

# Factors Affecting the Environmental Awareness of Vietnamese Citizens

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**Abstracts:** This study aims to investigate the environmental awareness of Vietnamese citizens and identify its affecting factors through the survey of a total of 825 households in the North and the South of Vietnam. Descriptive statistics, comparative analysis and linear regression were mainly used to analyze the survey data. The study results show that the respondents' positive attitudes on environment protection and the high average score on environmental awareness proxy reflected the relatively high environmental awareness of Vietnamese citizens. Gender, education, household income and accessibility to the information on environmental issues were statistically found to be the significant contributing factors to the environmental awareness through both comparative analysis and linear regression model. More dissemination on environmental issues through various means will probably help improve the Vietnamese citizens' environmental awareness in the future.

**Keywords:** Environmental Issue, Environmental Attitudes, Awareness, Factors, Vietnam.

## 1. INTRODUCTION

Nowadays, both developing and developed countries are facing serious environmental problems. A variety of environmental issues and complications co-exist with the implementation of economic activities in any country. Environmental awareness or the understanding the side effects of economic activities (air and water pollution, dust deposition, solid waste, noise, etc.) on public health, green areas, water resources, and other important socioeconomic aspects of life is so important for both individuals and communities. Environmental awareness thus plays a significant role in strengthening the sustainable development. Jianguo (2004) acknowledged that the environmental awareness and environmental quality are important indicators to judge how civilized a nation or race is. Athman and Monroe (2000) explained that environmental awareness of processes and system play an important role in environmental education. Madsen (1996) stated that environmental awareness is necessary to achieve environmental protection and restoration. Awareness was also studied along with environmental knowledge and concern by Hausbeck et al. (1992). Assessment of environmental awareness and determination of factors contributing to the environmental awareness is therefore considered as the first step in understanding the levels of knowledge that different groups of people possess concerning the severity of environmental problems, and how they respond to or interact with their environment. Additionally, assessment results should help professional educators understand, quantify, and establish educational environmental awareness programs to fit the needs of the public

Vietnam is a progressing nation that has embarked on a path of industrialization and urbanization to stimulate its economy in recent decades. From 1990 to 2010, the country's GDP consistently expanded, averaging approximately 7% per year. During this period, Vietnam's industrial production increased by over 10% annually, and its contribution to GDP rose significantly, from 23% to around 41% (GSO Vietnam, 2010). The remarkable economic growth, accompanied by rapid industrialization and urbanization, has lifted numerous people out of poverty. However, it has also given rise to several environmental problems, including water, air, soil pollution as well as the depletion of natural resources. In fact, Vietnam is facing with environmental pollution due to urbanization, industrialization and the widespread use of agrochemicals. According to a 2005 report from the Asian Development Bank (ADB), the air quality in cities and industrial zones across Vietnam has significantly deteriorated, leading to a noticeable and frequent occurrence of respiratory issues among the population. Simultaneously, water pollution has emerged as a pressing concern, primarily due to the discharge of untreated industrial and domestic wastewater. This environmental pollution poses a considerable challenge to Vietnam's pursuit of sustainable development.

Despite ongoing efforts by Vietnamese government to address these issues and implement controls on current and future growth, there remain unanswered questions about how citizens perceived these problems and how they respond to them. This study is thus designed to investigate the Vietnamese citizen's environmental awareness and to identify the factor affecting their environmental awareness. The results are expected to provide the base for designing measure to improve the environmental awareness, thus better helping environmental protection in the future.

