GLOBAL INFORMATION SOCIETY WATCH 2019

Artificial intelligence:
Human rights, social justice and development

Association for Progressive Communications (APC),
Article 19, and Swedish International Development Cooperation Agency (Sida)

Global Information Society Watch

2019

Global Information Society Watch 2019
Artificial intelligence: Human rights, social justice and development

Operational team
Valeria Betancourt (APC)
Alan Finlay (APC)
Mallory Knodel (ARTICLE 19)
Vidushi Marda (ARTICLE 19)
Maja Romano (APC)

Project coordination team
Valeria Betancourt (APC)
Cathy Chen (APC)
Flavia Fascendini (APC)
Alan Finlay (APC)
Mallory Knodel (ARTICLE 19)
Vidushi Marda (ARTICLE 19)
Leila Nachawati (APC)
Lori Nordstrom (APC)
Maja Romano (APC)

GISWatch 2019 advisory committee
Namita Aavriti (APC)
Rasha Abdul Rahim (Amnesty International)
Alex Comninos (Research ICT Africa)
Malavika Jayaram (Digital Asia Hub)
J. Carlos Lara (Derechos Digitales - América Latina)
Joy Liddicoat (Centre for Law and Emerging Technologies, University of Otago)
Andrew Lowenthal (EngageMedia)
Micaela Mantegna (Geekylegal/Machine Intelligence Lab, Center for Technology and Society, San Andres University)
Valeria Milanes (Asociación por los Derechos Civiles)

Project coordinator
Maja Romano (APC)

Editor
Alan Finlay (APC)

Assistant editor and proofreading
Lori Nordstrom (APC)

Publication production support
Cathy Chen (APC)

Graphic design
Monocromo

Cover illustration
Matías Bervejillo

We would like to extend a special note of thanks to a number of authors who have made ad honorem contributions to this edition of GISWatch.
We gratefully acknowledge the following:

Philip Dawson and Grace Abuhamad (Element AI)
Anita Gurumurthy and Nandini Chami (IT for Change)
Rasha Abdul Rahim (Amnesty International)

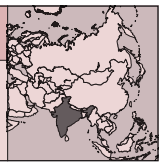
APC would like to thank the Swedish International Development Cooperation Agency (Sida) and ARTICLE 19
for their support for Global Information Society Watch 2019.

Published by APC
2019
Printed in USA

Global Information Society Watch 2019 web and e-book
ISBN 978-92-95113-13-8
APC Serial: APC-201910-CIPP-R-EN-DIGITAL-302

INDIA

INTERROGATING "SMARTNESS": A CASE STUDY ON THE CASTE AND GENDER BLIND SPOTS OF THE SMART SANITATION PROJECT IN PUNE, INDIA



Independent; ARTICLE 19
Malavika Prasad and Vidushi Marda
www.article19.org

Introduction

Pune, a city of 6.4 million people in western India, is home to a smart sanitation project that aims at building resilient and sustainable sanitation solutions in the city. Artificial intelligence (AI) is one of the potentially transformative technologies currently being considered in this project.[1] Real-time collection and monitoring of data through sensors, as well as analytics and insights at scale, means that the use of AI systems can be beneficial.

Current data collection through sensors will impact the design and development of AI systems in the future. Questions of *how* this data is created, *where* it arises from, *what* types of analytics and insights are being recorded, *which* areas of work are made more efficient, and *who* benefits from smart sanitation remain to be answered.

This report aims to highlight the importance of situating AI systems in context by analysing how Pune's smart sanitation project interacts with the societal fabric within which it is being developed. We explore two pointed questions. First, what AI systems are planned to be deployed and how are they being designed and developed? And second, how does this impact caste and gendered systems of labour undergirding sanitation work in India?

Context

Pune has consistently ranked as one of India's top smart cities since the launch of the Smart Cities Mission (SCM).[2] In 2017, the Pune Smart City Development Corporation signed a memorandum of understanding with the University of Toronto and the Indian Institute of Technology (IIT) Bombay to use AI to make it a truly smart city.[3] This is in line with the National Strategy for AI, published by the National Institution for Transforming India (NITI Aayog) in June 2018, which identifies smart cities as a key area for AI intervention in India.[4] In August 2017, Pune's Municipal Corporation announced plans to make Pune the world's first smart sanitation city.[5]

