



India and the Doughnut Economy: Navigating Social Equity and Ecological Boundaries

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ABSTRACT

Kate Raworth's Doughnut Economy model offers a forward-looking lens through which national development can be re-evaluated beyond conventional GDP-centric thinking. This paper examines India's socio-economic and environmental performance through this dual-boundary framework, drawing on secondary data from organisations including the World Bank, UNDP, UNESCO, FAO, and Our World in Data. The central question explored is how effectively India is advancing toward Raworth's notion of a "safe and just space for humanity" - the zone that satisfies essential human needs without transgressing the planet's ecological thresholds. The analysis reveals a distinctive pattern: while India largely operates within its ecological ceiling, it grapples with pronounced social shortfalls in domains such as education, poverty reduction, and healthcare access. The study argues that embedding Doughnut principles into India's commerce and governance architecture offers a credible pathway toward equitable and environmentally responsible development.

Keywords: Doughnut Economics, Sustainability, Social Foundation, Ecological Ceiling, India, Inclusive Growth

1. Introduction

Conventional economic thinking has long treated GDP growth and industrial output as the primary scorecards of national success. Although this growth paradigm has driven technological progress and raised incomes in many regions, it has consistently marginalised other dimensions of human welfare - among them, access to quality education, equitable healthcare, gender parity, and social justice. Beyond these social lacunae, unfettered economic expansion has generated severe ecological consequences: rampant deforestation, escalating pollution levels, resource depletion, and an accelerating climate crisis. These twin failures expose the inadequacy of growth-only models as frameworks for sustainable development.

A compelling alternative was articulated by Kate Raworth (2017) through the Doughnut Economy, a framework that redefines prosperity as the outcome of operating within two concentric boundaries. The inner boundary — the social foundation —

establishes a floor of essential human needs: food security, shelter, healthcare, education, and social equity. The outer boundary — the ecological ceiling — marks the biophysical limits within which life on Earth can be sustained, encompassing climate stability, freshwater availability, and biodiversity integrity. Humanity's challenge, according to this model, is to thrive within this doughnut-shaped safe and just space, neither falling short of the social floor nor breaching the ecological roof.

For India, this challenge is at once urgent and complex. Home to the world's largest population, the country is simultaneously navigating rapid urbanisation, industrial expansion, and deep-seated socioeconomic disparities. While infrastructure development and economic liberalisation have improved living conditions for segments of the population, widespread poverty, unequal access to education, and gaps in healthcare coverage persist at scale. Concurrently, India faces mounting ecological pressures — particularly freshwater stress and biodiversity degradation — that demand more thoughtful stewardship of natural resources.

This study situates India within the Doughnut framework to assess whether the country is moving coherently toward balanced and sustainable development. It investigates progress across two axes: social foundations — including literacy rates, healthcare outcomes, gender equality

indices, and poverty headcounts — and ecological ceilings — including carbon emissions, freshwater extraction, material footprint, and nutrient loading. The ultimate aim is to evaluate whether India's development trajectory is converging with the conditions necessary for long-term human and planetary well-being.

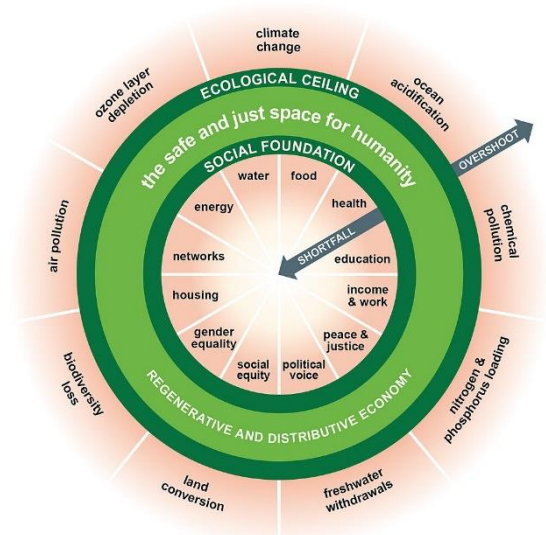


Figure 1: The Doughnut Economics Framework - The Safe and Just Space for Humanity (Raworth, 2017)

2. Objectives of the Study

The study is guided by the following key objectives:

- To assess India's performance across social indicators as defined within the Doughnut Economics framework.



- To evaluate India's environmental sustainability relative to established planetary boundaries.
- To identify and quantify the gaps between social development targets and ecological sustainability thresholds.
- To propose actionable policy and commerce-based strategies oriented toward inclusive and sustainable growth.

3. Research Methodology

3.1 Nature of the Study

The research adopts a descriptive and analytical approach. It systematically describes India's current socioeconomic and environmental conditions and subjects these conditions to structured analytical interpretation through the lens of Doughnut Economics.