## 2. METHODOLOGY

Vinh Phuc and Binh Duong provinces were chosen as survey locations to gain insight into the environmental awareness of their residents. There were several reasons to select these two provinces as study sites. Firstly, both Vinh phuc and Binh Duong are situated in Vietnam's economic focal regions. Since 1997, the Vietnamese government established three economic focal regions in Northern, Central and Southern regions, with the aims of promoting balanced economics growth and leveraging the comparative advantages of different geographic areas. By 2004, these three Economic Focal Regions encompassed 20 provinces out of 64 nationwide. Although they represented only 22.3% of Vietnam's land area, they were home to approximately 41.6% of its population and contributed to 63.5% of the total GDP and roughly 86% of total Vietnamese exports (ICEM, 2007). Vinh Phuc is located in the Northern economic focal region while Binh Duong is in the Southern region and both provinces are recognized for their success in attracting foreign direct investment and other financial support for regional economic development (Nguyen Phi Lan, 2006). Consequently, both provinces experienced impressive economic growth, exceeding 15% during the period from 2000 to 2009 while the national growth rate averaged 7%. Secondly, both Vinh Phuc and Binh Duong have undergone rapid industrialization and urbanization processes. The industrial sector's contribution to the total GDP of Binh Duong and Vinh Phuc provinces was 62.8% and 56.8% in 2009, respectively. significantly higher than the nationwide figure of 40.2% (GSO Vietnam, 2010). Additionally, during the period from 1995 to 2010, the proportion of the urban population in Vinh Phuc and Binh Duong increased from 7.6% and 17.5% to 22.4% and 29.9%, respectively whereas the national urban population only rose from 20.7% to 29.6% (with urbanization mainly concentrated in Hanoi and Ho Chi Minh cities). Lastly, both provinces have exhibited relatively high population levels compared to others in their respective regions. They ranked among the top 10 most polluted provinces in Vietnam, with Binh Duong being the second most polluted province in the Southern region and Vinh Phuc ranked 8<sup>th</sup> in the Northern region (ICEM 2007).

A total of 825 households (424 in Vinh Phuc and 401 in Binh Duong) were selected for the survey in 2010. To ensure that the survey captured a representative cross-section of the households with various backgrounds, including factors such as age, gender, education level, residential location, and social status, a specific sampling methodology was employed. At first, the number of sample for survey in each ward was determined based on the respective share of the household numbers of the wards in total household numbers in the province. Then, in each ward, the survey samples were randomly selected. This approach ensured that the survey samples were drawn from all wards within the provinces.

The term "awareness" can encompass two related aspects: it can refer to the knowledge acquired through one's empirical observations and perception and it can also be synonymous with "cognizance" which is the recognition of something sensed or felt (Ziadat, 2010). When it comes to environmental awareness, it can be understood as comprising two dimensions, including a concern for state of the environment, and the development of value, emotions, and motivations related to the environment (Aminrad et al., 2011). To gather information regarding these dimensions of environmental awareness, a standardized questionnaire was designed for this study. This questionnaire aimed to collect data on respondents' concerns and their attitude and values concerning the environment. Additionally, information about the respondents and their households was gathered to facilitate further analysis, helping to identify the primary factors affecting environmental awareness.

The empirical analysis in this research followed three primary procedures. At first, descriptive statistics were employed to provide an overview of respondents and their environmental awareness. Secondly, comparative analysis was conducted to illustrate the impact of demographic and socioeconomic factors on the environmental

awareness of respondents. In addition, the regression with the dependent variable to be the proxy for environmental awareness will be estimated to understand the major contributing factors to environmental awareness. The questions to understand the environmental awareness of the respondents is presented in table 1 and the score as the proxy for environmental awareness is calculated based on the answer of the respondents.

