International Journal for Multidisciplinary Research
Two-Day National Conference on WOMEN LED DEVELOPMENT: Pathways to Inclusive, Sustainable & Equitable Growth
Organized by De Paul College, Mysore & Center for Women Studies and Research, Mandya University, Mandya on 14th & 15th March 2026
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Impact Factor: 9.24

Women's Power as the Architect of Sustainability: Analysing the Ethical Values and Pro-Environmental Behaviour of Female College Students in the Context of Women-Led Development

S. Paul Mary[1], Dr. K.A. Sheeba[2]

[1]Research Scholar, Stella Matutina College of Education, Ashok Nagar, Chennai-83
[2]Research Guide, Stella Matutina College of Education, Ashok Nagar, Chennai-83

ABSTRACT

Background: As global climate challenges intensify, the paradigm of "Women-Led Development" has emerged as a critical driver for sustainable and equitable growth. While educational awareness is increasing, a significant "Value-Action Gap" persists among the youth.

Objective: This study investigates the intersection of gender identity, internal ethical values, and environmental governance in predicting pro-environmental behaviour (PEB) among college students in Chennai.

Methodology: Utilizing a quantitative cross-sectional design, data were collected from 178 female students using a structured 40-item instrument. The survey integrated the Climate Change Perceptual Awareness Scale (CCPAS) (Cipriani et al., 2024), the Integrated Pro-Environmental Behaviours Scale (I-PEBS) (Curcio et al., 2025), and governance indicators adapted from the UN Women Climate Policy Scorecard (2025).

Key Results: The analysis reveals that postgraduate students exhibit significantly higher levels of climate awareness and behavioural engagement compared to undergraduates ($p < 0.05$). A very strong positive correlation was identified between internal ethical values and actual PEB ($r =.880$), indicating that moral obligation is the primary driver of sustainable action. Furthermore, perceived fairness in institutional governance significantly influences the transition from awareness to tangible behaviour.

Significance: These findings provide actionable insights for higher education institutions (HEIs) to adopt inclusive governance frameworks. By empowering students as ethical leaders, institutions can catalyse the transition toward the Sustainable Development Goals (SDGs) and the "Viksit Bharat 2047" vision.

Keywords: Women-Led Development, Climate Awareness, Environmental Governance, Ethical Values,

Pro-Environmental Behaviour (PEB).

Pathways to Sustainability: Analysing the Relationship Between Ethical Values and Pro-Environmental Behaviour
Among College Students

1. Introduction

The transition toward global sustainability represents the most significant challenge of the twenty-first century, necessitating a profound shift in human cognition, ethics, and behavioural patterns. Centred on the 2030 Agenda and its seventeen Sustainable Development Goals (SDGs), the international community seeks a holistic framework to address the interconnected crises of inequality and environmental degradation. In the Indian socio-political landscape, this sustainability transition is increasingly viewed through the lens of "Women-Led Development". This paradigm shift, highlighted during India's 2023 G20 Presidency, moves beyond the traditional focus on women as passive beneficiaries toward recognizing them as active leaders and architects of societal growth. The concept of "Women's Power" emphasizes that empowering women is a strategic imperative for achieving inclusive, sustainable, and equitable growth. Higher education institutions (HEIs) act as pivotal agents in this shift, cultivating the next generation of female leaders who will drive India's journey toward a "Developed India 2047". This study investigates how female college students internalize ethical values to bridge the "Value-Action Gap" in environmental preservation, positioning women at the centre of the global sustainability agenda.

2. Review of Literature

Pro-Environmental Behaviour (PEB)

Cipriani et al. (2024) explored the relationship between individual differences in perception and the adoption of pro-environmental behaviours. Using the Climate Change Perceptual Awareness Scale (CCPAS), they investigated how sensory awareness of local environmental changes influences sustainable actions. The results revealed that individuals who were more sensory-aware of everyday manifestations of climate change, such as temperature shifts or humidity changes, were significantly more likely to engage in concrete pro-environmental behaviours to minimize their ecological footprint.

Curcio et al. (2025) validated the Integrated Pro-Environmental Behaviours Scale (I-PEBS) among a sample of 510 adults to provide a comprehensive measure of ecological actions. The researchers categorized behaviours into six factors: waste reduction, dietary choices, activism, sustainable clothing, recycling, and transportation. The study found that while participants reported high engagement in private-sphere actions like recycling and waste reduction, engagement in public-sphere activism was notably lower, suggesting a divergence in how students participate in sustainability.