3.2 Data Sources

All data are sourced from credible secondary repositories. International data were obtained from the World Bank, UNDP, UNESCO, FAO, Our World in Data, and the Stockholm Resilience Centre. India-specific supplementary data were drawn from the Ministry of Environment, Forest and Climate Change (MoEFCC), the

Ministry of Statistics and Programme Implementation (MoSPI), and NITI Aayog.

3.3 Reference Period

The study focuses primarily on the year 2023, using the most recently published and verified data to ensure contemporaneous relevance.

3.4 Analytical Tools

The analysis employs tabular comparison, percentage gap calculations, and qualitative interpretation to identify social shortfalls and ecological overshoots. Charts and graphical representations have been incorporated to enhance data comprehension and visual accessibility.

4. Data Analysis and Interpretation

4.1 India's Social Foundations

Table 1 presents India's performance against key social indicators within the Doughnut framework's social foundation layer, benchmarked against aspirational targets derived from international standards.



Indicator	Observed Value (2023)	Target Threshold	Data Source
Literacy Rate (%)	77.7	≥ 90	UNESCO (2023)
Poverty Rate (% below \$3.65/day)	10	≤ 3	World Bank (2023)
Life Expectancy (years)	70.2	≥ 75	UNDP (2023)
Access to Clean Water (%)	92	≥ 95	World Bank (2023)
Gender Equality Index (0–1)	0.65	≥ 0.85	UN Women (2023)

Table 1: India's Social Foundation Indicators (2023)

India demonstrates reasonably strong performance in clean water access (92%), though a gap of around three percentage points still remains before the safe threshold is met. The areas of greatest concern are literacy (12.3 points below target), gender equality (a 0.20 deficit on the index), and poverty (more than three times the target rate). These persistent social gaps signal that a substantial portion of the Indian population remains beneath the social floor envisaged by the Doughnut model.

4.2 India's Ecological Ceiling Performance

Table 2 presents India's ecological footprint across five key planetary boundary dimensions, compared against safe operating limits as defined by international scientific consensus.

Ecological Dimension	Observed Value	Safe Operating Limit	Data Source
CO ₂ Emissions (t/capita)	1.9	≤ 2.0	Our World in Data (2023)
Material Footprint (t/capita)	4.2	≤ 7.0	UNEP (2023)
Freshwater Use (% of renewable supply)	28%	≤ 20%	FAO (2023)
Nitrogen Loading (Tg N/year)	15	≤ 62	Stockholm Resilience Centre (2023)
Phosphorus Loading (Tg P/year)	5	≤ 11	Stockholm Resilience Centre (2023)

Table 2: India's Ecological Ceiling Performance (2023)

India's ecological profile is broadly encouraging. Per capita carbon dioxide emissions (1.9 t/capita) remain just within the safe limit, and both the material footprint and nutrient loading figures sit comfortably below their respective ceilings. The one area of concern is freshwater extraction: at 28% of renewable supply, India already exceeds the recommended 20% threshold. Seasonal variability and uneven regional distribution compound this challenge, pointing to the need for significant improvements in water resource governance and demand management.

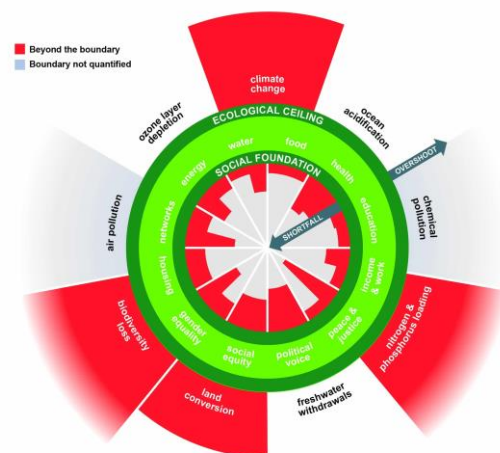


Figure 2: India's Doughnut — Social Shortfalls and Ecological Overshoot Profile



4.3 Sectoral Contributions to Carbon Emissions

Table 3 disaggregates India's total carbon dioxide emissions by economic sector,

providing a clearer picture of the primary sources of environmental pressure and corresponding intervention priorities.

