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BIOMETRIC GOVERNANCE AND HUMAN RIGHTS: THE SOCIAL AND ETHICAL IMPLICATIONS OF AADHAAR IN INDIA'S PUBLIC DISTRIBUTION SYSTEM

O. Grace Ngullie*

Abstract

Aadhaar, recognised as the world's largest biometric identification system, has acquired legitimacy within Indian society; however, it has also resulted in exclusions from the Public Distribution System, thereby compromising the right to food. Aadhaar also raises critical ethical concerns relating to surveillance, privacy, the protection of human rights, highlighting the need for democratic technological governance. This empirical study conducted in Nagaland explores the social and ethical implications of Aadhaar biometric governance, revealing its failure to address the subjective conditions of the impoverished marginalised, which may exacerbate exclusion and disempowerment. The ubiquitousness of Aadhaar lacks adequate justification while centralised governance mechanisms falling short of ensuring institutional accountability hinder citizens' fundamental rights. Addressing these concerns requires a transition toward flexible identification methods and the promotion of decentralisation, which together enhance inclusivity within the PDS. Empowering local governance structures and women's collectives such as Self-Help Groups is essential for effective welfare management. A paradigm shift is necessary in the approach to technology, moving beyond an exclusively instrumental perspective to one that acknowledges its inherent values. This transition requires the integration of moral reasoning into technological policy formulation to discern beneficial outcomes from harmful ones. The ethical framework surrounding Aadhaar must reflect the moral responsibilities of policymakers, grounded in principles that promote justice and human dignity. Ultimately, fostering a just technological society necessitates a deep commitment to ethical values and democratic engagement, ensuring that technological advancements serve to uplift, rather than exclude.

Keywords: biometric, governance, human rights, Aadhaar, PDS

Introduction

Aadhaar is a digital identity system that assigns a unique 12-digit identification number to individual residents in India. This identification number is linked to biometric data, which includes facial photographs, fingerprints, and iris scans. Aadhaar also integrates personal and demographic details, such as name, mobile number, date of birth, gender, and address. The Government of India officially launched the Aadhaar project to identify people living below the poverty line (BPL) in India. On March 3, 2006, the Department of Information Technology, under the Ministry of Communications and Information Technology, approved the project titled 'Unique Identification for BPL Families' (Government of India, n.d.). On December 4, 2006, the Empowered Group of Ministers (EGOM) was formed to consolidate the National Population Register as stipulated under the Citizenship Act of 1955 and data from the Aadhaar project. Official preparations continued until the Unique Identification Authority of India (UIDAI) was established and its office attached to the Planning Commission by an executive order dated January 28,

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2009 (Government of India, 2009). The UIDAI oversees the management of Aadhaar enrollment, authentication, and the associated systems and policies. The data collection officially commenced with the issuance of the first UID on September 29, 2010 (Government of India, n.d.).

The establishment of UIDAI through an executive order and its subsequent collection of personal data sparked concerns regarding the legality of Aadhaar and the potential risks about profiling and intrusion, which could make individuals feel insecure and unsafe. Asserting that public consultation should occur before implementing such policies, Ramanathan (2010) questioned the constitutionality of the Aadhaar project. In response, R S Sharma, the former Director General of the UIDAI, argued that the poor often lack proper identification infrastructure, which hinders their ability to access welfare benefits; Sharma (2010) asserted that public consultations were sought with various stakeholders and also assured the public that the lack of Aadhaar would not result in the denial of services and that users' data would be protected under a data protection law. In a rebuttal to Sharma, Gupta (2010) reiterated that the Aadhaar project lacked constitutionality because relevant public consultation was unavailable in the public domain. There were concerns that Aadhaar was being used only for strengthening national security and the surveillance of citizens, while state authorities were exempted from accountability (Ramanathan, 2010; Gupta, 2010). It was doubted that Aadhaar was improving welfare services for the poor. This skepticism was not unfounded, as identity systems in the US and UK were motivated by national security and the fight against global terrorism, and India's government also aimed to create identity systems for the same reasons before later promoting them as a means of providing welfare (Guha, 2010).

On August 11, 2015, the Supreme Court of India issued a temporary ruling via the Writ Petition 494 of 2012, authorising the use of Aadhaar for prevention of corruption within the Public Distribution System (PDS) and for aiding criminal investigations; the government's actions were seen as contrary to the rule of law, and the Supreme Court was criticised for not providing adequate oversight (EPW Editorial, 2015). It was put forth that if the government were to claim that Aadhaar has become an integral part of governance and cannot be reversed, the Supreme Court would be held responsible for allowing its use without proper adherence to legal standards (EPW Editorial, 2015). In a sequence of legislative and judicial actions, the Government of India legitimised the Aadhaar framework. The Aadhaar Act 2016 aimed to promote good governance and ensure efficient, transparent, and targeted delivery of subsidies, benefits, and services. This Act transformed the UIDAI into a statutory authority within the Ministry of Electronics and Information Technology, Government of India. The Supreme Court in 2018 affirmed the constitutionality of the Act and recognised the right to privacy as a fundamental right, derived from the right to life and personal liberty under Article 21 and the freedoms enshrined in Article 19 (Hedge, 2019). However, over a decade after its inception and enrollment of over one billion biometric details, the Aadhaar initiative was implemented without a data protection law (Young, 2019). It was only in 2023 that the Indian Parliament enacted the Digital Personal Data Protection Act.

While Aadhaar technology embodies a pro-poor strategy intended to enhance access to welfare services, it does not, by itself, confer rights or entitlements (Government of India, 2010). Aadhaar is intrinsically linked to the right to life, since access to basic necessities, such as food, is contingent upon it. Under the National Food Security Act (NFSA) 2013, Aadhaar is mandated for unique identification and precise targeting of beneficiaries within the PDS for ration delivery. Its deployment within the framework

of the Right to Food programme has been associated with exclusionary tendencies, particularly affecting the most vulnerable segments of society, including widows, elderly individuals, and manual labourers, which potentially impairs their exercise of the fundamental right to food (Bhardwaj *et al*, 2016; Dreze *et al*, 2017; Khera, 2017; Nayak & Nehra, 2017; Rao, 2013). This is particularly exigent, as the burden of exclusion predominantly impacts the poor and marginalised, exacerbating various forms of social injustice (Carswell & Neve, 2022; Jayal, 2019; Masiero & Bailur, 2021; Masiero & Das, 2019; Nyst *et al*, 2016; Rao & Nair, 2019). Thus, Aadhaar has been implicated in the perpetuation of social injustice and inequality, especially among marginalised communities, concerning realising the right to food.