Pune's smart sanitation project lies in the intersection of five key imperatives of the Indian government. The first is the SCM, a centrally sponsored policy seeking to enhance 100 cities by improving the "quality of life" in a "sustainable environment" using "smart solutions",[6] while driving economic growth.[7] Smart solutions envisaged under this policy range from e-governance solutions such as e-service delivery and video crime monitoring, energy management solutions such as smart meters and harnessing renewable energy, and waste management solutions such as the circular use of waste as energy and compost and the reuse and recycling of water.[8] The second is the Swacch Bharat Mission (SBM), also a centrally sponsored policy, which aims to achieve safe, sustainable, cost-effective and "universal sanitation coverage", making India "open defecation free"[9] by October 2019. The third is Digital India, an initiative that is closely related to SCM,[10] and is geared towards providing digital infrastructure to every citizen as a core utility, and

1 Toilet Board Coalition. (2018). *Smart Sanitation City.* https://www.toiletboard.org/media/45-TBC_2018PuneReport_11202018.pdf?v=1.0.1

2 Ministry of Housing and Urban Affairs, Government of India. (2016). *City Challenge.* http://smartcities.gov.in/content/city_challenge.php?page=winning-city-proposals-in-round-1-of-city-challenge.php; also see http://smartcities.gov.in/upload/city_challenge/58dfa4cb13064582318f5d6d8eRankingofSmartCities(1).pdf

3 Smart Cities Council. (2017, 5 December). AI to make Pune a truly "Smart City". https://india.smartcitiescouncil.com/article/ai-make-pune-truly-smart-city

4 NITI Aayog. (2018). National Strategy for Artificial Intelligence #AIFORALL. https://www.niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf

5 Express News Service. (2017, 1 September). PMC partners with TBC to become 'Smart Sanitation City'. *The Indian Express.* https://indianexpress.com/article/india/pmc-partners-with-tbc-to-become-smart-sanitation-city-4823309

6 Guideline 2.3, Ministry of Urban Development, Smart City Mission Statement and Guidelines, 2015 ("SCM Guidelines").

7 SCM Guideline 2.6.

8 SCM Guideline 2.5.

9 The term was defined as follows: "ODF is the termination of faecal-oral transmission, defined by: 1) no visible faeces found in the environment/village; and 2) every household as well as public/community institutions using safe technology option for disposal of faeces." See Government of India Letter no.@-11011/3/2015-SBM dated 9 June 2015.

10 IANS. (2017, 16 March). Digital India initiatives playing major role in smart cities mission. *The Financial Express.* https://www.financialexpress.com/india-news/digital-india-initiatives-playing-major-role-in-smart-cities-mission/590381

transforming India into a digitally empowered society and knowledge economy.[11] The fourth is the National Urban Innovation Stack (NUIS), a central government initiative using layered digital infrastructure to provide all stakeholders with "digital tools and platforms, standards, specifications and certifications, and enable greater coordination and integration amongst them."[12] The fifth is the National Strategy for Artificial Intelligence,[13] which contemplates the need for AI to propel inclusive economic growth and social development, with smart cities as a key area of AI intervention.

The government views the convergence of these policy imperatives as desirable.[14]

Our report focuses on sanitation workers – largely women from Dalit communities[15] – who are hired by the municipality as labourers through a contractor and therefore often fall outside of labour laws.[16] Sanitation work refers broadly to all *safai kam* or "cleaning work" ranging from sweeping streets, collecting and transporting garbage, to cleaning sewers.[17] Cleaning workers are considered polluted and impure by upper castes, due to which Dalit communities,[18] treated as ordained by birth for such labour, are excluded from other occupational opportunities.[19] That sanitation workers are largely Dalit women means that they are marginalised in an altogether qualitatively different manner: by upper-caste women and men on account of being Dalit,[20] and by Dalit men on account of being women.[21]

Some states have introduced government employment for sanitation work, open to persons from all castes. Non-Dalit candidates have filled about half of these posts[22] because of the economic benefits and job security in government posts.[23] However, some upper-caste candidates use these posts as a stepping stone to permanent posting, after which they transfer to other governmental departments.[24] As succour to Dalit workers who have been dispossessed by non-Dalits, some states have begun to mandate that Dalit communities shall be prioritised for sanitation posts.[25] Nevertheless, governmental intervention in this realm has further marginalised Dalits, without undoing the stigma attached to cleaning labour. The key issue that states have failed to address is that Dalit workers who used to earn a living from sanitation work are unable to access alternative opportunities for work.[26]

Indian law forbids employment and even contractual engagement for one type of

11 Press Information Bureau, Government of India. (2014, 20 August). *Digital India – A programme to transform India into digital empowered society and knowledge economy.* https://pib.gov.in/newsite/PrintRelease.aspx?relid=108926

