

FROM SURVIVAL TO SUSTAINABILITY: GREEN WORK BEHAVIOR IN INFORMAL BICYCLE-BASED MICRO-ENTREPRENEURSHIP AND ITS IMPLICATIONS FOR COMMUNITY LIVELIHOOD SYSTEMS IN INDONESIA

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Abstract

This study examines sustainability-driven behavior in informal micro-entrepreneurship by focusing on bicycle-based coffee vendors—popularly known as “Starling” (Starbucks Keliling) in Jakarta, Indonesia—as a low-carbon, survival-driven livelihood model within community-based economic systems. Although situated in an urban setting, such micro-enterprises reflect adaptive, resource-efficient practices that are highly relevant for rural and peri-urban livelihood systems facing similar structural constraints. Drawing on the Resource-Based View (RBV) and a behavioral sustainability perspective, this study investigates the effects of environmental awareness and sustainable work motivation on green work behavior and micro-entrepreneurial performance, while testing the mediating role of green work behavior and the moderating role of resource efficiency orientation. Data were collected from 172 vendors and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that environmental awareness and sustainable work motivation significantly influence green work behavior. Green work behavior emerges as the strongest direct predictor of performance, while sustainable work motivation plays a critical role as a primary driver of both behavior and performance. However, green work behavior does not mediate the relationship between sustainability drivers and performance, indicating a compressed pathway in which motivation translates more directly into economic outcomes. Resource efficiency orientation strengthens the effect of environmental awareness on performance but does not moderate the motivation–performance relationship. This study contributes by demonstrating that in informal micro-entrepreneurship, sustainability outcomes are shaped by the interaction between motivation, efficiency, and adaptive practices rather than environmental cognition alone. The findings highlight the relevance of low-carbon micro-enterprises in supporting inclusive livelihood systems and advancing the Sustainable Development Goals (SDG 8 and SDG 11).

Keywords: Environmental Awareness, Sustainable Work Motivation, Green Work Behavior, Resource Efficiency Orientation, Micro-Entrepreneurial Performance, Informal Entrepreneurship, Sustainability, SDG 8, SDG 11

INTRODUCTION

The global transition toward sustainable development has reshaped contemporary economic discourse, emphasizing the integration of environmental responsibility with inclusive growth and social equity. The United Nations’ Sustainable Development Goals (SDGs) position responsible consumption, sustainable urban development, and decent work as central pillars of long-term development (Sachs, 2015; Geissdoerfer et al., 2017; Bansal & DesJardine, 2014). Sustainability is

increasingly viewed not only as an ethical imperative but also as a strategic resource that enhances resilience and competitiveness in uncertain environments (Porter & Kramer, 2011; Schaltegger et al., 2018).

From a theoretical perspective, the Resource-Based View (RBV) suggests that performance is shaped by internal capabilities that are valuable and difficult to imitate (Barney, 1991). In resource-constrained informal settings, intangible factors such as environmental awareness, sustainability-driven motivation, and pro-environmental behavior may function as critical micro-level capabilities. Rather than relying on formal organizational systems, informal entrepreneurs depend heavily on adaptive behaviors, efficiency-oriented decision-making, and self-regulated practices to sustain their livelihoods. In this context, green work behavior (GWB) can be understood as a behavioral manifestation of such capabilities, reflecting daily practices related to resource efficiency, waste reduction, and environmentally responsible actions (Norton et al., 2015). While insights from green human resource management (GHRM) literature remain relevant, they are applied here as a behavioral lens rather than as formal organizational practices (Renwick et al., 2013; Dumont et al., 2017).

Empirical studies have demonstrated that environmental awareness and pro-environmental motivation influence green behavior and performance outcomes (Afsar & Umrani, 2020; Kim et al., 2019). However, these studies are predominantly situated in formal organizational contexts characterized by structured systems and institutional support. Consequently, limited attention has been given to how sustainability mechanisms operate in informal, survival-driven micro-entrepreneurial environments, where behavior is shaped more by necessity, efficiency, and immediate economic pressures than by formalized environmental strategies (Amankwah-Amoah et al., 2021).

This limitation is particularly relevant in emerging economies, where informal micro-entrepreneurship plays a central role in both urban and peri-urban livelihood systems that are structurally linked to broader rural supply and consumption networks (Chen, 2012; Tambunan, 2019; Beck et al., 2005). Informal enterprises often function as connectors between rural production, peri-urban distribution, and urban consumption, forming integrated community-based livelihood systems. Within such systems, small-scale entrepreneurs contribute to local economic circulation, employment generation, and inclusive development, particularly in resource-constrained environments.

