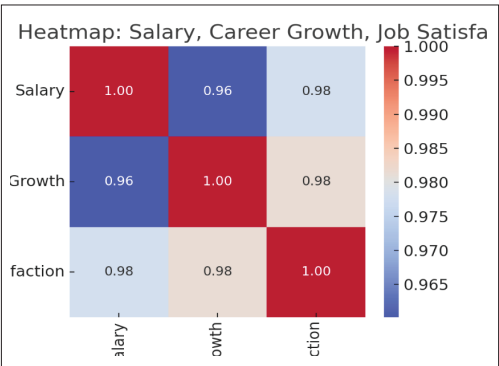


Figure 3: Heatmap

Figure 3 displays the correlation coefficients among salary, career growth, and job contentment. Strongest positive correlations appear between salary and job contentment.

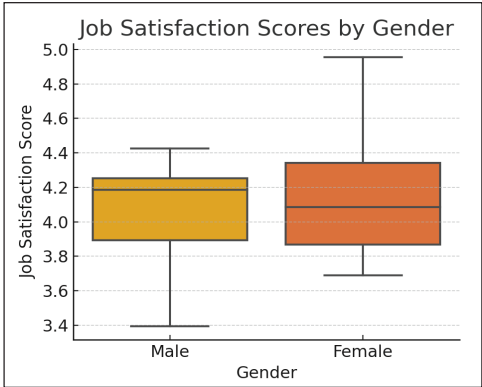


Figure 4:Box Plot

Figure 4 shows the distribution of job contentment scores by gender. Median contentment scores are slightly higher among female lecturers.

Figure 5: Line Diagram

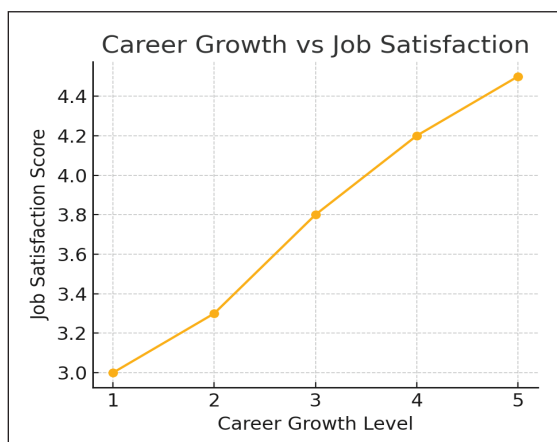


Figure 5 illustrates the upward trend in job contentment scores with increased career growth prospects.

5. DISCUSSION

This study examined the determinants of job contentment among government-aided and self-financed institution lecturers in Odisha, India, using the idea of social sustainability. The findings offer several insights that both align with and extend prior research.

5.1 Salary and Institutional Type as Primary Predictors

Salary emerged as the strongest predictor of job contentment, consistent with Kumar (2020), who highlighted the importance of structured pay scales and financial stability in improving faculty morale. The positive association between institutional type and contentment reflects the advantages enjoyed by government-aided lecturers in terms of job security and resources. These findings back call for wage parity, a policy imperative closely tied to SDG 8: Decent Work and Economic Growth.

5.2 Career Growth Opportunities

Career growth was also a notable determinant, aligning with Roberts (2020) and Doğan (2024), who noted that structured promotion pathways, skill enhancement initiatives, and mentorship programs help achieve higher contentment and retention rates.

5.3 Socio-Demographic Influences

Gender differences show that male lecturers were slightly less satisfied than their female counterparts, though moderate. This contrasts with Singh (2020) but supports the view that gendered expectations and role perceptions can

affect job contentment. Marital status and spousal occupation also played positive roles, likely because of the financial and emotional stability associated with supportive family structures.

5.4 Geographic Disparities and Infrastructure

Interestingly, lecturers in city-based institutions reported lower contentment levels despite better infrastructure. This may be because of higher workloads, administrative demands, or cost-of-living pressures. On the other hand, countryside-based lecturers, though facing infrastructural deficits, may enjoy stronger community bonds and reduced institutional pressures, echoing findings by Jayasingh et al. (2022).

5.5 Social Sustainability Implications

The results underscore the relevance of social sustainability in higher education. Key priorities include:

- Equitable salary structures.
- Investment in professional development.
- Addressing urban–rural disparities in working conditions.

Aligning institutional practices with these priorities can help to achieve SDG 4, SDG 8, and SDG 10.

5.6 Comparison with Global Trends

Internationally, salary, institutional backing, and career growth are consistently cited as top drivers of job contentment (Kim et al., 2023; Wiyono et al., 2025). However, the Odisha-specific disparities between institutional types emphasize the requirement for context-specific reforms rather than one-size-fits-all approaches.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study investigated the elements influencing job contentment among lecturers in government-aided and self-financed colleges in Odisha, by considering social sustainability. The findings reveal that salary, institutional type, career growth, spousal occupation, marital status, and institution location significantly affect faculty contentment in India, while gender plays a moderate role.

Government-aided lecturers reported higher contentment levels because of structured pay, job security, and better infrastructure. Self-financed lecturers faced lower remuneration and limited career growth prospects; on the other hand, Career growth emerged as a critical driver of contentment, underscoring the requirement for professional advancement prospects. These findings reinforce the importance of aligning higher education policies with social sustainability principles, ensuring equitable remuneration, career back, and balanced working conditions across institutional types. Such reforms directly

help to achieve SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities).

6.2 Recommendations

1. Implement Wage Parity: State-level policy reforms to secure fair pay between government-aided and self-financed institutions.
2. Enhance Professional Growth: Structured mentorship programs, research grants and skill enhancement workshops.
3. Upgrade Infrastructure: Investment in digital classrooms, libraries, and research facilities, especially in self-financed institutions.
4. Address city-based–countryside-based Disparities: Targeted measures to lower workload in city-based colleges and improve facilities in countryside-based areas.
5. Back Work–Life Balance: Flexible work arrangements, counselling services and family-friendly policies.

6.3 Limitations

This study is limited by its cross-sectional design, which restricts causal inference. Data were self-reported, potentially introducing bias. Findings are specific to Odisha and may not generalise to other regions.

6.4 Future Research Directions

Future studies could adopt longitudinal designs to track changes in job contentment over time, use mixed-methods approaches for deeper qualitative insights, and conduct comparative analyses across multiple states or countries.

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GENDER EQUALITY AND GENDER-RESPONSIVE GOVERNANCE: A PATHWAY TO INCLUSIVE DEVELOPMENT

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ABSTRACT

Gender equality and gender-responsive governance are crucial for fostering an inclusive, just, and sustainable society. Effective governance structures must go beyond mere inclusion to actively integrate gender perspectives into policymaking, budgeting, and institutional frameworks. In India, legal and policy measures like the Women's Reservation Bill (Nari Shakti Vandan Adhiniyam, 2023) and gender budgeting (since 2005) represent significant steps forward. However, significant challenges remain, including women's low workforce participation (24%) and underrepresentation in politics. Odisha, as a progressive state, has pioneered initiatives like Mission Shakti, which has empowered over 70 lakh women through Self-Help Groups (SHGs), and the 50% reservation for women in Panchayati Raj Institutions (PRIs). These initiatives have greatly improved women's access to political leadership, healthcare, and economic opportunities, but challenges persist in achieving true gender equity.

This paper highlights the path to building inclusive governance through the lens of gender equality, with a focus on Odisha's successes and ongoing challenges. It emphasizes that gender equality must transition from being a policy objective to a core governance framework, ensuring gender-inclusive, data-driven, and impact-oriented development strategies. Odisha's experience offers valuable lessons for bridging gender gaps at the grassroots level, and the road ahead demands political will, institutional commitment, and societal participation to create a gender-just governance ecosystem.

Keywords: Gender Equality, Gender-Responsive Governance, Women's Leadership, Mission Shakti, Gender Budgeting, Women's Empowerment, Inclusive Development, Odisha.

1. INTRODUCTION

The concept of gender equality is increasingly seen not only as a fundamental human right but also as an essential foundation for societal progress. Achieving gender equality is central to creating a just, equitable, and prosperous society. Over the past few decades, the discourse has evolved from focusing on individual empowerment to an emphasis on systemic change through gender-responsive governance. Governance structures must integrate gender perspectives into policy and decision-making processes, ensuring that both women and men benefit equally from development initiatives.

In India, where gender disparities are deeply embedded in socio-cultural norms and practices, governance plays a key role in breaking barriers and creating an inclusive society. Odisha, with its innovative approaches to gender-responsive governance, serves as a critical case study for understanding the challenges and opportunities in implementing gender-sensitive policies at the grassroots level. This paper explores the intersection of gender equality and governance, emphasizing how gender-responsive policies and leadership can drive inclusive development.

In an era defined by democratic ideals and inclusive development, the concept of Gender Responsive Governance (GRG) emerges as both a necessity and a promise. Governance, at its core, is about making decisions, allocating resources, and ensuring justice and equity. When governance structures overlook gender, they fail to be truly representative or effective. GRG ensures that both women and men, regardless of social, economic, or cultural identity, have equal voices in shaping policies, planning development, and accessing benefits.

Gender inequality is not merely a social concern; it is a governance issue. Traditional governance systems, often shaped by patriarchal norms, have historically marginalized women's voices, limited their participation in public decision-making, and ignored their specific needs. Gender Responsive Governance seeks to correct these systemic biases by integrating gender perspectives into every stage of governance, from policy formulation to implementation, budgeting, and evaluation.

The rationale for GRG is grounded in the belief that development without gender equity is incomplete and unsustainable. Studies worldwide demonstrate that countries with greater gender parity in governance exhibit more inclusive growth, reduced corruption, and better policy outcomes. Whether in public health, education, urban planning, or climate resilience, integrating gender perspectives leads to more just and effective solutions.

Importantly, GRG is not about privileging one gender over another. Rather, it emphasizes equity over equality, recognizing that historical disadvantages must be acknowledged and actively corrected. This involves creating institutional frameworks, laws, and policies that are not only non-discriminatory but also proactively empowering to women and marginalized genders.

In India, constitutional provisions, landmark policies like the National Policy for Women, and the 73rd and 74th Amendments have laid the foundation for greater gender inclusion. However, real transformation requires more than legal guarantees. It demands a cultural shift in how governance is imagined and practised, where women are not just beneficiaries, but active shapers of policy and planning.

Odisha, for instance, offers glimpses of progress with women-led panchayats, self-help group movements like Mission Shakti, and gender-inclusive programs. Yet, challenges remain—ranging from under-representation in higher decision-making bodies to gender-blind budgeting. GRG provides a framework to bridge these gaps, making governance more sensitive, just, and inclusive.

A truly gender-responsive governance system involves multiple layers of engagement: institutional reforms, gender-disaggregated data, inclusive public services, safe political environments, capacity building, and mechanisms for accountability. It also means involving men and boys as allies in dismantling stereotypes and building equitable governance landscapes.

Moreover, GRG is not only relevant to governments but also to institutions of learning, NGOs, corporations, and community-based organizations. Universities, in particular, have a pivotal role in shaping gender-sensitive leaders, policymakers, and researchers. The integration of gender studies into mainstream academic discourse can enhance critical thinking and develop future-ready governance models.

Globally, the Sustainable Development Goals (SDGs), especially Goal 5 (Gender Equality) and Goal 16 (Peace, Justice, and Strong Institutions), underline the centrality of gender justice in governance. From local governance bodies in rural Africa to parliaments in Scandinavia, there is growing evidence that gender-responsive governance improves not only representation but also results.

In conclusion, Gender Responsive Governance is more than a policy framework—it is a moral imperative and a strategic necessity. It invites governments and societies to introspect, reform, and renew their commitment to justice. As we move toward a more complex world challenged by inequalities, climate change, and conflict, GRG provides a beacon of hope for a more inclusive, participatory, and resilient future for all.

Gender Responsive Governance – Made Simple

“When women participate in governance, society becomes more just and inclusive.”

What is Gender Responsive Governance (GRG)?

GRG means making governance (how we run our villages, towns, and country) fair and equal for both women and men. It ensures that women have real power to make decisions, raise issues, and shape the development of their community.

It is not just about electing women, but also about helping them lead effectively, ensuring their voices are heard, respected, and acted upon.

Why is GRG Important?

Women understand the challenges in healthcare, education, water, safety, and social welfare better, especially at the grassroots level. Their presence in decision-making improves these services.

A Real-Life Example from Odisha:

In Gajapati district, under the UN Women and ICRW program, elected women leaders (Sarpanches) have raised key issues like:

- Building toilets in schools for girls.
- Improving Anganwadi centres for better child care.
- Bringing attention to domestic violence cases, which earlier no one dared to discuss.

These are the outcomes of GRG, where women's everyday concerns become governance priorities.

How Did India Support Women's Participation?

The 73rd and 74th Amendments to the Constitution (1992) made it compulsory to reserve 1/3rd of seats in local bodies (Panchayats and Municipalities) for women. Now, some states, like Odisha, have even gone up to 50% reservation. Thanks to this, over 1.5 million women are now part of local governments across India.

But Is Just a Reservation Enough?

No! Just being elected doesn't mean women are truly empowered. Why ?

Challenges Women Face:

- **Lack of education** or knowledge of government processes.
- **Cultural barriers:** Many believe politics is "not for women."
- **Household responsibilities** leave little time for public roles.
- **Family control:** In some cases, husbands or fathers speak on behalf of elected women.

Examples from Odisha & India:

- In Koraput, many women leaders were shy to speak in Gram Sabhas initially. But after attending leadership workshops by NGOs like Mahila Samakhya, they began confidently speaking on ration card issues, drinking water, and roads.
- In Kerala, a state known for effective decentralization, Women's Component Plans are created after community meetings. For example, women suggested local health camps and vocational training for girls, and these were included in panchayat budgets.

What Needs to Be Done Now?

To make GRG successful, we must:

- **Train women leaders:** Help them understand budgets, laws, and planning.
- **Involve men too:** Teach male leaders and officers to respect women's voices.
- **Support from society:** Encourage families and communities to let women lead.
- **Make systems fairer:** Government departments should work with a gender lens.

How Civil Society Is Helping in Odisha:

- NGOs like Sansristi and Sakhi have trained women to file RTI applications, monitor school mid-day meals, and take action against child marriage.
- Some women Sarpanches in Mayurbhanj have formed collectives to raise issues of land rights for tribal women and better maternal healthcare.

A New Way to Look at Governance

Let's move beyond just giving women seats. We need to:

- **Include women meaningfully** in planning and budgeting.
- Ensure their ideas **influence decisions**.
- Let women grow into **confident leaders**, not just token representatives.

In Simple Terms, GRG Means:

- Women are **elected**.
- Women are **heard**.
- Women can **decide and lead**.
- **Government listens and responds** to their needs.

A Dream for the Future

A day when:

- No special reservation is needed because equal participation is natural.
- Women feel safe, respected, and capable in politics.
- Development plans reflect real-life problems of women and families.

Understanding Gender-Responsive Governance

Gender-responsive governance is not merely about adding women to decision-making processes; it is about structuring policies, institutions, and programs to address gender inequalities systematically. It is an approach that requires gender considerations to be integrated into every aspect of governance, from lawmaking to budgeting and program implementation. The key components of gender-responsive governance include:

- a) **Mainstreaming Gender in Policy Formulation:** Policies must be designed to address the different needs and priorities of both women and men. Gender mainstreaming involves ensuring that all laws, policies, and programs are analyzed for their potential gender impacts.
- b) **Budgeting with a Gender Lens:** Gender-responsive budgeting involves allocating resources to programs and initiatives that specifically target women's empowerment and gender equality. It requires the government to assess how fiscal policies affect women and men differently and ensure that women's needs are prioritized in financial allocations.
- c) **Inclusive Representation in Governance:** Equal representation in decision-making processes is crucial for fostering gender-responsive governance. This entails increasing women's participation in political leadership, public administration, and policymaking at all levels.
- d) **Eliminating Structural Barriers:** Gender-responsive governance works to eliminate structural barriers such as gender-based discrimination, wage gaps, and unequal access to education, healthcare, and employment.
- e) **Strengthening Legal and Institutional Frameworks:** Effective governance requires robust legal frameworks and enforcement mechanisms to protect gender rights. Laws must be enacted and implemented to prevent gender-based violence, ensure equal opportunities, and uphold women's rights in all spheres of life.

Gender Equality in India: Progress and Challenges

India has made considerable strides in promoting gender equality through legal reforms and policy initiatives. Key constitutional provisions, such as Articles 14, 15, and 16, guarantee equality before the law, prohibit discrimination, and ensure equal opportunities in public employment. However, significant gaps persist in the practical implementation of these provisions.

Legal and Policy Interventions in India

Several landmark policies and initiatives have sought to address gender disparities in India:

- a. **Constitutional Provisions:** India's Constitution lays the foundation for gender equality with provisions that ensure equal treatment under the law and prohibit discrimination based on gender.
- b. **Legislative Measures:**
 - **The Protection of Women from Domestic Violence Act (2005):** Provides legal protection against domestic violence and empowers women to seek redress.
 - **The Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act (2013):** Addresses workplace harassment and ensures a safe environment for women employees.
 - **The Maternity Benefit (Amendment) Act (2017):** Expands maternity leave and benefits for women in the workforce.

