

RESEARCH ARTICLE



Role of Demographic Factors in Shaping Sustainable Lifestyles: An Empirical Study in Vietnam

Phuong Mai Nguyen^{1,*} , Minh Thanh Chu¹ and Minh Duong Nguyen¹

¹International School, Vietnam National University Hanoi, Vietnam

Abstract: In recent years, sustainable lifestyles (SLS) has emerged as a topic that addresses the trend of sustainable development globally. However, most developing and emerging economies have not put adequate effort to promote SLS. Vietnam is not an exception. There is not much evidence of how Vietnamese people are responding to the urgent call of actions toward sustainable development. In such a context, this paper explores how demographic factors shape the SLS in Vietnam. An online survey was implemented to gather primary data from Vietnamese people in 4 months. Finally, we received 385 valid responses. ANOVA tests were employed to check the proposed hypotheses about the differences in SLS regarding age, gender, and income. Research results revealed that age, gender, and income are not associated with the SLS of Vietnamese people. Our findings imply that the Vietnamese government should play a proactive role in promoting SLS. Some recommendations were proposed, including investment in public transportation, sustainable product design, zero-waste policies, and the like.

Keywords: sustainable development, sustainable lifestyles, demographic factors, Vietnam

1. Introduction

Nowadays, sustainable lifestyles (SLS) has become the trend of sustainable development globally. It is observed in these recent years that the Earth's ecosystems are being pushed to their breaking point. Biodiversity is being lost, lands are degrading, and our oceans are acidifying. Moreover, the symptoms of climate change are becoming increasingly severe and frequent. There is a large scientific consensus on the prospect of ecological disaster on planet earth, despite vigorous extensively published denial by fossil fuel-funded and conservative political support, especially in the USA to the contrary [1]. Therefore, pertaining to SLS is no longer an option but a requirement for our survival and future generations.

Governments and civil society organizations have put much emphasis on raising awareness of individuals to live sustainably. In 2011, a framework for SLS was developed by the UK government's Department for Environment, Food, and Rural Affairs. This framework aimed to analyze the optimal behaviors of individuals in their everyday lives. Under this framework, individuals are often advised to engage in a variety of actions to assist the environment, like recycling waste and reducing personal car usage, as well as limit the use of energy or water at home [2]. Subsequently, there has been a progression in sustainability-oriented lifestyle habits [3].

The SLS tendency is becoming increasingly popular in Western countries and some Asian ones (i.e., India, Indonesia, Hong Kong, the Philippines, and China). It is revealed that the majority of SLS

research has been place in wealthy countries. According to a study conducted by Shafqat et al. [4] in the fashion business, minimalism is a preferred choice for individuals seeking consumer well-being and life pleasure. This approach involves prioritizing what is most important in life and directing one's efforts accordingly. In addition, Axon et al. [5] examined the modifications in SLS in Connecticut among the COVID-19 pandemic. Based on semi-structured interviews with 20 participants, the authors concluded that individual sustainability engagement varied as a result of lockdowns and efforts to mitigate the pandemic. Participants changed their nutritional, mobility, energy, and food consumption patterns. In a similar vein, Huang et al. [6] examined the carbon emissions associated with the consumption patterns of households in 11 prominent urban regions in Japan. These authors discovered that transportation activities exhibit the most significant geographical disparity in carbon footprints.

In transition nations, there has been insufficient study on SLS. Furthermore, few studies have focused on factors determining consumer sustainable consumption behavior [7, 8], particularly in the context of consumers' lifestyles. For example, Akhtar [9] discussed and clarified the critical components of an SLS, which are responsible consumption, reduced waste output, energy efficiency, and water conservation. He also confirmed that SLS is a path toward environmental sustainability and sustainable development.

It is observed that previous studies in other developed countries and emerging ones have investigated the SLS behaviors in some different context, but the findings are controversial. Moreover, these previous studies mainly use qualitative methods.

In Vietnam, sustainable development is gaining traction across a wide range of societal stakeholders. In particular, the government is showing greater concern for sustainable growth recently. Decision

*Corresponding author: Phuong Mai Nguyen, International School, Vietnam National University Hanoi, Vietnam. Email: mainp@vnu.edu.vn

No. 1658, issued by the Vietnamese government, introduces the national green growth strategy for the period of 2021–2030. This strategy also aims at the vision of green growth until 2050 [10]. This growth strategy emphasizes the importance of businesses and consumers as primary actors in accomplishing sustainable development goals. However, few researchers have looked at SLS in Vietnam from the consumer's point of view, including Le [11], de Koning et al. [12], Duy Luan [13], Nguyet et al. [14], Nguyen et al. [15], Thong et al. [16], and Tran [17].

Given the reality that SLS is still an emerging concept in Vietnam, this paper explores whether Vietnamese people of different demographic groups have the same response to sustainability issues or not. In such a context, there is a quest for further research on demographic factors and their influences on SLS in Vietnam. We chose Vietnam to study due to the fact that this country is among the top 10 countries that are most severely affected by global climate change [18]. In recent years, it has been shown that climate change in Vietnam is even happening faster than expected. Thus, this study aims to explore how factors, such as age, gender, and income, are associated with the choices of Vietnamese people to live sustainably. We chose these three demographic factors, which are age, gender, and income, because previous studies in other contexts have confirmed the impact of these demographic factors on sustainable consumption or green behaviors. However, this issue has not yet been adequately examined in the Vietnamese context. In this regard, our initial findings carry implications for public and private sectors and consumers to promote SLS in Vietnam toward a better world.

