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E-Commerce Penetration in Rural India- A Case Study of Village Level Obstacles with Insights from Telangana State

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ABSTRACT

The rapid growth of e-commerce has transformed retail across the globe, yet its penetration into rural India remains uneven, hindered by several village-level obstacles. This case study examines the specific challenges faced by rural communities in accessing and adopting e-commerce platforms. Focusing on a selected village in rural India, the study explores key barriers such as limited internet connectivity, inadequate digital literacy, unreliable delivery services, and trust issues related to online transactions. The research also highlights the socio-economic factors that influence e-commerce adoption in these areas, including income disparities, education levels, and cultural preferences for traditional shopping methods. Through primary data collection and analysis, the study aims to provide insights into the local obstacles that prevent broader e-commerce integration in rural regions, while suggesting potential solutions to bridge the digital divide and enhance the benefits of online retail for rural consumers. The findings offer valuable perspectives for stake holders seeking to expand digital commerce in India's rural landscape.

Keywords: Rural e-commerce, Digital Infrastructure, Socio-Economic Barriers, Digital Penetration, Digital Financial Literacy, Logistical Challenges.

1.Introduction

E-commerce has transformed retail, bringing convenience and a broad range of goods to consumers, especially in urban areas where platforms like Amazon and Flipkart are widely popular. However, in rural India, where around 65% of the population resides, the growth of e-commerce has been slower. This study delves into the unique challenges facing rural areas in Telangana, specifically in the Kodakandla Mandal region, that limit e-commerce adoption. Although online shopping could significantly benefit rural economies, issues such as weak digital infrastructure, low financial literacy, unreliable internet access, and hesitation toward online purchasing present obstacles.

Government initiatives, such as Digital India, are essential for reducing this digital divide. Efforts like BharatNet and Telangana's T-Fiber Project aim to improve rural connectivity by providing high-speed internet through fiber optic networks. Yet, despite these efforts, internet access remains inconsistent, impeding the ability of rural communities to engage fully in e-commerce. Digital literacy programs like the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) and financial inclusion initiatives like the Pradhan Mantri Jan Dhan Yojana (PMJDY) are designed to boost digital and financial knowledge, making online shopping more accessible. Still, cash remains the main mode of transaction in rural areas, with many hesitant about online payments due to security and unfamiliarity with digital banking.

Furthermore, initiatives like Make in India and Startup India support small businesses and encourage local e-commerce. However, logistical challenges such as inadequate road infrastructure and high delivery expenses hinder last-mile delivery, making it difficult for rural residents to receive e-commerce services effectively. This study integrates insights from primary data, gathered through questionnaires and interviews with residents, local business owners, and delivery personnel, along with secondary data from reputable sources, including research articles, official websites, and reports. These combined data sources provide a comprehensive look into the barriers to e-commerce adoption in rural Telangana.

1.2. Socio-Economic Profile of Villages in Kokadkandla Mandal

Kodakandla Mandal, located in Jangaon district of Telangana, is a rural region comprising 16 villages with a combined population of 51,816 (2011 Census). The economy is primarily agrarian, with most households relying on agriculture for their livelihoods. Key crops include paddy, cotton, maize, and pulses, grown largely through rain-fed methods, with limited irrigation from local water sources. Traditional farming practices are prevalent, although some areas have adopted modern techniques. Animal husbandry is also common, with residents keeping cattle, goats, and poultry to supplement their income. Seasonal wage labor provides additional earnings, especially during off-harvest periods. The local economy is underdeveloped, with few employment options outside of agriculture. Small-scale commerce includes kirana stores, agricultural supply shops, and vegetable vendors. A minority work as government school teachers, local administration employees, Anganwadi staff, and in private jobs, while some are self-employed in occupations

like carpentry, blacksmithing, weaving, and pottery. Due to limited job diversity, many migrate seasonally to Hyderabad and other cities for work in construction and factories.

Kodakandla's literacy rate, around 60-65%, is below the state average, with a notable gender gap favoring male literacy. Education facilities are limited, with only a few government schools at the primary and secondary levels. The high dropout rate, especially among girls, is often due to economic constraints. Access to higher education is minimal, leading many students to travel to nearby towns. Vocational training opportunities are scarce, limiting skill development among youth and restricting their employment prospects. Many households face economic challenges, and a large portion of the population lives below the poverty line. Government welfare programs, such as the Public Distribution System (PDS), MGNREGA, and pension schemes, provide some relief. However, reliance on seasonal agriculture, unpredictable rainfall, and limited economic diversity contribute to ongoing poverty.