- c. **Gender Budgeting:** India adopted gender budgeting in 2005 to allocate resources for women-specific schemes and ensure that fiscal policies promote gender equality. However, the effective utilization of these resources remains a challenge.

Challenges to Gender Equality in India

While legal and policy measures have made significant strides, deep-rooted socio-cultural norms continue to perpetuate gender disparities. Major challenges include:

- a. **Low Female Labour Force Participation:** Women's participation in the workforce remains at just 24%, one of the lowest globally. The barriers include societal norms, lack of access to quality education, and inadequate childcare support.
- b. **Underrepresentation in Governance:** Women's political representation in India remains below 15%, despite recent efforts like the Women's Reservation Bill. The bill, which mandates 33% reservation for women in legislatures, is a significant step, but its effective implementation remains a challenge.
- c. **Disparities in Education and Health:** While female literacy has improved, disparities persist in access to higher education. Issues such as maternal mortality, malnutrition, and inadequate reproductive healthcare continue to hinder gender equality.

Gender-Responsive Governance in Odisha

Odisha has emerged as a leader in gender-responsive governance in India, implementing several innovative policies and programs aimed at empowering women and ensuring their active participation in governance.

Flagship Gender-Centric Initiatives in Odisha

- a. **Mission Shakti:** A flagship program that has empowered nearly 70 lakh women through Self-Help Groups (SHGs), Mission Shakti promotes financial inclusion, entrepreneurship, and leadership among women in rural areas.
- b. **Mamata Scheme:** A conditional cash transfer program that provides financial assistance to pregnant and lactating mothers, ensuring improved maternal and child health outcomes.
- c. **Biju Swasthya Kalyan Yojana (BSKY):** A healthcare scheme that prioritizes women-headed households, ensuring access to quality healthcare services.
- d. **Mukhyamantri Mahila Sashaktikaran Yojana:** A program aimed at promoting women's leadership at the grassroots level, encouraging active participation in local governance.
- e. **50% Reservation for Women in Panchayati Raj Institutions (PRIs):** Odisha was one of the first states to implement 50% reservation for women in PRIs, significantly increasing their representation and participation in local governance.

Success Stories from Odisha

- **Women-Led Panchayats:** Women leaders in districts such as Ganjam, Kandhamal, and Mayurbhanj have successfully implemented rural development programs, improving access to health, sanitation, and education services.
- **Tribal Women Entrepreneurs:** The Mission Shakti program has provided tribal women in districts like Koraput and Rayagada with the skills and resources to become entrepreneurs, thereby breaking socio-economic barriers.
- **All-Women Police Stations:** Odisha has established all-women police stations in various districts to provide better support for victims of gender-based violence and ensure more effective law enforcement.

The Road Ahead: Strengthening Gender-Responsive Governance

While Odisha has made significant progress, further work is needed to create a truly gender-equal society. Key areas for further development include:

a. Enhancing Women's Representation in Decision-Making

- **Effective Implementation of the Women's Reservation Bill:** Ensuring that the 33% reservation for women in legislatures is implemented effectively at all levels of governance.
- **Encouraging Corporate Leadership:** Creating pathways for women to assume leadership roles in the private sector and corporate governance.

b. Strengthening Gender-Budgeting Mechanisms

- **Increasing Fiscal Allocation for Women's Empowerment:** More resources should be allocated for women's education, healthcare, and economic empowerment.
- **Ensuring Transparency in Fund Utilization:** Strengthening mechanisms for monitoring the implementation of gender-sensitive policies and ensuring that funds are effectively used.

c. Reforming Workplace Policies

- **Equal Pay for Equal Work:** Ensuring that women receive equal pay for the same work and tackling wage disparities.
- **Strengthening Maternity Benefits:** Expanding maternity leave policies to provide women with greater support in balancing work and family responsibilities.

d. Tackling Gender-Based Violence

- **Expanding Fast-Track Courts:** Creating more fast-track courts for the swift handling of gender violence cases.
- **Strengthening Support Services:** Enhancing community policing, helplines, and victim support services.

e. Digital and Financial Inclusion

- **Enhancing Digital Literacy:** Expanding digital literacy programs for women, especially in rural areas, to increase their access to technology and digital resources.
- **Increasing Access to Financial Services:** Ensuring that women have access to credit, loans, and financial literacy programs to encourage economic independence.

f. Shifting Societal Attitudes

- **Gender Sensitization Campaigns:** Promoting gender-sensitive education and campaigns targeting youth and communities to challenge stereotypes and promote equality.
- **Engaging Men as Allies:** Encouraging men to actively participate in gender equality movements and create supportive environments for women.

2. MOTIVATION

Gender Responsive Governance refers to a system of governance that actively considers and promotes the rights, needs, and interests of all genders, especially women and marginalized gender groups, in policy-making, implementation, and evaluation. It ensures that the voices of women and other gender minorities are included in decision-making at every level, from local to national. This approach aims not only at equality in law but also in practice, addressing the structural barriers that hinder equal participation. In many societies, women and gender minorities have historically been excluded from power and decision-making spaces. Their specific needs in areas like health, education, livelihoods, safety, and representation are often overlooked in traditional governance structures. Gender responsive governance seeks to correct these imbalances by making institutions more inclusive, accountable, and equitable. It ensures that public policies work for everyone, regardless of gender.

The motivation behind promoting gender responsive governance comes from a growing understanding that sustainable development, peace, and justice are not possible without gender equality. Evidence shows that when women are involved in governance, institutions become more transparent, responsive, and socially just. Countries and communities that promote gender equity in governance see better outcomes in development, education, health, and overall well-being. Further, gender responsive governance is essential for achieving the goals of international frameworks like the Sustainable Development Goals (especially SDG 5 on gender equality and SDG 16 on strong institutions). It supports democratic participation, strengthens social cohesion, and promotes dignity for all. Encouraging the active role of women and marginalized genders in shaping policies lays the foundation for a more inclusive and fair society.

In essence, gender responsive governance is not just about women's participation; it's about transforming systems to be fair, inclusive, and effective for all. It's a powerful tool to correct historical injustices, promote equality, and build resilient communities. The time has come to move from gender-neutral approaches to gender-aware and gender-responsive governance that truly reflects the diversity of our societies.

3. RATIONALE

The rationale behind studying Gender Responsive Governance (GRG) lies in the persistent and widespread gender disparities observed in political representation, access to public services, and participation in decision-making processes. Despite constitutional guarantees and international commitments, women and other gender minorities remain underrepresented in governance structures at all levels. This study is essential to understand the root causes of such exclusion and to explore strategies that promote equitable governance. It seeks to highlight the need for systemic reforms that can transform existing institutions into more inclusive and gender-sensitive bodies.

Gender roles and social norms continue to influence the way policies are designed and implemented, often favouring dominant groups while neglecting the needs of marginalized genders. This study is motivated by the realization that governance which is blind to gender perspectives can unintentionally perpetuate inequality. By analyzing governance systems through a gender lens, the study aims to identify gaps in policy formulation and service delivery and offer recommendations to bridge those gaps. Understanding these gaps is vital for crafting inclusive policies that ensure justice and equal access to opportunities for all citizens. Moreover, the study responds to the growing evidence that gender-responsive institutions perform better in terms of transparency, accountability, and responsiveness. When women and gender minorities participate in governance, they often bring unique perspectives and priorities, such as safety, education, health, and community development, which lead to more balanced and equitable policy outcomes. Therefore, examining how gender dynamics influence governance can offer critical insights into how democratic processes can be strengthened to benefit society as a whole. Another significant rationale is the pressing need to align national and local governance structures with global development goals, such as the Sustainable Development Goals (SDGs). Goal 5 (Gender Equality) and Goal 16 (Peace, Justice, and Strong Institutions) directly call for inclusive and participatory governance. This study provides an opportunity to assess how far current governance systems have moved toward these goals and what further steps are necessary. It also explores the role of capacity-building, gender budgeting, legal frameworks, and institutional reforms in advancing gender justice.

4. OBJECTIVES OF THE STUDY

The primary objective of this study is to understand how governance systems can be made more gender responsive, inclusive, and equitable. It aims to explore the extent to which gender considerations are integrated into policy-making, planning, and service delivery at various levels of government. The study also seeks to examine the role of institutions, laws, and frameworks in promoting or hindering gender equality in governance processes. By doing so, it hopes to identify strengths, gaps, and areas for improvement in existing structures. In addition, the study aims to recommend practical strategies for policymakers, civil society organizations, and governance institutions to mainstream gender into their day-to-day functioning. This includes the promotion of gender budgeting, capacity-building for officials, the use of gender-disaggregated data, and inclusive policy dialogues. The goal is not only to study governance from a gender lens but also to contribute meaningfully to the creation of just, participatory, and resilient governance systems.

5. EXAMPLES AND CASE STUDIES IN INDIA

One of the most well-known examples of Gender Responsive Governance in India comes from Rajasthan, where the introduction of 50% reservation for women in Panchayati Raj Institutions led to a silent revolution. Women sarpanches like Chhavi Rajawat of Soda village in Tonk district brought in innovations in water conservation, sanitation, and digital governance. Her leadership challenged traditional norms and showcased how educated women in local governance can bridge the gap between tradition and technology, especially in rural areas.

In Bihar, the Jeevika program has empowered lakhs of rural women by linking them with livelihood opportunities through Self-Help Groups. What sets Bihar's model apart is its convergence with local governance structures. Women from SHGs were trained and inducted into village-level monitoring committees to oversee health, nutrition, and education schemes. Their participation not only enhanced transparency and accountability but also ensured that grassroots governance became more responsive to women's and children's needs.

A powerful case of inclusive urban governance comes from Kerala, where the Kudumbashree Mission is internationally recognized for mainstreaming women in governance and economic development. Women's Neighbourhood Groups, formed under Kudumbashree, actively participate in planning and implementing local development projects. They influence the priorities of local self-governments, ensuring that issues such as gender-based violence, housing, health, and skill development are addressed with urgency and empathy.

In Nagaland, traditional village councils have historically been male-dominated. However, with the intervention of civil society and judicial

activism, women's organizations have pushed for representation and gender-sensitive decision-making. The Naga Mothers' Association (NMA) has played a key role in mediating peace, promoting health awareness, and advocating for women's roles in governance. This example shows that even in culturally conservative settings, persistent advocacy can lead to shifts in governance norms.

Another striking example is from Madhya Pradesh, where the state government trained elected women representatives under the Panchayat Mahila Evam Yuva Shakti Abhiyan. Women leaders were given exposure to legal rights, public speaking, and digital tools. As a result, many women confidently raised issues of public concern in Gram Sabhas, took action against absentee teachers, ensured proper ration distribution, and advocated for health infrastructure in their areas, demonstrating the real impact of capacity-building in GRG.

These diverse examples from across India highlight that Gender Responsive Governance is not a one-size-fits-all approach. It must be locally rooted, contextually adapted, and institutionally supported.

6. POLICY RECOMMENDATIONS FOR STRENGTHENING GRG

- a) **Mandatory Training for Officials and Elected Representatives:** To build a gender-sensitive governance framework, it is crucial to institutionalize mandatory gender training for all elected representatives, bureaucrats, and frontline government staff. These training modules should include legal frameworks related to gender equality, tools for gender analysis, and methods of inclusive planning and budgeting. Special attention must be paid to local governance leaders such as sarpanches and ward members, who play a vital role in implementing development schemes on the ground.
- b) **Establishment of District GRG Resource Centres:** Each district should establish a Gender Responsive Governance Resource Centre that acts as a hub for research, training, documentation, and support services. These centres can work in close coordination with the District Collector's office, local universities, women's commissions, and civil society organizations. Their functions should include building capacity among local governance actors, conducting gender audits, and supporting women's participation in decision-making at all levels.
- c) **Gender Sensitization Programs at Schools and Colleges:** To create a gender-just society, sensitization must begin early. Including gender equality, rights, and responsibilities in school and college curricula is essential. Workshops, debates, and activities on gender roles and stereotypes should be introduced in educational institutions. These initiatives help cultivate an inclusive mindset among the youth, who are future citizens, leaders, and professionals.

- d) **Peer Learning and Monitoring Networks:** Creating Peer Monitoring Groups at the block and panchayat levels can empower women leaders through shared learning. These peer groups can regularly meet to discuss governance challenges, share best practices, and build solidarity among women representatives. Senior or more experienced women leaders can mentor newer entrants, helping them gain confidence and skills for effective governance.
- e) **Regular Gender Audits of Public Policies and Programs:** Gender audits should be made a regular and integral part of governance systems. These audits evaluate how policies, budgets, and programs affect different genders, especially marginalized women. Conducted by independent agencies or gender experts, such audits can identify gaps and recommend corrections. Public sharing of audit results can increase transparency and accountability.
- f) **Robust Monitoring and Evaluation Mechanisms:** An effective gender-responsive monitoring framework is essential to track progress and course-correct. Governments must create dedicated GRG monitoring cells at the district and state levels to collect gender-disaggregated data, analyze implementation trends, and provide regular feedback to departments. These cells should be equipped with digital tools and linked to larger governance dashboards.
- g) **Promotion of Gender-Responsive Budgeting (GRB):** Government departments and local bodies should be mandated to practice Gender-Responsive Budgeting, where the financial implications of all programs on women and men are clearly analyzed. Allocations must be made to support women-specific priorities in sectors such as health, education, livelihoods, and safety. Capacity-building workshops for budget officers can ensure this is institutionalized.
- h) **Strengthening Women's Participation in Decision-Making:** While political representation is increasing, there is a need to ensure that women have a real say in decision-making. Special platforms for women representatives to voice their concerns—such as Mahila Sabhas, women-led Gram Sabhas, and policy consultations—must be encouraged. Institutional support in the form of leadership coaching, legal aid, and grievance redressal is vital to empower these voices.
- i) **Partnerships with Civil Society and Academia:** Governments should collaborate with civil society organizations, universities, and research bodies to deepen GRG efforts. These institutions can provide technical expertise, conduct impact studies, and mobilize communities for gender justice. State-level GRG forums can be set up to regularly bring together all stakeholders for policy dialogue and innovation.
- j) **Incentives and Recognition for Gender Champions:** To motivate performance and build a culture of inclusion, governments should institute awards and incentives for “Gender Champions” at all levels—Gram

Panchayat, Block, District, and State. These could include best-performing women leaders, panchayats with inclusive governance, or officials who promoted gender-equity initiatives. Public recognition inspires others and spreads positive models of change.

These recommendations, when implemented holistically, can transform governance from being gender-blind to truly gender-responsive.

7. CONCLUSION

Gender equality and gender-responsive governance are indispensable to building an inclusive and progressive society. India and Odisha have taken meaningful steps, but continued efforts are required to bridge gender gaps in governance, economic participation, and social structures. Policies must move beyond merely empowering women to creating an ecosystem where everyone, regardless of gender, has equal opportunities.

Odisha's pioneering efforts in women-led governance, financial empowerment, and grassroots leadership offer valuable lessons for other states and countries seeking to promote gender-responsive governance. The road ahead demands continued political will, institutional commitment, and societal participation to create a gender-just governance ecosystem that upholds the principles of equity, empowerment, and progress.

As we move forward, integrating gender perspectives into governance at all levels—whether in policy formulation, budget allocation, or program implementation—is key to ensuring that no one is left behind. Gender equality should be embedded in all development strategies to foster a society where all individuals can thrive, regardless of gender.

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SELF HELP GROUPS AND SOCIO-ECONOMIC DEVELOPMENT OF WOMEN: A STUDY IN BALASORE DISTRICT OF ODISHA

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ABSTRACT

The real India lives in her villages, where more than two-thirds of India's population pursues their livelihood. The labour participation rate in rural areas was 56.7 per cent, of which the women labour participation rate was only 37 per cent in the year 2022-23. Rural development is crucial for India's progress, as poverty is more prevalent in the countryside. Empowering marginalized populations, particularly those living below the poverty line and women, is the primary goal of Indian development efforts since independence. Despite government efforts, women face challenges like gender discrimination, violence, and unequal pay. Rural women, in particular, struggle with limited education, property rights, and resource access. Furthermore, there has been no significant development in the status of women in rural areas. Since 1980, the Indian government has promoted Self Help Groups (SHGs) as a strategy of rural development for empowering women and alleviating poverty. The present study aims to explain the role of self-help groups in empowering marginalized groups of society, especially women. The study was conceived to look at the growing trend of SHGs in Odisha to bring about changes in the socio-economic status of rural families. The present study is confined to the Balasore district in Odisha. Balasore district was chosen due to its significant number of Self-Help Groups (SHGs), ranking third in Odisha with 31,268 SHGs, representing 5.81 per cent of the total in the state. The primary objectives of the study are to analyse trends of growth of SHGs in Odisha and to find out the correlation between socio-economic variables and the level of satisfaction of SHG members.

