Challenges and Opportunities of Digital India Programme in Rural Tribal Development

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Introduction

The Digital India initiative, launched by the Government of India in 2015, aims to transform the country into a digitally empowered society and knowledge economy (Ghosh, 2022). The program focuses on enhancing digital infrastructure, increasing internet connectivity, and ensuring digital literacy among all sections of society, including marginalized communities (Sharma et al., 2016). However, the tribal communities of India, constituting about 8.6% of the total population, according to the 2011 census, often remain on the periphery of this digital revolution due to socio-economic constraints, lack of infrastructure, and digital illiteracy (Population Finder, 2011).

Tribal communities, primarily residing in remote and forested regions, face several challenges in accessing digital services, including poor internet penetration, language barriers, and inadequate policy implementation (Jenkins et al., 2017). Despite these challenges, Digital India presents significant opportunities for improving tribal livelihoods, governance, healthcare, and education through e-governance, digital banking, and online learning platforms. Policies such as the Aadhaar-linked Direct Benefit Transfer (DBT), Common Service Centers (CSCs), and digital financial inclusion initiatives have the potential to empower tribal communities (Gond, 2022).

This study examines the challenges and opportunities of the Digital India initiative in the context of tribal development, with a focus on the role of policy interventions. It evaluates how government policies facilitate digital access for tribal populations and explores the gaps in implementation. The study also highlights best practices and suggests policy recommendations to bridge the digital divide and promote inclusive development.

Literature Review

Several studies have explored the impact of digital initiatives on marginalized communities, particularly tribal populations, highlighting both progress and persistent challenges.

1. Digital India and Rural Development

Previous research suggests that digital inclusion plays a crucial role in rural development. Digital connectivity enhances access to government services, improves transparency, and reduces bureaucratic inefficiencies (Avianto et al., 2022). However rural and tribal populations face infrastructural deficits, limiting their ability to fully participate in the digital economy.

2. Challenges in Digital Inclusion for Tribal Communities

Studies indicate that the digital divide remains a major concern for tribal communities. According to Gond (2022), Lack of internet connectivity, absence of digital literacy programs in tribal languages, and resistance to technology adoption hinder the progress of digital initiatives. The urban-rural gap in digital penetration exacerbates socio-economic inequalities, making it difficult for tribal populations to benefit from Digital India initiatives (Laskar, 2023).

3. Opportunities and Success Stories

Despite these challenges, some studies showcase successful digital interventions in tribal regions. Dass & Bhattacherjee (2011) document how the implementation of Common Service Centers (CSCs) has enabled tribal populations to access e-governance services, apply for welfare schemes, and avail financial services. Patel (2023) emphasizes the role of mobile banking and Aadhaar-enabled payment systems in fostering financial inclusion among tribal communities, thereby reducing dependency on middlemen.

4. Policy Interventions and Their Effectiveness

Research on government policies suggests mixed outcomes. Gahlot & Gahlot (2020) note that while policies such as the Digital Saksharta Abhiyan (DISHA) and BharatNet Project aim to improve digital infrastructure, their implementation remains slow in tribal areas due to logistical and administrative barriers. However, Manzar & Srivastava (2022) highlight that government collaborations with private technology firms and NGOs have resulted in some successful digital literacy programs tailored for tribal communities.

Research Gap

While existing literature provides insights into the challenges and benefits of Digital India for tribal communities, there is limited research focusing specifically on policy effectiveness and implementation gaps. This study aims to fill this gap by providing a policy-oriented analysis of the Digital India initiative in tribal development, offering recommendations for improving digital accessibility and inclusion.