12 Ministry of Housing and Urban Affairs. (2019). *National Urban Innovation Stack.* https://smartnet.niua.org/sites/default/files/resources/national_urban_innovation_stack_web_version.pdf

13 NITI Aayog. (2018). Op. cit.

14 SCM Guideline 14.2.

15 Kadlak, H., Salve, P. S., & Karwade, P. (2019, 19 March). Intersectionality of Caste, Gender and Occupation: A Study of *Safai Karamchari* Women in Maharashtra. *Contemporary Voice of Dalit.*

16 Yadavar, S. (2017, 17 June). Sanitation Workers Clean Our Cities But They Are Denied Even Minimum Wage. *India Spend.* https://archive.indiaspend.com/indias-great-challenge-health-sanitation/sanitation-workers-clean-our-cities-but-they-are-denied-even-minimum-wage-72329; Fernandes, S. (2019, 4 March). How Mumbai's Sanitation Workers Fought the Municipal Corporation - and Won. *The Scroll.* https://scroll.in/article/914733/how-mumbais-sanitation-workers-fought-the-municipal-corporation-and-won

17 Kadlak, H., Salve, P. S., & Karwade, P. (2019, 19 March). Op. cit.

18 The Constitution of India abolishes the practice of untouchability and requires parliament to punish the enforcement of disabilities arising from untouchability (Article 17). To this end, the Scheduled Caste and Scheduled Tribe (Prevention of Atrocities) Act, 1989, criminally punishes practices arising from the system of untouchability. Nonetheless, untouchability manifests in new ways.

19 B. R. Ambedkar, political theorist, chairman of the Drafting Committee of the Indian Constitution and a towering caste scholar has this to say: "[I]t is clear that according to the Hindu Shastras and the Hindu notions, even if a Brahmin did scavenging, he would never be subject to the disabilities of one who is born a scavenger. In India, a man is not a scavenger because of his work. He is a scavenger because of his birth irrespective of the question whether he does scavenging or not." Ambedkar, B. R. (1945). *What Congress and Gandhi Have Done to the Untouchables.* Bombay: Thacker and Co.

20 The caste system is built on the subjugation of all women, as Ambedkar had argued as early as 1916. However, the feminist movement in India has not successfully reckoned with this reality and has been criticised for engaging in advocacy using an upper-caste lens. See Ambedkar, B. R. (1917). Castes in India: Their Mechanism, Genesis and Development. *Indian Antiquary, XLI.* http://www.columbia.edu/itc/mealac/pritchett/ooambedkar/txt_ambedkar_castes.html

21 The separability of caste and sex is easy for those who are subordinated on the basis of one marker and privileged by the other (such as upper-caste women), but is virtually impossible for those who are either privileged (upper-caste men) or subordinated by both markers (Dalit women). See MacKinnon, C. (2016). *Sex Equality.* (Third edition). Foundation Press.

22 Tripathi, T. (2012). Safai Karmi Scheme of Uttar Pradesh: Caste Dominance Continues. *Economic and Political Weekly, 47*(37). https://www.epw.in/journal/2012/37/commentary/safai-karmi-scheme-uttar-pradesh.html

23 Tripathi, T. (2015). Safai Karmis of Uttar Pradesh. *Economic and Political Weekly, 50*(6). https://www.epw.in/journal/2015/6/reports-states-web-exclusives/safai-karmis-uttar-pradesh.html

24 Roytalukdar, R. (2019, 28 January). #Republic of Grit: Who gets Coveted Government Sanitation Jobs in Rajasthan? *The Wire.* https://thewire.in/caste/republic-of-grit-who-gets-coveted-government-sanitation-jobs-in-rajasthan

25 Jain, S. (2019, 29 April). Manual Scavengers in Rajasthan Struggle to Be Recruited as Govt Sanitation Workers. *The Wire.* https://thewire.in/labour/manual-scavengers-in-rajasthan-struggle-to-be-recruited-as-govt-sanitation-workers

26 There is some evidence that the State of Mizoram has successfully dislodged the stigma attached to cleaning work by hiring tier four government employees who are required to serve in turns as sanitation workers, peons, office assistants, etc. Pisharoty, S. B. (2019, 20 March). For Sanitation Workers in Aizawl, Stigma Isn't a Problem. *The Wire.* https://thewire.in/rights/for-sanitation-workers-in-aizwal-stigma-isnt-a-problem

sanitation work called "manual scavenging"[27] – the manual cleaning of faecal matter – owing to the caste-based origin of confining this labour to only certain Dalit communities.[28] However, the prohibition on such hiring is lifted if protective gear or devices are provided to the workers.[29] From a human rights perspective, as Special Rapporteur Leo Heller reported to the 39th session of the UN Human Rights Council,[30] protective gear does not eliminate the stigma associated with manual scavenging or cleaning labour, which continues to be the only occupational opportunity available to 1.3 million Dalits in India.[31] While "eradication of manual scavenging" was stated as a policy imperative in the SCM guidelines,[32] further details were not forthcoming until 2017.[33] The scant guidance in the revised 2017 guidelines does not have anything to say on the varieties of sanitation work outside manual scavenging.[34]