In terms of infrastructure, Kodakandla has seen modest progress. Basic road connectivity links the villages to nearby mandals and towns, but the frequency and reach of public transportation are limited. Healthcare and educational facilities are inadequate, contributing to the socio-economic challenges. While mobile phone ownership is common, digital infrastructure remains underdeveloped. Internet access is limited, hindering digital financial inclusion and e-commerce adoption. Socially, the mandal reflects traditional values and caste-based divisions, which influence local governance and socio-economic dynamics. Overall, Kodakandla Mandal faces significant barriers to economic and social development, including poor infrastructure, low digital penetration, and limited employment and educational opportunities, which collectively impact the quality of life for its residents.

2. Review of Literature

2.1. Venkatesh, V., Thong, J. Y., & Xu, X. (2018) investigate technology adoption in rural India using the Unified Theory of Acceptance and Use of Technology (UTAUT). Their findings show that ease of use, perceived benefits, and social influence play vital roles in e-commerce adoption, though barriers like limited digital literacy and trust issues persist.

2.2. Kumar, S., & Sharma, S. (2019) analyze the impact of the Digital India initiative on rural e-commerce, focusing on projects like BharatNet and Common Service Centers (CSCs) that aim to improve rural connectivity. The authors argue that, while these initiatives are crucial, they are not wholly effective due to insufficient localized digital training and financial literacy support.

2.3. Raj & Sharma (2019) highlight that low digital literacy rates in rural regions make it challenging for residents to utilize online shopping platforms. Programs like Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) aim to bridge this gap, though their effectiveness is inconsistent.

2.4. Gupta & Banerjee (2020) identify income disparities and cultural habits as key factors influencing rural shopping behavior. Traditional shopping methods, distrust of online transactions, and concerns over product authenticity deter many rural consumers from engaging in e-commerce. Furthermore, logistical difficulties, such as unreliable delivery services and poor road infrastructure, make last-mile delivery challenging in remote areas.

2.5. Bhaskar, M., & Karthik, R. (2020) examine the structural challenges that hinder e-commerce in rural Indian areas, such as unreliable internet, lack of digital literacy, and limited transportation infrastructure. Despite government initiatives, the digital divide remains significant, preventing rural communities from fully participating in online commerce platforms.

2.6. NITI Aayog (2020) notes that without foundational digital skills, rural consumers face challenges in navigating e-commerce interfaces, conducting digital transactions, and ensuring online security, which ultimately limits their engagement in the digital economy.

2.7. Jain, A., & Singh, M. (2021) explore socio-economic factors affecting rural consumption behaviors, noting that income disparities, educational gaps, and cultural preferences often lead to a preference for traditional marketplaces over online shopping options.

2.8. Verma, A., & Choudhary, N. (2021) discuss logistical challenges in rural e-commerce, including high delivery costs and inadequate road infrastructure, which complicate last-mile delivery. The authors propose that improved rural infrastructure and public-private partnerships could enhance delivery systems.

2.9. Agarwal et al. (2021) find that limited internet connectivity and digital infrastructure, especially in areas with poor telecommunications access and insufficient electricity, exacerbate the rural-urban digital divide, restricting rural consumers' access to digital services and online retail.

2.10. Chandrasekhar (2021) emphasizes the importance of targeted policies like Digital India and BharatNet, aimed at improving connectivity and promoting digital literacy. However, the uneven implementation at local levels means these policies have varying degrees of effectiveness. The author suggests that sustained efforts and localized solutions are necessary for creating an inclusive digital economy that benefits rural communities.

2.11. Prasad, R. K., & Bhatnagar, S. (2022) examine how security concerns and distrust in digital transactions deter rural populations from engaging in e-commerce, suggesting that secure, user-friendly platforms could alleviate these concerns.

3. Objectives and Hypothesis of the Study

1. **Examine Key Obstacles to E-Commerce in Rural Areas**: To investigate the social, economic, and logistical challenges that residents of Select Villages in Kodakandla Mandal face in using e-commerce platforms.

2. **Develop Actionable Strategies for Enhanced E-Commerce Access**: To propose specific solutions for reducing these barriers, enabling broader online shopping participation among rural consumers in the India.

3.1. Hypothesis

H1: Insufficient digital infrastructure, coupled with limited financial literacy, significantly hinders e-commerce adoption in rural villages of Kodakandla Mandal.

