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From the Desk of Managing Editor

Dear IJAR&D Readers,

Greetings for a Successful 2023,

We are glad to present seventeenth issue of IJAR&D which consists of 5 papers on various aspects namely Supply Chain Management, Case Study of Nagada Village, Digital Empowerment of Women, Inclusive Infrastructure of Digital Education and Multidimensional Poverty.

The joint paper of Prof. Sengupta and Mr. Amarjeet delves into the notion of behavioural supply chain management, scrutinizing the impact of human behaviour on the operations and outcomes of supply chain. This paper presents a comprehensive analysis of prominent behavioural theories and their relevance in the context of supply chain management.

Mr. Trilochan Sahoo's paper presents a critical study of Tribal population with special reference to Nagada village of Jajpur district, Odisha. As per the study, residents of Nagada are depending for their livelihood on daily labour and on forest. As the normal and plain road not available, there is a hilly and climbing road is available to reach to this village.

The joint paper of Prof. Suneel et al provides a comprehensive analysis of digital literacy programs aimed at enhancing digital awareness among rural women. Through a rigorous methodology, the review examines the effectiveness of these programs in improving digital skills, knowledge acquisition, and confidence levels among participants. It proposes programmatic interventions, such as infrastructure development and policy changes, to overcome these barriers and ensure equitable access to digital resources.

The joint paper of Dr. Amna Mirza and Akshitta Nagpal offers a commentary on transition towards technological advancements of 5G, 6G for an inclusive infrastructure of digital education. An inclusive approach is essential to ensure that these technological advancements benefit everyone, and global leadership is crucial to harness their potential.

Mr. Pradeep Kumar Panda's paper presents a comparative analysis of multidimensional poverty of Odisha among with neighbouring states and lowest MPI states. As per the paper, the state has been largely successful in multidimensional development and eliminating poverty at a faster level than nation.

We thank all the authors for their insightful papers which will certainly enrich our readers. We take this opportunity to thank all our reviewers for their structured efforts. We express our heartfelt thanks to all our journal subscribers and readers for their relentless support which provide our team motivation to bring out journal issue in desirable shape. We commit ourself to bring out high quality issues in future.

Best Wishes from IJAR&D !!!

Wishing you all a very happy, safe and fulfilling New Year 2023!!!

Thanking You

**Pradeep Kumar Panda
Managing Editor**

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Understanding the Role of Human Behavior in Supply Chain Operations: Exploring Behavioral Supply Chain Management

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Abstract

The management of supply chains is a multifaceted domain that necessitates the harmonization and amalgamation of diverse entities, procedures, and assets. Historically, the primary emphasis of supply chain management has been on enhancing operational efficiency and minimizing expenses. Recent studies have emphasised the significance of incorporating human behaviour into supply chain decision-making procedures. The present study delves into the notion of behavioural supply chain management, scrutinizing the impact of human behaviour on the operations and outcomes of supply chain. This paper presents a comprehensive analysis of prominent behavioural theories and their relevance in the context of supply chain management. Additionally, it examines the practical implications of these theories for professionals in the field and outlines potential avenues for future research.

Keywords: Behavioural Supply Chain Management, Human Behaviour, Supply Chain Operation, Trust.

1. Introduction:

Supply chain management has long been recognized as a critical function for organizations seeking to optimize operational efficiency and achieve competitive advantage. Traditionally, supply chain management has primarily focused on the optimization of processes, such as procurement, production, and distribution, through the application of analytical models and operational frameworks. However, recent research has shed light on the influential role of human behaviour in shaping supply chain operations and outcomes. This realization has given rise to the emerging field of behavioural supply chain management, which explores the cognitive, social, and psychological factors that drive decision-making, collaboration, and coordination among supply chain stakeholders (Tsanos et al., 2014).

The traditional methodology employed in supply chain management tends to neglect the behavioural factors that

exert a substantial influence on the efficacy and efficiency of supply chain activities. The integration of behavioural theories and concepts into supply chain practises can provide organisations with a more comprehensive comprehension of the determinants that impact human behaviour within the supply chain. This knowledge can be utilised to enhance decision-making, cultivate trust, foster collaboration, and ultimately augment the overall performance of the supply chain (Schorsch et al., 2017.).

Behavioural supply chain management recognizes that individuals and groups within the supply chain make decisions and engage in behaviour that can have substantial consequences for the entire network. Factors such as cognitive biases, risk preferences, social influence, trust, and ethical considerations can shape the outcomes of supply chain operations, influencing everything from supplier selection and relationship management to demand forecasting, inventory management, and risk mitigation. (Michael Knemeyer & Naylor, 2011).

Understanding the role of human behaviour in supply chain operations offers valuable insights for practitioners seeking to optimize supply chain performance. By taking into account the behavioural aspects of supply chain management, organizations can design more effective strategies and interventions that align with the preferences, motivations, and behaviours of supply chain stakeholders. This approach holds the potential to improve collaboration, enhance decision-making processes, reduce risks, increase resilience, and foster sustainable practices within the supply chain. (Balachandra et al., 2020.)

This research paper aims to explore and examine the concept of behavioural supply chain management, providing a comprehensive understanding of the role of human behaviour in supply chain operations. It will delve into various behavioural theories and concepts, their application in supply chain management, and their implications for practitioners. Additionally, the paper will highlight the challenges and limitations of incorporating behavioural aspects into supply chain management practices and suggest future research directions in this evolving field.

1.1 Background and Context

Supply chain management encompasses a network of organizations, processes, and activities that collaborate to deliver products or services to end customers. Traditionally, supply chain management has primarily focused on optimizing operational processes, such as procurement, production, and distribution, to achieve cost efficiencies and improve overall performance. However, research in recent years has highlighted the significant impact of human behaviour on supply chain operations and outcomes (DuHadway et al., 2019). Behavioural supply chain management recognises that the actions and choices of individuals and groups within the supply chain have the potential to impact the overall performance of the supply chain. The nascent discipline acknowledges the significance of comprehending the cognitive, social, and psychological determinants that propel decision-making, collaboration, and coordination among stakeholders in the supply chain. (Siemsen, 2022.)

By integrating behavioural theories and concepts into supply chain management practices, organizations can gain deeper insights into the drivers of human behaviour and leverage this knowledge to enhance decision-making, build trust, foster collaboration, and improve overall supply chain performance. (Overstreet et al., 2019)

1.2 Research Objectives

- To explore and analyze the various behavioural theories and concepts relevant to supply chain management.
- To understand the specific ways in which human behaviour influences key supply chain operations.
- To examine the impact of human behaviour on supply chain performance indicators.
- To identify the challenges and limitations associated with incorporating behavioural aspects into supply chain management practices.
- To investigate the potential interventions and strategies that can be employed to leverage behavioural insights for improving supply chain decision-making, collaboration, and coordination.
- To provide practical implications and recommendations for practitioners in terms of incorporating behavioural aspects.
- To suggest future research directions in the field of behavioural supply chain management.

The present study endeavours to augment the comprehension of the function of human behaviour in supply chain operations and furnish valuable perspectives for practitioners to optimise their supply chain management practises by addressing the research objectives. Additionally, the study will make a valuable contribution to the current corpus of knowledge in the realm of behavioural supply chain management, and establish a foundation for forthcoming research endeavours.

1.3 Research Questions

- How do various behavioural theories and concepts, such as rational choice theory, prospect theory, social influence theory, cognitive biases, decision-making under uncertainty, trust, and cooperation, apply to supply chain management?
- What are the specific ways in which human behaviour influences supplier selection and relationship management, demand forecasting and planning, inventory management, collaboration and coordination, risk management and resilience, and sustainable and ethical practices within the supply chain?
- How does human behaviour impact key supply chain performance indicators, such as operational efficiency, cost reduction, customer satisfaction, responsiveness, and sustainability?

- What are the challenges and limitations associated with incorporating behavioural aspects into supply chain management practices, including data availability and measurement, cultural and contextual factors, resistance to change, coordination and alignment issues, and ethical considerations?
- What interventions and strategies can be employed to leverage behavioural insights for improving supply chain decision-making, collaboration, and coordination?
- What are the practical implications and recommendations for practitioners in terms of incorporating behavioural aspects into supply chain strategies, enhancing collaboration and communication, developing trust and relationships, addressing cognitive biases and decision-making challenges, and designing effective incentive systems?
- What are the future research directions in the field of behavioural supply chain management, including the need for longitudinal studies, cross-cultural investigations, integration of behavioural and operational models, exploration of technology and automation, and examination of sustainability and social responsibility aspects?

2. Behavioural Theories and Concepts in Supply Chain Management:

2.1 Rational Choice Theory:

According to rational choice theory, individuals engage in decision-making processes by assessing the potential costs and benefits associated with various options in order to optimise their own self-interest. (Simon, 1957). In supply chain management, rational choice theory helps understand decision-making processes such as supplier selection, contract negotiation, and pricing (Mentzer et al., 2001). This statement offers valuable insights into the determinants that impact the process of decision-making, encompassing the assessment of expenses, advantages, and compromises.

2.2 Prospect Theory:

According to the theory of prospect developed by Kahneman and Tversky, individuals' decision-making process is influenced by their subjective assessment of gains and losses, rather than objective outcomes (Kahneman & Tversky, 1979). Prospect theory is a useful tool in elucidating risk attitudes and risk perception in the domain of supply chain management, specifically in the realms of demand forecasting, inventory management, and supply chain risk management (Li et

al., 2020). Comprehending the cognitive and behavioural processes involved in risk perception and response can facilitate the development of more efficacious risk reduction measures.

2.3 Social Influence Theory:

Social influence theory examines how individuals' behaviors and decision-making are influenced by their social interactions and networks (Friedkin, 1998). In supply chain management, social influence theory helps explain the dynamics of collaboration, information sharing, and cooperation among supply chain partners (Li et al., 2018). It sheds light on the role of trust, norms, and social relationships in shaping supply chain performance and coordination efforts.

2.4 Cognitive Biases:

Cognitive biases refer to systematic deviations from rationality in decision-making (Tversky & Kahneman, 1974). These biases can impact supply chain management decisions, including supplier evaluation, demand forecasting, and inventory management. Common cognitive biases in supply chain management include confirmation bias, anchoring bias, and overconfidence bias (Mason & Wouters, 2013). Recognizing and addressing these biases can lead to more accurate decision-making and improved supply chain performance.

2.5 Decision-Making Under Uncertainty:

Supply chain management often involves decision-making under uncertainty, where complete information is not available or outcomes are unpredictable (Ballas & Voß, 2005). Behavioral decision-making models, such as bounded rationality and heuristics, provide insights into how individuals and organizations make decisions when faced with uncertainty (Gaur et al., 2019). Understanding decision-making under uncertainty is crucial for supply chain managers when dealing with demand variability, supply disruptions, and market dynamics.

2.6 Trust and Cooperation in Supply Chains:

Trust and cooperation are essential for effective supply chain management. Trust enables collaboration, reduces transaction costs, and fosters long-term relationships (Dyer & Chu, 2003). Behavioral theories, such as social exchange theory and game theory, help understand the formation and maintenance of trust and cooperation among supply chain partners (Liu & Huo, 2014). These theories also address issues related to opportunistic behavior, moral hazard, and adverse selection, providing strategies to enhance trust and cooperation in supply chains.

3. Impact of Human Behaviour on Supply Chain Operations:

The subject of the influence of human behaviour on supply chain operations has gained significant significance within the realm of supply chain management. Although supply chains are commonly linked with the movement of commodities, amenities, and data, it is the individuals engaged in these operations who ultimately determine their triumph or downfall. Comprehending the significance of human behaviour in the context of supply chain operations is imperative for the purpose of enhancing efficiency, mitigating risks, and promoting cooperation among the members of the supply chain network.

Human behaviour encompasses a wide range of factors, including individual decision-making processes, cognitive biases, communication patterns, teamwork dynamics, and organizational culture. These factors significantly influence how individuals and organizations operate within the supply chain, impacting various aspects such as demand forecasting, procurement, production planning, inventory management, logistics, and customer service.

Recognizing the impact of human behaviour in supply chain operations enables organizations to address challenges and leverage opportunities more effectively. For example, understanding cognitive biases can help decision-makers recognize and mitigate their effects on decision-making processes, leading to more informed and rational choices. Similarly, understanding communication patterns and teamwork dynamics can improve collaboration and information sharing among supply chain partners, enhancing coordination and responsiveness.

Additionally, human behaviour plays a vital role in managing risks and disruptions within supply chains. By understanding how individuals perceive and respond to risks, organizations can design risk management strategies that align with human behaviour, promoting early detection, proactive mitigation, and effective recovery from disruptions.

Furthermore, organizational culture and leadership style significantly influence the behaviour of individuals within the supply chain. A culture that values transparency, trust, and collaboration fosters a positive working environment and encourages proactive engagement across the supply chain network.

