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Building Green Behavioral: The Role of Eco Literacy and Financial Literacy in Moderating Household Finances

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Abstract

Eco literacy among housewives has been increasing, supported by the application of green behaviour in household finances. The purpose of this study is to determine the relationship between green behaviour as an independent variable, eco-literacy and financial literacy as moderating variables, and household finances as a dependent variable. The quantitative research sample involved 100 respondents using snowball and purposive sampling techniques among housewives in Semarang City. The results indicate that green behaviour, eco-literacy, and financial literacy have a positive influence, while Moderated Regression Analysis (MRA) shows that eco-literacy and financial literacy significantly weaken the influence of green behaviour on household finances. These findings not only support the hypothesis that increased environmental understanding can help individuals make appropriate financial decisions, but also highlight challenges in its implementation among the public, necessitating more effective educational strategies.

Membangun Perilaku Hijau: Peran Literasi Ekologi dan Literasi Keuangan dalam Memoderasi Keuangan Rumah Tangga

Abstrak

Eco Literacy di lingkungan Ibu rumah tangga sudah semakin meningkat, hal ini didukung dengan penerapan green behavioral pada keuangan rumah tangga. Tujuan penelitian untuk mengetahui hubungan antara green behavioral sebagai variabel independen, variabel moderasi eco literacy dan literasi keuangan yang juga sebagai variabel independen terhadap variabel dependen keuangan rumah tangga. Pengambilan sampel penelitian kuantitatif ini melibatkan 100 responden menggunakan teknik snowball dan purposive sampling pada Ibu Rumah Tangga di Kota Semarang. Variabel yang diteliti meliputi eco literacy sebagai variabel independen, green behavioral sebagai variabel dependen, dan interaksi antara keduanya sebagai variabel moderasi. Hasil menunjukkan bahwa green behavioral, eco literacy dan literasi keuangan berpengaruh positif, sedangkan Moderated Regression Analysis (MRA) menunjukkan bahwa eco literacy, dan literasi keuangan secara signifikan memperlemah pengaruh green behavioral terhadap keuangan rumah tangga. Temuan ini mendukung hipotesis bahwa peningkatan pemahaman lingkungan dapat membantu individu dalam membuat keputusan keuangan yang tepat, namun juga menunjukkan adanya tantangan dalam implementasinya di kalangan masyarakat, sehingga perlu adanya strategi edukasi yang lebih efektif.

JEL Classification: D14, D91, G53

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INTRODUCTION

In recent years, environmental issues have become a global concern as the impacts of climate change, pollution, and environmental degradation have become more apparent. This certainly forces people to adopt a more environmentally friendly behavior or green behavior as a solution to preserve the earth. In reality, in realizing these actions, there are great challenges that must be faced related to the lack of in-depth understanding of eco literacy and financial literacy in supporting this green behavior, especially in the context of household finances (Sandri, 2024). The large number of households that do not have sufficient knowledge about environmentally responsible behavior can contribute to long-term financial well-being. Based on conditions in the environment, living a green lifestyle is often considered quite expensive, so people hesitate to take this step. Whereas good financial literacy can help households manage their financial resources more effectively and better in supporting sustainable decisions (Prayogi, 2024).

The phenomenon shows that although people are starting to realize the importance of green behavior, the lack of sufficient knowledge makes its application in daily life far from optimal. Many individuals have the intention to behave in an environmentally friendly manner, but they still experience difficulties in implementing it mainly due to limited knowledge and skills in terms of ecological literacy and financial management. This can be seen in many households that do not fully understand how to make financial decisions that can support environmental sustainability without having to sacrifice their economic stability. The lack of financial literacy has led many people to procrastinate on implementing green behaviors. On the other hand, eco-friendly products are often perceived as more expensive, which exacerbates that green lifestyle is not affordable for all. This suggests that eco literacy and financial literacy play an important role in shaping a more purposeful and sustainable green behavior (Kustina et al., 2024).

The Financial Services Authority has measured the level of financial literacy and inclusion in the country over the past five years in the form of the National Survey of Financial Literacy and Inclusion (SNLIK). SNLIK has been conducted three times, namely in 2019, 2022, and 2024. Based on the survey results, there has been a significant increase in financial literacy among the Indonesian population, broken down by gender (male and female), from year to year. In 2019, the financial literacy rate for men was 39.94% and for women was 36.13%, which then increased to 49.05% for men and 50.33% for women in 2022, and further increased in 2024 to 64.14% for men and 66.75% for women.

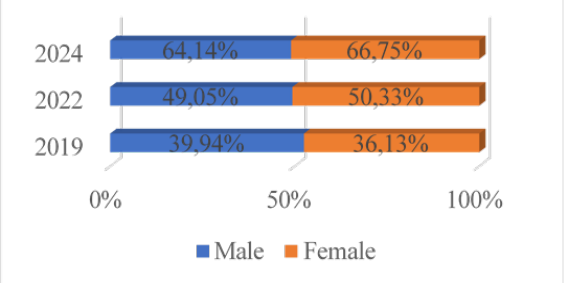

Figure 1. Financial Literacy Index in Indonesia in 2019, 2022, 2024
Source: Data processed from the National Survey of Financial Literacy and Inclusion (SNLIK) (2025)

Based on this data, it explains that although the level of financial literacy has increased from year to year, the implementation of green behavior among the community, especially households, is still not optimal. This is reinforced by the gap between pro-environmental attitudes and

actual behavior which is often caused by a lack of in-depth understanding of environmental issues as well as limitations in sustainable household financial management. In other words, individuals who have good intentions towards the environment are not necessarily able to apply them consistently in their daily lives. The Indonesian government is committed to supporting the implementation of a green economy. The historical basis of the green economy and SDGs is found in Article 33 paragraph (3) of the 1945 Constitution of the Republic of Indonesia which reads "the earth, water and natural resources contained therein shall be controlled by the state and utilized for the greatest prosperity of the people" which is the mandate of the Green Constitution. For example, renewable energy and waste management policies at the regional level have contributed to green economic growth on a micro level (Setiyadi et al., 2023).

To support the analysis in this study, data from the 2019, 2022, and 2024 National Survey on Financial Literacy and Inclusion (SNLIK) were used. Gender-based data was selected because the main focus of this study is on women, especially housewives, who play an important role in financial decision-making as well as in managing daily household activities, including consumption, waste management, and energy use. Women, especially in their role as housewives, are often the main actors in shaping green behavior within the family. Therefore, analysis based on gender data from SNLIK provides stronger relevance in understanding the relationship between financial literacy, green behavior, and the household context which is the main object of study in this research.

