Tacit Knowledge Affects the Environmental Practice of Populations in Bangkok Metropolis and Vicinity

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Abstract

Bangkok Metropolis and the surrounding area were ranked the 5th worst in the world for the air quality index in 2023. These environmental problems stem from the lack of basic knowledge of the population's environmental management skills. This research analyzed the Tacit Environmental Knowledge factors affecting the Environmental Management Practice of Populations. This quantitative research study used a questionnaire to collect data from 410 respondents living in the Bangkok Metropolis and the surrounding area. Results showed the highest tacit knowledge of environmental management in The Skills for Saving Water Resources, with an average score $\bar{x}$ of 0.94. The second was The Conservation of The Environment is a Public Responsibility, with an average score $\bar{x}$ of 0.89. The lowest tacit knowledge of environmental management was The Contrast Between "Ozone" and "Clean Air", with an average score $\bar{x}$ of 0.10. The highest practice in environmental management was the Repair Practice, with an average score $\bar{x}$ of 1.85. The second was Using Energy-Efficient Products Behavior, with an average score $\bar{x}$ of 1.67, and the lowest practice level was Taking Public Transportation Instead of a Personal Car Behavior, with an average score $\bar{x}$ of 0.38. Results also showed that the factors affecting Environmental Management Practice by Correlation Analysis including Education, Environmental Learning Pathway, and Tacit Environmental Knowledge positively related to the Environmental Management Practice of Populations, with statistical significance at $\alpha = 0.01$.

Keywords: Tacit Knowledge; Environmental Practice; Environmental Management; Practice of Populations

1. Introduction

The world is developing toward transforming development processes that involve applying technology (UNESCO, 2023). This transformation promotes the convenience of consumer consumption but also has negative environmental impacts. Excessive use of resources, without awareness of their natural value, increase in various types of waste, and increased greenhouse gas emissions from the industrial sector all negatively impact the environment. Thailand recognizes the importance of these issues and has collaborated by agreeing to achieve sustainable development goals within the year 2030 (Sustainable Development Goals: SDGs) (United Nations Thailand, 2023). Thailand is one of 193 countries that have signed and recognized these sustainable development goals. The Bangkok Metropolis, as the capital city and main developmental center, had the 5th worst global air quality index (IQAir Air, 2023). This area faces environmental problems of urban waste totaling 22,472 tons per day (Pollution Control Department, 2022). One of the main causes of these environmental problems is the regional economic disparity, which is not evenly distributed or concentrated in the Bangkok Metropolis and the surrounding area. Populations from neighboring provinces seek economic benefits in the metropolitan area resulting in a total population of over 10M (Department of Provincial Administration, 2022). Moreover, the average population density is 5,660.1 people per square kilometer (National Statistical Office, 2022).

Therefore, environmental issues in the Bangkok Metropolis and the surrounding area are a significant concern that requires cooperation and responsibility from the government sector, the private sector, and most importantly, the inhabitants. Most people do not consider how pollution can harm the environment. Researchers, therefore, see the importance of studying the factors influencing the environmental management behavior of the population in Bangkok and its adjacent suburban areas. Tacit Environmental Knowledge is related to the

Environmental Management Practice of Populations in the Bangkok Metropolis and the surrounding area. Each individual has life experiences, circumstances during different life stages, and varying lifestyles, which are common factors influencing behavior due to changes in social structure, values, economic growth, political changes, and technology. This study investigated Tacit Knowledge factors as the knowledge acquired from individual experiences. These factors are variables that affect behavior in managing the environment, enabling everyone to lead a daily life that is environmentally friendly and understand how to promote environmental management. This study provided data to support guidelines for developing public behavior, thoughts, and attitudes of Populations in the Bangkok Metropolis and Vicinity to align with Thailand's sustainable development goals.

2. Objectives

1) Study the tacit knowledge of the environmental management of populations in the Bangkok Metropolis and the surrounding area.

2) Analyze the tacit knowledge factors affecting practices in the environmental management of the Bangkok Metropolis and nearby Populations.

3. Materials and Methods
3.1 Literature Review

Secondary data were collected by studying documents, research reports, and articles both nationally and internationally related to the factors influencing learning and environmental management behavior.