**Table 1. Posing question on environmental awareness and score structure**

Question	Score structure
Q1. Which objectives you believe is first, second, and third most important to achieve in your province (from 5 listed objective)?	To get 1 point if one selected <i>Reduce water pollution</i> or <i>Reduce air pollution</i> to be the first or second or third most important objective; 0 for otherwise ( <i>Promote economic growth; Improve healthcare service; Improve schools and education</i> )
Q2. Which one do you believe is first, second, and third most important environmental issues in your town (from 5 listed issue)	To get 1 point if the answer is <i>lack of treatment of wastewater</i> or <i>not so good solid waste disposal and garbage collection</i> or <i>pollution of the water canals and rivers</i> . 0 for otherwise ( <i>air pollution</i> or <i>noise pollution</i> )
Q3. Do you agree that your town needs to accelerate the industrialization and urbanization to increase jobs and incomes even if this implies increasing pollution and reducing environmental quality in the town.	To get 1 point if the answer is <i>strongly disagree</i> or <i>disagree</i> . 0 for otherwise ( <i>neutral, agree</i> or <i>strongly agree</i> )
Q4. Do you think we (town citizens) should sacrifice some of our income and standard of living so that the next generation may benefit from a better environment?	To get 1 point if the answer is <i>strongly agree</i> or <i>agree</i> . 0 for otherwise ( <i>neutral, disagree</i> or <i>strongly disagree</i> )
Q5. Do you agree with the statement of Vietnam Environmental Protection Law: "Environmental Protection is the cause of the whole society, the right as well responsibility of state agencies, organizations, households and individuals".	To get 1 point if the answer is <i>strongly agree</i> or <i>agree</i> . 0 for otherwise ( <i>neutral, disagree, strongly disagree</i> or <i>don't know</i> )
Q6. Do you know that all household wastewater in your town go into canals and rivers without any treatment?	To get 1 point if the answer is <i>Yes, I know</i> . 0 for otherwise ( <i>No, I don't know</i> or <i>I am not sure</i> )
Q7. Do you believe that in the past the wastewater from the households has polluted the rivers and canals in your town?	To get 1 point if the answer is <i>Yes, I believe so</i> . 0 for otherwise ( <i>No, I don't believe so</i> or <i>I am not sure</i> )
Q8. Do you believe that in the future if the wastewater from the households is not treated it could pollute the rivers and canals in your town?	To get 1 point if the answer is <i>Yes, very significantly</i> or <i>Yes, slightly</i> . 0 for otherwise ( <i>No, I don't believe so</i> or <i>I am not sure</i> )
Q9. Do you feel that improving the cleanliness (hygiene) condition of your town is very important to you?	To get 1 point if the answer is <i>Yes, very important</i> or <i>Yes, important</i> . 0 for otherwise ( <i>No, not very important</i> or <i>No, not important at all</i> )
Q10. Do you agree that the enterprise should pay for their wastewater to be treated	To get 1 point if the answer is <i>Yes</i> . 0 for otherwise ( <i>No</i> or <i>I am not sure</i> )
Q11. Do you agree that households should pay for their wastewater to be treated?	To get 1 point if the answer is <i>Yes</i> . 0 for otherwise ( <i>No</i> or <i>I am not sure</i> )

### 3. RESULTS AND DISCUSSIONS

#### 3.1. Demographic Information

As mentioned, a total of 825 respondents were interviewed in the northern and southern regions of Vietnam. The average age of respondents was 51 years old, and the majority of them were married (97.5%). Notably, there was a difference in the gender distribution between the two regions. In the South, male respondents accounted for only 37.4%, while in the North, this figure was higher at 62.4% (table 2). This discrepancy can be attributed to the fact that men in the South were typically away from home during the daytime, while their wives often stayed home to take care of household chores. Consequently, interviewers in the South more frequently interacted with wives during the interviews. Regarding education levels, most of the respondents had completed secondary and high school, which was a common educational background in Vietnam, except for some mountainous areas. The average family size was 4.5 persons per household, with 3.3 individuals aged 18 or older. However, the number of individuals with paid jobs within each household was 2.2 persons. There were no significant differences in family size or the number of individuals with paid jobs between the North and the South, based on the survey data. Regarding income, the majority of households (87.8%) reported a monthly income of less than 10 million VND in 2009. Specifically, 71% of households fell within the income range of 4-10 million VND. About 4.4% of surveyed

households indicated that their income was insufficient to meet basic needs, 10.4% stated that it was just enough for food, and 24.5% declared it covered both food and clothing expenses. Approximately 60% of households reported that their income was sufficient for a good quality of life and allowed for some savings.

**Table 2. Demographic information of the survey respondents**

	Unit	South (n = 401)	North (n = 424)	Total (n = 825)
1. Age of respondents	years	48.1 (11.9)	53.7 (13.4)	51.0 (12.9)
2. Gender	- Male	37.4	62.4	49.2
	- Female	62.6	37.6	50.8
3. Education	- Primary school	12.5	24.1	18.4
	- Secondary school	31.9	32.1	32.0
	- High school	32.4	32.3	32.4
	- College & University	20.2	5.7	12.7
4. Married respondents	%	96.5	98.3	97.5
5. Family size	Pers.	4.7 (1.8)	4.3 (1.8)	4.5 (1.8)
	Pers.	3.4 (1.7)	3.2 (1.3)	3.3 (1.5)