In 2025, household waste such as used cooking oil is still often disposed of carelessly by the public, causing serious environmental pollution. In addition to polluting soil and water, disposal without proper treatment negatively affects ecosystems and human health. Other household waste that is not properly managed also creates additional problems, such as bad odors and the risk of spreading diseases. To overcome this, various parties have made efforts, such as Diponegoro University (UNDIP) KKN students who held a program to utilize used cooking oil into soap in several villages, including Dengkeng, Klaten (Abdillah, 2024), Belik, Pemalang (Ananda, 2024), and Eromoko, Wonogiri (Hakim, 2025). This program aims to provide education to the community about processing household waste independently and environmentally friendly, especially in utilizing used cooking oil into economically valuable products such as soap. This activity not only helps reduce environmental pollution, but also provides economic opportunities for the local community.

In previous research, green behavioral has a positive and significant effect on household finances (Sapuan, 2020). Eco-literacy has a positive and significant effect on household finances (Setiyadi et al., 2023). There are several previous studies regarding financial literacy has a positive and significant effect on household finances (Maulita et al., 2023). Meanwhile, it is different from the findings of Octavera & Rahadi (2023) which shows that financial literacy has a negative effect on household finances.

However, most of the previous studies have focused on areas outside Semarang City and have not specifically examined how housewives in this region manage their finances in relation to green behavior, environmental literacy, and financial literacy. In fact, Semarang City as one of the major cities with complex economic and social dynamics has its own characteristics in consumption behavior and household management. Therefore, the selection of

housewives in Semarang City as the object of research is not only because of their important role in managing household finances and activities, but also to fill the void of previous research and provide data that is in accordance with the conditions in the area. This is unique to this study, as it can provide a better understanding of the real conditions in the field and help design more appropriate education and policies.

The moderating role in this study means how eco literacy and financial literacy can interact with each other to produce optimal solutions for households. This allows households to make decisions that are not only financially beneficial but also contribute to environmental conservation. This research is not only relevant for micro-level communities (households), but also for public policies to promote sustainability more broadly. Building green behavior driven by eco literacy and financial literacy is an important step to create a society that is more aware of environmental impacts and wiser in managing financial resources. Based on this explanation, it is very important to understand how eco literacy and financial literacy can moderate green behavior in sustainable household financial management.

Based on the above, the purpose of this study is to determine the relationship between green behavioral as an independent variable, the moderating variable of eco literacy and financial literacy which is also an independent variable on the dependent variable of household finance. The formulation of the problem in this study is that green behavioral affects household finance; eco literacy affects household finance; financial literacy affects household finance; eco literacy strengthens the influence of green behavioral on household finance; financial literacy strengthens the influence of green behavioral on household finance. It is hoped that these findings can support the hypothesis that increased environmental understanding can help individuals make the right financial decisions, but it also shows that there are challenges in its implementation among the public, so there is a need for more effective educational strategies.

Hypothesis Development

Green Behavioral Relationship to Household Finance

According to Goleman et al. (2012) Green Behavioral is human behavior in protecting and maintaining the environment in their immediate environment. Which shows that households with high levels of green behavioral tend to have more efficient spending and can improve financial well-being. Green behavior in households reflects proactive actions in managing resources sustainably, such as reducing energy consumption, recycling, and using environmentally friendly products. These behaviors can improve the efficiency of household spending through reduced energy costs and consumption of goods.

According to Yin et al. (2024) households that actively implement green behaviors such as renewable energy use and waste management contribute to the reduction of carbon emissions at the micro level. This is in line with research conducted by Hardi et al. (2024) which found that household green decisions, including reduced fossil fuel consumption, can have a cumulative impact on community and even regional emission reduction targets.

According to Prasetyo & Kistanti (2022) households in Indonesia are starting to show interest in energy saving, especially in urban areas. At the household level, this increasing trend not only reduces the negative impact on the environment, but also supports government policies in promoting a green economy and achieving sustainable development goals (SDGs). This policy makes a real contribution to reducing pollution and

maintaining people's quality of life. The implementation of green behavior in households provides direct benefits to daily finances through cost savings. Meanwhile, it shows that households that use energy-efficient devices, such as LED lights and Energy Star labeled electronic devices, are able to reduce electricity expenditure by up to 20%. In addition, the habit of reducing single-use plastic consumption or using eco friendly transportation also helps in reducing long-term costs. This research emphasizes that green habits at the household level have the potential to have a significant positive economic impact amid rising energy prices and household needs (Yin et al., 2024). Therefore, the hypothesis can be proposed, namely:

H1: Green Behavioral has a positive effect on household finances.

The Relationship between Eco Literacy and Household Finance

According to Keraf (2014) eco-literacy as a state in which people have understood the principles of ecology and live according to these ecological principles in organizing and building life with humanity on this earth to realize a sustainable society. Eco literacy refers to an individual's understanding of the concept of environmental sustainability and its impact on financial decisions. This literacy influences mindsets and actions in financial management that consider environmental impacts. It has been shown that individuals with high levels of eco literacy tend to make wiser investments in environmentally friendly products and technologies, ultimately improving household financial stability.

According to Whitmarsh et al. (2022) eco literacy increases critical awareness of consumption and waste choices, which in turn reduces the ecological footprint. Households with good eco literacy are better able to understand and implement energy-saving and resource conservation practices, thus supporting green economy goals at the micro level. Another study by Putu et al. (2024) shows that deep ecological knowledge triggers more pro-environmental behaviors, especially in terms of recycling, water management, and energy consumption. Eco literacy ultimately enables people to actively participate in maintaining environmental sustainability, which is very relevant in this study to strengthen the green economy at the household level. Therefore, the hypothesis can be proposed, namely:

H2: Eco Literacy has a positive effect on household finances.

Relationship between Financial Literacy and Household Finance

Financial literacy is the knowledge and expertise in applying understanding related to risk concepts, skills to be able to make effective decisions in finance to improve financial well-being both individually and socially and can participate in the community environment (Kurniawati & Murwani, 2024).

Research shows that financial literacy has a significant effect on the financial management of housewives in Indonesia (Wulan & Suarni, 2023). Financial behavior states that financial literacy helps individuals deal with financial risk and maximize income. Other studies show that financial literacy has a positive and significant effect on women's financial management in managing family finances (Maulita et al., 2023).

