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# From Green Claims to Credible Evidence: Auditing the Credibility of Corporate Sustainability Claims through an Evidence-Maturity Framework in Indian FMCG

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## Abstract

Corporate sustainability communication increasingly relies on claims concerning naturalness, circularity, resource efficiency and environmental responsibility. Framed as an evidence-based audit of corporate sustainability-claim credibility, this study develops and applies an exploratory Evidence-Maturity Framework to nine Indian fast-moving consumer goods (FMCG) cases: ITC, Hindustan Unilever Limited (HUL), Nestlé India, Amul/GCMMF, Himalaya Wellness, Akshayakalpa Organic, Mamaearth/Honasa Consumer, Paper Boat/Hector Beverages and Patanjali. Using secondary data from annual reports, Business Responsibility and Sustainability Reports (BRSRs), sustainability disclosures, official product/brand pages, certification information and selected secondary sources, the study codes seven dimensions: environmental performance, circularity, social sustainability, product-level sustainability, measurement, verification and disclosure. Two descriptive indices distinguish sustainability implementation from evidence infrastructure, and four researcher-defined evidence-maturity profiles are derived from explicit thresholds. A targeted claim–evidence matrix examines identifiable public-facing claims as a boundary-control exercise rather than a census of marketing communications. The findings show a clear separation between firms with systematic, quantified and assured disclosure and firms whose evidence is concentrated in initiatives, sourcing practices or selected programmes. The framework argues that sustainable marketing credibility depends not only on sustainability action but also on the ability to measure, bound, verify and communicate that action at the relevant entity, product, temporal and lifecycle boundary. The study advances a practical “proof before promise” logic while avoiding the inference that low disclosure proves poor sustainability performance or intentional greenwashing.


## 1 Introduction

The FMCG sector occupies an important position in sustainability debates because its products are consumed frequently, distributed at scale and commonly rely on packaging, agricultural inputs, manufacturing energy and complex end-of-life systems. Sustainability can therefore affect product formulation, packaging design, sourcing, manufacturing, logistics, waste management and consumer information.

At the same time, sustainable marketing creates a communication problem: consumers may encounter a sustainability message at product or brand level while the supporting evidence exists only at corporate, project or supply-chain level. Green-marketing research has increasingly treated credibility, trust and consumer interpretation as central boundary conditions for sustainability communication, while greenwashing research emphasises the consequences of communication that is not adequately matched to environmental performance [1–3]. Recent systematic work further shows that greenwashing is conceptually heterogeneous and can occur at firm, product and executional levels [4].

The Indian context is particularly relevant because BRSR reporting and BRSR Core assurance have expanded the availability of structured sustainability information for listed entities. SEBI introduced BRSR in 2021 and subsequently introduced BRSR Core and associated assurance requirements for listed entities, increasing the availability of comparable ESG indicators while not eliminating differences in entity, product and lifecycle boundaries. [12, 13]

Although the present study does not directly measure firm-level SDG impact, it addresses a preceding requirement for credible sustainability accountability: whether corporate sustainability claims are supported by sufficiently measurable, verifiable and appropriately bounded evidence. Accordingly, the study positions evidence maturity as an audit-oriented mechanism linking corporate sustainability disclosure with the credibility of sustainability claims, rather than as a direct measure of SDG achievement.

This study therefore examines, through an evidence-maturity audit framework, how dispersed public evidence can be systematically organised to distinguish sustainability implementation from evidence infrastructure and to evaluate the extent to which that infrastructure can support credible sustainable marketing communication. The contribution is deliberately narrower than a greenwashing detection model: the framework audits evidence maturity and identifies potential claim–evidence gaps, but does not infer intentional deception from incomplete disclosure.

# 2 Conceptual background and research gap

### 2.1 Sustainable marketing and the evidence problem

Sustainable marketing is treated here as marketing that integrates environmental and social considerations into the creation, communication and delivery of value rather than treating sustainability as an advertising layer. Green marketing orientation research likewise distinguishes strategic, tactical and internal dimensions, indicating that sustainability in marketing is broader than promotional messaging alone [5, 6].

The case materials underlying this study repeatedly revealed a boundary problem: a company could document tree planting, recycling, renewable energy, organic sourcing or farmer support without demonstrating that every product in its portfolio had a lower lifecycle impact. The study consequently distinguishes three constructs: (1) sustainability implementation, referring to actions or outcomes; (2) evidence infrastructure, referring to measurement, disclosure and verification; and (3) claim–evidence alignment, referring to whether a specific public claim can be substantiated at the same relevant boundary. Together, these constructs provide the basis for auditing the credibility of corporate sustainability claims without equating incomplete disclosure with poor sustainability performance. These constructs can coincide but are not interchangeable.