Keywords: Rural Poverty, Self Help Groups, Socio-Economic Development, Women Empowerment.

1. INTRODUCTION

India resides in its 6,40,930 villages. Around 908,804,812 (in 2022) people live in these villages across the country. They constitute 68.80 percent of our total population of 141.72 crores. Women constitute half of the rural population; therefore, women's development and empowerment are critical to the social and economic aspirations of the country. The main goal of the process of development in India is to empower the marginalized groups, particularly, the poor and women. Since the 1990s, Non-Government Organizations, Panchayati Raj Institutions and Self-Help Groups have played a major role as catalysts in the administration of rural development. However, they have been working as administrative mechanisms to expedite the process of development. Therefore, the study of Self-Help Groups as agents of change is vital to the study of women's empowerment. Women, when empowered economically and socially, become a potent force for change.

1.1 Status of Women In India

"Every living culture has voices — some relatively powerful, some relatively silent, and some incapable of speaking at all in public." Women are more sensitive to falling into the second or even third category than the first due to obvious reasons. In India, gender disparities persist across several societal domains, despite the dynamic socio-economic context. Indian women's social destitution, economic servitude, and reliance emerge as exploitation in the family, the workplace, and the political sphere. The unfavourable gender ratio for females, the elevated rate of infant mortality, the persisting unfairness against a girl child or kid, and the concealed act of girl feticide are some of the drawbacks that Indian women face. While the influence of different developmental programs and policies enacted during the past few decades has resulted in a noticeable development in the middle-class women's economic status, Indian women's continue to face lower social standing. Furthermore, there has been no significant improvement in the status of women in rural India. In India, rural women face educational barriers, uneven property rights, and little access to resources. Therefore, women's empowerment must occur at a pecking order of levels, including the person, household, village, and society.

1.2 Self-Help Group

Self-help groups (SHGs) are familiar organisations of persons who work collectively to better their living situations. They are primarily self-governing and peer-controlled. People from equal economic and social statuses frequently seek assistance from non-governmental organisations (NGOs) or government agencies to solve their troubles and improve their living standards.

1.3 Women's Development and Self-Help Groups:

Women's development in India has occupied the centre stage in our development planning since independence. Initially, the policymakers tried to address women's issues by adopting certain welfare measures and

constituting the Central Social Welfare Board to administer those measures. Since the Fifth Five-Year Plan (1974-78) onwards, there has been a marked shift in the approach to women's issues from 'welfare' to development. However, it was in the 1980s that women were recognized as a separate target group for development and given their rightful place in developmental planning by including a separate chapter 'Women & development' in the Sixth Plan document. This marks the final breakaway from a developmental approach to empowerment. The major goal of this approach was to ensure all-around development of women as a human resource and bring them into the mainstream of the national developmental process. The main aim of the state was to raise their overall status -social, economic and political to par with that of men. Therefore, empowerment in India has developed as a dynamic concept by addressing multi-dimensional issues affecting women's development.

The concept of 'Self Help Group' is a product of such an empowerment approach. A self-help group is an informal club constituted for economic regeneration. The most common product provided by the Self-Help Group is micro-credit, which aims to empower women individually by adding some money to their personal purses. This model believes that the economic dimension of these groups would slowly and gradually contribute towards personal empowerment of women and then, to social empowerment, which is core to the entire empowerment process. It was supposed that it would strengthen women from the beginning by enhancing their economic capabilities. Implicit in this effort is to make them financially literate and attain their financial inclusion in the process of their socio-economic development.

The Self-Help Model incorporates many of the elements of social movement that seek to create a political sphere that is directly controlled by the community. In a larger perspective, it binds the members in a social bond, so as to enable them to fight against social injustice.

The root of the Self-Help Group model can be traced back partly to the indigenous saving systems of India and partly to the group-based model of Grameen Bank in Bangladesh, though it is different from its origin in several respects. The women Self-Help Groups form around 90.00 percent of total Self-Help Groups in India. The National Bank for Agriculture and Rural Development (NABARD) home page (2006) declares that more than 400 women join the Self-Help Group movement every hour.

National focus on Self Help Groups has encouraged many researchers to work on them. The virtual absence of such studies with regard to Odisha, the eastern state of the Indian Union, has prompted us to take up the present study.

2. REVIEW OF LITERATURE

Neeta Tapan (2010) made an elaborate empirical study at the grassroots level on SHGs and came out with a conclusion that the Self-Help Group has freed women from the clutches of money lenders. The study indicated that micro credit through SHG has helped women in enhancing their income and standard of living.

NABARD (2011) indicated that Self-Help Groups are formed by bringing together 10-12 members from society who contribute themselves in terms of time and money and get registered with any banking organisation. They get involved in productive activities and help members achieve financial and social security. NABARD indicates SHGs can contribute a lot to women empowerment in the country and uplift the standard of living among the urban and rural poor.

Rao and Radhika (2011) conducted a qualitative study to determine the attitude of change of Self-Help Group members. According to their findings, SHG is a viable tool for women empowerment. After a long time of experimentation, our country has identified SHG as a real means to promote socio-economic development and unity among the poor.

Women entrepreneurs, according to **Sharma et al. (2012)**, can act as a catalyst for the social and economic advancement of the nation. The women entrepreneurs face numerous challenges, particularly in the areas of finance and product marketing. Participation of rural women in micro enterprises needs to be encouraged at all levels, specifically in the case of SHGs, those who desire to flourish their enterprise effectively. The study also indicated that the constant return and higher value are behind genuine efforts to integrate SHGs into the mainstream of development. The idea of SHG for rural women empowerment has not fully succeeded in achieving its goal yet. The success of SHG in transforming rural women into a more powerful segment of society can further be affected through efforts in modifying the characteristics of the group and their goal-setting.

Minimol and Makesh (2012) conducted a study to determine the empowerment of rural women in Kerala through Self Help Groups. Their study revealed the impact of participation and the outcome of SHG. According to the study higher the participation rate, the greater the financial empowerment along with socioeconomic status. The significant result concluded that the concept of SHG for rural women has to be strengthened, as many of the SHGs have not achieved their objectives yet.

Pavan and Subrahmany(2013) concluded in their study that women who join Self-Help Groups are more involved in the decision-making process about household purchase, consumption, education, marriage and personal financial choices. The SHG raise their social status in the area under study.

Mishra (2014), in a study in Odisha on Self-Help Groups, indicated that micro entrepreneurship has changed the status of rural women. The study concluded that micro enterprise through SHG has a greater impact on socio socio-economic status of rural women. It provides economic independence, leading to empowerment. The SHG can be more mobilized through effective training and a planned program to solve problems like poverty and unemployment in rural Odisha.

Kasthuri et al. (2014) on a study found that the role of micro finance in assisting Self Help Groups to empower women through income generation and saving. The women expressed satisfaction with the social status they have achieved through SHG and savings.

Saravanan (2016) analysed the effect of Self-Help Groups on rural women in Tamil Nadu State, considering their socio-economic status from secondary data and other sources. They concluded that the empowerment of women focuses on holistic social development, not just on their economic needs. According to their study, SHGs give self-confidence, empowerment and economic status to the members of SHGs. Therefore, SHG is considered a means for rural development.

Rose and Jose (2017), in a study in Kerala investigating 16 SHGs, concluded that there is a need to strengthen the preparatory programmes provided to SHG members in terms of self-improvement and entrepreneurial skill development.

A study on *“Impact of Socio-economic Factor on Investment Behaviour of Women Entrepreneurs”* conducted by **A. Chaturvedi & S. Joshi (2019)** revealed that age, marital status, education and monthly income have little or no effect on how risky women perceive themselves to be. The women of SHG are not willing to take risks for which many of the SHGs are not progressing well because of less investment.

Gupta and Choudhary (2020), in a study, found that women’s empowerment through Self-Help Groups is quite possible. The impact of SHG is visible in Uttar Pradesh when calculating the effect from both primary and secondary data. The study covered 90 SHGs from 15 villages of two blocks in Jaunpur district of Uttar Pradesh. The study further revealed that due to joining SHGs, rural women and the weaker section of society enhance their knowledge, ability, awareness and participation in social activities.

Krishan Lal Grover (2022) in their study discovered that after joining SHG, the mean scores of several economic empowerment indicators improved. Women entrepreneurs’ monthly income grew considerably after joining SHG in terms of earnings generation and contribution to family income. It is suggested that actions at the grassroots level should be aimed at altering the societal attitudes and behaviours that are strongly discriminatory towards women.

2.1 Research Gap

Studies in various poverty-stricken areas have brought out mixed results, adding to the confusion about the role of microfinance through SHG in poverty alleviation and income generation. While some studies have pointed out that the SHGs program is successful in reaching the poor and improving their economic status through employment, some other studies have also highlighted that the SHG program has increased the saving habits of the poor people but has not been able to achieve its real goal fully.

The foregoing review outlines several gaps in the literature. There have been inconclusive inferences about the socio-economic impact of micro-finance on the client beneficiaries. A few studies have been undertaken in the state of Odisha related to SHGs and their impact on women's empowerment, but no study has been made so far on the SHGs as a tool for women empowerment in the district of Balasore by influencing entrepreneurial activities. Therefore, the present study relating socio-economic status of women and the SHG programme in Balasore district is an attempt to enable us to achieve certain insight into the working of self-help groups as a tool for women empowerment at the village level. The findings of the study may throw some light on the strengths and weaknesses of SHG programmes and may indicate solutions to the problem of rural women's empowerment.

3. OBJECTIVES

The primary objectives of the study are –

- To study the status of SHGs of Balasore district in relation to the State of Odisha.
- To find out the correlation between socio-economic variables and the satisfaction level of members as being in SHGs.

4. RESEARCH METHODOLOGY

Selection of District: Balasore district was chosen for the study due to its significant number of Self-Help Groups (SHGs), ranking third in Odisha with 31,268 SHGs, representing 5.81% of the total in the state.

Selection of Block: Four out of twelve blocks were selected for the study: Nilgiri, Basta, Baliapal, and Bhograi, representing 33.33 percent of the total.

Selection of SHGs: Five GPs were selected randomly from each selected block, and from each GP, five SHGs were randomly selected. Therefore, out of 20 GPs, 100 SHGs were randomly selected for the present study.

Selection of Respondents: The study encompasses 300 numbers of respondents. The respondents were selected randomly @ 3 from each selected SHG, irrespective of their position.

Collection of Data: Information was collected in two stages: secondary data on the status of SHGs at the district and state. Secondary data was collected from visiting different official websites and government offices like DRDA and Mission Shakti, Odisha. Primary data are collected through direct interviews with selected respondents.

Empirical measurement of Factors: Factors included were quantified depending on their relative merit in the measurement scale. Further, for better measurement of factors, quantification was made using a scoring analysis method.

To measure the relationship between Socio-economic variables and Level of Satisfaction, responses were collected on a three-point scale, like very much, much and little, as a means of change on different parameters of SHG. The satisfaction level was measured on ten variables like annual income, engagement, decision-making power, family support, savings, new investment, social mobility, contact with officials, family health and general education. The level of satisfaction was calculated taking 60% and above of the total score as high level, 30% and less as low level, and between 31% 59% as medium level. The satisfaction level contains ten parameters of change, and the total score was 30. The classification was as follows.

Statistical Procedure Adopted: Percentage was used in descriptive analysis for making comparisons. The Chi-square test was conducted to compare the effects of socio-economic and SHG-related variables and perception of the respondents as per the formula given below.

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Where,

O = Observed value

E = Expected value

The significance of the calculated χ^2 value was tested with the tabulated value of χ^2 at $(n1-1) \times (n2-1)$ degrees of freedom under a 0.05 level of probability.

5. FINDINGS AND DISCUSSION

The results of the investigation have been presented objectively with statistical analysis.

5.1 Objective I: Status of Self-Help Groups In Balasore In Relation To Odisha.

The objective was to determine the growth of SHGs in the district of Balasore in relation to the State of Odisha. It was necessary to present an insight into the growing nature of SHGs at all levels. The SHGs have become a means of economic transformation among the women of rural India. In short, the position of the district of Balasore in relation to the State and Nation is as follows.

Table 1: Number of SHGs

Particulars	Number of SHG	Percentage
Balasore	31268	0.37
Odisha	538327	5.81
India	8529187	100.00

Source: Compiled from collected data.

The district Balasore accounts for about 0.37% at the national level and 5.81% at the State level, respectively, so far as the strength of SHGs is concerned.

5.1.1 SHG in Odisha and Balasore in relation to the State

Empowerment of women through WSHGs under Mission Shakti is a flagship programme of the Odisha government. The programme started with an initial objective of forming two lakh groups in two years. By 2006-07, 2,48,689 women SHGs had been formed, which increased to 3,14,646 by March 2017. The State of Odisha comprises 30 districts, and the SHGs are growing rapidly in all the districts, totalling 538327 as of April 2024. In comparison to other districts, Balasore ranks third so far as the number of SHGs concerned.

Table 2: SHGs in Odisha

Sl. No.	Name of the District	Number of SHGs	Percentage
1.	Jharsuguda	5569	1.03
2.	Deogarh	5793	1.08
3.	Boudh	6794	1.26
4.	Subarnapur	7923	1.47
5.	Malkangiri	8509	1.58
6.	Gajapati	8825	1.64
7.	Nuapada	9533	1.77
8.	Sambalpur	11639	2.16
9.	Nabarangpur	12188	2.26
10.	Rayagada	12291	2.28
11.	Kandhamal	12839	2.39
12.	Nayagarh	15129	2.81
13.	Bargarh	16181	3.01
14.	Dhenkanal	16315	3.03
15.	Koraput	17658	3.28
16.	Jagatsinghpur	18665	3.47
17.	Khordha	18796	3.49
18.	Bhadrak	19820	3.68
19.	Kendrapara	20552	3.82
20.	Kalahandi	20900	3.88
21.	Angul	21640	4.02
22.	Balangir	21817	4.05
23.	Sundergarh	23593	4.38
24.	Kendujhar	24039	4.47
25.	Puri	25849	4.80
26.	Jajpur	26068	4.84

27.	Cuttack	29743	5.53
28.	Balasore	31268	5.81
29.	Ganjam	32434	6.03
30.	Mayurbhanj	35957	6.68
Total		538327	100.00

Source: <https://nrlm.gov.in> (latest data available as of April 2024)

The data presented in the table above justifies the selection of district Balasore (5.81%) out of 30 districts of the State for the study in relation to total SHGs. The percentage share of different districts of the State is indicated in the table.

5.1.2 SHG in Balasore District:

The status of SHGs in Balasore district is presented herewith, covering all twelve blocks.

Table 3: SHGs in Balasore District

Sl. No.	Name of the Block	Number of SHGs	Percentage
1.	Oupada	1300	4.16
2.	Bahanaga	1837	5.88
3.	Soro	1912	6.11
4.	Nilgiri	1993	6.37
5.	Simulia	2291	7.33
6.	Basta	2363	7.56
7.	Baliapal	2717	8.69
8.	Balasore	2826	9.04
9.	Jaleswar	3055	9.77
10.	Remuna	3234	10.34
11.	Khaira	3549	11.35
12.	Bhograi	4191	13.40
	Total	31268	100.00

Source: <https://nrlm.gov.in> (latest data available as of April 2024)

As revealed in the table, the total number of SHGs in Balasore district is 31268 in number. The study has rightly selected blocks of Nilgiri, Basta, Baliapal and Bhograi, which contribute 6.37%, 7.56%, 8.69% and 13.40% respectively to the status of the district. The justification behind the selection of four blocks is that the selected blocks have SHGs from low to high percentages of SHGs in the Balasore district. It has 12 blocks, and the study was limited to 4 blocks representing 33.33% of the total.

5.2 Objective II: Relationship between Socio-economic Variables and Level of Satisfaction

To understand socioeconomic status, there is a need to analyse multiple aspects covering economic and social indicators. It is also known as economic analysis, aiming at the welfare of the people. It covers well-being-related outcomes for society of a given measure.

Socio-economic is a term that combines two aspects of society, i.e., Socio refers to social factors, and Economic refers to economic factors. It is used to describe the relationship between socioeconomic conditions within a given community, religion or country. Socio-economic factors encompass a wide range of elements that impact and are also influenced by the dynamism of social and economic indicators.

As the present study deals with SHGs in the reduction of poverty, the need for SES analysis is of greater importance. Keeping such considerations in view, different parameters of SES have been studied in relation to SHG members and their level of satisfaction.

The study consists of 300 samples drawn from four blocks of Balasore district for correlation and comparison. The sample respondents were grouped into three categories, i.e., high, medium and low in the scale of satisfaction. The parameters on which the satisfaction was measured are as follows.