It includes an understanding of basic financial concepts, the ability to manage savings and investments, an understanding of risk management, and the capacity to make sound financial decisions. Good financial literacy enables households in Semarang City to optimize their financial resources while considering environmental sustainability aspects. Therefore, the

hypothesis can be proposed, namely:

H3: Financial Literacy has a positive effect on household finances.

Moderation of Eco Literacy on Green Behavioral towards Household Finance

According to Keraf (2014) eco literacy as a state in which people have understood the principles of ecology and live according to the principles of ecology in organizing and building life with humanity on this earth to realize a sustainable society. Eco literacy means a state where people are enlightened about the importance of the environment. So eco literacy is a state where a person has realized how important the environment is, namely by maintaining, caring for, and preserving the earth.

From the perspective of the Theory of Planned Behavior (TPB), a high level of individual understanding of eco literacy can enhance perceived behavioral control regarding the environmental impact of their financial decisions, making them more likely to adopt financial policies aligned with sustainable principles (Purwanto & Budiyanto, 2022).

It is expected that eco literacy can positively reinforce green behavioral towards household finances with awareness and knowledge of the financial benefits of environmentally friendly practices, such as reduced costs of electricity, water, and the use of recycled goods. As well as saving costs and improving financial efficiency, they will feel more in control of their financial decisions. In addition, subjective norms that support green behavior in society, coupled with high eco literacy, will further encourage individuals to adopt more sustainable financial decisions.

Eco-literacy can act as a moderating variable in strengthening the relationship between green behavioral and household finance in Semarang City. An in-depth understanding of the environment allows individuals to optimize their green behavior so that it has a more significant financial impact. Based on the explanation above, the hypothesis can be proposed, namely:

H4: Eco Literacy strengthens the relationship between Green Behavioral and household finance.

Moderation of Financial Literacy on Green Behavioral towards Household Finance

Financial literacy is the knowledge and expertise in applying understanding related to risk concepts, skills to be able to make effective decisions in finance to improve financial well-being both individually and socially and can participate in the community environment (Kurniawati & Murwani, 2024).

From the perspective of the Theory of Planned Behavior (TPB), a high level of individual understanding of financial literacy enhances perceived behavioral control, increasing confidence in making financial decisions that support sustainability (Purwanto & Budiyanto, 2022).

With a good understanding of financial management, a person can more easily adjust green behavior to an optimal financial strategy. In addition, subjective norms that support sustainable financial practices in society will further strengthen the tendency of individuals to adopt green behaviors in their financial decisions.

Financial literacy can also moderate the relationship between green behavioral and household finance by strengthening households' ability to integrate green practices into the financial strategies of housewives in Semarang City. Behavioral finance theory states that individuals with good financial literacy are better able to allocate resources efficiently, including in the context of spending that supports sustainability. Based on the explanation above, the hypothesis can be proposed, namely:

H5: Financial literacy strengthens the relationship between Green Behavioral and household finance.

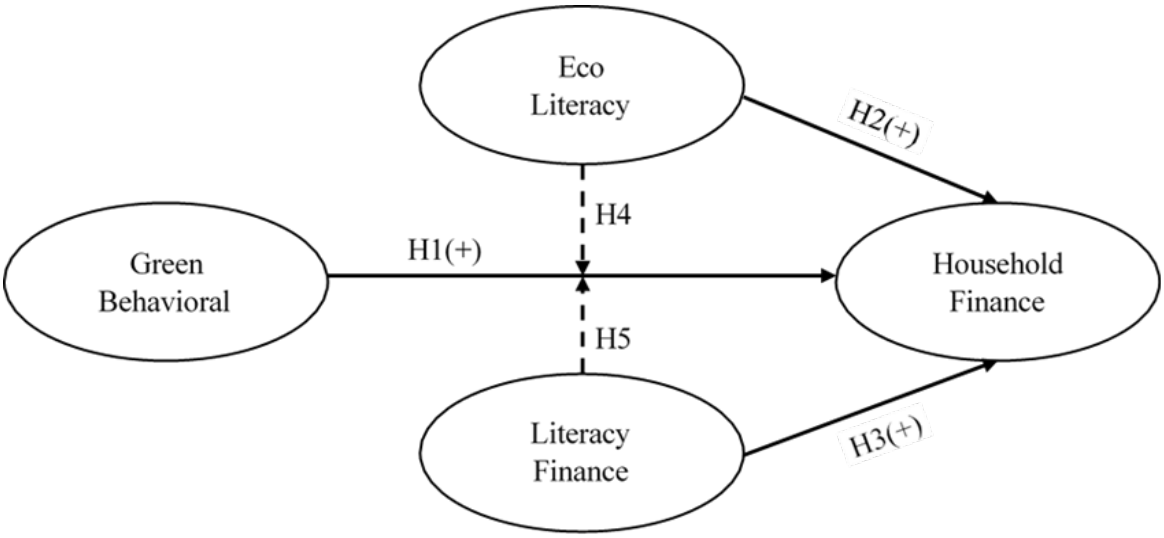

Figure 2. Empirical Research Method

METHOD

This study uses a quantitative approach to determine the influence of environmentally friendly behavior, environmental literacy, and financial literacy on household finances, and to examine the moderating role of environmental and financial literacy in this relationship. The data used are primary data obtained directly from respondents through a questionnaire. The data sources consisted of housewives residing in Semarang City, with a population of 189,086 (BPS Semarang, 2024).

The sample size was determined using the Slovin formula with a margin of error of 10%, resulting in a total sample of 100 respondents. The sampling techniques used were snowball sampling and purposive sampling, with the criteria for respondents being housewives residing in the city of Semarang. So the respondent criteria is housewives who are/reside in the Semarang City area. Data measurement in this study is based on a Likert scale consisting of 5 levels, namely: (1) strongly disagree, (2) disagree, (3) less agree, (4) agree, (5) strongly agree.

The data analysis techniques used in this study were multiple regression analysis and *Moderated Regression Analysis (MRA)* to test the direct effects and interactions of the moderator variables. The independent variable in this study was green behaviour (X), the dependent variable was household finances (Y), and the moderator variables consisted of environmental literacy (Z_1) and financial literacy (Z_2).

The operational definitions of each variable are explained as follows: Green behavior refers to individual behaviors that support environmental protection and preservation, such as reducing resource use, waste management, environmentally friendly transportation, sustainable purchasing, tree planting and park preservation, energy conservation, participation in environmental care programs, refusal to use hazardous materials, and environmental advocacy (Sapuan, 2020; Hidayat et al., 2024).