A compelling example of such resilience-driven informal entrepreneurship is found in bicycle-based coffee vendors, widely known as “Starling” (Starbucks Keliling) in Jakarta, Indonesia. These micro-entrepreneurs operate across dense urban and peri-urban spaces, relying on mobility, low capital, and direct customer interaction. Importantly, their business model reflects characteristics that are highly relevant for rural and peri-urban entrepreneurship, including low entry barriers, flexible operations, and efficient resource utilization. As such, Starling vendors represent not only an urban informal phenomenon but also a transferable model of low-carbon micro-enterprise applicable to community-based livelihood development in resource-constrained rural and peri-urban contexts.

Despite their relevance, existing studies have not sufficiently examined how sustainability-driven mechanisms operate in informal, survival-oriented micro-entrepreneurship. Prior research generally assumes a structured cognition–behavior–performance pathway, in which environmental awareness translates into green behavior and subsequently into performance outcomes (Norton et al., 2015; Kim et al., 2019). However, such assumptions may not hold in informal settings marked by uncertainty, limited resources, and survival-driven decision-making (Ali et al., 2021; Webb et al., 2013; Sutter et al., 2019). This raises a critical question as to whether sustainability drivers in informal economies follow similar mechanisms or whether more direct, efficiency-driven pathways emerge.

Therefore, this study aims to examine the influence of environmental awareness and sustainable work motivation on green work behavior and micro-entrepreneurial performance

among bicycle-based coffee vendors. It further investigates the mediating role of green work behavior and the moderating role of resource efficiency orientation. This study provides one of the first empirical examinations of sustainability mechanisms in informal, bicycle-based micro-entrepreneurship, offering a novel perspective on resilience-driven green behavior in emerging economies. The findings are expected to demonstrate a compressed sustainability pathway, in which motivation and efficiency-oriented capabilities directly shape performance, partially bypassing structured behavioral processes observed in formal contexts, while highlighting the role of low-carbon micro-enterprises in supporting community-based and urban–rural linked livelihood systems and contributing to SDG 8 and SDG 11.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Environmental Awareness → Green Work Behavior

Environmental awareness refers to an individual's cognitive understanding of environmental issues and the ecological consequences of human activities. Within sustainability research, awareness is considered a foundational cognitive resource that shapes pro-environmental attitudes and guides individual decision-making. From a behavioral perspective, awareness enables individuals to recognize the importance of environmentally responsible actions, thereby encouraging engagement in green work behavior (GWB), such as resource conservation, waste reduction, and efficiency-oriented practices (Norton et al., 2015; Dumont et al., 2017; Kim et al., 2019).

While prior studies—largely grounded in formal organizational contexts—position environmental awareness as an important antecedent of green behavior (Renwick et al., 2013; Paillé et al., 2014), its role may differ in informal micro-entrepreneurial settings. In such contexts, behavior is not guided by formal environmental systems but by individual judgment, resource constraints, and operational necessity. For bicycle-based coffee vendors (Starling), environmental awareness is likely to influence how limited resources are managed, how waste is minimized, and how efficiency is embedded in daily business practices.

Within broader livelihood systems—particularly those linked to rural and peri-urban economies—such awareness-driven behavior becomes relevant as micro-entrepreneurs adapt to resource scarcity and sustainability pressures. Therefore, environmental awareness is expected to positively influence green work behavior.

H1: Environmental Awareness positively influences Green Work Behavior.

Sustainable Work Motivation → Green Work Behavior

work motivation refers to the internal and external drivers that encourage individuals to engage in work practices aligned with environmental sustainability. Unlike awareness, which represents a cognitive state, motivation functions as a behavioral force that determines the intensity, direction, and persistence of action. Drawing on the Ability–Motivation–Opportunity (AMO) framework, motivation plays a central role in translating knowledge into sustained behavioral engagement.

In sustainability and behavioral research, motivation has been consistently identified as a key determinant of green work behavior, particularly in contexts where formal controls are limited (Ardito et al., 2021; Dumont et al., 2017; Afsar & Umrani, 2020). Motivated individuals are more likely to engage in proactive and consistent environmentally responsible practices, driven by both internal goals and practical considerations.

This mechanism becomes especially critical in informal micro-entrepreneurship. Bicycle-based coffee vendors operate under survival-oriented conditions characterized by limited capital, fluctuating demand, and income uncertainty. In such environments, motivation is closely linked to efficiency, cost reduction, and business continuity. As a result, sustainable work motivation not only complements environmental awareness but often becomes the dominant driver of behavior, as environmentally aligned practices simultaneously support economic survival.

This dynamic is also relevant for community-based and rural-linked livelihood systems, where micro-entrepreneurs rely heavily on self-driven initiatives and adaptive strategies. Therefore, sustainable work motivation is expected to exert a strong positive influence on green work behavior.

H2: Sustainable Work Motivation positively influences Green Work Behavior.

Environmental Awareness → Micro-Entrepreneurial Performance

Environmental awareness is widely regarded as a cognitive resource that shapes environmentally responsible decision-making. Within the Resource-Based View (RBV), it can be conceptualized as an intangible capability that contributes to performance by guiding individuals toward more efficient and sustainable practices (Barney, 1991). Prior research suggests that while awareness alone may not always guarantee performance improvements, it can influence outcomes when it informs efficiency-oriented decisions and operational practices (He et al., 2021; Ones & Dilchert, 2012; Norton et al., 2015).