1. Annual income
2. Engagement
3. Decision-making power
4. Family support
5. Saving
6. New investment
7. Social mobility
8. Contact with officials
9. Family health
10. General education

The responses were collected on a three-point scale, like very much, much, and little, as a means of change on the above parameters as realised by members of SHGs. The level of satisfaction was calculated taking 60% and above of the total score as high level, 30% and less as low level, and between 31% to 59% as medium level. Since there are 10 parameters of change, the total score would be 30. The classification of the table is given below.

Table 4: Classification of respondents/ sample on the basis of satisfaction

Satisfaction level	Range of scores	Number	Percent
High	18 & above	180	60.00
Medium	10 to 17	75	25.00
Low	9 & less	45	15.00
Total		300	100.00

On the basis of the above classification, the correlation between socioeconomic variables and the extent of satisfaction was estimated by adopting the Chi-square (χ^2) test.

The investigation examined as many as 13 socio-economic variables and computerised data to determine the influence of these variables on the satisfaction level of SHG members working in different SHGs. The findings are given below.

Table 5 Relationships between Socio-Economic Variables and Level of Satisfaction

Sl. No.	Variable	Chi-square(χ^2) Value	Level of Significance
1.	Age	15.248	Significant
2.	Education	33.872	Significant
3.	Marital Status	11.524	Significant
4.	Caste	24.469	Significant
5.	Religion	11.030	Significant
6.	Economic Group	5.690	Not Significant
7.	Family Size	37.905	Significant
8.	Family Type	5.937	Not Significant
9.	Residence	15.908	Significant
10.	Major Occupation	20.467	Significant
11.	Annual Family Income	32.681	Significant
12.	Land Possession	53.553	Significant
13.	Social Amenities	89.894	Significant

(χ^2 = Significant at 5% level of Probability) Source: Computed from primary data

Explanation of the table is as follows.

- a) **Age:** Age is a progressive indicator that has been able to establish a relationship with the level of satisfaction. The sociologists are of the view that, age of an individual has a significant influence on his activities and performance, for which significant results have been obtained.
- b) **Education:** Education is the most important factor in determining progressiveness, output and achievement of persons. In all societies, education is attached with maximum value because it provides knowledge, skill and attitude for better performance. The present findings conform with many scientists who have worked on rural poverty and livelihood.
- c) **Marital Status:** Marital status indicates family burden and responsibility, for which individuals are forced to opt for income-generating activities. The hypothesis reflected in the study indicates a significant relationship.
- d) **Caste:** Caste continues to be a social factor in our society, influencing people and their activities. In the present study, caste is found to be significant, although many of the social scientists have obtained negative results in this respect.
- e) **Religion:** Religion is a belief in supernatural power, which is significant in shaping the activities and decision-making process of the individuals under study.
- f) **Economic Group:** The economic group, like APL, BPL and Antodaya, which were formed a decade back found to have no relationship with the satisfaction level of the SHG members. According to recent views of economists, such classification does not hold good to provide accurate information, and that is the reason why it has failed to reveal a relationship with satisfaction level.
- g) **Family Size and Family Type:** Family size is found to be significant, whereas family type is not. Family size stands for family strength and economic security because of the total earnings of the family. It is believed that the bigger the family size higher the level of income and family prosperity, which has been proven to indicate a significant relationship with the level of satisfaction.
- h) **Residence:** The type of residence is a criterion to assess socioeconomic status in villages. It has proved to a significant level of the group classified based on satisfaction.
- i) **Major Occupation:** The major occupations, like farming, wage earning, business, and service, are significantly related to the level of satisfaction, confirming the findings of many other social scientists.
- j) **Annual Family Income:** Annual family income is an arithmetical indicator of economic status. The hypothesis higher the income level greater the satisfaction has been proven in the study.

- k) **Land Possession:** Ownership of land has always been found significantly associated with the level of satisfaction, which has been reflected in the study.
- l) **Social Amenities:** Social amenities indicate the status of living and the wellness of life. In these aspects, the sample respondents are in a better position, for which a significant relationship has been found between social amenities and the level of satisfaction.

5.2.1 Difference between Groups of Levels of Satisfaction:

Further analysis was made to find out the difference between groups belonging to high, medium, high-low and medium-low satisfaction levels on 13 important socioeconomic parameters. The table given below reflects the analysis of differences.

Table 6: Difference between Groups of Levels of Satisfaction

Sl. No.	Variable	High Medium	High Low	Medium Low
1.	Age	6.06	16.91	21.94
2.	Education	0.00	28.02	28.02
3.	Marital Status	5.95	5.67	0.30
4.	Caste	3.52	19.71	22.54
6.	Economic Group	1.43	0.71	0.72
7.	Family Size	13.85	15.88	2.35
8.	Family Type	8.06	4.39	12.10
9.	Residence	5.86	15.63	10.37
10.	Major Occupation	8.20	12.08	4.23
11.	Annual Family Income	0.38	28.96	29.23
12.	Land Possession	11.11	32.59	24.17
13.	Social Amenities	30.60	27.32	4.51

Source: Computed from Primary Data

The respondents who were categorised as high, medium and low, their socioeconomic background were computerised to find out the difference.

- High and Medium levels of satisfaction:** In the case of high and medium levels of satisfaction, the difference was observed in the case of family size, land possession and availability of social amenities. In rural Odisha, family size is attached with social values because of the hypothesis that the more members more is the income and the joint family system in Odisha is found to have more land, so they also have more social amenities.
- High and Low levels of satisfaction:** In case of high and low satisfaction levels, the difference was marked for the variables of case of age, education, caste, family size, type of residence, major occupation, annual

family income, land possession and social amenities. The result indicates the difference between the high and low satisfaction groups on many accounts; they have a differential status, indicating the distance between the high and low satisfaction levels to which the sample women belong, as per the classification.

3. **Medium and Low levels of satisfaction:** In the case, medium and low levels of satisfaction, the difference was observed in the case of age, education, caste, family type, type of residence, annual family income and land possession. It is interesting to note that in social amenities, medium and low groups did not differ significantly.

On the whole, in the variables like marital status and economic group, all three categories were almost the same without any difference.

6. CONCLUSION

Self-help groups have proven to be a powerful mechanism for socio-economic transformation in India. By fostering financial independence, empowering women and building community resilience, SHGs have the potential to address pressing developmental challenges. With continued support from governments, NGOs and financial institutions, SHGs can further strengthen their impact and contribute to building a more inclusive and equitable society. On the whole, the study reveals that there is a need to examine the status of SHGs, correlating factors of socio-economic variables, to remove lacuna in structure, function and activities and to strengthen motivational factors. In short, the need for supervision, training, marketing facilities, introduction of new technology and cohesiveness among members are to be taken care of to strengthen the SHG under study in the District of Balasore.

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UNLOCKING POSSIBILITIES: ENABLING MARGINALIZED COMMUNITIES FOR A SUSTAINABLE PROSPECT

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ABSTRACT

The empowerment of marginalized communities is decisive for nurturing unbiased social and economic progress. Education, as an influential tool, plays a primary role in resolving the obstacles faced by these communities. From an economic perspective, engraining in education for marginalized groups not only endorses social mobility but also contributes to the overall affluence of civilization. This paper delves into the junction of education, economic advancement, and social equity, focusing on the empowerment of marginalized communities through access to quality education. Individuals from marginalized backdrop often face significant challenges to educational accomplishment, including economic adversity, cultural prejudice, and lack of access to assets. These barriers preserve cycles of poverty, limiting their economic openings and augmenting disparity. However, by emphasizing inclusive education policies and targeted intrusion, marginalized communities can surmount these barriers and achieve economic autonomy. The main objective of this article is to review the literature on steps that may be taken to enable communities. We perceived from the literature that there are three levels of empowerment; psychological, organizational and community levels of empowerment. We also recognized three models that are suitable for use in community work for the purpose of empowering marginalized communities.

From the model developed by Jackson et al. (1989), we concluded that steps that may be taken in empowering the marginalized through community work are: developmental casework, mutual support, issue identification and campaign, community participation and social movements. The paper concludes that the economic perspective of education must be revamped not only as a private good but as a shared societal investment. Empowering marginalized communities is essential to achieving sustainable development and reducing global inequalities. The paper highlights the role of governments, NGOs, and international organizations in facilitating educational access and economic empowerment for these communities.

Keywords: Power, Marginalized Community, Community Empowerment, Odisha.

1. INTRODUCTION

In the pursuit of sustainable development and equitable growth, the inclusion and empowerment of marginalized communities remain indispensable. These communities, frequently excluded based on caste, race, ethnicity, gender, socioeconomic status, or geographical remoteness, face persistent structural barriers that hinder their access to education, healthcare, employment, and political representation (Sen, 1999; Kabeer, 2005; Fraser, 2008). Addressing these barriers is not only a moral imperative but also essential for achieving the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (quality education) and SDG 10 (reduced inequalities) (UNESCO, 2020). Empowerment, primarily through education, emerges as a powerful tool for dismantling systemic inequities and fostering inclusive development.

Education is widely acknowledged as a key driver of social transformation and individual empowerment. It enables people to acquire knowledge, critical thinking skills, and the confidence needed to engage meaningfully in civic, economic, and political life (Nussbaum, 2011; Delors et al., 1996). Paulo Freire's foundational work on *critical pedagogy* emphasized education as a liberatory process, enabling oppressed groups to question and challenge the structures of their marginalization. Numerous empirical studies corroborate the link between educational attainment and improved life outcomes, including economic stability, better health, and enhanced civic engagement (World Bank, 2018; OECD, 2019). Yet, access to quality education remains uneven, especially among marginalized populations, due to persistent challenges such as poverty, cultural discrimination, linguistic exclusion, and infrastructural deficits (Subrahmanian, 2005; Banks, 2016; Stromquist, 2014).

This paper explores the intersection of education, economic mobility, and social equity by investigating how equitable access to quality education can empower marginalized communities. It draws upon theoretical insights from empowerment theory, the capability approach, and critical pedagogy, while emphasizing practical strategies grounded in community-based interventions. Central to this discussion is the empowerment model introduced by Jackson, Mitchell, and Wright (1989), which identifies three

interconnected levels of empowerment: psychological (individual agency and self-efficacy), organizational (institutional capacity-building), and community (collective participation and action). These dimensions form the basis for fostering resilience and transformative social change within disenfranchised populations.

The paper further highlights community empowerment practices such as developmental casework, mutual support systems, participatory planning, and advocacy-based engagement—approaches that have been shown to build collective identity and democratize access to resources and decision-making (Zimmerman, 2000; Cornwall & Gaventa, 2001). Such models advocate for a paradigm shift in viewing education not merely as a private good or market-driven asset, but as a collective, public responsibility. Framing education in this way reinforces its potential to advance not just personal well-being but also broader community development and national progress.

Lastly, the paper underscores the roles of governments, NGOs, and international organizations in institutionalizing inclusive education and supporting grassroots empowerment. By implementing inclusive policy frameworks, fostering local leadership, and facilitating participatory development, these actors can help marginalized communities overcome entrenched barriers and achieve long-term sustainability. Ultimately, inclusive education and community empowerment are not just pathways to development—they are foundational to building equitable, just, and resilient societies.

2. LITERATURE REVIEW

Jemi, Habib & Alam (2024), in their article, *“Strategies for Integrating Marginalized Communities into Supply Chains,”* investigate methods to incorporate disadvantaged groups into supply chains as suppliers, producers, and distributors. Through case studies and qualitative data, the study identifies critical factors such as capacity-building initiatives, access to affordable financing, fair trade practices, and technology utilization. Findings reveal barriers like societal mindsets, limited financial support, and logistical challenges, proposing actionable strategies for sustainable and inclusive supply chain models.

Mawere and Mukonza (2024), in their study, *“Empowering Marginalised Communities: Leveraging Indigenous Knowledge for Sustainable Energy Development in South Africa,”* explore the integration of indigenous knowledge systems into the energy sector. Using thematic analysis of secondary data, the research advocates for Afrocentric paradigms like traditional resource governance and community-driven energy solutions. Findings suggest that incorporating indigenous knowledge can address energy crises, promote socio-economic empowerment, and reinforce environmental stewardship.

Vinod and Kumar’s (2024) work, *“Empowering Marginalized Communities in India,”* investigates how higher education can serve as a tool for overcoming inequality. Through a compilation of studies focusing on Dalits, minorities,

persons with disabilities, and women, the book examines the state of higher education in India. It discusses policies like the National Education Policy 2020 and explores challenges such as caste discrimination, access issues, and gender parity. The findings underscore the potential of inclusive and equitable pedagogy in empowering marginalized groups.

Okech, Neszméry, and Mačkinová (2020) conducted a literature review titled *“Empowering the Marginalized through Community Work”* to explore strategies for enhancing the well-being of marginalized communities. Utilizing a traditional literature review methodology, they sourced data from databases such as Springer Link, Wiley Online Library, and ProQuest Central. The study identified three levels of empowerment: psychological, organizational, and community. It also highlighted models suitable for community work, including developmental casework, mutual support, issue identification and campaigns, community participation, and social movements.

UNESCO (2020), in its report titled *Education as a Catalyst for Social Inclusion*, explores how education can disrupt intergenerational poverty and foster social inclusion. Utilizing global trend analysis and educational data, the report identifies that indigenous and rural children are disproportionately affected by structural and situational barriers such as the costs of schooling and the need for child labour. The findings stress the urgency of eliminating these obstacles to prevent dropout and ensure meaningful participation in education for marginalized populations.

Banks (2016) argues that in *Culturally Responsive Inclusive Education*, inclusive education must transcend mere physical access to classrooms. His theoretical work, rooted in multicultural education and equity frameworks, highlights the necessity of curricula and teaching methods that reflect the cultural and socioeconomic realities of marginalized learners.

His findings reveal that when curriculum content fails to align with students' lived experiences, educational inclusion becomes superficial, and true equity remains unattained.

Stromquist (2014), through her work *Intersectionality and Educational Exclusion*, underscores how overlapping identities—such as gender, ethnicity, and poverty—intersect to create compounded disadvantages for certain groups, particularly girls from marginalized ethnic backgrounds. Employing an intersectional analytical framework, her study shows that educational policies must be multidimensional and sensitive to these interlocking forms of discrimination to be effective in promoting equitable access.

Nussbaum (2011) in *Education through the Capabilities Approach* presents a philosophical inquiry into the role of education in enabling individuals to lead dignified and autonomous lives. Her analysis emphasizes that equity in access must be matched by equity in educational content and pedagogical strategies. The findings advocate for education that not only includes all learners but also empowers them through content that fosters their full human development.

Cornwall (2008), in *Participatory Development in Educational Reform*, critiques top-down policy approaches that often fail to resonate with local needs. Through qualitative case studies of development initiatives, her research reveals that educational reforms are most effective when communities are actively involved in planning and implementation. Without this participation, even well-meaning policies may miss the mark, failing to address the contextual challenges faced by marginalized learners.

Ainscow et al. (2006) in *Policy Support for Inclusive Education*, provide empirical evidence from diverse educational settings to demonstrate that inclusive education policies yield positive outcomes when accompanied by local-level support and stakeholder engagement. Their findings show that the success of such initiatives is contingent upon the involvement of school staff, families, and community organizations in implementing inclusive practices tailored to local realities.

Subrahmanian (2005), in her work *Structural Barriers to Educational Access*, identifies persistent challenges such as poverty, geographic remoteness, and institutionalized discrimination that continue to hinder equitable educational access. Drawing on policy analyses and case studies, she emphasizes that addressing these systemic barriers is essential for achieving inclusive and just education systems.

Zimmerman (2000), in *Empowerment through Education and Community Psychology*, introduces a conceptual model rooted in community psychology, proposing that empowered communities exhibit critical awareness, participatory behavior, and a sense of control. His theoretical framework highlights how education can foster these traits, enabling marginalized groups to engage actively in shaping their social and political environments.

Amartya Sen (1999), in *Capabilities and Freedom through Education*, frames education as a foundational capability that enables individuals to pursue lives, they value. His theoretical exposition within the capabilities approach positions education as a central pillar of freedom and development. The findings emphasize that without education, individuals lack the means to realize their potential and contribute fully to society.

Jackson, Mitchell, and Wright (1989), in *A Framework for Community Empowerment*, identify three interconnected levels of empowerment: psychological, organizational, and community. Grounded in empirical research, this model has been widely applied in development contexts to guide strategies for resilience and self-reliance. The findings support the view that sustainable educational transformation requires interventions that operate across all three empowerment levels.

Finally, Paulo Freire's seminal work *Pedagogy of the Oppressed (1970)* lays the foundation for conceptualizing education as a practice of freedom. Through a participatory and dialogic learning model, Freire emphasizes the importance of critical consciousness among marginalized learners. His methodology,

rooted in lived experience and reflection, continues to inform community-based educational practices aimed at liberation and social transformation.

3. THEORETICAL FRAMEWORK

The theoretical foundation for this study on empowering marginalized communities through education and community development draws from critical pedagogy, empowerment theory, and the capability approach. Together, these frameworks provide a multidimensional lens to analyze how education and community engagement can disrupt systemic inequities and foster sustainable development.