This paper examines the social and ethical implications of Aadhaar biometric governance and its role in advancing the right to food. The analysis will address these questions: What impact has Aadhaar had on marginalised groups regarding their access to the PDS? What social and ethical concerns arise concerning surveillance, privacy, and exclusion within the framework of Aadhaar governance? How do issues of marginalisation intersect with human rights in digital systems and welfare governance? The analysis is based on empirical research conducted in India's northeastern region, particularly the state of Nagaland. The north-east region exhibits significant vulnerability to a digital divide, exacerbated by geographical isolation and infrastructural deficiencies (Council for Social and Digital Development, 2023). These disparities predominantly affect marginalised communities, resulting in exclusion from access to public services (Oxfam, 2022). Within these contexts, this study specifically examines marginalised groups' access to the PDS while examining the social and ethical implications of Aadhaar biometric governance. The study also has implications for the socio-political landscape of tribal and indigenous communities as they navigate governance frameworks in an increasingly digitised society.

Biometric Data, Human Rights, and Democratic Technological Governance

In contemporary statecraft, Aadhaar biometric governance constitutes a significant technological framework through which the state acquires knowledge, exercises power, and exerts control over the populace, critically analysed through the lens of governmentality theory. Governmentality encompasses the assembly of institutions, strategies, and techniques that the state employs to manage and regulate its populace (Foucault, 1991). This political framework simultaneously acts as a platform for understanding governance not solely through the lens of the relationship between the state and its populace, but also by emphasising the ways in which individuals can engage in self-governance within the political spaces defined by overarching governmental principles (Foucault, 1991). The Aadhaar system uniquely incorporates biometric data enhancing the depth of knowledge about the population while facilitating welfare governance (Rao, 2019). Biometrics data points, such as fingerprints or facial recognition, are indicators of population units—whether enrolled, not enrolled, denied access, or classified as suspects, also serves as indexical and statistical representations (Maguire, 2009). Within the framework of governmentality, they facilitate a systematic surveillance of the body, contributing to the mechanisms of knowledge and control over populations (Maguire, 2009) and of life itself based on biological characteristics of human bodies (Ajana, 2013). It encapsulates the notion of biopolitics, the governance

of life, and raises questions concerning the integration of the body and technology within regulatory frameworks (Ajana, 2013).

Biometric data, described as biocentric data, are intrinsically connected to an individual's physiological or physical identity and play a significant role in influencing one's autonomy over bodily disposition (Alterman, 2003). The intrinsic moral value of biometric data arises from its characteristics, which are representative of a person's body and, by extension, their autonomy and self-esteem (Alterman, 2003). Thus, biocentric data engenders a fundamental interest in privacy; any usage that adversely affects an individual's right to control or make decisions regarding their own body constitutes a serious infringement on the right to privacy (Alterman, 2003). Biometric governance and surveillance often operate to serve interests other than those of the individual, thereby undermining personal autonomy and agency; this dynamic transforms the individual's body into a means for pursuing the objectives of external entities (Alterman, 2003). Within this framework, individuals from economically disadvantaged and marginalised communities constitute the most vulnerable segments of the population, particularly in terms of potential exploitation and manipulation by technological systems (Eubanks, 2018). The widespread implementation of Aadhaar has raised concerns regarding potential manipulation by emerging populist movements, disproportionately affecting minorities and vulnerable groups (Jacobsen, 2012; Ragas, 2017; Satpathy, 2017). The marginalised often lack the requisite digital literacy concerning data privacy and protection, which are critical components of human rights in Aadhaar governance (Panigrahi, 2021). It subjects marginalised groups to surveillance mechanisms that exploit their biometric data, frequently without their informed consent. This passive submission raises significant concerns over data misuse and violations of privacy, undermining fundamental rights.

In *The Technological Society* (1964), Jacques Ellul contextualised technology, defining *technique* not merely as machinery or technology but as the comprehensive array of rational methods demonstrating absolute efficiency in all aspects of human activity. This *technique* transcends mechanisation and emerges as the dominant force in modern life, evolving into a sociological phenomenon and a social reality (Ellul, 1964). This conception of technology neglects essential human values and objectives in the discourse surrounding technological advancements (Ellul, 1964). Modern and contemporary theorists have critically examined technology, identifying its exploitative applications that are emblematic of an instrumentalist approach, marked by a disconnect between means and ends. Karl Marx exposed the capitalist nature of technology, suggesting that advancements in science and technology predominantly served the interests of the elite (Hall, 1979; Feenberg, 2010b). Nonetheless, Max Weber's observations reinforced the notion that technical rationality is prevalent across all societal forms, particularly in relation to the centralisation of power observed in communist regimes (Feenberg, 2010b). A critical issue arises from the tendency to neglect the thorough consideration of the consequences associated with these techniques (Ellul, 1964). That rationality is institutionalised within modern technologies and social systems and technical experience influence societal dynamics and vice versa, the integration of social and technical rationality fosters democratic agency by actively engaging social actors in discussions and projects related to technology, thereby extending the principles of democracy into the technical domain (Feenberg, 2010a).

The critical theory of technology emphasises human agency in the age of ubiquitous technology through the concept of technical citizenship (Beira & Feenberg eds., 2018). While the technical dimensions

of a device necessitate a foundational understanding of natural principles to operate effectively, technology must navigate the complexities of the social world, shaped significantly by user experiences (Feenberg, 2010a). In this framework, expert knowledge must transcend mere technical expertise and incorporate the experiential insights derived from interactions with technologies and their societal impacts (Feenberg, 2010a). Feedback from users and experience have a significant impact on the development of technology and how it interacts with the social world. This paves the way for embedding values and meanings into technical products and services; thence, technology is not a predetermined destination, but rather a permanent 'social battlefield' (Beira & Feenberg eds., 2018, p. x). This constructive approach to technology advocates for public participation in governance, thereby democratising technological societies. Implementing mechanisms at the micropolitical level encourage enhanced democratic engagement among citizens in shaping the future of technology and yield beneficial outcomes for local communities, user groups, and those adversely affected by technology (Feenberg, 2010a). This framework acknowledges the significant contributions of knowledge and experiences from individuals, communities, and technical experts, all of which play a vital role in shaping the technological society we inhabit. This approach necessitates the establishment of a more democratic structure for technological governance.

