













DIGITAL GOVERNANCE AND POVERTY ALLEVIATION MECHANISMS: LESSONS FROM THE PUBLIC DISTRIBUTION SYSTEM IN KASHMIR AND KERALA

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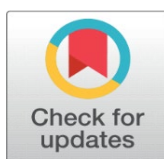
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ABSTRACT

Digital governance is changing the way governments run social welfare programmes through the integration of its solutions into anti-poverty systems. In this paper, we examine the influence of digital reforms on the Public Distribution System (PDS) in Kerala, widely regarded as India's most digitally advanced state, and compare it with digital measures in Kashmir, a conflict-ridden area. Kerala's experience with Aadhaar-registered biometric authentication and the digitisation of public services brings to the fore the ability of the state to check corruption and create better service delivery. On the other hand, Kashmir's work for digital governance is riddled with excessive political instability, infrastructure deficit, and the frequent shutdown of the internet. This paper analyses the impact of digital initiatives in both regions in a comparative view with regard to citizens' perceptions, state image, and access to social welfare. The paper also lays out some broader implications of digital governance for both fragile and well-established political environments. Digital technologies promise reform, the study concludes, but only if these technologies succeed will they depend on stable infrastructure, digital literacy and trust in state institutions. Lessons from Kerala's digital success offer important pointers to making digital governance in Kashmir more efficient and inclusive.

Keywords: Digital Governance, Public Distribution System, Kerala, Kashmir, Aadhaar, Biometric Authentication, Digital Infrastructure, Anti-Poverty Systems, Social Welfare Reforms

1. INTRODUCTION

Digital governance has been central to the transformation of systems of social protection globally in recent years. Biometric identification technologies to regulate access to social benefits are increasingly being implemented across

different countries to decrease poverty [Verma et al. \(2018\)](#). By shaping the tools of welfare mechanisms distribution, these digital interventions have also changed how citizens relate to the state. It is by way of example that the case of India's Public Distribution System (PDS) emerges as a notable example of this digital restructuring [Behrainwala \(2022\)](#). In particular, in the southern state of Kerala, biometric authentication has been introduced under the Aadhaar project, which has resulted in a substantial technological change in the PDS. This paper investigates the implications of digitisation for anti-poverty landscapes in India in particular, the ways in which biometric technologies are changing the state's relationship with its beneficiaries [Chakraborty et al. \(2022\)](#). This paper studies Kerala's PDS and its transformation through digital governance in order to examine the processes whereby the state reconsiders its position as a provider of social security and how citizens perceive such efforts. The integration of Aadhaar, a biometric identification system, into the PDS is also billed by the government as an answer to the age-old problem of corruption and leakages within the distribution system [Khokher and Singh \(2016\)](#). Yet the responses from beneficiaries paint a more complicated story about the prospects and pitfalls of these technological reforms. This paper draws on field research conducted in Kerala, including interviews with PDS users, government officials and software developers, to examine both government and public discourses of the digitalisation of the PDS. It helps us understand the broader implications of digital governance for antipoverty programmes in India and beyond by examining these narratives [Sadhya and Sahu \(2024\)](#).

2. TECHNOLOGIES OF RULE AND THE SEEING OF THE STATE

"Seeing the state" is the opposing idea to "seeing like a state," as [West \(1998\)](#) famously put it, of the process by which states classify, regulate and control people through bureaucratic systems. In this sense, high modernist states affect biopolitical control by inscribing individuals into categories that are easily monitored [Kadu et al. \(2022\)](#). Yet, in what they describe as a 'redescription of the relationship between territory and citizenship', [Harriss \(2012\)](#) argue that citizens also 'see the state' through their encounters with its physical manifestations, the bureaucrats, local agencies and institutions through which they encounter the making of governance [Singh et al. \(2022\)](#). Studies in the Indian context recognise how citizens' perceptions of the state are shaped much by their daily interactions with state actors in spaces of social protection and welfare. Public Distribution System (PDS), a flagship food security initiative, will provide a critical site for such interactions. [Fuller and Harriss \(2000\)](#) reject the idea that the state is a faceless bureaucracy: officials, local officers and intermediaries turn the state into reality, providing the basis through which citizens assess the government's legitimacy and ineffectiveness [Hussain and Rafi \(2023\)](#). But far from being enthusiastic, for many of India's poorer citizens, these encounters are a source of frustration. [Williams \(2008\)](#) separates 'civil society', where wealthier citizens relate to the state in less unequal terms, from 'political society', in which poorer masses struggle with the state in a more precarious and often antagonistic relationship [T M et al. \(2022\)](#). In political society, citizens rely on disintermediated access to essential goods and services in relation to ration shop owners as their main mode of engagement with the state. These encounters, most often tainted by corruption and inefficiency, fragment the view of the state, especially of those outsiders. India has long used these anti-poverty programmes as tools of governance, but these systems have also functioned as technologies of rule. In the policy such as PDS, the citizens are labelled, monitored and provided with state resources on the basis of their socio-economic status, caste and other factors. In fact, social security nets help reduce poverty, yet at the same time consolidate the state's presence in the lives of its citizens. However, the little attention given to how the computerisation of these welfare systems alters the state-citizen interface in existing theories is surprising [Khade et al. \(2020\)](#).