2. Literature Review and Hypotheses

2.1. SLS concept

The concept of lifestyle can be understood as the patterns of consumption and usage (of material and symbolic goods) associated with various groups and classes in a society. In addition, lifestyle involves activities including domestic practices and paid work activity [19]. Lifestyles may also be viewed as a focal point of a group or individual identity as the individual expresses him or herself via the meaningful selection of things or patterns of behavior as symbolic codes from a variety of options [20–22]. However, the analysis of lifestyles must examine the extent to which lifestyle choice constitutes a free and creative choice [20].

In recent discussions regarding sustainable development, the concept of lifestyle has frequently been brought up in relation to topics like consumerism, greenhouse emissions, security, and risk. SLS refers to acts that are undertaken with the goal of conserving the ecological and social resources of our planet [23]. Therefore, SLS was developed by combining the definitions of “sustainability” and “lifestyles.”

Lifestyles are defined as behavior patterns that set people apart from one another to satiate both personal and social wants and desires [24]. The definition of sustainability, on the other hand, is understood as a way of living that satisfies current demands without endangering those of future generations [25]. SLS is thus described as behavior patterns people employ to identify with and set themselves apart from other people. These behaviors reduce the use of natural resources, provide basic requirements, and improve quality of life. It is inevitable that SLS is made up of sustainable behaviors that define a person's long-term way of life.

Long-term patterns of people's behaviors, passions, and beliefs that promote environmental, social, and economic sustainability

serve as the cornerstones of SLS. These two authors insisted that SLS is made up of a variety of environmental-related behaviors, including the use of water and energy, waste management, housing, organic food purchasing and consumption, transportation, and leisure activities.

Consumption is the most frequently discussed aspect of lifestyle and sustainable development [26–28]. This has an intriguing aspect in that, although ecologically concerned individuals consume a lot, they choose extremely carefully [29, 30]. SLS is based on sustainable life patterns in addition to patterns of consumption and production. Sustainable consumption includes buying goods and services, using them, and discarding them. In contrast, SLS covers a wider range of pursuits, including but not limited to material consumption, social connection, leisure pursuits, sports, and education [22]. SLS is a term used to describe behaviors and decisions influenced by various factors that aim to reduce the depletion of natural resources, enhance the overall quality of life, and ensure the well-being of future generations [31]. Thus, SLS encompasses unique engagements with the surroundings, assets, and individuals, alongside diverse patterns of consumption [32]. SLS, as a concept, centers around comprehending behaviors or patterns within the context of individuals' lifestyle [31].

2.2. Impact of demographic factors on SLS and hypotheses

SLS is influenced by a complex and dynamic collection of forces that reflect the individual circumstances and external socio-technical and economic conditions. Some individual factors include income, identity, taste, and values. Meanwhile, the external factors are culture, social context, peer pressures, and the like. There are also physical or natural boundaries, which promote or restrict choices of lifestyles. Moreover, consumer decision-making studies in a variety of sectors reveal that cognitive abilities, psychological, social, economic, regulatory, and institutional frameworks all play a role, emphasizing that the driving reasons underlying lifestyles are interconnected and often conflicting [33].

Lifestyle factors can be represented in overlapping layers [33]. People's needs and desires are fundamental. These demands and desires are influenced by an individual's situation as well as the socio-technical environment. Finally, in order to remain within sustainable bounds, needs and desires can only be met within natural or ecosystem constraints.

Lifestyle is affected by a range of changing elements from the micro to the macro level. In essence, how we fulfill our needs and desires (our lifestyles) is framed by factors ranging from our circumstances to the enablers and restraints of more extensive exterior socio-technical settings and finally to physical and natural bounds. According to Balaceanu et al. [2], there is a separation between behavioral and situational factors.

Regarding SLS, in this study, we selected two daily behaviors of individuals. They are (1) water and energy use and (2) mobility. We aimed to test the role of demographic factors in shaping SLS. Thus, we chose age, gender, and income as the main demographic variables.

Age is one of the personal factors considered in many studies about pro-environmental behaviors. For example, Peano et al. [34] insisted that young people between the ages of 21 and 30 are

clustered as “environmentally sensitive” and “local ecosystem preservation” groups.

Thus, in the present study, we assumed that people at different age groups might have dissimilar sustainable behaviors. Thus, two hypotheses were raised as follows:

H1a: There is a difference in water and energy use (WE) between age groups.

H1b: There is a difference in mobility (MO) between age groups.

Furthermore, gender has also been addressed in some studies on pro-social behaviors such as organic food purchases [35, 36], eco-label or green products [37, 38], and sustainable mobility [39, 40]. Similarly, we also think that gender might affect the sustainable behaviors of Vietnamese people. Thus, the following hypotheses were initiated:

H2a: There is a difference in water and energy use (WE) between males and females.

H2b: There is a difference in mobility (MO) between males and females.

