

FACTORS AFFECTING EMPLOYEES' PERCEPTION OF GREEN ECONOMY AT PHARMACEUTICAL COMPANIES IN HO CHI MINH CITY

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ABSTRACT

The article is derived from a thorough literature review and theoretical foundations, the research model was developed with five independent variables: Green Knowledge (KT), Attitude (TD), Communication (TT), Organizational Culture (VH), and Participation in Green Activities (TG). The dependent variable is Perception of Green Economy (NT). The study adopted a quantitative method, using structured questionnaires distributed to 342 participants (334 valid responses) at pharmaceutical companies in Ho Chi Minh City area. Data were processed using SPSS through reliability testing (Cronbach's Alpha), Pearson correlation, and multiple linear regression analysis. The findings indicate that the model fits the data well, with an adjusted R^2 of 0.921. Among the factors, Participation in Green Activities was found to have the strongest influence (Beta = 0.920), followed by Knowledge and Communication, which exert comparable effects (Beta = 0.054 each), and Organizational Culture (Beta = 0.035). Notably, Attitude was not statistically significant, suggesting that personal beliefs alone are insufficient to form green awareness without supporting actions and organizational environment. Based on these findings, the study provides several practical managerial implications: businesses should enhance green knowledge training programs, facilitate hands-on environmental initiatives, strengthen internal communication aligned with sustainability goals, and integrate green values into internal policies and corporate culture. Future research directions include expanding the scope to other industries, combining qualitative methods, and developing extended models with mediating or moderating variables.

Keywords: Green economy, perception, green awareness, pharmaceutical companies.

1. INTRODUCTION

Against the backdrop of globalization and intensifying climate change pressures, the transition toward a green economy has emerged as an imperative for sustainable development. Adamowicz [1] argues that green growth is fundamental to mitigating environmental impacts, optimizing resource efficiency, and advancing societal well-being. In Vietnam, particularly Ho Chi Minh City, pharmaceutical companies face increasing pressure to embed sustainability within their operations because of regulatory requirements and the industry's inherently resource-intensive characteristics. Although many firms have adopted green practices, their effectiveness substantially depends on employee awareness and engagement. Employees perform a pivotal role in operationalizing sustainability strategies into tangible practices, and previous studies have affirmed the importance of employee awareness for attaining

environmental objectives [5], [6]. Nevertheless, empirical evidence within Vietnam remains limited. Pham et al. [10] reported that employees in Vietnam frequently demonstrate insufficient understanding of green economy principles, which in turn limits their participation. Furthermore, existing research predominantly concentrates on general industries, with inadequate attention directed toward the pharmaceutical sector and employee-level perceptions. Accordingly, this study investigates the factors influencing employees' perceptions of the green economy in pharmaceutical companies in Ho Chi Minh City, thereby contributing to both theoretical development and practical advancement in sustainability management.

2. LITERATURE REVIEW AND RESEARCH MODEL

2.1. Literature Review

Based on the backdrop of globalization and intensifying climate-related pressures, the shift toward a green economy has become a strategic necessity for realizing sustainable development. Mebratu [9] and Adamowicz [1] conceptualise the green economy as an instrument for mitigating environmental impacts, improving resource-use efficiency, and advancing societal well-being. Within organizations, especially in resource-intensive sectors such as pharmaceuticals, employee awareness assumes a central role in converting sustainability goals into observable organizational outcomes. Anchored in the Theory of Planned Behavior [2], awareness not only influences employees' attitudes toward environmentally responsible practices but also reinforces perceived behavioral control and normative commitment, thereby enhancing the propensity for pro-environmental action. Likewise, Green Human Resource Management (Green HRM) Theory [11] emphasizes how systematic training, performance appraisal, and incentive mechanisms can institutionalize environmental priorities within organizational culture. Nevertheless, the Awareness–Action Gap Theory [8] cautions that awareness alone is inadequate; in the absence of enabling policies, cultural support, and meaningful engagement opportunities, knowledge may not develop into enduring behavior. In the Vietnamese context, empirical evidence [10] indicates that inadequate comprehension of green economy principles limits participation and weakens the effectiveness of environmental initiatives; whether this pattern holds specifically in the pharmaceutical sector remains an open question that the present study addresses. Consequently, identifying and addressing determinants of employee awareness is essential for cultivating a workforce able to effectively implement corporate sustainability strategies and collectively fulfill national as well as global environmental obligations.