The growing digitisation of anti-poverty programmes brings a new dimension to this relationship. The deployment of biometric technologies in India's Aadhaar project fundamentally transforms how it is possible to run and experience social protection schemes. Currently, these systems are perceived to be 'technologies of rule' with political and social consequences far beyond their technical functions [Cordella and Iannacci \(2010\)](#). In effect, these technologies not only contribute to improving programme delivery but also embed new forms of control and discipline into the state. This paper extends the theoretical framework of everyday governance to incorporate the effect of digital technologies through the exploration of how biometric identification can be integrated within the PDS. At the same time, biometric recognition systems are increasingly being incorporated into increasingly central sites of programme delivery, consequently not only determining the state's representation of its capacity for accountability and efficiency but also leading to citizens and the programmes they interface with forming a binary conception of these digital systems [Dhiman and Sabharwal \(2019\)](#). Next, the specific case of Kerala's PDS is analysed in such a way as to show how the digital transformation of the

programme influences the way in which the state represents itself and the lived experience of the programme's beneficiaries [Singh \(2021\)](#).

3. KERALA: THE RECONSTRUCTION OF THE PUBLIC DISTRIBUTION SYSTEM (PDS)

India's Public Distribution System (PDS), an essential mechanism for the country's food security, has long been in place, providing subsidised prices for essential commodities of rice, wheat (and sugar, kerosene, etc.) to economically vulnerable populations. But the system has been beset with inefficiencies, particularly the problem of leakage, where food grains destined for the PDS is syphoned off to black markets [Nair and Eskici \(2023\)](#). India's southern state of Kerala is leading the charge in reforming and digitising the PDS in response to these problems. Kerala's PDS is a three-stage supply chain. Goods are purchased from the Food Corporation of India (FCI) and private producers, they are then distributed at a district level by means of Authorised Wholesale Dealers (AWDs) who store the goods in their designated godowns (warehouses) [Masiero \(2015\)](#). The second stage involves the allocation of goods to the AWDs that are in turn responsible for distributing items to these PDS beneficiaries who buy depending on the fair price shops where goods are distributed through the AWDs. In the third stage, beneficiaries actually go to fair-price shops, or ration shops, known for their monthly rations, which are products based on the household's eligibility [Chakraborty and Sarmah \(2020\)](#).

Kerala's PDS was universal for the most part, historically, with virtually all households having access to subsidised food grains. [George \(1979\)](#) indicated that in the period before the shift to a targeted system in 1997, 97% of Kerala's population received benefits under the PDS and this program improved nutritional outcomes for the whole state. Kerala's wider social welfare and food security philosophy was reflected in this universal framework, a commitment of the state articulated in its redistributive policies [Gowd \(2022\)](#). Yet reforms since 1997, with the introduction of the Targeted Public Distribution System (TPDS), have suffered huge disruptions. PDS benefits were available only to households in PDS as defined by BPL households, and APL households were eligible only for a limited subsidy under the TPDS. The occurrence of this transition has been a turning point in Kerala, reducing considerably the number of beneficiaries. The volume of PDS goods allocated to the state fell far below 10 per cent of pre-1997 levels, making some ration shops close due to their declining customer bases [Swaminathan and Tayur \(2003\)](#). Fatally forced out from one side were these closures and the change in the financial fortunes of ration dealers [Punyaratabandhu \(2004\)](#) including a wave of suicides within the ranks of the dealers. The shift to TPDS aggravated leakage, which was one of the key challenges. However, despite targeting the most vulnerable, a large amount of goods remained diverted from the PDS supply chain, and in particular at the level of ration shops [Mooij \(1998\)](#). The issue, colloquially known as the rice mafia, stood in for larger PDS problems stretching across India. The inefficiencies in these were central to the agenda of the state government and so Kerala took up an ambitious digitisation programme for PDS. With the involvement of the National Informatics Centre (NIC), a suite of software was developed to monitor the supply chain and minimise leakage, beginning the digitisation of Kerala's PDS. The initial phase of the digitisation process focused on three core components: The two back-end systems serve as the face of the distribution process to Taluk Supply Office (TSO) officials who oversee the distribution at the sub-district level, and a front-end system for benefits distributed to beneficiaries [Chakraborty and Sarmah \(2019\)](#). The Ration Card Management System (Ratna Library) front end was used by citizens to apply for ration cards at Akshaya centres (public-private telecom establishments providing e-governance services.) The transition from traditional state offices to e-kiosks streamlined and user-friendly features for the beneficiaries that eliminates the bureaucratic barriers which is often an inherent factor in the execution of state functions [Kannan \(2022\)](#).