Income is one of the most powerful lifestyle indicators. More disposable income means greater affordability of goods and services and easier access to more credit, which can continuously encourage consumerism [41, 42]. In addition, there is compounded social pressure to maintain lifestyle levels once adopted. Therefore, in this study, we hypothesized that income level might lead to differences in the sustainable behaviors of Vietnamese people. Two hypotheses were formulated as follows:

H3a: There is a difference in water and energy use (WE) between income groups.

H3b: There is a difference in mobility (MO) between income groups.

3. Research Methodology

3.1. Measurements

Regarding SLS, in this study, we selected two daily sustainable behaviors of individuals. They are (1) water and energy use (5 items) and (2) sustainable mobility (4 items). These two measurements were adapted from the New Ecological Paradigm scale and previous studies by Woodward [20], Thøgersen [21], Haq et al. [43], and Mozos-Blanco et al. [39]. The questionnaire required respondents to assess the frequency with which they engage in sustainable activities, using a scale ranging from 1 (never) to 5 (always). The Appendix contains comprehensive information on all measuring scales utilized in this investigation.

In addition, demographic factors, including age, gender, and income, were also included in our research framework. We treated these factors as grouping variables to explore any differences among groups of people who are classified by these factors.

Regarding age groups, we surveyed people 18 years old and above. We classified into two groups: young people (18–30 years old) and not-young people (over 30 years old). Our age group classification is adapted from Azamussan and Shanmugam [44].

For monthly income level, we classified into two groups, including low-income level (below 5 million VND per month) and middle-income and higher level (over 5 million VND per month). This classification is based on the average income level in Vietnam announced by the Ministry of Labor – Invalids and Social Affairs.

3.2. Participants

We chose respondents for our survey using the convenient and snowball sampling methods.

Firstly, we use our social network to choose 20 potential respondents on a random basis. We sent them a Google Form questionnaire to these early advocates. Then, we encouraged them to distribute our questionnaire to others on their social networks. We received 385 valid responses during 4 months. The characteristics of our sample are summarized in Table 1.

Table 1 shows that over 70% of our respondents are young people and females. The monthly income is mostly below 225 USD.

Table 1
Demographic profile of respondents (n = 385)

Characteristic	Frequency	Percent (%)
Age		
18–30 years old	284	73.8
Over 31 years old	101	26.2
Gender		
Male	88	22.9
Female	297	77.1
Monthly income		
Below 5 million VND (\$225)	194	50.4
Over 5 VND (from \$225 above)	191	49.6

3.3. Data analysis methods

SPSS software was used to check the reliability and validity of the measurements. To test the influence of demographic factors on SLS, we employed the one-way ANOVA test in SPSS software with three grouping variables, i.e., age, gender, and income.

4. Results and Discussions

4.1. Preliminary analysis

Cronbach’s alpha and factor loadings are two main criteria that we used to check the reliability of measurements in SPSS. Concurrently, the accuracy of the measurements was assessed using the variance inflation factor (VIF) and average variance extracted (AVE). The results are displayed in Table 2.

Table 2
Reliability, validity, and convergence of the measurements

Constructs	Items	Factor loading	VIF	Cronbach’s alpha	CR	AVE
Water and energy (WE)	WE1	0.769	1.552	0.728	0.830	0.550
	WE2	0.736	1.530			
	WE4	0.783	1.529			
	WE5	0.675	1.403			
Mobility (MO)	MO1	0.819	2.317	0.843	0.894	0.678
	MO2	0.832	1.681			
	MO3	0.860	2.583			
	MO4	0.782	1.619			

Note: CR = composite reliability, AVE = average variance extracted
Recommended value: Cronbach’s alpha ≥ 0.7 ; outer loadings ≥ 0.5 ;
VIF < 5 ; CR ≥ 0.7 ; AVE ≥ 0.5

As shown in Table 2, most item factor loadings are greater than 0.5. Only one item, WE3, with loadings less than 0.5, was eliminated from the measurement scale. Cronbach's alpha values for the two measurement scales were 0.728 and 0.843, respectively. Furthermore, all composite reliability values were greater than 0.8, indicating good internal consistency reliability.

Moreover, all items in both assessments possess VIF values ranging from 1 to 3, which is below the suggested threshold of 5. Consequently, the issue of multi-collinearity does not occur across all measurement scales. Furthermore, the AVE values were above 0.5, signifying the successful attainment of convergent validity.

4.2. Hypothesis testing

In the present study, we want to explore if the demographic factors affect the SLS of Vietnamese people. Thus, we employed the one-way ANOVA test to check the difference of SLS using age, gender, and income as grouping variables. The one-way ANOVA test was run for water and energy use (WE) and sustainable mobility (MO) separately.

4.2.1. Age and SLS

In previous studies, age has been addressed in explaining pro-environmental behaviors. In this study, age was used as a grouping variable in the one-way ANOVA test as we want to know if people of different age groups might practice the same sustainable behaviors. We ran the one-way ANOVA test for WE and MO independently, and then the results are presented in some tables below.

Table 3 shows that for WE, mean values of two age groups are almost the same. However, for MO, the mean values show more difference between the two age groups. To further check the difference between age groups in terms of SLS, we use Levene test results to check the homogeneity of variances (see Table 4).

