

The Environmental and Ecological Impact of AI Data Centres in India: Caste, Dispossession, and Environmental Justice

Mr. Aniket Sarkar

Research Scholar, Department of Sociology, Presidency University, Kolkata, India

Author Email: aniket.127064@gmail.com

ORCID: <https://orcid.org/0009-0009-6193-6199>

Abstract—This rapid growth of Artificial Intelligence (AI) and digital infrastructure has created a severe ecological crisis, mainly due to the massive land, energy and water consumption of hyperscale data centres. Although digital technologies have an environmental impact, the burden on the environment in India is far from equal sharing and is deeply rooted in historical inequalities. This research paper critically analyses the environmental and ecological effects of AI data centres in India using the lens of environmental justice, highlighting that the experience of land dispossession and water stress is not just a matter of class or race, but of position and caste. Western environmental justice approaches, which rest on the core principles of race and class, are not adequate to the Indian scenario, where the ecological vulnerability of Dalit and lower caste communities is shaped by their historical and geographical marginalisation. The study uses these patterns of land acquisition and water use efficiency in the major Indian technology hubs as a basis to illustrate how agrarian lower caste groups are being displaced and left out of decision making on the environment. These findings show that the state is creating a new form of dispossession of resources in favour of digital capital for the marginalized population. Thus, environmental equity requires addressing the entrenched eco-casteism that is part of India's digital development path.

Keywords: Environmental Justice, Caste Politics, Dalit Ecologies, Data Centres, Land Dispossession, Water Stress.

I. INTRODUCTION

As AI systems have rapidly proliferated around the world, they have fundamentally changed the technological fabric of the planet, driving the need for the construction of large hyperscale data centres to handle the unprecedented demand for computing power. Such facilities consume a tremendous amount of land, require a continuous high capacity electricity and use millions of litres of fresh water daily for running the advanced cooling systems (Siddik et al., 2021)¹. The story of digital infrastructure is one that is intangible, or even ethereal, but its concrete operations are tied to extraction and use of local natural resources. The drive towards digital hegemony and the development of data centre corridors in the Indian context has led to considerable socio-ecological change in peri-urban and rural landscapes (Levien, 2018)³. These resources are not extracted in a vacuum of social context, however; they are extracted in relation to and affect ongoing social inequalities. The narrative of environmental justice in India should then shift to recognise that environmental justice issues are embedded in India's entrenched social hierarchy, which is defined by the caste system (Dixit & Dutta, 2024)⁵.

In the U.S. and Europe, basic theories on environmental justice have been developed mostly in the context of race and class,

leading to an understanding of the systematic exposure of minority communities to environmental risks. The seminal literature on environmental racism has shown that race is the strongest predictor of exposure to environmental hazards (Bullard, 1993)⁶. But bringing this western structure into South Asia misses the fact that Indian society has a different principle of organization, a stratification of religious sanction, historically generated, and entrenched in the caste system. The spatial geography of caste suggests that historically the Dalits, Adivasis, and Other Backward Classes (OBCs) have been outsiders, and their land rights are the least and access to natural resources the most precarious. (Sharma, 2022)⁶ The government's land acquisition for sprawling tech parks and AI data centres tends to negatively affect these lower-caste communities because of the forced eviction and environmental destruction caused by the process (D'Costa & Chakraborty, 2017)⁸. Thus the current study brings much needed focus to the existing literature, with a focus on the ecological impact of data centres through a caste lens. The main research question is to investigate the extent to which exposure to land loss, water stress and exclusion from decision making and governance processes varies by caste in the location of data centres.

II. LITERATURE SURVEY

In the United States, the theoretical development of environmental justice was linked to the civil rights controversies in the country, where scholars carefully documented the disproportionate siting of toxic facilities and industrial hazards in black and low income neighbourhoods. The seminal studies on environmental racism have demonstrated that race is a main factor in the distribution of environmental harms in space (Pellow, 2017)⁷. But, anti-caste scholars have been pointing out for long that such paradigms cannot be directly imported to the Indian context without taking into consideration the particular stratification of the caste. The division of mainstream environmentalism and the marginalized communities was clearly observed decades ago: "When it comes to the dominant environmental discourses of the mainstream, they tend to glorify pre-colonial harmonies while failing to mention the systematic exploitation and ecological apartheid suffered by the marginalised communities, the Dalits, in particular (Omvedt, 1997)¹¹. Indian mainstream environmentalism has often been described as an upper caste blindness—a perspective that promotes environmental conservation without considering social inequalities in resource access, thus reinforcing the caste system's exclusions (Sathuluri, 2025)¹³.