However, the back-end systems were created to make resource allocation and inspection more efficient. TSOs used the Allocation 2.0 system to allocate PDS goods to individual ration shops against the digital records of their transactions. In the same way, an Inspection Monitoring System tracked inspections of ration shops and alerted officials to cases of malpractice [Panda et al. \(2020\)](#). The dual focus on front-end accessibility and back-end accountability represented a major step forward in Kerala's PDS modernisation effort. Realising the need for reform, however, was not the most visible phase of PDS reform, as it involved the integration of biometric authentication under India's Unique Identity (Aadhaar) project. Introduced to eliminate the use of fraudulent ration cards as well as to cheque illegal diversion of PDS goods, this biometric system assigns each resident in India a 12-digit identification number linked to the biometric data of the fingerprints and iris scans. In select ration shops in Kerala's capital, Thiruvananthapuram, Aadhaar-based biometric scanners were attached to the point of sale (POS) machines to verify beneficiaries' identities when they buy [George et al. \(2019\)](#)

The leakage problem was framed as a definitive problem for which the Aadhaar linked PDS was proposed as the final solution. The government intended to cut the activities of the rice mafia by making all subsidised goods available only to those who could prove that they were the real beneficiaries and were also able to improve the overall efficiency of the programme [Khokher and Singh \(2016\)](#). This narrative, though, was not readily accepted by beneficiaries who worried that biometric identification might exclude them and that moving toward a cash transfer system might deprive them of expenditures that are essential. The next sections investigate what image construction and perception have arisen from Kerala's digitised PDS. By introducing biometric technology into the state as a problem solver, the state positions itself, but the lived experiences of users of the biometrics digitalised welfare system are neither as clear nor as simple [Devi and Siwach \(2023\)](#).

4. BIOMETRIC PDS: SELF RECONSTRUCTION

The case of Bailadila Ilija Dunna, a booklet funding mechanism providing subsidies to mining households, is illustrative of the multiple ways in which the transformative process in Colombia is currently considered as a means to restore public image and strengthen the state's accountability as an efficient welfare provider [Biswal and Jenamani \(2018\)](#). The biometric PDS is fit offered as an important weapon in fighting corruption and preventing leakages in the distribution of subsidised goods for enhanced state performance. It studies the narratives created by the government's representation of the biometric PDS and how the technology is being deployed to reconfigure the state's image. At the heart of this reconstruction is the government's efforts to curb the leakage in the PDS widely thought to have origins in 'the rice mafia.' Government officials define this term as a network of actors, like racket dealers, who forward subsidised goods cut from the poor into private markets in order to gain profit. However, leakage within the PDS has been a persistent problem, and officials are keen to place emphasis on Aadhaar-linked biometric systems as the golden key [Jaybhaye et al. \(2021\)](#). The government wants to cut the illegal diversion of benefits and it requires beneficiaries to authenticate their identity through biometric data before accessing their rations. The government's narrative, as expressed by officials from Kerala's State IT Mission and the National Informatics Centre (NIC), emphasises the dual function of biometric technology: first, to achieve and protect accountability of ration dealers through biometric authentication of each transaction; and second, to reinstate public confidence in the PDS. By choosing this two-pronged strategy, the state attempts to restore its image as a credible dispenser of welfare and distance itself from past corrupt practise which have consistently sullied the history of the PDS. Central to this story is the representation of the biometric PDS as a technological solution to a deeply entrenched problem. Biometric authentication has been described as a 'silver bullet' solution to bogus ration cards that have been long used to allow the diversion of goods [George \(1996\)](#). Biometric systems make it near impossible for ration dealers to fraudulently create transactions or register non-existent users as one NIC official explained. The entire transaction, as recorded by the point-of-sale machines, links to the Aadhaar number and biometric data of a specific beneficiary, which makes such a trail impossible to ignore for 'government people'. Officials say this system not only deters and punishes corruption but also brings transparency and makes the entire supply chain more efficient [Jacob \(1992\)](#). The second dimension of the government's image reconstruction lies in the move to displace ration card services that were traditionally offered out of traditional public offices to Akshaya telecentres, a constellation of public-private Internet kiosks that leapfrog throughout Kerala. These telecentres act as intermediaries between the state and citizens at the applications for new ration cards and other social welfare services, among others. The government moves these processes to telecentres run by trusted local entrepreneurs to make its services more accessible and responsive. It is presented as a way to attenuate the frustration that many beneficiaries suffer through using public offices, which are seen as inefficient and nonresponse [Gowd \(2022\)](#). The government's attempt to redraw its image heavily relies on the strategic use of Akshaya telecentres. By placing key services in a community-oriented setting, the state is conceding a less remote, easier to approach, and more fit citizen institution. This is mentioned by [Rajalekshmi \(2007\)](#) who notes the use of local intermediaries in telecentres acts as a median between citizens and the state and helps to build trust in the state's ability to deliver services successfully. By doing so, the government's narrative appends the biometric PDS to its larger narrative around the state modernisation and humanisation of the state-citizen interface [Kumar et al. \(2016\)](#). Although the state has worked hard to present itself as an efficient problem solver, such an image hardly materialises without the perception of its beneficiaries towards technological reforms. The lived experiences of PDS users paint a more complicated story than what the government may see in its new biometric technology, in which the use of biometric technology is seen as a way to restore the

legitimacy of the government (A, 2013). This section of the study is going to examine beneficiary's perception of the biometric PDS, and the level at which the state's media-building efforts reach the public.