### 2.2 Greenwashing, disclosure and legitimacy

Greenwashing research provides a basis for examining the gap between performance and communication. Delmas and Burbano [1] identify organisational and communication conditions through which environmental performance and positive environmental communication can become decoupled, while Lyon and Montgomery [2] conceptualise greenwash as communication that can lead stakeholders to form overly positive beliefs about environmental performance. Seele and Gatti [7] further caution against equating any accusation or communication gap with intentional deception. Accordingly, this study uses the more conservative language of potential claim–evidence gaps and greenwashing-risk conditions. [4, 10]

Sustainability reporting can serve accountability and legitimacy functions, but reporting volume is not equivalent to reporting substance. The distinction is especially relevant when corporate reports contain detailed operational indicators, whereas consumer-facing claims concern individual products or broad environmental benefits. Recent work on the substance of sustainability reporting reinforces the need to consider the nature, sensitivity and completeness of disclosed indicators rather than simply counting disclosure volume [8].

### 2.3 Research gap and theoretical positioning

Three gaps motivate the study. First, sustainable marketing research often asks whether a claim is true or misleading, while less attention is given to the evidence architecture through which operational sustainability becomes marketable proof. Second, ESG research often aggregates environmental, social and governance indicators, whereas sustainable marketing requires attention to product, packaging, claim and lifecycle boundaries. Third, secondary-data case comparisons can remain descriptive. A transparent ordinal coding system can convert dispersed corporate metrics, certifications and initiative evidence into comparable evidence profiles while preserving entity and temporal caveats.

The paper makes three contributions. First, conceptually, it separates implementation from evidence infrastructure and claim–evidence alignment. Second, methodologically, it provides an auditable coding architecture for heterogeneous public sustainability evidence and explicit profile thresholds. Third, managerially, it advances a claim-boundary principle: a sustainability claim is most defensible when the evidence corresponds to the claim in entity, product, geography, reporting period, metric and methodological/lifecycle boundary. This logic is consistent with the Indian ASCI environmental-claims guidance, which requires environmental claims to be reliable, verifiable, transparent and appropriately limited to the aspect of a product or service that actually has the environmental benefit. [9]

# 3 Research questions and objectives

# 3.1 Research questions

- RQ1. What dimensions of sustainability implementation and public evidence are disclosed by selected Indian FMCG companies?
- RQ2. How do the companies differ across environmental, circularity, social, product-level, measurement, verification and disclosure dimensions?
- RQ3. What exploratory evidence-maturity profiles emerge from the cross-case coding?
- RQ4. What level of evidence infrastructure is publicly available to support sustainable-marketing communication, and where are claim–evidence boundary gaps visible?
- RQ5. What recurring gaps exist between sustainability initiatives, product-level outcomes and public sustainability communication?
- **3.2 Research objectives**

1. Identify measurable sustainability practices disclosed by selected Indian FMCG companies.
2. Compare environmental, circularity, social and product-level sustainability evidence.
3. Assess measurement, disclosure and external verification.
4. Classify cases using an exploratory evidence-maturity profile framework rather than statistical clustering.
5. Examine whether identified public-facing claims are aligned with the scope of available evidence where claim-level observations can be located.
6. Identify recurring evidence gaps and derive implications for evidence-based sustainable marketing.

## 4 Methodology

# 4.1 Research design

The study adopts a qualitative-dominant secondary-data comparative case design with structured ordinal coding. The unit of analysis is the company or brand case, but every observation is retained with an explicit entity boundary. The approach is designed for evidence synthesis rather than causal inference and does not claim that the selected cases statistically represent the Indian FMCG population.

# 4.2 Case selection

The cases were selected purposively to create variation in ownership, scale, product category, sustainability communication and disclosure maturity. Inclusion criteria were: (1) substantial Indian FMCG presence; (2) publicly accessible sustainability, responsibility or product-level evidence; (3) sufficient material to code multiple framework dimensions; and (4) deliberate variation in disclosure maturity and business model. The final set comprises ITC, HUL, Nestlé India, Amul/GCMMF, Himalaya Wellness, Akshayakalpa Organic, Mamaearth/Honasa Consumer, Paper Boat/Hector Beverages and Patanjali. Fabindia was excluded from the core FMCG sample because its primary business model is more strongly associated with textiles and lifestyle products. The Indian organic-food market was treated as sector context rather than a company-level case.

# 4.3 Data sources, search and extraction protocol

Data were extracted from annual reports, BRSR disclosures, sustainability reports, official sustainability or responsibility pages, official product/brand pages, certification information and selected secondary sources used to corroborate project-specific evidence. Priority was given to primary company and regulatory sources, quantified metrics, statutory disclosures, independent assurance statements and evidence with identifiable dates and boundaries. A four-tier source hierarchy was applied: Tier 1 primary authoritative sources (BRSR, annual reports, assured sustainability reports, assurance statements and certification records); Tier 2 company primary communication (official corporate, brand and product pages); Tier 3 credible

independent secondary sources; and Tier 4 discovery/context sources. Tier 3/4 material was not treated as equivalent to independently assured primary disclosure.