Anuppur District

The scheduled tribes of the Anuppur district in the southeast region of Madhya Pradesh are the subject of the current study. Central India contains the district of Anuppur, which is populated by tribal people. The district is mostly made up of hilly, wooded terrain. The census book states that King Virat's capital was once located here. This links Amarkantak to the Pandava brothers and Bhrigu Markandeya. Additionally, the northern Sone River is thought to have been a part of the Magadha Empire. The Panvanshi of Mekala was another name for the Mekala king. He was once subject to Vakataks' suzerainty. The Mekala region indicates in the direction of the modern-day Amarkantak hills. At the same time, other academics think that Mekala was a tribe that lived in the Amarkantak hills. The king of Rewa was granted the districts of Sohagpur and Amarkantak following the Revolt of 1857. The district was thereafter ruled by the Baghel until 1947 rivers (About District).

Anuppur has four sub-district (Anuppur, Pushparajar, Jaithari & Kotma) with 571 villages (inhabited 562), whose population 7,49,237 (persons) and Literacy rate here is 67.88 percent. 23.39% of the population lives in urban areas, while 72.61% of the population resides in the rural region. Anuppur is one of the most tribal populated district in MP, which 47.8% of the population belongs to the Scheduled Tribes (3,58,543) (Census of India 2011 - Madhya Pradesh - Series 24 - Part XII B - District Census Handbook, Anuppur).

.**Objectives:**

1. To analyze the key challenges faced by tribal communities in accessing and benefiting from the Digital India initiative.
2. To examine the policy measures and opportunities provided under the Digital India program for tribal development.

Research Questions:

1. What are the major obstacles hindering the effective implementation of Digital India in tribal regions?
2. How do existing policies under the Digital India initiative contribute to the socio-economic development of tribal communities?

Research Methodology

Research Design

This study adopts a mixed-methods research design, integrating both qualitative and quantitative approaches to analyze the challenges and opportunities of the Digital India initiative in tribal development from a policy perspective. The research is descriptive and exploratory in nature, focusing on assessing the impact, barriers, and future potential of Digital India for tribal communities.

Study Area

The research has been conducted in Anuppur district, which has a significant tribal population. The selection of the study area is based on its demographic composition, digital infrastructure penetration, and socio-economic conditions of tribal communities.

Sampling Design

A multi-stage stratified random sampling technique has been used to select the respondents: Stage-1: Selection of tribal-dominated villages based on Census data and government records. Stage- 2: Stratification of households based on digital accessibility, education level, and socio-economic status. Stage- 3: Random selection of 400 tribal households ensuring representation across different sub-groups (gender, age, income levels, and literacy rates).

Proportionate of Sampling- The total rural population of Anuppur District is 5,43,996, 58.38% (3,17,627) of a tribe who live in villages. Based on the total rural tribal population residing in Anuppur. Most of the tribal population live in the Pushprajgrah sub-district. 54.50 percent of the total rural tribal population of Anuppur resides in Pushprajgarh while 7.29 percent in Kotma, 13.49 percent in Jaithari and 24.69 percent in Anuppur.

The 400 respondent for the survey has been divided based on the percentage of tribes living in villages from these four sub-districts. In Pushparajgarh, 54.50% of tribes live in villages, so 54.50% of 400 respondents are taken from Pushparajgarh, i.e.220 households. Similarly, in Kotma, 7.29% of tribes live in villages, 28 respondent have been taken from there, 52 respondent from Jaithari and 100 respondent from Anuppur.

Data Collection Methods

Primary Data Collection- Household Surveys: Structured questionnaires will be administered to 400 tribal households to gather data on awareness, accessibility, and utilization of Digital India services. Focus Group Discussions (FGDs): Conducted with community members to gain insights into perceptions, experiences, and expectations regarding Digital India initiatives.

Secondary Data Collection- Government reports, policy documents, and Digital India program implementation reports. Census 2011 data, National Sample Survey Office (NSSO) reports, and other relevant statistical sources. Research articles, books, and case studies related to digital inclusion and tribal development.

Data Presentation

Tribe of respondents		
Tribe	Frequency	Percent
Gond	180	45
Baiga	41	10.3
Panika	20	5
Kol	91	22.8
Other	68	17
Total	**400**	**100**

The dataset represents the distribution of tribal respondents participating in the study, categorized by their respective tribes.