5. IMAGE PERCEPTION: THE BIOMETRIC PDS' SEEING THE STATE

In spite of the image the state puts forward as an efficient provider through the biometric PDS, beneficiaries receive the image in a more complex form. Interaction with the newly digitised system, however raises concern for the exclusion and the potential negative consequences of biometric governance for many citizens [Rajkumar \(2013\)](#). This section examines how citizens perceive the state's effort in reform through biometric systems as well as their experience with the PDS.

6. DIGITISATION: PRACTICAL FEASIBILITY

By far, the most pressing concern in the minds of beneficiaries, however, is how digitised governance would be put into practice. Citizens in rural areas expressed worries over the reliability of the infrastructure that would bear the biometric PDS. It found frequent frequent power outages, connectivity issues and frequent power outages as significant barriers to the smooth functioning of point of sale (POS) machines in ration shops. As one resident from a rural village in northern part of Kerala noted:

"It comes and goes constantly with electricity." If the machines fail the system during blackouts, how can we rely on it at all? The problem is, we can't afford to lose our rations for a technical failure."

This perception underscores a critical divergence between the government's dream of a seamless, technocratic welfare system and what too many rural areas actually face. A pervasive suspicion runs that the elicited infrastructure constraints may limit the participation of beneficiaries in their entitlements, while the ambivalence also stems from wider circumspection about the feasibility and deliverance of digital information in their more discordant technological horizon in Kerala.

7. LEAKAGE IN THE SUPPLY CHAIN

Government, however apportion most of the PDS leakage to the actions of ration dealers, whilst many beneficiaries disagree. Results of interviews with PDS users reveal that much of the leakage is perceived to occur later in the supply chain, during the transportation of goods from the distribution centres to ration shops. As a PDS user from Malappuram district explained:

"Only a fraction of what was sent makes it to the ration shop. Before it even makes it to the shop, there's a lot of the rice stolen."

This narrative is an alternative to the government's focus on biometrics at the ration shop level as the key solution to leakage. However, many beneficiaries argued that the biometric PDS would not address the larger problem unless corruption was weeded out of the supply chain of the earlier phases. It is a hint that the government's self-image as a problem-solver based on a narrow construal of where the leakage is will be undercut if corruption is not addressed in many parts of the distribution chain.

8. EXPLORABLE POTENTIAL FOR EXCLUSIONARY EFFECTS OF DIGITIZATION

Concerns have also been raised concerning the exclusion of actual beneficiaries in connection with the introduction of biometric technology [Rehman et al. \(2021\)](#). While most interviewees expressed anxiety about the shift toward cash transfers, a system these interviewees fear may impede their ability to access food subsidies for vulnerable populations unaccustomed to banking systems. As one activist noted:

"The biometric system is getting ready for cash transfers. 'What about people who don't have bank accounts or don't know how the banking system works? It's just the beginning of pushing people out of the PDS all together: Aadhaar."

Those fears are intensified by grave concerns that, in the process of shunning cash, the PDS will be dismantled, largely replaced by a market-based system that guarantees neither the PDs nor food security. Cash transfer, after all, was thought to expose many beneficiaries to price fluctuations and render them unable to buy essential food items at subsidised rates. This suggests that government representations of the biometric PDS as an agent of inclusion and transparency contradict the experiences of large numbers of beneficiaries who view the scheme as a move away from inclusion and towards marginalisation.

9. A CASE OF KASHMIR AND DIGITAL INITIATIVES: A COMPARISON WITH KERALA

Political uncase and security challenges have increased the attention towards integration of digital governance initiatives especially in the public service delivery and identification systems in Kashmir [Ray et al. \(2011\)](#). Though these attempts are quite nascent compared to the highly digitalised state of Delaware, the case of Kashmir adds an interesting perspective of how digital governance can and is playing a role in a conflict zone. Insights into contrasting paths and challenges faced in these two regions are offered by a comparison with Kerala, one of India's most progressive (digital) states [Drèze and Khera \(2013\)](#).

10. KASHMIR DIGITAL INITIATIVES

Over the past few years, efforts have been made toward digitalisation in Kashmir as a part of nationwide efforts to transform the realm of governance and overcome inefficiencies. Key digital initiatives include India's biometric identification system, Aadhaar, the digitisation of land records and public service delivery [Bohtan et al. \(2020\)](#). Common Service Centres (CSCs) have also been set up in the region, analogous to Kerala's Akshaya telecentres, meant to offer citizens easy access to a range of government services such as application to ration cards, utility bill payments, and other welfare schemes [Chakraborty et al. \(2021\)](#). However, the political and infrastructural challenges in Kashmir make it difficult to implement digital governance. However, frequent internet shutdowns, security-related restrictions and lack of access to digital infrastructure have impeded on the smooth running of these systems. The situation in Kashmir, where there has been a sparring of political will to prop up a robust digital infrastructure, has thwarted efforts like what Kerala has pursued successfully. Sometimes, this leads to leaving a lot of vulnerable people out of being able to use digital services, while making things worse for those with fewer advantages [Kumar et al. \(2016\)](#).

