

Push and Pull Factors of Environment-Related Migration in Jharkhand, India: An Exploratory Review

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Abstract: *Jharkhand is a primary hub for seasonal and circular labour migration with over 45 million people migrating for livelihoods. Here, livelihood depends on rainfed farming and forests produce. This review asks how environmental change influences migration from the state, with special reference to Ranchi district. Peer-reviewed studies and official data were analysed using Lee's classic theory of migration, which groups factors into those at the origin, those at the destination, intervening obstacles and personal factors. Three environmental push factors were found at the origin: erratic monsoon rainfall and drought, degradation of forests and falling income from forest products, and displacement by mining and mine fires. Land ties, forest produce and public employment act as hold factors. Labour demand in brick kilns, construction, irrigated farms and urban homes pulls migrants outward, while debt, recruiters and kin networks shape who moves. Gender, tribe, caste and poverty decide whether a household migrates, stays or is trapped. Environmental change rarely acts alone; it shifts an existing balance of push and pull. Better irrigation, secure forest rights, safe-migration support and a fair transition away from coal are recommended.*

Keywords: Environmental migration; Push–pull factors; Forest livelihoods; Coal mining; Jharkhand

1. Introduction

Climate change and other environmental pressures are expected to influence where and how people move in coming decades [1]. Much of the published work, however, treats migration as a direct response to climate hazards. It gives less attention to the social, environmental and economic conditions that decide who actually moves [2]. Migration is better understood as the result of several drivers working together: economic, political, social, demographic and environmental [3].

In eastern India, Jharkhand offers a clear example of such interaction. Out-migration has become a routine part of rural livelihoods in the state [4]. Young people go to brick kilns, quarries, small scale industries in neighbouring states [5], women travel to metro cities as domestic workers [6], and men work on construction sites, agricultural farm of northern India, garments industries of Gujarat and Punjab. At the same time, the state's rainfall is declining, its forests are under pressure and coal mining continues to occupy land.

This paper uses Lee's theory of migration [7] as a simple lens to organise the evidence. Lee described migration as the outcome of factors at the place of origin, factors at the destination, obstacles between them and the personal circumstances of the migrant. The aim is to show where environmental change fits within this wider set of factors in Jharkhand, and particularly in Ranchi district.

2. Literature Survey

2.1 Theories of migration

Lee [7] argued that every place has positive factors that hold people, negative factors that push them away and neutral factors. People compare these at origin and destination, but

they must also overcome obstacles such as distance, cost and legal barriers. Personal traits such as age, education and family situation shape how each person weighs these factors.

Push–pull models have been criticised for treating migrants as passive. The aspirations–capabilities approach adds that people move only when they both wish to and are able to [8]. In the environmental field, a widely used framework places environmental change alongside economic, political, social and demographic drivers rather than above them [3]. Recent reviews also caution against assuming that climate is the main cause of migration [2].

2.2 Environment and migration

Environmental shocks can increase migration, but they can also prevent it. Very poor households may lose the money needed to move and become trapped [9]. A global meta-analysis found that links between environmental change and migration are strongest in countries that depend on agriculture [10].

Several studies from India are relevant to Jharkhand:

- In forest-fringe villages of central India, migration from the poorest district was high every year and did not respond to climate, while richer farming districts were more climate-sensitive [11].
- Drought frequency is associated with higher migration between Indian states [12].
- Climatic shocks in rural India mostly cause internal and rural-to-urban movement [13].
- In Bihar, farmers who perceive climate risk to their livelihoods are more likely to migrate [14].
- Access to secure irrigation reduces short-term migration from rural India [15].

2.3 Migration in Jharkhand

Field surveys across Jharkhand describe rural out-migration as widespread and largely seasonal [4]. Studies in western Jharkhand identify the household characteristics associated with temporary migration [16]. Panel data from eastern India show that crop losses linked to climate raise the intensity of seasonal migration, and that remittances raise household consumption [17].

Ethnographic work describes migration to brick kilns [5], to irrigated sugarcane farms in Uttar Pradesh [18] and to domestic work in Delhi [6]. A further body of research documents the displacement of Adivasi communities by coal mining [19,20]. These strands, however, are rarely brought together under a common framework.

3. Problem Definition

Studies of migration in Jharkhand focus mainly on poverty and employment. Studies of rainfall, forests and mining in the state seldom examine their effect on migration. As a result, the role of environmental change in Jharkhand's migration remains unclear. This review addresses three questions:

- 1) Which environmental factors act as push or hold factors in rural Jharkhand?
- 2) How do destination, intervening and personal factors interact with these environmental factors?
- 3) What gaps remain for research and policy?