3.1 Supplier Selection and Relationship Management:

Human behavior significantly influences supplier selection and relationship management in supply chains. Researchers have emphasized the importance

of trust, communication, and mutual understanding in building strong supplier relationships (Cousins et al., 2019). Factors such as cultural differences, negotiation tactics, and personal relationships can influence supplier selection decisions (Wu & Pagell, 2011). The behavior of supply chain managers and their ability to establish and maintain effective relationships with suppliers directly impact supply chain performance.

3.2 Demand Forecasting and Planning:

Human behavior plays a critical role in demand forecasting and planning processes. Behavioral factors, such as biases in judgment and decision-making, can affect the accuracy of demand forecasts (Chen et al., 2019). The behavior of sales personnel, their incentives, and their relationship with customers can influence demand information sharing and the reliability of demand forecasts (Choi et al., 2017). Understanding and accounting for these behavioral aspects are essential for improving demand forecasting accuracy and enhancing supply chain planning processes.

3.3 Inventory Management:

Human behavior has implications for inventory management practices. Cognitive biases, such as overconfidence and anchoring biases, can affect inventory decisions, leading to inefficient inventory levels (Xiao et al., 2014). The behavior of individuals involved in inventory management, including buyers, planners, and warehouse staff, influences inventory control practices and the accuracy of inventory records (Fugate et al., 2017). Addressing these behavioral factors can help optimize inventory levels, reduce costs, and improve customer service.

3.4 Collaboration and Coordination:

Behavioral aspects of collaboration and coordination impact supply chain performance. Trust, cooperation, and effective communication among supply chain partners are crucial for successful collaboration (Lambert et al., 2019). Behavioral factors, such as individual attitudes, power dynamics, and conflict resolution skills, influence collaboration and coordination efforts within supply chains (Barratt, 2004). Developing a collaborative culture and aligning incentives can promote positive behavioral outcomes, leading to improved supply chain coordination and performance.

3.5 Risk Management and Resilience:

Human behavior influences risk management and resilience in supply chains. Behavioral biases, such as optimism bias and loss aversion, can lead to inadequate risk assessment and mitigation (Manuj & Mentzer, 2008). The behavior of supply chain managers and employees in responding to disruptions, their decision-making under

pressure, and their ability to adapt to unexpected events impact supply chain resilience (Ponomarov & Holcomb, 2009). Addressing behavioral factors can enhance risk management practices and build resilient supply chains.

3.6 Sustainable and Ethical Practices:

Human behavior plays a vital role in driving sustainable and ethical practices in supply chains. The behavior of supply chain managers, employees, and consumers influences decisions related to environmental sustainability, social responsibility, and ethical sourcing (Seuring & Müller, 2008). Attitudes, values, and ethical considerations guide decision-making regarding sustainable procurement, responsible supplier selection, and green logistics (Linton et al., 2007). Fostering a culture of ethical behavior and sustainability consciousness can lead to environmentally and socially responsible supply chain practices.

4. Behavioural Interventions in Supply Chain Management:

4.1 Training and Education Programs:

Training and education programs are effective behavioral interventions in supply chain management. These programs aim to enhance employees' knowledge, skills, and decision-making abilities, leading to improved supply chain performance (Gunasekaran et al., 2018). Training programs can focus on specific areas such as demand forecasting, inventory management, or sustainable practices. For example, a study by Stock et al. (2018) found that training programs on sustainable supply chain practices positively influenced employees' attitudes and behaviors towards sustainability.

4.2 Incentive Systems and Contracts:

Incentive systems and contracts play a crucial role in shaping behavior in supply chain management. By aligning incentives with desired behaviors and outcomes, organizations can motivate supply chain partners to act in certain ways (Cachon & Lariviere, 2005). Incentives can be financial (e.g., performance-based bonuses) or non-financial (e.g., recognition and rewards). Contractual agreements can also specify behavioral expectations, such as information sharing, quality standards, and cooperation (Gattorna, 2010). These interventions help foster desired behaviors and promote collaboration among supply chain partners.

4.3 Information Sharing and Transparency:

Promoting information sharing and transparency is a behavioral intervention that improves supply chain performance. By providing access to accurate and timely information, organizations enable better decision-making and coordination (Choi et al., 2019). Information sharing

platforms, such as electronic data interchange (EDI) systems or cloud-based platforms, facilitate real-time exchange of information among supply chain partners (Lee et al., 2015). Increased transparency in supply chain operations enhances trust, reduces uncertainty, and fosters collaboration.

4.4 Decision Support Systems:

Decision support systems (DSS) are technological interventions that assist supply chain managers in making informed decisions. These systems use algorithms, analytics, and modeling techniques to analyze complex supply chain data and provide decision recommendations (Sahay et al., 2013). DSS can support various supply chain activities, such as demand forecasting, inventory optimization, and transportation planning. By incorporating behavioral factors and cognitive biases into the decision-making process, DSS can help mitigate biases and improve decision quality (Kannan et al., 2018).

4.5 Collaboration and Communication Platforms:

Collaboration and communication platforms are behavioral interventions that enhance information exchange and coordination among supply chain partners. These platforms facilitate real-time communication, document sharing, and collaboration on joint projects (Hofmann et al., 2014). Examples include web-based portals, social media platforms, and project management software. By providing a centralized communication channel, these platforms improve collaboration, strengthen relationships, and enable faster decision-making (Lee et al., 2019).

5. Challenges and Limitations:

Challenges and limitations are inherent in implementing behavioural interventions in supply chain management. These challenges can impact the effectiveness and success of behavioural interventions. Here's an overview of some key challenges and limitations:

5.1 Data Availability and Measurement:

One of the challenges in implementing behavioral interventions in supply chain management is the availability and measurement of relevant data. Behavioral factors can be subjective and difficult to quantify (Fugate et al., 2019). Gathering accurate and comprehensive data on individual behaviors, decision-making processes, and their impact on supply chain outcomes can be challenging. Additionally, accessing real-time behavioral data from supply chain partners may require trust and information sharing agreements (Bode et al., 2011). Overcoming these data-related challenges is crucial for effectively implementing behavioral interventions.

5.2 Cultural and Contextual Factors:

Cultural and contextual factors pose challenges to behavioral interventions in supply chain management. Different cultural norms, values, and communication styles can influence how individuals behave in supply chains (Wieland & Handfield, 2013). Implementing behavioral interventions across diverse cultural settings requires considering these contextual factors. For example, the approach to incentive systems or communication platforms may need to be customized to align with the cultural norms and preferences of supply chain partners (Pagell & Wu, 2009). Understanding and adapting to cultural and contextual differences is vital for successful implementation.

5.3 Resistance to Change:

Resistance to change is a significant challenge when introducing behavioral interventions in supply chain management. People may resist changes in their routines, roles, or decision-making processes (Melnyk et al., 2019). This resistance can stem from fear of the unknown, concerns about job security, or skepticism about the effectiveness of the interventions (Pagell & Wu, 2009). To surmount opposition to change, it is necessary to employ proficient change management tactics, articulate the advantages in a lucid manner, and engage stakeholders in the development and execution of the intervention (Gunasekaran et al., 2018).

5.4 Coordination and Alignment Issues:

Coordinating and aligning the behaviors of multiple supply chain partners can be challenging. Supply chains involve multiple entities with different goals, priorities, and incentives (Li et al., 2018). Achieving behavioral alignment requires addressing conflicting interests, fostering trust, and establishing common goals (Gattorna, 2010). Coordination mechanisms such as collaborative planning, forecasting, and replenishment (CPFR) and shared performance metrics can help align behaviors and promote collaboration (Hofmann et al., 2014). However, ensuring coordination and alignment across the supply chain can be complex and require ongoing efforts.

5.5 Ethical Considerations:

Behavioral interventions in supply chain management raise ethical considerations. Incentive systems and contracts should be designed to avoid unethical behaviors or unintended consequences (Melnyk et al., 2019). For example, poorly designed incentive systems may lead to unethical practices such as gaming the system or neglecting long-term sustainability goals. Behavioral interventions should be guided by ethical principles and ensure that the interests of all stakeholders are taken into account (Carter & Rogers, 2008). Addressing ethical

considerations helps maintain trust, reputation, and long-term sustainability in supply chain relationships.

6. Implications for Practitioners:

Behavioural interventions in supply chain management have several implications for practitioners. By considering these implications, organizations can effectively leverage behavioural insights to improve supply chain operations. Here's an overview of the implications for practitioners:

6.1 Incorporating Behavioural Insights into Supply Chain Strategies:

Practitioners should recognize the importance of incorporating behavioural insights into their supply chain strategies. This involves understanding the behavioural dynamics that impact supply chain performance and integrating behavioural considerations into decision-making processes and strategic planning. By aligning strategies with human behaviour, organizations can enhance their ability to anticipate and respond to market dynamics effectively.

6.2 Enhancing Collaboration and Communication:

Behavioural interventions emphasize the significance of collaboration and communication among supply chain partners. Practitioners should focus on fostering an open and transparent communication culture, promoting knowledge sharing, and facilitating effective collaboration platforms. This can enhance information flow, coordination, and problem-solving capabilities, leading to improved supply chain performance and responsiveness.

6.3 Developing Trust and Relationships:

Building trust and strong relationships among supply chain participants is critical for successful behavioural interventions. Practitioners should invest in developing trust through reliable and consistent actions, maintaining open lines of communication, and demonstrating commitment to shared goals. Strong relationships contribute to effective collaboration, information sharing, and a willingness to adopt behavioural changes across the supply chain.

6.4 Addressing Cognitive Biases and Decision-Making Challenges:

Practitioners should actively address cognitive biases and decision-making challenges within the supply chain. This can involve providing training and education on cognitive biases, promoting awareness and recognition of biases, and implementing decision support systems to counteract biased decision-making. By fostering a more rational decision-making environment, practitioners can mitigate risks and enhance supply chain performance.

6.5 Designing Effective Incentive Systems:

Incentive systems play a crucial role in driving desired behaviours within the supply chain. Practitioners should design incentive systems that align with behavioural goals, promote collaboration, and reward behaviours that contribute to supply chain optimization. By linking incentives to behavioural targets, practitioners can motivate participants and reinforce behaviours that enhance performance and competitiveness.

By considering these implications, practitioners can harness the power of behavioural interventions to optimize supply chain operations. Incorporating behavioural insights into strategies, enhancing collaboration and communication, building trust, addressing cognitive biases, and designing effective incentive systems can lead to improved supply chain performance, enhanced decision-making, and stronger relationships among supply chain partners.

7. Future Research Directions:

Future research directions in the field of behavioural supply chain management can further advance our understanding of human behaviour's impact on supply chain operations. Here are some potential research areas for exploration:

7.1 Longitudinal Studies and Experimental Research:

Conducting longitudinal studies can provide insights into the long-term effects of behavioural interventions on supply chain performance. Experimental research can help test the effectiveness of specific behavioural interventions and evaluate their impact on decision-making, collaboration, and overall supply chain outcomes.

7.2 Cross-Cultural Studies:

Investigating the influence of cultural factors on behavioural dynamics within supply chains is essential for understanding how behaviours vary across different cultural contexts. Cross-cultural studies can identify cultural drivers of behaviour, explore cultural differences in decision-making processes, and inform the design of culturally sensitive behavioural interventions.

7.3 Integration of Behavioural and Operational Models:

Integrating behavioural theories and models with operational models can offer a comprehensive understanding of supply chain dynamics. Future research can explore how behavioural factors interact with operational variables such as inventory management, demand forecasting, and logistics decision-making, leading to more accurate and effective models for supply chain optimization.

7.4 Technology and Automation in Behavioural Supply Chain Management:

With advancements in technology and automation, future research can explore the role of digital platforms, artificial intelligence, and machine learning in supporting and augmenting behavioural interventions. This includes investigating how technology can facilitate communication, decision-making, and behaviour monitoring in supply chain contexts.

7.5 Sustainability and Social Responsibility:

Examining the intersection of behavioural supply chain management with sustainability and social responsibility can provide valuable insights. Future research can explore how behavioural interventions can promote sustainable practices, ethical decision-making, and responsible behaviours across the supply chain, leading to environmentally and socially responsible outcomes.

By focusing on these future research directions, scholars can contribute to the evolution of behavioural supply chain management as a field. Longitudinal studies, cross-cultural investigations, integration of behavioural and operational models, exploration of technology's role, and sustainability considerations can deepen our understanding of the complex interplay between human behaviour and supply chain operations. Such research can provide practical insights for practitioners and contribute to the development of effective strategies and interventions in managing supply chains.