In informal micro-entrepreneurial contexts, such as bicycle-based coffee vendors (Starling), environmental awareness plays a context-specific role. Although these entrepreneurs operate under resource constraints and survival pressures, awareness can still shape how resources are utilized, how waste is minimized, and how daily operations are managed. Within broader livelihood systems—particularly those linked to rural and peri-urban economies—such awareness-driven decisions can contribute to incremental efficiency gains that enhance performance.

Therefore, environmental awareness is expected to have a positive influence on micro-entrepreneurial performance, although its effect may operate alongside other stronger behavioral drivers.

H3: Environmental Awareness positively influences Micro-Entrepreneurial Performance.

Sustainable Work Motivation → Micro-Entrepreneurial Performance

Sustainable work motivation represents a key behavioral driver that influences effort, persistence, and performance outcomes. Within the Ability–Motivation–Opportunity (AMO) framework, motivation directs and sustains individual action, making it a central determinant of performance.

In sustainability research, motivation has been consistently identified as a strong predictor of performance because it facilitates active engagement in efficient, goal-oriented behavior (Dumont et al., 2017; Pham et al., 2020). This role becomes even more pronounced in informal micro-entrepreneurship, where formal systems and external controls are largely absent.

For bicycle-based coffee vendors, motivation to sustain income, maintain customer relationships, and ensure business continuity directly shapes operational effectiveness. In survival-driven environments, sustainable work motivation encourages persistence, adaptability, and continuous effort, which collectively enhance performance outcomes. This dynamic is also relevant for community-based and rural-linked livelihood systems, where micro-entrepreneurs rely heavily on self-driven initiatives and adaptive capabilities.

Therefore, sustainable work motivation is expected to positively influence micro-entrepreneurial performance.

H4: Sustainable Work Motivation positively influences Micro-Entrepreneurial Performance.

Green Work Behavior → Micro-Entrepreneurial Performance

Green work behavior (GWB) refers to individual actions that contribute to environmental sustainability through resource efficiency, waste reduction, and responsible operational practices. Within sustainability research, GWB functions as a critical mechanism linking sustainability-oriented inputs to performance outcomes (Norton et al., 2015).

From a Resource-Based View perspective, GWB can be conceptualized as a valuable micro-level capability that enhances operational efficiency and cost effectiveness (Porter & van der Linde,

1995; Dumont et al., 2017). By optimizing resource utilization and minimizing waste, individuals can simultaneously achieve environmental and economic benefits.

In informal micro-entrepreneurship, such as bicycle-based coffee vendors, this capability becomes particularly salient. Given tight resource constraints, practices such as efficient input management, waste minimization, and adaptive daily operations directly influence income stability and business sustainability. In this context, GWB is not only an environmentally responsible behavior but also a core efficiency strategy that underpins performance.

Therefore, green work behavior is expected to have a strong positive influence on micro-entrepreneurial performance.

H5: Green Work Behavior positively influences Micro-Entrepreneurial Performance.

Environmental Awareness → GWB → Performance

Environmental awareness provides a cognitive foundation for recognizing environmentally responsible actions. However, its influence on performance is often indirect and contingent upon its translation into observable behavior. Prior studies in sustainability and organizational behavior literature suggest that green work behavior (GWB) functions as a key mechanism linking environmental cognition to performance outcomes, particularly through practices such as resource efficiency and waste reduction (Luu, 2022; Norton et al., 2015; Kim et al., 2019).

From this perspective, awareness alone is insufficient to generate tangible performance improvements unless it is enacted through consistent behavioral practices. GWB therefore represents the behavioral pathway through which environmental awareness can be operationalized into efficiency-enhancing actions.

Nevertheless, this mediating mechanism may be less stable in informal micro-entrepreneurial contexts. Unlike formal organizations, where structured routines support the translation of awareness into behavior, informal entrepreneurs operate under conditions of resource constraints, uncertainty, and immediate economic pressure (Webb et al., 2013; Sutter et al., 2019). In such environments, awareness may influence decision-making selectively rather than systematically, and its conversion into consistent green behavior may be constrained by survival priorities.

Within broader community-based and rural-linked livelihood systems, this suggests that the relationship between awareness and performance may not always follow a structured behavioral pathway. Instead, awareness may contribute to performance in a more fragmented or context-dependent manner.

Therefore, although green work behavior is theoretically expected to mediate the relationship between environmental awareness and micro-entrepreneurial performance, the strength and consistency of this mediation may vary in informal and resource-constrained settings.

H6: Green Work Behavior mediates the relationship between Environmental Awareness and Micro-Entrepreneurial Performance.