The working dataset records the company, brand, legal/entity boundary, reporting period, evidence category, metric or observation, value, metric type, source tier, source title, page/section where available, URL, access date, boundary caveat, verification status and coding rationale. Supplementary Dataset 1 provides the full coding matrix, evidence register, source audit, claim–evidence matrix and coding protocol. Report page/section references are provided where the source is paginated; web-based evidence is identified by its relevant section or page URL.

A primary evidence window was defined as FY2023-24 to FY2025-26 for current cross-case interpretation. Earlier evidence is retained when it is necessary to understand a programme or product claim, but it is labelled historical and is not treated as directly comparable current-year performance. This prevents historical plant-level evidence, such as Paper Boat/Hector solar data from 2019, from being interpreted as equivalent to FY2024-25 corporate reporting.

## 4.4 Coding framework and decision rules

Each of seven core dimensions is coded on a three-point ordinal scale: 0 = no sufficient public evidence located in the reviewed source set; 1 = partial, emerging, historical, initiative-level or otherwise incomplete evidence; and 2 = substantial, systematic and/or quantified evidence with a clear operational scope. A score of 0 does not mean that a company is unsustainable; it means that sufficient public evidence was not located in the reviewed source set. The dimension-specific decision rules are summarised in Table 1.

Table 1
Coding framework and ordinal decision rules

| Dimension | 0 | 1 | 2 |
|---|---|---|---|
| Environmental | No sufficient evidence | Partial/initiative evidence or incomplete boundary | Systematic quantified environmental performance with defined scope |
| Circularity | No sufficient evidence | Partial/project evidence | Quantified packaging/waste/EPR evidence with defined scope |
| Social | No sufficient evidence | Some stakeholder/initiative evidence | Systematic and/or quantified stakeholder outcomes |
| Product | No sufficient product evidence | Limited product/certification evidence | Strong product-specific proof with identifiable scope |
| Measurement | No meaningful metrics | Some incomplete or isolated metrics | Multiple material metrics and/or targets with defined basis |
| Verification | None located | Selected certification/project verification | Independent assurance or strong third-party verification |
| Disclosure | None located | Scattered/limited disclosure | Structured sustainability/BRSR reporting |

Additional coding controls distinguish metric types. Absolute quantities are not treated as equivalent to intensity metrics; percentages retain their denominator or base; cumulative metrics are not compared directly with single-year flows; targets are not treated as achieved outcomes; and estimated or potential impacts are separately labelled from measured outcomes. The 250,000-t estimated CO2 sequestration potential reported by Honasa, for example, is treated as an estimated potential metric rather than as a measured emissions reduction.

## 4.5 Derived scores and evidence-maturity profiles

The Sustainability Implementation Score is the mean of environmental, circularity, social and product-level scores. The Evidence Infrastructure Score is the mean of measurement, verification and disclosure scores. Claim credibility is deliberately removed from the evidence score to avoid circularity: an outcome derived partly from evidence quality should not simultaneously be used as a component of the evidence-quality predictor.

The four profiles are researcher-defined descriptive categories for n = 9 purposive cases. They are not statistical clusters, and no clustering algorithm is claimed. Thresholds were specified before profile assignment: P1 = implementation ≥ 1.75 and evidence infrastructure ≥ 1.75; P2 = implementation ≥ 1.50 and evidence infrastructure 1.25–1.74; P3 = implementation < 1.50 and evidence infrastructure < 1.50; P4 = implementation ≥ 1.50 and evidence infrastructure < 1.25. These thresholds are used only to make the two-axis classification reproducible. The resulting thresholds are shown in Table 2. The four profiles cover the observed score combinations in the present nine-case sample; unobserved combinations outside these thresholds are not assigned a profile and should be tested in future applications.

Table 2
Evidence-maturity profile thresholds

| Profile | Implementation | Evidence infrastructure | Interpretation |
|---|---|---|---|
| P1 Evidence-backed sustainability leaders | ≥ 1.75 | ≥ 1.75 | High implementation and high measurement/verification/disclosure infrastructure. |
| P2 Structured transitioners | ≥ 1.50 | 1.25–1.74 | Meaningful implementation with developing evidence infrastructure. |
| P3 Initiative-led emerging adopters | < 1.50 | < 1.50 | Initiatives or selected product/social evidence without a consolidated evidence architecture. |
| P4 Implementation–disclosure asymmetry | ≥ 1.50 | < 1.25 | Meaningful implementation evidence materially exceeds public evidence infrastructure. |

## 4.6 Claim–evidence alignment and boundary controls

A claim–evidence alignment assessment is conducted only where a specific public-facing product, brand or corporate environmental communication could be identified. The scale is: 0 = unsupported/unclear in the reviewed evidence set; 1 = partially supported or supported only at a narrower/different boundary; 2 = strongly supported for the stated claim scope. The alignment assessment checks entity, product, geography, period, metric and methodological/lifecycle boundary. It does not establish intent to mislead. For claim–evidence alignment, company-reported product specifications are treated as evidence of the stated attribute only where the source provides a specific, identifiable product-level basis; independent assurance is assessed separately and is not required for a score of 2 unless the claim itself depends on externally verified performance.