3.1 Critical Pedagogy

Freire's (1970) *Pedagogy of the Oppressed* laid the foundation for critical pedagogy, emphasizing education as a process of *conscientization*—raising critical awareness among the oppressed to help them recognize and transform the structural conditions of their marginalization. He critiqued the traditional “banking model” of education, where students are passive recipients, and instead advocated for a dialogical and participatory model that empowers learners to become agents of change. In the context of marginalized communities, critical pedagogy promotes educational practices that are culturally relevant, participatory, and justice-oriented, closely aligning with the goals of both empowerment and capability enhancement.

3.2 Empowerment Theory

Zimmerman (2000) further clarified that empowered communities demonstrate control over their environment, critical awareness, and active participation—qualities essential for sustainable change. These elements are highly relevant in addressing the intersecting disadvantages faced by marginalized populations.

Zimmerman (1995) expanded empowerment theory by framing it as a multi-level process:

- Psychological empowerment: fostering a sense of agency and competence in individuals
- Organizational empowerment: strengthening institutions to support individual and group empowerment
- Community empowerment: enabling collective action and civic engagement

Jackson, Mitchell, and Wright (1989) contributed a practical framework for community empowerment, outlining developmental strategies such as mutual support, issue identification, campaign work, and community participation. Their work emphasized building capacity at psychological, organizational, and community levels, particularly in marginalized settings.

3.3 CAPABILITY APPROACH

Martha Nussbaum (2011) extended this framework by emphasizing that true empowerment requires the development of essential human capabilities, such as health, education, and agency. She stressed that equity in access must be accompanied by equity in content, context, and pedagogical method, ensuring that education is meaningful for those it aims to serve.

Amartya Sen (1999) introduced the capability approach, which shifts the focus from resource distribution to the expansion of individual freedoms and opportunities. Sen argued that marginalized individuals often experience “unfreedoms” that constrain their choices and wellbeing. Education, seen through this lens, becomes a public investment that enhances individuals’ capacity to participate fully in economic, social, and political life.

4. RESEARCH GAP

Despite increased scholarly attention to education and empowerment as drivers of inclusive development, critical gaps remain in understanding how these mechanisms function within marginalized communities, especially across psychological, organizational, and community dimensions (Zimmerman, 1995; 2000). While education is widely recognized as a pathway to social mobility (Sen, 1999; UNESCO, 2020), much research emphasizes top-down reforms (Ainscow et al., 2006) and overlooks the lived experiences of groups such as indigenous peoples, rural women, and the urban poor. These approaches often ignore cultural biases, social stigmas, and institutional barriers that inhibit meaningful inclusion (Subrahmanian, 2005; Banks, 2016). Existing frameworks—empowerment theory, the capability approach, and critical pedagogy—are rarely integrated, despite their shared emphasis on agency, transformation, and justice (Freire, 1970; Nussbaum, 2011). For instance, Zimmerman’s psychological empowerment model seldom intersects with structural analyses of educational inequity (Freire, 1970) or the lack of substantive freedoms (Sen, 1999). Furthermore, most studies focus on short-term outcomes, lacking longitudinal insights into how education fosters lasting community change (Stromquist, 2014). Community-led empowerment models rooted in grassroots participation remain underexplored, despite early contributions by Jackson, Mitchell, and Wright (1989). Bridging these gaps is vital for crafting context-sensitive, sustainable, and inclusive education strategies.

5. RESEARCH OBJECTIVES

- 1) To examine the role of education in empowering marginalized communities at psychological, organizational, and community levels.
- 2) To explore the barriers that hinder access to quality education for marginalized populations.

- 3) To identify the role of governments, NGOs, and international organizations in facilitating inclusive education and empowerment efforts for marginalized groups.

6. RESEARCH QUESTIONS

- 1) How does education contribute to the empowerment of marginalized communities across psychological, organizational, and community dimensions?
- 2) What are the key barriers preventing marginalized individuals from accessing quality and inclusive education?
- 3) What roles do government policies, NGOs, and international organizations play in promoting educational access and empowerment for marginalized communities?

7. DATA AND METHODOLOGY RESEARCH DESIGN

This study adopts a mixed-methods research design, combining both qualitative and quantitative approaches to gain a comprehensive understanding of how education can empower marginalized communities and foster sustainable development. The integration of both methods allows for triangulation, ensuring validity and a deeper insight into the lived experiences of participants alongside measurable impacts.

7.1 Population And Sampling Population

The population for this study comprises individuals who are part of marginalized communities—groups that are systematically excluded from access to resources, opportunities, and full participation in social, economic, and political life. These include, but are not limited to, ethnic and religious minorities, economically disadvantaged households, women in rural or patriarchal settings, persons with disabilities, and other socially excluded groups. These communities often face persistent barriers such as poverty, limited educational access, cultural stigma, discrimination, and inadequate representation in decision-making processes. As education is a key factor in breaking the cycle of marginalization and fostering empowerment, the selected population is particularly relevant for examining how inclusive educational opportunities can catalyze sustainable development and social equity. By focusing on this diverse yet vulnerable segment of society, the study aims to generate insights that reflect the real challenges and needs of those most affected by structural inequality, while also identifying pathways toward empowerment, economic independence, and community resilience.

7.2 Sample

The study focuses on individuals from marginalized communities in the Mayurbhanj district, including ethnic minorities, economically disadvantaged households, women residing in rural areas, and persons with disabilities.

The target population comprises a diverse group of stakeholders such as community members (including students, parents, and youth), educators and school administrators, community development officers, and representatives from nongovernmental organizations (NGOs) and government bodies. To ensure comprehensive and inclusive representation, a purposive sampling method is employed for the qualitative component of the study, enabling the selection of participants based on their lived experiences, contextual relevance, and informed perspectives. For the quantitative component, a stratified random sampling technique is used to select a total sample size of 100 respondents. The stratification is based on key demographic variables such as gender, socio-economic status, and geographic location (rural/tribal), ensuring that various subgroups within the marginalized population are proportionately represented. The adjusted sample size of 100 is deemed appropriate for balancing analytical depth with practical feasibility, especially within the logistical and resource constraints of fieldwork in Mayurbhanj. This design supports robust data collection and meaningful analysis of the intersections between education, empowerment, and social inclusion in the local context.

7.3 Data Collection Methods

In-depth Interviews (IDIs): Conducted with 20–30 key stakeholders such as educators, NGO workers, and local leaders to understand the challenges, strategies, and impacts of education on community empowerment.

Focus Group Discussions (FGDs): Conducted with groups of community members (5–8 participants each) to explore shared experiences and collective perspectives on empowerment and education.

7.4 Data Analysis

Interview and FGD transcripts are coded and thematically analyzed using qualitative software. Emerging themes are mapped against the theoretical framework, particularly focusing on empowerment levels (psychological, organizational, and community).

8. FINDINGS

8.1 Demographic Insights (n = 100)

- **Gender Distribution:** Of the 100 participants, 60% were female (n = 60) and 40% were male (n = 40). This reflects a strong female representation in the study, which is significant given the gendered nature of marginalization, particularly in rural and tribal contexts.
- **Education Levels:** 10% (n = 10) of respondents had no formal education, 30% (n = 30) had completed primary education, 40% (n = 40) had attained secondary education, and 20% (n = 20) had pursued higher education. These figures suggest that the majority of participants still fall within the basic education bracket, highlighting ongoing challenges in access to higher education.

- Employment Status: 45% (n = 45) reported being employed, 30% (n = 30) were unemployed, and 25% (n = 25) worked in the informal sector. This distribution points to substantial economic vulnerability among respondents, with many lacking stable or formal employment opportunities.

Table 1: Demographic Profile of Survey Respondents (N = 100)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	40	40%
	Female	60	60%
Age Group	18–25	25	25%
	26–35	30	30%
	36–45	20	20%
	46 and above	25	25%
Educational Attainment	No formal education	10	10%
	Primary	30	30%
	Secondary	40	40%
	Higher Education	20	20%
Employment Status	Employed	45	45%
	Unemployed	30	30%
	Informal sector	25	25%

2. Barriers to Accessing Education

Participants reported multiple overlapping barriers.

Table 2: Barriers to Accessing Education (Multiple Responses Allowed)

Barrier	Frequency (n)	Percentage (%)
Financial constraints	70	70%
Lack of infrastructure (schools, roads)	60	60%
Cultural beliefs/gender norms	40	40%
Language barriers	25	25%
Discrimination or prejudice	30	30%
Distance from school	35	35%

Interpretation: Financial and infrastructural barriers were the most frequently cited, suggesting the need for targeted educational funding and infrastructure development.

Table 4: Empowerment Dimension

Empowerment Dimension	Educated Respondents (%)	Less-Educated Respondents (%)
Psychological Empowerment	85%	38%
Organizational Involvement	65%	27%
Community Participation	58%	18%

Table 5: Stakeholder

Stakeholder	Percentage Reporting Positive Impact	Key Contributions
Government Policies	72%	Free education, scholarships, and infrastructure
NGOs	35%	Awareness, local access, materials, flexibility
International Organizations	22%	Funding, policy frameworks, and strategic guidance

Research Question 1: How does access to education contribute to the empowerment of marginalized communities?

8.2 Psychological Empowerment

Psychological empowerment refers to an individual's sense of self-worth, confidence, and belief in their ability to effect change in their own life and surroundings.

- 85% of participants with secondary education or higher reported a stronger sense of self-efficacy and greater optimism about their future, compared to only 38% among those with no formal education.
- Interview data revealed that access to education fostered self-confidence, especially among women and youth, with many citing education as the “first step to being heard.”
- A young female participant from a rural community shared:

“Before I went to school, I used to think I couldn’t do anything on my own. Now, I feel confident speaking up at meetings and helping others.”

8.3 Organizational Empowerment

Organizational empowerment relates to individuals' involvement in and influence over formal or informal structures like schools, cooperatives, or local councils.

- Among educated respondents, 65% had participated in school management committees, local cooperatives, or community development projects.
- Only 27% of those with no or primary education had engaged in any organizational activities.
- Education was linked to better leadership skills, the ability to manage resources, and confidence in participating in decision-making processes.
- Educators noted that educated individuals were more likely to initiate programs, lead community meetings, and advocate for inclusive development.

8.4 Community Empowerment

Community empowerment involves the ability of community members to come together, share knowledge, and collectively advocate for their rights.

- 58% of educated respondents had been involved in advocacy efforts, awareness campaigns, or community projects, compared to 18% of less-educated peers.
- Community empowerment was evident in regions where education campaigns were linked to civic engagement (e.g., voter registration, water sanitation).
- One community leader stated:

“Our literacy classes didn’t just teach people to read—they taught them how to demand better services and speak up when something is wrong.”

Interpretation: The data demonstrate that education significantly contributes to the empowerment of marginalized individuals by enhancing individual confidence, organizational participation, and community leadership. These findings confirm the hypothesis that education is a multi-level enabler of empowerment.

Research Question 2: What are the main barriers to accessing quality education for marginalized communities?

- The most frequently cited barriers include financial constraints (70%), lack of infrastructure (60%), and cultural beliefs and gender norms (40%).
- A significant portion of respondents also reported issues like language barriers (25%) and discrimination (30%), indicating multiple, intersecting forms of exclusion.

Interpretation: These findings suggest that structural, economic, and cultural barriers collectively hinder educational access for marginalized groups, reinforcing the need for targeted, inclusive interventions.

Research Question 3: What policy measures or organizational strategies are most effective in empowering marginalized groups through education?

8.5 Government Policies

Governments were identified as primary enablers of systemic change through policy formulation, funding allocation, and infrastructure development.

- 72% of respondents from communities with active government education policies (e.g., free primary education, mid-day meal schemes) reported higher school enrolment and retention rates.
- Key programs mentioned included: Free and Compulsory Primary Education Acts O Scholarship & Stipend Schemes for Marginalized Students, to Inclusive Education Policies for Students with Disabilities
- A district education officer stated:

“Policy alone isn’t enough, but it creates the foundation. Without government support, NGOs would have very limited reach.”

8.6 NON-GOVERNMENTAL ORGANIZATIONS (NGOS)

NGOs played a critical intermediary role in addressing gaps left by government services, especially in remote and underserved areas.

- 35% of respondents attributed their access to education or vocational training to NGO led programs.
- NGOs were effective in:
 - Community mobilization and awareness campaigns
 - Providing school supplies, uniforms, and remedial coaching
 - Running bridge schools and adult literacy classes
 - An NGO coordinator shared:

“We focus on the most vulnerable—children who dropped out, girls, and differently-abled individuals. We can respond quickly and locally.”

8.7 International Organizations

International organizations (e.g., UNICEF, UNESCO) played a strategic role by offering technical guidance, policy influence, and funding for inclusive education initiatives.

- 22% of surveyed beneficiaries were part of projects co-funded or designed with international partners.
- Contributions included:
 - Grants for school construction and teacher training
 - Policy frameworks promoting SDG 4 (Quality Education)
 - Monitoring systems to track access and outcomes
 - A UNICEF consultant remarked:

“We ensure that governments have the data and direction needed to keep vulnerable groups at the centre of educational reform.”

Interpretation: Policy effectiveness depends not only on design but also on grassroots implementation and community ownership of educational development.

9. CONCLUSION

The study reaffirms that education serves as a powerful catalyst for the empowerment of marginalized communities, fostering growth across psychological, organizational, and community dimensions. Findings reveal that access to education enhances self-confidence, leadership capacity, and collective agency, thereby enabling individuals to overcome social and economic barriers. Moreover, the roles of governments, NGOs, and international organizations are shown to be pivotal. While government policies provide the structural framework for inclusive education, NGOs complement these efforts by delivering community-based, context-sensitive interventions. International organizations further support this ecosystem through funding, innovation, and global collaboration. Despite existing implementation challenges, these stakeholders collectively contribute to expanding educational access and facilitating sustainable empowerment. Ultimately, a multisectoral approach—grounded in inclusive, equitable, and community-oriented education—emerges as essential to breaking cycles of marginalization and achieving long-term development. These findings underscore the need for coordinated, sustained efforts to ensure that no community is left behind in the pursuit of educational justice.

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WOMEN EMPOWERMENT THROUGH DEEN DAYAL UPADHYAYA GRAMEEN KAUSHALYA YOJANA (DDU-GKY) IN KEONJHAR DISTRICT OF ODISHA

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ABSTRACT

The Government of India's flagship initiative, the Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), aims to improve rural youth employment and foster skill development. The district of Keonjhar in Odisha, which is primarily rural and has a diverse tribal population, struggles with unemployment, livelihood insecurity and a lack of job possibilities. Women have an essential component in the development of both our nation and society. They confront a variety of difficulties in managing their social, economic, and cultural affairs. Women are overcoming numerous constraints and barriers over the period of time. The existing study examines the efficacy of the DDU-GKY program in Keonjhar district of Odisha, focusing on women with a particular emphasis on how they affect socioeconomic advancement, employability, and skill development. This study investigates the efficiency of DDU-GKY operations in Keonjhar, with an emphasis on their influence on skill development, employability, and women's socioeconomic status, along with the social well-being and their quality of life through the DDU-GKY program. The main objective is to study the livelihood security of the women through DDU-GKY, and to study the social well-being and quality of life of the rural women through DDU-GKY. The study uses a mixed-method approach to evaluate the program's implementation, reach, and results, combining qualitative interviews with quantitative surveys. According to the findings of the study, the DDUGKY program has a beneficial influence on rural women, assisting them in achieving financial and social empowerment. It has also been observed that the women can sustain their livelihood setup through the DDU-GKY program.

Keywords: DDU-GKY, Rural Employment, Skill Development, Rural Livelihood, Women Empowerment.

1. INTRODUCTION

The Ministry of Rural Development, Government of India, launched the Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), a state-wide program that offers skill development training and placement opportunities to improve the employability of rural youth. DDU-GKY, which was introduced on September 25, 2014, is an important part of the National Rural Livelihood Mission (NRLM), which aims to support the professional goals of rural youth between the ages of 15 and 35 and diversify sources of income for impoverished rural households. Particularly in places like Keonjhar, DDU-GKY has played a significant role in empowering rural youth in Odisha. Project Implementing Agencies (PIAs), who set up training facilities to provide industry-relevant skills, are the program's operational agents. Keonjhar is one among the several locations that *Gram Tarang Employability Training Services*, such as PIA, has established around Odisha. In 18 batches, the *Gram Tarang* Keonjhar Centre enrolled 536 individuals, 488 of whom were employed in various occupations. The value which DDU-GKY places on women's empowerment is one of its most significant characteristics. In order to increase women's involvement in the workforce and advance gender equality, the program requires that at least 33% of the applicants trained be female (Phukun, 2021). The influence of DDU-GKY on Keonjhar has been significant. According to research, the initiative has greatly increased employment and income in the district. The chosen candidates in Keonjhar accounted for 5.67% of the total candidates in Odisha, demonstrating substantial district engagement (Mishra and Jena, 2018).