H2: Logistical issues, such as last-mile delivery problems, along with cultural resistance to online shopping, act as major obstacles to the growth of e-commerce in rural Telangana.

H3: Awareness and trust in e-commerce platforms are positively correlated with the likelihood of rural residents using these services.

4. Research Methodology

This study uses a mixed-methods approach, combining quantitative data with secondary sources, to explore key barriers to e-commerce adoption in rural villages of Kodakandla Mandal, Telangana. Primary data was gathered from July to September 2024 through a Likert-scale questionnaire distributed to 400 respondents selected via stratified random sampling, ensuring representation across demographics. The questionnaire assessed obstacles like infrastructure, digital literacy, traditional shopping habits, logistics, income, trust, and language barriers. Descriptive statistics, including mean and standard deviation, were calculated to understand the intensity of each barrier. Secondary data from government reports, academic studies, websites and policy documents provided context on e-commerce adoption, rural digital infrastructure, and economic factors. Ethical approval was obtained, and data confidentiality was maintained. This methodology offers a comprehensive view of e-commerce challenges in rural areas.

4.2. Determination of Sample Size

To determine the sample size needed for this study with a desired precision level and 95% confidence, the following formula was applied:

$$n = \frac{N}{1+\mathrm{N(e)}^2}$$

Here, N represents the total population of Kodakandla Mandal villages, which is 51,816, and e (margin of error) is set at 0.05. Plugging in these values:

$$n = \frac{51{,}816}{1+51{,}816(0.05)^2} = 396.94$$

Rounding up, a sample size of 400 was chosen to ensure accurate representation of the population.

5. Data Analysis

A structured questionnaire gathered detailed insights into the key obstacles faced by villagers in Kodakandla Mandal when using e-commerce platforms. The data, systematically organized into a table format, revealed critical challenges that limit e-commerce adoption in these rural areas. These barriers include inadequate digital infrastructure, limited availability of e-commerce services, and low digital financial literacy, which hinder ease of access and usage. Additionally, cultural preferences for traditional shopping methods, logistical difficulties in last-mile delivery, and economic factors such as low disposable income pose significant obstacles. Trust deficits and concerns about privacy and cybersecurity further discourage online transactions, as do language and interface barriers that make e-commerce platforms less accessible. These insights underscore the importance of tailored interventions and strategies for stakeholders aiming to expand e-commerce in rural India. Targeted efforts to improve digital infrastructure, raise digital literacy, and build trust in online systems could help facilitate greater e-commerce integration, thereby fostering economic inclusivity in villages like those in Kodakandla Mandal.

Table – I

Practical Experience on Major Obstacles of E-Commerce

S. No	Particulars	1	2	3	4	5	Total	Mean	S. D
1	Insufficient Infrastructure	280	100	20	0	0	400	1.35	0.57
		70	25	5	0	0	100		
2	Unavailability of E- Commerce Service	273	91	24	12	0	400	1.44	0.74
		68.3	23	6	3	0	100		
3	Low Digital Financial Literacy	291	81	15	8	5	400	1.39	0.76
		72.8	20	3.8	2	1.3	100		

4	Cultural and Traditional shopping habits	198	161	15	16	10	400	1.70	0.91
		49.5	40	3.8	4	2.5	100		
5	Delivery and logistics Challenges	300	78	12	10	0	400	1.33	0.66
		75	20	3	3	0	100		
6	Low Disposable Income and Other Economic factors	181	163	18	23	15	400	1.82	1.02
		45.3	41	4.5	6	3.8	100		
7	Trust Deficit	304	69	15	8	4	400	1.35	0.74
		76	17	3.8	2	1	100		
8	Privacy and Cybers Security Concern	208	152	24	16	0	400	1.62	0.77
		52	38	6	4	0	100		
9	Language and Interface Barriers	301	78	21	0	0	400	1.30	0.56
		75.3	20	5.3	0	0	100		

Source: Primary Data

Strongly Agree - 1, Agree - 2, Neutral - 3, Disagree - 4 & Strongly Disagree - 5.