The supplementary claim matrix includes seven identifiable public-facing claim examples and two cases where claim-level coding could not be completed from the supplied dataset and targeted public-source review. Those two cases are explicitly marked as pending rather than scored. This is a deliberate safeguard against treating an unobserved claim as evidence that no claim exists.

Four boundary controls were applied. First, evidence was retained with its date and source boundary. Second, corporate-group evidence was not automatically transferred across legally distinct entities. Third, AmulFed metrics were treated as AmulFed evidence rather than automatically as evidence for the entire GCMMF cooperative system. Fourth, Patanjali Foods assurance was not transferred to Patanjali Ayurved. Absence of evidence was recorded as an evidence limitation rather than negative proof.

## 4.7 Coding reliability

The current study does not claim inter-rater reliability because the supplied dataset was coded by a single researcher and no independent double-coded dataset was available. Accordingly, the protocol treats reliability as an explicit limitation rather than reporting a kappa statistic that cannot be supported by the available coding procedure. For future validation, two independent coders should code the full matrix and weighted Cohen's kappa should be calculated for the ordinal dimensions, with disagreements resolved through a prespecified adjudication rule.

# 5 Results

## 5.1 Cross-case evidence extraction

The extraction demonstrates substantial heterogeneity in the form and maturity of sustainability evidence. The largest listed FMCG cases provide structured quantitative reporting, while private and emerging brands often disclose individual programmes, sourcing practices or certifications without a consolidated environmental scorecard. Illustrative evidence and source references are summarised in Table 3; the full source audit is provided in Supplementary Dataset 1.

Table 3
Illustrative cross-case sustainability evidence and source references

| Company | Illustrative evidence | Boundary | Interpretation | Source |
|---|---|---|---|---|
| ITC | 50% renewable energy; >89,000 t external waste paper; ~70,000 t plastic managed | Corporate | Broad and quantified | [15] |
| HUL | 6.1% PCR packaging; 207,005 t end-of-life plastics; 100% EPR compliance | Corporate/BRSR | Strong circularity/disclosure | [16] |
| Nestlé India | 25,600 t plastic managed vs ~ 23,000 t target; 59% designed for recycling | Corporate/packaging | Strong measurement | [17] |
| Amul/AmulFed | 45,498 tCO2e Scope 1; 61,386 tCO2e Scope 2; 78,074 t plastic recycled | AmulFed | Strong metrics; boundary issue | [18] |
| Himalaya | 1,000 + acres fair-trade farming; 5,000 + acres supervised wild harvesting; ISO 14001 | Sourcing/certification | Strong practice evidence | [20] |
| Akshayakalpa | Farmer-income evidence; organic practices; biodigesters; >50,000 kg plastic recycled | Farm/business model | Strong social/practice evidence | [21, 23] |
| Mamaearth/Honasa | 6 lakh+ trees; 3,800 acres; 250,000 t estimated CO2 potential; 11,912 MT plastic recycled | Initiatives/corporate | Initiative-led evidence | [19] |
| Paper Boat/Hector | 345.6 kWp solar; ~523,000 kWh/year; ~430 tCO2/year avoided; Fairtrade Chikki | Plant/product | Credible but fragmented/historical | [24, 25] |
| Patanjali | Patanjali Foods: 64,670 t total waste; 928 t plastic; BRSR assurance | Related listed entity | Disclosure/entity asymmetry | [22] |

The public-source review also illustrates why source hierarchy matters. ITC's 2024 Sustainability Report states that its reporting period is 1 April 2023 to 31 March 2024 and that the report received independent reasonable assurance; Nestlé India's 2023-24 annual report similarly describes reasonable assurance of BRSR Core by Grant Thornton Bharat. Patanjali Foods' FY2024-25 assurance statement explicitly limits assurance to Patanjali Foods Limited. [15, 17, 22]

## 5.2 Coding matrix and evidence-maturity profiles

The cross-case coding matrix is presented in Table 4; the underlying case-level evidence records are provided in Supplementary Dataset 1.