Recently, a significant number of women have been entering emerging nations like India to pursue entrepreneurship as a new career path. The expansion of numerous women's empowerment initiatives and policies by the government, non-governmental organizations, and other banking and non-banking financial institutions (NBFIs) has a greater impact (Rajendhiran and Devi, 2017 and Sahoo, 2020). As a result, women have become more independent and empowered, surpassing a number of limitations and obstacles. However, a thorough grasp of the engagement of women and girls from both rural and urban areas is necessary in order to have a greater understanding of these challenges. Understanding the connection between the obstacles and the need to empower Indian women entrepreneurs is crucial. The various demographic profiles of female entrepreneurs must be taken into account when evaluating their goals, challenges, and possibilities. In order to empower women entrepreneurs in high-skilled, non-traditional, male-dominated business enterprises and to help them overcome obstacles, a training and skill development approach is necessary.

In India, unemployment is a major concern. The government takes a number of steps to minimize youth unemployment. In addition to emphasizing male employability, the Skill India Mission has taken action to include all women in the program, which will ultimately benefit our economy and gender equality. Economic progress and financial stability can result from both men and women

working together. This program's trainings truly address every demand of women. Women enjoy free lodging and transportation, while mothers have specific facilities to care for their children. By actively participating in the skill development program, this support structure encourages our Indian women to live socially independent lives.

Due to gender bias, women in our society were previously ignorant in every area of social growth. Later, as the times changed, women were also encouraged to get involved in social issues. Only when each person makes an equal contribution to the process of growth can we say that our nation has developed. In addition to being skilled, self-assured, and assertive, women are never supposed to be housewives. In certain locations, the progress is still restricted and slow. Since mainstream society still holds women in unequal positions, empowering them is now essential to improving their lot in life. If women are aware of their rights and responsibilities as concerned citizens, they can be empowered.

By strengthening a variety of talents and crafts, Skill India launches training programs to boost our economic growth. Under the Skill India Mission, it fully engaged the women who are always occupied with housework and who also pursue training to become competent individuals who can support themselves in unconventional ways. Under this program, we can observe that women of the new age actively participate in the Industry.

2. LITERATURE REVIEW

Although there are many ways to interpret the idea of women's empowerment, in general, it refers to the process through which women acquire more control over their lives, improve their access to resources, and actively engage in decision-making. According to Kabeer (1999), empowerment is the process of taking charge of one's own life by giving one more decision-making authority. This definition places equal emphasis on having access to resources and being able to use them in a meaningful way.

The UN has defined women's empowerment in terms of five main dimensions;

- *Economic Empowerment*: The ability of women to access financial services, work, income, and real estate.
- *Social Empowerment*: The capacity of women to engage in political, cultural, and social life.
- Women's involvement in *political processes*, such as voting, holding leadership positions, and formulating policies, is known as political empowerment.
- The development of a strong feeling of *self-worth and the self-assurance* to take part in social and economic decision-making is known as psychological empowerment.
- *Legal Empowerment*: Having access to laws protecting women, legal rights, and the ability to pursue justice through the legal system.

2.1 Dimensions of Women Empowerment

In this segment of our research article, we have categorised the different dimensions, on the basis of past literature reviewed, to better understand women empowerment.

2.1.1 Economic Empowerment

One of the most important aspects of overall women's empowerment is economic empowerment. According to studies, women's position in their families and in society improves when they have access to financial resources, education, and work. Women who work are more financially independent, which gives them more freedom to make their own decisions. The World Bank (2012) asserts that economic empowerment is associated with better health, more educational attainment, and a decrease in poverty for women and their families.

Microfinance organizations have played a significant role in giving women access to financial resources in many developing nations. One example of how women might escape poverty and gain social and economic empowerment is the Grameen Bank model in Bangladesh (Yunus, 2007). But there are still issues, especially with regard to fair compensation, job stability, and prospects for career progression.

2.1.2 Social Empowerment

The ability of women to participate in cultural practices, obtain healthcare, education, and social services is a component of social empowerment. One of the best strategies for empowering women is frequently seen to be education. A study made by UNESCO (2011) found that education improves women's health, social mobility, and decision-making skills in addition to their economic potential.

Furthermore, women's involvement in social movements that support gender equality or reproductive rights has been crucial in changing how society views women's roles. Participation by women in self-help groups (SHGs) or community organizations has also been shown to improve social cohesion and collective empowerment, especially in rural regions (Mohan, 2002).

2.1.3 Political Empowerment

For women to exercise their rights and take part in the democratic process, political empowerment is essential. One important measure of women's empowerment is their involvement in politics. According to a 2007 study by Paxton et al., women's involvement in governance improves policy outcomes, particularly in fields like gender equality, health, and education. Laws and regulations that address economic inequality, discrimination, and gender-based violence can be promoted by women leaders.

Nonetheless, the underrepresentation of women in political positions continues to be a problem on a global scale. Only 25.5% of legislative seats

worldwide are held by women, according to the Inter-Parliamentary Union (IPU, 2020). Barriers to political empowerment include gender stereotypes, a lack of mentorship and training, and the intersectional challenges faced by women from marginalized communities.

2.1.4 Psychological Empowerment

Women's self-worth, confidence, and faith in their capacity to make choices and alter their situation are all factors in psychological empowerment. According to Bandura's (1977) theory of self-efficacy, women are more likely to act in the direction of their goals when they have confidence in their ability to accomplish them. Research shows that women's mental health is greatly enhanced by empowerment through education, work, and social interaction, which gives them a stronger sense of control over their lives (Zimmerman, 2000).

Programs focusing on building women's self-confidence have proven successful, particularly in the context of rural empowerment. For example, initiatives like the Self-Employed Women's Association (SEWA) in India have empowered women by providing vocational training, financial literacy, and community support, thus enhancing their psychological well-being (Chen et al., 2007).

2.1.4 Legal Empowerment

The term "legal empowerment" describes women's access to rights, justice, and legal safeguards. Women continue to endure legal restrictions in many nations that limit their access to inheritance, property, and protection from abuse. For women to be empowered, laws protecting them from sexual harassment, domestic abuse, and other types of discrimination must be upheld. Legal reforms, such as the enactment of laws against child marriage, dowry-related violence, and sexual harassment, are crucial in improving women's rights, according to a seminal study conducted by the United Nations Development Programme (UNDP, 2012). Teaching women about their rights and giving them the tools to fight unfair systems through legal action are further aspects of legal empowerment.

2.1.5 Factors Influencing Women Empowerment

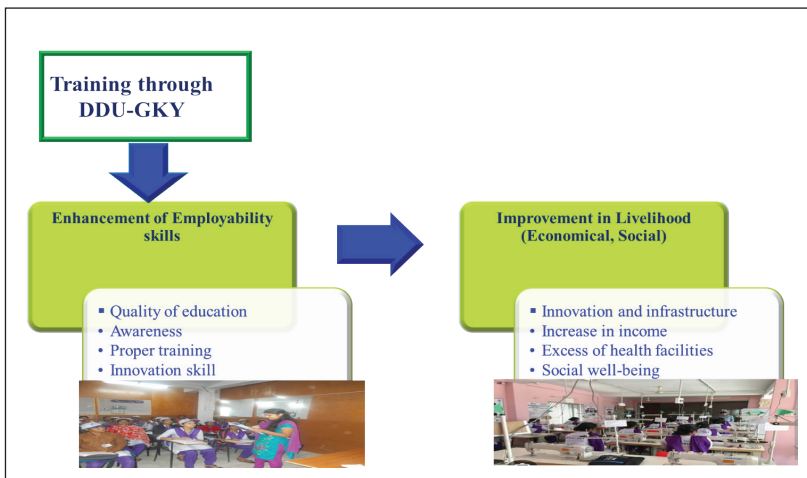
Women's empowerment is influenced by a number of factors, such as education, which is a key component of women's empowerment, is having access to education. A woman's prospects of becoming monetarily independent, taking part in decision-making, and escaping social limitations increase with her level of education (Jain & Arora, 2016). Another factor that influences is access to technology. Women's empowerment is significantly squeezed by the digital gap as well. Digital technology access can give women in many developing nations access to information, education, and networking possibilities (Tambe & Nwogwugwu, 2019). Similarly, social and cultural expectations around gender roles have the potential to either support or undermine empowerment.

Women seeking empowerment frequently face additional obstacles in societies with more rigid gender roles (Agarwal, 2015). In fostering an atmosphere that supports women's empowerment, government policies and legal frameworks play a critical role (Duflo, 2012).

2.1.6 Impact of Women Empowerment

Both women and society at large have been greatly influenced by women's empowerment. Empowered women have greater access to family planning, nutrition, and healthcare; they typically have better health outcomes for themselves and their children (Smith et al., 2003). Women's economic involvement makes a substantial contribution to the expansion of the national economy. The McKinsey Global Institute (2015) projected that \$12 trillion may be contributed to global GDP by promoting women's equality in the workforce. One of the best methods for lowering poverty is to empower women. There are intergenerational benefits since women are more inclined than men to spend their money in their families, especially in the healthcare and education of their children (World Bank, 2012).

3. CONCEPTUAL FRAMEWORK



4. OBJECTIVES

- To study the livelihood security of the women through DDU-GKY.
- To study the social well-being and quality of life of the rural women through DDU-GKY.

5. DATA AND METHODOLOGY

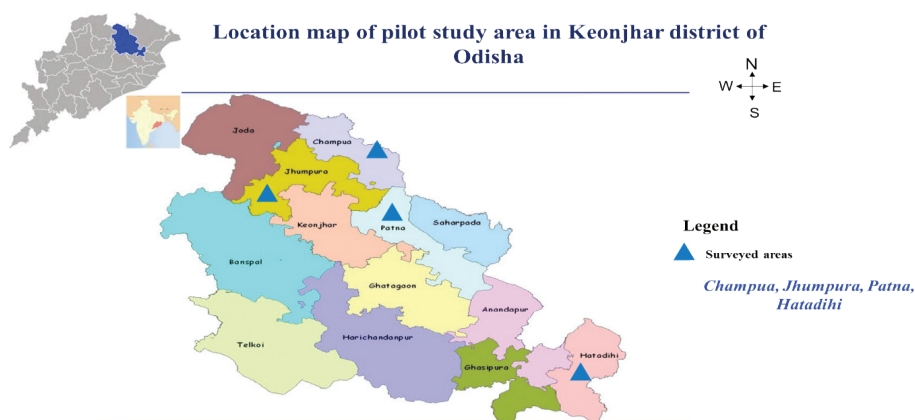
The study focuses on Keonjhar district in Odisha, which is one of the key areas in the state where the DDU-GKY scheme is operational. Keonjhar has a predominantly rural population, with a large number of youths engaged in agriculture and related unorganized sectors.

5.1 Data Collection Methods

Sampling: A stratified random sampling method has been used to select the participants for the study. 150 beneficiaries of the DDU-GKY program from various training centres in Keonjhar.

Survey Questionnaire: Structured questionnaires were administered to the beneficiaries to assess the skills acquired, training experience, and post-training employment status.

5.2 Study Area:



6. RESULT AND DISCUSSION

Table 1: Sector-wise distribution of women candidates (%)

Sl. No	Sector Name	Frequency	Percentage Share
1	Apparel	39	26
2	Beauty & wellness	5	3.34
3	Construction	48	32
4	Electrical	3	2
5	Healthcare	2	1.34
6	IT-ITES	34	22.67
7	Retail	8	5.34
8	Telecom	5	3.34
9	Tourism & Hospitality	6	4
Total		150	100

Source: Primary data

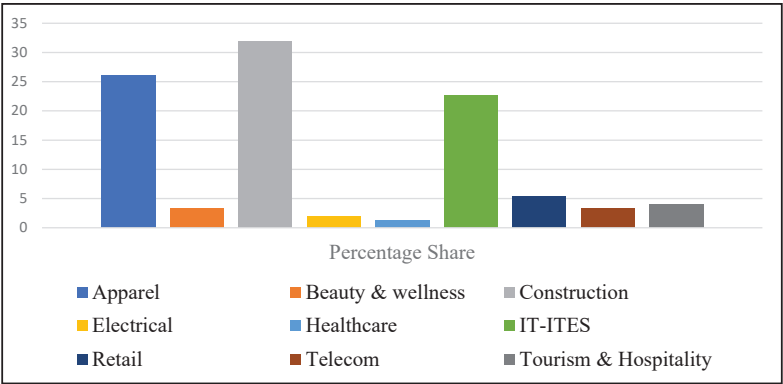


Figure 2: Sector-wise distribution of women candidates (%)

Table 1 presents a sector-wise distribution of workforce engagement, highlighting the frequency and percentage share of participation across various industries. The total frequency recorded is 150, with the data divided among nine prominent sectors: Apparel, Beauty & Wellness, Construction, Electrical, Healthcare, IT-ITES, Retail, Telecom, and Tourism & Hospitality.

The Construction sector leads with the highest frequency of 48, accounting for 32% of the total. This indicates a strong demand and participation in the construction industry, possibly due to the consistent infrastructure development and urban expansion in many regions. Following closely is the Apparel sector, with 39 participants, representing 26% of the total. The significant share in this sector suggests its vital role in employment generation, especially in regions where textile and garment manufacturing is a key industry.

The IT-ITES sector is the third-largest, with 34 individuals, making up 22.67% of the total. This highlights the growing impact of digital transformation and the increasing opportunities in the field of information technology and enabled services. With the ongoing digitization across industries, this sector is likely to witness continuous growth.

Other sectors, such as Retail, Telecom, and Beauty & Wellness, contribute modestly with 8 (5.34%), 5 (3.34%), and 5 (3.34%) individuals, respectively. The Retail sector's share reflects a steady demand for frontline sales and customer service roles. The equal share of Telecom and Beauty & Wellness sectors suggests niche but stable areas of employment.

Tourism & Hospitality accounts for 6 participants (4%), reflecting a recovering but still relevant industry post-pandemic, where travel and hospitality services are gradually regaining momentum. Meanwhile, the Electrical sector has a minor share of 3 individuals (2%), indicating either a more specialized skill demand or limited current opportunities. The Healthcare sector has the smallest representation with only 2 individuals (1.34%), which might seem surprising given its global importance. However, this could be due to the specialized qualifications and certifications required to enter this field.

To sum up, the table illustrates a diverse range of employment across sectors, with Construction, Apparel, and IT-ITES taking the lead. The distribution not only reflects the current labour market trends but also offers insights into the areas where skill development and training might be intensified to balance workforce distribution and meet future demands. As economies evolve, a dynamic and responsive workforce allocation will be key to sustained growth and productivity.

The table illustrates the distribution of individuals across different employment sectors, detailing the respective frequency and percentage share. The workforce, comprising 150 individuals in total, is distributed across nine key sectors, with varying levels of participation. We can gain insight into present employment trends and their potential causes by examining this data.

The Construction sector leads with the highest number of participants, 48 individuals, accounting for 32% of the total. The extensive development of infrastructure in urban and rural settings alike can be credited for this dominance. Construction work is typically labour-intensive and requires either semi-skilled or unskilled labour, making it accessible to a broad demographic, particularly those lacking advanced educational qualifications. Furthermore, government initiatives such as housing schemes, road development, and smart city projects contribute to the growing demand in this sector.

With 39 participants, the Apparel sector ranks second and constitutes 26% of the total. This sector has traditionally relied on labour and serves as a significant source of jobs, especially for women. The apparel and textile industries serve as major employers in numerous areas, owing to the low capital investment required and the high demand for manual labour. The existence of garment manufacturing units and export houses increases employment in this sector.

IT-ITES occupies the third position, comprising 34 individuals (22.67%). This sector has become a formidable player in job creation due to the burgeoning digital economy, the rising dependence on technology, and the growth of IT-enabled services such as BPOs, KPOs, and software development. This field attracts many young graduates because of its higher salaries, flexible work culture, and opportunities for advancement. Access to these jobs has also broadened due to the increase in remote work and digital platforms.

The retail sector, Tourism and hospitality sector, beauty and wellness sector, telecom and electrical sector have experienced consistent growth due to the proliferation of shopping malls, supermarkets, and e-commerce. Although the figure is comparatively small, the sector provides extensive employment opportunities, especially in urban regions. The competitive nature of the sector or seasonal hiring trends could explain the lower frequency observed here.