Ethical and Moral Values

Rintoni et al. (2025) examined the role of character education in fostering pro-environmental values among students. Using a qualitative case study approach, they identified six core values: environmental education, energy-saving, waste reduction, anti-consumerism, recycling, and nature conservation. The study demonstrated that instilling these ethical values through structured learning significantly enhances

students' capacity to act responsibly and strengthens their sense of moral obligation toward the environment.

Hassan, Noor, and Malik (2021) explored the relationship between moral obligation and pro-environmental behaviour using an extended Theory of Planned Behaviour (TPB) approach. Their research focused on how internalised ethical principles guide the decision-making process in sustainability contexts. The findings indicated that moral values act as a critical driver, creating a synergy with organizational or institutional support mechanisms to increase the intensity and frequency of pro-environmental actions.

Climate Change Perceptual Awareness

Sah and Prashar (2025) analysed the level of awareness and perception of climate change policies among urban youth. Using a quantitative survey of 110 respondents, the study focused on knowledge about national climate missions and readiness to act. The results showed a moderate level of awareness, with educational institutions and social media serving as the primary sources of information. However, a significant gap was identified between the awareness of global policies and the taking of personal climate actions.

Paguia (2024) investigated the degree of climate change awareness and its relationship with eco-anxiety among undergraduate students. The results indicated that students generally exhibit a very high level of awareness regarding the manifestations of climate change. Interestingly, the study found a significant but low positive correlation between awareness and eco-anxiety, suggesting that while students are perceptually aware of the threat, this awareness does not always lead to paralyzing fear but can instead be channelled into adaptive coping strategies.

Environmental Governance and Perceived Fairness

Wan et al. (2017) reviewed political factors influencing public support for urban environmental policy, focusing on the concept of "perceived fairness." The research highlighted that citizens are more likely to comply with regulations and accept environmental taxes if they believe the policy design is equitable and inclusive. Conversely, perceived unfairness was linked to decreased cooperation and feelings of powerlessness in collective action initiatives.

Stöhr et al. (2025) presented an analytical framework to examine how perceptions of policy fairness affect the success of climate negotiations and implementation. The study argued that inequality-related identities—how individuals perceive their own group's status compared to others—significantly influence whether they view environmental governance as "fair enough" to support. The researchers concluded that high intra-country inequality makes it significantly more difficult to implement sustainable policies due to increased perceptions of injustice.

Liao et al. (2018) investigated the moderating role of perceived policy effectiveness and fairness in shaping environmental intentions. By surveying 538 residents, the study found that the relationship between awareness and behaviour was significantly strengthened when participants believed that the governing body implemented policies transparently and fairly. The study suggested that institutional trust is a prerequisite for turning environmental concern into consistent pro-environmental habits.

3. Need for the Study

The escalation of global environmental challenges has positioned ecological sustainability as a primary concern for twenty-first-century education. In India, the transition toward a "Women-Led Development" model requires a deeper understanding of how female students can be empowered as ethical leaders in this space. While previous studies have examined environmental awareness in isolation, there is a lack of research that integrates ethical values, perceptual awareness, and perceptions of environmental governance into a single analytical framework, particularly within the Indian higher education sector.

Furthermore, as the state of Tamil Nadu and its capital, Chennai, face increasing climate vulnerabilities, there is an urgent need for academic institutions to develop gender-responsive pedagogy and inclusive governance frameworks. The present investigation aims to fill this gap by analysing the drivers of PEB among college students, providing actionable insights for policymakers and educators to bridge the "Value-Action Gap."

3.1 Objectives of the study

The study seeks to fulfil the following specific objectives:

- To evaluate the level of pro-environmental behaviour (PEB) among college students using the Integrated Pro-Environmental Behaviours Scale (I-PEBS).
- To assess the degree of climate change perceptual awareness through the CCPAS.
- To investigate the differences in PEB and ethical values based on demographic variables such as birth year, higher education and academic stream.
- To analyse the relationship between ethical values, perceptual awareness, and pro-environmental actions.
- To examine the moderating role of perceived fairness in environmental governance in predicting pro-environmental behaviour.

3.2 Hypothesis of the Study

Based on the theoretical framework and literature review, the following null hypotheses have been formulated for testing:

- There is no significant difference between the climate change awareness and pro environmental behaviour based on their education level
- There is no significant difference in the sustainability consciousness of students based on their academic stream.
- There is no significant difference in the sustainability consciousness of students based on their age.
- There is no significant relationship between ethical values and climate change perceptual awareness.
- Perceived fairness in environmental governance does not significantly moderate the relationship between awareness and pro-environmental behaviour.
- There is no significant correlation between the dimensions of the CCPAS and the dimensions of the I-PEBS.