Method

The study employed qualitative research methodologies to gather primary data through three principal methods: semi-structured interviews with target respondents from the community, key informant interviews with representatives from service delivery agencies and the relevant government department, and focus group discussions (FGD) with members of the village council. The field study was carried out in January 2024 in Kohima, the capital city of Nagaland, which comprises both rural and urban areas characterised by a multifaceted socio-cultural landscape. The Angami Naga tribe constitutes the predominant community; however, the district is also inhabited by individuals from various other Naga tribes and migrant populations, contributing to a diverse and dynamic social fabric.

A total of 50 semi-structured interviews were conducted across five distinct social groups identified as particularly vulnerable to social exclusion: individuals aged 80 years and older, widows, persons with disabilities, manual labourers including agricultural labourers, and migrants. The participants included 11 individuals aged 80 years and older, 10 persons with disabilities, 10 manual labourers, 9 migrants, and 10 widows. Their ages ranged from 16 to 103 years, with a mean age of 59. The majority of respondents were female (72%), while 28% identified as male. Religious affiliation was predominantly Christian, with 48 respondents identifying as Christian and two as Hindu. Both Hindu respondents were Nepali migrants, one of whom belonged to the older age group. All migrant respondents had originated from Nepal and had established permanent residency in Kohima. The group also included local Naga women married to Nepali migrants, with most migrants identifying as Christian, consistent with the religious profile of the wider population.

Among the 31 respondents who disclosed household income, five reported zero income, while the average monthly household income was ₹15,971 (approximately USD 186). Nineteen respondents chose not to disclose their income information. The occupational status of respondents reflects both paid

and unpaid forms of engagement, based on self-reported primary activities at the time of data collection. Manual labourers constituted 30% of the sample. Another 30% were identified as homemakers, indicative of unpaid domestic labour within the local context. Employed individuals included workers in both government and private sectors, and self-employed such as vegetable vendors, represented 10% of the sample. Pensioners made up 10% of respondents, while the unemployed consisted entirely of persons with disabilities. One respondent with a disability enrolled in secondary education was categorised under the student classification.

Key informant interviews were undertaken with representatives from the PDS implementing agency—the Department of Food and Civil Supplies, the Fair Price Shop (FPS) dealer, and Aadhaar Enrollment Agencies. The Department provided insights via email correspondence signed by the Joint Director regarding Aadhaar governance within the PDS framework. The FPS interviewed was selected based on its implementation of the biometric verification system for ration delivery within the PDS. Responses from two Aadhaar Enrollment Agencies located in urban Kohima and the FPS dealer operating in rural Kohima aided in understanding the service delivery agent experiences with the biometric identity registration and verification process, providing credible feedback on the Aadhaar system. The FGD with Village Council members helped gain an understanding of the general welfare management of local institutions and their responses to digital governance. This multi-faceted approach aimed to capture the lived experiences and perspectives of individuals and institutions interacting with Aadhaar technology, contributing valuable insights into the welfare governance framework surrounding biometric identification systems.

Findings

No Choice, Only Biometrics: Navigating Aadhaar with Illiteracy and Disability

An elderly woman recounted her lived experiences during World War II, a period characterised by the involvement of the ethnic Naga community in support of British India against the Japanese forces:

> *I have lived through the Japanese occupation of Nagaland. While I am over 90 years old, I am yet to reach a hundred. In those days, we did not observe birthdays, instead, we used to go to the forest and inscribe our age on a stone slab. During that time, we were treated very harshly by the Japanese, and we had to hide among trees and stones to survive.*

Despite her advanced age, she continues to work in the agricultural field and utilises the Aadhaar system for biometric verification to receive her ration. She stated, 'If they ask me to press, I just press. I don't know much.' Her preference for fingerprint authentication arises from illiteracy, rendering her unable to write or sign her name. She noted a discrepancy in biometric recognition, stating that her left finger is undetected, while her right finger functions well during the authentication process.

A 71-year-old widow articulated, 'Fingerprint is better because I am old now and I did not go to school, and I don’t know how to hold a pen either. I shiver when I hold a pen. I don’t know anything. If people ask for Aadhaar, I just produce it.' Similarly, a 50-year-old migrant woman preferred fingerprint verification, explaining 'Signing makes me nervous, especially in crowded areas. I tend to tremble and

feel uneasy when signing in front of others. However, I have no problem signing when I am alone. It's a different matter when I'm being watched (laughs).' A 25-year-old blind man emphasised, 'Not everyone can sign, not everyone is lettered.' A 57-year-old farmer articulated a preference for fingerprint verification due to challenges associated with vision impairment, noting further that he does not use corrective eyewear such as spectacles.

For this demographic, the preference for biometric verification reflects a compelled dependency that arises from factors such as illiteracy and disabilities. This reliance positions biometric verification as a necessity rather than a choice, as individuals in this group lack the ability to produce handwritten signatures or engage effectively in literacy-related activities. Their ability to exercise fundamental rights becomes contingent upon the production of biometric technology. This dependency introduces significant risks, particularly in the event of technical failures, which may result in the exclusion of individuals who are unable to employ traditional methods, such as handwritten signatures. Thus, the implications of biometric verification compliance within this framework reveal critical concerns regarding accessibility and equity in the exercise of fundamental rights.

Accessibility Challenges in Aadhaar Authentication: Technological, Physiological, Disability, and Health Constraints

A 54-year-old female migrant observed, 'Signature is better. Sometimes there is no current (electricity) and we have to wait for a long period of time, or we are asked to collect some other day. Sometimes, we send our kids to collect, but their fingerprints don't work. In such cases, they have to come back and ask for their mom to go. I know how to go about it, but those who send their kids come back with the rice, but ask for their mother's fingerprint.' A 60-year-old woman articulated her frustrations: 'In the case of fingerprints, the machine does not work sometimes and we have to wait. In hand sign, we just have to sign and leave but with the machine, if there is no electricity, we have to wait the whole day. Sometimes it works, sometimes it does not.'

Certain individuals advocate for the implementation of a signing mechanism that permits a designated representative to authenticate transactions on behalf of the older, bedridden, and individuals with disabilities. In the absence of such measures, the Aadhaar biometric system, or handwritten signatures, hold limited relevance for this demographic, as they are often unable to physically access ration shops to validate their identities and receive their entitlements. Elderly individuals, particularly those aged 95 and above, encounter significant challenges as a result of their age and health conditions, which often include being bedridden or incapacitated, experiencing memory loss, and facing difficulties in walking to the ration shop to collect their entitlements. The FPS dealer acknowledged the challenges faced when trying to assist elderly individuals who are unable to physically visit verification points due to mobility constraints, noting that while they have gone to great lengths to record fingerprints for some individuals in their homes, it is not always feasible to do so for everyone. A woman speaking on behalf of her 35-year-old intellectually disabled brother noted, 'He has never been to the Fair Price Shop and he won't know. He can speak a few sentences but beyond that he will get confused because he is not used to it. There has to be a limit, he can't take much instructions, otherwise it is difficult for him to follow.' A 43-

year-old intellectually disabled man who is unlettered and cannot sign, and whose finger reportedly sweats excessively, leads to several attempts at verification.