8. Conclusion:

8.1 Summary of Key Findings:

The study on behavioural interventions in supply chain management has shed light on the significant role of human behaviour in shaping supply chain operations. It has highlighted various behavioural theories, such as rational choice theory, prospect theory, social influence theory, and cognitive biases, and their implications for decision-making, collaboration, and performance within the supply chain. Additionally, the study has explored the importance of trust, transparency, and communication in facilitating behavioural interventions and improving supply chain outcomes.

8.2 Practical Implications:

The findings of this research have practical implications for supply chain practitioners. Incorporating behavioural insights into supply chain strategies can lead to better decision-making, enhanced collaboration, and improved supply chain performance. Practitioners can leverage tools such as training and education programs, incentive systems, and technology platforms to support behavioural interventions and foster desired behaviours among supply chain participants.

8.3 Contribution to the Field:

This research has made a valuable contribution to the field of supply chain management by emphasizing the significance of human behaviour and its impact on supply chain operations. It has provided a comprehensive overview of various behavioural theories and their application in the supply chain context. By highlighting the challenges, limitations, and implications of behavioural interventions, this research has created a foundation for future studies and practical implementations.

8.4 Recommendations for Future Practice and Research:

To further advance the field of behavioural supply chain management, future practitioners and researchers should consider several recommendations. First, they should focus on longitudinal studies and experimental research to better understand the long-term effects of behavioural interventions and test their effectiveness. Additionally, cross-cultural studies can provide insights into how cultural factors influence behaviours in different supply chain contexts. Integrating behavioural and operational models, exploring technology's role, and examining sustainability and social responsibility aspects are also important avenues for future research and practice.

In conclusion, the study on behavioural interventions in supply chain management has demonstrated the significance of human behaviour in shaping supply chain operations. By understanding and leveraging behavioural insights, practitioners can design interventions and strategies that lead to improved decision-making, collaboration, and overall supply chain performance. Future research should continue to explore and expand upon these findings, enabling the field to evolve and contribute to more effective and sustainable supply chain management practices.

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A Critical Study of Tribal Population : With Special Reference to Nagada Village of Jajpur District

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Abstract

Nagada is a small village discovered in 2016 which is situated in Sukinda block of Jajpur district of Odisha. This is a tribal village. Basically the Juanga Communities are residing in this village. This village is situated in the hill top. After intervention of the Local Administration, the communication and livelihood standard have been increased. Before discover of this village , the people of this villagers are eating only Rice with salt. Eating of vegetables other curry with their rice was a dream. But now this has been changed a lot. People are depending for their livelihood on daily labor and on forest. As the normal and plain road not available, there is a hilly and climbing road is available to reach to this village. In the rainy season its creates a huddle for all. Prior to discover there was no education facility, but after the discovery of this village two schools have been established in this village.

Keywords : Education, Juanga Communities, Local Administration, livelihood, Tribal.

I Introduction

Nagada is a small village discovered in 2016 which is situated in Sukinda block of Jajpur district of Odisha. This is a tribal village. The said village situated fifty four Kilo Meters towards west part from the district head quarters of Jajpur district of Odisha. Nagada is surrounded by four Tahasils that is danagadi Tehsil of Danagadi block is situated from the East side , Bhuban Tehsil of Dhenkanal district is situated from west side, Byasanagar of (Jajpur district) Tehsil is situated from the East side of the Nagada village and the Gondia Tehsil is situated from the south side of this village.

NAGADA was a village without either any knowledge of district administration nor the state Government. Nobody is aware that such types of village will be possible in such a hill top, where there was no road, no electrification, no water like this. They are were living in a marginalized and very poor life. They were not able to how to survive. First time this NAGADA village was discovered in the year 2016. After this the State Government as well as the District Administration was

prepared to supply every support to these villagers. But till date they are ling as they were.

II. Review of Literature:

T. BRAHMANANDAM & T. BOSU BABU(2016) in their paper they have suggested that the Inclusion of local culture, folklore, and history to the curriculum can help building confidence among the tribal children, and this approach may help in increasing their enrolment and retention at school since music and dance are the essential aspects of their cultural life. Further they have suggested that the tribal literature and ethnology constitute the invaluable indigenous knowledge. It should be documented, researched, and promoted in a special way and also the tribal history should be teaches to the tribal people in great extent. They have also marked that there is a remarkable absence of quality education both in secondary and higher secondary schools in tribal areas. ¹

K. Sahu(2014), in her paper has identify that tribal communities are facing different types problem in their day to day life like language for proper communication,

attitude of the parents, lack of proper monitoring and lack of local as well as community teachers with respect to tribal areas, economic condition of the tribal people. Keeping in view this problem she suggested that extensive literacy campaign may be adopted and also the attitude of the tribal parents should have to improve through proper counseling and guidance. Different scholarship for tribal community and special school or residential school should be provided to such people to improve their standard of living. Smt Sahu has also suggested that local as well as female teachers and special study material for tribal community should have to be provided to the tribal areas. Moreover she has also suggested that the social security for the students especially for the adolescent girls should be given and proper monitoring facilities should be extended to such areas for proper implementation of the Plan and Programmes.²

Dr. Jayanta Kumar Nayak and Rajeswar Maharana (2017), in their article they have identify that the children are the main source of income, it means that they are the asset for the family. So that the dropout rate and accessible for schooling facilities to such people are very negligent. So they have suggested different parameter to overcome the problems faced by such tribal group. The major suggestion are to provide proper schooling facility with some special curriculum facilities to such children. The tribal life culture should be given to the tribal people..³

Alok Ranjan Behera and Subasini Maharana (2018) in their paper they have analyses that the dropout rate at Class I and Class X is 77%. According to them the main problems in tribal education in Odisha are, Poverty, mental attitude, lack of schooling facilities available in the local areas, lack of subject specific teachers, some environmental problem and lack of monitoring facilities etc. They have also elaborated the Government initiatives for improvement of the facilities available for tribal communities.⁴

Dr G.Anbuselvi and P. John Leeson (2015) have vividly discussed regarding student assessment in his paper and they have analyzed that the attitude of the other students, social factor, lack of interest of formal education are the most reliable and major factor which are affecting to the tribal education. They have suggested that Vocational Education, Residential facilities with all amenities should provide to teachers and other staffs, High level of monitoring facilities for checking the teaching methodology should be provided such tribal people.⁵

Dr. Jayanta Kumar Nayak and Sili Rout (2017) they have analyzed different challenges faced by the tribal people like Parental attitude on Male and Female Education,

Infrastructural facilities, Toilet and Water Facilities, Classroom and Teaching Facilities etc.⁶

A.V. Yadappanavar (2003) He has mentioned that 80% heads of House Holds did not have any secondary source of subsidiary occupation. SO that they have much more depends upon one source for their livelihood. As a result which they faced so many problems in their day to day life.⁷

Sutapa Agrawal (2013), She has studied that tribal population in Odisha have a little health awareness and having no knowledge about to improve their standard of living. But they are fail to implement it in practical point of view.⁸

III. Research Problem

There are so many problems are associated with the tribal community. But in the present era female foeticide, lack of communication, residing in a separate habitation, lack of education in their local language are the major problems arises in the field life of tribal population. Further due to lack of education they could not have aware of different benefits provided by the Government, as a result of which they have deprived from it. And also child population has been increased in a great extent. As a result of which they couldn't have provided sufficient education to their children. Further different problems which are associated with different sectors of education and to diagnosis them in a spectacular method. Due to lack of education they have fails to maintain their day to day life, i.e. to aware about the health, law, facilities available by the Govt, how to accrue the income for the family etc. This is main problem faced by the tribal community. And also this may differ basing upon the geographical region.

As the Nagada village is situated in a Hill Top of the boarder of Jajpur district. Near about 300 hundred household is residing in this area. Further more than 30 this types of villages is situated in the Jajpur as well as in Keonjhar district. Although Government has been encouraging different developmental plan and programmes in order to develop their standard of living, but due to social awareness amongst them and due to lack of education and knowledge they have been repeatedly deprived from availing such benefits provided by the local government. One cannot said that it is happening due there in born problem, but some more focus should be given in order to mainstreaming them with comparison to the general people. Now a days Government has formulating different plans and kept different budgetary provision on the basis of community. The main objective of this is to strengthening their standard of life. But in many cases it could not reach to the ground level or to the appropriate beneficiaries. As a result of which the

low standard of people particularly the tribal peoples could not get hundred percent benefits from it. There are so many problems, challenges and difficulties are available in this route.

IV. Objective of the Study

In spite of the broader prospective and far reaching consequences, the outstanding objectives can be analyzed as follows

1. To find the trends of socio-economic status of tribal population in Nagada Village.
2. To investigate major problems and challenges faced by the tribal people in different sectors of their social life in Nagada Village.
3. To find out particular reasons behind the poor standard of living and low socio-economic life of tribal people of Odisha with special reference to Nagada Village of Jajpur district and its remedial measures.

V. Methodology

In order to analyze and find out the socio-economic status of tribal population of Nagada Village of Jajpur district of Odisha the following methodologies are to be applied.

1. Primary data are used through questionnaire.
2. Secondary data are used through government record.
3. Data analysis methods are to be applied for socio economic status of tribal population in Nagada village of Jajpur district.

Sampling design and collection of data

Multi stage and multiphase sampling technique shall be used. Simple random sampling shall be used to select the respondents. Primary data collection in proposed to be conducted through pre questionnaire. The respondents are to be interviewed personally. The questionnaire both open-ended and close-ended questions. The socio economic status of tribal population residing in Nagada Village shall be prepared with the help of district as well as block level officials of the Departments of State Government.

To collect secondary data, various officials records are to be used which includes publications of

- Report from various Government Department of Jajpur and Keonjhar District.
- Different Sample Survey Office of Odisha
- Data from SC & ST Development , Minorities and OBC Department of Odisha.

- Data from S & ME Department.
- Data from different Social Organizations/NGOs working for the tribal community.
- TATA Steel Ltd and OMC Ltd.

Statistical Tools used:

In order to find and analyze the socio-economic status of tribal population from different communities of Jajpur district , the statistical device used like correlation, regression, variance, co-efficient of variance and simple average. Graph, ration, percentage, bar diagram, secular trends, line graph shall be used.

Results And Discussion

Nagada is situated in Sukinda block of Jajpur district. Now a day a drastic change has been occurred in this village/hamlet situated in hilltop, home to vast mineral wealth.

The people depend on nearest Government Medical which is situated at Sukinda Block Head Quarter. Although the Mobile Health unit and AWW is follow up the medical checkup work but it is not sufficient.

Now a days communication facility has been well extended to this two villages. The electricity and mobile network also been available at this hill top which is a achievement of District Administration, Jajpur and Govt of Odisha as a whole.

Recent Development Status of Nagada Village :

Two schools named as Nagada PS and Guhiasala PS has been opened since 2016. Four Mini Anganawadi Centre were been constructed in this areas. out of four Mini AWW, two AWW has been constructed by the TATA Steel and another two AWW has been completed by the OMC Ltd. Till date 85 numbers of Mothers have been covered under MAMATA Yojana. The people were using the river water for their daily uses. Now the district administration has constructed six numbers of Tube well in this village. Out of total population 117 numbers of Job Card has been issued. They till depending the traditional ways for their daily livelihood. The following agricultural activities have been taken up by the District Administration , Jajpur District.

Interventions	Activities	Action Taken
Agricultural Production System	Farmer of Gramya Krushak Mancha	Nagada - 29 Farmers Guhiasala - 21 Farmers Tumuni - 23 Farmers

Promotion of Oil Seed (Mustard)	Awareness Campaign	Held at Nagada on Mustard Cultivation
	Demonstration	10 Acres
	Organization of Field Day	Organized in the month of March 2017

Coverage of Social Securities Activities :

No of Beneficiaries	Name of the Scheme	Village Covered	
		Nagada	Guhiasala
68	MBPGY (OAP)	16	12
	MBPY (WP)	6	6
	IGN (OAP)	5	9
	IGN (WP)	3	6
	IGN (DP)	0	5
TOTAL		30	38

Two Primary Schools named as Nagada Primary School and Guhiasala Primary School has been opened in the year 2016 and also these two schools have been upgraded to Upper Primary Schhol in the year 2022. The total students reading in these schools is 94

The Samagra Siksha Jajpur has been conform for the universalisation of elementary education in Jajpur district.

Demographic and education profile of Nagada and Guhiasal villages of Chingudipal Panchayat, Sukinda Block, Jajapur District, Odisha.

Sl No	Head	Nagada	Guhiasala
1	Number of households	55	32
2	Total Population	307	155
3	Total male Population	149	80
4	Total female population	158	75
5	Population below 6 years	95	29
6	Male population below 6 years	48	17
7	Female population below 6 years	47	12
8	ST Population	307	134
9	ST Males	149	69
10	ST Females	158	65
11	Literate Population	1	2
12	Literate Male	1	2
13	Literate Female	0	0

Source : Census 2011

Suggestion

Inspite of above development till now there are so many problems are available in NAGADA village. First and most important problem is that the communication facility should be improved during the rainy season. One Extended medical facility and 24x7 electric facility should be available in all hamlets of this village. Monthly monitoring by the district authority is to be taken up regarding the progress and development of this village. Although the drop out has not been found but this factor should not be omitted in the near future, a special attention should be given to regular checkup to reduce the dropout in this village. The basic livelihood problem should be solved and adequate employment facility should be created for the people of Nagada.