Ecological literacy is defined as an understanding of ecological principles and the ability to apply them in life, including empathy for living things, practicing sustainability as a community group action, making the invisible visible, anticipating unexpected impacts, understanding how

natural life takes place (Nurhalisa et al., 2020; Agustina et al., 2023).

Financial literacy is the knowledge and expertise in applying understanding related to the concept of risk, skills to be able to make effective decisions in finance to improve financial well-being both individually and socially and can participate in the community environment, such as one's understanding of the value of an item, understanding the basics of investment, making careful preparations for retirement, understanding the function of shopping, such as comparing products and knowing advice and information, being able to prioritize in handling personal financial affairs (Kurniawati & Murwani, 2024; Setianingsih & Kurnianingsih, 2024).

Meanwhile, household finance refers to the ability of housewives to manage consumption, savings, debt, and family cash flow (Novitasari, 2022; Indania et al., 2024). Each indicator in the variable is measured through a questionnaire with structured statements in accordance with the theory and results of previous research.

RESULT AND DISCUSSION

Result

Description of Characteristics of Research Respondents

Respondent characteristics are used to provide an overview of respondents obtained from distributing questionnaires. The object of research studied was housewives who reside in Semarang City. The description of the characteristics in the research sample is as follows:

Based on Table 1, regarding the description of respondents, it can be seen that the respondents in this study are spread across various areas of Semarang City, including Pedurungan (11%), Gajah-

Table 1. General Demographics of Respondents

	Description	Number	Percentage
A	Residence		
	Banyumanik	9	9%
	Candisari	7	7%
	Gajahmungkur	9	9%
	Gayamsari	4	4%
	Genuk	7	7%
	Gunung Pati	6	6%
	Mijen	4	4%
	Ngaliyan	5	5%
	Pedurungan	11	11%
	Semarang Barat	5	5%
	Semarang Selatan	6	6%
	Semarang Tengah	4	4%
	Semarang Timur	4	4%
	Semarang Utara	5	5%
	Tembalang	8	8%
	Tugu	6	6%
	Total	100	100%

	Description	Number	Percentage
B	Age		
	17-27 Years	34	34%
	28-43 Years	46	46%
	44-59 Years	20	20%
	Total	100	100%
C	Education Level		
	Junior High School/SLTP	2	2%
	High School/SLTA	40	40%
	D1-D3	15	15%
	D4/S1	42	42%
	S2-S3	1	1%
	Total	100	100%
D	Occupation		
	State-Owned Enterprises/Civil Servants/ Government Employees	16	16%
	Housewife	32	32%
	Private Employee	24	24%
	Student/University Student	11	11%
	Entrepreneur	16	16%
	Other	1	1%
	Total	100	100%
E	Income		
	Below Rp 2.000.000	22	22%
	Rp 2.000.000 - Rp 4.000.000	36	36%
	Rp 4.000.000 - Rp 6.000.000	29	29%
	Rp 6.000.000 - Rp 8.000.000	10	10%
	Above Rp 8.000.000	3	3%
	Total	100	100%

Source: Processed Data (2025)

mungkur and Banyumanik 9%, Tembalang 8%, Candisari and Genuk 7%, Tugu, Semarang Selatan, and Gunung Pati 6%, Ngaliyan, Semarang Utara, and Semarang Barat 5%, while areas such as Semarang Tengah, Mijen, Semarang Timur, and Gayamsari have a lower percentage of 4%. Based on age groups, the majority of respondents are in the 28–43 age range at 46%, followed by those aged 17–27 at 34%, and the remaining 20% are aged 45–59. In terms of highest level of education, the majority of respondents had completed a D4/S1 degree (42%), followed by high school graduates (40%), D1–D3 graduates (15%), junior high school graduates (2%), and S2–S3 graduates (1%). Based on occupation, most respondents were housewives (32%), private sector employees (24%), state-owned enterprise/civil servant/government employee and self-employed (16% each), students/university students (11%), and others (1%). Meanwhile, in terms of monthly income,

most respondents had an income of Rp 2,000,000 – Rp 4,000,000 (36%), followed by Rp 4,000,000 – Rp 6,000,000 (29%), below Rp 2,000,000 (22%), Rp 6,000,000 – Rp 8,000,000 (10%), and the remainder above Rp 8,000,000.

Variable Descriptive Statistics

Descriptive statistics of variables are data summaries that describe the tendency pattern of respondents' answers to questions in the questionnaire. The calculation is done by applying the formula:

Index value=

$$\frac{(F1x1) + (F2x2) + (F3x3) + (F4x4) + (F5x5)}{5}$$

Description:
F1 = Frequency of respondents who gave answer 1
F2 = Frequency of respondents who gave answer 2
F3 = Frequency of respondents who gave answer 3
F4 = Frequency of respondents who gave answer 4
F5 = Frequency of respondents who gave answer 5

Determination of value index using the Three-box Method

$$\text{Maximum Score } \left(\frac{F5\times5}{5}\right) = \left(\frac{100\times5}{5}\right) = 100$$

$$\text{Minimum Score } \left(\frac{F5\times1}{5}\right) = \left(\frac{100\times1}{5}\right) = 20$$

$$\text{Range (R)} = 100 - 20 = 80$$

$$\text{Median (M)} = 20 + \frac{80}{2} = 60$$

$$\text{Interval (I)} = \frac{80}{3} = 26.66$$

Thus, the nominal index produced has a value range of 20-100, with a range of 80. The Three-box Method is used by dividing the value range of 80 into 3 parts, resulting in a value range of 26.67. This range is then used as the basis for interpreting the index value (Ferdinand, 2014).
Index 20-46.66 = Low Interpretation
Index 46.67-73.33 = Moderate Interpretation
Index 73.34-100 = High Interpretation

Based on these provisions, the respondents' perception index for this research variable was determined. Furthermore, the interpretation of the respondents' results is explained in Table 2.