The green economy is increasingly regarded as a strategic avenue for reconciling economic development with environmental sustainability, especially across rapidly developing emerging economies. Earlier research indicates that an effective transition to a green economy depends on a comprehensive ecosystem integrating policy frameworks, governance arrangements, technological and institutional capacity, and active engagement by organizations and individuals alike. Nevertheless, substantial obstacles persist, including insufficient environmental awareness, constrained financial and technological capacity, and uneven policy implementation. Overcoming these constraints requires coordinated initiatives to raise awareness, reinforce institutional support, stimulate technological innovation, and deepen international cooperation [3].

Organizational initiatives, particularly Green Human Resource Management (Green HRM), have been demonstrated to encourage employees' environmentally responsible behavior. Empirical research indicates that green HRM practices affect workplace conduct both directly and indirectly through the mediating influence of a psychological green climate, whereas individual values further amplify this association [4]. These findings suggest that

cultivating a green organizational culture, underpinned by formal HR policies and mechanisms, is indispensable for strengthening employee involvement in sustainability initiatives.

2.2. Proposed research model

Through synthesizing and analyzing theories, theoretical models and empirical models, the group of authors proposed a research model including 5 independent variables and a dependent variable: employees' perception of green economy at pharmaceutical companies in Ho Chi Minh City.

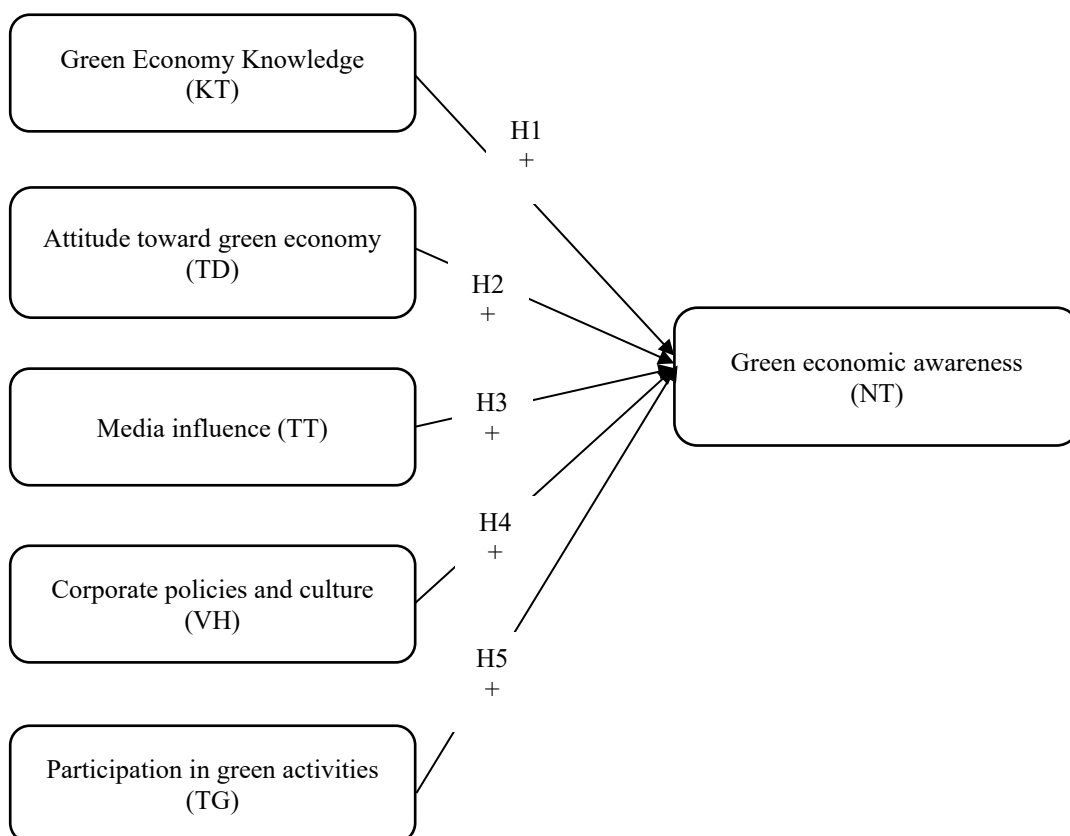


Figure 1. Proposed research model

Source: Author group synthesizes and proposes, 2025

The research hypotheses are presented as follows:

H1: Green Economy Knowledge – This hypothesis reflects the extent to which employees comprehend the concept and fundamental principles of the green economy.

H2: Attitude Toward the Green Economy – This hypothesis captures employees' perspectives and emotional responses regarding activities and policies associated with sustainable development.