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Contamination in Sukinda Mining Region of Jajpur District, Odisha

Seasonal Assessment of Groundwater Quality in Terms of Heavy Metal

Contamination in Sukinda Mining Region of Jajpur District, Odisha

Seasonal Assessment of Groundwater Quality in Terms of Heavy Metal

Contamination in Sukinda Mining Region of Jajpur District, Odisha

Empowering Rural Women in the Digital Age: A Systematic Review

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Abstract

This systematic literature review provides a comprehensive analysis of digital literacy programs aimed at enhancing digital awareness among rural women. Through a rigorous methodology, the review examines the effectiveness of these programs in improving digital skills, knowledge acquisition, and confidence levels among participants. It identifies key strategies employed, including community engagement, tailored training approaches, and the use of technology resources. Additionally, the review addresses the challenges and barriers faced by rural women, such as limited access to technology and socio-economic constraints. It proposes programmatic interventions, such as infrastructure development and policy changes, to overcome these barriers and ensure equitable access to digital resources. The review also highlights gaps in the literature, emphasizing the need for further research on specific aspects of digital literacy programs for rural women. Overall, this review provides valuable insights for policymakers, practitioners, and researchers to design sustainable digital literacy initiatives that empower rural women and bridge the digital divide in rural communities.

Keywords: Digital literacy programs, Rural women, Effectiveness, Challenges and Systematic Review

1. Introduction

In today's digital age, digital literacy has become an essential skill for individuals to actively participate in various aspects of life, including education, employment, communication, and accessing information[1]. However, a significant digital divide persists, particularly among rural communities, where access to technology and digital resources is limited. Within these rural areas, women face additional challenges in acquiring digital literacy skills due to socio-economic factors, cultural

norms, and limited access to educational opportunities[2]. Empowering rural women through digital literacy programs has emerged as a crucial strategy to bridge this digital divide and enhance their digital awareness. These programs aim to equip rural women with the necessary knowledge, skills, and confidence to effectively navigate the digital landscape, access online resources, communicate digitally, and leverage digital tools for personal and professional development[3]. This systematic literature review aims to critically examine existing research on digital literacy programs

specifically targeted towards rural women. By analysing and synthesizing the findings of previous studies, this review seeks to shed light on the effectiveness of such programs in enhancing digital awareness among rural women.

The first objective of this review is to assess the effectiveness of digital literacy programs in improving digital awareness among rural women. By evaluating the outcomes and impacts of these programs, we aim to identify the extent to which they contribute to empowering rural women and closing the digital gap. Understanding the effectiveness of these programs will provide insights into the outcomes that expected and help in identifying areas for improvement. The second objective is to identify key strategies employed in successful digital literacy programs for empowering rural women. By examining the various components, approaches, and methodologies utilized in these programs, we identified the best practices and effective strategies that replicated or adapted in similar contexts. This knowledge will inform the design and implementation of future digital literacy initiatives, ensuring their relevance and effectiveness in empowering rural women. The third objective is to address the challenges faced by rural women in acquiring digital literacy skills and propose program solutions to overcome these barriers. Rural areas often lack adequate infrastructure, affordable internet connectivity, and digital resources, making it difficult for women in these regions to access and utilize technology. By examining the challenges faced by rural women, such as socio-economic constraints and gender-related barriers, we proposed practical solutions and programmatic interventions to address these issues effectively.

Overall, this systematic literature review will provide a comprehensive overview of the current state of digital literacy programs targeting rural women. By examining their effectiveness, identifying key strategies, and addressing challenges, this review aims to contribute to the development of evidence-based interventions that empower rural women and enhance their digital awareness. Ultimately, this research will help promote digital inclusion and enable rural women to actively participate in the digital age.

Research Objectives

- I. Assessing effectiveness of digital literacy programs for rural women's digital awareness.
- II. Identifying key strategies in successful programs for empowering rural women through digital literacy.
- III. Addressing challenges in acquiring digital literacy skills for rural women and proposing effective program solutions.

2. Research Methodology

This section describes the research methodology employed in conducting the systematic literature review on digital literacy programs for rural women. The methodology outlines the steps taken to identify relevant studies, select appropriate articles for inclusion, extract data, and analyze the findings. A systematic and rigorous approach was followed to ensure the reliability and validity of the review.

- I. **Research Questions:** Clear research questions were formulated to guide the systematic literature review. These questions focused on digital literacy programs specifically targeted towards rural women and aimed to explore their effectiveness, strategies for empowerment, challenges, and gaps in the existing literature.
- II. **Search Strategy:** A comprehensive search strategy was developed to identify relevant articles. Multiple electronic databases, such as Scopus, and Web of Science, were searched using appropriate keywords such as "Enhancing digital literacy" OR "Digital literacy programs" OR "Digital literacy interventions". The search strategy was designed to be inclusive, capturing a broad range of studies related to digital literacy programs for rural women.
- III. **Study Selection:** A two-stage process was employed for study selection. In the first stage, titles and abstracts of retrieved articles were screened to assess their relevance to the research questions. In the second stage, full-text articles of potentially relevant studies were reviewed to determine their eligibility for inclusion in the review. Inclusion and exclusion criteria were established to ensure the selected articles met the predetermined criteria.
- IV. **Data Extraction:** A standardized data extraction form was developed to systematically extract relevant information from the selected articles. Data extraction included details such as study characteristics (e.g., authors, year of publication), participant characteristics, intervention components, outcomes assessed, and key findings related to the research questions. This process was conducted independently by two researchers, and any discrepancies were resolved through discussion and consensus.
- V. **Quality Assessment:** The quality of the included studies was assessed to evaluate their methodological rigor and potential bias. Various quality assessment tools, such as the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Systematic Reviews and Research Syntheses, were utilized to assess the methodological quality of the

studies. The assessment considered aspects such as study design, sampling methods, data collection procedures, and data analysis techniques.

VI. Data Synthesis: A narrative synthesis approach was used to analyze and summarize the findings of the included studies. Themes and patterns identified in the literature were synthesized to address the research questions and provide an overview of the key aspects related to digital literacy programs for rural women. The findings were organized and presented in a coherent and logical manner to facilitate a comprehensive understanding of the research area.

The methodology employed above criteria for study selection, resulting in the inclusion of 65 relevant papers for review. These papers were carefully assessed for their relevance to the research questions and the quality of their methodology. The inclusion of a diverse range of studies allowed for a more comprehensive analysis of the topic.

3. Findings

3.1. Digital Literacy Programs for Rural Women:

Digital literacy programs targeting rural women have gained significant attention in the literature, acknowledging the need to bridge the digital divide and empower marginalized populations[4]. These programs aim to equip rural women with the necessary skills and knowledge to navigate the digital landscape effectively. This section provides an overview of the existing literature on digital literacy programs specifically tailored to rural women, examining their key components, objectives, and outcomes[5, 6]. The key components of digital literacy programs for rural women encompass various aspects, including technical skills training, access to technology and connectivity, information literacy, critical thinking, and online safety. These components are designed to provide a holistic approach to digital literacy, addressing both the practical skills required for digital participation and the critical understanding of digital technologies.

Objectives of digital literacy programs for rural women revolve around enhancing their digital awareness, promoting digital inclusion, and empowering them to utilize digital tools for personal and professional development. These programs aim to enable rural women to access online resources, engage in e-commerce, communicate digitally, seek educational opportunities, and connect with a broader network of individuals and communities. The outcomes of digital literacy programs for rural women are multifaceted. First and foremost, these programs seek to improve participants' digital skills, such as using basic computer applications,

navigating the internet, utilizing online communication tools, and engaging with digital content. Moreover, digital literacy programs aim to enhance participants' confidence and self-efficacy in using technology, fostering a sense of empowerment and independence. Improved digital awareness also enables rural women to access online information and resources, thus expanding their knowledge and opportunities. Additionally, digital literacy programs may contribute to socio-economic development by enabling rural women to engage in online entrepreneurship, digital marketing, and remote employment opportunities.

Several studies have highlighted the importance and positive impacts of digital literacy programs for rural women. For example, research has shown that these programs lead to increased access to educational resources, improved health literacy, and enhanced participation in community and civic activities. Digital literacy programs have also been linked to economic empowerment, enabling rural women to engage in income-generating activities and contribute to their households' financial well-being. Moreover, participating in digital literacy programs lead to increased social connectivity and networking opportunities for rural women, reducing isolation and fostering social inclusion. However, challenges exist in designing and implementing effective digital literacy programs for rural women. Limited infrastructure, lack of affordable internet connectivity, and cultural barriers hinder access to technology and participation in these programs. Additionally, gender-related constraints and social norms may limit rural women's engagement with digital technologies. Therefore, digital literacy programs need to address these challenges through tailored approaches, such as providing access to technology, considering cultural sensitivities, and incorporating gender-responsive pedagogies[5].

In conclusion, digital literacy programs tailored to rural women aim to empower and enhance their digital awareness. These programs encompass various components, objectives, and outcomes, focusing on developing digital skills, promoting digital inclusion, and enabling rural women to leverage digital tools for personal and professional growth. While these programs have shown positive impacts, challenges related to infrastructure, affordability, cultural barriers, and gender norms need to be addressed for effective implementation. Further research is needed to explore innovative approaches and best practices in designing and delivering digital literacy programs for rural women, ensuring equitable digital opportunities and empowering marginalized communities.

3.2. Effectiveness of Digital Literacy Programs:

The effectiveness of digital literacy programs targeted towards rural women has been a subject of empirical investigation in the literature[7]. This section examines the findings of empirical studies and evaluations that assess the impact and outcomes of these programs, with a specific focus on digital skill development, knowledge acquisition, and confidence levels among participants[8]. Digital literacy programs have been found to be effective in improving the digital skills of rural women[9]. These programs provide hands-on training and support in using various digital tools and applications, including computer skills, internet navigation, email communication, and online information retrieval. Research studies have shown that participation in digital literacy programs leads to significant improvements in participants' digital competencies and proficiency[10]. These improvements are observed in their ability to perform tasks such as creating and editing documents, using online search engines, and engaging with social media platforms[11].

Furthermore, digital literacy programs contribute to the acquisition of knowledge and information among rural women. These programs emphasize information literacy skills, helping participants effectively locate, evaluate, and utilize digital resources. Through targeted training on accessing online information and engaging with educational platforms, rural women gain knowledge in diverse areas, such as health, agriculture, entrepreneurship, and vocational skills. The acquisition of such knowledge enhances their ability to make informed decisions, engage in lifelong learning, and access resources that were previously inaccessible due to geographic constraints[12]. Participation in digital literacy programs has also been found to positively impact the confidence levels of rural women in using digital technologies. Many studies have reported that program participants exhibit increased self-assurance and self-efficacy in their ability to engage with digital tools and navigate the online environment. As rural women acquire digital skills and knowledge, they develop a sense of empowerment and overcome the initial barriers and fears associated with technology use. This increased confidence motivates them to explore further digital opportunities and engage more actively in online activities[13]. Moreover, digital literacy programs have demonstrated positive outcomes in terms of enhancing the overall well-being and quality of life among rural women. Through improved digital awareness, rural women gain access to a wide range of resources and opportunities, including educational resources, healthcare information, financial services, and networking platforms[14]. This increased access

to resources and opportunities has the potential to positively impact their socio-economic conditions, health outcomes, and social connectedness within their communities[2]. However, it is essential to note that the effectiveness of digital literacy programs for rural women are depending on various contextual factors. Factors such as the design and delivery of the program, the availability of resources and infrastructure, the cultural and socio-economic context, and the participants' prior experiences with technology influence the outcomes of these programs[15]. Therefore, it is crucial for program designers and policymakers to consider these factors and tailor the programs to the specific needs and circumstances of rural women[16, 17].

In conclusion, empirical studies and evaluations provide evidence of the effectiveness of digital literacy programs in improving digital awareness among rural women. These programs have been found to enhance digital skills, facilitate knowledge acquisition, boost confidence levels, and contribute to the overall well-being of participants. However, the effectiveness of these programs is influenced by contextual factors, emphasizing the need for tailored approaches and considerations of the specific needs of rural women. Further research is needed to explore the long-term impacts of digital literacy programs and identify best practices for maximizing their effectiveness in empowering rural women in the digital age.