Table 2. Respondent Response Index

Variabel	Indicator	Score					Score	Index	Criteria
		STS	TS	KS	S	SS			
Green	X1.1.1	0	0	3	24	73	470	94.00%	High
Behavioral	X1.1.2	0	0	7	52	41	434	86.80%	High
	X1.2.1	2	3	5	31	59	442	88.40%	High
	X1.2.2	2	4	2	34	58	442	88.40%	High
	X1.3.1	2	7	7	42	42	415	83.00%	High
	X1.3.2	1	3	6	38	52	437	87.40%	High
	X1.4.1	0	4	5	43	48	435	87.00%	High
	X1.4.2	0	5	6	42	47	431	86.20%	High
	X1.5.1	1	1	2	33	63	456	91.20%	High
	X1.5.2	1	2	2	50	45	436	87.20%	High
	X1.6.1	0	3	7	33	57	444	88.80%	High

	X1.6.2	5	5	3	31	56	428	85.60%	High
	X1.7.1	2	7	5	34	52	427	85.40%	High
	X1.7.2	1	2	2	32	63	454	90.80%	High
	X1.8.1	0	4	8	41	47	431	86.20%	High
	X1.8.2	2	4	5	39	50	431	86.20%	High
	X1.9.1	0	7	2	42	49	433	86.60%	High
	X1.9.2	0	1	1	45	53	450	90.00%	High
	X1.10.1	1	1	0	43	55	450	90.00%	High
	X1.10.2	0	3	3	35	59	450	90.00%	High
	Average						439,8	87.96%	High
Household	Y1.1.1	0	4	2	35	59	449	89.80%	High
Finance	Y1.1.2	1	4	6	41	48	431	86.20%	High
	Y1.2.1	3	3	3	43	48	430	86.00%	High
	Y1.2.2	4	3	2	26	65	445	89.00%	High
	Y1.3.1	2	3	6	38	51	433	86.60%	High
	Y1.3.2	1	7	1	43	48	430	86.00%	High
	Y1.4.1	2	1	4	40	53	441	88.20%	High
	Y1.4.2	0	11	3	38	48	423	84.60%	High
	Average						435,25	87.05%	High
Eco Literacy	Z1.1.1	0	3	2	30	65	457	91.40%	High
	Z1.1.2	2	2	4	52	40	426	85.20%	High
	Z1.2.1	2	5	3	34	56	437	87.40%	High
	Z1.2.2	5	3	3	33	56	432	86.40%	High
	Z1.3.1	3	1	5	36	55	439	87.80%	High
	Z1.3.2	3	7	1	42	47	423	84.60%	High
	Z1.4.1	2	7	3	31	57	434	86.80%	High
	Z1.4.2	2	2	2	39	55	443	88.60%	High
	Z1.5.1	1	5	1	28	65	451	90.20%	High
	Z1.5.2	1	4	2	43	50	437	87.40%	High
	Average						437,90	87.58%	High
Financial	Z2.1.1	1	2	7	31	59	445	89.00%	High
Literacy	Z2.1.2	1	3	0	50	46	437	87.40%	High
	Z2.2.1	1	4	2	43	50	437	87.40%	High
	Z2.2.2	4	3	1	28	64	445	89.00%	High
	Z2.3.1	1	3	3	34	59	447	89.40%	High
	Z2.3.2	1	7	6	36	50	427	85.40%	High
	Z2.4.1	1	5	4	38	52	435	87.00%	High
	Z2.4.2	4	6	2	39	49	423	84.60%	High
	Z2.5.1	1	13	4	36	46	413	82.60%	High
	Z2.5.2	3	3	5	39	50	430	86.00%	High
	Average						433,90	86.78%	High

Source: Processed Data (2025)

Based on the results of the questionnaire completed by respondents on green behavioral indicators, it shows that the highest average value is located in the indicator of reducing resource use which reflects respondents' awareness in managing energy efficiently. For the household finance variable, it shows that respondents who have the highest value on the indicator of consumption of goods or services tend to prioritize household spending on goods or services in the long term. Meanwhile, the eco-literacy variable, the highest assessment result of respondents' answers refers to the indicator of developing empathy towards all forms of life which describes respondents' awareness of pro-environmental attitudes. Finally, the financial literacy variable, the highest statement in respondents' answers refers to the indicator of making thorough preparations for retirement, this indicates that respondents tend to prepare for retirement needs.

Data Eligibility Test

Validity testing is a measurement that indicates the degree of accuracy of an instrument in relation to the concept being studied (Sugiyono, 2020). The validity of an instrument is determined by correlating the values obtained with the total value. If

Table 3. Validity Test Results

Variable	Item	Value	Description
Green Behavioral	X1.1.1	0.000	Valid
	X1.1.2	0.000	Valid
	X1.2.1	0.000	Valid
	X1.2.2	0.000	Valid
	X1.3.1	0.000	Valid
	X1.3.2	0.000	Valid
	X1.4.1	0.000	Valid
	X1.4.2	0.000	Valid
	X1.5.1	0.000	Valid
	X1.5.2	0.000	Valid
	X1.6.1	0.000	Valid
	X1.6.2	0.000	Valid
	X1.7.1	0.000	Valid
	X1.7.2	0.000	Valid
	X1.8.1	0.000	Valid
	X1.8.2	0.000	Valid
	X1.9.1	0.000	Valid
	X1.9.2	0.000	Valid
	X1.10.1	0.000	Valid
	X1.10.2	0.000	Valid
Household Finance	Y1.1.1	0.000	Valid
	Y1.1.2	0.000	Valid
	Y1.2.1	0.000	Valid
	Y1.2.2	0.000	Valid
	Y1.3.1	0.000	Valid
	Y1.3.2	0.000	Valid
	Y1.4.1	0.000	Valid
	Y1.4.2	0.000	Valid

Variabel	Item	Value	Description
Eco Literacy	Z1.1.1	0.000	Valid
	Z1.1.2	0.000	Valid
	Z1.2.1	0.000	Valid
	Z1.2.2	0.000	Valid
	Z1.3.1	0.000	Valid
	Z1.3.2	0.000	Valid
	Z1.4.1	0.000	Valid
	Z1.4.2	0.000	Valid
	Z1.5.1	0.000	Valid
	Z1.5.2	0.000	Valid
Financial Literacy	Z2.1.1	0.000	Valid
	Z2.1.2	0.000	Valid
	Z2.2.1	0.000	Valid
	Z2.2.2	0.000	Valid
	Z2.3.1	0.000	Valid
	Z2.3.2	0.000	Valid
	Z2.4.1	0.000	Valid
	Z2.4.2	0.000	Valid
	Z2.5.1	0.000	Valid
	Z2.5.2	0.000	Valid

Source: Processed Data (2025)

the value of each question item correlates significantly with the total value at a certain level, then the measuring instrument can be said to be valid. Conversely, if the correlation is not significant, the measuring instrument is not valid. Validity testing is a test that demonstrates the validity of data. This validity test uses bivariate correlation, and the results of the bivariate analysis are viewed from the Cronbach Alpha value. If $\alpha > 0.05$, there is a correlation between variables.