Table 4
Cross-case coding matrix and evidence-maturity profiles

| Company | Env | Circ | Social | Product | Measure | Verify | Disclosure | Impl. | Evidence infra | Profile |
|---|---|---|---|---|---|---|---|---|---|---|
| ITC | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2.00 | 2.00 | P1 |
| HUL | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2.00 | 2.00 | P1 |
| Nestlé India | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1.75 | 2.00 | P1 |
| Amul/GCMMF (AmulFed evidence) | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1.50 | 1.67 | P2 |
| Himalaya Wellness | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1.75 | 1.00 | P4 |
| Akshayakalpa Organic | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1.75 | 1.00 | P4 |
| Mamaearth/Honasa | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1.25 | 1.33 | P3 |
| Paper Boat/Hector | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1.25 | 1.00 | P3 |
| Patanjali (Ayurved/Foods distinct) | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1.25 | 1.33 | P3 |

Note: the profile labels are descriptive classifications generated from explicit thresholds, not statistical clusters. Himalaya Wellness and Akshayakalpa Organic are classified as P4 because their implementation scores are 1.75 while their evidence-infrastructure scores are 1.00.

## 5.3 Evidence-maturity profiles

P1, evidence-backed sustainability leaders, comprises ITC, HUL and Nestlé India. These cases combine relatively high implementation with structured measurement, disclosure and verification. The distinction is not that their sustainability performance is necessarily superior in every respect, but that the public evidence architecture is comparatively mature.

P2, structured transitioners, comprises Amul/GCMMF. This case shows meaningful sustainability systems, but measurement, disclosure or assurance is less comprehensive or less uniformly bounded than in P1. Amul/AmulFed is particularly constrained by the distinction between AmulFed operating metrics and the wider cooperative system.

P3, initiative-led emerging adopters, comprises Mamaearth/Honasa, Paper Boat/Hector and Patanjali. Tangible projects or product attributes are visible, but company-wide evidence architectures are comparatively incomplete. The Patanjali case is best interpreted as a boundary-control case because assurance capability is demonstrable in Patanjali Foods while the specific Patanjali Ayurved product communication examined here is not supported by equivalent product-level evidence.

P4, implementation–disclosure asymmetry, comprises Himalaya Wellness and Akshayakalpa Organic. Both show meaningful sustainability practice evidence, including sourcing, certification or farm-level initiatives, but their public evidence infrastructure is less consolidated than their implementation profiles. This profile should not be interpreted as poor sustainability performance.

## 5.4 Claim–evidence boundary findings

Among the publicly identifiable claims included in the targeted claim-level review, ITC, HUL and Nestlé provide examples where product or packaging claims can be tied to specific packaging attributes and portfolio-level metrics. Akshayakalpa similarly communicates product-specific packaging attributes, although formal advertising should qualify end-of-life conditions. Himalaya and Mamaearth/Honasa illustrate a different issue: meaningful sustainability initiatives exist, but broad brand-level

environmental positioning is wider than the specific evidence identified. Patanjali provides the clearest entity-boundary warning: the product page uses a broad “natural and Eco-friendly” formulation, whereas the assured BRSR evidence identified in the study applies to Patanjali Foods Limited. The analysis therefore records a potential claim–evidence gap, not intentional greenwashing.

This approach is consistent with ASCI’s environmental-claims guidance, which states that absolute claims such as “eco-friendly” or “sustainable” require robust substantiation and that general environmental claims should be based on the full lifecycle unless their limits are clearly stated. [9]

The resulting implementation–evidence maturity map is presented in Fig. 1.

## 6 Discussion

# 6.1 From sustainability activity to evidence maturity

The central finding is that sustainability implementation and evidence infrastructure are related but distinct. A company can implement a meaningful environmental or social programme without publishing a comprehensive evidence architecture. Conversely, a company can disclose extensive information without providing product-level lifecycle evidence for every consumer-facing claim. Sustainable marketing therefore requires a translation mechanism between operational practice and credible consumer-facing proof.

The framework conceptualises this translation as commitment → initiative → measurement → integration → verification → bounded communication. The sequence is analytical rather than a claim that organisations always progress linearly. Measurement creates observability; integration embeds sustainability into systems; verification strengthens credibility; and bounded communication translates evidence into a claim whose scope is no broader than the supporting proof.

The resulting conceptual evidence pathway and boundary controls are presented in Fig. 2.

# 6.2 Product-level proof is the critical missing layer

A recurring finding is that corporate or programme-level sustainability does not automatically establish product-level environmental superiority. Tree planting, farmer training, recycling, renewable electricity and EPR compliance are meaningful actions, but each addresses a particular part of a value chain. A product-level claim can imply a much broader lifecycle conclusion. This reframes greenwashing risk as a boundary problem as well as a truthfulness problem: the question is not only whether the evidence is true, but whether it is the right evidence for the exact claim, product, period, geography and lifecycle boundary.

# 6.3 Disclosure quality matters more than disclosure volume

The strongest cases provide metrics, reporting periods, targets, operational definitions and assurance information. HUL’s distinction among EPR compliance, recycled content and end-of-life quantities is illustrative. Nestlé India similarly separates EPR quantities, design-for-recycling and virgin-plastic reduction. These distinctions matter because a single sustainability headline can hide materially different environmental mechanisms. Recent consumer research and systematic reviews also indicate that claim credibility and greenwashing perceptions influence trust and downstream consumer responses, reinforcing the importance of specific, verifiable communication rather than generic sustainability language [3, 11].