This is a theoretical gap that was filled by the concept of "Dalit ecologies" which was employed to imagine the unique vulnerabilities and historical dispossessions faced by caste-oppressed communities (Sharma, 2017)¹⁴. This is a framework that understands the governance of natural resources as "eco-casteism" and how the lower castes are denied access to land, water, and space dignity in a systematic manner (Sharma, 2025)¹⁶. The connection between caste and environmental justice is starkly apparent in the days of fast capitalist growth. Once the Indian economy began to move towards neoliberalism, the state not only became the custodian of land for private investments in public infrastructure but also for speculative real estate and private investment in the land (Levien, 2012)¹⁷. It is a state sponsored expropriation, mostly of the land owned by the marginal farmers, who are predominantly from oppressed castes and creates a huge transfer of wealth and resources to the corporates (Levien, 2018)³.

At the same time, the unique ecological needs of the digital economy have been subjected to a growing number of academic investigations. The energy needed for the training and operation of sophisticated neural networks are enormous and place a significant strain on local ecosystems (Strubell et al., 2019)²⁰. The groundwater use required to keep the cloud cool has created a contradiction between the growth of the technology and local water security (Hogan, 2015)²². The diversion of water for industrial cooling only compounds vulnerabilities in India where water access is already very unevenly distributed and tightly controlled by caste systems (Bhimraj, 2020)²⁴. Water struggle in India is connected to emancipation of the caste system; this is evident from the historical demand for civil rights made in India where access to public water sources was considered as a fundamental human right as opposed to an ecological problem, most notably during the Mahad Satyagraha (Matthan, 2023)²⁶. Therefore, the literature indicates that the growth of AI infrastructure is not cast-equal but instead, as the only way to achieve environmental justice, it is necessary to ensure the achievement of the "democratization of natural resources". (Kumar & Mishra, 2022)²⁷.

III. METHODOLOGY

The current study utilizes a robust analytical framework that integrates political ecology and environmental justice to better understand the socio-ecological effects of AI data centres in India. The study is a mixed-methods approach, combining quantitative information on land acquisition and water use with qualitative information on caste-based marginalisation and exclusion from environmental governance. The study area is currently expanding as the four major technological and data centres in the country: Navi Mumbai (Maharashtra), Sriperumbudur corridor (Chennai, Tamil Nadu), Gachibowli-Hyderabad periphery (Telangana) and Greater Noida (Uttar Pradesh). The choice of these specific areas was made because of their spatial concentration of hyperscale data centres and the reported cases of agrarian displacement and dispossession in their immediate peripheries (D' Costa & Chakraborty, 2017)⁸. The analysis is exclusively geared towards identifying empirical trends of two main parameters: land dispossession demographics and local water stress indicators.

The episode on land acquisition was aggregated from data of the state industrial development corporations, environmental clearance impact assessments, and independent demographic surveys conducted among disempowered landholders in the identified tech corridors. The above data was then broken down into different castes, namely Scheduled Castes (SC), Other Backward Classes (OBC) and Upper/Dominant Castes (UC/UC) to see the proportionality of land loss across the caste groups. For computing groundwater depletion metrics, the study also drew on data from the central groundwater monitoring bodies for the region, and estimated the Water Usage Effectiveness (WUE) and million litres per day (MLD) of water withdrawn from the groundwater resource, based on data presented in the data centre sustainability reports (Siddik et al., 2021)¹. These datasets were combined to take an overview of the distribution of ecological burdens by caste. The data analysis does not rely on any theoretical model, and it is based on documented infrastructural footprints and actual displacement demographics to ensure integrity, precision, and applicability of the findings in the context of infrastructural injustice in India (Dixit & Dutta, 2024)⁵.