- Gond (45%): The largest proportion of respondents belong to the Gond tribe, making up nearly half of the sample (180 out of 400). This indicates that the Gond community has a significant presence in the study area.
- Kol (22.8%): The second-largest group is the Kol tribe, comprising 91 respondents (22.8%), showing a notable representation in the region.
- Baiga (10.3%): The Baiga tribe accounts for 41 respondents (10.3%), reflecting a smaller yet relevant segment of the tribal population.
- Panika (5%): The Panika tribe has 20 respondents (5%), indicating a minor presence in the surveyed population.
- Other Tribes (17%): A combined category of 68 respondents (17%) includes various other tribal groups, suggesting diversity beyond the major tribes listed.

Maximum educated member in the family		
Education	Frequency	Percent
Illiterate	61	15.3
5th	52	13
8th	88	22
10th	106	26.5
10+2	48	12
Graduation	34	8.5
More than Graduation	11	2.8
Total	**400**	**100**

This dataset represents the highest level of education attained by the most educated member in 400 surveyed tribal households. Here's a breakdown of the findings:

- Illiterate (15.3%) – A significant portion (61 households) have no formally educated member, indicating persistent educational challenges in tribal communities.
- Primary Education (5th Grade - 13%) – 52 households have their most educated member reaching only the 5th grade, suggesting early dropout rates.
- Middle School (8th Grade - 22%) – The largest group in basic education, with 88 households having their highest-educated member completing the 8th grade.
- Secondary Education (10th Grade - 26.5%) – The highest proportion (106 households) have a member who has completed 10th grade, showing some progress toward secondary education.
- Higher Secondary (10+2 - 12%) – 48 households have at least one member who has completed 12th grade, marking a decline from the 10th-grade level.
- Graduation (8.5%) – 34 households have at least one member who has completed a college degree, showing limited higher education access.
- Post-Graduation and Above (2.8%) – Only 11 households have a member with education beyond graduation, highlighting a significant gap in advanced education among tribal populations.

A majority (63.5%) of households have their most educated member attaining education only up to the 10th standard or below. Only 11.3% of households have a member with higher education (Graduation or above). The drop in numbers from 10th grade onward suggests barriers such as economic constraints, accessibility, and socio-cultural factors affecting further education.

Testing the association between different tribes and maximum education in the family

Table- 7.2: Different tribes and maximum education in the family

Maximum Education in the Family		Illiterate	5th	8th	10th	10+2	Graduation	more than Graduation	Total
Gond	Count	20	24	28	54	23	23	8	180
	% within Tribe	11.1 %	13.3 %	15.6 %	30.0 %	12.8 %	12.8 %	4.4%	100%
	% of Total	5%	6%	7%	13.5 %	5.8%	5.8%	2%	45%
Baiga	Count	10	8	13	7	1	2	0	41
	% within Tribe	24.4 %	19.5 %	31.7 %	17.1 %	2.4%	4.9%	0%	100%
	% of Total	2.5%	2%	3.3%	1.8%	0.3%	0.5%	0%	10.3%
Panika	Count	2	1	4	7	4	0	2	20
	% within Tribe	10%	5%	20%	35%	20%	0%	10%	100%
	% of Total	0.5%	0.3%	1.0%	1.8%	1%	0%	0.5%	5%
Kol	Count	19	13	21	17	15	6	0	91
	% within Tribe	20.9 %	14.3 %	23.1 %	18.7 %	16.5 %	6.6%	0%	100%
	% of Total	4.8%	3.3%	5.3%	4.3%	3.8%	1.5%	0%	22.8%
Other	Count	10	6	22	21	5	3	1	68
	% within Tribe	14.7 %	8.8%	32.4 %	30.9 %	7.4%	4.4%	1.5%	100%
	% of Total	2.5%	1.5%	5.5%	5.3%	1.3%	0.8%	0.3%	17%
T	Count	61	52	88	106	48	34	11	400

	% within Tribe	15.3 %	13%	22%	26.5 %	12%	8.5%	2.8%	100%
	% of Total	15.3 %	13%	22%	26.5 %	12%	8.5%	2.8%	100%

This dataset presents the educational attainment levels of households across different tribal communities— Gond, Baiga, Panika, Kol, and Other Tribes—based on the highest level of education attained within each family. The total sample size is 400 tribal households.