# 6.4 Theoretical contribution

The study contributes an evidence-maturity perspective to sustainable marketing by connecting sustainable business practice, sustainability disclosure and green communication. Evidence is treated as an intermediate organisational capability: action creates something to measure; measurement creates evidence; disclosure and verification increase observability; and boundary alignment determines whether that evidence can credibly support a market claim.

The framework also extends the interpretation of greenwashing. A company may possess strong sustainability performance and still make an over-broad claim, while another may have modest sustainability activity but communicate it cautiously and accurately. Accordingly, the unit of credibility should often be the claim and its evidence boundary rather than the company as a whole. This is consistent with recent greenwashing scholarship that cautions against collapsing different forms of misleading communication and different levels of analysis into a single label [4, 7].

## 6.5 Implications for Indian sustainable-marketing governance

The Indian regulatory environment makes this distinction increasingly consequential. SEBI's BRSR and BRSR Core architecture increases structured corporate disclosure, while ASCI's environmental-claims guidance directly addresses the reliability, verification and scope of green claims in advertising. The research framework complements these developments by treating claim substantiation as a boundary-matching problem rather than as a simple disclosure-volume problem. From a broader sustainability-governance perspective, effective sustainability outcomes also depend on transparent decision-making, stakeholder participation, institutional coordination and adaptive governance mechanisms. [9, 12, 13, 14]

# 7 Managerial implications

- Create a sustainability evidence register in which every environmental claim is traceable to a metric, reporting period, boundary, methodology and data owner.
- Separate corporate, programme, product and packaging claims. Do not transfer evidence between these levels without explicit justification.
- Use a claim–evidence matrix before communication and classify claims as strongly supported, partially supported or unsupported/unclear.
- Report achievements together with limitations and scope qualifiers.
- Prioritise product-level metrics for high-volume FMCG products, particularly packaging material, recycled content, recovery routes and lifecycle evidence.
- Distinguish measured outcomes from targets, cumulative metrics, modelled estimates and potential impacts.
- Use independent verification strategically for material indicators likely to influence consumers, investors or regulators.
- Sustainability evidence systems should also be embedded within organisational coordination processes, with clearly defined responsibilities for data owners, sustainability teams and relevant stakeholders to support transparency and accountability [14]
- Treat EPR as one circularity indicator rather than the whole circularity story; report source reduction, recycled content, design-for-recycling and recovery separately.

# 8 Policy and societal implications

For regulators and industry bodies, the results suggest that sustainability-claim governance should encourage comparability and boundary clarity rather than simply increasing disclosure volume. Standardised terminology for product-level claims, transparent substantiation requirements and clearer distinctions between corporate initiatives and product outcomes can reduce information asymmetry. ASCI's current environmental-claims framework already moves in this direction by requiring reliable and verifiable support and by limiting broad claims when the evidence covers only a part of a product's lifecycle. [9]

For consumers and civil-society stakeholders, the framework provides a practical reading strategy: identify what exactly is claimed, what entity or product the evidence covers, what period it refers to, whether the metric is absolute or intensity-based, whether it is measured or estimated, and whether an independent party has verified it.

# 9 Limitations and future research

The sample is purposive and small and cannot statistically represent the Indian FMCG population. Public disclosure is uneven, so the framework measures evidence accessibility as well as reporting maturity. A low evidence score is not proof of poor environmental performance. The ordinal coding framework is researcher-developed and exploratory; the current study does not claim inter-rater reliability because no independent double coding was available. The profile thresholds are descriptive and have not been psychometrically validated.

The analysis also does not constitute a census of all consumer-facing sustainability claims. The claim–evidence matrix contains a targeted set of publicly identifiable claims and explicitly marks cases where claim-level coding could not be completed. Accordingly, conclusions about claim–evidence alignment apply only to the targeted claim set rather than to each company's full marketing communications.

Reporting periods and metric definitions still differ across companies. The dataset preserves original periods and labels historical evidence rather than creating false comparability. Company-reported metrics may also involve different methodologies. Future work should use two independent coders, calculate weighted Cohen's kappa, expand the sample, standardise reporting windows where possible, and test the framework against independent ESG, lifecycle or consumer-response datasets.

Longitudinal research could examine whether firms move from initiative-led to evidence-backed sustainability and whether evidence maturity predicts consumer trust, willingness to pay, brand credibility or regulatory scrutiny. Experimental research could then test whether consumers distinguish strongly supported, partially supported and unsupported claims when the same claim is accompanied by different evidence boundaries.