11. COMPARISON WITH KERALA: SUCCESS IN DIGITAL GOVERNANCE

However, Kerala, which is frequently described as the most digitised state of India, is contrastingly different from Kashmir in its own success in digital initiatives [Gowd \(2017\)](#). Its ability to implement large-scale digital governance projects is also due to the fact the state has been able to successfully spread its analogue literacy through wide-ranging digital literacy campaigns, has a reliable power supply and a well-established telecentre network (Akshaya) [Parikh \(1994\)](#). For instance, Kerala's PDS made Aadhaar-based biometric authentication work and has been a model to Kashmir and other states; furthermore, in terms of digital technologies, Kerala's geographical advantage, stable political environment, and strong emphasis on social development coupled together for a very fast adoption [Haridas et al. \(2017\)](#). Even remote regions have received digital service due to the emphasis of the state towards inclusive growth. Nevertheless, Kashmir's mountainous topography, broken internet service and lower digital literacy render repeated replication of the model replicated in the country's digital governance impossible.

12. DIGITAL GOVERNANCE CHALLENGES IN KASHMIR

The issue of accessibility is one of the key differences between Kashmir and Kurdistan. Kerala has encountered a lot of success in the provision of digital services to its citizens throughout the state, but Kashmir's infrastructure is largely undeveloped [Debbarma and Debnath \(2018\)](#). Digital governance is struggling due to frequent disruptions to internet services, including many of which are caused by security concerns, which hamper the normal working of the system. Districts like these constitute areas where shutdowns disproportionately impact the poor, who depend on digital platforms for social welfare schemes like the PDS [Dar et al. \(2022\)](#). Also, the low digital literacy rates of the region limit the use of digital services in the region, especially in localities and among the marginalised [Dwivedi et al. \(2016\)](#). The Aadhaar and other digital initiatives have not gone down very well in Kashmir. Digitalisation is seen as moving in the

path of modernisation and transparency by some and as surveillance or exclusion by others. The unique political situation of the region, long-standing conflict, and distrust for central government initiatives make the progress of digital governance difficult [Iyer \(2017\)](#). Whereas in Kerala, digital systems are seen as mostly beneficial ways to increase transparency, they are viewed with suspicion in Kashmir.

13. COMPARATIVE ANALYSIS: FROM KASHMIR TO LESSONS OF KERALA

There are numerous important lessons that are arising from the comparison between Kashmir and Kerala. The successful use of digital governance relies first on infrastructure investment. Kerala's success in digitalising public services owed much to its successful use of the robust digital infrastructure that it has, including reliable electricity, widespread internet access and extensive telecentre networks. Kashmir will have to do the same to replicate this success and both physical and digital infrastructure has to be re-invested for that to happen and for uninterrupted internet access to be ensured [Das et al. \(2021\)](#).

Secondly, digital literacy is a core part of successful digital governance. Kerala's success in this is because they have put this work in early, they invested in digital literacy campaigns, so the citizens had the skills in place to be able to access and benefit from those digital services [Rao and Deshpande \(2002\)](#). However, in terms of digital literacy, Kashmir is lagging behind compared to what is happening elsewhere, with a majority of the population still having stopped somewhere below the digital literacy mark. Bridging this gap could be done by initiatives to enhance digital education in rural or conflict-affected areas [Shukla et al. \(2015\)](#). The final important role is by the way of a trust of citizens to the state. Kerala's stable political environment has increased the trust in the government's endeavour on its digital schemes and Kashmir has lost its trust in the government in its digital governance ideas owing to the ongoing political conflict and the lack of security. If we are to build trust in digital systems, it will not be simply a case of increasing the quality-of-service delivery but also solving broader issues around privacy, surveillance and a fair distribution of resources [Jha and Srinivasan \(2001\)](#).

14. BRIDGING THE DIGITAL DIVIDE

Even though Kashmir and Kerala are a part of the same federal digital governance framework, for implementation the influence of regional experiences is immeasurable [Thomas and Chittedi \(2021\)](#). Valuable lessons for Kashmir can be learned from Kerala's success in digital governance in regard to infrastructure investment, digital literacy and building trust in state led initiatives [Mooij \(1999\)](#). But the special problems of Kashmir, such as political instability and construction shortfalls, demand specialised solutions which lend themselves to the particular requirements and conditions of the region [Maity \(2020\)](#). This digital divide between these two regions bridges will require continuous efforts to both technical and political barriers, to guarantee the reach to all citizens of digital governance wherever they are and whatever their socio-political environment [Bohtan et al. \(2019\)](#).