Designing and developing Pune's smart sanitation: A closer look

The Union Ministry of Urban Development stated in May 2016 that it did not plan to privatise the management of basic utilities such as sewage treatment in smart cities.[35] However, private sector involvement is key to the financing of a smart city plan under the SCM.[36] In Pune, the "Smart Sanitation Economy" was the vision[37] of the Toilet Board Coalition (TBC) – a business-led partnership[38] that is offering technical assistance to the Pune Smart City and the Pune Municipal Corporation (PMC).[39] The "Smart Sanitation Economy" aims to lower costs of delivering sanitation by tapping a yet untapped market of health care and other services around the sanitation system.[40] The other two mutually reinforcing "economies" of interest for the TBC are the "Toilet Economy", comprising businesses looking to buy and sell toilet products and services, and the "Circular Sanitation Economy", which replaces traditional waste management practices, and comprises businesses capturing toilet resources such as urine and faecal matter for producing fuel, reusable water, compost and organic fertilisers, bio-plastics, etc.[41]

Our research and interviews indicate that in the "Toilet Economy", toilets will be privately established and operated. Sanitation workers will thus be hired by private entities, either as employees or as contract labourers, and it is unclear what legal regime will regulate their hire.[42]

Democratic accountability and responsiveness

The question of democratic accountability in smart cities generally is vexing. In the Pune case, the Pune Smart City is a special purpose vehicle (SPV) – a limited company held by the state and the PMC[43] – to whom rights, obligations and powers of the PMC are to be delegated.[44] However, this requirement does not convey the exact terms of the relationship between the PMC and the SPV, or delineate

27 Section 5 of the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 (2013 Act).

28 "Manual scavenging" is defined as the manual "cleaning, carrying, disposing of, or otherwise handling in any manner, human excreta" in any insanitary latrine or open drain or pit or railway track or other such spaces notified by the States or Central Government, under Section 2(g) of the 2013 Act .

29 See Explanation (b) of Section 2(g) of the 2013 Act. It is worth noting that those sanitation workers hired for manual scavenging with protective gear, if hired as contract labourers, continue to remain outside labour law protections.

30 Report of the Special Rapporteur on the human rights to safe drinking water and sanitation on his mission to India from 27 October to 10 November 2017, 6 Jul 2018, A/HRC/39/55/Add.1, Paragraph 25.

31 International Dalit Solidarity Network, Manual Scavenging. https://idsn.org/key-issues/manual-scavenging/

32 Guidelines for SBM (Gramin) 2014.

33 The Revised Guidelines for SBM (Urban), 2017 state in one line: "The State Governments shall pursue the following: i. All manual scavengers in urban areas are identified, insanitary toilets linked to their employment are ii. upgraded to sanitary toilets, and the manual scavengers are adequately rehabilitated." Para 6.4.14 of the Revised Guidelines for SBM (Gramin), 2017, merely forbid the construction of insanitary latrines and mandate conversion of existing ones to sanitary latrines. See also Updated Guidelines for SBM (Gramin), 2019.

34 See also Interview of Bezwada Wilson, National Convenor of the Safai Karmachari Andolan and Beena Pallical, Chair of the National Campaign for Dalit Human Rights by Newslaundry, November 2017. https://www.youtube.com/watch?v=GjqT7rwwtcY&t=6255

35 Lok Sabha Unstarred Question No. 2964, to be answered on 11 May 2016.

36 SCM Guideline 9.1.2.

37 Toilet Board Coalition. (2018). Op. cit.

38 The TBC is a "business-led partnership and platform" connecting "private, public and non-profit sectors" towards achieving Sustainable Development Goal 6 for universal access to sanitation. https://www.toiletboard.org/about

39 Guideline 6.3.2 of the SCM Guidelines defines Handholding Agencies for the proposal stage of the Smart City Mission. The Toilet Board Coalition was engaged well into Pune's proposal being selected in the SCM.