The preference for hand signing over fingerprint verification are due to various challenges associated with the latter method, such as technical malfunctions, lack of electricity or network, non-detection of fingerprints, the impact of aging and disabilities, as well as a general familiarity with the practice of signing. Some respondents favoured signatures over fingerprints due to failure in detecting their children's fingerprints.Farmers who toil hard, whose fingers are burnt or with damaged skin reportedly face difficulty in capturing finger prints.Thus, children with tender hands, elderly individuals with mobility constraints, persons with physical-intellectual disabilities including those bedridden, farmers and daily labourers with weathered hands, are specific physiological, social and health factors that Aadhaar fails to accommodate, and has the potential for resulting in exclusion and disempowerment of the marginalised.

The Near Ubiquity and Perception of Aadhaar

The Aadhaar system, originally disseminated by the government to facilitate access to welfare, has evolved to become integral to numerous facets of everyday life. Its applications are now practically ubiquitous, extending to banking services, acquisition of SIM cards, travel arrangements, securing gas connections, seeking employment, enrolling in educational institutions, establishing identity and address proof, obtaining disability certificates, accessing health insurance, utilising medical services, and acquiring Wi-Fi services, among various other functions.

Figure 1: Word cloud representation of Aadhaar usage

Source: Primary data

'I don't know where Aadhaar is not required (laughs). They ask for it everywhere.' said a 50-year-old widow. An 88-year-old man eloquently puts it, 'Seems like it is necessary everywhere as is the age. Even to travel, people carry it. For citizens, Aadhaar has become crucial.' This sentiment is echoed by another senior citizen, an 82-year-old man, who adds, 'Seems like nothing can be done without it. For

anything that we need to do, they ask us to bring only an Aadhaar card.' A 60-year-old widow emphasised, 'In this world, Aadhaar is asked everywhere. We don't need it when we go to Church and Prayer House.'

Aadhaar is deemed 'important' and necessary 'everywhere' especially in government-related activities. However, the pervasive application of Aadhaar remains inadequately comprehended by individuals. An 82-year-old woman shared her confusion, 'We don't even have a full understanding of where and how Aadhaar card is used. We don't understand nor does anyone make us understand. But we should have that isn't it, compulsory, isn't it?' They are persistently informed that proceeding without Aadhaar is not permissible. Their understanding is limited to the notion that it is deemed 'mandatory,' without a comprehensive explanation of the underlying reasons for this requirement. Its application has become nearly ubiquitous but not adequately justified to the user community.

Accessing fundamental necessities, such as ration, is contingent upon the possession of Aadhaar. The spouse of a 53-year-old disabled woman explained, 'We use Aadhaar card for important works such as ration. Without Aadhaar card, we cannot do anything, that is what we are made to understand, and that is how it is used. For collecting ration, and it is needed only when the government asks for Aadhaar card; otherwise in the village, Aadhaar card is not needed, that is what I think. I think it is needed in town. In the village, there is no such thing as this where it is needed. Because village people work in fields so Aadhaar card is not needed there'. Among the farming community in the village, Aadhaar is used for a specific purpose—ration, while its relevance in other aspects of their lives remains inconsequential. An 80-year-old farmer remarked, 'It is not applicable anywhere except while obtaining ration.'

Gaps in Aadhaar Policy and Governance

The state government has identified Aadhaar compliance as the principal reason for the majority of exclusions within the state. As of February 2024, the Directorate of Food and Civil Supplies in Nagaland has estimated that over 100,000 individuals are excluded from the PDS due to insufficient Aadhaar enrolment. Although the Directorate has not determined the exact number of households or individuals awaiting a ration card, it has observed that the elderly and minors are experiencing the highest rates of exclusion from the PDS. Furthermore, the complaints and grievances reported to the Directorate predominantly relate to issues arising from Aadhaar compliance. The primary data gathered from respondents indicate that a significant proportion of individuals excluded from the PDS encounter challenges in acquiring the application form necessary for obtaining a ration card, even among those who possess Aadhaar cards. Complications related to Aadhaar further contribute to these exclusions.

The Aadhaar system is centrally managed by the UIDAI under the purview of the Ministry of Electronics and Information Technology. Conversely, the PDS, which mandates biometric identification via Aadhaar for ration delivery, is implemented by the Ministry of Consumer Affairs, Food and Public Distribution. There exists a notable lack of coordination among these institutions in addressing grievances that arise from biometric registration and authentication failures. The challenges posed by failures in Aadhaar biometric verification surpass the capacity of state implementing agencies and local governing bodies to address them. The enrolment agencies tasked with facilitating Aadhaar registrations itself lack the necessary resources and expertise to manage these challenges. Respondents from these agencies have indicated that the final determination of application acceptance or rejection rests solely with the

UIDAI that relies on automated system detection processes. The UIDAI represents a centralised institutional framework that fails to provide effective mechanisms for addressing grievances related to Aadhaar failures. This administrative unresponsiveness within the Aadhaar digital governance model poses a risk of infringing upon fundamental rights and undermining citizen participation and further disempowers already marginalised groups.

The Aadhaar policy does not adequately account for the various factors that facilitate effective digital-based welfare governance. Specifically, the Village Council has observed a notable lack of digitalisation within the Naga community, particularly stemming from inadequate network connectivity. A 40-year-old female migrant articulated her experiences, stating, 'Signature is good, sometimes the network is bad and we face difficulty. That's why giving signature seems easy. My fingerprint is detected; however, I face difficulty due to network problems. I wait for some time and press again and sort it out that way, and I sign too.' The FPS dealer expressed a preference for signatures over fingerprints as some beneficiaries at the shop experience difficulties with fingerprint detection; it was noted that out of 351 beneficiaries, approximately 50-60 individuals experienced difficulties with fingerprint detection. It also creates a setback for the FPS dealers as they are unable to report 100% biometric verification-based delivery of ration to the state department and the subsequent ration allocation for the shop would be determined on the basis of this report.