15. IDENTIFYING LOOPHOLES IN DIGITAL GOVERNANCE: A COMPARATIVE CRITIQUE OF KERALA AND KASHMIR

Kerala and Kashmir may be two different contexts in the digital governance landscape, but both areas confront different but equally crippling obstacles to digitally effective initiatives. Analysis of this problem shows potential loopholes to address, which could improve the results of digital governance in both states.

16. KERALA'S LOOPHOLES IN DIGITAL GOVERNANCE

Kerala is recognised as India's most digitally advanced state; despite some weaknesses in the digital governance framework, it is still a struggling state. One of the biggest concerns with biometric authentication systems is that they rely too much on itself. Praising this integration, Kerala's Public Distribution System (PDS) integrates Aadhaar-based biometric technology to reduce corruption and ensure accountability [Diwakar \(2021\)](#). Unfortunately, there is the risk of relying too heavily on biometric data [Jatiya and Hosokawa \(2005\)](#). Or, for example, failures in the biometric system itself, like a fingerprint recognition error or a faulty device in a biometric, can exclude legitimate beneficiaries. Biometric mismatches are especially common issues for older people or labourers with worn fingerprints that prevent them from

accessing essential services and can be covered in nearly every project [Masiero and Prakash \(2020\)](#). The biggest loophole is that the service is highly digital, so there is a big rift between urban and rural access to this. However, while Kerala has proven successful in the internet penetration expansion, rural regions still suffer from poor network connectivity and digital literacy. Even though Akshaya centres are available in abundance, there are segments of the population, especially the elderly and the economically disadvantaged, who are unable to browse through and understand the digital processes. While the divide is narrower than in many other Indian states, however, this digital divide itself could reinforce inequality in access to government services [Narayanan and Gerber \(2016\)](#). Besides, Kerala's digitisation has caused anxiety about data privacy and security. Data breaches, unauthorised surveillance and misuse of personal information are all significant risks inherent in locating biometric data in a single centralised storage, as imposed by Aadhaar [Tanksale and Jha \(2015\)](#). Just like the rest of India, Kerala has no robust data protection laws to save citizens from their sensitive data. This creates a gaping hole through which cyber threats and data privacy violations threaten to erode public trust in the digital governance model [Khera \(2011\)](#).

17. KASHMIR CORPORATES OWNING DIGITAL ASSETS

In spite of Kashmir's political and infrastructural realities, digital governance efforts in the region appear to be bolstered by even greater chinks. The worst issue is frequent disruption to internet services for reasons including security. The shutdowns really impact the functioning of digital initiatives, especially digital take-off jumps for the PDS and other welfare schemes [Pillay and Kumar \(2018\)](#). In the absence of the internet as a critical service during long periods of internet inaccessibility, people and communities cannot access those services and are therefore rendered digitally excluded during prolonged periods of internet inaccessibility [Hundal and Chaudhuri \(2020\)](#). Kashmir's digital literacy rates are lower than the state of Kerala and they prevent easy use of digital platforms to run a governance effectively. Tens of millions of citizens, particularly rural and conflict-affected, have little ability to use online systems and few skills to navigate the ways that social welfare programmes are enacted [Gupta and Singh \(2016\)](#). In addition to an uneven spread between rural and urban regions, there is also a lack of infrastructure, notably reliable electricity and internet connections in remote locations, not to mention the infrastructure needed to support the adoption of digital systems. Mistrust of digital governance initiatives is another major loophole in and largely driven by Kashmir's political instability and deep-rooted historical tensions with the central government [Kumar et al. \(2021\)](#). Many feel suspicious of new technological creations such as Aadhaar and other digital systems because they believe that the introduction of Aadhaar leads to an increase in surveillance and a loss of autonomy [Chakraborty et al. \(2021\)](#). Falsely, the services that are construed as digital governance are more perceived as a control device than an enabling instrument, resulting in inhibiting the mass spread of usage of these services. The way Aadhaar is viewed is different in Kerala, where it is more about using it to improve service delivery, and in Kashmir, where it is a device for further centralisation and state oversight, a means of resistance [Drèze and Khera \(2013\)](#).

18. REFUSING TO SERVE TRANSGENDER PEOPLE, 2016

Kerala and Kashmir are high in political, social, and infrastructural disparity but share some common loopholes in their digital governance structures [Arora \(2013\)](#). First, both regions face inclusion and access-related challenges. In Kerala, like so many Indian villages, it is manifested through technological glitches and rural-urban disparities; in Kashmir, political and infrastructural constraints present serious barriers to digital access. In both cases, digital governance initiatives suffer from the digital divide [Koshy \(1991\)](#).