## 10 Conclusion

This study demonstrates that dispersed sustainability data can be converted into a structured comparative evidence dataset when entity, product, temporal and methodological boundaries are made explicit. The cross-case analysis of nine Indian FMCG cases shows that sustainability implementation, evidence infrastructure and sustainable-marketing credibility should not be treated as synonyms.

The strongest cases combine operational action with measurement, structured disclosure and external verification. Other cases show meaningful sustainability practices but have evidence architectures that remain fragmented, historical, initiative-specific or entity-bounded. The principal implication is therefore a proof-before-promise approach: sustainability claims should emerge from measurable and appropriately bounded evidence rather than the other way around. In this sense, the proposed framework provides an exploratory basis for auditing the credibility of corporate sustainability claims by examining whether the evidence is measurable, verifiable and appropriately aligned with the scope of the claim.

The Evidence-Maturity Framework is not proposed as a validated sustainability ranking or a statistical clustering model. Its value lies in making visible the pathway through which sustainability practice becomes credible market evidence and in identifying where a claim is broader than the evidence available to support it. The four descriptive profiles should likewise be interpreted only within the observed score space of the present nine-case sample until tested on additional cases.

## Declarations

**Funding**

No external funding was received for this study.

**Ethics approval**

Not applicable. The study uses publicly available secondary data and does not involve human participants, animals or identifiable personal data.

**Consent to participate**

Not applicable. As the study uses publicly available secondary data.

**Consent for publication**

All authors reviewed and approved the manuscript and consent to its publication.

**Competing interests**

The authors declare no competing financial or non-financial interests in relation to this work.

**Clinical Trials**

No clinical trials were conducted for the study. The study is based on secondary data which is available on public domain. Clinical trial number: not applicable

**Data availability**

The secondary-data extraction and coding dataset is provided as Supplementary Dataset 1 (FMCG Evidence-Maturity Framework Dataset, XLSX). It contains the coding matrix, evidence register, coding protocol, source audit, profile thresholds, metric-type definitions and claim–evidence matrix. Public source URLs and access dates are provided throughout, with page or section references for paginated reports and named web sections for online sources.

**Author contributions**

**Catherene Julie Aarthy. C:** Conceptualisation, research design, development of the Evidence-Maturity Framework, methodology, data curation, formal analysis, interpretation of findings, synthesis of results, and original manuscript drafting; supervision and coordination of the study; critical revision and finalisation of the manuscript.

**Smriti Verma:** Data collection, identification and verification of secondary sources, methodological support, and critical review of the manuscript.

**Deepa Manokaran:** Research design support, formulation and refinement of the research questions, literature review, and critical review of the manuscript.

**S. Catherine:** Literature synthesis, methodological review, interpretation of the conceptual framework, and critical revision of the manuscript.

**M. S. Shahina Begum:** Data validation, review of evidence categorisation and coding logic, discussion of findings, and critical revision of the manuscript.

**Bhakti Pawar:** Analytical and methodological review, validation of the comparative analysis, interpretation of findings, and critical revision of the manuscript.

**All authors** reviewed the manuscript critically, approved the final version, and agreed to be accountable for the work.

