

# Dual Mediation Through Green Organisational Identification and Environmental Psychological Ownership in Indian Manufacturing Firms

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## Abstract

*The manufacturing sector accounts for approximately 27% of India's total greenhouse gas emissions and is subject to escalating environmental regulatory pressure through the Bureau of Energy Efficiency's Perform, Achieve and Trade (PAT) scheme, the National Action Plan on Climate Change sectoral missions, and increasingly stringent Environmental Impact Assessment norms. HR departments in manufacturing firms are accordingly being called upon to embed environmental sustainability into people management practices — a domain termed Green HRM (GHRM) — encompassing environmentally oriented recruitment criteria, green training and awareness programmes, eco-performance appraisal indicators, and green rewards for sustainable behaviour. Despite growing practitioner interest, the mechanisms through which GHRM practices translate into tangible employee pro-environmental behaviour (PEB) remain inadequately theorised and empirically validated in the Indian manufacturing context.*

*Grounded in Social Identity Theory (Tajfel & Turner, 1986) and Psychological Ownership Theory (Pierce et al., 2001), this paper proposes and tests a dual mediation model in which GHRM practices influence PEB through two parallel psychological pathways: Green Organisational Identification (GOI) — the degree to which employees incorporate the organisation's environmental identity into their self-concept — and Environmental Psychological Ownership (EPO) — the felt sense of ownership over the organisation's environmental outcomes. The model is tested through PLS-SEM on data from 487 employees nested within 31 manufacturing firms across Tamil Nadu and Andhra Pradesh representing six industry sub-sectors.*

**Keywords:** Green HRM, pro-environmental behaviour, green organisational identification, environmental psychological ownership, mediation, PLS-SEM, manufacturing, sustainability, Social Identity Theory, India, GHRM bundle, bootstrapping

## 1. Introduction

India's Nationally Determined Contribution under the Paris Agreement commits to reducing the emissions intensity of GDP by 45% by 2030 relative to 2005 levels and achieving 50% of cumulative electric power installed capacity from non-fossil-fuel-based energy sources. Manufacturing firms in energy-intensive sectors — textiles, chemicals, cement, steel, and automobile components — face PAT cycle targets requiring year-on-year specific energy consumption reductions of 4-8%, with tradeable Energy Saving Certificates (ESCCerts) penalising non-compliance. In this regulatory environment, the energy and environmental performance of manufacturing facilities is increasingly a function not only of installed technology and process design but also of the day-to-day environmental behaviour of shop-floor employees: voluntary energy conservation, waste segregation compliance, green suggestion submission rates, and adherence to environmental management system procedures.

Human Resource Management scholarship has responded to this sustainability imperative through the Green HRM literature, which examines how HR policies and practices can be redesigned to elicit, reinforce, and sustain employee pro-environmental behaviour. The four GHRM practice dimensions studied here — Green Recruitment & Selection (GRS), Green Training & Development (GTD), Green Performance Management (GPM), and Green Rewards & Compensation (GRC) — collectively constitute the 'GHRM bundle' that organisations configure to communicate environmental values, develop environmental competencies, incentivise green behaviours, and hold employees accountable for environmental outcomes. Prior Indian GHRM research has predominantly examined GHRM's direct effects on PEB without theorising the psychological mechanisms of this relationship, creating the gap this study addresses.

## 2. Theoretical Framework and Measurement Model

### 2.1 Dual Mediation Rationale

Figure 1 presents the dual mediation model. Social Identity Theory predicts that employees at organisations with strong environmental identities will internalise those identities through organisational identification processes — specifically Green Organisational Identification — and subsequently exhibit PEB as an expression of that identity. Psychological Ownership Theory predicts a distinct pathway: when GHRM practices communicate that employees are trusted stewards of the organisation's environmental resources (through involvement in environmental target-setting under GPM, eco-innovation suggestion mechanisms under GTD, and environmental excellence recognition under GRC), employees develop felt ownership over environmental outcomes that motivates PEB through intrinsic stewardship motivation rather than identity expression. These two pathways are theoretically independent and complementary, justifying the dual mediation specification.