Sustainable Work Motivation → GWB → Micro-Entrepreneurial Performance

Sustainable work motivation is inherently action-oriented and plays a central role in shaping both behavior and performance. Within the Ability–Motivation–Opportunity (AMO) framework, motivation determines the intensity and persistence of effort, making it a strong antecedent of green work behavior (Dumont et al., 2017; Afsar & Umrani, 2020).

Prior research suggests that GWB functions as a behavioral mechanism through which motivation is translated into performance outcomes, particularly by enabling efficiency-oriented actions such as resource optimization and waste minimization. In this view, motivation initiates behavioral engagement, while GWB operationalizes that motivation into concrete practices that enhance performance.

However, in informal micro-entrepreneurial contexts, this indirect pathway may not fully materialize. For bicycle-based coffee vendors, motivation is closely tied to immediate economic survival, cost efficiency, and income stability. As a result, motivated individuals may translate their efforts directly into performance-enhancing actions without necessarily engaging in structured or consistently observable green behaviors.

This dynamic reflects a more direct and efficiency-driven mechanism, where motivation bypasses formal behavioral processes and leads directly to outcomes. Within community-based and rural-linked livelihood systems, such patterns suggest that performance is often driven by adaptive and pragmatic decision-making rather than sequential behavioral mechanisms.

Therefore, while green work behavior is theoretically positioned as a mediator between sustainable work motivation and micro-entrepreneurial performance, its mediating role may be weakened in survival-driven informal contexts.

H7: Green Work Behavior mediates the relationship between Sustainable Work Motivation and Micro-Entrepreneurial Performance.

Moderating Role of Resource Efficiency Orientation

Resource efficiency orientation refers to an individual's tendency to utilize resources in a careful, optimal, and cost-effective manner. Within the Resource-Based View (RBV), it can be conceptualized as a micro-level capability that enhances value creation under conditions of resource constraint by improving the conversion of inputs into outputs (Barney, 1991; Teece et al., 1997).

In informal micro-entrepreneurial settings such as bicycle-based coffee vendors (Starling), efficiency orientation is not merely a strategic choice but a necessity for survival. Limited capital, fluctuating demand, and operational uncertainty require individuals to continuously optimize resource utilization. As such, resource efficiency orientation functions as a boundary condition that shapes how internal drivers are translated into performance outcomes within broader community-based and rural-linked livelihood systems.

Environmental Awareness → Performance

Environmental awareness provides a cognitive basis for environmentally responsible decision-making; however, its direct impact on performance is often limited unless it is supported by practical implementation capabilities. Prior research suggests that awareness alone is insufficient to generate tangible outcomes without the ability to translate knowledge into efficient operational practices (Singh et al., 2021; Norton et al., 2015; Dumont et al., 2017).

In this context, resource efficiency orientation strengthens the relationship between environmental awareness and performance by enabling individuals to operationalize environmental cognition into cost-efficient actions. For bicycle-based coffee vendors, those who are both environmentally aware and efficiency-oriented are more likely to minimize waste, optimize inputs, and improve daily operational effectiveness.

Within informal and resource-constrained environments, this interaction becomes particularly important, as awareness requires enabling capabilities to produce measurable economic benefits.

H8: Resource Efficiency Orientation strengthens the relationship between Environmental Awareness and Micro-Entrepreneurial Performance.

Sustainable Work Motivation → Performance

Sustainable work motivation is inherently action-oriented and directly influences performance by shaping effort, persistence, and adaptive behavior. Within the AMO framework, motivation serves as a primary driver of performance, particularly in contexts where individuals rely

on self-regulation rather than formal systems (Zhang et al., 2022; Appelbaum et al., 2000; Dumont et al., 2017).

However, the moderating role of resource efficiency orientation in this relationship may be less pronounced in informal micro-entrepreneurial settings. In survival-driven environments, such as bicycle-based coffee vendors, motivated individuals already tend to prioritize cost efficiency and operational effectiveness as part of their daily practices. As a result, efficiency-oriented behavior is often embedded within motivation itself rather than functioning as a separate reinforcing capability.

This suggests that while resource efficiency orientation is theoretically relevant, its incremental moderating effect on the motivation–performance relationship may be limited. Within community-based and rural-linked livelihood systems, performance is therefore likely to be driven more directly by motivation rather than by the interaction between motivation and efficiency orientation.

H9: Resource Efficiency Orientation strengthens the relationship between Sustainable Work Motivation and Micro-Entrepreneurial Performance.

The conceptual framework integrates environmental awareness and sustainable work motivation as key antecedents of green work behavior and micro-entrepreneurial performance in informal, resource-constrained settings. Grounded in the Resource-Based View (RBV) and a behavioral sustainability perspective, the model positions green work behavior as a potential behavioral pathway through which sustainability-oriented cognitions and motivations may be translated into performance outcomes, while resource efficiency orientation functions as a boundary condition that conditions the strength of these relationships (Barney, 1991; Dumont et al., 2017; Norton et al., 2015).