There exists a considerable lack of public awareness regarding digital personal data protection, accompanied by insufficient training for service providers responsible for handling citizens' data. This deficiency compromises both data protection and data privacy. A substantial 94% of respondents were unaware of the Digital Personal Data Protection Act (DPDPA) 2023, with only 6% acknowledging familiarity with the legislation. While 48% of participants recognised that personal information can be stored on a computer, 52% did not. Furthermore, 64% of respondents were neither knowledgeable about nor able to form an opinion regarding the potential misuse of data. In contrast, 22% expressed concerns about the possibility of data misuse or manipulation, while 14% expressed confidence in the security of biometric data, asserting that fingerprints are not susceptible to theft or misuse and that both fingerprints and iris patterns are unique to each individual. The implementing agencies, including the FPS dealer, have not undergone training related to data privacy and protection, a fact corroborated by the department. Collectively, these findings highlight a significant policy gap in the governance of the Aadhaar system.

Discussion

Subjectivising Marginalisation in Aadhaar Biometric Governance

Data is a capital from which new forms of knowledge and value can be derived in a number of ways (Sadowski, 2019). It can serve multiple functions, including fulfilling political governance and enhancing administrative efficiency, but also raises ethical concerns related to profiling and population targeting (Sadowski, 2019). Dataveillance refers to a surveillance method employing digital tools, wherein population data is utilised within the framework of information capitalism (Taylor, 2017). This approach enables the observation and monitoring of individuals, while simultaneously adopting governmentality as a means of enforcing disciplinary functions that operate as normative coercion, often overlooking differential capabilities among populations (Taylor, 2017). Within this context, marginalised groups,

particularly the impoverished, experience the most detrimental effects of data systems including the Aadhaar system. The Aadhaar system does not account for the material conditions of poverty and pressures individuals to conform to a standardised notion of normalcy that aligns with the bodies and lifestyles of the middle and upper classes (Taylor, 2017).

The Government of India and the Supreme Court have endorsed Aadhaar as a means to enable access to welfare for marginalised populations. However, Aadhaar as a mechanism does not adequately capture the unique circumstances and needs of each individual. In the cases examined in this study, the barriers to welfare accessibility for these demographics are not solely technological; they are further intricated by socio-economic factors such as poverty, illiteracy, disability, and health-related issues. Individuals from certain demographics who are compelled to depend on biometric verification due to factors such as illiteracy and disability face a significant risk of exclusion from welfare, particularly in instances of biometric detection failure. Those who opt for manual verification methods, such as hand sign, experience barriers in Aadhaar authentication because of technological, physiological, disability and health-related challenges. Failure in Aadhaar biometric recognition due to technical, human, and infrastructural issues not only hinder state recognition of individuals but leads to denial of welfare rights compromising their autonomy, dignity, and privacy rights associated with human identity (Singh, 2021).

Biometric data pertain to bodily attributes over which individuals possess an inherent right to govern their use and purpose (Alterman, 2003). The nature and method of biometric data collection and its usage are critical aspects of contemporary discourse. Data extraction, acquiring data without meaningful consent and without corresponding compensation, raises serious concerns (Sadowski, 2019). The collection and utilisation of biometric data necessitate a strong justification, and its mandate must involve the informed consent of the individual data owners and require thorough deliberation (Alterman, 2003). The production and collection of biometric data can be seen as a surrender of one's data without meaningful consent, an action devoid of free will, particularly for those who may lack awareness regarding the implications and functions of these data systems. This process perpetuates a state of unfreedom among marginalised populations who remain uninformed about the consequences of their data being utilised (Alterman, 2003).

For the marginalised population, the interplay of socio-economic disadvantage and illiteracy including digital illiteracy and lack of awareness regarding digital rights further compromises individuals' dignity, personal autonomy, and agency. Individuals who are illiterate or have disabilities incline towards biometric verification as a coerced dependency, primarily from their inability to read and write, as well as from physical limitations, rather than from an informed choice regarding the use of their bodily features for the authentication of their biometric identity. The coerced dependency on either technology or third parties may be perceived as a compromise to both dignity and individual autonomy (Singh, 2021). The participants' narratives in this study reveal a profound lack of understanding regarding data privacy, data protection, and the biometric authentication process. They often indicate that they unassumingly produce their Aadhaar cards when requested, not out of comprehension or volition, but because of policy compliance. In this context, individuals are compelled to relinquish control over their bodies to meet governmental requirements. It represents a pertinent illustration of the instrumental definition of technology, primarily as a mechanism for verifying recorded biometric data, with the goal of confirming

biometric identity and to render oneself visible to the governance modality. Should the goal of validating biometric identity not be achieved, there exists a potential risk of being denied access to welfare benefits. The instrumental philosophy of technology connotes a disjunction between means and ends overlooking the broader aim of fostering welfare objectives or preserving human values (Beira & Feenberg eds., 2018). Thus, Aadhaar biometric verification functions primarily as a mechanism for accessing welfare resources and serves to reinforce the modalities of state governance, rather than as an avenue for personal empowerment or autonomy and to assert fundamental rights. The framework of governmentality requires recalibration to ensure that the state prioritises the perspectives of citizens and takes into account the experiences of individuals affected by data systems and associated social issues (Corbridge et.al., 2005; Fourcade & Gordon, 2020; Scott, 1998).

Technological Risks, Centralisation and Accountability Gaps in Aadhaar Governance

Aadhaar has emerged as a critical component of life for the populace, being perceived as 'important' and necessary ‘everywhere’, and ‘mandatory’. This extensive prevalence of Aadhaar in various domains raises questions regarding its legitimacy and the potential gaps associated with its implementation. The ubiquitousness of Aadhaar signifies a passive embrace of technology as the norm, fostering a new social reality. Such rational methodologies extend beyond mere mechanisation, evolving into a dominant influence in society, which in turn generates a sociological phenomenon and constructs a specific social reality (Ellul, 1964). Ultimately, the risk lies in constructing a technologically driven society that eclipses the human aspect, where individuals comply without critical awareness or conscious consent. These experiences and realities with and related to technology serves as feedback to enable us to engage with the world, as we conceive, control, and act (Feenberg, 2010a). It presents an opportunity to take responsibility, understand and recognise these risks, and strive for freedom and alignment with our values, rather than succumbing to the determinism of technological civilisation (Ellul, 1964). Acknowledging these risks in our increasingly tech-focused society will enable us to gain a comprehensive understanding of technology's impact on our social fabric (Feenberg, 2010a).