Overall Education Trends- The most common highest educational level in tribal households is 10th grade (26.5%), followed by 8th grade (22%) and 5th grade (13%). Graduation and higher education levels remain low, with only 8.5% reaching graduation and 2.8% attaining education beyond graduation.

Tribe-wise Educational Distribution:

Gond Tribe (45% of total sample): Highest representation across all educational levels. 30% of Gond households have at least one member educated up to the 10th grade, while 4.4% have education beyond graduation.

Baiga Tribe (10.3% of total sample): High illiteracy rate (24.4%), the highest among all tribes. Only 7 households (17.1%) have education up to the 10th grade, and just 2 families (4.9%) have a graduate member.

Panika Tribe (5% of total sample): A small sample size but with a higher percentage reaching the 10th grade (35%). No representation in the graduation category.

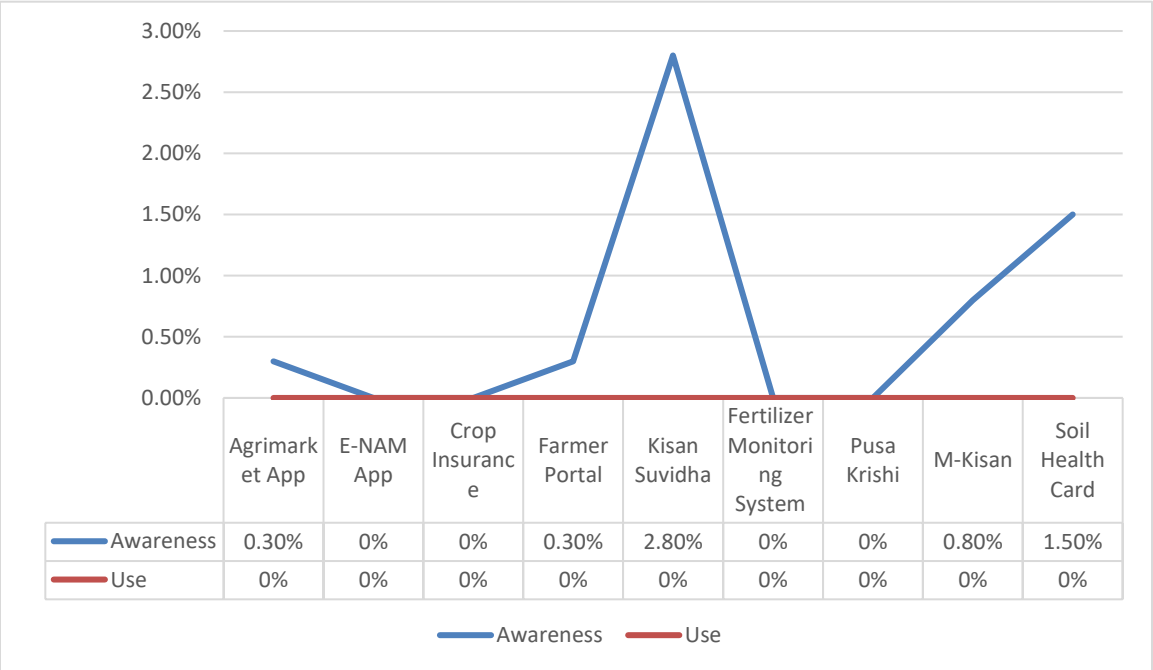
Kol Tribe (22.8% of total sample): Significant portion educated up to the 8th grade (23.1%) and 10th grade (18.7%). Low presence in higher education categories.