Sector	CO ₂ Emissions (Mt)	Percentage Share (%)	Data Source
Energy (Electricity & Heat Generation)	1,200	45	Our World in Data (2023)
Transport	750	28	MoEFCC, India (2023)
Agriculture	350	13	FAO (2023)
Industry	300	11	World Bank (2023)
Residential & Other Uses	100	3	UNEP (2023)

Table 3: Sectoral Breakdown of CO₂ Emissions in India (2023)

Energy production — particularly electricity generation and industrial heat — accounts for nearly half of India's carbon emissions (45%), followed by the transport sector (28%). Together, these two sectors represent nearly three-quarters of the total emissions load. Agriculture contributes a notable 13%, making it the third-largest emitting sector. These sectoral concentrations indicate where policy interventions can yield the greatest emission reductions: accelerating renewable energy adoption and transitioning to cleaner transport solutions stand out as priority areas.

4.4 International Comparative Assessment

Table 4 situates India's social and ecological performance within a global comparative perspective, benchmarking it against countries at varying stages of development.



Country	Social Shortfall Score (0–100)	Ecological Overshoot Score (0–100)	Source
India	45	8	World Bank & UNDP (2023)
United States	12	34	Our World in Data (2023)
Norway	10	28	DEAL (2023)
Kenya	55	4	UNDP (2023)

Table 4: Comparative Social Shortfall and Ecological Overshoot Scores (2023)

The comparative data underscore a dichotomy that is common across developing economies: India carries a notably higher social shortfall score than high-income nations such as the USA and Norway, yet its ecological overshoot score is dramatically lower. This contrast reflects the dual challenge India must navigate — it must substantially expand its social provisioning without replicating the ecological overreach of affluent economies. Kenya's profile is similarly instructive: with a very low ecological overshoot but the highest social shortfall among the group, it illustrates the risk of environmental compliance at the cost of human welfare.

5. Key Findings

The analysis yields four principal findings:

- Social development gaps remain substantial: India has not yet met internationally benchmarked thresholds across education, gender equality, and poverty reduction —

the three domains most critical to ensuring a dignified social foundation for its citizenry.

- Ecological performance is largely within safe limits: With the notable exception of freshwater extraction — which exceeds its safe boundary — India operates within the planetary boundaries defined by the Doughnut framework, representing a meaningful advantage over many developed economies.
- Sectoral emission patterns highlight clear policy leverage points: The energy and transport sectors together account for nearly three-quarters of India's carbon output, making them the most strategically significant targets for decarbonisation efforts.
- India occupies a distinct global development trajectory: Its relatively modest ecological



footprint, combined with significant social deficits, positions it differently from both high-income overconsumers and extremely low-income nations — a profile that demands tailored, context-specific policy solutions.

6. Conclusion and Policy Recommendations

India possesses a distinctive opportunity to define a new form of prosperity — one that is simultaneously socially just and ecologically sound. The Doughnut Economy framework, with its dual-boundary logic, provides not merely an analytical tool but a normative blueprint that can guide India's development planning toward outcomes that neither sacrifice human welfare on the altar of environmental compliance nor consume ecological capital to fuel social progress.

For this vision to materialise, the following strategic directions are recommended:

6.1 Strengthening the Social Foundation

Priority investment must be directed toward expanding access to quality public education, universalising affordable healthcare, and constructing robust social safety nets for vulnerable populations. Targeted programmes addressing gender disparities and income inequalities are essential if India is to close the significant gap between current social outcomes and Doughnut-aligned thresholds.

6.2 Advancing Environmental Sustainability

India should accelerate the large-scale deployment of renewable energy technologies, improve water-use efficiency through demand-side management and infrastructure upgrades, and scale up sustainable agricultural practices. Clean energy investment and water conservation frameworks deserve particular urgency given the freshwater overshoot already observed.

6.3 Integrating Circular Economy Principles

Industrial production, waste management systems, and agricultural supply chains should progressively incorporate circular economy principles — reducing virgin resource extraction, recovering materials, and closing production loops. Such approaches can yield both environmental dividends and economic efficiency gains.

6.4 Encouraging Green Innovation and Entrepreneurship

Policy support for start-ups, small enterprises, and technology ventures addressing ecological challenges can help India unlock economic growth and employment generation aligned with sustainability goals. Green innovation ecosystems should receive enhanced access to capital, regulatory facilitation, and market incentives.



6.5 Building Coherent and Accountable Governance

A cross-sectoral regulatory framework is needed to align fiscal, industrial, and social policies with the Doughnut's dual boundaries. Robust monitoring systems, transparent evaluation mechanisms, and strong accountability structures will be critical to ensuring that development initiatives remain within the safe and just space over time.

In summation, India's development profile — marked by social gaps yet relatively modest ecological impact — is not a fixed condition but a starting point from which purposeful, coordinated action can yield transformative change. By embedding Doughnut principles into policy frameworks, corporate strategies, and civic discourse, India holds real potential to emerge as a global example of sustainable and equitable development in the twenty-first century: a nation where improving human well-being and respecting planetary limits are treated not as competing goals, but as mutually reinforcing imperatives.

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