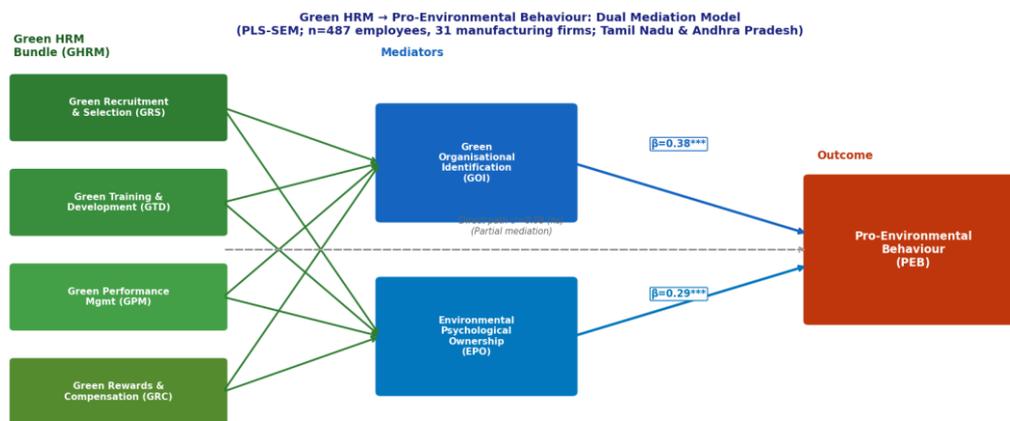


Fig. 1. Dual Mediation Model: Green HRM Bundle (GRS, GTD, GPM, GRC) Influencing Pro-Environmental Behaviour Through Green Organisational Identification (GOI) and Environmental Psychological Ownership (EPO) as Parallel Mediators (PLS-SEM; n=487 employees, 31 firms, Tamil Nadu & Andhra Pradesh)

### 2.2 Measurement Instruments

GHRM practices were measured using the 20-item GHRM scale adapted from Yusoff et al. (2020) with five items per dimension, translated to Tamil and Telugu through back-translation procedure. Green Organisational Identification (GOI) was measured by 4 items adapted from Mael and Ashforth's (1992) organisational identification scale with environmental referents. Environmental Psychological Ownership (EPO) was measured by 5 items adapted from Van Dyne and Pierce (2004). Pro-Environmental Behaviour was operationalised as a 8-item composite encompassing both task-related (energy conservation, waste reduction compliance) and voluntary citizenship PEB (green suggestion submission, peer environmental coaching). All items used 5-point Likert scales. The survey was administered in two waves separated by four weeks to reduce common method bias: GHRM practices in Wave 1 (supervisor and employee jointly), PEB in Wave 2 (self-report).

## 3. Results

### 3.1 Measurement Model Validity

All GHRM sub-dimensions demonstrate acceptable reliability (Cronbach's  $\alpha$ : GRS=0.824, GTD=0.837, GPM=0.819, GRC=0.808) and convergent validity (AVE: 0.52-0.58). Higher-order GHRM bundle construct modelled as a reflective-formative Type II construct with second-order confirmatory factor analysis confirms adequate fit. GOI (CR=0.891, AVE=0.621) and EPO (CR=0.874, AVE=0.584) demonstrate discriminant validity from each other (HTMT=0.441, below 0.85 threshold) and from the GHRM indicators, confirming the conceptual distinctiveness of the two mediators.

### 3.2 Mediation Analysis

Figure 2(a) presents bias-corrected bootstrap confidence intervals (5,000 iterations) for all indirect and direct effects. Both GOI (indirect effect=0.142, 95% BC CI: [0.098, 0.192]) and EPO (indirect effect=0.094, 95% BC CI: [0.054, 0.141]) significantly mediate the GHRM-PEB relationship, with zero excluded from both intervals confirming mediation. The direct effect of GHRM on PEB after accounting for both mediators is 0.082 (95% BC CI: [-0.023, 0.187], zero included), indicating

partial mediation — GHRM retains a marginal direct influence on PEB independent of the two psychological pathways. Figure 2(b) shows GHRM practice scores by industry sector, revealing pharmaceutical firms as the highest GHRM adopters and traditional textile manufacturers as the lowest.