Note: The numbers in parentheses are Std Deviation

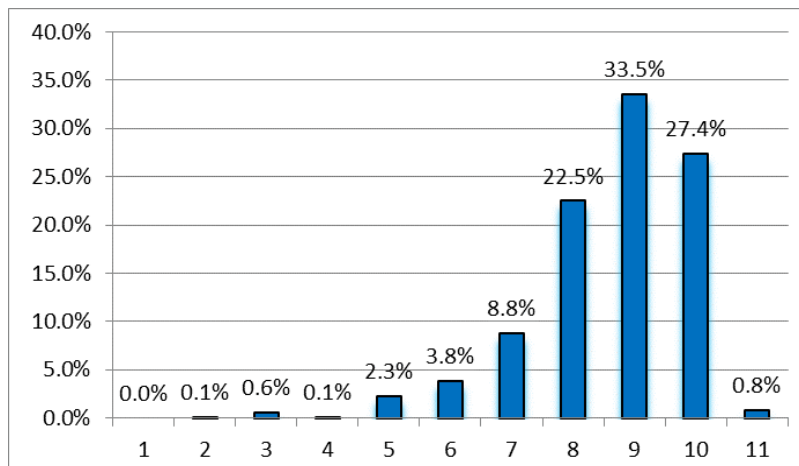
(Source: Survey data, 2010)

### 3.2. Factors affecting to Citizen’s Environmental Awareness

#### 3.2.1. Constructed Proxy for Environmental Awareness

This study tries to makes the analyses of the link between the socio-demographic factors and environmental awareness, focusing on the particular case of Vietnamese citizens. For this purpose, at first, the variable of citizens’ environmental awareness is constructed based on responses of the respondents to the questions on their environmental concerns and attitudes. If one respondent had the positive response or right answer to one posing question, one point would be given to him or her. There were totally 11 posing questions and one respondent could get maximum of 11 points (Table 1). A total point of one respondent reflected his or her environmental awareness and it was used as proxy to measure a respondent’s environmental awareness in this study.

As seen in Fig. 1, most respondents obtained 7-10 points from 11 posing questions, and there was not much different between the North and the South. A significant share of respondents (more than 50%) received 9 and greater than 9 points. This reflects the relatively high environmental awareness of Vietnamese citizens from two study sites of Binh Duong and Vinh Phuc province.



**Fig 1.** Distribution of Respondents’ Awareness Score

### 3.2.2. Geographical and Demographic Factors

The people in various regions of countries may have different environmental awareness due to divergence of culture, custom or living conditions. However, the comparative analysis from this study did not find the significant difference in citizens' environmental awareness between the North and the South. While the average environmental awareness score of citizens in the South was 8.62 point, the figure for the North was 8.65 (Table 3). This difference was statistically insignificant ( $T\text{-stat} = -0.299$  and  $p = 0.382$ ).

**Table 3. Geographic and demographical factors and environmental awareness**

	Factor	N	Mean	Min	Max	Std. Dev
1. Region	- South region	401	8.62	3.00	11.00	1.37
	- North region	424	8.65	2.00	11.00	1.29
2. Gender	- Male	407	8.78	3.00	11.00	1.15
	- Female	418	8.49	2.00	11.00	1.47
3. Marriage status	- Married	804	8.63	2.00	11.00	1.34
	- Unmarried	21	8.62	7.00	10.00	0.86
4. Age	- Under 40	169	8.61	5.00	11.00	1.23
	- Between 40-60	464	8.59	3.00	11.00	1.39
	- Over 60	192	8.76	2.00	11.00	1.26

Source: survey data, 2010

The relationship between gender and environmental awareness has been a topic of extensive study and has been carefully theorized more than other structural variations in environmental concern, as noted by Dietz et al. (1998). Various studies, such as one from 1972 quoted in Van Liere and Dunlap (1981), have suggested that men tend to be more concerned about the environment than women. This is often attributed to men's higher levels of education and their greater involvement in communities and political issues. However, it's important to note that conflicting research findings exist. Some studies, for example, Passino and Lounsbury (1976), also quoted in Van Liere and Dunlap (1981), have indicated that women are actually more concerned about the environment than men. This difference in concern has been attributed to the notion that men tend to prioritize economic growth and stability more than women when compared to their environmental concerns. In this study, the awareness score of the men (8.78) was higher than of the women (8.49), and this difference was statistically significant ( $T\text{-stat} = 3.194$  and  $p = 0.0007$ ). Thus, the men significantly had the better environmental awareness than the women in the study sites. This is possibly because the men in Vietnam usually had higher educations than the women. The comparative analysis also reveals that the environmental awareness score was nearly the same between the men and the women and marriage status of respondents did not have the significant effects on their environmental awareness ( $T\text{-stat} = 0.459$  and  $p = 0.325$ ).