The risk is heightened when the Aadhaar technological system operates under an automated framework devoid of institutional accountability, which hinders individuals' access to welfare services. There is a notable lack of institutional mechanisms for addressing abuses or grievances within the Aadhaar governance framework (Taylor, 2017). The political capacity for effective communication and coordination among governing bodies at all levels—central, state, and local—as well as within and between departments, is significantly deficient in the implementation of the Aadhaar policy for the attainment of welfare objectives. The state-level PDS implementing agencies, service delivery partners such as FPS dealers and Aadhaar enrollment agencies, lack the capacity to address and resolve incidents of biometric failure. The Aadhaar governance model operates independent of local governing bodies, which diminishes the political engagement of local communities. This biometric governance model undermines the ability of citizens to challenge or contest the state's unjust governance practices. The centralising structure of Aadhaar governance has been linked to a weakening engagement between citizens and the state,

perpetuating inequality and injustice among poor and marginalised populations (Chaudhuri, 2021; Carswell & Neve, 2022; Rao & Nair, 2019).

The lack of training related to data privacy and protection for implementing agencies raises concerns about potential violations of individual rights. Multiple government initiatives have been found to be susceptible to privacy breaches and security risks, which paradoxically counteract their intended objectives by leading to a loss of welfare and a resurgence of corruption manifested through data manipulation, diversion of benefits, theft, and fraud (Sadhya & Sahu, 2024). Moreover, the government's rationale for the implementation of Aadhaar in welfare programmes, such as the PDS, Mahatma Gandhi National Rural Employment Guarantee Act, and social security pensions, has not effectively fulfilled its intended objectives of promoting inclusion and reducing corruption (Khera, 2017), and enhancing the efficiency and transparency of governmental operations (Chaudhuri, 2021). Beneficiaries have indicated that pre-Aadhaar systems were more effective in facilitating access to welfare benefits (Singh, 2021). Technological risks and institutional weaknesses raise significant concerns about potential violations of fundamental rights, specifically the rights to food and privacy, which are fundamental to the broader scope of the right to life as articulated in Article 21.

Ethical framework for technological policies: ensuring rights and dignity in Aadhaar governance

Mitcham (ed) (2005) highlights the unity of ethics and politics in the technoscientific realm and the relationship between technoscience and society. The questions that arise from this endeavor include how to lead a fulfilling life in a high-tech scientific world, what the shape of a just state looks like in a technological world, what virtues and moral principles and reasoning can be applied to technological pursuits, and what underpins the ethical and political practices where knowledge and power intersect with technology. Such ethical and critical questions can aid us in better comprehending the increasingly technoscientific world we build and inhabit (Mitcham (ed), 2005). Multiple moral dimensions encompassing vision and conduct, decision-making, and policy implementation at the individual, professional, and governmental levels is emphasised (Mitcham (ed), 2005). It requires both technology and the actors involved in its design, development and governance to embrace moral responsibility and accountability for their actions and the resultant effects. This moral obligation must be both prospective, pertaining to the design, development, and anticipated consequences of technology, and retrospective, ensuring that technology is not misused or abused in ways that could lead to undesirable outcomes (Hou, 2021).While technology, including artificial intelligence, is poised for continued advancement, it is essential to balance instrumental and value rationality in order for humanity to be truly liberated (Hou, 2021). Max Weber’s theory of rationality posits that value rationality emphasises the intrinsic worth or moral code of an action, independent of its consequences or advancements, and instrumental rationality focuses on the tangible benefits derived from it (Hou, 2021).

Policies and legal frameworks should enable citizens to exercise their values and agency in ways that align with their personal interests and priorities (Taylor, 2017). The social contract plays a critical role in determining the extent to which individuals may be rendered visible to the state and, conversely, the degree of visibility that citizens are obligated to maintain towards the state (Taylor, 2017). Such framework

encourages a conceptual shift in governance, promoting the transition of individuals from mere data subjects to empowered data citizens (Ruppert *et al*, 2017). While the government's claim on Aadhaar is intrinsically linked to various dimensions of welfare, security, mobility, and accessibility, the crucial question arises regarding the state's ability to ensure welfare services to its citizens in the absence of biometric identification. This issue is particularly pertinent for vulnerable populations, including senior citizens, individuals with disabilities or health challenges, manual labourers, and children, who often face difficulties in maintaining consistent biometric readings. It necessitates a comprehensive understanding of the unique challenges faced by the marginalised population and the development of policies that promote inclusive access to welfare services, thereby upholding the rights and dignity of all citizens within the digital governance framework.

The Constitution of India demonstrates a robust commitment to the Fundamental Rights under Part III, that protect the rights of citizens. In this, Article 21 safeguards the right to life and personal liberty. The right to food serves as a robust manifestation of the right to life and human dignity, rights that are both inherent and unconditional. An infringement upon this inherent right would be 'unnatural and crazy' or unreasonable and unacceptable, and we must denounce it as an attack on human dignity (Kass, 2007). Any legislation or policy that undermines this right to life and dignity would be deemed unreasonable (Kass, 2007). The welfare state seeks to reinforce the legal framework and rationale underlying this assertion, with the objective of addressing the fundamental needs requisite for a life of dignity (Allan, 1997). The right to live with dignity also necessitates the establishment of institutional mechanisms that empower individuals to voice their grievances and provide a framework for rightsholders to seek recourse in the event of rights violations (Kent, 2010). The government bears the primary duty and moral obligation to honour, ensure, and protect this fundamental right for all individuals. The judiciary plays a pivotal role in interpreting and enforcing these ethical principles enshrined in the Indian Constitution, including those articulated in the Directive Principles of State Policy. This implies that policies including technological interventions such as the Aadhaar governmental framework must recognise and uphold the inherent moral value and worth of every individual. Welfare rights contingent on Aadhaar challenge the principles of dignity and risk further disempowering marginalised populations unable to comply with biometric recognition. Making biometric authentication a prerequisite for exercising fundamental rights undermines the intrinsic and unconditional nature of the right to life.

Conclusion

The effectiveness of technology in governance or E-Governance is significantly impeded by several factors including inadequate internet infrastructure, high costs of access and usage, limited public awareness, low digital literacy, and a restricted range of available services (Sapru & Sapru, 2014). In the context of Nagaland, digitisation of public programmes has encountered challenges due to lack of institutional electrification, internet connectivity, hardware components, and training (Anand *et al*, 2024; Government of Nagaland, 2024). Mandatory adherence to the Aadhaar governance framework, when it neglects the critical components necessary for effective digital governance, risks exacerbating the marginalisation and disempowerment of disadvantaged populations. This oversight often comes at the expense of addressing genuine human needs and the risk of exclusion. Consequently, the fundamental objective of ensuring

welfare is neglected, undermining the fundamental right to food for the excluded individuals. Technology, in this instance Aadhaar, is not inherently suited to achieve value-driven goals and may inadvertently steer the process, leading to potential risks of exclusion, unless it takes into account the potential for exclusion and the direction it imposes.