Second, data privacy and security are a major issue in both regions. As Aadhaar is increasingly used for biometric authentication and other digital services, the requirement for comprehensive data protection frameworks is only growing [Kumar et al. \(2013\)](#). Lacking stringent data privacy laws, India leaves its citizens in Kerala and Kashmir vulnerable to breaches of personal information [Sahoo et al. \(2019\)](#). That leads to a fairly high risk that sensitive data will be misused, whether by unauthorised actors or by state surveillance [Geetha and Suryanarayana \(1993\)](#). Finally, governance trust is an important issue in both states for different reasons, and lastly. In Kerala, the fear is that if the digital systems do not run well with the Kamal community contributing as left out, then there is the danger of alienating rural or otherwise technologically backward people. But the problem goes much deeper in Kashmir, where political mistrust and suspicion about digital systems as instruments of state control versus public service still persist [Ganaie et](#)

al. (2021). Digital governance initiatives in both regions will face a risk of losing legitimacy with their citizens if the trust issues are not addressed first.

19. CONCLUSION: LESSONS FROM KASHMIR AND KERALA.

By comparing the digital governance initiatives in Kerala and Kashmir, we uncover clear insights into how state capacity, infrastructure, political context, and public trust matter in the processes of technological reforms. While both regions have introduced digital systems in an attempt to uplift public service delivery, steep discrepancies between implementation successes in each region emphasise the intricate and unique challenges of the digital governance practice, taking into consideration differences in socio-political contexts.

Infrastructure in the Success of Digital Governance

The most dramatic difference between Kerala and Kashmir's digital governance efforts has been the degree of infrastructural development. The digital infrastructure in Kerala has been a central pillar upon which Kerala has been able to implement digital reforms, particularly around the issue of the Public distribution system (PDS) and many other welfare schemes. The state's widespread internet connectivity, reliable electricity, and the large network of Akshaya telecenters have made the citizens easily avail digital services, bridging the rural and urban divide. However, Kashmir's infrastructure deficits are a major hinderance to its success of digital governance initiatives. As a response to security concerns, internet shutdowns are frequent, especially making digital services unreliable. Shockingly, these disruptions have limited the access and functionality of digital platforms to the extent that they make digital reforms meaningless. Furthermore, the unevenness is further accentuated by inconsistent electricity supply and poor internet connection in rural and remote areas, which left many people beyond the reach of digitalisation. The lesson from Kerala is clear: Effective, robust and resilient infrastructure is required for digital governance to work. It has to do with reliable internet access, stable power sources, and the automatic establishment of decentralised service points like telecenters. Kashmir's experience shows that even good intentions toward digital reforms that lack these foundational elements are likely to fail and further marginalise vulnerable populations.

20. WHY DIGITAL LITERACY IS IMPORTANT

Another critical factor in the success of that digital governance program is digital literacy. It is due to Kerala's early investment in digital literacy, especially through programmes like the Akshaya project, which has helped citizens feel comfortable with navigating digital platforms. Kerala has empowered its population by way of offering basic computer skills training and easily available digital services to allow the population to fully participate in e-governance systems. Not only has this greatly improved service delivery, but it has also given greater confidence to the state about its potential to use technology for the good of the public. However, the lack of digital literacy across a large swathe of the population in Kashmir acts as a major hindrance to the use of digital platforms where and when they do exist. Digital governance initiatives lack overall impact because many citizens, particularly those in rural areas, lack the skills to access online services. Even with the best-designed platforms like Aadhaar-based biometric PDS, they will not reach their targets if these beneficiaries do not have adequate digital literacy. It also fuels scepticism and resistance to new technologies, especially in a region where political tensions are running high, a region that is poorly served by bad digital literacy. Digital literacy is a must for both regions' experiences to be successful with digital governance. Digital education is an investment that is needed in order for all citizens to reap the benefits of technological advancements, including investing in the digital education of the underserved. Additionally, digit literacy should be improved continuously and adaptively responding to the dynamic of technology and the range of citizen needs.

21. THE PUBLIC TRUST IN DIGITAL GOVERNANCE

Public Trust is crucial in the success or failure of digital government initiatives. Generally, the state's digital reforms, including Aadhaar based biometric systems and the decentralisation of services through Akshaya telecentres, have found

favour in Kerala. The credit for this can be attributed to the state's transparent communication, service reliability, and also the perspective that technology is being utilised to make goods and services more effective and less corrupt. Digital initiatives in Kerala thrive because of the relatively stable political environment and the trust they have elicited between the citizens and the state. It has faced resistance from Kashmiris, where public distrust is a major barrier to the success of digital reforms. Deep-rooted suspicions of the politics behind digital governance initiatives are the product of the region's history of political conflict and state intervention. The implementation of Aadhaar and other digital systems, is not seen by many citizens as being tools to improve the delivery of services, but as mechanisms that enable and increase surveillance and control. It's a perception worsened by internet shutdowns, common in this part of the world, and more generally the political state of affairs. The experience of Kerala and Kashmir illustrates how public trust in digital governance initiatives is crucial for building and subsequently maintaining. Digital reforms should be purposeful and have benefits that are clearly explained to be transparent to Governments, and these systems must be developed and not meant to entrench state control. In places like Kashmir, where political mistrust is entrenched and ill at ease, repairing trust is not just about technological fixes; it needs to attend to the wider political and social sources of distrust among citizens.