3.3 Strategies in Empowering Rural Women through Digital Literacy:

The empowerment of rural women through digital literacy programs requires the implementation of effective strategies that cater to their unique needs and circumstances. This section explores the key strategies employed in successful digital literacy programs, highlighting the approaches, methodologies, and best practices that enhance digital awareness and promote active participation among rural women.

3.3.1 Tailored Curriculum Design: Successful digital literacy programs recognize the importance of designing a curriculum that is tailored to the specific needs and interests of rural women. This involves considering their existing knowledge and skill levels, cultural context, and practical applications of digital literacy in their daily lives. The curriculum should be designed in a way that is relevant, engaging, and practical, incorporating real-life examples and case studies that resonate with the experiences of rural women.

3.3.2. Participatory and Experiential Learning: Digital literacy programs for rural women should adopt participatory and experiential learning approaches. This involves actively involving participants in the learning process through hands-on activities, group discussions,

and interactive sessions. By engaging in practical exercises, such as using digital devices, navigating online platforms, and collaborating on digital projects, rural women gain first-hand experience and develop confidence in their digital skills.

3.3.3. Community Engagement and Peer Support:

To foster a supportive and empowering learning environment, successful digital literacy programs emphasize community engagement and peer support. They encourage participants to share their knowledge, experiences, and challenges, creating a sense of camaraderie and collaboration. Peer mentoring and support networks can be established to facilitate ongoing learning and provide a platform for rural women to seek assistance and advice from their peers.

3.3.4. Access to Technology and Infrastructure:

Addressing the digital divide requires ensuring access to technology and infrastructure for rural women. Successful digital literacy programs work towards providing affordable and reliable access to digital devices, internet connectivity, and necessary software applications. This may involve partnerships with local community centres, libraries, or mobile technology initiatives to ensure that rural women have the necessary tools to engage with digital technologies.

3.3.5. Holistic Approach to Digital Literacy: Effective digital literacy programs take a holistic approach, recognizing that digital literacy encompasses more than technical skills. They address the broader aspects of digital literacy, including information literacy, critical thinking, online safety, and ethical considerations. By equipping rural women with the necessary knowledge and skills to navigate the digital landscape responsibly and confidently, these programs promote a comprehensive understanding of digital literacy[18].

3.3.6 Capacity Building for Trainers and Facilitators:

The success of digital literacy programs relies on the capacity of trainers and facilitators to effectively deliver the curriculum and support participants. Therefore, it is crucial to provide comprehensive training and professional development opportunities for program staff[19]. This includes enhancing their own digital literacy skills, fostering a deep understanding of the needs and challenges of rural women, and equipping them with effective facilitation techniques and pedagogical strategies[20].

3.3.7 Sustainability and Continuous Learning:

Successful digital literacy programs recognize that learning is an ongoing process and strive to foster a culture of continuous learning and sustainability. They provide opportunities for rural women to build upon their initial digital literacy skills, access further training

and resources, and stay updated with technological advancements[21]. Additionally, these programs establish partnerships and collaborations with relevant stakeholders, including government agencies, non-profit organizations, and private sectors, to ensure long-term support and sustainability.

In summary, strategies employed in successful digital literacy programs for rural women focus on tailored curriculum design, participatory and experiential learning, community engagement, access to technology, holistic approach, capacity building for trainers, and sustainability. By implementing these strategies, digital literacy programs can effectively empower rural women, enhance their digital awareness, and promote their active participation in the digital age. Further research is needed to explore the effectiveness and scalability of these strategies and identify additional best practices for empowering rural women through digital literacy initiatives.

3.4. Addressing Challenges and Barriers:

Addressing the challenges and barriers faced by rural women in acquiring digital literacy skills and accessing technology is crucial for promoting their digital inclusion. This section examines the literature that identifies the key challenges, including socio-economic constraints, gender-related barriers, and limited infrastructure. It also explores programmatic interventions and solutions proposed to overcome these challenges and ensure equitable access to digital resources for rural women.

3.4.1. Socio-economic Constraints: Rural women often face socio-economic constraints that limit their access to digital literacy programs and technology. Limited financial resources, lack of transportation, and competing household responsibilities hinder their participation. To address these challenges, interventions such as providing subsidies or low-cost technology options, offering flexible scheduling of training sessions to accommodate their responsibilities, and establishing digital literacy programs near rural communities have been proposed.

3.4.2. Gender-related Barriers: Gender-related barriers significantly impact rural women's access to digital literacy and technology. Deep-rooted socio-cultural norms, restrictive gender roles, and unequal power dynamics create barriers to their participation in digital literacy programs. Interventions to address these barriers include creating safe and inclusive learning environments, promoting gender-sensitive teaching methodologies, and incorporating gender-responsive content that addresses the specific needs and interests of rural women.

3.4.3. Limited Infrastructure: Limited infrastructure, including inadequate internet connectivity and access to digital devices, is a significant challenge for rural women. Without reliable and affordable internet access, rural women face difficulties in participating in digital literacy programs and utilizing online resources. Programmatic interventions to overcome this barrier include establishing community digital centers with internet access, utilizing mobile technology for delivering digital literacy content, and advocating for improved infrastructure and connectivity in rural areas.

3.4.4 Training and Support: Providing comprehensive training and ongoing support is essential to address the challenges faced by rural women in acquiring digital literacy skills. Tailored training programs that consider the varying levels of digital literacy among participants, provide hands-on practice, and offer continuous learning opportunities are crucial. Additionally, mentorship programs, peer support networks, and access to help desks or helplines ensure that rural women receive the necessary support and guidance throughout their digital literacy journey.

3.4.5. Collaboration and Partnerships: Collaboration and partnerships among various stakeholders are essential for addressing the challenges and barriers faced by rural women in digital literacy. Collaboration between government agencies, non-profit organizations, educational institutions, and community leaders can leverage resources, expertise, and networks to develop and implement effective interventions. Public-private partnerships (PPP) help secure funding, technological resources, and infrastructure support, ensuring sustained and scalable digital literacy programs for rural women.

3.4.6. Community Engagement and Ownership: Engaging rural communities and empowering them to take ownership of digital literacy initiatives is critical for long-term success. Programs that involve community members in the planning, implementation, and evaluation processes not only ensure cultural relevance but also foster a sense of ownership and sustainability[22]. Community-led initiatives create a supportive environment that encourages the participation of rural women and builds a culture of continuous learning and digital empowerment

Thus, addressing the challenges and barriers faced by rural women in acquiring digital literacy skills requires targeted interventions and multi-stakeholder collaboration. Strategies such as addressing socio-economic constraints, promoting gender-sensitive approaches, improving infrastructure, providing comprehensive training and support, fostering collaboration, and engaging communities are crucial for ensuring equitable access to digital resources. By

implementing these programmatic interventions, digital literacy initiatives effectively overcome barriers and empower rural women to participate fully in the digital age. Further research is needed to evaluate the impact of these interventions and identify additional solutions to enhance digital inclusion for rural women[23].

4. Discussion of the Study

4.1. Gaps and Future Directions:

This section discusses gaps and limitations in the existing literature on digital literacy programs for rural women. It highlights areas that require further research and suggests potential future directions for enhancing digital awareness among rural women. It also explores the role of partnerships, policy implications, and sustainability in promoting digital literacy initiatives.

I. Limited Focus on Intersectionality: One key gap in the literature is the limited exploration of intersectionality in digital literacy programs for rural women. Intersectionality considers the overlapping identities and social categories that individuals possess, such as gender, race, class, and age, and how they intersect to shape experiences and outcomes. Future research should consider the unique challenges faced by rural women with diverse backgrounds and experiences, and how these factors influence their digital literacy needs and engagement[24].

II. Long-Term Impact Assessment: Another important gap is the limited focus on long-term impact assessment of digital literacy programs for rural women. While existing studies often report short-term outcomes, there is a need for longitudinal research to examine the sustained effects of these programs on participants' digital skills, knowledge acquisition, and socio-economic empowerment. Longitudinal studies can provide insights into the lasting benefits and potential areas for improvement in digital literacy initiatives[25, 26].

III. Contextual Factors and Localized Approaches: The literature on digital literacy programs for rural women often lacks a comprehensive analysis of contextual factors and the need for localized approaches. Rural communities have unique characteristics, including cultural norms, infrastructure challenges, and socio-economic disparities. Future research should explore the role of context in shaping the design and implementation of digital literacy programs, highlighting the importance of tailoring interventions to address specific needs and barriers faced by rural women in different geographical and cultural settings[27].

IV. Partnerships and Collaborations: Further research is needed to examine the role of partnerships and collaborations in strengthening digital literacy initiatives for rural women. The literature suggests that successful programs often involve collaborations among multiple stakeholders, including government agencies, non-profit organizations, educational institutions, and community leaders. Future research should investigate effective partnership models, the role of different stakeholders, and strategies for sustaining collaborative efforts in promoting digital awareness among rural women[27].

V. Policy Implications and Supportive Ecosystems: The literature would benefit from a deeper exploration of policy implications and the creation of supportive ecosystems for digital literacy programs. Policymakers play a crucial role in facilitating the implementation and sustainability of these initiatives. Future research should examine policy frameworks, funding mechanisms, and regulatory approaches that support digital literacy programs for rural women[28]. Additionally, exploring the integration of digital literacy into broader development policies and initiatives can help create supportive ecosystems that foster the long-term success of digital literacy programs.

VI. Sustainability and Scalability: Another important area for future research is the sustainability and scalability of digital literacy programs for rural women. While many initiatives have demonstrated positive outcomes, there is a need to explore strategies for scaling up successful programs and ensuring their long-term sustainability. Research should focus on identifying funding mechanisms, building local capacity, leveraging existing community resources, and developing strategies to overcome challenges related to resource constraints and changing technological landscapes[29].

Thus, addressing the gaps and limitations in the existing literature on digital literacy programs for rural women requires further research and exploration. Future studies should examine intersectionality, assess long-term impacts, consider contextual factors and localized approaches, explore partnerships and collaborations, analyze policy implications, and address sustainability and scalability. By addressing these gaps and advancing the knowledge base, researchers, practitioners, and policymakers can contribute to enhancing digital awareness and empowerment among rural women, fostering equitable and inclusive digital societies.

5. Conclusion and Limitation

In conclusion, this systematic literature review provides a comprehensive overview of digital literacy programs for

rural women. It highlights the importance of empowering rural women through digital literacy initiatives and explores various aspects such as program effectiveness, strategies for empowerment, addressing challenges, and identifying gaps in the existing literature. The review revealed that digital literacy programs significantly improve digital awareness among rural women, enhancing their digital skills, knowledge acquisition, and confidence levels. Participatory and experiential learning approaches, tailored curriculum design, community engagement, and access to technology were identified as effective strategies in empowering rural women through digital literacy. However, the literature also identified challenges such as socio-economic constraints, gender-related barriers, and limited infrastructure that hinder digital inclusion for rural women.

The review suggests several future directions for research and practice. It emphasizes the need for a more intersectional approach to digital literacy programs, considering the diverse backgrounds and experiences of rural women. Long-term impact assessment is essential to understand the sustained effects of these programs and identify areas for improvement. Contextual factors and localized approaches should be considered to tailor interventions to the specific needs and challenges of rural women in different settings. Partnerships and collaborations among stakeholders, policy implications, and supportive ecosystems are crucial for the success and sustainability of digital literacy initiatives for rural women[30].

Despite its contributions, this systematic literature review has several limitations. Firstly, the review focused on published literature within a specific timeframe, which may have excluded relevant studies published before or after the specified period. Secondly, the review process itself may introduce bias, as the selection of articles and synthesis of findings depend on the judgment and interpretation of the researchers. Thirdly, the included studies may have variations in methodologies, sample sizes, and geographic locations, which may affect the generalizability of the findings. Furthermore, the review primarily relied on the available literature, and there may be unpublished studies, reports, or gray literature that could provide additional insights into digital literacy programs for rural women. Language bias may also be a limitation, as the review only considered studies published in English. Lastly, the review did not include a meta-analysis or statistical synthesis of the findings, and instead focused on providing a narrative synthesis of the literature. Despite these limitations, this systematic literature review provides a valuable synthesis of the existing knowledge on digital literacy programs for rural women. It highlights the importance of digital empowerment for rural women and identifies key

strategies, challenges, and future directions for research and practice. By addressing these limitations and conducting further research, policymakers, practitioners, and researchers can continue to enhance digital literacy initiatives, promote digital inclusion, and empower rural women in the digital age.

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Transition Towards Technological Advancements of 5G, 6G for an Inclusive Infrastructure of Digital Education : A Commentary

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Abstract

This article explores the implications of 5G and 6G technologies on digital education and proposes an inclusive approach to address potential challenges. With the increasing adoption of online learning and remote education, the demand for high-speed internet connection has become essential. The article discusses the benefits of 5G and 6G technologies, such as high bandwidth, in enhancing the overall digital learning experience. However, the article also highlights potential issues such as the digital divide and the need for accessibility for all learners. An inclusive approach is required to ensure that technology accessible to all and beneficial for all the people, irrespective of their socio-economic status, location, or disabilities. This article emphasizes the importance of addressing these challenges to ensure equitable access to digital education.