Table 3
Descriptive of sustainable lifestyles between age groups

					95% confidence interval for mean	
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound
<i>Water and energy use (WE)</i>						
1 (18–30 years old)	284	4.30	0.520	0.030	−0.113	0.147
2 (over 31 years old)	101	4.29	0.697	0.069	−0.133	0.167
Total	385	4.30	0.571	0.027	0.517	0.623
<i>Mobility (MO)</i>						
1 (18–30 years old)	284	4.44	0.562	0.033	−0.049	0.224
2 (over 31 years old)	101	4.35	0.699	0.069	−0.065	0.239
Total	385	4.42	0.601	0.024	0.551	0.649

It is revealed in Table 4 that for WE and MO, the significance value is 0.002 and 0.007, respectively (much smaller than 0.05). Consequently, we must use Welch test result to evaluate the difference of means between groups.

As shown in Table 5, the significance values for WE (0.824) and MO (0.260) are higher than 0.05. Consequently, we

Table 4
Levene test results of sustainable lifestyles between age groups

Test of homogeneity of variances			
<i>Water and energy use (WE)</i>			
Levene statistic	df1	df2	Sig.
9.566	1	383	0.002
<i>Mobility (MO)</i>			
7.323	1	383	0.007

Table 5
Robust tests of equality of means for WE and MO between age groups

		Statistic ^a	df1	df2	Sig.
WE	Welch	0.050	1	141.600	0.824
MO	Welch	1.277	1	148.551	0.260

Note: ^aAsymptotically *F* distributed

concluded that there is no difference between two age groups in terms of WE and MO. Hypotheses **H1a** and **H1b** were rejected.

4.2.2. Gender and SLS

Using gender as a grouping variable, we ran the one-way ANOVA test for two variables WE and MO. Results are shown in Tables 6, 7, and 8.

Table 6
Descriptive of sustainable lifestyles between male and female

					95% confidence interval for mean	
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound
<i>Water and energy use (WE)</i>						
Male	88	4.37	0.560	0.059	4.256	4.493
Female	297	4.28	0.573	0.033	4.218	4.349
Total	385	4.30	0.571	0.029	4.247	4.361
<i>Mobility (MO)</i>						
Male	88	4.46	0.594	0.063	4.342	4.594
Female	297	4.40	0.604	0.035	4.337	4.475
Total	385	4.42	0.601	0.030	4.360	4.481

Table 7
Levene test results of sustainable lifestyle between male and female

Test of homogeneity of variances			
<i>Water and energy use (WE)</i>			
Levene statistic	df1	df2	Sig.
0.188	1	383	0.665
<i>Mobility (MO)</i>			
0.393	1	383	0.531

It is clear from Table 6 that males have a higher mean value than females in terms of water and energy use and mobility. Then, we used the result of the Levene test to check the robustness of the ANOVA test (see Table 7).

Table 8

One-way ANOVA test result of sustainable lifestyle by gender

ANOVA					
	Sum of squares	df	Mean square	F	Sig.
<i>Water and energy use (WE)</i>					
Between groups	0.566	1	0.566	1.738	0.188
Within groups	124.788	383	0.326		
Total	125.355	384			
<i>Mobility (MO)</i>					
Between groups	0.263	1	0.263	0.724	0.395
Within groups	138.821	383	0.362		
Total	139.084	384			

As shown in Table 7, the significance value of the Levene statistic based on a comparison of medians is 0.665 for WE and 0.531 for MO. This is not a significant result, which means the requirement of homogeneity of variance has been met, and the ANOVA test can be considered to be robust. Then, we look at the result of the ANOVA test (F test) in Table 8.

The significance value of F test in Table 9 is 0.188 and 0.395 (higher than 0.05) for WE and MO, respectively. These figures indicate that we do not reach a significant result. Thus, there is no difference between males and females regarding SLS. Hypotheses H2a and H2b were rejected.

Table 9

Levene test results of sustainable lifestyle between income groups

Test of homogeneity of variances			
<i>Water and energy use (WE)</i>			
Levene statistic	df1	df2	Sig.
1.643	1	383	0.201
<i>Mobility (MO)</i>			
1.330	1	383	0.250

Table 10

Descriptives of sustainable lifestyle among income groups

					95% confidence interval for mean	
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound
<i>Water and energy use (WE)</i>						
1 (below 5 million VND)	194	4.28	0.531	0.038	4.210	4.361
2 (over 5 million VND)	191					
Total	385	4.30	0.571	0.029	4.247	4.361
<i>Mobility (MO)</i>						
1 (below 5 million VND)	194	4.41	0.581	0.041	4.333	4.498
2 (over 5 million VND)	191					
Total	385	4.42	0.601	0.030	4.360	4.481

Table 11

One-way ANOVA test result of WE and MO between income groups

ANOVA					
	Sum of squares	df	Mean square	F	Sig.
<i>Water and energy use (WE)</i>					
Between groups	0.133	1	0.133	0.408	0.524
Within groups	125.221	383			
Total	125.355	384			
<i>Mobility (MO)</i>					
Between groups	0.008	1	0.008	0.022	0.882
Within groups	139.076	383	0.363		
Total	139.084	384			

4.2.3. Income and SLS

Using income as a grouping variable, we ran the one-way ANOVA test for two variables WE and MO. Results are shown in Tables 9, 10, and 11.