5.1. Insufficient Infrastructure

The data provides in Table - I insight into the major challenges faced by residents of Kodakandla Mandal in engaging with e-commerce transactions, specifically pointing to infrastructure inadequacies as a major obstacle, this distribution of responses shows that an overwhelming majority (95%) of respondents agree, either strongly or moderately, that inadequate infrastructure poses a barrier to e-commerce. Only 5% of respondents feel neutral, and no one disagreed with the statement. This suggests a clear consensus within the community, The average score of 1.35 is very close to 1, indicating a strong inclination toward “Strongly Agree.” This mean score implies that most people experience significant obstacles in using e-commerce services due to infrastructure limitations. The low standard deviation shows that responses are clustered closely around the mean, which highlights a consistent view among respondents regarding the importance of infrastructure. There is very little disagreement, suggesting a strong, unified opinion across different demographic groups or locations within the Mandal. The high level of agreement reflects a widespread perception that the infrastructure in these rural areas is insufficient to support e-commerce activities. Infrastructure in this context could encompass several aspects, Reliable and high-speed internet is often a prerequisite for online transactions, which are crucial for e-commerce. Many rural areas may lack this, making it difficult for residents to access online platforms. Roads, delivery logistics, and access to delivery services may be inadequate, hindering both the receipt and dispatch of goods bought or sold online. Limited access to devices like smartphones or computers and the knowledge to use them can also fall under "infrastructure" challenges, as they directly impact the ability to engage in e-commerce.

5.2. Unavailability of E- Commerce Service

From Table I, it is clear that a significant majority (91%) of respondents in the villages of Kodakandla Mandal are experiencing substantial challenges due to the unavailability of e-commerce services. Only a small proportion (6%) remain neutral, and an even smaller group (3%) disagrees, indicating minimal opposition to this viewpoint. The mean score of 1.44 reflects responses that lean strongly toward "Strongly Agree," underscoring the strong sentiment about the impact of limited e-commerce access. With a standard deviation of 0.74, responses show little variation, highlighting a consistent concern shared across respondents.

Many e-commerce providers, such as Amazon Pantry, BigBasket, Grofers (now Blinkit), Flipkart Grocery, 1mg/PharmEasy, and Zomato/Swiggy, are unable to extend their delivery services to remote areas. This limitation is likely due to logistical and infrastructure challenges. Rural areas often lack the necessary last-mile delivery network, which makes it difficult and costly for e-commerce companies to reach these locations. Additionally, poor road conditions in many villages further complicate transportation, driving up costs. Given the high expense of deliveries and limited demand, serving remote areas may be financially unsustainable for these platforms, which see such expansions as costly and unprofitable.

5.3. Low Digital Financial Literacy

Table - I illustrate the perceptions of villagers in Kodakandla Mandal regarding "Low Digital Financial Literacy" and its influence on e-commerce participation. A substantial 92.8% of respondents "Strongly Agree" or "Agree" that limited digital financial literacy poses a significant hurdle to engaging in e-commerce, underscoring a widely recognized barrier within the community. Only 3.8% of respondents remain neutral, while an even smaller 3.3%

disagree, indicating near-universal consensus on the issue.With a mean score of 1.39, close to "Strongly Agree," the responses reflect a strong collective sentiment that low digital financial literacy is a critical impediment. Additionally, the low standard deviation of 0.76 shows that responses are closely clustered around the mean, suggesting consistent viewpoints among respondents with minimal variation.

The findings highlight that most villagers in Kodakandla Mandal view limited digital financial literacy as a major obstacle to adopting e-commerce. This issue likely arises from insufficient knowledge or confidence in using e-commerce platforms and digital payment methods, a lack of awareness about online financial security, and limited exposure to digital financial tools. Addressing these gaps could be crucial in facilitating e-commerce adoption and enabling villagers to participate more fully in the digital economy.

5.4. Cultural and Traditional Shopping Habits

According to Table I, almost 90% of respondents (49.5% "Strongly Agree" and 40.25% "Agree") feel that cultural and traditional shopping habits pose a significant barrier to e-commerce adoption. This overwhelming majority reflects a strong acknowledgment of the role that conventional shopping preferences play in hindering the shift to online shopping. Only a small segment of respondents are neutral (3.75%), and even fewer (6.5%) disagree or strongly disagree, indicating limited opposition to this view. The mean score of 1.70, leaning toward "Strongly Agree," underlines a clear consensus within the community that traditional shopping behaviors limit the acceptance of e-commerce. The standard deviation of 0.91 shows moderate clustering around the mean, indicating some variation but overall consistent opinions.