Sekher *et al*, (2017) contends that technology should be designed to empower the individuals it serves and promote transparency and inclusive participation, particularly in the PDS. They believe that technology can improve governance and give beneficiaries access to benefits, as well as a responsive platform for reporting grievances. While digital governance has the potential to empower individuals and enhance the quality of participation, effective accountability mechanisms and administrative responsiveness is crucial for realising these outcomes (Sharma *et al*, 2024). The successful implementation of E-Governance requires building institutional capacity, developing a strong policy framework, strengthening technological platforms, and ensuring adequate support in human capital and financial resources, alongside committed leadership and increased citizen awareness for effective service delivery (Sapru & Sapru, 2014). Sud and Craig (2015) made a compelling case for the Aadhaar initiative, asserting that identity is a basic human right and that the state has a responsibility to provide verifiable identification for the poor to achieve welfare goals. Their ethical analysis of Aadhaar called for legislation that safeguards data and privacy while ensuring that data is only used for its intended policy purposes. Aadhaar governance exhibits significant deficiencies in fulfilling these critical factors that enable effective digital governance.

Examining real-world case studies offers critical insights for technological solutions to address policy challenges while facilitating a flexible and adaptive implementation process (O'Connor *et al*, 2024). The interplay between technology and human experience, and the socio-cultural context in which it operates, is essential to consider (Feenberg, 2010a). This perspective highlights the importance of practicality in the formulation of effective policies, rather than relying on a uniform, standardised approach (Ritchie, 2021). In the context of Nagaland, during the time of this empirical study, the implementation of Aadhaar biometric verification at the FPS was not fully operational. This period marked a transition from the traditional method of identity verification, which relied on hand signatures, to a biometric validation system. Beneficiaries were afforded the option to use either hand signatures or biometric verification during this transitional phase, a flexibility that has significantly contributed to increasing the utilisation rate of the PDS. The absence of reports from respondents regarding alternative identity verification methods, such as one-time passwords (OTPs) sent via mobile phones and iris scans, indicates that these practices are not prevalent in this context. Current policy allows any member of a household to collect rations on behalf of their family, requiring one individual to authenticate their identity by pressing their fingerprint into a biometric device. Individuals with disabilities, those bedridden, and the elderly typically rely on household members, relatives, and neighbours to procure rations on their behalf, as they face challenges in complying with both hand sign and biometric verification. For some households, the requirement for biometric verification necessitates some individuals with recognised biometric profiles to remain at home during the designated day for ration collection. This situation can lead to a loss of employment or wages, particularly when alternative family members encounter challenges with biometric identification.

Flexibility in modes of identity verification presents a practical solution to enhance inclusivity within the PDS. Empowering local governance structures and women-led collectives to oversee PDS would facilitate greater inclusivity within welfare governance frameworks. With 95.7% of villages in Nagaland, totaling 1,230 villages, having formed SHGs, institutional frameworks are in place (Government of Nagaland, 2024). The National Food Security Act 2013 endorses the involvement of public institutions and bodies including SHGs and women collectives in the licensing and management of FPSs. The execution of these directives would exemplify an inclusive political practice, promoting both direct and representative democracy, thereby enhancing participation in governance and facilitating inclusivity in welfare policies (Törnquist *et al* (eds), 2009).

References

Ajana, B. (2013). *Governing through Biometrics: The Biopolitics of Identity*. Palgrave Macmillan.

Alterman, A. (2003). "A Piece of Yourself": Ethical Issues in Biometric Identification. *Ethics and Information Technology*, 5: 139-150.

Allan, R. (1997). Money for Nothing: The Ethics of Social Welfare. *Policy and Society*, 14 (1): 1-22.

Anand, S., Khalid, A. and Yanlem, M. (2024). Enabling Development in Nagaland: The Case for Energy Access Explorer. *WRI India*. https://wriindia.org/perspectives/enabling-development-nagaland-case-energy-access-explorer?

Beira, E. and Feenberg, A. (eds) (2018). *Technology, Modernity, and Democracy*. Rowman and Littlefield.

Bhardwaj, A., Dey, N., Dreze, J. and Khera, R. (2016). PDS in Danger. *Economic and Political Weekly*, 51 (38): 4.

Carswell, G. and Neve, G. D. (2022). Transparency, Exclusion and Mediation: How Digital and Biometric Technologies are Transforming Social Protection in Tamil Nadu, India. *Oxford Development Studies*, 50 (2): 126-141.

Chaudhuri, B. (2021). Distant, Opaque and Seamful: Seeing the State through the Workings of Aadhaar in India. *Information Technology for Development*, 27 (1): 37-49.

Corbridge, S., Williams, G., Srivastava, M. and Veron, R. (2005). *Seeing the State: Governance and Governmentality in India*. Cambridge University Press.

Council for Social and Digital Development (2023). *Connecting the North Eastern Himalayas: The State of Access, Digital Connectivity, and Digital inclusion in North Eastern Region of India*. Council for Social and Digital Development.

Dreze, J., Khalid, N., Khera, R. and Somanchi, A. (2017). Aadhaar and Food Security in Jharkhand: Pain without Gain? *Economic and Political Weekly*, 52 (50): 50-59.

Editorial (2015). A Legal Vacuum: The Supreme Court has Failed to Protect Citizens from Government Illegality on Aadhaar. *Economic and Political Weekly*, 50 (34): 7-8.

Ellul, J. (1964). *The Technological Society* (John Wilkinson trans). Vintage books.

Eubanks, V. (2018). Automating Inequality. How High-tech Tools Profile, Police, and Punish the Poor. St. Matin's Press.

Foucault, M. (1991). Governmentality. In G. Burchell, C. Gordon. and P. Miller (eds), *The Foucault Effect: Studies in Governmentality*, (pp. 87-104). University of Chicago Press.

Feenberg, A. (2010a). *Between Reason and Experience. Essays in Technology in Modernity*. MIT Press.

Feenberg, A. (2010b). Marxism and the Critique of Social Rationality: From Surplus Value to the Politics of Technology. *Cambridge Journal of Economics*, 34 (1): 37-49.

Fourcade, M. and Gordon, J. (2020). Learning Like a State: Statecraft in the Digital Age. *Journal of Law and Political Economy*, 1 (1).