4. Methodology / Approach

4.1 Study area

Jharkhand lies on the Chotanagpur plateau and covers 79,716 km². It had 32.99 million people in 2011, and forests cover

close to 29.81% of its area [21]. Ranchi district had 2.91 million people, of whom 35.8% belonged to Scheduled Tribes [22]. The district contains both a fast-growing capital city and rural blocks with a large Adivasi population.

Long-term records show that annual and monsoon rainfall declined by about 14% and 16% respectively between 1901 and 2002 [23]. Seasonal rainfall continued to fall up to 2018, while minimum temperatures and the number of heat-wave days rose at Ranchi [24]. Dry spells within the monsoon have also lengthened, most clearly in Palamu, Garhwa and Latehar [25].

4.2 Approach

This is a narrative review in four steps:

- 1) **Literature search.** Peer-reviewed literature was searched in Web of Science, Scopus, Google Scholar and publisher databases, using combinations of Jharkhand, Ranchi or Chotanagpur with migration, displacement, drought, rainfall, forest, NTFP, mining and coal.
- 2) **Descriptive data.** Government reports were consulted for descriptive data only.
- 3) **Classification.** Each finding was classified under one of Lee's four groups of factors [7]: factors at origin (push and hold), factors at destination (pull and repel), intervening obstacles and facilitators, and personal factors.
- 4) **Synthesis.** The factors were summarised in a table and a conceptual figure.

5. Results and Discussion

The factors identified are summarised in Table 1 and illustrated in Figure 1.

Table 1: Factors influencing environment-related migration in Jharkhand

Group (Lee, 1966)	Factors in Jharkhand	Effect on migration	Sources
Origin: push	Declining rainfall and drought; forest degradation and falling NTFP income; mining displacement and mine fires	Increase out-migration, mostly seasonal	[17,23–32]
Origin: hold	Land ties and tenancy protection; forest produce; MGNREGA, PDS and irrigation	Keep people at home or make migration circular	[15,26,30,33]
Destination: pull and repel	Brick kilns, construction, irrigated farms, domestic work, jobs in Ranchi	Attract migrants; shape where and how long they stay	[5,6,18,34,35]
Intervening obstacles and facilitators	Cost and debt; recruiters and advances; kin networks; safe-migration policy	Make migration easier or harder	[9,36,37]
Personal factors	Gender, age, tribe, caste, poverty, land ownership	Decide who moves, who stays and who is trapped	[6,9,11,19,37]

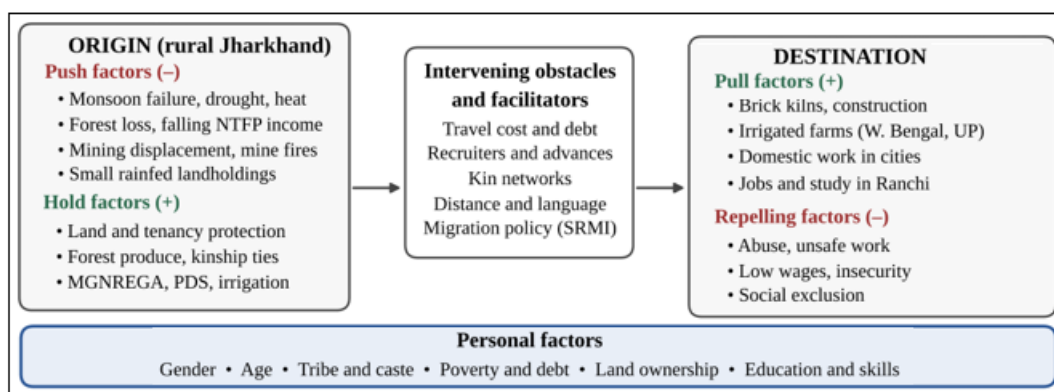


Figure 1: Environment-related migration in Jharkhand organised by Lee's theory of migration

5.1 Push factors at the origin

Declining rainfall and drought: Most farmland in Jharkhand grows a single rainfed paddy crop. When the monsoon is late or weak, transplanting is delayed and wage work for landless labourers disappears. Rainfall records show a long-term decline and longer dry spells [23–25]. Household data from eastern India confirm that crop losses linked to climate increase the intensity of seasonal migration [17].