In Table 9, we can see that the significance value of WE and MO is 0.201 and 0.250, respectively (higher than 0.05), meaning that the variances are not different between groups. Then, we use the F test to check the equality of means. Table 11 shows the F test results for WE and MO in detail.

As shown in Table 11, the significance values for WE and MO are higher than 0.05. Consequently, we concluded that there is no difference in SLS between two income groups. Hypotheses H3a and H3b were rejected.

5. Discussions

It is found in this study that there is no relationship between demographic factors and the SLS of Vietnamese people. We did not find a statistically significant difference among males and female in our sample. According to the Sustainable Development Report in 2017 by Nielsen¹, Vietnamese consumers are the most oriented toward sustainable society and development in Southeast Asia. It is observed that Vietnamese males and females have the equal access to information and government policies of sustainable development. As a result, their awareness has been raising and they are not different in their SLS behaviors. Our finding contradicts the findings from some previous studies on sustainable mobility (i.e., adopting electronic vehicles or car-sharing, using bicycles, etc.) and energy-saving behaviors. For example, Gallo and Marinelli [40] confirmed that gender is an essential factor influencing the intention to adopt an electronic vehicle. Similarly, Mozos-Blanco et al. [39] found that urban women are more concerned about environmentally friendly mobility and use fewer cars than men.

In addition, income was not associated with the differences in the SLS of Vietnamese people. Our finding is not the same as other studies that address income level in explaining pro-environmental behaviors. For instance, Papagiannakis et al. [45], when surveying 853 Greek people, found that low-income individuals tend to choose sustainable mobility choices such as using public transport, walking, or cycling for optional trips like shopping and entertainment. Regarding the influence of income on water and energy-saving behaviors, some studies show that high-income people tend to choose eco-label electronic devices [46, 47]. The finding of our study about income

¹2016–2017 Materiality Assessment: Updated responsibility & sustainability non-financial materiality assessment highlights Nielsen's responsibility to its stakeholders. <https://www.nielsen.com/about-us/responsibility-and-sustainability/esg-assessment/2016-2017/>

and SLS might be explained in the sample distribution with half of the respondents have monthly income lower than 5 million people. We classify respondents into only two income groups. Thus, we cannot look into details of the different sustainable behaviors between the rich and the poor people in Vietnam.

Furthermore, it is indicated in our present study that different age groups are not different in terms of SLS. Our finding is not in line with the study of Wang et al. [47]. The indifference in SLS between the young and not-young people in our study can be explained by the fact that the young generation in Vietnam is paying as much attention to sustainable development as the old generation. Thanks to the rapid growth of social media channels and broadcasting, Vietnamese people of all ages are accessible to plenty of information about sustainable development. Therefore, they are motivated to practice SLS and there is no significant difference in their SLS.

6. Implications, Limitations, and Conclusion

6.1. Theoretical and practical implications

In terms of theory, the present study provides the evidence of the role of demographic factors in shaping the SLS of citizens in an emerging country context. Unlike previous studies that confirmed the differences in sustainable behaviors in developed countries, our study revealed the contradictory results. Thus, we shed light on the issue of SLS in the emerging country contexts, which might attract further in-depth studies.

Regarding the practical contribution, our study provides some implications for policymakers in Vietnam to promote SLS. Examining SLS allows us to understand better the impact of our daily choices and habits on the environment. It is important to realize that every product we consume, every mode of transport we use, and every piece of waste we generate have an environmental cost. By understanding this, we can make more informed decisions that lower our ecological footprint. According to the Footprint Factbook Vietnam 2009, our average Ecological Footprint per person is 1.3 gha, smaller than the world average footprint of 2 gha [48]. Thus, it is essential for Vietnamese people to be aware of the fact and change their actions toward sustainable development. Furthermore, SLS is also considered a powerful strategy for addressing many of the world's most pressing problems, from climate change to health, financial concerns, and beyond. It challenges the prevailing societal narrative of consumerism and endless growth, providing an alternative vision for a future where humanity lives in harmony with the Earth's finite resources. It is a critical step toward transitioning to a more sustainable, equitable, and resilient world.

Our findings suggest that the Vietnamese government should play a proactive role in promoting SLS. For example, Vietnam is a very densely populated country, particularly in big cities. Thus, the government should invest heavily in public transportation systems to reduce the need for individual car ownership and promote carpooling and biking. Moreover, the government should encourage green infrastructure like green roofs, rain gardens, and permeable pavements designed to manage stormwater, reduce the heat island effect, and improve urban biodiversity. The abovementioned measures require strong political will, public support, and international cooperation. However, they are necessary to transition to a more SLS and combat climate change.

6.2. Limitations and conclusion

The free-market approach to economic and social development in the 20th century has extensively utilized the Earth's resources, surpassing

its stable limits and thus jeopardizing the sustainable development of future generations [21]. Signals of environmental pollution and degradation have been recognized more clearly in these two decades. In such a context, sustainability is becoming a buzzword in more and more countries worldwide. Governments and international agencies have started to develop action plans to deal with these global threats for sustainable development. People around the world are now being more exposed to fundamental concepts such as sustainable consumption and production, green growth, carbon footprint, and the like. In this regard, it is critical to understand the drivers of individuals' lifestyles and direct them toward sustainable development. Therefore, our present study aims to explore demographic factors affecting individuals' SLS in a new research context of an emerging country, Vietnam.