The extensive literature survey of Van Liere and Dunlap (1981) stated 'age' as a dominant factor in determining the degree of environmental concern. In this study, age of the respondents also had some effect on their environmental awareness. The old group (over 60) had the highest score of environmental awareness (8.76). The difference was statistically significant at 10% between the old group and the medium group of between 40 and 60 ( $T\text{-stat} = -1.55$  and  $p = 0.06$ ). Meanwhile, the difference was not statistically significant between the old group and young group of less than 40 ( $T\text{-stat} = -1.15$  and  $p = 0.125$ ).

### 3.2.3. Socio-Economic Factors

There is a hypothesis that states "environmental concern is positively associated with social class as indicated by education, income and occupational prestige" (Van Liere and Dunlap, 1981). The education level usually plays a significant role in the degree of environmental awareness. This was also reasserted in this study. The study results in table 4 disclosed that the higher the education which the respondent obtained, the better the environmental awareness they achieved. The respondents obtaining education at high schools and above had higher environmental awareness than the respondents who just completed secondary and less with statistical significance at 1% ( $T\text{-stat} = -5.01$  and  $p = 3.34E-07$ ).

**Table 4. Socioeconomic factors and environmental awareness**

Factor		N	Mean	Min	Max	Std. Dev
1. Education	not go to school	35	7.86	2.00	10.00	2.05
	Primary School	152	8.45	3.00	10.00	1.47
	Secondary School	264	8.49	3.00	11.00	1.38
	High School	267	8.84	5.00	11.00	1.09
	College and University	107	8.96	6.00	11.00	1.05
2. Occupation	- Government staff	127	8.83	3.00	11.00	1.10
	- Workers	69	8.51	5.00	10.00	1.31
	- Farmers/ doing self-business	198	8.33	3.00	11.00	1.44
	- Unemployment	36	8.31	2.00	10.00	2.10
3. Respondent income	- Less than 2 mil. VND	177	8.53	3.00	11.00	1.50
	- Between 3 and 5 mil. VND	505	8.62	2.00	11.00	1.31
	- Over 5 mil. VND	143	8.80	5.00	11.00	1.15
4. Household income	- Less than 4 mil. VND	138	8.20	2.00	10.00	1.64
	- Between 4 and 10 mil. VND	586	8.68	3.00	11.00	1.25
	- Over 10 mil. VND	101	8.93	6.00	11.00	1.15
5. Respondent's opinion on the living condition	- Very bad	17	7.94	5.00	10.00	1.85
	- Bad	76	8.20	2.00	11.00	1.75
	- Average	560	8.70	3.00	11.00	1.28
	- Good	136	8.71	3.00	11.00	1.15
	- Very good	13	9.00	8.00	11.00	1.00

(Source: Survey data, 2010)

In the field of economics, the discourse surrounding the Environmental Kuznets Curve (EKC) underscores a parallel connection between income and environmental quality. According to this theory, there exists an association where an enhancement in environmental quality coincides with an increase in income, typically measured by GDP per capita. In essence, the EKC posits that as income rises, so does the potential for an improvement in environmental quality. The comparative analysis from this survey data show the positive relation between respondent's income and environmental awareness. The respondents with higher income had more score of environmental awareness. The respondents with income of over 5 million per month had the better environmental awareness with statistical significance at 5% ( $T\text{-stat} = -1.813$  and  $p = 0.0355$ ). The positive relation is also found between household income level and environmental awareness proxy. The respondents of higher income household groups had higher awareness than the lower one with the statistical significance at 5%. Furthermore, the respondents who had the better living condition (according to their own assessment) seem to have better awareness as their score was higher.

Occupation of the respondents may also place some effect on their environmental awareness. The respondents as the government staff had the higher proxy score than other respondents who were workers, farmers or self-business. This difference was statistically significant at 1% ( $T\text{-stat} = 3.525$  and  $p = 0.0002$ ). The fact that the government staff had more chances to be able to access to information on environmental protection (through training, public media, talks and discussions) was possible the major reason to explain this difference.