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## Figures

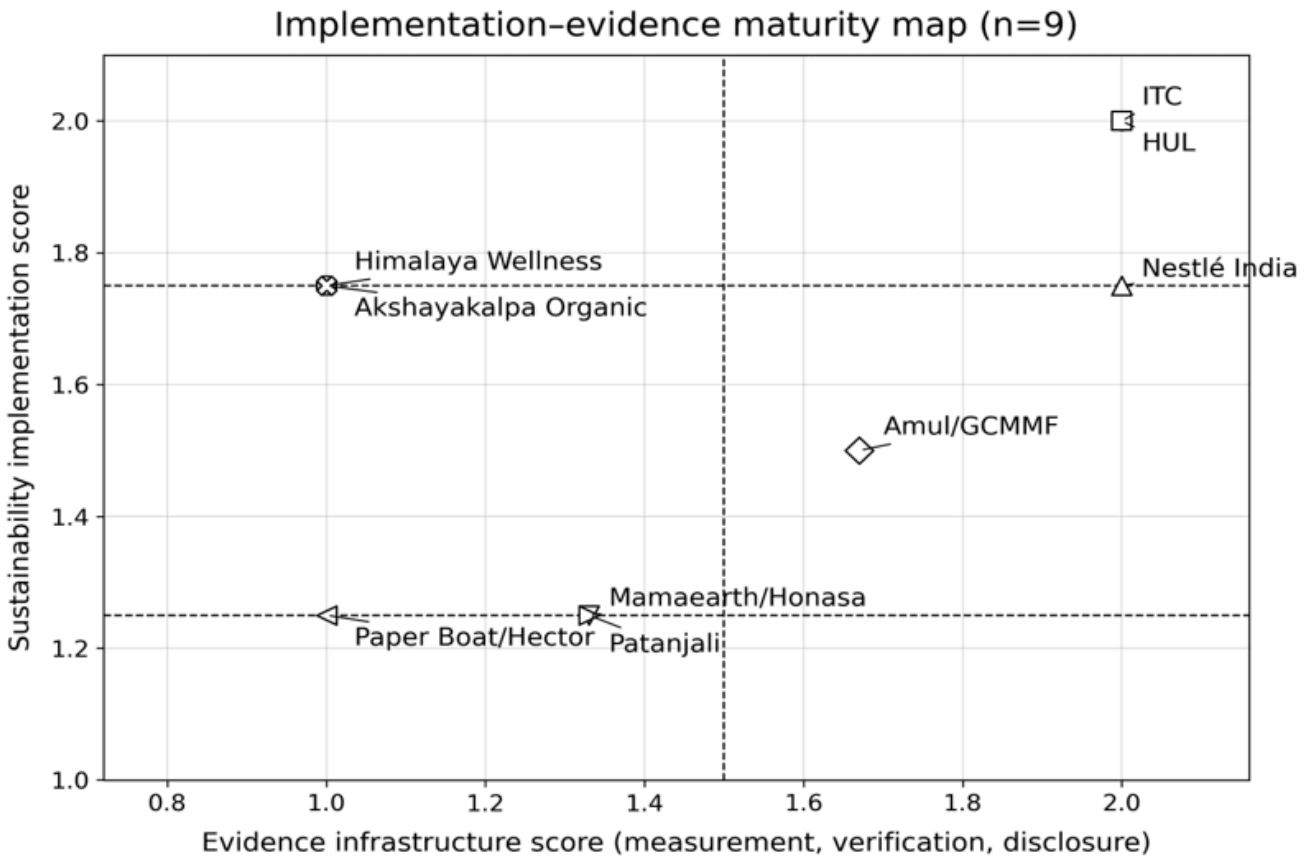



**Figure 1**

Implementation–evidence maturity map. Evidence infrastructure is the mean of measurement, verification and disclosure; implementation is the mean of environmental, circularity, social and product-level scores

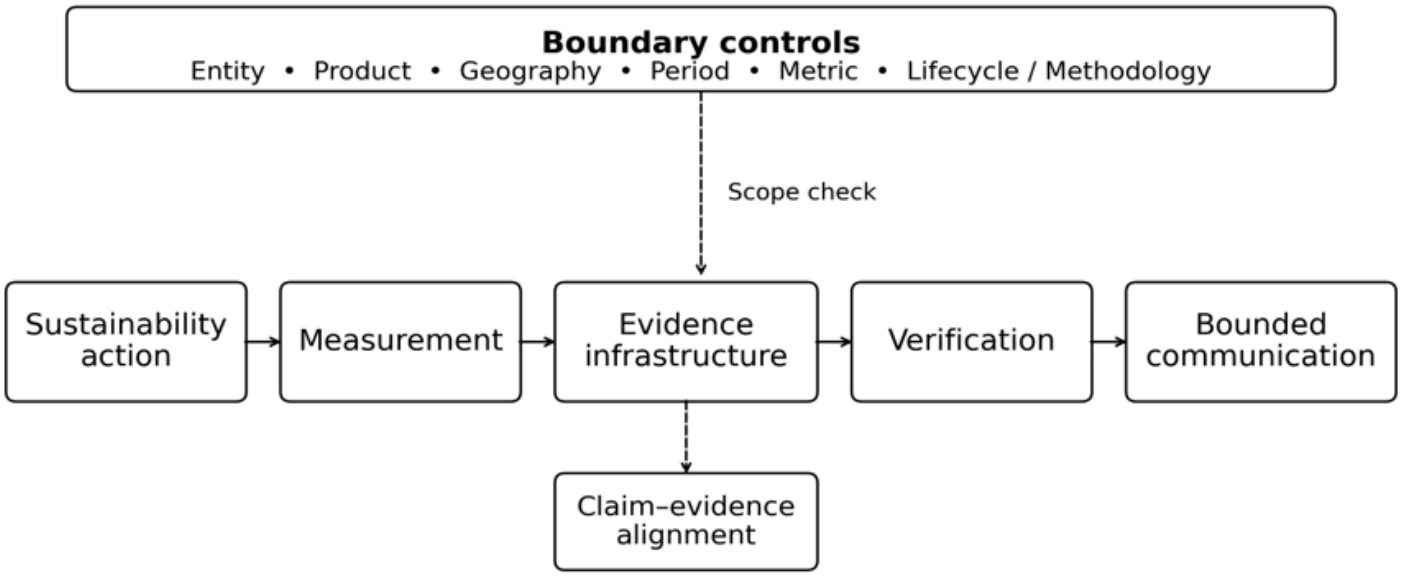


**Figure 2**

Conceptual evidence pathway and boundary controls

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- S1FMCGEvidenceMaturityFrameworkDataset.xlsx