In the context of bicycle-based coffee vendors (Starling), this framework reflects a survival-driven logic of informal entrepreneurship, where performance is shaped not only by environmental cognition but more critically by motivational intensity and efficiency-oriented action. Importantly, the model acknowledges that in such contexts, the translation from cognition to behavior and performance may not always follow a structured sequence, but can occur through more direct and adaptive pathways.

This configuration aligns with sustainable development perspectives, particularly SDG 8 (decent work and economic growth) and SDG 12 (responsible consumption and production), by highlighting how informal micro-entrepreneurs contribute to low-carbon, resource-efficient, and community-based livelihood systems that are relevant to both urban and rural-linked economic contexts.

Overall, the model extends prior GHRM and RBV research by demonstrating that in informal micro-entrepreneurial settings, sustainable performance is driven more strongly by motivation and efficiency-oriented capabilities than by environmental awareness alone, reflecting a more direct and resilience-based sustainability pathway.

Figure 1 presents the conceptual framework of the study.

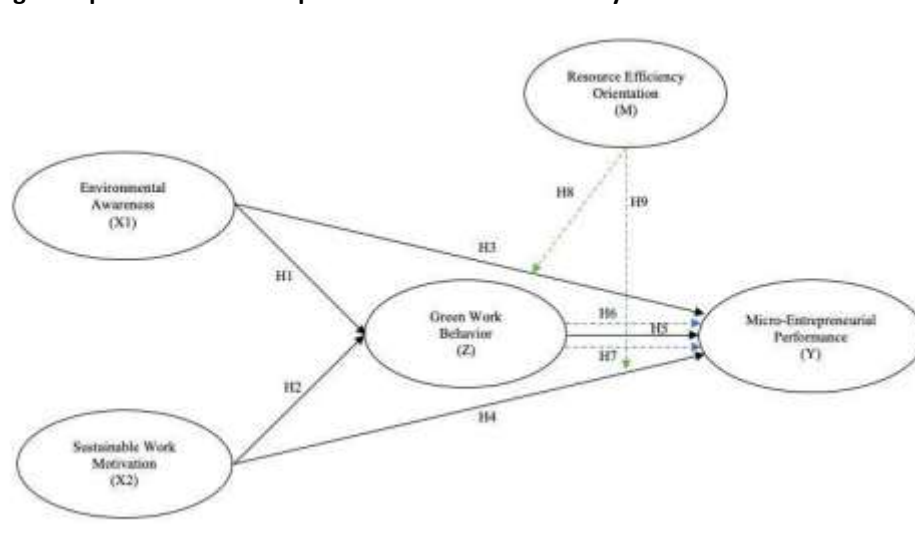


Figure 1. Conceptual Framework

RESEARCH METHODS

Research Design

This study adopts a quantitative cross-sectional survey design to examine the relationships among environmental awareness, sustainable work motivation, green work behavior, resource efficiency orientation, and micro-entrepreneurial performance. The model is analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), which is appropriate for complex predictive models involving mediation and moderation effects and is suitable for exploratory research in emerging and resource-constrained contexts (Hair et al., 2019; Hair et al., 2021). This approach is particularly relevant given the informal and dynamic nature of micro-entrepreneurial activities in developing urban economies.

Sample and Data Collection

The empirical setting focuses on bicycle-based coffee vendors, commonly known as “Starling” (Starbucks Keliling), operating in major business districts in Jakarta, Indonesia. These informal micro-entrepreneurs operate under conditions of high uncertainty, limited capital, and mobility-based business models, reflecting a survival-driven form of urban entrepreneurship. Data were collected using purposive sampling, targeting individuals who (1) operate independently, (2) use bicycles as their primary business medium, and (3) have at least six months of operational experience. A total of 200 questionnaires were distributed, with 172 valid responses retained for analysis. This sample size meets the minimum requirements for PLS-SEM and is considered adequate for estimating complex structural models (Hair et al., 2019).

To minimize common method bias inherent in self-reported survey data, procedural remedies such as ensuring respondent anonymity and item randomization were applied during data collection.

Measurement of Variables

All constructs were measured using multi-item scales adapted from prior validated studies to ensure content validity. Responses were recorded on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Environmental awareness was measured based on individuals’ understanding of environmental issues and sustainability concerns (Norton et al., 2015; Kim et al., 2019). Sustainable work motivation captured intrinsic and extrinsic drivers of environmentally

responsible behavior (Dumont et al., 2017; Afsar & Umrani, 2020). Green work behavior was assessed through indicators reflecting daily resource efficiency, waste reduction, and environmentally responsible actions (Norton et al., 2015; Ones & Dilchert, 2012). Resource efficiency orientation was operationalized as an individual tendency to optimize the use of limited resources in a cost-effective manner, adapted from sustainability efficiency literature. Micro-entrepreneurial performance was measured using subjective indicators, including perceived income stability, business growth, customer satisfaction, and operational effectiveness (Venkatraman & Ramanujam, 1986; Wiklund & Shepherd, 2005). All instruments were contextually adapted to reflect informal micro-entrepreneurial conditions.