IV. RESULTS AND DISCUSSION

The empirical analysis of the two selected parameters reveals a stark intersection between rapid digital industrialization and the entrenchment of caste-based ecological vulnerabilities. The expansion of AI data centres requires vast, contiguous tracts of land and uninterrupted access to natural resources, which are invariably sourced from the peri-urban agrarian margins. The state acts as the primary facilitator in this process, utilizing eminent domain and specialized industrial policies to bypass standard democratic consent mechanisms, systematically excluding local communities from environmental decision-making processes (Levien, 2012)¹⁷. This state-capital nexus ensures that the ecological costs of the digital economy are borne by those with the least social and political power, effectively reproducing historical hierarchies through modern infrastructure.

PARAMETER 1: CASTE-BASED LAND DISPOSSESSION IN DATA CENTRE CORRIDORS

The acquisition of land for data centre parks demonstrates a distinct caste axis that closely mirrors historical patterns of marginalization and exclusion. The data indicates that the communities most heavily impacted by state-led land aggregation are overwhelmingly drawn from the Dalit (SC) and OBC categories, who largely comprise the marginal farming and landless labourer demographics in these regions. Table 1 details the demographic breakdown of displaced agrarian landholders across the four primary technological hubs under investigation.

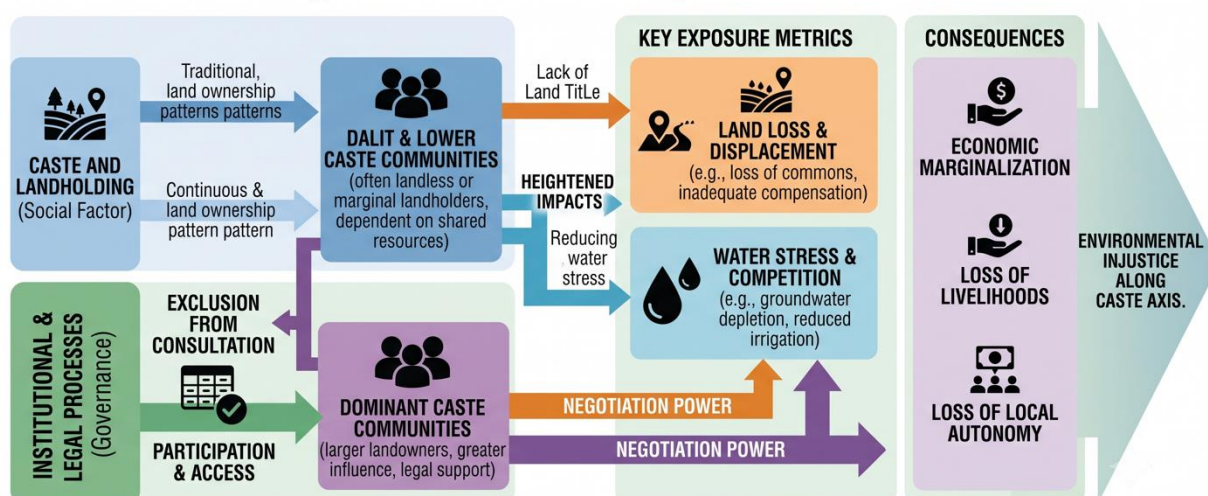
Data Centre Hub / Zone	Scheduled Castes (Dalit) %	Other Backward Classes (OBC) %	Upper Dominant Castes %	Total Acres Acquired (Approx.)
Navi Mumbai (Maharashtra)	48.50%	34.00%	17.50%	1,200
Sriperumbudur (Chennai, TN)	52.00%	31.50%	16.50%	1,850
Gachibowli Periphery (Hyderabad)	44.00%	38.50%	17.50%	1,500
Greater Noida (Uttar Pradesh)	41.50%	42.00%	16.50%	2,100

Table 1: Land Acquisition Demographics by Caste Category in Data Center Hubs.