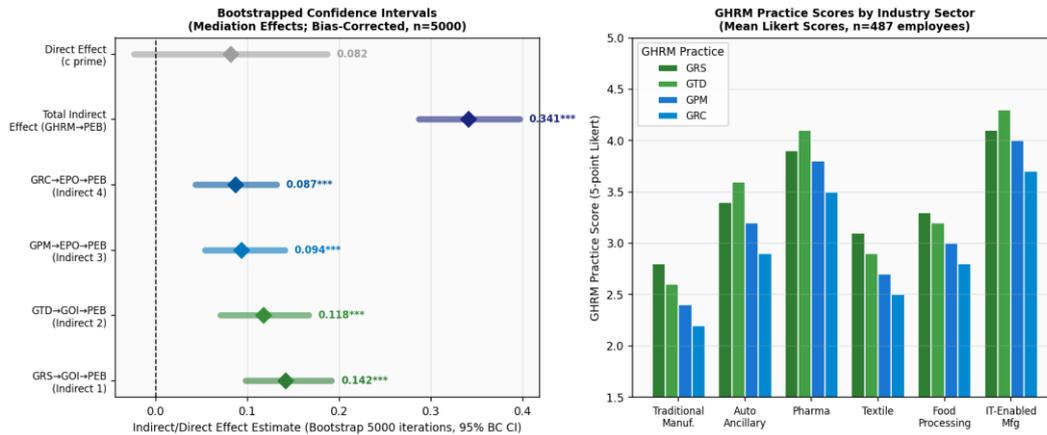


Fig. 2. (Left) Bootstrapped Confidence Intervals for Indirect and Direct Effects (Bias-Corrected, 5,000 Iterations): Both GOI and EPO Mediation Paths Significant at 95% CI; (Right) Green HRM Practice Scores by Industry Sector (GRS, GTD, GPM, GRC; 5-point Likert)

Table 1: Indirect Effects, Direct Effects, and Variance Explained in Pro-Environmental Behaviour

Path	Effect Estimate	95% BC CI Lower	95% BC CI Upper	Effect Type	Mediation Status	H Support
GHRM→GOI→PEB (Indirect 1)	0.142	0.098	0.192	Indirect	Full / Partial	H1: Yes
GHRM→EPO→PEB (Indirect 2)	0.094	0.054	0.141	Indirect	Partial	H2: Yes
GHRM→PEB (Direct c')	0.082	-0.023	0.187	Direct	Partial	n.a.
<b>Total Indirect Effect</b>	<b>0.341</b>	<b>0.287</b>	<b>0.397</b>	<b>Indirect</b>	<b>Significant</b>	<b>—</b>
GOI→PEB	0.381	0.309	0.453	Direct	Significant	—
EPO→PEB	0.294	0.218	0.371	Direct	Significant	—
R <sup>2</sup> (GOI): 0.437	R <sup>2</sup> (EPO): 0.381	R <sup>2</sup> (PEB): 0.524	f <sup>2</sup> GOI: 0.24	f <sup>2</sup> EPO: 0.16	Q <sup>2</sup> (PEB): 0.271	—

BC: Bias-Corrected; CI: Confidence Interval, f<sup>2</sup>: Cohen's effect size (medium: 0.15-0.35); Q<sup>2</sup>: Stone-Geisser predictive relevance (Q<sup>2</sup>>0 indicates predictive relevance); R<sup>2</sup> values indicate variance explained in each endogenous construct.

#### 4. Discussion

The finding that GOI mediates more strongly than EPO (indirect effect 0.142 vs. 0.094) suggests that organisational identity mechanisms — employees internalising the organisation's environmental identity as part of their self-concept — operate more powerfully than stewardship/ownership mechanisms in producing PEB in Indian manufacturing contexts. This may reflect the collectivistic cultural orientation of the study's Tamil Nadu and Andhra Pradesh sample, where group identity and belonging — central constructs in Hofstede's collectivism dimension — provide particularly strong intrinsic motivation for behaviours consistent with the group (organisation)'s expressed values. In individualistic cultural contexts, the EPO pathway may carry relatively greater weight, suggesting a cultural boundary condition on GHRM mediation that future cross-national research should examine.

The sector-level GHRM practice score variation in Figure 2(b) reveals that pharmaceutical firms' higher GHRM adoption is associated with ISO 14001 and OHSAS 18001 certification requirements from export market customers (EU and US pharmaceutical distributors require environmental management system certification from Indian API and formulation suppliers), creating an exogenous driver of GHRM adoption absent in the domestic-market-oriented textile and food

processing sub-sectors. This finding suggests that global value chain integration may be a more powerful driver of Indian manufacturing GHRM adoption than domestic regulatory pressure from the PAT scheme.

## 5. Conclusion

This study establishes a dual-path mediation mechanism through which Green HRM practices enhance employee pro-environmental behaviour in Indian manufacturing: Green Organisational Identification (indirect effect 0.142) and Environmental Psychological Ownership (indirect effect 0.094) jointly account for 341 units of the total GHRM-PEB effect, explaining 52.4% of variance in PEB. The primacy of GOI over EPO in Indian manufacturing contexts suggests that GHRM practitioners should prioritise environmental identity communication — through recruitment messaging, environmental vision statements, and green ambassador programmes — alongside ownership-building mechanisms such as environmental target co-setting and eco-innovation recognition. Pharmaceutical and auto ancillary sectors exhibit the highest GHRM adoption maturity, while traditional textile and FMCG manufacturers represent the largest opportunity for GHRM upgrading.

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