It shows shopping tendencies and mindset of villagers, suggesting that they may prefer to see and feel products before buying, avoid waiting for deliveries, and possibly harbor concerns about product quality and potential damage during shipping. This indicates that deep-rooted cultural and traditional shopping habits are perceived as major obstacles to adopting e-commerce in Kodakandla Mandal. The preference for familiar, in-person shopping experiences, combined with potential distrust of online platforms, likely fuels this sentiment. The strong level of agreement and low variability show that shifting from traditional to digital shopping is challenging for this community. For e-commerce providers, understanding these preferences and building trust in the digital shopping process may be key to overcoming this resistance.

5.5. Delivery and Logistics Challenges

As per Table - I, an overwhelming 94.5% of respondents (with 75% "Strongly Agree" and 19.5% "Agree") believe that delivery and logistics challenges significantly hinder e-commerce adoption. This strong majority highlights a clear recognition of logistical barriers as a primary obstacle to engaging with e-commerce. Only a small portion of respondents remain neutral (3%), while a minimal 2.5% express disagreement, and none strongly disagree, indicating a nearly unanimous concern regarding delivery and logistics issues. The mean score of 1.33, close to "Strongly Agree," reflects a solid consensus within the community that logistical challenges are a significant concern. Furthermore, the low standard deviation of 0.66 demonstrates that responses are closely grouped around the mean, revealing little variation in opinion and indicating that this issue resonates consistently across the group.

The data underscores that delivery and logistics difficulties are widely viewed as major impediments to e-commerce adoption in Kodakandla Mandal. Contributing factors may include inadequate last-mile infrastructure, limited availability of reliable delivery services, delays, and potentially high transportation costs. The strong agreement combined with low variability points to a unified, urgent concern about the difficulties of receiving goods efficiently and reliably in this area. Addressing these logistical challenges may be critical to fostering greater e-commerce participation in rural regions.

5.6. Low Disposable Income and Other Economic Factors

According to Table I, a notable 86% of respondents in Kodakandla Mandal (45.3% "Strongly Agree" and 41% "Agree") consider low disposable income and economic limitations as major hindrances to e-commerce adoption. This substantial majority illustrates that financial constraints are a key factor restricting access to online shopping. Only a small percentage of respondents are neutral (4.5%), with minimal disagreement (5.75%) and an even smaller 3.8% strongly disagreeing. This slight variability suggests only limited opposition to this viewpoint.

The mean score of 1.82, aligning closely with "Strongly Agree," highlights a dominant perception that limited finances act as a significant obstacle. With a standard deviation of 1.02, responses display moderate variability, indicating some diversity in opinions but still a largely unified sentiment. This data implies that villagers associate low disposable income and broader economic factors such as underemployment, seasonal agricultural income, and reliance on credit from local shops with barriers to e-commerce participation. These financial challenges likely lead to reduced spending on non-essential items, making online shopping feel out of reach. The community's strong alignment on this issue emphasizes that addressing economic limitations is crucial if e-commerce is to become accessible and viable for these rural consumers.

5.7. Trust Deficit

Table I reveals that a significant 93% of respondents (76% "Strongly Agree" and 17.25% "Agree") view a "Trust Deficit" as a critical barrier to e-commerce adoption in Kodakandla Mandal. This high level of agreement points to widespread apprehension about online transactions, suggesting that trust issues are a major obstacle. Only a small fraction of respondents (3.75%) are neutral, and even fewer (3%) disagree, reflecting very little dissent on this issue. The mean score of 1.35, which is close to "Strongly Agree," underscores the strong consensus on trust-related challenges. Additionally, the standard deviation of 0.74 indicates low variability, showing that most respondents share similar views.

The data highlights that trust concerns, possibly linked to fears of online fraud, uncertainties about product quality, delivery issues, privacy issues, or unfamiliarity with e-commerce, are prevalent within the community. This shared perspective suggests that building trust is essential for encouraging e-commerce adoption among villagers. Addressing these trust concerns could be key to enabling a smoother transition to digital shopping, paving the way for increased e-commerce engagement in Kodakandla Mandal.

5.8. Privacy and Cybers Security Concern

In Table I, a substantial 90% of respondents (52% "Strongly Agree" and 38% "Agree") identify "Privacy and Cyber Security Concerns" as significant barriers to adopting e-commerce in Kodakandla Mandal. This strong majority indicates a widespread awareness of and concern about online privacy and security risks among villagers. Only a small portion of respondents are neutral (6%), and very few (4%) disagree, reflecting minimal opposition to this view. The mean score of 1.62, closer to "Strongly Agree," highlights a prevailing sense of caution regarding privacy and cyber security issues. The standard deviation of 0.77 signifies relatively low variability in responses, suggesting a consistent perspective on this matter across the community.