Based on the validity test results in Table 3, all research variable statement instruments, namely Green Behavioural (X), Household Finance (Y), Eco-Literacy (Z^1), and Financial Literacy (Z^2), show a Sig. value < 0.05, specifically 0.000. This indicates that each statement item in each variable has a significant relationship with the total score of its variable, as the Sig. level is < 0.05. Therefore, all research instruments are deemed valid for measuring the variables under study.

Reliability Test

Reliability testing is a measuring tool that shows the consistency of measurement results when the measuring tool is used by the same person at different times or by different people at the same time or at different times (Sugiyono, 2020). Reliability testing is a test related to the consistency and stability of the data being studied. In this study, the One Shot technique was used, employing the Cronbach Alpha (α) statistical test. Data is considered reliable if the α value is greater than 0.70; the higher the α value, the more consistent the respondents' responses.

The reliability test results in Table 4 show that all research variables, namely Green Behavioural (0.929), Household Finance (0.851), Eco Literacy (0.904), and Financial Literacy (0.856), have Cronbach's Alpha values above 0.7. Therefore, all variables can be considered reliable, meaning the instruments used are consistent when applied under similar conditions or over time.

Table 4. Reliability Test Results

Variable	Cronbach's Alpha Value	Description
Green Behavioral	0.929	Reliable
Household Finance	0.851	Reliable
Eco Literacy	0.904	Reliable
Financial Literacy	0.856	Reliable

Source: Processed Data (2025)

Classical Assumption Test

Normality Test

The normality test aims to determine whether the research data is normally distributed or not (Ghozali, 2021). The normality test also aims to determine whether the regression model used is appropriate. A good regression model has a normal distribution or detects normality. In research, normality testing can be conducted using the Kolmogorov-Smirnov significance test for each variable. If the K-S significance value is greater than 0.05, the data is normally distributed; conversely, if the K-S significance value is less than 0.05, the data is not normally distributed.

The results of the normality test in Table 6 using the One-Sample Kolmogorov-Smirnov test show a significance value of 0.200, which is greater than 0.05 for Eco Literacy (Z1) and Financial Literacy (Z2). Therefore, it can be concluded that the residual data in this study is normally distributed, meaning the difference bet-

ween the values predicted by the model (expected values) and the actual values (observations) is randomly distributed and follows a normal distribution pattern.

Table 5. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		100
Normal Parameters[a,b]	Mean	0.0000000
	Std. Deviation	1.04805213
Most Extreme Differences	Absolute	0.058
	Positive	0.054
	Negative	-0.058
Test Statistic		0.058
Asymp. Sig. (2-tailed)		0.200[c,d]

Source: Processed Data (2025)

Multicollinearity Test

The multicollinearity test aims to test whether the regression model finds correlations between independent variables and moderation, because if there is a high correlation, the relationship between variables will be disrupted (Ghozali, 2021). There are two methods used: analysing the correlation matrix of the independent variables and examining the tolerance value or VIF (variance inflation factor) value. If the tolerance value is > 0.10 and the VIF value is < 10, then the data is considered free of multicollinearity, meaning the data is normal. Conversely, if the tolerance value is < 0.10 and the VIF value is > 10, it is declared to be not free from multicollinearity, meaning the data is not normal.

The results of the multicollinearity test in Table 6 show the Tolerance and Variance Inflation Factor (VIF) values. For the Tolerance value of the Green Behavioural variable (X1) of 0.178, it is greater than 0.10 with a VIF of 5.621; Eco Literacy (Z1) of 0.134, which is greater than 0.10 with a VIF of 7.455; and Financial Literacy (Z2) is 0.202, which is greater than 0.10 with a VIF of 4.947. Therefore, it can be concluded that a VIF value < 10 and a Tolerance greater than 0.10 indicate no significant multicollinearity between the independent variables.

Table 6. Multicollinearity Test

Coefficients[a]			
Model	**Tolerance**	**Collinearity Statistics**	
		VIF	
1	Green Behavioral	0.178	5.621
	Eco Literacy	0.134	7.455
	Financial Literacy	0.202	4.947
a. Dependent Variable: Household Finance			

Source: Processed Data (2025)

Heteroscedasticity Test

The heteroscedasticity test aims to determine whether there is unequal variance of residuals from one observation to another in the regression model (Ghozali, 2021). If the variance of residuals from one observation to another remains constant, it is called homoscedasticity, and if it differs, it is called heteroscedasticity. To determine whether heteroscedasticity is present in this regression model, the Glejser test can be used by examining its significance probability. If the significance value is > 0.05, it can be concluded that the regression model does not contain heteroscedasticity, and vice versa if the significance value is < 0.05.

Based on Table 7, which shows the results of the heteroscedasticity test using the Glejser test with the ABS Residual variable, it can be seen that the Green Behavioural (X1), Eco Literacy (Z2), and Financial Literacy (Z2) have significance values greater than 0.05, meaning there is no systematic error pattern or non-constant variance in the residuals, thus fulfilling the heteroskedasticity test.

Table 7. Heteroscedasticity Test

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**		
B		**Std. Error**	**Beta**		**t**	**Sig.**
1	(Constant)	2.900	0.524		5.531	0.000
	Green Behavioral	-.024	0.013	-0.390	-1.778	0.079
	Eco Literacy	-.022	0.025	-0.227	-.900	0.371
	Financial Literacy	.023	0.022	0.217	1.057	0.293

a. Dependent Variable: ABS_RES1

Source: Processed Data (2025)

DISCUSSION

Based on the results of multiple linear regression analysis and Moderated Regression Analysis (MRA), a summary of the hypothesis testing is presented in the following table to show the effect of each independent variable on Household Finance, as well as the moderating role of Eco Literacy and Financial Literacy.

Table 8. Research Hypothesis Test

Hypothesis		**Path Coefficients**	**t-value**	**Results**
Linear Regression Analysis				
Green Behavioral → Household Finance	H1	0.077	3.134	Support
Eco Literacy → Household Finance	H2	0.187	4.114	Support
Financial Literacy → Household Finance	H3	0.501	12.416	Support
Moderated Regression Analysis (MRA)				
Green Behavioral - Eco Literacy → Household Finance	H4	-0.013	-5.470	Unsupport
Green Behavioral - Financial Literacy → Household Finance	H5	-0.004	-2.200	Unsupport

Source: Processed Data (2025)

Green Behavioral Relationship to House-hold Finance

Based on the results of the questionnaire completed by respondents on green behavioral indicators, it shows that the highest average value is located in the indicator of reducing resource use which reflects respondents' awareness in managing energy efficiently.