Forest degradation and falling NTFP income: Forest products such as sal leaves, mahua, tendu, lac and various forest produce provide cash in the lean season. Forest income serves as a safety net for poor households [26]. However, almost half of the recorded forest area in Jharkhand lacks tree cover [21], and forest loss is greatest near settlements [27]. Collectors also receive low prices from middlemen [28]. Communities report that erratic rainfall reduces the availability of forest products, and that crop failure leads to over-harvesting [29]. When forest income falls, migration becomes the main way to bridge the lean season.

Mining displacement and mine fires: Coal mining has taken land from many village households, and women have lost access to land and forest in particular ways [19]. In North Karanpura, land was acquired one mine at a time [20]. Households without land titles moved into insecure coal work or left the area [30], and casual labour is common around mines [31]. In the Jharia coalfield, underground fires and land subsidence have forced families to relocate. Resettlement colonies far from work have left many without livelihoods [32].

5.2 Hold factors at the origin

Several factors keep people in their villages:

- **Land:** Land is central to Adivasi identity and kinship, and tenancy laws limit its sale. Most households therefore keep their land and village home while members migrate seasonally [30].
- **Place attachment:** Attachment to place often outweighs perceived risk [33].
- **Forest produce:** Where forests remain healthy, forest income can reduce the need to migrate [26].
- **Water:** Secure irrigation reduces short-term migration [15].

Public programmes such as MGNREGA and the public distribution system can also act as hold factors, but their effect in Jharkhand has not been measured.

5.3 Pull and repelling factors at the destination

Migrants are attracted by labour demand in brick kilns [5], on irrigated farms in Uttar Pradesh [18] and in urban households [6]. Movement toward areas with more reliable rainfall or irrigation has also been reported elsewhere [34]. Ranchi itself draws rural migrants for construction, services and education.

Destinations also repel. Domestic workers from Jharkhand in Delhi often live in their employers' homes, and report, restricted movement and sometime wage issues [35].

5.4 Intervening obstacles and facilitators

Moving costs money. Very poor households may be unable to migrate after a drought, which leaves them trapped [9]. Recruiters, cash advances and debt often make migration possible, but they also bind workers to employers [36]. Kin networks spread information about jobs. Jharkhand's Safe and Responsible Migration Initiative, launched in 2021, registers migrant workers and supports them at destinations.

5.5 Personal factors

Gender strongly shapes migration. Young women dominate the domestic-work stream [6]. After the 2020 lockdown, far fewer women than men wished to migrate again [37]. Adivasi and Dalit households without land titles are most exposed to displacement [19,30]. Age and education also influence who goes: seasonal migration is concentrated among young adults [5]. In the poorest villages, almost every household sends migrants regardless of the weather [11].

5.6 Discussion

The review shows that environmental change in Jharkhand rarely causes migration on its own. Instead, it shifts the balance of factors described by Lee [7]: drought, forest loss and mining weaken the hold factors and strengthen the push. Destination demand, recruiters and personal circumstances then decide who moves, where and for how long. This supports the view that environmental change should be studied as one driver among many [2,3].

Two future changes may alter this balance:

- **Coal phase-out.** A transition away from coal could become a strong new push factor. When the Piparwar mine has ceased its original open-cast operations in 2020, informal workers lost work and some left the region [30]. Most coal workers surveyed in 2023 said they would seek work elsewhere if mines closed [38].
- **"Green" land use.** Compensatory afforestation [39] and large solar parks [40] can take common land from poor households.

The push–pull lens has limits. It can make migrants appear passive, and it does not capture people's aspirations well [8]. It nevertheless provides a simple and transparent way to organise a wide range of evidence.

6. Conclusion

Migration from Jharkhand is driven by many factors, and environmental change is an important but rarely sole cause. Three environmental push factors stand out: declining rainfall and drought, forest degradation with falling NTFP income, and displacement by coal mining. Land ties, forest produce and public programmes act as hold factors. Labour demand elsewhere, recruiters and networks pull migrants outward. Gender, tribe, caste and poverty decide who moves, who stays and who is trapped. Policies that strengthen hold factors, including water security, secure forest rights and fair NTFP markets, while making migration safer, can reduce distress migration.

7. Future Scope

Limitations. This review is limited to English-language sources. Some figures come from government or organisational reports, and no new data were collected.

Future research should:

- 1) Link block-level rainfall and temperature data with migration records, such as the Jharkhand Migration Survey and MGNREGA work demand;
- 2) Survey forest-dependent households in Ranchi, Khunti, Gumla, Simdega and Lohardaga to measure how NTFP income affects migration;
- 3) Follow households displaced by mining and mine closure over time;
- 4) Study how women and the poorest households experience migration and immobility;
- 5) Assess how far MGNREGA, irrigation and safe-migration programmes act as hold factors.