Government of India (2010). *UIDAI Strategy Overview: Creating a Unique Identity Number for Every Resident in India*. Unique Identification Authority of India (UIDAI), Planning Commission. https://ia600500.us.archive.org/15/items/StrategyOverveiw001/Strategy_Overveiw-001.pdf

Government of India (2009). *Notification No.-A-43011/02/2009-Admn.I*. https://uidai.gov.in/images/notification_28_jan_2009.pdf

Government of India (n.d). Retrieved December 8, 2024, from https://uidai.gov.in/en/about-uidai/unique-identification-authority-of-india.html

Government of Nagaland (2024). *Economic Survey 2023-2024*. Department of Economics & Statistics. Nagaland.

Guha, K. (2010). Making the Poor Count: India's National Identity Scheme. *Harvard International Review*, 32 (3): 8-9.

Gupta, R. (2010). Justifying the UIDAI: A Case of PR over Substance? *Economic and Political Weekly*, 45 (40): 135-36.

Hall, A. S. (1979). Marx in the Modern World. *Nebraska Journal of Economics and Business*, 18 (1): 5-14.

Hedge, V. G. (2019). *State Practice of Asian Countries in International Law India.* In Lee, S., Lee, H. E. and Sim, C. (eds), Asian Yearbook of International Law, 23 (2017), 227-254. Brill.

Hou, H. (2021). On the Three Constraints of the Development of Artificial Intelligence: Value, Liberation and Responsibility. *Cultures of Science*, 4 (3): 159-68.

Jacobsen, E. K. U. (2012). Unique Identification: Inclusion and Surveillance in the Indian Biometric Assemblage. *Security Dialogue*, 43 (5): 457-74.

Jayal, N. G. (2019). Reconfiguring Citizenship in Contemporary India. *South Asia: Journal of South Asian Studies*, 42 (1): 33-50.

Kass, L. R. (2007). The Right to Life and Human Dignity. *The New Atlantis*, 16 (Spring), 23-40.

Kent, G. (2010). The Human Right to Food and Dignity. *Human Rights*, 37 (1): 2-5.

Khera, R. (2017). Impact of Aadhaar on Welfare Programmes. *Economic and Political Weekly*, 52 (50): 61-70.

Maguire, M. (2009). The Birth of Biometric Security. *Anthropology Today*, 25 (2): 9-14.

Masiero, S. and Bailur, S. (2021). Digital Identity for Development: The Quest for Justice and A Research Agenda. *Information Technology for Development*, 27 (1): 1-12.

Masiero, S. and Das, S. (2019). Datafying Anti-Poverty Programmes: Implications for Data Justice. *Information Communication & Society*, 22 (7): 916-933.

Mitcham, C. (ed), (2005). *Encyclopaedia of Science Technology and Ethics. Volume I*. Thomson Gale, USA.

Nayak, N. and Nehra, S. (2017). Accessing the Right to Food in Delhi. *Economic and Political Weekly*, June 10, 52 (23): 2349-8846.

Nyst, C., Pannifer, S., Whitley, E. and Makin, P. (2016). *Digital identity: Issue analysis*. Consult Hyperion.

O'Connor, R., Bolton, M., Saeri, A. K., Chan, T. and Pearson, R. (2024). Artificial Intelligence and Complex Sustainability Policy Problems: Translating Promise Into Practice. *Policy Design and Practice*, 7 (3): 308-323.

Oxfam India (2022). Digital Divide. India Inequality Report 2022. Oxfam India. https://www.oxfamindia.org/knowledgehub/workingpaper/india-inequality-report-2022-digital-divide

Panigrahi, S. (2021). *Marginalised Aadhaar: Digital ID and Exclusion of Marginalised Communities in India*. Yoti. https://www.yoti.com/wp-content/uploads/Marginalised_Aadhaar-Subhashish-Panigrahi.pdf

Ragas, J. (2017). The Silent Revolution: How ID Cards are Changing the World. *Harvard International Review*, 38 (2): 24-27.

Ramanathan, U. (2010). A Unique Identity Bill. *Economic and Political Weekly*, 45 (30): 10.

Rao, U., and Nair, V. (2019). Aadhaar: Governing with Biometrics. *South Asia: Journal of South Asian Studies*, 42 (3): 469-481.

Rao, U. (2013). Biometric Marginality: UID and the Shaping of Homeless Identities in the City. *Economic and Political Weekly*, 48 (13): 71-77.

Ritchie, C. (2021). The Path is Made by Walking: Knowledge, Policy Design and Impact in Indigenous Policymaking. *Policy Design and Practice*, 4 (3): 413-425.

Ruppert, E., Isin, E. and Bigo, D. (2017). Data Politics. *Big Data & Society*. July–December 2017: 1–7.

Sadhya, D. and Sahu, T. (2024). A Critical Survey of the Security and Privacy Aspects of the Aadhaar Framework. *Computers & Security*, 140 (2024):103782.

Sadowski, J. (2019). When Data is Capital: Datafication, Accumulation, and Extraction. *Big Data & Society*, 6 (1): 1-12.

Sapru, R. K. and Sapru, Y. (2014). Good Governance through E-governance with Special Reference to India. *Indian Journal of Public Administration*, lx (2): 313-331.

Satpathy, T. (2017). The Aadhaar: "Evil" Embodied as Law. *Health Technol,* 7: 469-487.

Scott, J. C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press.

Sekher, M., Parasuraman, S., Pritchard, B., Kumar, S. S. and Rai, R. K. (2017). Empowering People to Power the Public Distribution System: A Process Mapping Analysis. *Economic and Political Weekly*, 52 (51): 97-107.

Sharma, R S. (2010). Identity and the UIDAI: A Response. *Economic and Political Weekly*, 45 (35): 101-103.

Sharma, S., Kar, A. K. and Gupta, M.P. (2024). Untangling the Web between Digital Citizen Empowerment, Accountability and Quality of Participation Experience for E-government: Lessons from India. *Government Information Quarterly*, 41 (101964): 1-16.

Singh, P. (2021). Aadhaar and Data Privacy: Biometric Identification and Anxieties of Recognition in India. *Information, Communication & Society*, 24 (7): 978-993.

Sud, M. and Craig. V. V. (2015). Identity Rights: A Structural Void in Inclusive Growth. *Journal of Business Ethics*, 132 (3): 589-601.

Taylor, L. (2017). What is Data Justice? The Case for Connecting Digital Rights and Freedoms Globally. *Big Data & Society*, 4 (2): 1-14.

Törnquist, O., Webster, N. and Stokke, K. (eds) (2009). *Rethinking Popular Representation*. Palgrave Macmillan

Young, K. (2019). Key Differences Between the U.S. Social Security System and India's Aadhaar System. *New America*.

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