Our study has several limitations. Firstly, the small sample size limits the generalization of our study for the whole Vietnamese population. Secondly, employing a convenient sample procedure could introduce bias when interpreting the research findings. Thirdly, this study focuses only on demographic factors. Other factors explaining SLS have not yet been considered. To address the aforementioned limitations of this study, we recommend that future research endeavors focus on augmenting the sample size and research model by incorporating additional factors. For instance, the decision-making process of SLS could be influenced by personal attitude, subjective and personal norms, as well as several surrounding circumstances. Hence, future investigations could focus on examining that particular element and constructing an all-encompassing framework to assess the influence of these factors on SLS. Furthermore, future research might also address the cross-country analysis to explore factors affecting SLS in various contexts.

Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

Data Availability Statement

Data are available on request from the corresponding author upon reasonable request.

Author Contribution Statement

Phuong Mai Nguyen: Conceptualization, Methodology, Software, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Supervision, Project administration. **Minh Thanh Chu:** Validation, Investigation, Writing – original draft. **Minh Duong Nguyen:** Investigation, Visualization.

References

- [1] Case, M. J., Johnson, B. G., Bartowitz, K. J., & Hudiburg, T. W. (2021). Forests of the future: Climate change impacts and implications for carbon storage in the Pacific Northwest, USA. *Forest Ecology and Management*, 482, 118886. <https://doi.org/10.1016/j.foreco.2020.118886>
- [2] Balaceanu, C. T., Zaharia, D. L., Gruiescu, M., Constantinescu, M., & Deák, G. (2020). Sustainable measures in environmental