H3: Media Influence – This hypothesis assesses the level of information exposure and the impact of various media channels on individual awareness of green economy issues.

H4: Corporate Policies and Culture – This hypothesis evaluates the organization's commitment to promoting green initiatives and fostering a culture of sustainability.

H5: Participation in Green Activities – This hypothesis reflects the actual level of employee engagement in environmental protection programs within the workplace.

2.3. Research Methodology

Data were collected through a structured survey administered both online via Google Forms and in person. Respondents were employees working at pharmaceutical companies in Ho Chi Minh City, surveyed from November 2024 to February 2025. A total of 342 questionnaires were distributed and 334 were retained after screening, yielding a valid response rate of 97.66%. The instrument comprises 30 observed items measured on a five-point Likert scale, of which 25 items measure the five independent constructs and 5 items measure the dependent construct. Following the rule of at least five observations per item [7], the minimum required sample size is 150; the achieved sample of 334 therefore satisfies this requirement.

3. DATA ANALYSIS AND DISCUSSION

3.1. Reliability Assessment of Measurement Scales

The results indicate that total independent variables met the reliability criteria, with Cronbach's alpha coefficients exceeding 0.6 and remaining below the upper threshold of 0.95. In addition, the item-total correlation coefficients for observed variables in total were greater than 0.3, suggesting acceptable internal consistency. Therefore, all items were retained for subsequent analyses (Table 1).

Table 1. Reliability assessment of Cronbach's Alpha

Scale	Symbol	Cronbach's Alpha	Observation variables
Green Economy Knowledge	KT	0.789	5
Attitude Toward the Green Economy	TD	0.797	5
Media Influence	TT	0.748	5
Corporate Policies and Culture	VH	0.729	5
Participation in Green Activities	TG	0.750	5
Green economic awareness	NT	0.830	5

Source: Summary results from SPSS, 2025

3.2. Exploratory Factor Analysis (EFA)

For the independent variables, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.820, satisfying the condition of $KMO \in [0.5; 1]$, thereby confirming the appropriateness of the dataset for factor analysis. Additionally, the significance value of Bartlett's Test of Sphericity was 0.000 (< 0.05), showing that the observed variables are sufficiently correlated to justify factor analysis. Five factors were extracted, corresponding to the five independent constructs in the model; the fifth factor records an eigenvalue of 1.299 (> 1), so all extracted factors satisfy the retention criterion. The total variance explained was 58.961%, exceeding the acceptable threshold of 50.00% (Table 2).

For the dependent variable, the KMO value was 0.702, also within the acceptable range of $[0.5; 1]$. Bartlett's Test of Sphericity generated a significance value of 0.000 (< 0.05), confirming the presence of adequate correlations among the observed variables for factor analysis. Furthermore, the extracted factor demonstrated an eigenvalue of 3.016 (> 1), indicating that it meets the retention criterion. The total variance explained was 60.323%, also exceeding the required threshold of 50.00% (Table 2).

Table 2. Exploratory Factor Analysis

	KMO	Sig.	Eigenvalue	TVA
Independent variables	0.820	0.000	1.299	58.961%
Dependent variable	0.702	0.000	3.016	60.323%

Source: Results from SPSS, 2025

3.3. Pearson correlation test

The Pearson correlation table demonstrates positive and statistically significant relationships ($p < 0.01$) between green economy awareness (NT) and five independent variables: green economy knowledge (KT), attitude toward the green economy (TD), media influence (TT), corporate culture (VH), and participation in green activities (TG). Among these, TG showed the strongest correlation with NT ($r = 0.957$), highlighting its substantial impact. KT ($r = 0.425$), TD ($r = 0.387$), and TT ($r = 0.402$) exhibited moderate positive correlations, suggesting their supportive roles in shaping awareness. VH had the weakest yet still significant correlation ($r = 0.171$; $p = 0.002$), indicating limited influence of corporate culture (Table 3). The results confirm that all variables in the model are linearly and positively associated with employees' awareness of the green economy (we used the original result of Pearson correlation test, for example: .957 should be understood: 0.957 and the others should be the same).