Data Analysis Technique

Data analysis was conducted using PLS-SEM following a two-stage approach: measurement model and structural model evaluation (Hair et al., 2019; Hair et al., 2021). The measurement model was assessed through indicator loadings, composite reliability (CR), and average variance extracted (AVE). Discriminant validity was evaluated using the Fornell–Larcker criterion and heterotrait–monotrait ratio (HTMT) (Henseler et al., 2015). The structural model was evaluated using bootstrapping to estimate path coefficients, t-values, and significance levels. The coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2) were used to assess model quality. Mediation effects were tested using indirect effect estimation, while moderation effects were analyzed through interaction terms within the PLS framework. To address potential common method bias, a full collinearity assessment was conducted, and all variance inflation factor (VIF) values were below the recommended threshold, indicating that common method bias is unlikely to be a serious concern (Kock, 2015).

RESULTS AND DISCUSSION

Respondent Characteristics

Table 1 presents the demographic profile of respondents. The majority of bicycle-based coffee vendors are female (83.1%), indicating that informal micro-entrepreneurship in this context is largely driven by women's participation in low-capital and flexible livelihood activities. Most respondents are within the productive age groups of 19–29 years (48.8%) and 30–40 years (36.0%), reflecting the role of young and early-career individuals in sustaining this form of informal economic activity. In terms of education, most respondents completed senior high school education (71.5%), followed by junior high school (21.5%) and a smaller proportion holding higher education degrees (7.0%). This suggests that bicycle-based coffee vending serves as an accessible entry point into entrepreneurship for individuals with diverse educational backgrounds.

Regarding work experience, the majority of respondents have been operating their business for 4–10 years (52.3%), indicating relatively stable engagement and persistence in this informal micro-entrepreneurial sector. This longevity reflects the resilience and adaptability of Starling vendors in sustaining livelihoods under competitive and resource-constrained urban conditions, consistent with informal economy dynamics in emerging markets and the broader goals of inclusive and sustainable economic development (SDG 8).

Table 1. Characteristics of respondents.

Variable	Category	Frequency	Percent (%)
Gender	Female	143	83.1
	Male	29	16.9
Age (years old)	<18	24	14.0
	19–29	84	48.8
	30–40	62	36.0
	41–50	18	10.5
	≥50	2	1.2

Education	Junior High School	37	21.5
	Senior High School	123	71.5
Length of Work (years)	Graduate	12	7.0
	<3	37	21.5
	4–10	90	52.3
	11–17	33	19.2
	18–24	23	13.4
	>25	7	4.1

Source: Data processing

Table 2. Variables and measurement items.

Variable	Item	Factor Loading	SD	CR	Cronbach's α	AVE
EA	EA1	0.74	0.721	0.853	0.833	0.557
EA	EA2	0.76	0.712			
EA	EA3	0.77	0.755			
EA	EA4	0.76	0.679			
SWM	SWM1	0.78	0.718	0.830	0.757	0.574
SWM	SWM2	0.78	0.657			
SWM	SWM3	0.73	0.723			
GWB	GWB1	0.76	0.761	0.856	0.818	0.598
GWB	GWB2	0.77	0.779			
GWB	GWB3	0.75	0.783			
GWB	GWB4	0.78	0.743			
MEP	MEP1	0.79	0.732	0.883	0.834	0.572
MEP	MEP2	0.75	0.761			
MEP	MEP3	0.78	0.677			
MEP	MEP4	0.72	0.698			
REO	REO1	0.74	0.733	0.842	0.832	0.583
REO	REO2	0.77	0.751			
REO	REO3	0.78	0.746			
REO	REO4	0.74	0.752			

Note: CR, Cronbach's α , and AVE are reported at the construct level.

Measurement Model

Table 2 presents the results of the measurement model evaluation. All indicator loadings exceed the recommended threshold of 0.70, ranging from 0.73 to 0.79, indicating satisfactory indicator reliability. The internal consistency reliability is confirmed, as composite reliability (CR) values range from 0.830 to 0.883, exceeding the recommended threshold of 0.70. Similarly, Cronbach's alpha values for all constructs are above 0.70, indicating acceptable reliability. Convergent validity is established, as all average variance extracted (AVE) values exceed the threshold of 0.50, ranging from 0.557 to 0.598. In addition, discriminant validity is confirmed based on both the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio, with all HTMT values below the conservative threshold of 0.90 (Henseler et al., 2015).

Table 3. the correlation of constructs.