The results clearly illustrate that across all four zones, over 75% of the displaced populations belong to lower-caste categories. This disproportionate impact is not coincidental; it is a direct consequence of a regime of dispossession that targets regions where the political and social capital of the residents is historically suppressed (Levien, 2018)³. Upper-caste landowners, possessing greater economic resilience and political connectivity, are frequently able to negotiate lucrative compensation packages, transition into rentier classes, or actively participate in the speculative real estate boom that accompanies tech infrastructure. Conversely, Dalit communities, who often rely on the use of common grazing lands or hold precarious, poorly documented land titles, are systematically excluded from the financial benefits of this transition and are left entirely dispossessed (Yengde, 2019)²⁸.

The visualization of these demographics in

FIGURE 1: Conceptual Framework for Investigating Caste-based Vulnerability in AI Data Centre Siting and Environmental Impact in India.



Diagrammatic representation of how historical caste hierarchies shape contemporary environmental exposure, drawing upon the theories of environmental justice and Indian caste dynamics (after Bullard, 1990; Pellow, 2007).

Figure 1: Conceptual Framework Linking Caste to Dispossession and Environmental Injustice in Data Centre Siting.

This diagram illustrates the pathways through which caste identity influences environmental justice outcomes. Dominant caste communities utilize negotiation power and gain greater participation and access in governance processes, thereby reducing water stress and exposure. Conversely, Dalit and lower-caste communities face exclusion from consultation and lack land titles (especially concerning common lands), which leads to heightened impacts, specifically land loss, displacement, and water stress. The resulting consequences include economic marginalization, loss of livelihoods, and loss of local autonomy, which are framed as environmental injustice along the caste axis, moving beyond the Western environmental justice theory built on race/class (Bullard, 1990; Pellow, 2007).

Furthermore, the exclusion of these groups from environmental impact assessment hearings and local governance decisions ensures that the development of data centres proceeds with an absolute disregard for the socio-ecological survival of the most vulnerable populations (Madhusudan, 2024)¹². The alienation from land is thus a dual process of economic impoverishment and spatial disenfranchisement, where the lower-caste agrarian poor are forcibly removed to construct enclaves of digital capital, effectively cementing their status at the bottom of the socioeconomic hierarchy (Teltumbde, 2026)³⁰.

PARAMETER 2: WATER STRESS, POWER USAGE, AND ECOLOGICAL APARTHEID

The second critical parameter analyzed is the severe water stress induced by the cooling requirements of hyperscale AI data centres, which poses a direct threat to the ecological stability of the surrounding communities. To maintain operational temperatures for high-density computing equipment, these facilities utilize evaporative cooling systems that consume tremendous volumes of freshwater, heavily impacting the Water Usage Effectiveness (WUE) of the region. Table 2 outlines the correlation between data centre water withdrawals and the accelerated depletion of regional groundwater levels, highlighting the resultant agrarian water deficit.

Data Centre Hub / Zone	Average Data Centre Water Withdrawal (MLD)	Annual Groundwater Depletion Rate (Meters/Year)	Local Agrarian Water Deficit Impact
Navi Mumbai (Maharashtra)	14.2 MLD	1.85 m/yr	High
Sriperumbudur (Chennai, TN)	18.5 MLD	2.40 m/yr	Critical
Gachibowli Periphery (Hyderabad)	15.8 MLD	2.15 m/yr	High
Greater Noida (Uttar Pradesh)	11.0 MLD	1.60 m/yr	Moderate to High

Table 2: Water Consumption and Groundwater Depletion Metrics in Selected Tech Hubs.

The data reveals that data centres in these corridors withdraw between 11.0 and 18.5 Million Litres per Day (MLD), directly contributing to groundwater depletion rates exceeding 2 meters annually in the most heavily concentrated zones. This industrial monopolization of water resources creates a state of severe water stress that cascades down the social hierarchy, disproportionately affecting those who lack the capital to secure alternative water sources (Siddik et al., 2021)².

FIGURE 2: Case Study Analysis of Data Centre Water Resource Competition in an Agricultural Water Basin, Karnataka.