Table 3. Result of Pearson correlation test

		NT	KT	TD	TT	VH	TG
NT	Pearson Correlation	1	.425**	.387**	.402**	.171**	.957**
	Sig. (2-tailed)		.000	.000	.000	.002	.000
	N	334	334	334	334	334	334
KT	Pearson Correlation	.425**	1	.449**	.361**	.101	.389**
	Sig. (2-tailed)	.000		.000	.000	.065	.000
	N	334	334	334	334	334	334
TD	Pearson Correlation	.387**	.449**	1	.351**	.237**	.390**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	334	334	334	334	334	334
TT	Pearson Correlation	.402**	.361**	.351**	1	.060	.364**
	Sig. (2-tailed)	.000	.000	.000		.274	.000
	N	334	334	334	334	334	334
VH	Pearson Correlation	.171**	.101	.237**	.060	1	.144**
	Sig. (2-tailed)	.002	.065	.000	.274		.008
	N	334	334	334	334	334	334
TG	Pearson Correlation	.957**	.389**	.390**	.364**	.144**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.008	
	N	334	334	334	334	334	334

Source: Results from SPSS, 2025

3.4. Result of linear regression analysis

Table 4. Result of linear regression analysis

Model	R	R ²	R ² adjusted	Std. Error of the Estimate	Durbin-Watson
1	.960 ^a	.922	.921	.22752	2.008
a. Predictors: Constant, TG, VH, TT, KT, TD					

Source: Results from SPSS, 2025

The regression findings yield an adjusted R² of 0.921, suggesting that the proposed model accounts for a substantial proportion of the variance in employees' perceptions of the green economy. This considerable explanatory capacity is theoretically defensible because the selected predictors encompass cognitive (knowledge), attitudinal, and particularly behavioral dimensions (participation), all of which are closely associated with perception formation. Notably, engagement in green activities represents a form of direct experiential learning and therefore may exert an immediate and substantial influence on employee awareness. Furthermore, the convergence of findings from both correlation and regression analyses provides additional support for the model's robustness. The dataset was obtained from a relatively homogeneous group operating within the same industry and geographical setting, which may minimize unexplained variation and improve overall model fit. Accordingly, the elevated R² value is best interpreted as an indication of strong interrelationships among the constructs within this particular research setting. At the same time, a value of this magnitude in behavioural research warrants caution: it may partly reflect conceptual proximity between participation and perception, an issue examined further in Section 4.3.

Table 5. Result of linear regression analysis

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	201.325	5	40.265	777.833	.000 ^b
	Residual	16.979	328	.052		
	Total	218.304	333			
a. Dependent Variable: NT						
b. Predictors: (Constant), TG, VH, TT, KT, TD						

Source: Result from SPSS, 2025

Hypothesis: H₀: R² = 0

The ANOVA results show that F = 777.833 with a significance level of 0.000 (less than 0.05), resulting in rejecting the hypothesis H₀. Therefore, the regression model is deemed appropriate for the collected dataset.

Table 6. Result of multiple linear regression

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.184	.118		1.557	.120		
	KT	.074	.025	.054	2.964	.003	.718	1.393
	TD	.029	.023	.023	1.263	.207	.694	1.441
	TT	.066	.021	.054	3.089	.002	.786	1.272
	VH	.052	.023	.035	2.231	.026	.939	1.065
	TG	.902	.017	.920	51.793	.000	.751	1.332
a. Dependent Variable: NT								

Source: Results from SPSS, 2025

As shown in Table 6, the Variance Inflation Factor (VIF) values of all independent variables are below 2, indicating the absence of multicollinearity. Four of the five predictors reach statistical significance at the 5% level: TG ($p < 0.001$), TT ($p = 0.002$), KT ($p = 0.003$) and VH ($p = 0.026$). By contrast, TD records $t = 1.263$ with $p = 0.207$, which exceeds the conventional threshold; hypothesis H2 is therefore not supported. The standardised coefficients of the four significant predictors are positive, indicating that green economy knowledge, media influence, corporate policies and culture, and participation in green activities each contribute positively to employees' perception of the green economy.

Standardized regression model:

$$NT = 0.054*KT + 0.054*TT + 0.035*VH + 0.920*TG + \text{Constant}$$

Note: TD is excluded from the standardised model because its coefficient is not statistically significant ($p = 0.207$).

Including:

KT: Green Economy Knowledge

TD: Attitude Toward the Green Economy

TT: Media Influence

VH: Corporate Policies and Culture

TG: Participation in Green Activities

NT: Green economic awareness

4. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion

This study examines the factors affecting employees' perception of the green economy at pharmaceutical companies in Ho Chi Minh City. Data were collected through a survey of 334 respondents who were living and working in pharmaceutical firms in Ho Chi Minh City between 11/2024 and 02/2025. The findings indicate that four of the five proposed factors significantly influence employees' green economy awareness, ranked by standardised coefficient as follows: (1) Participation in Green Activities (Beta = 0.920); (2) Green Economy

Knowledge and Media Influence, which exert comparable effects (Beta = 0.054 each); and (3) Corporate Policies and Culture (Beta = 0.035). Attitude Toward the Green Economy is not statistically significant ($p = 0.207$), indicating that favourable personal beliefs alone do not translate into green awareness in the absence of supporting actions and an enabling organisational environment.