Keywords: Technology, Digital Education, Infrastructure, Digital Divide, Challenges

Introduction

With the increasing adoption of online learning and remote education, the demand for high-speed internet connection has become essential. The article discusses the benefits of 5G and 6G technologies, such as high bandwidth, in enhancing the overall digital learning experience. However, the article also highlights potential issues such as the digital divide and the need for accessibility for all learners. An inclusive approach is required to ensure that technology accessible to all and beneficial for all the people, irrespective of their socio-economic status, location, or disabilities. This article emphasizes the importance of addressing these challenges to ensure equitable access to digital education.

This paper is divided into four sections. The first part focuses on the importance of the digital media in the realm of education and how digital education is the need of the hour. The second section studies the role of India in global governance by creating the roadmap for the

development of 5G and 6G. The third section focuses on the opportunities and challenges in this path. Lastly, we have concluded the paper by making recommendations on how maximum benefits can be reaped from these developments.

5G, 6G and Need for Inclusiveness

In today's dynamic world, changes are continuously taking place. Thus, changes in the field of education are clearly evident. Education is the key towards the development of the nation. It not only contributes to the life of the individuals but also shapes the society in a way in which we want our future generations to live. The rapid development of digital technology has revolutionized the way education is delivered and consumed. Digital education, mostly known as e-learning, refers to the use of technology to support and enhance learning. It has become increasingly important in the 21st century due to its flexibility and accessibility, allowing learners to

access education anytime, anywhere. The introduction of 5G and the aim of shifting to 6G has revolutionized the way in which the educators are able to create a learning environment and the students access their course materials.

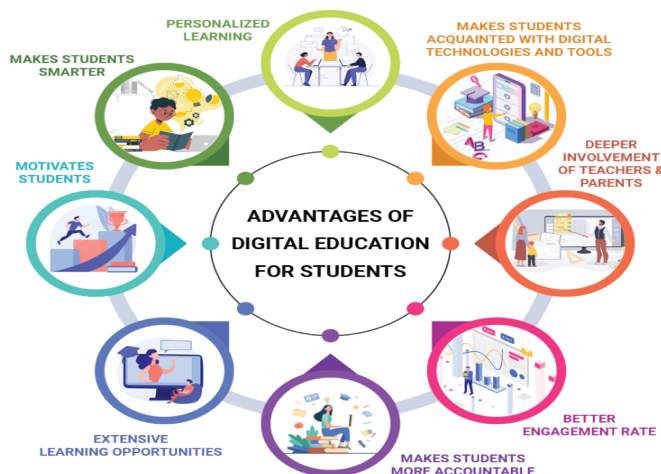
Digital education is a broad term that encompasses various forms of technology-based learning. It can range from simple text-based courses to immersive virtual reality experiences. The nature of digital education is highly customizable, allowing learners to personalize their learning experience to suit their preferences and needs. This flexibility has been especially crucial during the pandemic, where online learning has become the norm. The importance of digital education multiplied during the outbreak of the Covid-19 Pandemic when attending physical school was not a possibility. In this scenario, whether willingly or unwillingly, both the educators and learners had to adopt the path of technology-driven education. It had become the new norm of the day. Digital education has made education accessible to learners who previously faced barriers to access, such as distance, time, and financial constraints.

Digital education has brought a major transformation in the field of education. With time, it has become an essential component of education, and it is likely that its importance would increase in the future. It is a preferred form of education as it shifts from the conventional modes of education. Traditionally, the black-board based education lacked focus on visual representations but that has changed for positive now. Earlier, education focussed only on grades and examination-based studies but now the focus is on imparting skills and knowledge that would remain with students for years. Instead of just getting the degrees, now education's cornerstone is developing the ability of the students that would help them attain jobs in future.

The flexibility and accessibility of digital education make it a valuable tool for lifelong learning and skill development. Additionally, digital education has the potential to enhance the overall learning experience by providing learners with interactive and engaging content. Students can now personalise the curriculum as per their own pace and understanding. It also provides opportunities for collaboration and networking, which can further enrich the learning experience. It provides multiple opportunities to the learners to enrol for several courses and broaden their horizon. It allows students to access education from any part of the world by being in the comfort of their houses. Also, it encourages the learners to develop a rationale thinking as they have to sort out information from vast domain of available data on the internet. Moreover, it is extremely encouraging

for the students as the entire focus on technology has made the education system and the assessment pattern fast and transparent.

Advantages of Digital Education



Source: How Digital Learning is Changing the Face of Education, SkoolBeeps Blogs.

However, any technological advancement, gives rise to potential benefits and challenges, especially with the emergence of 5G and 6G technologies. The emergence of 5G and 6G technologies presents both opportunities and challenges for digital education. These technologies offer high-speed and reliable connectivity, which can significantly improve the digital learning experience. However, they also require significant infrastructure investment, which could reduce the earlier prevailing digital divide between learners who have access to these technologies and those who do not. An inclusive approach to digital education must ensure that all learners. Digital education has become an essential component of modern day sources of education.

Technological advancements have played a significant role in moulding the world. The industrial revolution was a turning point in human history. Currently, we are experiencing the fourth industrial revolution, mostly known as Industry 4.0. Each industrial revolution has brought about significant changes in the way of working and living over the decades.

The first industrial revolution which began in the late 18th century with the invention of the steam engine marked a shift from manual labour to machine-based manufacturing, significantly increasing productivity and economic growth. The second industrial revolution began in the late 19th century and saw the emergence of electricity and mass production, leading to the creation of assembly lines and the rise of consumerism.

The third industrial revolution, famously known as the digital revolution, began in the late 20th century. It started with the widespread adoption of computers and the internet. This revolution led to the automation of many manual tasks and the creation of new industries, such as e-commerce and social media. This was the same time when India adopted the Liberalization, Privatisation and Globalisation and the computers made a big way into the country.

The fourth industrial revolution is characterized by the convergence of physical, digital, and biological technologies. It is marked by the emergence of technologies such as artificial intelligence, the internet of things, and 5G, which are transforming the way we live and work. It marks a rapid interconnectivity in almost all fields. It has blurred all the lines of digital, physical and biological spheres. Klaus Schwab, the Executive Chairman of the World Economic Forum, in the book *The Fourth Industrial Revolution* mentions that the digital revolutions have changed the way we live. He further underlined that the science fictions of the previous decades have become a new reality and nothing seems impossible in future.

Globalization 4.0 is a term coined by the World Economic Forum to describe the current era of globalization, which is being shaped by technological advancements. It is characterized by the emergence of new technologies and the increasing interconnectedness of economies and societies. It can be seen as a landmark in the history as it provides several job opportunities to the people and gives them a scope to increase their income. Globalization 4.0 presents significant opportunities for economic growth and development by increasing the efficiency and productivity, but it also poses challenges, such as increasing inequality and job displacement. Andrew McAfee and Erik Brynjolfsson in their book *The Second Machine Age: Work, Progress and Prosperity in a Time of Brilliant Technologies* (2014) point out that even though the technological advancements might be focussing towards making the world a better place but it brings with a set of severe challenges that cannot be ignored as they have a tendency of perpetuating inequalities amongst the minorities and economically weaker sections of the society. The complexities associated with these technological advancements are so immense that humankind has hardly experienced anything of this sort till date. The involvement of multiple number of stakeholders makes the situation even more complicated.

India and Global Governance Leadership For 5G and 6G

India has emerged as a global leader in the field of information technology and is poised to take on a

leadership role in the development and deployment of 5G and 6G technologies. The government of India has taken several initiatives to promote the development of these technologies, such as setting up a task force to create a roadmap for the deployment of 5G in India. All this has to be done keeping in mind the need to connect billions of Indian citizens at the lowest cost possible. India's large and rapidly growing market presents significant opportunities for the development and deployment of these technologies. India has the potential to emerge as a global leader in the governance of these technologies, ensuring that they are developed and deployed in an inclusive and equitable manner. The functioning of a productive democracy is possible only if people can openly voice their opinions. These technologies serve as tools for making this possible as they increase the platforms for public engagement with the government. The development of 5G and 6G and the government's support in this creates an enabling environment wherein the public is encouraged to work towards innovation and capacity building.

The Government of India has taken several steps to combine the fields of education and technology to increase the access of internet and educational resources by overcoming the cost and geographical factors. PM e-Vidya is a comprehensive programme launched by the Government to accelerate India's aim of Atma Nirbhar Bharat by promoting multiple modes of education. The Bharat Network or the National Optical Fibre Network, started by Prime Minister Narendra Modi's government, aims to ensure that high speed internet connection reaches more than 2,50,000 gram panchayats to promote e-learning and e-commerce. This programme is further enhanced with the commencement of Vidya-daan wherein the Government has come up with a unique idea of making educational sources prepared by the urban educators available to the teachers from the rural areas at no cost. This would enhance the quality of education and help in bringing certain amount of similarity in the content being taught in urban and rural areas.

Digital Infrastructure for Knowledge Sharing (DIKSHA) is an online portal to provide reliable study material to students of schools and colleges. This initiative has also led to the formation of Swayam Prabha TV Channels in 32 Indian local languages so that the students without any internet access can also be provided with the required lectures related to their curriculum. A multi-gigabit national research and educational network has been established under as the National Knowledge Network (NKN). This project aims to connect all the eminent institutions of India like the IITs, IIMs etc., and is gradually developing as the backbone of the educational institutions in India.

Ministry of Education along with several private players in performing to maximum of their ability to ensure that every student in India has access to equal education at the lowest cost, be it digital or physical mode of education. Every subsequent budget of the country has seen a gradual increase in the amount allocated for the educational sector. But with such a large population, comes several implementation and budgeting issues. Now, the Government just needs to fill in these gaps to make digital education the new reality of modern India. This requires a planned public-private partnership that would be beneficial for all.

Factoring in Inclusivity in Digital Education Using 5G And 6G: Need For Synergies And Understanding Opportunities And Challenges

The emergence of 5G and 6G technologies presents significant opportunities for the advancement of digital education. These technologies can improve the accessibility and quality of education, particularly in remote areas, by enabling real-time streaming of lectures and interactive virtual classrooms. However, it is crucial to ensure that these technologies are deployed in an equitable manner to prevent further exacerbating existing inequalities in access to education. This vast availability of data helps researchers to study and analyse all the works done in their respective fields all across the globe.

To achieve this, there is a need for synergies between the government, private sector, and educational institutions. The government can play a crucial role in ensuring that these technologies are deployed in remote and underserved areas through policies and initiatives that promote inclusivity. The private sector can leverage their resources and expertise to develop and deploy these technologies in an inclusive manner. Educational institutions can collaborate with the government and the private sector to develop innovative and inclusive digital education solutions.

There are also challenges that need to be addressed, such as the cost of deploying these technologies and ensuring internet connectivity in remote areas. Since, the government and other authorities are still in the process of ensuring that internet reaches all parts of the country, it is still seen that the remote parts either do not have access to internet or have a poor connectivity. By providing sufficient funds, the government along with the operators need to work immediately on this front to ensure that an appropriate study environment can be created and no discrimination is done based on just the non-availability of internet. Keeping the current pandemic scenario in mind, internet and technology driven education is the only way to ensure that children of no section of society are left behind as far as their schooling and curriculum is concerned.

Also, misuse of this technology needs to be avoided at maximum cost. It needs to be ensured that issues like cyber-bullying and digital education inequalities do not create nuances in the society. Issues related to cyber-security need to be dealt with maximum care. Despite having enough advantages, parents need to manage the screen time of their children as students may find it extremely difficult to maintain self-discipline. They may misuse the available facility and spend more time online social media websites than on educational platforms. Additionally, there is a need to ensure that the deployment of these technologies does not lead to the replacement of human teachers with technology as it is teachers themselves who can guide the student and encourage them to think critically and rationally. Also, it needs to be understood by all that no online means can replace the student-teacher relationship that nurtures the most in a physical school and university campus. So, it is the responsibility of all institutions to train the teachers to combine the conventional and the modern means of education.

Conclusion

In conclusion, the emergence of 5G and 6G technologies presents significant opportunities for the advancement of digital education, but it is crucial to ensure that these technologies are deployed in an inclusive manner. The development and deployment of these technologies require synergies between the government, private sector, and educational institutions, which can address the challenges and promote opportunities for digital education. Furthermore, technological advancements have played an important role in shaping human history, and the fourth industrial revolution is transforming the way we live and work. An inclusive approach is essential to ensure that these technological advancements benefit everyone, and global leadership is crucial to harness their potential.