Other Tribes (17% of total sample): A relatively higher share in the 8th grade category (32.4%). Only 1.5% of households have education beyond graduation.

Comparative Insights: Gond households have the highest representation in higher education, but the overall percentage remains low. Baiga households face the most significant educational disadvantages, with the highest proportion of illiteracy (24.4%). The Panika and Kol tribes have moderate educational attainment, with a concentration around the 10th grade level. Other tribes follow a similar trend, with a higher percentage reaching middle school (8th grade, 32.4%) but a sharp decline in higher education.

The data highlights educational disparities among tribal communities, with most households not progressing beyond the 10th grade. The Gond tribe has relatively better educational attainment, whereas Baiga households show the highest illiteracy levels. The findings emphasize the need for targeted educational policies and interventions to promote higher education among tribal populations.

Overall Graph of awareness and uses of Digital India Programme related to agriculture in Rural Tribal Communities



	Agrimarket App	E-NAM App	Crop Insurance	Farmer Portal	Kisan Suvidha	Fertilizer Monitoring System	Pusa Krishi	M-Kisan	Soil Health Card
Awareness	0.30%	0%	0%	0.30%	2.80%	0%	0%	0.80%	1.50%
Use	0%	0%	0%	0%	0%	0%	0%	0%	0%

The data presents the awareness and usage levels of various Digital India initiatives related to agriculture among the surveyed tribal population. Here's an analysis of the findings:

Low Awareness Levels: Awareness about most of the digital platforms is extremely low, with no application exceeding 3% awareness among the respondents. The Kisan Suvidha app has the highest awareness at 2.80%, followed by the Soil Health Card at 1.50% and M-Kisan at 0.80%. Other platforms like Agrimarket App and Farmer Portal have a mere 0.30% awareness, while E-NAM, Crop Insurance, Fertilizer Monitoring System, and Pusa Krishi have 0% awareness.

Zero Usage Across All Platforms: Despite some awareness, none of the respondents reported using any of these digital platforms. This indicates a significant gap between awareness and adoption, suggesting barriers such as lack of digital literacy, internet access, infrastructure, or trust in digital solutions.

Common Service Centres (CSCs) are digital access points established under the Digital India initiative to provide various e-governance and digital services to rural and remote areas of India. These centers serve as one-stop solutions for multiple government and private services, helping to bridge the digital divide in underserved communities.

Number of household getting work done in CSC		
Interval	Frequency	Percent
Yes	397	99.3
No	3	0.8
Total	**400**	**100**

High Usage of CSCs: Out of 400 tribal households, 397 (99.3%) reported using CSCs for availing digital services. This indicates a widespread adoption of CSCs, highlighting their significance in providing digital access to tribal communities.

Minimal Non-Usage: Only 3 households (0.8%) reported not using CSCs. This suggests that barriers to CSC access (such as lack of awareness, digital literacy, or physical distance) affect a very small portion of the population.

Policy Implication: The near-universal access to CSCs suggests that Digital India initiatives are effectively reaching tribal households. Further research could explore how effectively these services are utilized and whether any challenges exist despite high adoption rates.

Chi-Square test to examine the association between the usage of CSCs for different services

N of Valid Cases- 397			
Usage of CSC	Pearson Chi-Square Value	df	Asymptotic Significance (2-sided)
Mobile Recharge	5.916	4	.205
TV Recharge	9.442	4	.051
Aadhar	1.463	4	.833
PAN Card	18.518	4	.001
Voter ID Card	18.548	4	.001
Passport	1.233	4	.873
License	2.202	4	.699
Land Related Work	4.088	4	.394
Agriculture Related Work	1.233	4	.873
Rashan Card	12.137	4	.016
Education Related Work	12.593	4	.013
Tickets	1.500	4	.827
Finance Related Work	3.074	4	.546
Pension	4.737	4	.315
Health	1.233	4	.873
Bills	40.755	4	.000
Policy	4.511	4	.341
Entertainment	5.848	4	.211
	Tabulation Value	9.488	

The data consists of 397 valid cases and presents a Pearson Chi-Square test to examine the association between the usage of CSCs for different services. The test results include Chi-Square values, degrees of freedom (df), and Asymptotic Significance (p-values).