Environmental Issues from Population

Climate change is characterized by the increasing concentration of greenhouse gases in the atmosphere and reflects the balance between the release of greenhouse gases from human activities and natural sources, and the absorption by ecosystems and the oceans. The Paris Agreement limits the annual increase in average temperatures for each country to no more than 1.5 degrees Celsius (World Meteorological Organization, 2021).

The issue of climate change is a long-term problem due to global warming, erratic weather patterns, and the loss of biodiversity resulting from climate change crises, food crises, and energy crises as the three major global risks that cannot be solved collectively (World Economic Forum, 2022). Pollution worldwide has increased by 6%, while the use of coal has risen by 9%, further impacting the global food crises. Many countries are affected by changing temperatures and sea levels, leading to decreased agricultural production. The food production process produces more than one-third of all global greenhouse gas emissions. Both crises are interconnected and cannot be avoided. It is predicted that by 2593 (Thai calendar year), the world will need to increase food production by more than 60% to meet demands. Therefore, using technology to improve food production efficiency and reduce greenhouse gas emissions is the way forward for future food security.

In 2020, Thailand's average annual temperature was 27.5 degrees Celsius, higher than the 30-year average annual temperature from 1999 to 2012 of 27.1 degrees Celsius. The average temperature has increased by approximately 0.4 degrees Celsius (Meteorological Department of Thailand, 2021). Thailand is ranked as one of the top 10 countries most at risk from the long-term impacts of climate change (Germanwatch, 2021). Currently, Thailand is also facing air pollution issues, particularly severe PM2.5 pollution, which is becoming increasingly problematic. This issue is complex and is influenced by various factors including forest fires, climate change, and pollution from transportation and industries (Seub Nakhasathien Foundation, 2023). In 2019, there were over 7,000 forest fires in Thailand, an increase from 3,000 fires in 2008. Air pollution from transportation and industries is another significant factor affecting PM2.5 levels. In 2020, PM2.5 emissions were attributed to different sectors including transportation (25%), electricity generation (40%), industry (29%), and other sources (6%).

The air pollution situation in the Greater Bangkok metropolitan area and its surrounding provinces is particularly challenging. Managing particulate matter and air pollution in this region requires intensive efforts. The sources of this pollution are diverse and include factors such as traffic emissions, industrial activities, and open burning. Solutions and measures to control and mitigate these problems are crucial to address air quality challenges in this vulnerable area (Pollution Control Department, 2020) (Figure 1).
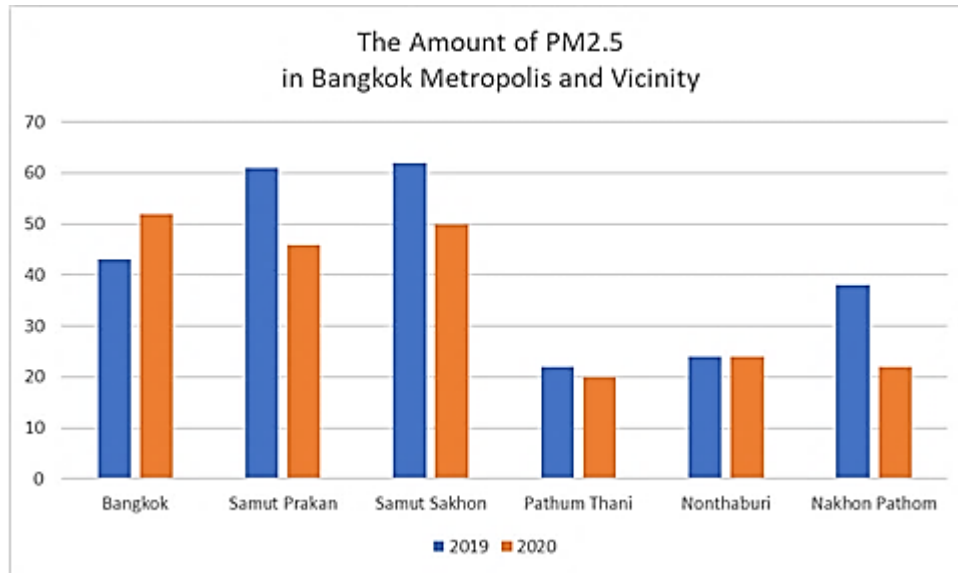
Figure 1 The Amount of PM 2.5 in Bangkok Metropolis and Vicinity
Source: Pollution Control Department (2020)

The impact of air pollution, including PM 2.5, on the health of the Thai population has become increasingly severe. The number of deaths attributable to air pollution has risen from 31,000 in the Thai calendar year 2533 to 49,000 in the Thai calendar year 2556. This increase can be attributed to the rapid industrial development in Thailand, particularly in densely populated areas such as the Greater Bangkok metropolitan region.