40 Toilet Board Coalition India Roundtable, 15 November 2017. https://www.youtube.com/watch?v=VUKB1WDJBjQ

41 Toilet Board Coalition. (2018). Op. cit.

42 Since the regulation of contract workers is less onerous than that of workers hired directly as employees, most establishments prefer to hire contract workers. If more than 20 workers are hired on contract, the Contract Labour Act, 1970, will regulate their hire. However, in cities such as Hyderabad, contractors have evaded this regulation by offering less than 20 workers for hire. Other cities have followed suit. See Yadavar, S. (2017, 17 June). Op. cit.

43 SCM Guideline 10.2 requires that the SPV be held in a 50:50 ratio by the State and the ULB in question.

44 Para 4, Annexure 5, SCM Guidelines.

the hierarchy of authorities.[45] Members of the Pune Smart City are largely bureaucrats, and to a lesser extent politicians, assisted by consultants for technical support, monitoring and evaluation, fund-raising from the market, as well as procuring implementation agencies.[46] Such conferral of decision-making powers in unelected bureaucrats raises questions about the democratic legitimacy of the smart city.[47]

Scholars have also expressed concerns about the class of citizens who will be consulted in the design of smart cities.[48] What demographics are represented at Pune Smart City's "Citizen Engagement meetings" remains to be studied. At least two such meetings for discussing smart city projects were conducted in housing-societies in the local area chosen for smart city development,[49] which comprise citizens with home-owning or renting capabilities. We are unable to find evidence of the attendance of citizen labourers servicing the smart city. The absence of participatory planning, failure to account for all citizens' needs or conduct social audits has effaced the "citizen-government interface" even in past urban-renewal missions in India.[50] India needs to reckon with this deficit in the democratic responsiveness of smart cities to citizen residents.

The deployment of "smart" solutions such as sensors in internet of things (IoT)-enabled toilets as a business use case – designed to maximise efficiency – as opposed to a public sector use case that accounts for human costs, further reduces democratic responsiveness in smart cities. The central concern is that privately deployed efficiency maximising systems need not reckon with human rights baselines that public sector systems do, such as, in this case, the dignity of workers who are confined to such labour owing to their caste identity.

The TBC's approach is concerned with the citizen toilet users at its core, because it is a business-led coalition attempting to tap a customer base of people without toilet access.[51] However, the state (i.e. the Pune Smart City) is constitutionally required to be accountable to all citizens, including citizen labourers. What instead appears to be happening is a dispersion of governmental power across multiple private, democratically unaccountable actors – from toilet operators to the toilet business in question – who manage and discipline sanitation workers to provide more efficient maintenance.[52] Since the Pune SCM's toilets will be privately operated, it is unclear how the toilet businesses will be held to norms of constitutional accountability. For instance, what legal recourse exists for sanitation workers who have been displaced from their previous jobs in the municipality's public toilets, in areas that now have privately operated "smart toilets"? Will toilet businesses running smart toilets be held to the constitutional obligation not to entrench caste-based sanitation work, or to ensure sanitary work conditions? Will the Pune SCM be truly democratically responsive to all its citizens, including citizen labourers from marginalised groups?

Sensors: Governmentality and unrepresentative training data

Sensors[53] form a fundamental building block of Pune's smart sanitation project by "enabling the collection of new data, feeding new insights, and

45 Anand, A., Sreevatsan, A., Taraporevala, P. (2018). *An Overview of the Smart Cities Mission in India*. New Delhi: Centre for Policy Research. https://cprindia.org/system/tdf/policy-briefs/SCM%20POLICY%20BRIEF%2028th%20Aug.pdf?file=1%26type=node%26id=7162; also see Taraporevala, P. (2017, 6 September). How Smart Cities Mission can help municipalities to improve governance. *The Hindustan Times*. https://www.hindustantimes.com/opinion/how-smart-cities-mission-can-help-municipalities-to-improve-governance/story-mTV2uXWofuiVlgL7A9cXPK.html

46 https://punesmartcity.in/about-pscdcl

47 Anand, A., Sreevatsan, A., Taraporevala, P. (2018). Op cit.

48 Ibid. Also see Hoelscher, K. (2016). The evolution of the smart cities agenda in India. *International Area Studies Review, 19*(1), 28-44.

49 Pune Smart City. (2018, 19 December). Pune Smart City continues with its Citizen Engagement Program campaign in Housing Societies to build awareness regarding the mission. https://punesmartcity.in/सटिझन-एंगेजमेंट-कार्यक/; Pune Smart City. (2018, 19 November). Pune Reaches Out To Housing Societies for Awareness Through Citizens Engagement Program, https://punesmartcity.in/पुणे-स्मार्ट-सटिच्या-प/

50 Roy, S. (2016). The Smart City Paradigm in India: Issues and Challenges of Sustainability and Inclusiveness. *Social Scientist, 44*(5-6), 29-48.