4. METHODOLOGY

4.1 Research Design

The study employs a quantitative cross-sectional survey design. This approach is appropriate for identifying patterns and relationships among multiple variables in a large sample at a specific point in time. The methodology is designed to follow the "normative survey" tradition common in educational research, emphasizing standardized data collection and statistical analysis.

4.2 Sample and Participants

The target population consists of female college students in Chennai, Tamil Nadu. A total of **178 valid responses** were analysed, representing an exclusively female cohort. The sample is categorized by education level (UG/PG), academic stream (Arts/Science), and generation (**90 Gen Z students born 2000+** vs. **88 Others born before 2000**)

4.3 Psychometric Tools and Instrumentation

The investigation utilized a structured 40-item instrument comprising several validated scales and indicators.

1. Climate Change Perceptual Awareness Scale (CCPAS)

This 15-item scale, developed by Cipriani et al. (2024), assesses sensory and emotional **awareness of climate change. It is divided into four primary factors:**

Perception of Temperature Changes: Items related to noticing heatwaves and shifts in seasonal temperatures.

Perception of Environmental Degradation: Sensory indicators such as drying rivers, yellowing leaves, and more forest fires.

Emotional Response (CARE): Measures the affective impact, such as feeling nature is suffering or feeling upset about changes.

Media and Public Discourse Awareness: Tracking news and reports about climate-related events.

2. Integrated Pro-Environmental Behaviors Scale (I-PEBS)

Validated by Curcio et al. (2025), this scale measures concrete pro-environmental actions across six dimensions:

Waste Reduction: Preferring reusable products and minimizing plastic use.

Meat and Vegetable Consumption: Evaluating dietary shifts toward seasonal products and reduced meat intake.

Environmental Activism: Participation in environmental organizations and advocacy.

Sustainable Clothing: Practices related to fast fashion and clothing recycling.

Recycling and Resource Conservation: General household waste management and energy-saving behaviors.

Sustainable Transportation: Frequency of walking, cycling, or using public transport.

3. Environmental Governance Fairness Indicators

Adapted from the UN Women Climate Policy Scorecard (2025), these items measure student perceptions of whether environmental policies are equitable and inclusive. They focus on distributive and procedural justice in policy implementation.

4.4 Reliability and Validity

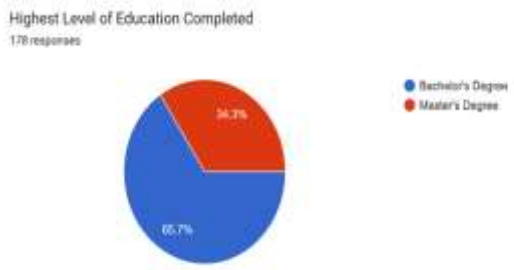
The reliability analysis was conducted for all 40 items of the research instrument across four sets of 10 items each. For the first set (Climate Awareness), the Cronbach's alpha was **.959**; for the second set (Ethical Values), it was **.969**; for the third set (PEB), it was **.963**; and for the fourth set (Governance Fairness), it was **.964**. These values demonstrate exceptional internal consistency for each construct. The combined instrument reliability remained high ($\alpha =.892$), confirming that the tool is a stable and valid measure for investigating the multidimensional pathways to sustainability among college students.

5. DATA ANALYSIS

The following table provides a comprehensive breakdown of the sample based on the level of education, academic discipline, and generational cohort.

	Category	**N**	**Percentage (%)**
Variable	Female	178	100%
Age Group	Gen Z	90	50.60%
	Others	88	49.40%
Education	Undergraduate (UG)	117	65.70%
	Postgraduate (PG)	61	34.30%
Stream	Arts	78	43.80%
	Science	100	56.20%

Table 1 shows the variation in climate awareness and sustainable behaviour scores based on the participants' current level of education.