From a theoretical perspective, the relationship between green behavioral and household finance can be explained through the Theory of Planned Behavior (TPB) (Purwanto & Budiyanto, 2022). This theory states that a person's behavior is influenced by attitudes, subjective norms, and perceptions of behavioral control. In this case, attitudes driven from respondents' awareness and habits in saving energy reflect a positive attitude towards green behavior, which is driven by an understanding of economic and environmental benefits. In addition, subjective norms through encouragement from family or social environments that support sustainable lifestyles also influence respondents' decisions to implement green behavioral. And through perceived behavioral control of the individual's ability to apply green behavior also plays a role in encouraging more efficient resource management. Here, housewives as the main managers of household finances and needs have great control in determining patterns of energy use and expenditure in everyday life. It is expected that with the understanding that reducing energy use can help save household costs, they are more motivated to implement green behavior consistently.

This research has similarities with a study conducted by Yin et al. (2024), which found that the implementation of green behavior in households provides direct benefits to daily finances through cost savings. This shows that households that use energy-efficient devices, such as LED lights and Energy Star labeled electronic devices, are able to reduce electricity expenditure by up to 20%. In addition, habits such as reducing single-use plastic consumption or using green transportation also help in reducing long-term costs. The research emphasizes that green habits at the household level have the potential to deliver significant positive economic impacts amidst rising energy prices and household needs.

The results of data analysis in Table 8 show that green behaviour has a positive and significant effect on household finances. This indicates that green behaviour, such as reducing resource use, waste management, green transportation, sustainable purchasing, tree planting and park conservation, environmental education and campaigns, energy conservation, participation in environmental programmes, use of hazardous materials, and advocacy and participation in environmental initiatives can improve household financial efficiency.

The Relationship between Eco Literacy and Household Finance

For the household finance variable, it shows that respondents who have the highest value on the indicator of consumption of goods or services tend to prioritize household spending on goods or services in the long term.

From a theoretical perspective, the relationship between eco literacy and household finance can be explained through the Theory of Planned Behavior (TPB) (Purwanto & Budiyanto, 2022). This theory states that a person's behavior is influenced by attitudes, subjective norms, and perceptions of behavioral control. In this case, a high level of eco literacy reflects a positive attitude towards environmentally friendly behavior, which can influence household financial decisions. Attitudes

are driven by an awareness of the importance of sustainability and the long-term impact of their consumption choices, such as choosing more energy efficient products or reducing waste to save costs in the household. In addition, subjective norms also play a role in shaping respondents' behavior regarding eco literacy and financial management. Supported by a good social environment such as from family and community can encourage individuals to be more concerned about sustainability practices, which in turn has an impact on wiser financial decisions. With positive social pressure, individuals are more motivated to apply the principles of eco literacy in their daily lives, including in managing household resources more efficiently and through perceived behavioral control of the individual's ability to implement sustainable behaviors, it will have an impact on household finances. Individuals with high understanding of eco literacy tend to be more confident in making decisions regarding responsible consumption and investment in more durable and energy-efficient products. This can help them reduce unnecessary spending, thus creating a balance between environmental sustainability and household financial stability.

This conclusion is in line with research by Whitmarsh et al. (2022), which explains that eco literacy increases critical awareness of consumption and waste choices, ultimately reducing the ecological footprint. Households with good eco literacy are better able to understand and implement energy-saving and resource conservation practices, thus supporting green economy goals at the micro level.

The results of data analysis in Table 8 show that eco-literacy has a positive and significant effect on household finances. This indicates that good environmental literacy enables individuals to understand the impact of sustainability on financial decisions. With eco literacy, households can make wise decisions, such as developing empathy for all forms of life, practising sustainability as a community action, making the invisible visible, anticipating unexpected impacts, and understanding the concept of the natural cycle of life.

Relationship between Financial Literacy and Household Finance

The financial literacy variable, the highest statement in respondents' answers refers to the indicator of making thorough preparations for retirement, this indicates that respondents tend to prepare for retirement needs.

In the Theory of Planned Behavior (TPB) (Purwanto & Budiyanto, 2022), states that financial behavior in individuals is influenced by a high level of financial literacy. This reflects that a positive attitude towards long-term financial planning, such as setting aside funds for retirement to ensure household financial stability. Usually this attitude is driven by an understanding of the importance of good financial management and awareness of the benefits of saving and investing for the future. In addition, subjective norms play a role in shaping respondents' financial decisions. Social environments, such as family, friends or community, can influence individuals to adopt more disciplined financial habits, including saving and planning for retirement. In the case of housewives, support from spouses and the surrounding environment can increase their motivation to manage their finances better, especially in terms of managing limited income and meeting long-term needs. And through the perception of behavioral control over the individual's ability to apply their abilities to financial management. In this theory, respondents who have a better understanding of financial management feel more confident in financial decisions, such as

budgeting, avoiding consumptive debt, and choosing investment instruments that suit their abilities. Thus, they are more able to control the financial condition of the household in a sustainable manner.

The results of this study are consistent with the findings of Yudhin & Widodo (2023), which states that financial literacy can assist individuals in dealing with financial risks and maximizing income. With a better understanding of finance, housewives can understand financial information and use it skillfully and confidently.

The results of data processing in table 8 show that financial literacy has a positive and significant effect on household finances because a housewife's understanding of the environment can influence household financial management. This indicates that understanding and financial management skills, such as understanding the value of an item, about the basics of investment, preparation for retirement, understanding the function of shopping, and being able to prioritize personal financial matters. Financial literacy also strengthens households' ability to support sustainable green behavior without compromising economic stability.

The Moderating Role of Eco Literacy on Green Behavioral towards Household Finance

Based on the results, the eco literacy variable shows an average value of 437.90. This finding reflects that most respondents, especially housewives in Semarang City, have sufficient awareness of environmental issues. The highest statement was given to the indicator of developing empathy towards all forms of life which illustrates respondents' awareness of pro-environmental attitudes with the statement *"I feel responsible for maintaining the balance of the ecosystem and protecting living things on earth"*. The majority of respondents have a D4/S1 educational background (42%) and an income of Rp 2,000,000-Rp 4,000,000 (36%), which shows a tendency to understand the concept of sustainability, but on the other hand also faces economic limitations in its application. This condition reinforces the assumption that high eco literacy does not necessarily directly encourage consistent environmentally friendly practices, because consumption decisions are also influenced by budget constraints. Therefore, there is a need for educational strategies and policy support that can integrate sustainability values into household financial practices in a realistic and directly useful way.