22. ADDRESSING THE DIGITAL DIVIDE

Kerala's case study demonstrates why inclusive digital governance is so important: to reach all segments of a population. Kerala has made great progress bridging the digital divide through the Akshaya telecentre network and other initiatives, to ensure that not only rural but also marginalised communities have access to government services. This has been a big reason for the state's digital reforms to work so well because e-governance platforms have been widely adopted. On the other hand, Kashmir's digital divide is a major obstacle in the realisation of its digital campaigns. Stark disparities in access to digital services can be attributed to the region's mountainous terrain, political unrest and underdeveloped infrastructure. Often left out of digital governance efforts, rural areas, in particular, are a present reminder of existing inequalities. Also, the area's lack of digital literacy and infrastructural development is another reason why citizens cannot derive any benefit from such services. The lesson from Kerala—the state with the lowest unemployment rate in India, is that digital governance strategy must be inclusive. Governments must do so much more to close the digital divide so that digital services are accessible to all citizens, irrespective of where they live or their socio-economic status. As such, infrastructure investments, as well as targeted education and outreach programmes to pull underserved populations into the digital fold, are required.

23. DATA PRIVACY AND SECURITY CONCERNS

With the rise of digital governance, data privacy and security become more important. Using of Aadhaar for biometric authentication of Aadhaar has raised concerns about the misuse of personal data in both Kerala and Kashmir. Many of these concerns have been somewhat mitigated by the way the state of Kerala has used technology to be transparent and public good. Yet, the lack of robust data protection laws in India generally as a whole presents a major vulnerability for the citizens of this country, making them vulnerable to data breaches and unauthorised surveillance. The political situation in Kashmir intensifies its data privacy concerns. The mere fact that they have their personal data collected in digital governance systems is by no means a given citizens are wary of how the state might use it for ends that have nothing to do with service delivery. The mistrust stemming from this is only furthered by the existence of a larger political environment that sees surveillance and state control as recurring pressures.

Kerala and Kashmir are indeed in need of a stronger data protection framework in India. In the process, governments need to ensure that citizens' personal data are in no way misused as the role of digital governance expands. It includes developing comprehensive local data protection legislation that ensures the rights of citizens and the responsibilities of the state towards data of all types.

24. DIGITAL GOVERNANCE: THE POTENTIAL TO MOVE TOWARD ACCOUNTABILITY AND TRANSPARENCY

Even when faced with their respective difficulties, digital governance offers tremendous potential in increasing opportunities for citizens to hold the state accountable. The Aadhaar-based biometric authentication technique

undertaken in Kerala has successfully reduced corruption from the PDS and can help streamline welfare delivery and minimise opportunities for fraud. Digital systems can make government more traceable and transparent, more accountable and more efficient. While Kashmir faces more daunting problems, digital governance could help in reducing these challenges in the same measure. Digital platforms could, if used effectively, ease bureaucratic inefficiencies, enhance service delivery and constrain the opacity of governance. However, to achieve these outcomes, the region's infrastructural deficit needs to be addressed, public trust has to be rebuilt and digital systems have to be used in ways that the population will most benefit.

25. MOVING FORWARD: A CONTEXT-SENSITIVE APPROACH

The comparison of the governance in Kerala and Kashmir reinforces the fact that a digitally governed society is better understood from a context-specific perspective. Digital technologies do have some powerful solutions to governance and service delivery questions, but they are not guaranteed success. The outcomes of digital reforms are dependent on the local political, social and infrastructural context. Digital governance initiatives are doing well in the state's relatively stable political environment, strong infrastructure and focus on inclusivity in Kerala. Whereas similar initiatives have lacked success, political instability, infrastructural deficiencies, and low public trust in Kashmir have stood in the way. Both sets of disequilibrium suggest that there is a need for governments to localise digital governance strategies to the particular requirements and circumstances of a given region. From now on, governments must realise that digital governance does not come in a single style. Technology can be a great tool for increasing service delivery and accountability, but not if not carefully planned, appropriately implemented in context, and sustained efforts to earn the public trust. The government can gain from the sagacity of Kerala and Kashmir and create better digital governance frameworks which genuinely help all citizens.

LIST OF ABBREVIATIONS

- APL:** Above Poverty Line
- AWD:** Authorized Wholesale Dealer
- BPL:** Below Poverty Line
- FCI:** Food Corporation of India
- NIC:** National Informatics Centre
- PDS:** Public Distribution System
- PoS:** Point of Sale
- TPDS:** Targeted Public Distribution System
- TSO:** Taluk Supply Office

DISCLOSURE STATEMENT

The authors declare that they do not have any conflict of interest

USAGE OF AI

The AI was used in this paper to check grammar and style through the usage of the Grammarly Student account (<https://app.grammarly.com/>) provided by University of Hyderabad. Besides this, the initial similarity of this paper was checked through Grammarly account.

CONFLICT OF INTERESTS

None.

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