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Multidimensional Poverty in Odisha: A Comparative Analysis

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Abstract

Government of India's premier thinktank NITI Aayog has published its first 'National Multidimensional Poverty Index (MPI) 2021- Baseline Report'. As per MPI, Kerala has lowest poverty (0.71%) and Bihar has highest poverty (51.91%). This index is India's first ever index based on the NFHS Round 4 data (2015-16). Odisha has 29.35% multidimensional poverty. Low nutrition, less access to safe cooking fuel, less sanitation coverage and less housing coverage are contributing towards high multidimensional poverty. Odisha's performance is noteworthy in comparison to neighbouring and comparable states. Though Odisha has performed well between NFHS – 4 and NFHS – 5, due to historical incidence of backwardness, there is broad gap to catch up with lowest MPI states. Odisha's poverty has precipitously decreased by 24.61 percentage points from 57.20% (2004-05) to 32.59% (2011-12). Average annual decline in poverty is 3.52 percentage points. This is highest reduction in poverty among major states in the country. It is worth noting that, India saw 15 percentage points poverty reduction and average annual decline in poverty for the country was 2.14 percentage points during the same period. The state has performed way better than nation and major states in terms of elimination of poverty over last two decades. The state has been largely successful in multidimensional development and eliminating poverty at a faster level than nation. Among other accomplishment in SDG, the achievements of the state is remarkable in the domain of elimination of poverty in last two decades. Several welfare measures with targeted intervention has lead to achievement of fastest poverty reduction and state is targeting to reduce poverty to 10% by the end of 2025. Elimination of all forms of poverty, hunger, malnutrition, socio-economic deprivation will lead to achievement of 2030 agenda of Sustainable Development in Odisha.

Keywords: Poverty, MPI, Multidimensional poverty, Odisha, India, Growth, Education, Health, Development, SDG, Sustainable Development

I. Introduction

Poverty is pronounced deprivation in well-being. Poverty anywhere is a threat to prosperity everywhere. Since independence, defining a poverty line has been a debatable issue. During 1970s, first such poverty line concept in India was came into existence. Generally, poverty measures in India are money metric in nature and calculated according to a threshold level of MPCE. The connotation of poverty has changed over the years to adjust the measures of poverty line and poverty ratio. The constitution of a Working Group (1962), the Alagh Committee (1979), Lakdawala Committee (1989), Tendulkar Committee (2005), and Rangarajan Committee

(2009) contributed to redefining poverty in the country, particularly those of the poor. Multidimensional poverty measures poverty from multiple perspective in terms of education, health, standard of living etc and also involves nonmetric measures in terms of access and deprivation of basic necessities of life. The paper studies evolution of poverty and number of poor population since independence till date for Odisha and compares with multidimensional poverty of other states of India.

II. Poverty in Odisha

All round growth of Odisha Economy began in the 1940's and accelerated during the post-independence era in the 1950s, with the introduction of planned

development. Odisha's paramount mineral reserves, flora and fauna, 484 km long coastline would lead to multidimensional development of all regions of Odisha and all sections of society with special focus on deprived population. Balanced regional development helps in poverty alleviation as fruits of growth reaches to all the section of population and gap between rich and poor diminishes gradually. Tendulkar Committee Report (2005) and several subsequent national Sample Survey Organisations survey results outlines estimates of poverty for state and nation. Poverty is denoted in terms of poverty line and head count ratio. The poverty lines for the state are estimated at Rs. 695 for rural and Rs. 861 for urban area by 2011-12. 32.59% of population (138.2 lakh people) were below poverty line in Odisha by 2011-12. Several welfare measures with targeted intervention has lifted 82 lakh people out of poverty. Poverty has declined by 24.61 percentage points from 57.20% (2004-05) to 32.59% (2011-12). Average annual decline in poverty is 3.52 percentage points. This is highest reduction in poverty among major states in the country (Economic Survey, 2021). It is worth noting that, India saw 15 percentage points poverty reduction and average annual decline in poverty for the country was 2.14 percentage points during the same period (Government of India, 2009). The state has performed way better than nation and major states in terms of elimination of poverty over last two decades. Several welfare measures with targeted intervention has lead to achievement of fastest poverty reduction and state is targeting to reduce poverty to 10% by the end of 2025. Percentage of poor population in Odisha (Rural and Urban) from the year 1973 to the year 2012 is given in Table 1.

Table 1: Percentage of Rural and Urban poor in Odisha from 1973-2012

Year	Odisha		India	
	Rural	Urban	Rural	Urban
1973-74	67.78	55.62	56.44	49.01
1977-78	72.38	50.92	53.07	45.24
1983-84	67.53	49.15	45.65	40.79
1987-88	57.64	41.53	39.09	38.2
1993-94	49.72	41.64	37.27	32.36
1999-00	48.01	42.83	27.09	23.62
2004-05	60.80	37.60	41.80	25.70
2011-12	35.69	17.29	25.70	13.70

Source: Planning Commission Reports

In 1973-74, 66.2 percentage of people were poor, which increased to 70.1% (1977-78), declined to 65.3% (1983), to 55.6% (1987-88), to 48.6% (1993-94) and again declined to 46.6% (2004-05). Poverty started declining after the year 1978. Elimination was more prominent between 1977-78 and 1987-88 (14.5 percentage points). 67.2% of people were poor in rural area, which increased to 72.4% (1977-78), again declined to 67.5% (1983), to 57.6% (1987-88), and to 49.7% (1993-94) and finally declined to 46.8% (2004-05). Between 1993-2005, poverty in total has declined only 2 percentage points. In rural area, decline was 2.9 percentage points (Panda, 2015). The state has performed way better than nation and major states in terms of elimination of poverty over last two decades. Several welfare measures with targeted intervention has lead to achievement of fastest poverty reduction and state is targeting to reduce poverty to 10% by the end of 2025.

III. Multidimensional Poverty Index of India

Government of India's premier thinktank NITI Aayog, New Delhi has published its first 'Multidimensional Poverty Index (MPI) 2021- Baseline Report' on 26 November 2021 (NITI Aayog, 2021). As per the report, Kerala has lowest poverty (0.71%) and Bihar has highest poverty (51.91%). This index is India's first ever multidimensional poverty index measure based NFHS Round 4 data (2015-16). The multidimensional poverty index is popularly employed non-money metric poverty index in the world. The index covers overlapping deprivations in health, education and basic standards of living. The non-money metric measures complements money metric poverty measurements because it measures and compares deprivations directly on the basis of several aspects of development.

The Global Agenda 2030 for Sustainable Development was signed on 25 September 2015 by 193 member nations of UN. The agenda established the 17 Sustainable Development Goals (SDG), 169 targets and 232 indicators. SDG 1 calls for Ending poverty in all its forms everywhere. The goal is multidimensional in its totality. Multidimensional poverty index has wide ranging application for any country in terms of development of schemes and targeted interventions which contribute towards elimination of poverty in all its form from everywhere in the world. The district-wise estimation of multidimensional poverty will help in identifying deprived districts based on these indicators and accordingly policies can be planned and implemented for reaching the goal of Left No One Behind (LNOB) by the year 2030.

NITI Aayog has prepared this index with consultation with Ministries of Union Government. The index has 3

equally weighted dimensions namely health, education and Basic Living Standard. These three dimensions are measured by 12 indicators listed below.

- i. "Nutrition"
- ii. "Child and adolescent mortality"
- iii. "Maternal health"
- iv. "Years of schooling"
- v. "School attendance"
- vi. "Cooking fuel"
- vii. "Sanitation"
- viii. "Drinking water"
- ix. "Electricity"
- x. "Housing"
- xi. "Assets"
- xii. "Bank account"

Percentage of population who are poor in these 12 indicators in all states and union territories is given in Table 2.

Table 2: State/UT Wise Multidimensional Poor Population in India

SI No	State	Headcount Ratio (%)
1	Bihar	51.91
2	Jharkhand	42.16
3	Uttar Pradesh	37.79
4	Madhya Pradesh	36.65
5	Meghalaya	32.67
6	Assam	32.67
7	Chhattisgarh	29.91
8	Rajasthan	29.46
9	Odisha	29.35
10	Nagaland	25.23
11	Arunachal Pradesh	24.27
12	West Bengal	21.43
13	Gujarat	18.60
14	Manipur	17.89
15	Uttarakhand	17.72
16	Tripura	16.65
17	Maharashtra	14.85
18	Telangana	13.74
19	Karnataka	13.16
20	Andhra Pradesh	12.21
21	Haryana	12.28

22	Mizoram	9.80
23	Himachal Pradesh	7.62
24	Punjab	5.59
25	Tamil Nadu	4.89
26	Sikkim	3.82
27	Goa	3.76
28	Kerala	0.71
	Union Territory	
1	Dadra & Nagar Haveli	27.36
2	Jammu & Kashmir, & Ladakh	12.58
3	Daman & Diu	6.82
4	Chandigarh	5.97
5	Delhi	4.79
6	Andaman & Nicobar Islands	4.30
7	Lakshadweep	1.82
8	Puducherry	1.72
	India	25.01

Source: NITI Aayog MPI Report, 2015-16

IV. Multidimensional Poverty in Odisha

Odisha is ranked at bottom 9 in the MPI with 29.35% of multidimensional poverty. Total MPI score of Odisha is 0.136 (Rural MPI score - 0.152 and Urban MPI score - 0.057). Poverty headcount ratio for the state is 29.35% whereas intensity score is 46.42%. Percentage of population who are multidimensionally poor in each district is given in Table 3.

Table 3: District Wise Multidimensional Poor Population in Odisha

SI No	District	Headcount Ratio (%)
1	Nabarangapur	59.32
2	Malkangiri	58.71
3	Koraput	51.14
4	Rayagada	48.14
5	Kalahandi	47.28
6	Mayurbhanj	44.9
7	Kandhamal	44.75
8	Kendujhar	41.78
9	Gajapati	38.8
10	Nuapada	38
11	Debagarh	37.1
12	Baouda	33.03

13	Dhenkanal	30.08
14	Bhadrak	28.43
15	Subarnapur	28.05
16	Balangir	27.49
17	Bargarh	24.9
18	Sundargarh	24.75
19	Anugul	24.57
20	Sambalpur	24.53
21	Balasore	24.42
22	Ganjam	21.88
23	Kendrapara	21.67
24	Jajpur	20.75
25	Nayagarh	20.49
26	Jharsuguda	18.62

27	Khordha	15.49
28	Cuttack	14.97
29	Jagatsinghapur	11.83
30	Puri	11.64
	Odisha	29.35

Source: NITI Aayog MPI Report, 2015-16

Region wise analysis of multidimensional poverty will enable to identify the deprived population. Undivided Koraput and Kandhamal region has historical incidence of poverty in Odisha. These region include districts namely: Nabarangapur, Malkangiri, Koraput, Rayagada, Kalahandi, Kandhamal, Nuapada, Subarnapur and Balangir. The Kandhamal Balangir Koraput (KBK) region poverty is highlighted in several literature and report. Percentage of population who are deprived in each indicator for undivided Koraput and undivided Kandhamal region is given in Table 4.

Table 4: Indicator Wise Score of Undivided Koraput and Undivided Kandhamal Districts

District	Nutrition	Child & Adolescent Mortality	Maternal Health	Years of Schooling	School Attendance	Cooking Fuel	Sanitation	Drinking Water	Electricity	Housing	Assets	Bank Account
Nabaran-gapur	53.72	4.06	33.56	34.15	15.40	90.73	83.31	26.92	29.89	80.22	33.74	19.31
Malkangiri	58.90	6.94	28.08	43.56	17.12	94.63	83.26	19.56	11.53	76.07	35.56	9.26
Koraput	47.60	2.56	24.91	38.82	15.58	81.10	82.22	20.06	22.62	59.13	39.72	16.35
Rayagada	46.62	5.50	25.96	36.80	12.98	83.60	76.90	16.26	19.18	59.51	36.58	15.80
Kalahandi	41.41	1.83	21.33	28.84	8.47	92.52	85.40	27.27	31.17	75.93	27.94	16.98
Kandhamal	42.69	3.57	27.12	19.50	5.43	93.88	83.95	52.94	20.93	63.14	45.09	6.69
Nuapada	49.05	2.52	16.59	21.37	7.34	90.56	80.02	18.59	16.83	71.33	17.54	5.85
Subarnapur	43.04	2.03	14.17	11.83	1.28	85.30	82.59	17.64	9.16	64.12	17.77	6.63
Balangir	44.84	2.19	10.63	16.15	4.01	90.57	85.50	22.09	15.62	65.84	16.75	6.08
Odisha	37.3	2.2	19.5	16.7	5	80.9	70.4	21	13.4	55.8	19.2	10.9
India	37.6	2.7	22.6	13.9	6.4	58.5	52	14.6	12.2	45.6	14	9.7

Source: NITI Aayog MPI Report, 2015-16

If we analyse indicator score for these districts, it can be said that low nutrition, less access to safe cooking fuel, less sanitation coverage and less housing coverage are contributing towards high multidimensional poverty. However, in indicators like child & adolescent mortality, school attendance, and bank account these districts are performing well in comparison to other indicators.