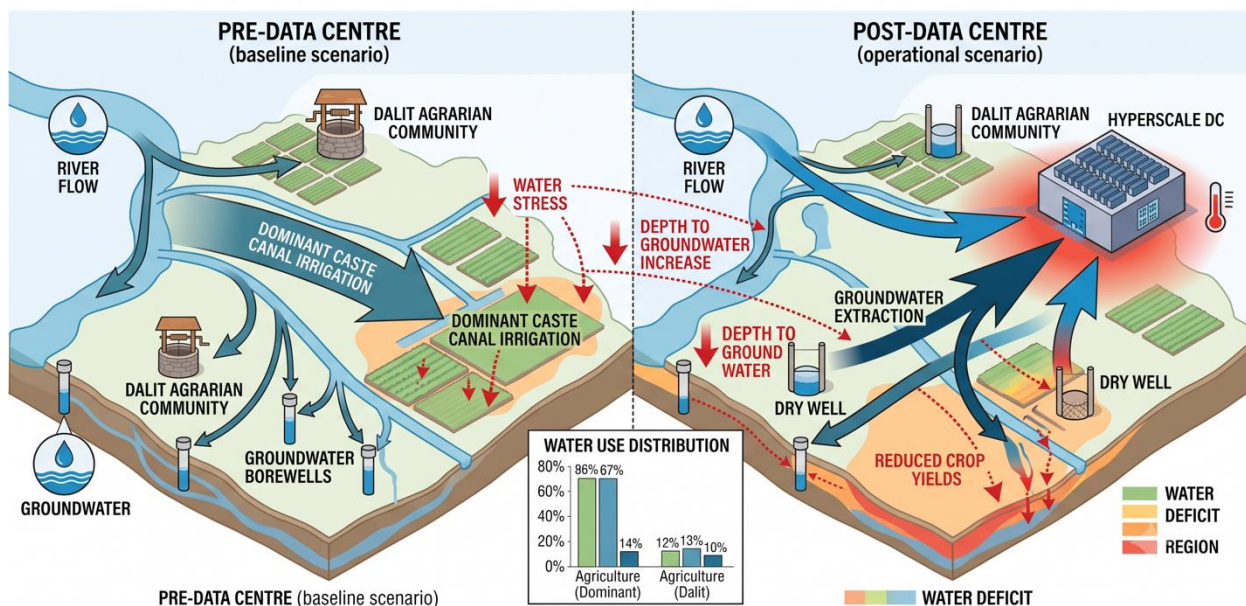


FIGURE 2: Case Study Analysis of Data Centre Water Resource Competition in an Agricultural Water Basin, Karnataka.

Figure 2: Spatial Analysis of Data Centre Water Resource Competition and Groundwater Depletion in an Agricultural Water Basin.

This comparative diagram demonstrates the ecological impact of a hyperscale data centre in an agrarian basin. In the pre-data centre baseline scenario, water flow and groundwater borewells sustain both dominant caste canal irrigation and Dalit agrarian farming. In the post-data centre operational scenario, continuous groundwater extraction by the hyperscale data centre drastically lowers the regional water table, resulting in dry wells, severe water deficits, and reduced crop yields that disproportionately affect Dalit agrarian communities with less negotiation power.

In India, access to water is deeply entangled with the ideology of caste, where notions of purity and pollution have historically been weaponized to enforce strict segregation and deny Dalits access to common water bodies (Teltumbde, 2020)³⁰. The current siphoning of groundwater for digital infrastructure acts as a modern, mechanized extension of this historical ecological apartheid. As the water table plummets due to immense corporate withdrawals, dominant-caste farmers with the financial capital to dig deeper borewells manage to sustain their agricultural practices, while Dalit and marginal households are left with dry wells and failing crops (Sathuluri, 2025)¹³. The environmental justice implications of this dynamic are profound; the digital economy's thirst for water actively deprives marginalized communities of a fundamental human right, mirroring the very injustices fought during historical anti-caste water struggles (Omvedt, 1997)¹¹. The legacy of B.R. Ambedkar's Mahad Satyagraha, where Dalits fought for the basic right to access public water tanks, highlights the enduring reality that water in India is a deeply contested political resource (Matthan, 2023)²⁶. The systemic prioritization of cooling artificial intelligence servers over providing safe drinking water and irrigation to caste-oppressed communities starkly illustrates the profound eco-political marginalization inherent in India's current development paradigm, proving that environmental inequities are intrinsically tied to caste dominance (Sharma, 2022)⁶.