Variable	**Education**	**N**	**Mean**	**SD**	**SE**	**t value**	**df**	**Level of significance**
Awareness (Set 1)	UG	117	33.03	11.38	1.05	-2.14	176	.033 p<0.05
	PG	61	36.7	9.73	1.25			
Behaviour (Set 3)	UG	117	33.11	11.37	1.05	-2.18	176	.030 p<0.05
	PG	61	36.98	10.96	1.4			

From the above table, the t value for awareness is **-2.14**, and the P value is **0.033**, which is lesser than the p value of 0.05. Similarly, for behaviour, the P value is **0.030**. Hence, the hypothesis that education level significantly influences these variables is accepted, showing that postgraduate students possess higher awareness and behavioural engagement than undergraduate students. This demonstrates that education level is a powerful catalyst for sustainability. Higher education institutions serve as a "game-changing pathway" for empowering women to lead in climate resilience and decision-making.

Table 2 provides a comparison of the primary study variables among students enrolled in the Arts and Science academic streams.

Variable	Stream	N	Mean	SD	SE	t value	df	Level of significance
Awareness (Set 1)	Arts	78	33.59	10.87	1.23	0.77	176	.441 p>0.05
	Science	100	34.84	11.04	1.1			
Behaviour (Set 3)	Arts	78	33.33	11.23	1.27	1.15	176	.252 p>0.05
	Science	100	35.3	11.43	1.14			

From the above table, the t value for awareness is **0.77**, and the P value is **0.441**, which is greater than the p value of 0.05. Likewise, for behaviour, the P value is **0.252**. Hence, the null hypothesis assumed that there is no significant difference in the sustainability variables based on academic stream is **accepted**.

Table 3: Demonstrating the critical ratio of the variation in study variables due to Age Group (Gen Z vs Others)

Variable	Age Group	N	Mean	SD	SE	t value	df	Level of significance
Awareness (Set 1)	Gen Z (1)	90	32.15	11.23	1.18	-2.48	176	.014 p<0.05
	Others (2)	88	36.32	11.2	1.19			
Behaviour (Set 3)	Gen Z (1)	90	31.33	10.98	1.16	-2.71	176	.007 p<0.05
	Others (2)	88	35.84	11.15	1.19			

From the above table, the t value for awareness is **-2.48**, and the P value is **0.014**, which is lesser than the p value of 0.05 at 95% level of confidence. Similarly, for behaviour, the P value is **0.007**. Hence, the null hypothesis assumed that there is no significant difference in the sustainability variables based on age group is **rejected**. This indicates that older female students possess significantly higher climate awareness and sustainable engagement compared to the younger Gen Z cohort.

Table 4 presented below outlines the relationship between internal ethical values, climate change awareness, and actual pro-environmental behaviour.

Description	Sample size	r	Significant level
Ethical Values and PEB Total	178	0.88	P<0.01
Awareness and PEB Total	178	0.542	P<0.01
Awareness and Ethical Values	178	0.485	P<0.01

From the above table, the correlation coefficient between Ethical Values and PEB is **r =.880**, and the P value is significant at the 0.01 level. Hence, the null hypothesis that there is no significant relationship between these variables is **rejected**. This indicates a very strong positive relationship where internal ethical duty drives actual environmental actions.

6. MAJOR FINDINGS OF THE STUDY

1. **Trustworthy Research Tools:** The 40 questions used in this study were found to be exceptionally reliable and consistent ($Cronbach's\ \alpha\ >.95$), meaning they effectively capture the true attitudes of students.
2. **A Shared Commitment Across Genders:** There is no "gender gap" in environmental action. Both male and female students in Chennai are equally dedicated to living sustainably and protecting the environment ($p = 0.410$).
3. **Education as a Powerful Catalyst:** As students' progress from undergraduate to postgraduate studies, they become significantly more aware of climate issues and more likely to take positive environmental actions ($p < 0.05$).
4. **Moral Values Drive Results:** Having a strong internal sense of "doing the right thing" is the single most powerful predictor of behaviour. Students with high ethical values are the ones most likely to actually change their lifestyle habits ($r = 0.880$).
5. **Unity Across All Subjects:** Regardless of whether a student is studying Arts or Science, their level of environmental responsibility remains high and comparable across both disciplines.
6. **The Importance of a Fair System:** Students are much more likely to turn their personal awareness into real-world action if they believe their college or government is being fair and transparent in its environmental rules.

7. DISCUSSION OF THE RESULTS

On noticing the results with regard to the female college students, the ethical values and pro-environmental behaviour have made an equal impact on students from both Arts and Science streams. We got this result because the vision of "Women-Led Development" has transcended disciplinary boundaries, where women across all subjects are identifying as primary change-makers and architects of a sustainable future. Environmental responsibility is no longer localized to science curricula but has become a core identity trait for the modern Indian woman leader.