References

- [1] Intergovernmental Panel on Climate Change. Climate change 2022: impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press; 2022. doi:10.1017/9781009325844.
- [2] Daoust G, Selby J. Climate change and migration: a review and new framework for analysis. WIREs Clim Change. 2024;15(4):e886. doi:10.1002/wcc.886.
- [3] Black R, Adger WN, Arnell NW, Dercon S, Geddes A, Thomas D. The effect of environmental change on human migration. Glob Environ Change. 2011;21(Suppl 1):S3-S11. doi:10.1016/j.gloenvcha.2011.10.001.
- [4] Kumar S, Sati VP, Singh R, Roy C. Patterns and drivers of internal migration: insights from Jharkhand, India. GeoJournal. 2023;88(5):4971-4990. doi:10.1007/s10708-023-10895-6.
- [5] Shah A. The labour of love: seasonal migration from Jharkhand to the brick kilns of other states in India. Contrib Indian Sociol. 2006;40(1):91-118. doi:10.1177/006996670504000104.
- [6] Rao N. Respect, status and domestic work: female migrants at home and work. Eur J Dev Res. 2011;23(5):758-773. doi:10.1057/ejdr.2011.41.
- [7] Lee ES. A theory of migration. Demography. 1966;3(1):47-57. doi:10.2307/2060063.
- [8] de Haas H. A theory of migration: the aspirations-capabilities framework. Comp Migr Stud. 2021;9(8). doi:10.1186/s40878-020-00210-4.
- [9] Black R, Arnell NW, Adger WN, Thomas D, Geddes A. Migration, immobility and displacement outcomes following extreme events. Environ Sci Policy. 2013;27(Suppl 1):S32-S43. doi:10.1016/j.envsci.2012.09.001.
- [10] Hoffmann R, Dimitrova A, Muttarak R, Crespo Cuaresma J, Peisker J. A meta-analysis of country-level studies on environmental change and migration. Nat Clim Change. 2020;10(10):904-912. doi:10.1038/s41558-020-0898-6.
- [11] Choksi P, Singh D, Singh J, Mondal P, Nagendra H, Urpelainen J, et al. Sensitivity of seasonal migration to climatic variability in central India. Environ Res Lett. 2021;16(6):064074. doi:10.1088/1748-9326/ac046f.
- [12] Dallmann I, Millock K. Climate variability and inter-state migration in India. CESifo Econ Stud. 2017;63(4):560-594. doi:10.1093/cesifo/ixf014.
- [13] Sedova B, Kalkuhl M. Who are the climate migrants and where do they go? Evidence from rural India. World Dev. 2020;129:104848. doi:10.1016/j.worlddev.2019.104848.
- [14] Jha CK, Gupta V, Chattopadhyay U, Sreeraman BA. Migration as adaptation strategy to cope with climate change: a study of farmers' migration in rural India. Int J Clim Change Strateg Manag. 2018;10(1):121-141. doi:10.1108/IJCCSM-03-2017-0059.
- [15] Zaveri E, Wrenn DH, Fisher-Vanden K. The impact of water access on short-term migration in rural India. Aust J Agric Resour Econ. 2020;64(2):505-532. doi:10.1111/1467-8489.12364.
- [16] Sucharita S. Socio-economic determinants of temporary labour migration in western Jharkhand, India. Millenn Asia. 2020;11(2):226-251. doi:10.1177/0976399620925451.
- [17] Basoya A, Pal R. Intensity of seasonal migration and its impact on household consumption: analysis of East Indian villages. Migr Dev. 2024;13(1):104-128. doi:10.1177/21632324241266303.
- [18] Rao N, Mitra A. Migration, representations and social relations: experiences of Jharkhand labour to western Uttar Pradesh. J Dev Stud. 2013;49(6):846-860. doi:10.1080/00220388.2013.778399.
- [19] Ahmad N, Lahiri-Dutt K. Engendering mining communities: examining the missing gender concerns in coal mining displacement and rehabilitation in India. Gend Technol Dev. 2006;10(3):313-339. doi:10.1177/097185240601000302.
- [20] Oskarsson P, Lahiri-Dutt K, Wennström P. From incremental dispossession to a cumulative land grab: understanding territorial transformation in India's North Karanpura coalfield. Dev Change. 2019;50(6):1485-1508. doi:10.1111/dech.12513.
- [21] Forest Survey of India. India state of forest report 2023. Vol II. Dehradun: Forest Survey of India, Ministry of Environment, Forest and Climate Change, Government of India; 2023.
- [22] Office of the Registrar General & Census Commissioner, India. District census handbook: Ranchi. Series 21, Part XII-A and Part XII-B. Ranchi: Directorate of Census Operations, Jharkhand; 2014.
- [23] Sharma S, Singh P. Long term spatiotemporal variability in rainfall trends over the state of Jharkhand, India. Climate. 2017;5(1):18. doi:10.3390/cli5010018.
- [24] Sharma R, Kotal SD. Analysis of temporal trend of rainfall, temperature and extreme events over Jharkhand. Mausam. 2022;73(4):795-808. doi:10.54302/mausam.v73i4.3520.
- [25] Tirkey AS, Ghosh M, Pandey AC, Shekhar S. Assessment of climate extremes and its long term spatial variability over the Jharkhand state of India. Egypt J Remote Sens Space Sci. 2018;21(1):49-63. doi:10.1016/j.ejrs.2016.12.007.