The tabulated Chi-Square value is 9.488 at 4 degrees of freedom (df). If the calculated Chi-Square value is greater than 9.488, it indicates a statistically significant association between CSC usage and the corresponding service. The p-value (Asymptotic Significance) indicates whether the association is significant. A p-value ≤ 0.05 suggests a statistically significant relationship.

Statistically Significant Associations ($p \leq 0.05$)

- PAN Card ($\chi^2 = 18.518$, $p = .001$)
- Voter ID Card ($\chi^2 = 18.548$, $p = .001$)
- Ration Card ($\chi^2 = 12.137$, $p = .016$)
- Education Related Work ($\chi^2 = 12.593$, $p = .013$)
- Bills ($\chi^2 = 40.755$, $p = .000$)

Interpretation: CSCs are significantly associated with the services of PAN card, voter ID card, ration card, education-related work, and bill payments, indicating that tribal users frequently access these services through CSCs.

Challenges of Digital India Programme in Rural Tribal Development:

1. Digital Infrastructure and Connectivity Issues

- Poor Internet Penetration: Many tribal areas lack adequate broadband connectivity, making access to digital services difficult.
- Electricity Issues: Unstable or absent electricity supply hampers the operation of digital infrastructure.
- Geographical Barriers: Remote and hilly terrains make it difficult to establish physical ICT (Information and Communication Technology) infrastructure.

2. Socio-Economic Barriers

- Low Digital Literacy: Many tribal populations are unaware of how to use digital services effectively.
- Economic Constraints: High costs of smartphones, computers, and internet services limit access.
- Language and Cultural Barriers: Digital content is often available in dominant languages like Hindi and English, which may not be understood by many tribal communities.

3. Technological Challenges

- Lack of Digital Infrastructure in Public Institutions: Government offices and schools often lack digital resources.
- Cybersecurity and Data Privacy Issues: Many rural tribal individuals are unaware of cybersecurity threats, making them vulnerable to online fraud and data exploitation.
- Limited Availability of Localized Digital Services: Essential e-governance services and mobile applications may not be tailored to the needs of tribal communities.

4. Policy and Implementation Gaps

- Slow Execution of Government Initiatives: Many Digital India projects face delays in implementation due to bureaucratic hurdles.
- Lack of Skilled Manpower: The shortage of trained professionals in rural areas affects digital service delivery.
- Ineffective Awareness Campaigns: Government efforts to promote digital adoption among tribal communities often do not reach the intended beneficiaries.
- Financial Exclusion: Limited access to banking and digital payment infrastructure hinders financial inclusion efforts under Digital India.

5. Social and Cultural Resistance

- Mistrust in Digital Transactions: Many tribal people prefer cash transactions over digital payments due to fear of fraud.
- Traditional Practices vs. Digital Adoption: Tribal communities often rely on traditional knowledge systems, making digital adoption slower.

Conclusion

The huge country of India is home to individuals from many diverse communities. Tribes make up a sizable portion of India's population. Tribal communities lack access to and use of information and communication technologies due to their economic and educational backwardness. Information and communication technology access and use require educational and economic empowerment. Digital India is a very extensive program with the goal of making

India a knowledge economy and society empowered by technology. For the development of tribal society, all programs under this program must be made accessible to the tribal communities. Tribal tribes are only using these centers for minimal tasks, thanks to CSC's facilitation. Tribes must be made aware of the various benefits of CSC so they can use these facilities for their own development without hesitation or fear.

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