51 Cheryl Hicks, executive director of the TBC, stated: "We are a corporate-led coalition started because companies saw a business opportunity in sanitation. The 2.3 billion people without toilets are customers that they don't have." When asked about the large numbers of the urban poor, she responded: "That is why the companies formed the coalition, because the people without toilets, the poor, are customers they don't have." Civil Society. (n.d.). 'Sanitation is the fortune at the bottom of the toilet'. https://www.civilsocietyonline.com/business/sanitation-is-the-fortune-at-the-bottom-of-the-toilet

52 Foucault, M. (1978). Lectures Three and Four. In M. Senellart (Ed.), *Security, Territory, Population: Lectures at the Collège de France 1977-1978*. Palgrave Macmillan. See also other Foucauldian critiques of private sector technological solutions in smart cities such as Vanolo, A. (2014). Smartmentality: The Smart City as Disciplinary Strategy. *Urban Studies, 51*(5), 883-898; Klauser, F., Paasche, T., & Söderström, O. (2014). Michel Foucault and the Smart City: Power Dynamics Inherent in Contemporary Governing through Code. *Environment and Planning D: Society and Space, 32*(5), 869-885.

53 A sensor is a machine that observes the environment and converts physical quantity into signals. The physical quantities that can be measured are numerous – including air quality, blockages, temperature, movement, humidity, etc. For a more detailed explanation on sensors, see: 3Bplus. (2018, 4 November). How do smart devices work: sensors, IoT, Big Data and AI. https://3bplus.nl/how-do-smart-devices-work-sensors-iot-big-data-and-ai

creating Sanitation Intelligence."[54] At least one smart solution in the Pune case uses sensor data for building self-cleaning toilets. The GARV toilets,[55] some of which are installed in Pune, have sensors triggering floor and toilet-pan washing mechanisms.[56] However, other smart solutions appear to rely on transferring sensor data to a control centre to enable local municipal authorities that take care of urban planning and resource management – usually called Urban Local Bodies (ULBs) or the PMC in this case – to make data-driven decisions. Regardless of the solution, one must ask what data is being collected, what decisions will be made based on such data, and by whom.

When data from sensors is assimilated in the command and control centre, the centre becomes a one-stop-shop for data acquisition, assimilation and analytics. The end result is a digital map of the entire city.[57] According to the TBC Interim Report on the progress in the Pune smart sanitation project, as of November 2018, "sensors" include footfall sensors to understand user numbers, sensors in treatment plants to understand flow and quality of toilet resources, and sensors within a toilet to detect pathogens and other indicators.[58] Data from these sensors will be used to improve efficiency and management of operations, including managing peak usage times, and disease prevalence in communities.

The TBC Interim Report suggests that smart public toilets will produce a layer of "city intelligence" on "operational status of toilets triggering maintenance and cleaning", which will be used by ULBs to "adjust stockage and deploy maintenance." Likewise, smart public toilets will also produce a layer of "business intelligence" on "scheduling maintenance and customer usage patterns", which will be used by the toilet-operating businesses to improve "consumer communications" as well as by the on-ground operators to "optimize service levels."[59]

This is ostensibly a laudable development for citizen toilet users, especially considering that the TBC's aim in Pune is to develop "new models" in products, services and infrastructure, to "scale up access, usage and behaviour change" in India.[60] A closer look, however, indicates that citizen labourers do not figure anywhere in this scheme – an issue of utmost gravity given the caste and gendered nature of sanitation work in India.

As mentioned, sensor data used as envisaged aids the ULB, the business or on-ground operators to monitor the condition of toilets for either deploying maintenance or optimising service delivery. We worry that this will amount to a round-the-clock surveillance of sanitation workers tasked with the maintenance and cleaning of toilets.[61] The dispersion of governmental power across multiple private, democratically unaccountable actors – from toilet operators to the toilet business in question – for managing and disciplining sanitation workers[62] to provide more efficient maintenance, further multiplies the avenues for surveilling the sanitation workers.[63]

In addition to the worry that sanitation workers will be subjected to a top-down surveillance[64] aimed at more efficient management of the smart toilets, we also worry that their needs will not be captured in the data sets that will be created using

54 Toilet Board Coalition. (2018). Op. cit.

55 https://www.garvtoilets.com/about.html

56 Dietvorst, C. (2016, 6 October). Indestructible and smart: public toilet innovation in India. *IRC Wash Systems.* https://www.ircwash.org/blog/indestructible-and-smart-public-toilet-innovation-india

57 Ministry of Housing and Urban Affairs. (2018). *ICCC Maturity Assessment Framework Toolkit.* https://smartnet.niua.org/sites/default/files/resources/iccc_maturity_assessment_framework_toolkit_vf211218.pdf.