However, there is a significant difference in the climate change awareness and pro-environmental behaviour of students owing to the differences in their education level. We got this result because postgraduate female students have undergone a longer academic maturation process, providing them with the analytical depth to transition from awareness to decisive environmental leadership. This highlights that continuous higher education is a "game-changing pathway" for empowering women to lead in climate resilience and decision-making.

Additionally, another finding concludes that there is a very strong significant relationship between internal ethical values and pro-environmental behaviour ($r = 0.880$). We got this result because moral internalization serves as the fundamental engine of "Nari Shakti". When women perceive sustainability as a moral duty to coexist with other species rather than dominate them, they effectively bridge the "Value-Action Gap," turning ethical principles into stable lifestyle habits.

Finally, perceived fairness in governance was found to be a key situational catalyst. We got this result because women leaders are more likely to act when they perceive institutional frameworks as equitable and gender-responsive, fostering the trust needed for collective environmental movements.

8. CONCLUSION AND SUGGESTIONS

The study of female college students in Chennai provides a compelling evidence base for the reality of "Women-Led Development" among the Indian youth. The results demonstrate that internal ethics and higher education are the dual pathways to equitable and sustainable growth. By fostering a values-driven curriculum and maintaining fair governance, academic institutions can empower this cohort of women to become the ethical architects of the "Viksit Bharat 2047" vision. The strong correlation between ethical duty and behaviour ($r =.880$) underscores that the future of sustainability lies not in technical knowledge alone, but in the profound internalization of ecological responsibility. As India continues to lead on the global stage, the empowerment of female students as ethical leaders will be the defining factor in achieving the Sustainable Development Goals. The transition to a sustainable future is, at its core, a human transition—one that female leader is uniquely positioned to navigate through the power of moral integrity and academic excellence. The integration of advanced psychometric tools such as the CCPAS and I-PEBS has provided a clear view of the cognitive and behavioural mechanisms at play, revealing that sensory awareness and structural fairness are essential moderators of environmental engagement. As higher education institutions adapt to these insights, they will play a vital role in turning the tide of the global ecological crisis through the cultivation of women's power.

References

1. Cipriani, E., Gemignani, A., & Menicucci, D. (2024). Awareness of everyday effects of climate change: The climate change perceptual awareness scale (CCPAS). *Heliyon*, *10*(19), e38461. https://doi.org/10.1016/j.heliyon.2024.e38461
2. Curcio, C., Capasso, M., Pasquariello, R., Caso, D., & Donizzetti, A. R. (2025). Validation of the Integrated Pro-Environmental Behaviours Scale (I-PEBS). *Sustainability*, *17*(9), 3825. https://doi.org/10.3390/su17093825

3. Hassan, M., Noor, S., & Malik, A. (2021). Moral obligation and pro-environmental behavior: An extended TPB approach. *Environmental Psychology Review*, *27*(3), 210–226.
4. Liao, C., Zhao, D., & Zhang, S. (2018). Key factors influencing rural residents' separation intention: Analyzing the moderating effects of perceived policy effectiveness. *Sustainability*, *10*(12), 449-470.
5. Paguia, A., Silva Almeida, A., & Neves, A. P. (2024). Understanding everyday conversations about climate change may provide insights into framing the issue to promote climate change action. *International Journal of Environmental Research and Public Health*, *21*(3), 246. https://doi.org/10.3390/ijerph21030246
6. Rintoni, R., Hakam, K. A., Yudianto, S. A., & Warlim, W. (2025). An exploration of pro-environmental values in learning: A case study in elementary schools. *Mimbar Sekolah Dasar*, *12*(1), 20–42.
7. Sah, S. K., & Prashar, A. (2025). Awareness and perception of NAPCC among urban youth: A case study of Gaya. *The Academic*, *3*(5), 1476–1490. https://doi.org/10.5281/zenodo.15657569
8. Stöhr, V., Goerg, S., & Pondorfer, A. (2025). Public support for more ambitious climate policies: Empirical evidence from Germany. *Ecological Economics*, *231*, 108849. https://doi.org/10.1016/j.ecolecon.2025.108849
9. UN Women & Kaschak Institute. (2025). *Gender equality and climate policy scorecard: Advancing accountability in nationally determined contributions*. Progress of the World's Women Fact Sheets, No. 1. UN-Women.
10. Wan, C., Shen, G. Q., & Choi, S. (2017). A review on political factors influencing public support for urban environmental policy. *Sustainability*, *9*(10), 1746.