Moderation of eco literacy on green behavioral towards household finance can be explained by Theory of Planned Behavior (TPB) on three factors, namely attitude, subjective norm, and perceived behavioral control (Purwanto & Budiyanto, 2022). In this case, although eco literacy encourages an individual to implement environmentally friendly behavior, financial limitations can be an obstacle that reduces the positive influence of green behavior on household finances. A positive attitude towards green behavior is reflected in respondents' awareness of their responsibility in maintaining the balance of the ecosystem. However, in practice, financial limitations may make it difficult for them to adopt greener products and habits if these options are more expensive or require a larger initial investment. In other words, although respondents have a high understanding of eco literacy, economic factors can hinder the optimal implementation of green behavioral in household financial management.

In addition, subjective norms from the social environment, such as family and community encouragement, may influence an individual's decision to behave green. However, when there is great economic pressure, more pressing financial deci-

sions may be prioritized over sustainable decisions. This confirms that eco literacy weakens the relationship between green behavior and household finances, because although social norms support green behavior, financial constraints may limit its implementation. Perceived behavioral control also suggests that individuals with high eco literacy may understand the importance of green behavior, but if they feel they do not have enough control over their financial resources, then the influence of green behavioral on household finance becomes weaker. Thus, under conditions of economic constraints, eco literacy can act as a factor that weakens the positive impact of green behavioral on household financial well-being, as environmental awareness cannot always be translated into concrete actions if it is not supported by adequate financial conditions.

The results of the first model moderation regression test in Table 8 show that eco literacy is able to weaken the influence of green behavioral on household finances, so it can be concluded as a quasi moderator, namely the eco literacy variable can act as a moderating variable on green behavioral variables on household finances while acting as an independent variable. Thus, the role of eco literacy as a quasi moderator that weakens the influence of green behavioral on household finances can be explained by the assumption that although they are aware of the importance of environmentally friendly lifestyles, they also simplify the application of green behavioral in limited financial conditions. This makes them prefer more cost-effective consumption behavior over more environmentally friendly behavior.

The Moderating Role of Financial Literacy on Green Behavioral towards Household Finance

Based on the research results, the financial literacy variable has an average of 433.90. Respondents showed awareness in preparing for long-term needs, especially retirement funds, as indicated by the statement *"I actively set aside funds for retirement to ensure the future financial stability of the household"*. Financial literacy acts as a moderator in the relationship between green behavioral and household finances. The majority of respondents have a four-year degree (42%) and an income of IDR 2,000,000-IDR 4,000,000 (36%), which reflects the ability to understand the long-term benefits of green behavior, while still considering financial limitations. In this case, financial literacy allows respondents to prioritize household economic stability over full green behavioral implementation.

Moderation of financial literacy on green behavioral towards household finance can be explained by Theory of Planned Behavior (TPB) on three factors, namely attitude, subjective norms, and perceived behavioral control (Purwanto & Budiyanto, 2022). In this case, high financial literacy can change the way individuals balance green behavior and household financial management, thus weakening the direct impact of green behavior on financial well-being. Attitudes towards green behavior remain positive, but individuals with high financial literacy are more likely to consider costs and benefits in every decision. They may realize the long-term benefits of sustainable consumption, but if the initial cost is high, they will be more cautious in allocating funds. As a result, despite their environmental awareness, they prioritize more pressing financial needs. In addition, subjective norms, such as the influence of family or community, may encourage environmentally friendly behavior. However, individuals with high financial literacy are more likely to prioritize household economic stability over following social norms on sustainability. They focus more on the balance between spending and saving, which may reduce

their tendency to adopt higher-cost green behaviors. Perceived behavioral control also shows that individuals with high financial literacy tend to have greater awareness of their financial constraints. Although they have a good understanding of the importance of sustainability, financial constraints may make them more selective in implementing green behaviors. Thus, financial literacy acts as a factor that weakens the relationship between green behavior and household finances, as individuals are more likely to prioritize financial stability over sustainable decisions that may require greater costs.

The results of the second model moderation regression test in table 8 show that financial literacy is able to weaken the effect of green behavioral on household finances. So it can be concluded that financial literacy acts as a quasi moderator, which is a variable that not only functions as a moderating variable on the green behavioral variable on household finances, but also acts as an independent variable on household finances. However, the moderation of financial literacy that weakens the effect of green behavior suggests that in situations of financial constraints, households prioritize immediate needs over the adoption of green behavior. This situation emphasizes the importance of sustainability in decision making, especially if the benefits are not visible in the short term. Thus, financial literacy helps households balance between financial needs and sustainable decisions.

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the results of the discussion, it can be concluded that Green behavioral has a positive and significant effect on household finances in Semarang City, Eco literacy has a positive and significant effect on household finances in Semarang City, Financial literacy has a positive and significant effect on household finances in Semarang City, Eco Literacy weakens green behavioral on household finance which shows that eco literacy is able to weaken the relationship between green behavioral on household finance in Semarang City, Financial literacy weakens green behavioral on household finance which shows that financial literacy is able to weaken the relationship between green behavioral on household finance in Semarang City. Which means both eco literacy and financial literacy weaken the relationship between green behavioral and household finance, indicating that external or internal factors, such as financial limitations or implementation challenges, may affect the effectiveness of the relationship.

Recommendation

Based on the research findings, the following suggestions can be made: a comprehensive education program is needed to improve eco literacy and financial literacy of the community, especially housewives, to support more effective and sustainable household financial management, the government and related parties should also provide incentives and easy access to eco-friendly products to encourage the adoption of green behavior in Semarang City, and in addition, it is important to provide practical guidance on integrating environmental and financial literacy into daily decisions, in order to maximize the positive impact on financial well-being.

The findings of this study have important implications, namely that housewives in the city of Semarang have a high level of awareness of eco literacy and financial literacy. However, financial constraints remain the main obstacle to the optimal implementation of green behaviour. It is hoped that with the increasing eco literacy and financial literacy of housewives in Se-

marang City, they can manage their finances better by creating a household budget that includes basic needs, savings, and investments. Additionally, the government needs to design policies that better support the adoption of green behaviour among households in Semarang City, particularly for low- to middle-income groups, through subsidies for environmentally friendly products, incentive programmes for households adopting sustainable practices (such as the use of renewable energy or better waste management), as well as more intensive educational campaigns about the economic benefits of green behaviour can help increase the affordability and adoption of sustainable practices.

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