58 Toilet Board Coalition. (2018). Op. cit.

59 Ibid.

60 Civil Society. (n.d.). Op. cit.

61 The SBM has come under heavy criticism similarly for attempting to enforce more stringent cleaning obligations on already exploited sanitation labourers from the Dalit communities, by valorising the service they provide without either ensuring alternate occupational opportunities for Dalits or destigmatising sanitation work by attracting an upper-caste work force. See Teltumbde, A. (2014). No Swacch Bharat Without Annihilation of Caste. *Economic and Political Weekly, 49*(45). https://www.epw.in/journal/2014/45/margin-speak/no-swachh-bharat-without-annihilation-caste.html; Gatade, S. (2015). Silencing Caste, Sanitising Oppression: Understanding Swachh Bharat Abhiyan. *Economic and Political Weekly, 50*(44). https://www.epw.in/journal/2015/44/perspectives/silencing-caste-sanitising-oppression.html

62 Foucault, M. (1978). Op. cit. See also other Foucauldian critiques of private sector technological solutions in smart cities such as Vanolo, A. (2014). Op. cit.; Klauser, F., Paasche, T., & Söderström, O. (2014). Op. cit.

63 See Levy, K. (2015). The Contexts of Control: Information, Power, and Truck-Driving Work. *The Information Society*, 31(2), 160-174, in which she finds that "[t]ruckers, a spatially dispersed group of workers with a traditionally independent culture and a high degree of autonomy, are increasingly subjected to performance monitoring via fleet management systems that record and transmit fine-grained data about their location and behaviors" and further that "managers make use of electronic monitoring (and the data it generates) to control workers by making their day-to-day practices more visible and measurable." Noopur Raval notes regarding Levy's findings that the worker is "no longer accountable to a single or limited set of entities (human boss, customer) and is now, instead, constantly being monitored" and that such "fine-grained surveillance of truckers' behaviour [...] also causes a fundamental shift in how efficiency is determined and who gets to determine how to structure the organization of daily work in order to maximize overall work done." Raval, N. (2019). Advances in Computing and the Future of Work. (Unpublished draft.) https://www.academia.edu/38459868/TLSDraftPaper_Raval.docx

64 Zuboff, S. (2019). *The Age of Surveillance Capitalism.* London: Profile Books.

sensors (i.e. data collection from the ground up). Sensors at present are collecting data only on the use of public toilets (including footfall, frequency of usage, air quality, etc.) and the state of sewer water treatment plants (to manage flow, blockages and leaks). Sanitation workers are conspicuously absent from these data sets, and consequently, from the digital map of the smart city. In other words, no data is collected for the potential of alleviating the work load of sanitation workers, minimising sanitary hazards by providing protective equipment and gear, or enhancing the sanitary conditions of their labour.

The digital map of the city is thus selectively built, with dark spots in data sets overlapping almost entirely with marginalised groups. As data sets embed prevalent intersectional caste, class and gender biases,[65] the digital map of Pune's smart city will ignore and thus doubly marginalise already underrepresented groups. Sensors, being one of the primary points of data collection within the smart sanitation system, will feed data directly into the design and development of potential AI systems. AI applications that focus on gaining insights from data will use machine learning – a process of generalising outcomes through examples.[66] This means that data sets have a direct and profound impact on *how* an AI system works – it will necessarily perform better for well-represented examples, and poorly for those that it is less exposed to.[67] The marginalising of sanitation workers no doubt predates the use of technology in sanitation. It is precisely that marginalisation that will be further normalised and solidified through dark spots in data sets.[68] Communities at the margins of data collection are often those who need to be counted most – making the nature of data set creation crucial.

This seems to be a pervasive blind spot across government initiatives. The NUIS, for instance, contemplates empowering field-level employees by providing tools and knowledge for their everyday work, and providing city administrators with data and intelligence. It is not clear who field-level employees are. Given that they are expected to have formalised tasks and deliverables,[69] it appears that they are operators of infrastructure, and not the workers hired by the operators. Consequently, we worry that while improving citizens' ease of living is a purported aim of the NUIS, citizen labourers including sanitation workers and their needs are not contemplated in the NUIS' core data infrastructure.