Table 2: Percentage share of different socio-economic variables and response of women candidates (%)

Sl No.	Socio-economic Variables	Yes	No
1	Scope for long-term income generation	71	29
2	Improvement in employment opportunities	67	33
3	Able to avail a better health care facility	67	33
4	Social involvement	75	25
5	Able to avail quality education	84	16
6	Increase in expenditure for a social cause	79	21
8	Increase in expenditure on basic needs	85	15

Source: Primary data

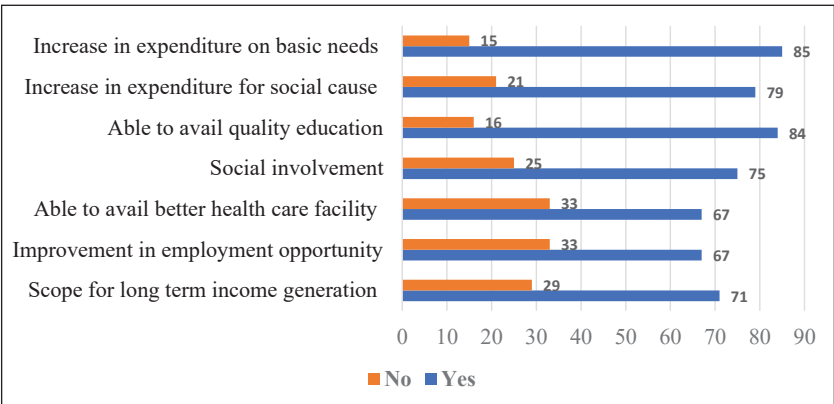


Figure 3: Percentage share of different variables and response of women candidates (%)

Table 2 presents data that sheds light on women’s perceptions of the effects of different developmental initiatives or livelihood programs on their lives. It shows the proportion of affirmative (Yes) and negative (No) replies from female candidates based on seven essential socio-economic variables. The responses illustrate both the domains in which a beneficial change is being sensed and the extent of women’s empowerment and inclusivity stemming from it.

According to Table 2, 71% of women agree that there is potential for long-term income generation, suggesting that many are starting to perceive financial stability through the opportunities available to them. This can be connected to enhanced access to livelihood programs, self-help groups (SHGs), vocational training, and small-scale business assistance. However, the 29% who answered “No” indicate that sustainable income generation is not a universal experience, likely due to factors such as limited market access, irregular earnings, or non-scalable income sources.

It is reported that 67% of women experience enhanced employment opportunities. This demonstrates the increasing availability of job positions via skill development initiatives and the involvement of women in fields that have historically been male-dominated. Nevertheless, the 33% “No” response indicates ongoing difficulties, like gender bias, inadequate formal education, or limited mobility, that hinder some women from fully benefiting from employment programs. Corresponding to the employment statistic, 67% of women indicated improved access to healthcare facilities. This indicates that attempts have been made to enhance primary healthcare infrastructure or initiatives aimed at women’s health. The 33% who did not notice an improvement might still be living in remote regions with inadequate medical resources or encounter financial and cultural obstacles to obtaining quality healthcare.

A significant proportion (75%) of women reported feeling a heightened sense of social involvement. This is a promising sign of empowerment, demonstrating that women are taking on greater roles in community decision-making, engaging in local governance, or becoming members of social organizations. The other 25% may still be limited by conventional standards, or may not have the confidence or opportunities to engage. The most significant affirmative reactions, with 84% of women agreeing that they or their families can now access quality education. This indicates effective educational outreach, scholarships, and awareness initiatives. The 16% who disagreed, a relatively small proportion, may indicate regions with inadequate educational infrastructure or teacher availability, or where families place other responsibilities above schooling.

As shown in Table 2, 79% of those surveyed stated that their expenditure on social causes like community events, ceremonies, or aiding others has risen. This implies an increase in disposable income for women and a heightened sense of community responsibility. It can also be motivated by an improved social standing and involvement. The 21% who replied negatively may still be facing financial constraints or concentrating exclusively on household needs. The area of basic needs represented the highest affirmative response, with 85% of women confirming an increase in spending. This indicates a better household income and enhanced living standards, allowing them to purchase better food, clothing, hygiene items, and other necessities. The 15% “No” response underscores that for some individuals; income levels are still inadequate to cover even basic needs.

The data indicate a distinct preference for sectors that are accessible, rely heavily on labour, and provide immediate job opportunities, like Construction and Apparel. Conversely, sectors that demand specialized skills, formal education, or are capital-intensive exhibit lower participation rates. Educators and policymakers must comprehend these trends in order to steer skill

development, training, and employment initiatives. By fostering vocational education and addressing skill gaps, it may be possible to achieve a more equitable distribution of employment across different sectors and to promote more balanced economic development.

From the above analysis, the data depict an encouraging view of women's advancement and their views on development. Positive responses are most pronounced in the domains of education, basic needs, and social involvement, suggesting that empowerment and welfare programs are having a tangible impact. The fact that a steady 25–33% of women indicate no progress in certain crucial domains underscores the persistence of gaps, especially concerning access to healthcare, job prospects, and sustainable income. In order to tackle these disparities, it is necessary to make targeted efforts to reach marginalized women, enhance infrastructure, and guarantee that the advantages of development are distributed equitably. To create inclusive and effective policies that guarantee all women benefit from social and economic progress, ongoing monitoring and feedback from women beneficiaries is essential.

7. CONCLUSION AND POLICY IMPLICATIONS

The empowerment of women is a multifaceted and dynamic process that encompasses economic, social, political, psychological, and legal dimensions. It is essential for attaining gender equality and sustainable development. Despite the considerable strides made in promoting women's rights and opportunities, challenges persist, especially regarding access to resources, legal protections, and equal involvement in political and economic processes. Tackling these challenges with thoroughgoing policies and measures can bring about transformative changes that empower women and, by extension, all of society.

In Keonjhar, initiatives such as Project Unnati have been launched to meet this aim. Project Unnati is an extensive initiative aimed at enhancing capabilities, leveraging social and economic development tactics to empower women. It focuses on areas such as livelihood, education, health, nutrition, sanitation, cleanliness, and credit and savings. This initiative connects Self-Help Groups (SHGs) with banks and other organizations to provide financial assistance and training. It has been implemented in Keonjhar and several other districts.

The initiative has been vital in empowering women and enhancing their economic and social status by providing them access to employment and skill-development opportunities. To sum up, the implementation of DDU-GKY in Keonjhar district has ignited rural development, focusing particularly on empowering women. By providing job opportunities and skill development, the initiative has enhanced the socioeconomic status of women and adolescents in the area.

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SOCIAL SUSTAINABILITY IN ODISHA WITH REFERENCE TO JAJPUR DISTRICT

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ABSTRACT

Social sustainability in Odisha is an essential component of the state's overall development strategy, aiming to ensure an equitable and inclusive society. The state, home to diverse populations, including urban, rural, and tribal communities, faces unique challenges in fostering social sustainability across its various districts. This paper explores the dimensions of social sustainability in Odisha, with specific attention to key districts such as Jajpur. The study examines socio-economic factors such as poverty, education, healthcare, gender equality, and community development, as well as the impact of industrialization on tribal and rural populations. While some districts have experienced positive economic growth, disparities in access to basic services and resources persist, particularly in remote areas. The role of government programs like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Mission Shakti, and Public Distribution System (PDS) are analyzed in improving social outcomes. The paper emphasizes the need for sustainable development strategies that promote inclusive growth and address the needs of marginalized groups. Data analysis from district-level surveys, government reports, and academic studies provides insights into the current status of social sustainability in Odisha.

Keywords: Social Sustainability, Inclusive Society, Odisha, MGNREGA.

1. INTRODUCTION

Odisha is concerned; the dwelling social issues include massive malnutrition and migration fueled by food insecurity, poverty, and natural disasters. Being a coastal state, natural disasters inevitably influence lifestyle changes every year, leading to thousands of migrants seeking a survivable lifestyle. This, in turn, converts to poor health not only of children but also of adults. At this juncture, Odisha is actively pursuing social sustainability as a key development path, focusing on the Sustainable Development Goals (SDGs) and integrating them into its budget planning and governance, aiming for a “New Odisha” through proactive measures and citizen-centric governance. Odisha adopted the SDG Monitoring Framework in 2019 to address complex economic, social, and environmental challenges, particularly in light of its geographic vulnerability and the impact of the COVID-19 pandemic. The state has implemented SDG budgeting to ensure that its schemes and programs align with the SDGs, rationalizing and reinvigorating its development approach. The state aims to integrate the SDGs into its overall budget planning process, making it more comprehensive and dynamic. Odisha’s flagship programs like Biju Swasthya Kalyan Yojana, SAMPURNA, KALIA, MAMATA, Mission Shakti, and BASUDHA directly address challenges highlighted by the SDGs. In the context of Jajpur district in Odisha, a state located in eastern India, social sustainability plays a pivotal role in fostering inclusive growth, addressing poverty, improving access to education and healthcare, and promoting social equity.

Jajpur is a district rich in both cultural heritage and natural resources, yet it faces several challenges that impact its social sustainability. The district, with its significant agricultural base and the growing industrial presence, is a microcosm of rural-urban dynamics in India. While development has improved living conditions in certain areas, issues like inadequate healthcare, access to quality education, gender inequality, and social exclusion of marginalized communities persist. Additionally, industrialization in the region has led to environmental and social challenges, further complicating efforts to achieve holistic and sustainable growth.

This paper explores social sustainability in Jajpur with a particular focus on its implications for the district’s residents, particularly in terms of education, healthcare, gender equality, social inclusion, and local cultural practices. By examining both the opportunities and challenges within Jajpur, the paper seeks to provide insights into how local governance, community initiatives, and government schemes can help create a socially sustainable future for all residents of this diverse and dynamic region.

2. REVIEW OF LITERATURE

The literature on social sustainability in Jajpur highlights the district’s progress and persistent challenges. Factors such as access to education, healthcare, gender equality, and social inclusion are key drivers of sustainability. However,

industrialization, caste-based inequalities, and gender disparities continue to hinder the district's development. Further research is needed to explore the effectiveness of existing policies and the role of community-driven approaches in achieving social sustainability in Jajpur, Odisha.

Several studies have explored the concept of social sustainability at the state level in Odisha. According to Pattnaik (2015), Odisha, as a predominantly rural state with pockets of urban growth, faces unique challenges in achieving social sustainability. The state has made strides in improving literacy rates, healthcare access, and rural infrastructure, but issues of poverty, caste-based discrimination, and gender inequality remain persistent barriers to true social equity.

Pradhan & Mishra (2017) highlight that the state has been slow to integrate sustainable development principles into its social policies. This is particularly evident in rural areas like Jajpur, where access to education, quality healthcare, and economic opportunities remain unevenly distributed.

Jajpur district is known for its cultural heritage and agricultural economy, but it is also undergoing rapid industrialization, particularly in mining and steel production. According to Patra et al. (2020), industrial growth in Jajpur has contributed to the economic growth of the region but also led to environmental degradation, which has social implications. The displacement of communities due to industrial expansion, especially from tribal and marginalized groups, poses a significant challenge for maintaining social sustainability. This has resulted in a need for careful policy planning that balances economic growth with the protection of vulnerable communities.

Sahoo & Das (2016) underscore that social sustainability in Jajpur depends on addressing the dual concerns of industrialization and agriculture. While agriculture continues to be the primary source of livelihood for many residents, the shift toward industries has created a divide between rural and urban populations. Rural areas, particularly those on the outskirts of industrial zones, struggle with inadequate healthcare, sanitation, and education, which undermine long-term social sustainability.

Das (2018) found that education is a critical area influencing social sustainability in Jajpur. While literacy rates have improved, particularly among young girls, disparities in access to education remain. According to Patra & Nayak (2019), the dropout rates are high in rural areas due to a variety of factors, including poverty, lack of transportation, and a focus on traditional agricultural work. In contrast, urban centers in Jajpur have better access to educational facilities, creating significant inequality between rural and urban populations.

Additionally, skill development programs have gained traction in the district, with both government and non-governmental organizations focusing on enhancing vocational skills. Das & Mohapatra (2020) argue that the skill gap, particularly among women and marginalized communities, is a major barrier to achieving sustainable livelihoods and, by extension, social sustainability in Jajpur.

Healthcare access is another critical factor in social sustainability. According to Sahoo (2017), rural areas in Jajpur face challenges related to inadequate healthcare infrastructure, a shortage of medical professionals, and high levels of malnutrition. The lack of basic healthcare facilities leads to poor maternal and child health outcomes, contributing to the perpetuation of poverty and social inequality.

Furthermore, Mishra & Patel (2020) emphasize the role of public health programs in improving outcomes in Jajpur, especially for vulnerable communities. Government initiatives like the National Health Mission (NHM) and the Pradhan Mantri Jan Arogya Yojana (PMJAY) have made some headway in providing healthcare, but their impact has been limited in rural and tribal regions, where accessibility remains a major challenge.

Gender equality is an area of focus for social sustainability in Jajpur. Studies like those by Panda & Kumar (2018) highlight the challenges women face in rural Odisha, including limited access to education, healthcare, and economic opportunities. While women in the district are involved in agricultural work, their contributions are often undervalued, and they have limited access to decision-making processes at the household and community levels.

Moreover, Pradhan (2017) found that gender-based violence and child marriage are prevalent in certain pockets of Jajpur, which further undermine women's ability to participate fully in social and economic life. Programs aimed at empowering women through self-help groups (SHGs) and entrepreneurship training have been relatively successful in some areas, but broader systemic changes are necessary to achieve true gender equality.

Social inclusion of marginalized communities, particularly Scheduled Castes (SCs), Scheduled Tribes (STs), and Other Backward Classes (OBCs), is a crucial issue in Jajpur. According to Das & Sahoo (2019), the social fabric of the district is heavily influenced by caste-based inequalities, with tribal communities often facing social exclusion and limited access to resources.

Studies by Chakraborty & Mishra (2021) suggest that while government programs have tried to address some of these disparities through affirmative action and social welfare schemes, the social stigmas associated with caste and tribal status still hinder meaningful progress in achieving social sustainability.

Government policies and initiatives aimed at improving social sustainability in Jajpur have had mixed results. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the Pradhan Mantri Awas Yojana (PMAY) have played roles in improving the economic and housing conditions of many rural residents, but challenges remain in terms of equitable implementation.

Non-governmental organizations (NGOs), such as Barefoot College and Action Aid, have been instrumental in promoting social sustainability through education, healthcare, and women's empowerment programs. Rath & Panda

(2021) argue that while NGOs have made significant contributions, their impact is often constrained by limited funding and the absence of a coherent, long-term policy framework at the state level.

Overall, literature on social sustainability in Jajpur suggests that while the district faces substantial challenges, including industrialization, poverty, inequality, and social exclusion, there are opportunities for improvement. Collaborative efforts between government, NGOs, and local communities are key to addressing the complex issues of social sustainability. Sahoo & Patnaik (2020) conclude that integrating social sustainability into local development plans and policies, alongside ensuring environmental sustainability and economic opportunities, is critical for Jajpur's long-term prosperity.

3. OBJECTIVES

- i. **To identify social challenges:** Investigate the key social issues facing the community, such as poverty, education, healthcare, gender equality, and social exclusion.
- ii. **To evaluate the impact of economic activities on social sustainability:** Examine the relationship between local industries (like mining, agriculture, etc.) and their effects on social stability, equity, and community welfare.
- iii. **To assess gender equity and social inclusion:** Examine the status of women, marginalized groups, and their access to resources, opportunities, and decision-making processes.
- iv. **To evaluate education and skill development initiatives:** Assess the availability and accessibility of education and skill-building opportunities for the youth, women, and other vulnerable groups.
- v. **To examine the impact of climate change and natural disasters:** Assess how environmental issues (like floods, droughts, or deforestation) impact social sustainability in the region.

4. METHODOLOGY

Key social sustainability indicators to consider include:

- **Education Access and Literacy Rate:** This could be measured by the literacy rate and the percentage of the population with access to primary, secondary, and higher education.
- **Health and Well-being:** Metrics might include child mortality rate, maternal health indicators, access to healthcare, and mental health indicators.
- **Income and Employment:** Employment rate, poverty rate, average household income, and income distribution (Gini coefficient).
- **Social Equity:** Distribution of resources and access across different social groups (e.g., Scheduled Tribes (STs), Scheduled Castes (SCs), backward classes, and women).

- **Housing and Sanitation:** Access to basic infrastructure like sanitation, drinking water, housing quality, and electricity.
- **Community Participation and Social Capital:** Metrics such as the level of participation in local governance, the number of community-based organizations, and social trust.

4.1. Variables for the Statistical Model

We will need to identify both dependent and independent variables for the model:

i. Dependent Variable (Y)

- A composite **Social Sustainability Index (SSI)** or a selected outcome variable such as “health and well-being”, “educational access”, or “income equality.”

ii. Independent Variables (X)

- **Education-related Variables:** Literacy rate, school enrollment rate, average years of schooling, and access to education.
- **Health-related Variables:** Child mortality rate, maternal mortality, vaccination rate, number of healthcare facilities, and access to sanitation.
- **Economic Variables:** Average income, poverty rate, employment rate, Gini coefficient (income inequality).
- **Demographic Variables:** Percentage of ST/SC population, age distribution, gender ratio.
- **Social Infrastructure Variables:** Percentage of households with access to clean water, sanitation facilities, and housing quality.
- **Social Capital:** Number of NGOs, community participation rate, voter turnout.