### 3.2.4. Factors affecting the environmental awareness through linear regression function

A linear regression function is applied to determine the factors affecting to environmental awareness. The dependent variable is the proxy or the total score of respondents' environmental awareness as described in the previous section. The independent variables in the function includes demographic characteristics of the respondent such as age, gender, education level, marriage status; the socio-economic variables as income level of the respondent and his/her household income, the respondent's access to the information on environmental issues as number of time of hearings on environmental issues in past 12 months, and the regional factor as dummy variable. The detail information on the independent variable and the summary output of regression are presented in table 5.

**Table 5. Summary output of regression analysis of factor affecting the environmental awareness of the citizen**

	Coefficients	Std- Error	t Stat	P-value
Intercept	7.349***	0.380	19.358	0.000
GENDER (Male = 1; Female =0)	0.187*	0.096	1.950	0.052
MARRIAGE (Married = 1; unmarried = 0)	0.023	0.297	0.078	0.938
EDU (Education level of respondent)	0.188***	0.048	3.869	0.000
AGE (Age of respondent)	0.001	0.004	0.236	0.814
HH_INCOME (Household income level)	0.028*	0.015	1.886	0.060
RES_INCOME (Respondent income level)	-0.019	0.021	-0.925	0.355
HH_POP (Number of member in household)	0.029	0.041	0.713	0.476
WORK_PERS (Working person in the household)	-0.008	0.048	-0.169	0.866
ACCESS (Accessibility to information on environmental issues)	0.305***	0.058	5.253	0.000
REGION (South = 1; North = 0)	-0.156	0.098	-1.593	0.112
F = 17.557; R-square= 0.45				

\*\*\* Significant at 1%; \*\* Significant at 5%; \* Significant at 10%.

The results of regression model show that gender, education, household income and accessibility to the information on environmental issues were statistically the significant affecting factors to the environmental awareness. The positive coefficient of GENDER variable as expected confirms that the men were better aware of environmental issue than the women. The result is consistent with the conclusion from the comparative analysis in the previous section. Income level of the households was also found to have the positive relation with the respondent's environmental awareness with statistical significance at 10%. The respondents of higher income households possibly concerned more on environmental issues as environmental quality was one of important factors to improve their life quality while the member of low income households may have less time to consider environmental quality since they faced more pressure to their earnings.

Coefficient of EDU variable in the regression was positive and statistically significant at 1%. It is consistent with our expectation and with the result from comparative analysis. The respondents with higher education level had better environmental awareness as the respondents could learn more about environmental issues at higher education levels and they could better understand the environmental problems with their higher education background. The positive coefficient was also found for ACCESS variable in the regression model with statistical significance at 1%. The respondents who often hear about environmental issues in past 12 months would have the better environmental awareness than others. More dissemination on environmental issues through various means (mass media, local speaker, leaflets, training, etc.,) will therefore help improve the citizens' environmental awareness.

## CONCLUSION AND IMPLICATION

This study endeavors to explore the environmental awareness of Vietnamese citizens and the factors influencing it, utilizing a survey of 825 households in both the Northern and Southern regions of Vietnam. Respondents were presented with a series of questions concerning their attitudes regarding economic development and its relationship with the environment. The findings of the study reveal that Vietnamese citizens are deeply concerned about environmental protection, particularly in relation to water pollution, with nearly 70% of respondents ranking it among the top three most pressing issues to address in the future. Respondents generally exhibited positive attitudes towards environmental protection, with a significant portion disagreeing or strongly disagreeing with the idea of accelerating industrialization and urbanization if it leads to increased pollution. Many respondents also expressed agreement or strong agreement with the willingness to sacrifice some income for a cleaner environment. The distribution of scores on environmental awareness further underscores the relatively high level of environmental consciousness among Vietnamese citizens. Statistical analysis, both through comparative analysis and linear regression models, identified several factors that significantly contribute to environmental awareness. These factors

include gender, education, household income, and access to information on environmental issues. The study suggests that increasing the dissemination of information on environmental topics through various channels may help enhance the environmental awareness of Vietnamese citizens in the future.

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