Conclusions

Smart cities are currently envisaged and framed as a business opportunity. In the process, we have lost sight of the responsibility of the state in smart cities. In studying publicly available documents on the SCM, SBM, Digital India, NUIS and the national strategy for AI as applied to the Pune smart sanitation project, we find that the needs and perspectives of only citizen toilet users and citizen residents are reflected in the development of the smart sanitation project. The design of "smart" solutions, that are pervasive and IoT-based, indicates a dispersion of governmental power across several private, democratically unaccountable actors, to better discipline and manage citizen workers servicing the smart city.

Consequently, while the rights and ease of living of citizens are purportedly a central concern of smart cities, not *all* citizens' needs and perspectives are reflected in designing "smart" solutions. The turn to technological solutions that are designed, developed and deployed by private actors, as a substitute for public services and obligations, benefits the citizen consumer but further marginalises the citizen worker, thus aggravating extant worries on democratic accountability and responsiveness of smart cities in India. The SCM generally also bears testimony to this fact, by permitting area-based development that encompasses less than 10% of the Indian population.[70] Studies have found that lower-income groups are suspicious of smart city initiatives as they view it as a vehicle for gentrification and driving them away from certain areas in cities.[71]

Examining the crucial data stage of Pune's smart sanitation project, we learn that the design of data sets at the bedrock of the Pune Smart City

65 Marda, V. (2018). Artificial Intelligence Policy in India: A Framework for Engaging the Limits of Data-Driven Decision-Making. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 376*. https://doi.org/10.1098/rsta.2018.0087

66 Surden, S. (2014). Machine Learning and the Law. *Washington Law Review, 89*(1).

67 Lerman, J. (2013). Big Data and Its Exclusions. *Stanford Law Review Online*. https://www.stanfordlawreview.org/online/privacy-and-big-data-big-data-and-its-exclusions

68 Crawford, K. (2013, 10 May). Think Again: Big Data. *Foreign Policy*. https://www.foreignpolicy.com/articles/2013/05/09/think_again_big_data.

69 Ministry of Housing and Urban Affairs. (2019). Op. cit.

70 Housing and Land Rights Network. (2018). *India's Smart Cities Mission: Smart for Whom? Cities for Whom?* New Delhi: Housing and Land Rights Network.

71 Anand, T., et al. (2018). *Smart City Mission in Pune.* On file with authors.

are also likely to be unrepresentative and embedded with bias. Decisions made at this stage undergird how systems function, define their goals and parameters for success, and influence the ways in which systems can be used. It is important for data collection and creation efforts within the Pune Smart City, therefore, to work on being inclusive and non-discriminatory throughout the process of building "smart" systems, not just at the stage of outcomes.

One overarching learning from studying the disparate impact of the above policies on Dalit women sanitation workers is that the condition of the most marginalised citizen groups ought to be at the centre when designing policies and initiatives. While the potential of AI systems to transform Pune's sanitation crisis is deliberated upon aggressively by a variety of stakeholders, current debates must also focus on where systems are deployed, how systems impact the marginalised, and what axes of power these systems entrench.

Action steps

The following lessons can be drawn from the smart sanitation project in Pune:

- Centre the perspectives of those persons and communities lying at the intersection of many axes of disadvantage, such as caste, class, gender and ability, prior to and while designing policy, instead of studying social impact after the fact.
- Be critical of AI as a socio-technical and not just technical system, i.e. do not only worry about accuracy, but critique the very existence of systems, their placement, and their beneficiaries.
- Focus on bringing about transparency in government procurement of privately developed technology for public service delivery. This is one of the only ways in which the constant obsession with the "business case" for programmes will be combated.

GLOBAL INFORMATION SOCIETY WATCH 2019

Artificial intelligence:
Human rights, social justice and development

Artificial intelligence (AI) is now receiving unprecedented global attention as it finds widespread practical application in multiple spheres of activity. But what are the human rights, social justice and development implications of AI when used in areas such as health, education and social services, or in building "smart cities"? How does algorithmic decision making impact on marginalised people and the poor?

This edition of Global Information Society Watch (GISWatch) provides a perspective from the global South on the application of AI to our everyday lives. It includes 40 country reports from countries as diverse as Benin, Argentina, India, Russia and Ukraine, as well as three regional reports. These are framed by eight thematic reports dealing with topics such as data governance, food sovereignty, AI in the workplace, and so-called "killer robots".

While pointing to the positive use of AI to enable rights in ways that were not easily possible before, this edition of GISWatch highlights the real threats that we need to pay attention to if we are going to build an AI-embedded future that enables human dignity.

GLOBAL INFORMATION SOCIETY WATCH
2019 Report
www.GISWatch.org

APC
ARTICLE 19
Sida