4.2 Statistical Model

If the dependent variable is continuous (e.g., Social Sustainability Index or Income Distribution), we can use multiple linear regression to identify relationships.

$$SSI_i = \beta_0 + \beta_1 \times EDUCATION\ Rate_i + \beta_2 \times HEALTH\ Access_i + \beta_3 \times Employment\ Rate_i + \dots + \varepsilon_i$$

Where:

- SSI_i is the Social Sustainability Index for the district (in this case, Jaipur).
- β_0 is the intercept term.
- $\beta_1, \beta_2, \beta_3$ are the coefficients for each independent variable.
- ε_i is the error term.

This model would provide insights into how education, health, and economic factors influence social sustainability in Jajpur.

To create a **simple mathematical model of social sustainability for Jajpur district**, we need to define the key components that contribute to social sustainability and express their relationships in a way that allows for prediction and analysis. Social sustainability typically involves factors like education, healthcare, economic equity, social participation, and governance.

In this model, we can aim to combine these factors into an index or score that represents the overall level of social sustainability in the district.

$$SSI = \alpha_1 \cdot SE + \alpha_2 \cdot ED + \alpha_3 \cdot HC + \alpha_4 \cdot CE + \alpha_5 \cdot EO$$

Where:

- **SSI** = Social Sustainability Index (dependent variable)
- **SE** = Social Equity (e.g., 1 - Gini coefficient, or % of people below poverty line)
- **ED** = Education (e.g., literacy rate, school enrollment rate)
- **HC** = Healthcare (e.g., life expectancy, access to healthcare facilities)
- **CE** = Community Engagement (e.g., voter turnout, number of community organizations)
- **EO** = Economic Opportunity (e.g., employment rate, access to microfinance programs)

And α_1 , α_2 , α_3 , α_4 , and α_5 are the weights that determine the importance of each factor in contributing to the overall social sustainability of the district. These weights can be adjusted based on local priorities and expert input.

4.3 Calculating the Social Sustainability Index (SSI)

Once the model is developed and the data for each of the variables (SE, ED, HC, CE, and EO) is gathered, the Social Sustainability Index (SSI) can be calculated by plugging the values of these variables into the formula.

For example, if:

- **SE = 0.7** (good social equity, low poverty and inequality)
- **ED = 0.7** (high literacy and enrollment rates)
- **HC = 0.65** (high life expectancy, good healthcare access)
- **CE = 0.6** (moderate community engagement, good voter turnout)
- **EO = 0.65** (moderate employment rate)

Then:

$$SSI = (0.2 \times 0.7) + (0.3 \times 0.7) + (0.2 \times 0.65) + (0.15 \times 0.6) + (0.15 \times 0.65)$$

So, the Social Sustainability Index for Jajpur would be 0.6675 on a scale from 0 to 1, where 1 indicates the moderate level of social sustainability.

5. DATA REPRESENTATION AND ANALYSIS

Sources for data collection could include:

- Government reports (e.g., Census data, District Human Development Reports).
- Surveys and field data from local institutions.
- Reports from NGOs or local community-based organizations.
- Data from government health, education, and social welfare departments.

Table 1: Demographic Indicators

Demographic Indicator	Value
Total Population	1,669,000 (Approx. 1.67 million)
Male Population	838,000 (50.2% of total)
Female Population	831,000 (49.8% of total)
Population Density	501 persons per km ²
Rural Population	88%
Urban Population	12%
Sex Ratio	991 females per 1,000 males
Literacy Rate	74%
Male Literacy Rate	85%
Female Literacy Rate	63%
Children (0-6 years) Population	12-15% of total population
Sex Ratio of Children (0-6 years)	939 females per 1,000 males
Scheduled Castes (SCs)	17-18% of total population
Scheduled Tribes (STs)	22-23% of total population
Religious Distribution (Hindu)	95%
Religious Distribution (Muslim)	2-3%
Religious Distribution (Others)	<1% (Christianity, Sikhism, etc.)
Main Workers	Predominantly agriculture-based
Marginal Workers	Seasonal or non-agricultural work
Total Households	~400,000
Average Household Size	4-5 members per household
Urban Centers	Jajpur Town, Kalinga Nagar, Vyas Nagar

This data is based on the 2011 Census, which is the most recent comprehensive demographic data available for India. For more up-to-date statistics, especially if you're looking for 2021 Census data or more specific data, you might need to consult the latest reports from the Office of the Registrar General and Census Commissioner, India or local government publications.

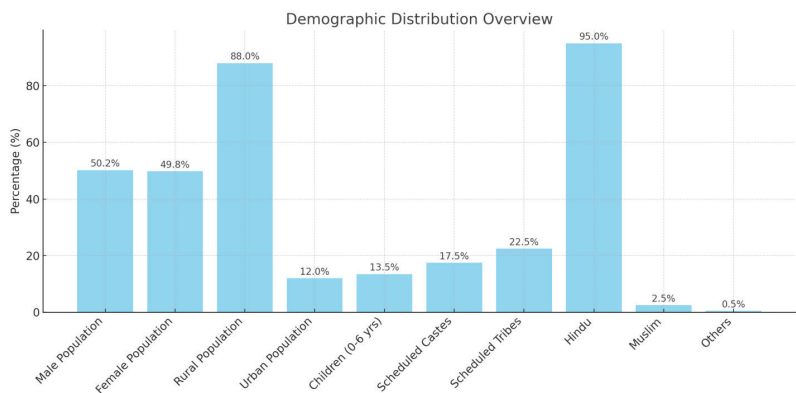


Figure 1: Demographic Distribution Overview

Jajpur District in Odisha, India, has a diverse economy with significant contributions from the agriculture and mining sectors. Below is a summary of key industries:

5.1 Agriculture

Agriculture is a dominant activity in Jajpur, with fertile loamy soil and a variety of crops cultivated.

Table 2: Crop Details in Jajpur

Crop	Season	Cultivated Area (hectares)
Paddy	Kharif	111,100
Groundnut	Rabi	30,000 to 35,000
Vegetables	Rabi	Significant cultivation in Rasulpur, Barachana, and Jajpur blocks
Sugarcane	Rabi	1,500

Source: <https://jajpur.odisha.gov.in/departments/agriculture>

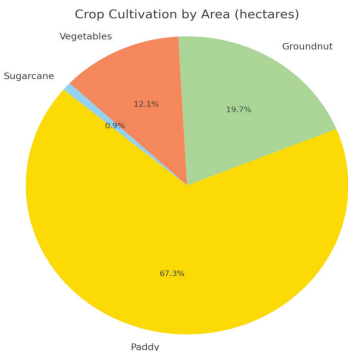


Figure 2: Crop Cultivation by Area

Source: Agriculture | Jajpur

5.2 Mining

The district is rich in mineral resources, particularly chromite, iron ore, and quartzite.

Table 3: Mining Details

Mineral	Number of Working Mines	Area Covered (hectares)	Workers Employed	Annual Output (metric tons)
Chromite	12	4,193	3,510	2,501,756
Iron Ore	1	190	984	861,074
Quartzite	2	87	23	40,965

Source: District Industries Centre, Jagatpur

5.3 Industrial Enterprises

Jajpur hosts several large-scale industries, primarily in the steel and ferroalloy sectors.

Table 4: Industrial Enterprises Details

Industry Name	Location	Product	Annual Production Capacity (metric tons)	Operational Status
Nilachal Ispat Nigam Ltd	Kalinganagar	Pig Iron	492,000	Operational
Tata Steel Ltd	Duburi	Steel	Not specified	Operational
Jindal Industries	Kalinganagar	Stainless Steel	1,600,000	Operational
VISA Steel	Jakhapura	Mild Steel	320,000	Operational
Rohit Ferro Tech Ltd	Kalinganagar	Ferro Alloys	80,000	Operational
K.J. Ispat Limited	Kalinganagar	Sponge Iron	30,000	Operational
IDCOL Ferrochrome Ltd	Jajpur Road	High Carbon Ferrochrome	18,000	Operational
Maithan Ispat Ltd	Kalinganagar	Sponge Iron	740,000	Operational
MESCO	Khurunti	Pig Iron	600,000	Operational
Dinabandhu Steel and Power	Kalinganagar	Steel	250,000	Operational

Source: District Industries Centre, Jagatpur

These sectors play a crucial role in the economic development of Jajpur District, providing employment opportunities and contributing to the region's industrial growth.

5.4 Poverty, Education, Healthcare, and Gender Equality Data for Jajpur District

Table 5: Socioeconomic Details of Jajpur

Indicator	Value
Poverty Rate	Approximately 32% of the population lives below the poverty line (based on Odisha's poverty data from planning and development reports).
Education	
Literacy Rate	74% (Overall)
Male Literacy Rate	85%
Female Literacy Rate	63%
School Enrollment Rate (Primary)	Around 90% (indicative, from state education reports)
Dropout Rate (Secondary)	High dropout rate, particularly for girls after the 8th grade (state average: around 25%)
Healthcare	
Infant Mortality Rate (IMR)	45 per 1,000 live births (approximate, based on state health data)
Maternal Mortality Ratio (MMR)	165 per 100,000 live births (approximate, based on state data)
Access to Healthcare Facilities	Poor in rural areas, with about 65% of villages lacking basic health infrastructure
Percentage of Population with Access to Clean Drinking Water	Approximately 85% (based on rural water supply data)
Percentage of Population with Access to Sanitation	Around 60% (state average for rural areas)
Gender Equality	
Female Workforce Participation	Around 25% (significantly lower than male participation)
Child Marriage Rate	Still prevalent, though declining (approximately 15% of women marry before 18)
Women in Decision-Making Roles	Low representation, especially in rural and tribal areas
Gender Parity in Education	Low, with fewer girls continuing education beyond secondary school, especially in rural areas
Access to Health Services for Women	Limited, especially for maternal healthcare and reproductive rights in rural areas
Access to Social Welfare Schemes	
Women's Empowerment Schemes	Active, but implementation can be uneven (e.g., Self-Help Groups (SHGs), Beti Bachao Beti Padhao Scheme, etc.)

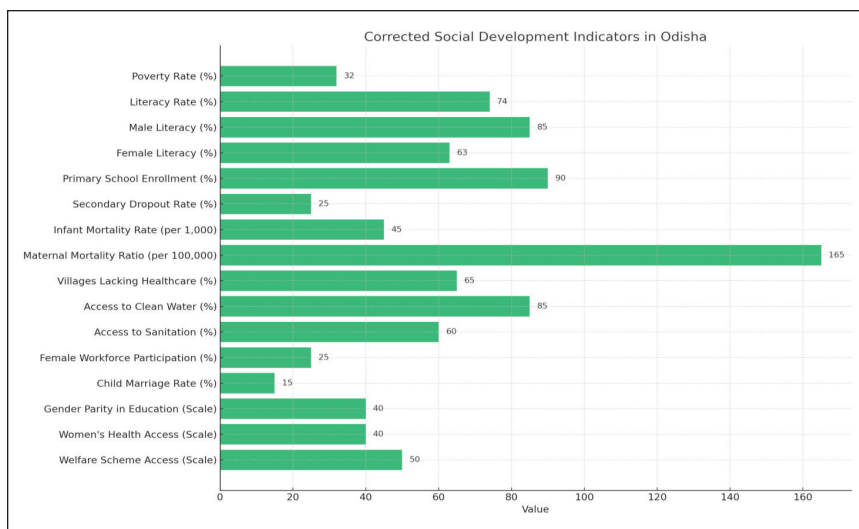


Figure 3: Corrected Social Development Indicators in Odisha

- **Poverty Rate:** The poverty rate is estimated based on general socioeconomic studies and government reports. Jajpur's rural areas face significant challenges related to poverty.
- **Education:** While enrollment rates in primary education are high, challenges in retention and quality of education persist. Dropout rates increase in secondary education, especially for girls, due to social and economic factors.
- **Healthcare:** There are challenges in accessing healthcare in rural areas of Jajpur. Health infrastructure is inadequate, leading to higher mortality rates compared to urban areas.
- **Gender Equality:** Although there have been improvements, gender inequality remains a significant issue in terms of access to education, employment, and healthcare, with girls and women facing more barriers.

For more precise data, especially on recent updates, reports from the Odisha State Government and the Ministry of Statistics and Programme Implementation would provide more specific figures.

Indicator	Details
Temperature Trends	While specific temperature data for Jajpur is limited, Odisha has observed an increase in average annual temperatures, with projections suggesting a rise of 1°C to 5°C by 2100.
Rainfall Patterns	Jajpur receives an average annual rainfall of approximately 1,014.5 mm. However, rainfall patterns have become more erratic, with a reduction in the monsoon season from the traditional 120 days to 60–70 days.

Cyclone Frequency	Jajpur, along with other districts in Odisha, is susceptible to cyclones. The frequency and intensity of cyclones have increased, with events like Cyclone Fani in 2019 and Cyclone Yaas in 2021 causing significant damage.
Flood Events	In August 2022, Odisha experienced floods affecting around one million people across 1,757 villages. While specific data for Jajpur is not detailed, neighbouring districts like Kendrapara and Puri were impacted, suggesting potential vulnerability in Jajpur as well.
Drought Incidence	Conversely, some regions in Odisha, including areas near Jajpur, have faced drought conditions due to altered rainfall patterns, affecting agriculture and water availability.

5.5 Observed Climate Anomalies

- **Rainfall Deviation:** On September 17, 2024, Jajpur experienced a rainfall deviation of 360%, indicating significantly higher-than-average rainfall on that day. Such anomalies contribute to flooding and agricultural challenges. |
- **Monsoon Variability:** The monsoon season has become less predictable, with a reduction in the number of rainy days and increased instances of heavy rainfall, leading to both floods and droughts. |

Implications

- **Agriculture:** Erratic rainfall and increased cyclone activity pose threats to crop yields and livestock, challenging the predominantly agrarian economy of Jajpur. |
- **Infrastructure:** Enhanced flood risks necessitate improved drainage systems and flood defenses to protect communities and infrastructure. |
- **Water Resources:** Altered rainfall patterns impact water availability, affecting both domestic use and irrigation. |
- **Disaster Preparedness:** The increasing frequency of extreme weather events underscores the need for robust disaster management strategies and early warning systems.

For more detailed and localized climate data, consulting the Odisha State Climate Change Action Plan and reports from the India Meteorological Department is recommended.

5.6 Skill Development Initiatives in Jajpur District

Institution/Organization	Program/Initiative	Details
Government Polytechnic, Jajpur	Stainless Steel Welding Course	In collaboration with Jindal Stainless Foundation, this program aims to train youths in stainless steel fabrication, enhancing employability in the steel industry.

Government Polytechnic, Jajpur	Proposed Skill Training Courses	Plans include courses such as Advanced Steel Welding, Modern Electrical Repairing, Auto CAD, among others, to equip students with industry-relevant skills.
Tata Steel Foundation	Multi Skill Development Centre (MSDC)	In partnership with the Odisha government, a center is being established in Jajpur to offer industry-specific training, focusing on enhancing employment prospects for youth in Danagadi and Sukinda blocks.
JSL Foundation and NIIT Foundation	Career Development Centre	Aimed at providing career-oriented training, this center focuses on enhancing employability through various skill development programs.
TP Northern Odisha Distribution Limited (TPNODL)	Skill Development Centers	TPNODL has inaugurated centers in Balasore and plans for additional centers in Mayurbhanj, Keonjhar, Bhadrak, and Jajpur districts, aiming to enhance skills of ITI and Diploma students, particularly in electrical trades.
ST & SC Development, Minorities & Backward Classes Welfare Department, Odisha	PRAYAS Scheme	This program provides skill development training to ST, SC, OBC, and Minority youth across Odisha, aiming to enhance employability and self-reliance.

These initiatives collectively aim to enhance the skill sets of the youth in Jajpur District, aligning with industry requirements and improving employment opportunities. For more detailed information on each program, including enrollment procedures and eligibility criteria, please refer to the respective official websites or contact the organizations directly.

6. CONCLUSION

The challenges faced in the district of Jajpur are multifaceted and demand strategic interventions. Unplanned development has had adverse effects on access to basic infrastructure and services, as well as transportation and mobility. The absence of structured infrastructure networks for water supply, sewerage, and storm drains poses a long-term risk of pollution, contamination of natural resources, seasonal flooding, and environmental damage.

Moreover, being a prominent center of industrial activity in the region, the district grapples with challenges related to over-extraction and competing demands for natural resources. This potential issue adds complexity to the development landscape. Despite the current population growth rate and urbanization levels in the district being below national averages according to the 2011 census, there is a pressing need to anticipate and accommodate a likely high urbanization rate in the near future within the framework of development

planning. Addressing these challenges requires a comprehensive and forward-thinking approach to ensure sustainable and resilient urban development.

7. POLICY IMPLICATIONS

- Assess the district's current level of social sustainability based on available data.
- Identify areas for improvement by seeing which factors (e.g., education, healthcare, etc.) have the lowest scores.
- Guide policymaking by focusing on the most critical areas that influence social sustainability. For example, if the Education (ED) score is low, policymakers might focus on improving school infrastructure, teacher training, or literacy programs.

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