Construct	EA	SWM	GWB	MEP	REO
EA	0.746				
SWM	0.541	0.758			
GWB	0.429	0.335	0.773		
MEP	0.462	0.377	0.446	0.756	
REO	0.426	0.420	0.453	0.323	0.764

Discriminant Validity

Table 3 presents the discriminant validity assessment using the Fornell–Larcker criterion. The square root of the average variance extracted (AVE) for each construct (diagonal values) is higher than the inter-construct correlations in all cases, indicating that each construct shares more variance with its own indicators than with other constructs. This confirms that all constructs are empirically distinct and demonstrate adequate discriminant validity.

Model Fit

Table 4 reports the model fit indices for the PLS-SEM model. The standardized root mean square residual (SRMR) value is 0.061, which is below the recommended threshold of 0.08, indicating an acceptable model fit. In addition, the normed fit index (NFI) value of 0.905 exceeds the 0.90 benchmark, suggesting a satisfactory model fit in accordance with PLS-SEM evaluation guidelines. However, it should be noted that model fit in PLS-SEM is primarily used as a supplementary criterion, as the method is mainly prediction-oriented rather than covariance-based (Hair et al., 2021).

Table 4. Model Fit and Quality Indices

Model Fit Measure	Recommended Value	Result	Description
SRMR	< 0.08	0.061	Good fit
NFI	> 0.90	0.905*	Acceptable fit

Table 5. Results of estimation structural model.

Path	Hypothesis	B	t-value	p-value	Result
EA → GWB	H1	0.35	6.17	<0.001	Supported
SWM → GWB	H2	0.52	6.24	<0.001	Supported
EA → MEP	H3	0.43	5.27	<0.001	Supported
SWM → MEP	H4	0.30	6.38	<0.001	Supported
GWB → MEP	H5	0.54	7.44	<0.001	Supported
EA → GWB → MEP	H6	0.19	1.60	0.110	Not Supported
SWM → GWB → MEP	H7	0.28	1.23	0.219	Not Supported
REO × EA → MEP	H8	0.73	6.19	<0.001	Supported
REO × SWM → MEP	H9	-0.34	1.58	0.115	Not Supported

Source: authors calculations based (2025).

Structural Model Results

Table 5 presents the results of the structural model analysis. The findings indicate that both environmental awareness and sustainable work motivation have significant positive effects on green work behavior, supporting H1 and H2. Furthermore, environmental awareness, sustainable work motivation, and green work behavior each have significant positive effects on micro-entrepreneurial performance, supporting H3, H4, and H5.

However, the mediating role of green work behavior is not supported, as the indirect effects of both environmental awareness and sustainable work motivation on performance are not statistically significant (H6 and H7 not supported). This suggests that green work behavior does not function as a transmission mechanism between sustainability-related drivers and performance in this context.

In addition, resource efficiency orientation significantly moderates the relationship between environmental awareness and performance (H8 supported), but does not moderate the relationship between sustainable work motivation and performance (H9 not supported).

Overall, the results reveal a distinctive pattern in which sustainable work motivation plays a critical role as a primary driver, whereas green work behavior emerges as the strongest direct predictor of performance, and environmental awareness operates more conditionally. The absence of mediation effects suggests that in survival-driven informal entrepreneurship, may not fully operate as expected, as individuals tend to translate motivation directly into economic outcomes.

The mixed moderation results further indicate that efficiency orientation primarily strengthens cognition-based effects (awareness), but adds limited incremental value to motivation-driven performance pathways.

Discussion

The findings provide important insights into how sustainability-driven mechanisms operate within informal micro-entrepreneurship. The significant effects of environmental awareness and sustainable work motivation on green work behavior (H1–H2) are consistent with prior studies highlighting cognitive and motivational drivers as key antecedents of pro-environmental behavior (Norton et al., 2015; Dumont et al., 2017; Kim et al., 2019; Afsar & Umrani, 2020). Notably, the stronger effect of sustainable work motivation suggests that, in informal and self-regulated contexts, behavioral engagement is driven more by internal motivation than by cognitive awareness alone, supporting the AMO framework (Appelbaum et al., 2000; Jiang et al., 2012).

The results further indicate that environmental awareness, sustainable work motivation, and green work behavior significantly influence micro-entrepreneurial performance (H3–H5 supported). These findings align with prior research demonstrating that sustainability-oriented practices enhance performance through efficiency and resource optimization (Porter & van der Linde, 1995; Dumont et al., 2017; Pham et al., 2020). Importantly, green work behavior emerges as the strongest direct predictor of performance, highlighting its role as a micro-level operational capability that improves efficiency in resource-constrained environments. This extends the Resource-Based View (RBV) by emphasizing that environmentally responsible practices function as efficiency-driven capabilities in informal settings.

However, the mediating role of green work behavior is not supported (H6–H7), diverging from prior studies that position behavior as a key transmission mechanism (Norton et al., 2015; Kim et al., 2019). This discrepancy can be explained by the nature of informal micro-entrepreneurship, where individuals operate under immediate economic pressures and rely on adaptive, outcome-oriented strategies (Webb et al., 2013; Sutter et al., 2019). In such contexts, sustainability-related drivers may translate more directly into performance without consistently operating through structured behavioral processes. This finding suggests the presence of a “compressed mechanism,” in which the cognition–behavior–performance pathway may not fully operate as expected.