V. MPI of Odisha and Comparable States

It is very interesting to study multidimensional poverty of comparable states namely Chhattisgarh, Jharkhand, West Bengal, Madhya Pradesh and Rajasthan. This will help us in understanding where the Odisha stands in terms of these 12 indicators compared to other states of the country.

In all indicators, progress of Odisha is visible between NFHS-4 and NFHS-5 (IIPS, 2012). In Stunting Children indicator, Odisha's performance is better than West Bengal and Chhattisgarh but lagging behind Jharkhand, Madhya Pradesh and Rajasthan. In Underweight Children indicator, Odisha is doing well in comparison to West Bengal but lagging behind Chhattisgarh, Jharkhand, Madhya Pradesh and Rajasthan. In Women BMI indicator, Odisha's performance is ahead of Chhattisgarh, Jharkhand and Madhya Pradesh but falling short of West Bengal and Rajasthan. In Men BMI indicator, all neighbouring states are performing well in comparison to Odisha. Overall in Nutrition component, Odisha's performance is better than neighbouring and comparable states.

In Child and Adolescent Mortality category, Odisha's performance is lagging behind all neighbouring and comparable states in all 3 indicators (neonatal mortality rate, infant mortality rate and under-five mortality rate). In at least 4 antenatal care visits of Mother indicator, Odisha's progress is noteworthy and way ahead of Chhattisgarh, Jharkhand and West Bengal. In Institutional Birth indicator and Births attended by skilled health personnel indicator, Odisha's performance is lagging behind all neighbouring and comparable states. Overall in Health component, Odisha's performance is lagging behind neighbouring and comparable states.

In Years of Schooling – Women indicator, Odisha is performing better than Jharkhand and Madhya Pradesh but lagging behind Chhattisgarh and Rajasthan. In Years of Schooling – Men indicator, Odisha's performance is better than Chhattisgarh, Jharkhand, Madhya Pradesh and Rajasthan. In School Attendance indicator, Odisha is performing better than Chhattisgarh, Jharkhand, Madhya Pradesh and West Bengal. Overall in Education component, Odisha's performance is better than neighbouring and comparable states.

In Cooking Fuel indicator, Odisha's performance is better than all neighbouring and comparable states. In Sanitation indicator, Odisha is performing better than West Bengal and Madhya Pradesh but lagging behind Chhattisgarh, Jharkhand and Rajasthan. In Drinking Water indicator, Odisha's performance is better than West Bengal but lagging behind Chhattisgarh, Jharkhand, Madhya Pradesh and Rajasthan. In Electricity indicator, Odisha is performing better than Chhattisgarh, Madhya Pradesh, West Bengal and Rajasthan and only lagging behind Jharkhand. In Bank Account indicator, Odisha's performance is better than Chhattisgarh and Rajasthan but lagging behind Jharkhand, Madhya Pradesh and West Bengal. Overall in Standard of Living component, Odisha's performance is better than neighbouring and comparable states. Indicator wise score of Odisha and other comparable states between two latest rounds of NFHS is outlined in Table 5.

Table 5: Indicator Wise Score of Odisha and Comparable States between NFHS 4 and 5

Sl No	State	Indicator	Odisha		Chhattisgarh		Jharkhand		West Bengal		Madhya Pradesh		Rajasthan	
			NHFS 4	NHFS 5	NHFS 4	NHFS 5	NHFS 4	NHFS 5	NHFS 4	NHFS 5	NHFS 4	NHFS 5	NHFS 4	NHFS 5
1	Nutrition	Stunted Children	34.1	31.0	37.6	34.6	45.3	39.6	32.5	33.8	42.0	35.7	39.1	31.8
		Underweight Children	34.4	29.7	37.7	31.3	47.8	39.4	31.6	32.2	42.8	33.0	36.7	27.6
		Women BMI	26.5	20.8	26.7	23.1	31.5	26.2	21.3	14.8	28.4	23.0	27.0	19.6
		Men BMI	19.5	15.3	24.1	17.4	23.8	17.1	19.9	15.1	28.4	20.8	22.7	14.0
2	Child & Adolescent Mortality	NNMR	28.2	27.0	42.1	32.4	33.0	28.2	22.0	15.5	36.9	29.0	29.8	20.2
		IMR	39.6	36.3	54.0	44.3	33.0	28.2	27.5	22.0	51.2	41.3	41.3	30.3
		U5MR	48.1	41.1	64.3	50.4	54.3	45.4	26.8	22.3	64.6	49.2	50.7	37.6
3	Maternal Health	Antenatal care	61.9	78.1	59.1	60.1	30.3	38.6	76.4	75.8	35.7	57.5	38.5	55.3
		Institutional births	85.3	92.2	70.2	85.7	61.9	75.8	75.2	91.7	80.8	90.7	84.0	94.9
		Skilled Home Birth	3.3	1.9	8.4	5.8	8.0	8.4	6.8	2.6	2.3	2.5	3.2	1.4
		Skilled Birth	86.5	91.8	78.0	88.8	69.6	82.5	81.6	94.1	78.0	89.3	86.6	95.6

4	Years of Schooling	Women years of schooling	26.7	33.0	26.5	36.9	28.7	33.2	26.5	32.9	23.2	29.3	25.1	33.4
		Men years of schooling	37.1	38.6	36.0	41.5	40.2	46.6	33.8	34.7	34.3	39.9	43.8	51.9
5	School Attendance	School Attendance	67.8	71.5	67.6	69.3	61.1	64.5	74.0	76.8	64.0	67.5	57.2	63.5
6	Cooking Fuel	clean fuel for cooking	19.2	34.7	22.8	33.0	18.9	31.9	27.8	40.2	29.6	40.1	31.8	41.4
7	Sanitation	Improved sanitation	30.0	60.5	34.8	76.8	25.0	56.7	52.8	68.0	34.8	65.1	46.1	77.1
8	Drinking Water	Improved drinking-water source	89.1	91.1	91.3	95.5	78.1	86.6	97.2	97.5	85.2	89.0	93.7	96.5
9	Electricity	households with electricity	86.6	97.0	96.3	98.8	81.2	94.3	94.3	97.5	90.9	98.4	91.2	98.1
10	Bank Accounts	Women having a bank or savings account	56.2	86.5	51.3	80.3	45.1	79.6	43.5	76.5	37.3	74.7	58.2	79.6

Source: Author's Calculation

VI. Odisha and Lowest MPI States

It is very interesting to study Odisha's performance in comparison to lowest multidimensional poverty states namely Kerala, Tamilnadu and Punjab. Though Odisha has performed well between NFHS – 4 and 5, due to historical incidence of backwardness, there is broad gap to catch up with lowest MPI states (IIPS, 2021). In Stunting Children indicator, Odisha's performance is better than Kerala, Tamil Nadu and Punjab. In Underweight Children indicator, Odisha is doing well in comparison to Kerala, Tamil Nadu and Punjab. In Women BMI indicator, Odisha's performance is ahead of Kerala, Tamil Nadu and Punjab. In Men BMI indicator, Odisha's performance is ahead of Kerala, Tamil Nadu and Punjab. In neonatal mortality rate indicator, Odisha's performance is better than Kerala and Punjab but broad gap to catch up. In infant mortality rate indicator, Odisha's performance is better than Kerala, Tamil Nadu and Punjab but broad gap to catch up. In under-five mortality rate indicator, Odisha is performing better than Kerala, Tamil Nadu and Punjab but broad gap to catch up. In at least 4 antenatal care visits of Mother indicator, Odisha's progress is noteworthy and way ahead of Kerala, Tamil Nadu and Punjab. In Institutional Birth indicator and Births attended by skilled health personnel

indicator, Odisha's performance is better than Kerala, Tamil Nadu and Punjab. In Institutional Birth indicator, Odisha's performance is better than Kerala, Tamil Nadu and Punjab. In Home births by skilled health personnel indicator, Odisha's performance is lagging behind Kerala, Tamil Nadu and Punjab. In Years of Schooling – Women indicator, Odisha is performing better than better than Kerala, Tamil Nadu and Punjab. In Years of Schooling – Men indicator, Odisha's performance is better than Punjab and Tamil Nadu but lagging behind Kerala. In School Attendance indicator, Odisha is performing better than Kerala, Tamil Nadu and Punjab. In Cooking Fuel indicator, Odisha's performance is better than Kerala, Tamil Nadu and Punjab. In Sanitation indicator, Odisha's performance is substantial and better than Kerala, Tamil Nadu and Punjab. In Drinking Water indicator, Odisha's performance is better Kerala, Tamil Nadu and Punjab. In Electricity indicator, Odisha's performance is substantial and better than Kerala, Tamil Nadu and Punjab. In Bank Account indicator, Odisha's performance is substantial and better than Kerala, Tamil Nadu and Punjab. Indicator wise score of Odisha and other lowest MPI states between two latest rounds of NFHS is outlined in Table 6.

Table 6: Indicator Wise Score of Odisha and Lowest MPI States between NFHS 4 and 5

SI No	State	Detailed Indicators	Odisha		Kerala		Tamil Nadu		Punjab	
			NHFS 4	NHFS 5	NHFS 4	NHFS 5	NHFS 4	NHFS 5	NHFS 4	NHFS 5
1	Nutrition	Stunted Children	34.1	31.0	19.7	23.4	27.1	25.0	25.7	24.5
		Underweight Children	34.4	29.7	16.1	19.4	23.8	22.0	21.6	16.9
		Women BMI	26.5	20.8	9.7	10.1	14.6	12.6	11.7	12.7
		Men BMI	19.5	15.3	8.5	10.0	12.4	12.1	10.9	12.5
2	Child & Adolescent Mortality	NNMR	28.2	27.0	4.4	3.4	14.0	12.7	21.2	21.8
		IMR	39.6	36.3	5.6	4.4	20.2	18.6	29.2	28.0
		U5MR	48.1	41.1	7.1	5.2	26.8	22.3	33.2	32.7
3	Maternal Health	Antenatal care	61.9	78.1	90.1	78.6	81.1	89.9	68.5	59.3
		Institutional births	85.3	92.2	99.8	99.8	98.9	99.6	90.5	94.3
		Skilled Home Birth	3.3	1.9	0.1	0.2	0.6	0.2	4.5	2.6
		Skilled Birth	86.5	91.8	99.9	100.0	99.2	99.8	94.1	95.6
4	Years of Schooling	Women years of schooling	26.7	33.0	72.2	77.0	50.9	56.6	55.1	56.0
		Men years of schooling	37.1	38.6	70.5	73.3	58.3	59.1	59.8	58.7
5	School Attendance	School Attendance	67.8	71.5	95.4	95.5	77.2	80.4	76.0	77.2
6	Cooking Fuel	clean fuel for cooking	19.2	34.7	57.4	72.1	73.0	82.9	65.9	76.7
7	Sanitation	Improved sanitation	30.0	60.5	98.2	98.7	52.5	72.6	82.7	86.6
8	Drinking Water	Improved drinking-water source	89.1	91.1	94.8	94.9	97.7	98.6	99.6	98.8
9	Electricity	households with electricity	86.6	97.0	99.2	99.6	99.0	99.3	99.6	99.7
10	Bank Accounts	Women having a bank or savings account	56.2	86.5	70.6	78.5	77.0	92.2	58.8	81.6

Source: Author's Computation

VII. Conclusion

As per NITI Aayog's first MPI report, Kerala has lowest poverty (0.71%) and Bihar has highest poverty (51.91%). Odisha is ranked at bottom 9 in the MPI with 29.35% poverty. Low nutrition, less access to safe cooking fuel, less sanitation coverage and less housing coverage are contributing towards high multidimensional poverty. Though Odisha has performed well between NFHS – 4

and 5, due to historical incidence of backwardness, there is broad gap to catch up with lowest MPI states. Poverty in Odisha has declined by 24.61 percentage points from 57.20% (2004-05) to 32.59% (2011-12). This is highest reduction in poverty among major states in the country. It is worth noting that, India saw 15 percentage points poverty reduction and average annual decline in poverty for the country was 2.14 percentage points during the same period. The state has performed way better

than nation and major states in terms of elimination of poverty over last two decades. The state has been largely successful in multidimensional development and eliminating poverty at a faster level than nation. Among other accomplishment in SDG, the achievements of the state is remarkable in the domain of elimination of poverty in last two decades. Several welfare measures with targeted intervention has lead to achievement of fastest poverty reduction and state is targeting to reduce poverty to 10% by the end of 2025.

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