- [26] Angelsen A, Jagger P, Babigumira R, Belcher B, Hogarth NJ, Bauch S, et al. Environmental income and rural livelihoods: a global-comparative analysis. *World Dev.* 2014;64(Suppl 1):S12-S28. doi:10.1016/j.worlddev.2014.03.006.
- [27] Kumari B, Pandey AC, Kumar A. Remote sensing approach to evaluate anthropogenic influences on forest cover of Palamau Tiger Reserve, Eastern India. *Ecol Process.* 2020;9:17. doi:10.1186/s13717-020-0219-z.
- [28] Magry MA, Cahill D, Rookes J, Narula SA. Marketing constraints of non-timber forest products: evidence from Jharkhand, India. In: Narula SA, Raj SP, editors. *Sustainable food value chain development*. Singapore: Springer; 2023. p. 221-237. doi:10.1007/978-981-19-6454-1_11.
- [29] Indo-Global Social Service Society. *Climate change and non timber forest produce: roles and potential in Jharkhand, Chhattisgarh and Odisha*. New Delhi: IGSSS; 2016.
- [30] Oskarsson P, Nayak S, Kindo N. A just transition or a downward spiral? Land and livelihood transitions to and away from coal mining in India. *J Agrar Change.* 2025;25(3):e70003. doi:10.1111/joac.70003.
- [31] Pelz S, Krumm A, Aklin M, Nandan V, Urpelainen J. The spatial and economic footprint of the coal industry on rural livelihoods in Jharkhand, India. *Energy Policy.* 2024; 186: 113973. doi:10.1016/j.enpol.2023.113973.
- [32] Mishra V. Reign of fire. *Down To Earth.* 2025 Oct 2. Available from: <https://www.downtoearth.org.in/amp/story/mining/reign-of-fire>.
- [33] Adams H. Why populations persist: mobility, place attachment and climate change. *Popul Environ.* 2016;37(4):429-448. doi:10.1007/s11111-015-0246-3.
- [34] Lewin PA, Fisher M, Weber B. Do rainfall conditions push or pull rural migrants: evidence from Malawi. *Agric Econ.* 2012;43(2):191-204. doi:10.1111/j.1574-0862.2011.00576.x.
- [35] International Labour Organization. *Indispensable yet unprotected: working conditions of Indian domestic workers at home and abroad*. Geneva: International Labour Office; 2015.
- [36] Mosse D, Gupta S, Mehta M, Shah V, Rees J, KRIBP Project Team. *Brokered livelihoods: debt, labour migration and development in tribal western India*. *J Dev Stud.* 2002;38(5):59-88. doi:10.1080/00220380412331322511.
- [37] J-PAL South Asia. *Short- and long-term effects of the lockdown on young rural migrants from Bihar and Jharkhand.* 2020. Available from: <https://www.povertyactionlab.org/project/short-and-long-term-effects-lockdown-young-rural-migrants-bihar-and-jharkhand>.
- [38] Climate Trends. *Livelihood opportunities for a just transition in Jharkhand*. New Delhi: Climate Trends; 2023.
- [39] Menon M, Kohli K. The judicial fix for forest loss: the Godavarman case and the financialization of India's forests. *J South Asian Dev.* 2021;16(3):414-432. doi:10.1177/09731741211061968.
- [40] Yenneti K, Day R, Golubchikov O. Spatial justice and the land politics of renewables: dispossessing vulnerable communities through solar energy mega-projects. *Geoforum.* 2016;76:90-99. doi:10.1016/j.geoforum.2016.09.004.