- protection through green products. *International Journal of Conservation Science*, 11(4), 1071–1082.
- [3] Böhme, J., Walsh, Z., & Wamsler, C. (2022). Sustainable lifestyles: Towards a relational approach. *Sustainability Science*, 17(5), 2063–2076. <https://doi.org/10.1007/s11625-022-01117-y>
- [4] Shafqat, T., Ishaq, M. I., & Ahmed, A. (2023). Fashion consumption using minimalism: Exploring the relationship of consumer well-being and social connectedness. *Journal of Retailing and Consumer Services*, 71, 103215. <https://doi.org/10.1016/j.jretconser.2022.103215>
- [5] Axon, S., Lent, T., & Njoku, A. (2023). Shifting sustainable lifestyle practices and behaviour during times of pandemic disruptive change: Implications for on-going socio-technical transitions. *Energy Research & Social Science*, 102, 103188. <https://doi.org/10.1016/j.erss.2023.103188>
- [6] Huang, L., Long, Y., Chen, J., & Yoshida, Y. (2023). Sustainable lifestyle: Urban household carbon footprint accounting and policy implications for lifestyle-based decarbonization. *Energy Policy*, 181, 113696. <https://doi.org/10.1016/j.enpol.2023.113696>
- [7] Joshi, Y., & Rahman, Z. (2019). Consumers' sustainable purchase behaviour: Modeling the impact of psychological factors. *Ecological Economics*, 159, 235–243. <https://doi.org/10.1016/j.ecolecon.2019.01.025>
- [8] Moise, M. S., Gil-Saura, I., & Ruiz Molina, M. E. (2021). The importance of green practices for hotel guests: Does gender matter? *Economic Research-Ekonomska istraživanja*, 34(1), 3508–3529. <https://doi.org/10.1080/1331677X.2021.1875863>
- [9] Akhtar, S. (2023). Sustainable lifestyle: A path towards environmental sustainability and sustainable development. *Management Journal for Advanced Research*, 3(4), 50–53. <https://doi.org/10.54741/mjar.3.4.8>
- [10] Tran, C. C., & Nguyen, G. T. H. (2023). The road to circular economy in Vietnam: The policy review of Vietnam green growth strategy. In *Contemporary Economic Issues in Asian Countries: Proceeding of CEIAC 2022*, 2, 263–280. https://doi.org/10.1007/978-981-99-0490-7_16
- [11] Le, L. C. (2022). Traditional concepts on “sustainability” in Vietnamese culture and its impacts on forming modern values of sustainable development. In *Global Changes and Sustainable Development in Asian Emerging Market Economies: Proceedings of EDESUS 2019*, 2, 35–55. https://doi.org/10.1007/978-3-030-81443-4_3
- [12] de Koning, J. I. J. C., Ta, T. H., Crul, M. R., Wever, R., & Brezet, J. C. (2016). GetGreen Vietnam: Towards more sustainable behaviour among the urban middle class. *Journal of Cleaner Production*, 134, 178–190. <https://doi.org/10.1016/j.jclepro.2016.01.063>
- [13] Duy Luan, T. (2014). Living in “new urban areas”: Towards sustainable urban communities in Hanoi, Vietnam. *WIT Transactions on Ecology and the Environment*, 181, 333–344. <http://doi.org/10.2495/EID140291>
- [14] Nguyet, D. T. A., Huyen, D. T., Tam, H. T., Thuy, B. T. T., & Thuy, N. T. (2011). Vietnamese youth in the paradox of transition: How concerns and expectations might inspire sustainable practices. In United Nations Environment Programme (Ed.), *Visions for change country papers* (pp. 106–112). United Nations Environment Programme.
- [15] Nguyen, T. N., Lobo, A., & Nguyen, B. K. (2018). Young consumers' green purchase behaviour in an emerging market. *Journal of Strategic Marketing*, 26(7), 583–600. <https://doi.org/10.1080/0965254X.2017.1318946>
- [16] Thong, N. T., Nguyen, D. H., Bich, P. T. N., & Huong, L. T. M. (2017). Sustainable consumption and production in Vietnam. In P. Schroeder, K. Anggraeni, S. Sartori, & U. Weber. (Eds.), *Sustainable Asia: Supporting the transition to sustainable consumption and production in Asian developing countries*, (pp. 327–356). World Scientific Press. https://doi.org/10.1142/9789814730914_0013
- [17] Tran, T. H. (2014). *Sustainable patterns of living based on an investigation of footprint in Hanoi-Vietnam*. PhD Thesis, Te Herenga Waka—Victoria University of Wellington.
- [18] Prakash, A. (2018). Boiling point. *Finance & Development*, 55(3), 22–26. <https://doi.org/10.5089/9781484368800.022>
- [19] Veal, A. J. (1993). The concept of lifestyle: A review. *Leisure Studies*, 12(4), 233–252. <https://doi.org/10.1080/02614369300390231>
- [20] Woodward, I. (2023). Consumption and lifestyles. In J. Germov, & M. Poole (Eds.), *Public sociology: An introduction to Australian society* (5th ed., pp. 171–188). Routledge. <https://doi.org/10.4324/9781003193791-10>
- [21] Thøgersen, J. (2023). A cognitive approach to sustainable lifestyles. In B. Gatersleben, & N. Murtagh (Eds.), *Handbook on pro-environmental behaviour change* (pp. 404–421). Edward Elgar Publishing. <https://doi.org/10.4337/9781800882133.00037>
- [22] Gadeikienė, A., Šalčiuvienė, L., Banytė, J., Dovalienė, A., Kavaliauskas, M., & Piligrimienė, Ž. (2021). Emerging consumer healthy lifestyles in Lithuania. *Sustainability*, 13(18), 10056. <https://doi.org/10.3390/su131810056>
- [23] Hunecke, M. (2022). Psychological resources for sustainable lifestyles. In M. Hunecke (Ed.), *Psychology of sustainability: From sustainability marketing to social-ecological transformation* (pp. 47–114). Springer Nature. https://doi.org/10.1007/978-3-031-16752-2_3
- [24] Elf, P., Gatersleben, B., & Christie, I. (2019). Facilitating positive spillover effects: New insights from a mixed-methods approach exploring factors enabling people to live more sustainable lifestyles. *Frontiers in Psychology*, 9, 2699. <https://doi.org/10.3389/fpsyg.2018.02699>
- [25] Berrone, P., Rousseau, H. E., Ricart, J. E., Brito, E., & Giuliadori, A. (2023). How can research contribute to the implementation of sustainable development goals? An interpretive review of SDG literature in management. *International Journal of Management Reviews*, 25(2), 318–339. <https://doi.org/10.1111/ijmr.12331>
- [26] Verplanken, B. (2018). Promoting sustainability: Towards a segmentation model of individual and household behaviour and behaviour change. *Sustainable Development*, 26(3), 193–205. <https://doi.org/10.1002/sd.1694>
- [27] Anantharaman, M. (2018). Critical sustainable consumption: A research agenda. *Journal of Environmental Studies and Sciences*, 8(4), 553–561. <https://doi.org/10.1007/s13412-018-0487-4>
- [28] Fischer, D., Reinermann, J. L., Guillen Mandujano, G., DesRoches, C. T., Diddi, S., & Vergragt, P. J. (2021). Sustainable consumption communication: A review of an emerging field of research. *Journal of Cleaner Production*, 300, 126880. <https://doi.org/10.1016/j.jclepro.2021.126880>
- [29] Abdulrazak, S., & Quoquab, F. (2018). Exploring consumers' motivations for sustainable consumption: A self-deterministic