With regard to moderation, resource efficiency orientation significantly strengthens the relationship between environmental awareness and performance (H8 supported), confirming that awareness requires enabling capabilities to generate economic value (Barney, 1991; Schaltegger et al., 2018). In contrast, its moderating effect on the relationship between sustainable work motivation and performance is not supported (H9), indicating that motivation operates as a sufficiently strong and self-contained driver of performance. In this context, efficiency practices appear to be embedded within motivated behavior rather than functioning as a separate reinforcing mechanism.

Overall, these findings highlight a distinctive sustainability logic in informal micro-entrepreneurship, where performance is driven by a combination of motivation and efficiency-oriented capabilities rather than by structured behavioral mediation. This study contributes to the literature by demonstrating that sustainability mechanisms in informal economies follow a more direct, resilience-driven pathway shaped by resource constraints, adaptability, and survival-oriented decision-making. Furthermore, the findings support the relevance of SDG 8 and SDG 11 by illustrating how informal micro-entrepreneurs contribute to low-carbon and inclusive urban livelihood systems.

Theoretical and Practical Implications

This study contributes to the sustainability, green human resource management (GHRM), and informal entrepreneurship literature by extending their application into survival-driven micro-

entrepreneurial contexts. First, the findings refine the explanatory logic of GHRM and the Ability–Motivation–Opportunity (AMO) framework by demonstrating that in informal settings, sustainable work motivation serves as a critical driver of both green work behavior and micro-entrepreneurial performance, while environmental awareness plays a more supportive cognitive role.

Second, this study challenges the conventional linear cognition–behavior–performance pathway commonly observed in formal organizations. The non-significant mediating role of green work behavior suggests that, in informal contexts such as bicycle-based coffee vendors (Starling), sustainability mechanisms may operate through more direct and compressed pathways. In such environments, cognitive and motivational drivers may translate into performance without consistently passing through structured behavioral processes, reflecting the adaptive and survival-oriented nature of informal entrepreneurship.

Third, this study extends the Resource-Based View (RBV) by conceptualizing green work behavior as a micro-level efficiency capability embedded in daily entrepreneurial practices. In resource-constrained environments, environmentally responsible actions—such as resource optimization and waste minimization—function not only as sustainability-oriented behaviors but also as strategic mechanisms that enhance cost efficiency and business continuity.

From a practical perspective, the findings suggest that policy interventions targeting informal micro-entrepreneurs should move beyond awareness-based approaches. Greater emphasis should be placed on strengthening sustainable work motivation, resilience, and resource efficiency capabilities. For bicycle-based coffee vendors, performance improvement is more likely to be achieved through practical capability development—such as cost management, operational efficiency, and adaptive business practices—rather than awareness-building alone.

Finally, this study contributes to the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth), SDG 11 (Sustainable Cities and Communities), and SDG 12 (Responsible Consumption and Production), by highlighting the role of informal micro-entrepreneurs as key actors in low-carbon, resource-efficient, and inclusive urban livelihood systems.

CONCLUSION

This study advances the understanding of sustainability-oriented behavior in informal micro-entrepreneurship by examining bicycle-based coffee vendors (Starling) as a resilient, low-carbon urban livelihood model. The findings indicate that sustainable work motivation plays a critical role in shaping both green work behavior and micro-entrepreneurial performance, while environmental awareness serves a more supportive function. In resource-constrained and self-regulated contexts, performance is driven primarily by motivation, adaptability, and survival-oriented decision-making.

Although green work behavior significantly enhances performance and emerges as the strongest direct predictor, its mediating role is not supported. This suggests that sustainability-related drivers may translate into economic outcomes more directly, without consistently passing through structured behavioral mechanisms. This finding supports the existence of a “compressed sustainability pathway” in informal entrepreneurship, where efficiency and practical necessity shape decision-making processes. Furthermore, resource efficiency orientation strengthens the impact of environmental awareness on performance, indicating that awareness becomes economically meaningful only when supported by efficiency-oriented capabilities.

Overall, this study positions Starling vendors as adaptive micro-entrepreneurs who integrate sustainability and livelihood survival through low-cost, mobile, and resource-efficient practices. The findings extend the literature on sustainability, green human resource management (GHRM), and the Resource-Based View (RBV) by demonstrating that sustainability mechanisms in informal economies are driven more by motivation and efficiency-oriented capabilities than by formal behavioral systems. From a policy perspective, strengthening informal low-carbon

enterprises requires shifting from awareness-based interventions toward approaches that enhance motivation, resilience, and resource efficiency. Such efforts contribute to inclusive and sustainable urban development and support the achievement of SDG 8, SDG 11, and SDG 12.

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