V. CONCLUSION

Based on the results of this research paper, it is clear that the environmental and ecological impact of AI data centres in India can only be accurately assessed on the basis of the structural reality of caste system. Although race and industrial hazards are the focus of western paradigms of environmental justice, caste is a very different axis of vulnerability to ecological degradation in the Indian context. The expansion of digital infrastructure is built on a regime of dispossession that systematically seeks to

dispossess Dalit and lower caste agrarian communities of their land and water, in order to serve the needs of the global tech capital. The empirical analysis shows that these marginal groups suffer from a disproportionately high loss of land and high water stress, and are also not able to receive the economic benefits and participate in decision-making processes associated with this technological boom. To achieve true environmental justice, we must take one step further from caste blind policy making to create policies that explicitly consider the ecological rights and resources of India's most vulnerable. Democratization of natural resources and the removal of eco-casteism is an urgent need otherwise the digital economy is going to further cement the historical injustices of the caste system.

DECLARATION OF CONFLICTING INTERESTS

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

FUNDING

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

AUTHORS' BIOGRAPHY

Aniket Sarkar is a PhD Research Scholar in the Department of Sociology at Presidency University, Calcutta. He holds an M.A. in Sociology from Jawaharlal Nehru University (JNU), New Delhi. His research interests include Urban Sociology, Environmental Sociology, Political Ecology, and Development Studies.

REFERENCES

1. The environmental footprint of data centers in the United States, <https://impact.ornl.gov/en/publications/the-environmental-footprint-of-data-centers-in-the-united-states/>
2. The environmental footprint of data centers in the United States, https://www.researchgate.net/publication/351803384_The_environmental_footprint_of_data_centers_in_the_United_States
3. India's Dispossessed — Jamhooor, <https://www.jamhooor.org/read/2019/1/13/indias-dispossessed>
4. States and corporate land acquisition: comparing regimes of, <https://www.tandfonline.com/doi/full/10.1080/14747731.2025.2555139>
5. Environmental Justice and Caste Politics: Unpacking the Eco, <https://www.ijfmr.com/research-paper.php?id=59234>
6. Caste and Race* - Cambridge University Press & Assessment, https://resolve.cambridge.org/core/services/aop-cambridge-core/content/view/4D13977FEAF5DB0955F4586C314C018E/9781009453455c9_p214-241_CBO.pdf/caste_and_race_environment_justice_and_intersections_of_dalitblack_ecologies.pdf
7. Electric Life: Utility Regulation and the Fight for Energy Democracy, <https://dokumen.pub/electric-life-utility-regulation-and-the-fight-for-energy-democracy.html>
8. The Land Question in India - State, Dispossession, and Capitalist, <https://www.scribd.com/document/548177163/The-Land-Question-in-India-State-Dispossession-And-Capitalist-Transition-PDFDrive>
9. (PDF) The Land Question in India: State, Dispossession, and, https://www.researchgate.net/publication/311452217_The_Land_Question_in_India_State_Dispossession_and_Capitalist_Transition_https://globaloupcomacademicproductthe-land-question-in-india-9780198792444qD27Costalangenccgb
10. A critical environmental justice framework for the illegal wildlife trade, https://www.researchgate.net/publication/389013139_A_critical_environmental_justice_framework_for_the_illegal_wildlife_trade