It reveals that privacy and security concerns are likely key factors in hindering e-commerce adoption in Kodakandla Mandal. Villagers may be worried about the safety of their personal and financial information, the potential for cyber fraud, and a general lack of knowledge about online security practices. This shared sentiment underscores the importance of addressing privacy and security issues to build confidence in e-commerce and foster greater participation among rural consumers in the area.

5.9. Language and Interface Barriers

Table I reveals that a notable 95.3% of respondents (with 75.3% "Strongly Agree" and 20% "Agree") view "Language and Interface Barriers" as a significant challenge to e-commerce adoption in Kodakandla Mandal. This overwhelming majority reflects a widespread consensus that issues related to language and complex user interfaces restrict villagers from effectively using online platforms. Only a small 5.3% remain neutral on this matter, with no disagreement or strong opposition, indicating virtually unanimous concern. The mean score of 1.30, which closely aligns with "Strongly Agree," further emphasizes the shared sentiment regarding these barriers. A low standard deviation of 0.56 signifies consistent responses across the community, with minimal variability, indicating that the perception of these obstacles is nearly universal.

The data indicates that villagers face notable challenges with language and interface usability on e-commerce platforms. Few platforms currently offer a local language interface, making it difficult for users who are not fluent in other languages. Additionally, the design of these platforms can be complex and unintuitive for those with limited digital literacy. This complexity might stem from insufficient local language support, ambiguous instructions, or overly sophisticated layouts that are hard to navigate without prior digital experience. The high level of agreement among respondents highlights the importance of making e-commerce platforms more accessible and user-friendly. Simplified navigation, clearer design, and robust language support that aligns with the linguistic needs of rural users in Kodakandla Mandal could be essential steps toward fostering greater engagement with e-commerce in these communities.

6. Result and Discussion

The study identifies several key challenges to e-commerce adoption in Kodakandla Mandal, stemming from infrastructural limitations, low digital financial literacy, and a preference for traditional shopping methods. Many residents find it difficult to engage in online shopping due to unreliable internet, inadequate road access, and limited availability of devices. The lack of locally available e-commerce services further restricts participation, as few online platforms cater specifically to rural areas. Additionally, a lack of familiarity with digital payment methods poses a barrier, with many feeling uncertain about the security of online transactions. Traditional shopping habits also play a strong role, as villagers often prefer in-person purchasing and tend to trust physical stores over online options. Economic factors, such as limited disposable income, make online shopping less feasible, as it's often viewed as suitable only for non-essential items. Finally, language and interface complexities on e-commerce platforms create additional obstacles, as many platforms do not support local languages or provide an accessible user experience. Addressing these issues could require a multifaceted approach, including improving infrastructure, enhancing digital literacy, and adapting e-commerce platforms to better fit rural needs, which would help bridge the digital gap and promote greater economic inclusion.

7. Conclusion

The findings from Kodakandla Mandal highlight major barriers to e-commerce adoption, underscoring the urgent need for solutions to bridge the rural digital divide. Infrastructure challenges, including unreliable internet, poor road networks, and limited delivery options, are primary obstacles, making online shopping and digital services difficult to access. Additionally, the lack of available e-commerce services, due largely to logistical constraints, limits rural residents' ability to engage in digital marketplaces. To address these barriers, e-commerce platforms should consider expanding last-mile connectivity through partnerships with local logistics providers, ensuring service reach in remote areas like Kodakandla.

Further, Kodakandla represents the broader reality of remote Indian villages where low digital financial literacy presents a significant hurdle. There is a pressing need for digital financial literacy initiatives, including workshops and mobile applications with easy-to-understand, local language tutorials on

secure online transactions. Cultural preferences for traditional shopping also impede e-commerce adoption, indicating the need for platforms to build trust by emphasizing product quality, transparent return policies, and providing local language options.

Kodakandla Mandal mirrors the situation in many other remote villages across India, suggesting that these areas should be prioritized like special economic zones. Governments should offer more subsidies to encourage e-commerce providers to serve remote regions, and not only central and state governments but also service-oriented agencies and organizations should work together to enhance infrastructure and digital financial education in rural communities. A unified approach improving infrastructure, intensifying digital literacy, simplifying user interfaces, and fostering trust can significantly increase e-commerce adoption in rural India. By making digital platforms accessible, secure, and user-friendly, e-commerce providers can empower rural consumers to actively participate in the digital economy.

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