4.2. Recommendations

Participation in Green Activities emerged as the most influential factor affecting employees' awareness of the green economy, highlighting that hands-on experiences through concrete actions are the most effective means of shaping and reinforcing green awareness. Organizations should foster an enabling environment and actively encourage employees to engage in green initiatives such as Green Week, Plastic-Free Days, energy-saving campaigns, waste recycling programs, or department-level green challenges. These activities should be accessible, voluntary, and aligned with corporate values, accompanied by recognition and reward mechanisms to sustain motivation and promote long-term commitment to sustainability.

Green economy knowledge has a positive and statistically significant impact on employees' awareness, underscoring the critical role of understanding its concepts, benefits, and significance in shaping perceptions and fostering action. Organizations should implement green knowledge enhancement programs through workshops, periodic training, internal handbooks, E-learning platforms, and interactive activities such as online mini-games or thematic newsletters to create a flexible and effective learning environment.

Media influence: from a managerial perspective, organizations should develop a consistent, multi-channel environmental communication strategy grounded in real workplace contexts. Messages should be simple, clear, and regularly delivered through channels such as newsletters, emails, internal social networks, short videos, or leadership announcements, while linking to tangible results and the specific role of each employee. Communication "touchpoints" such as green bulletin boards, LED displays, or periodic campaigns (e.g., Green Month, Eco Tips of the Week), along with content tailored to departments or job levels, can enhance relevance and engagement. Effective communication serves not only as an information channel but also as a catalyst for changing perceptions, fostering a green corporate culture, and encouraging employee participation in sustainability strategies.

Corporate Policies and Culture: in terms of policy, organizations should integrate environmental and sustainability criteria into internal governance, including workflows, performance evaluation (KPIs), reward-discipline systems, procurement, and employee training. Green policies must be clear, transparent, binding, and measurable to guide employee behavior effectively. From a cultural perspective, organizations should embed green-oriented core values, demonstrated through leadership behavior, internal slogans, eco-friendly codes of conduct, and collective "green office" activities. Recognizing and rewarding outstanding individuals or teams will reinforce commitment and standardize positive behaviors. Corporate policies and culture serve not only as supportive elements but also as critical levers for sustaining and expanding green economy awareness. When green principles are deeply embedded in operations and core values, employee awareness will be naturally nurtured, sustained, and diffused throughout the organization.

Attitude Toward the Green Economy: the non-significant coefficient of this construct warrants discussion rather than a prescriptive recommendation. One plausible explanation is that attitude operates as a distal antecedent whose effect is transmitted through participation in green activities, so that its direct contribution becomes negligible once participation is entered into the model. This interpretation is consistent with the Awareness-Action Gap Theory [8], which holds that favourable attitudes do not translate into awareness or behaviour

without enabling structures and concrete opportunities for engagement. Accordingly, organisations should not treat attitudinal campaigns as a stand-alone instrument; slogans and value statements need to be coupled with tangible activities and recognition mechanisms. Testing participation as a mediator between attitude and awareness is a promising direction for future research.

4.3. Limitations and directions for future research

Three limitations should be acknowledged. First, the correlation between participation in green activities and perception of the green economy is very high ($r = 0.957$), and the standardised coefficient of this predictor (Beta = 0.920) accounts for most of the explanatory power of the model (adjusted $R^2 = 0.921$). Although the two constructs are conceptually distinct, such a magnitude raises the possibility of conceptual overlap between the two scales, or of common method bias arising from the collection of both measures from the same respondents at a single point in time. Future studies should assess discriminant validity formally, for instance by comparing the square root of the average variance extracted with the inter-construct correlations, and should consider collecting the predictor and the outcome at different points in time.

Second, the cross-sectional design does not permit causal inference. The direction of the relationship between participation and perception may well be reciprocal: employees who participate more may develop stronger awareness, and those who are already aware may be more inclined to participate. A longitudinal design would be required to disentangle the two directions.

Third, the sample is confined to pharmaceutical companies in a single city, so the findings should be generalised with caution. Extending the study to other industries and localities, and incorporating qualitative interviews to explain why attitude does not exert a direct effect, would strengthen both the external validity and the explanatory depth of this line of research.

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