- approach. *Journal of International Consumer Marketing*, 30(1), 14–28. <http://dx.doi.org/10.1080/08961530.2017.1354350>
- [30] Jaiswal, D., & Singh, B. (2018). Toward sustainable consumption: Investigating the determinants of green buying behaviour of Indian consumers. *Business Strategy and Development*, 1(1), 64–73. <https://doi.org/10.1002/bsd2.12>
- [31] Sustainable Exchange. (2011). *A framework for sustainable lifestyles – Defra*. Retrieved from: <https://www.sustainabletyexchange.ac.uk/a-framework-for-sustainable-lifestyles-defra>
- [32] Hobson, K. (2001). Sustainable lifestyles: Rethinking barriers and behaviour change. In M. J. Cohen, & J. Murphy (Eds.), *Exploring sustainable consumption: Environmental policy and the social sciences* (pp. 191–209). Pergamon. <https://doi.org/10.1016/B978-008043920-4/50014-8>
- [33] Lubowiecki-Vikuk, A., Dąbrowska, A., & Machnik, A. (2021). Responsible consumer and lifestyle: Sustainability insights. *Sustainable Production and Consumption*, 25, 91–101. <https://doi.org/10.1016/j.spc.2020.08.007>
- [34] Peano, C., Merlino, V. M., Sottile, F., Borra, D., & Massaglia, S. (2019). Sustainability for food consumers: Which perception? *Sustainability*, 11(21), 5955. <https://doi.org/10.3390/su11215955>
- [35] Nguyen, H. V., Nguyen, N., Nguyen, B. K., & Greenland, S. (2021). Sustainable food consumption: Investigating organic meat purchase intention by Vietnamese consumers. *Sustainability*, 13(2), 953. <https://doi.org/10.3390/su13020953>
- [36] Peštek, A., Agić, E., & Cinjarević, M. (2018). Segmentation of organic food buyers: An emergent market perspective. *British Food Journal*, 120(2), 269–289. <https://doi.org/10.1108/BFJ-04-2017-0215>
- [37] Rahman, O., Fung, B. C. M., & Chen, Z. (2020). Young Chinese consumers' choice between product-related and sustainable cues—The effects of gender differences and consumer innovativeness. *Sustainability*, 12(9), 3818. <https://doi.org/10.3390/su12093818>
- [38] Milfont, T. L., Duckitt, J., & Cameron, L. D. (2006). A cross-cultural study of environmental motive concerns and their implications for proenvironmental behavior. *Environment and Behavior*, 38(6), 745–767. <https://doi.org/10.1177/0013916505285933>
- [39] Mozos-Blanco, M. Á., Pozo-Menéndez, E., Arce-Ruiz, R., & Baucells-Aletà, N. (2018). The way to sustainable mobility. A comparative analysis of sustainable mobility plans in Spain. *Transport Policy*, 72, 45–54. <https://doi.org/10.1016/j.tranpol.2018.07.001>
- [40] Gallo, M., & Marinelli, M. (2020). Sustainable mobility: A review of possible actions and policies. *Sustainability*, 12(18), 7499. <https://doi.org/10.3390/su12187499>
- [41] Girod, B., & de Haan, P. (2010). More or better? A model for changes in household greenhouse gas emissions due to higher income. *Journal of Industrial Ecology*, 14(1), 31–49. <https://doi.org/10.1111/j.1530-9290.2009.00202.x>
- [42] Tukker, A., Cohen, M. J., Hubacek, K., & Mont, O. (2010). The impacts of household consumption and options for change. *Journal of Industrial Ecology*, 14(1), 13–30. <https://doi.org/10.1111/j.1530-9290.2009.00208.x>
- [43] Haq, G., Whitelegg, J., Cinderby, S., & Owen, A. (2008). The use of personalised social marketing to foster voluntary behavioural change for sustainable travel and lifestyles. *Local Environment*, 13(7), 549–569. <https://doi.org/10.1080/13549830802260092>
- [44] Azamussan, S., & Shanmugam, M. (2022). An empirical examination of the effects of demographic groups on socially responsible consumption behaviour. *Social Responsibility Journal*, 18(5), 951–967. <https://doi.org/10.1108/SRJ-06-2020-0253>
- [45] Papagiannakis, A., Baraklianos, I., & Spyridonidou, A. (2018). Urban travel behaviour and household income in times of economic crisis: Challenges and perspectives for sustainable mobility. *Transport Policy*, 65, 51–60. <https://doi.org/10.1016/j.tranpol.2016.12.006>
- [46] Liu, W., Lund, H., & Mathiesen, B. V. (2013). Modelling the transport system in China and evaluating the current strategies towards the sustainable transport development. *Energy Policy*, 58, 347–357. <https://doi.org/10.1016/j.enpol.2013.03.032>
- [47] Wang, S., Wang, J., & Yang, F. (2020). From willingness to action: Do push-pull-mooring factors matter for shifting to green transportation? *Transportation Research Part D: Transport and Environment*, 79, 102242. <https://doi.org/10.1016/j.trd.2020.102242>
- [48] Global FootPrint Network. (2009). *FootPrint factbook Vietnam 2009*. Retrieved from: https://conservation-development.net/Projekte/Nachhaltigkeit/DVD_10_Footprint/Material/pdf/Footprint_Factbook_Vietnam_2009.pdf

How to Cite: Nguyen, P. M., Chu, M. T., & Nguyen, M. D. (2023). Role of Demographic Factors in Shaping Sustainable Lifestyles: An Empirical Study in Vietnam. *Green and Low-Carbon Economy* <https://doi.org/10.47852/bonviewGLCE32021397>

Appendix

Measurement items

Item		Source
Water & energy use (WE)		
WE1	Save water in daily use	New Ecological Paradigm (NEP) scale; Woodward [20], Thøgersen [21]
WE2	Do not exploit groundwater indiscriminately	
WE3	Turn off light and electric devices when not using	
WE4	Use air conditioner/heating device properly	
WE5	Buy electronic devices with “eco” label	
Mobility (MO)		
MO1	Use public transportation or bicycle instead of personal mobility vehicles	Haq et al. [43], Mozos-Blanco et al. [39]
MO2	Minimize traveling	
MO3	Use shared car or taxi when traveling	
MO4	Limit luggage weight while traveling to reduce air emission	