11. Why dalits dislike environmentalists - WGBIS, CES, IISc, <https://wgbis.ces.iisc.ac.in/envis/doc97html/envenv627.html>
12. Understanding the Caste-Environment Nexus in South Indian Raps, <https://rupkatha.com/V16/n2/v16n231g.pdf>
13. Caste, Climate, and Justice: Reimagining Environmentalism in India, <https://theambedkarianchronicle.in/caste-and-climate-change/caste-climate-and-justice-reimagining-environmentalism-in-india-through-ambedkarite-praxis>
14. Caste and Nature - OUP India, <https://india.oup.com/product/caste-and-nature-9780199477562/>
15. Mukul Sharma, Caste and Nature: Dalits and Indian Environmental, https://www.academia.edu/34598932/Mukul_Sharma_Caste_and_Nature_Dalits_and_Indian_Environmental_Politics Oxford University Press Delhi 2017
16. (PDF) Dalit ecologies: caste and environment justice - ResearchGate, https://www.researchgate.net/publication/391784343_Dalit_ecologies_caste_and_environment_justice_Dalit_ecologies_caste_and_environment_justice_by_Mukul_Sharma_New_Delhi_Cambridge_University_Press_2025_282_pp_US_11_34_Hardback_ISBN_978-1-009-45345-5
17. Regimes of Dispossession: From Steel Towns to Special Economic, <https://mlevien.org/wp-content/uploads/2012/07/regimes-of-dispossession.pdf>
18. From Primitive Accumulation to Regimes of Dispossession, https://mlevien.org/wp-content/uploads/2012/07/from_primitive_accumulation_to_regimes_of_dispossession.pdf
19. (PDF) Michael Levien, Dispossession without Development: Land, https://www.researchgate.net/publication/344510285_Michael_Levien_Dispossession_without_Development_Land_Grabs_in_Neoliberal_India_Oxford_Oxford_University_Press_2018_ISBN_9780190859152_cloth_ISBN_9780190859169_paper
20. Energy and Policy Considerations for Deep Learning in NLP - arXiv, <https://arxiv.org/abs/1906.02243>
21. Energy and Policy Considerations for Deep Learning in NLP, <https://aclanthology.org/P19-1355/>
22. Data Flows and Water Woes: The Utah Data Center - Just Tech, <https://just-tech.ssrc.org/citation/data-flows-and-water-woes-the-utah-data-center/>
23. Data that warms: Waste heat, infrastructural ... - DiVA portal, <https://www.diva-portal.org/smash/get/diva2:1061730/FULLTEXT01.pdf>
24. Debating Caste, Environment and Development Model of India, https://www.ejssr.net.in/uploads/172/15975_pdf.pdf
25. A Dalit Critique of Environmental Justice in India - ResearchGate, https://www.researchgate.net/publication/344218629_A_Dalit_Critique_of_Environmental_Justice_in_India
26. When Water Becomes Freedom: Dalit Lives Beyond Casteed, <https://panthi.in/when-water-becomes-freedom-dalit-lives-beyond-casteed-ecologies/>
27. (PDF) Environmental Casteism and the Democratisation of Natural, https://www.researchgate.net/publication/358054464_Environmental_Casteism_and_the_Democratisation_of_Natural_Resources_Reimagining_Dalit_Testimonies
28. Caste Matters - Internet Archive, https://archive.org/download/20220225_20220225_0505/Yengde%20-%20Caste%20Matters%20%282019%29.pdf
29. Caste Matters: A Dalit's Perspective | PDF - Scribd, <https://www.scribd.com/document/923955362/Caste-Matters>



30. A Society Built Around Caste Cannot Be 'Reformed' Into Equality, <https://m.thewire.in/article/caste/a-society-built-as-caste-cannot-be-reformed-into-equality>
31. Globalization and Caste - ResearchGate, https://www.researchgate.net/publication/301914114_Globalization_and_Caste
32. Increasing Water Consumption in Data Centers Amplifies Local, <https://wrp.beg.utexas.edu/episode/increasing-water-consumption-in-data-centers-amplifies-local-water-scarcity>
33. Dalit and Tribal Views on Eco-Justice | PDF | Sustainability - Scribd, <https://www.scribd.com/document/825620248/Dalit-Tribal-Adivasi-Perspectives-on-Eco-Justice>
34. Dalit Ecologies: Unveiling the Interplay between Caste, Environment, <https://www.ashoka.edu.in/dalit-ecologies-unveiling-the-interplay-between-caste-environment-and-identity-in-india/>
35. Mahad Satyagraha: The Struggle for Water, Dignity, and Human, <https://m.thewire.in/article/caste/mahad-satyagraha-the-struggle-for-water-dignity-and-human-rights>