The consequences of air pollution and PM 2.5 can be severe, especially for individuals with respiratory issues, heart disease, and circulatory problems. Exposure to air pollution levels exceeding the standard of 10 micrograms per cubic meter ($\mu g/m^3$) in the short term can lead to eye and throat irritation, coughing, and difficulty breathing. Long-term exposure to high levels of air pollution can increase the risk of heart disease, lung cancer, and other health problems. Air pollution is also detrimental to plant life, ecosystems, and visibility. The average PM 2.5 concentration in Thailand in 2020 was 29.8 $\mu g/m^3$, significantly higher than the recommended standard by the World Health Organization of 10 $\mu g/m^3$. These high levels of PM2.5 pose a significant risk to life and contribute to premature deaths, with an estimated 14,000 people in six provinces, Bangkok, Chiang Mai, Chonburi, Samut Sakhon, Khon Kaen, and Rayong being affected. This situation calls for urgent measures to mitigate air pollution and its impacts on public health and the environment.

In most countries worldwide, including Thailand, the industrial, manufacturing, consumption, and service sectors are using natural resources without regard to the detrimental impact on nature and the environment. The ever increasing demand from consumers and unnecessary consumption behaviors lead to water, air, and soil pollution that exacerbates health problems and the degradation of natural resources and the environment. Due to excessive consumption behaviors, the United Nations predicts that out of the 1.3 billion tons of food produced annually, one-third will become waste, while 10.5% of the population faces food scarcity issues, indicating a deteriorating societal condition (Food and Agriculture Organization of the United Nations, FAO, 2021).

The industrial sector contributes to greenhouse gas emissions, accounting for 25-30% of total emissions (Pollution Control Department, 2019). Natural resources and the environment are increasingly exploited in the manufacturing sector to compete in business and develop technology in the world of free trade, including Thailand, without considering the principles of resource value in the business sector. All these factors contribute to the climate crisis caused by greenhouse gas emissions, resulting in a rise in global temperature (The Nature Conservancy, 2023).

Researchers recognize the importance of addressing these impacts. National public sectors have established measures, policies, and regulations for industrial sectors but significant variables of these issues arise from excessive consumption, lack of environmental management behavior, and insufficient access to

environmental knowledge among the population. Pro-environmental Behavior (PEB) is a conscious behavior individuals exhibit to reduce negative environmental impacts (Department of Environmental Quality Promotion, 2015). De Groot, and Steg (2009) stated that environmental behavior involves sacrificing personal convenience for the benefit of others, relying on academic knowledge and tacit knowledge embedded through experiences to influence decision-making and behavior. Therefore, emphasizing tacit knowledge to promote environmental management behaviors among the population is crucial for driving responsible consumption behavior and sustainable development.

Tacit Environmental Knowledge and Behavior

Knowledge is the truth. Reality is information that humans receive and collect as a mass of experiences resulting in the learning process, from responses to stimuli, and through thinking, analyzing, comparing, synthesizing, and connecting with knowledge or information. Whether people accept or reject something reasonably, they go through the process of acquiring knowledge or needing to know about that thing to make decisions. Truths or various pieces of information support and provide answers to questions. This clarifies understanding and promotes a positive attitude toward a particular subject by heightening awareness. This is why the process of gaining knowledge is a structure that combines data memory with psychological states. Therefore, knowledge is a carefully selected memory that aligns with the mental state (Carter, 1973 as cited in Mongkolkasem, 1996).

Education or knowledge is a process that influences the recipients. Individuals who have received education at different levels, in different eras, in various educational systems, or in different fields of study are likely to have diverse thoughts, ideas, and varying needs. Those with higher education or extensive knowledge on a subject or subjects tend to be more effective recipients because they possess a broad range of knowledge in multiple subjects that may facilitate connections, interpretation, or a deeper understanding (River, et al., 1971 as cited in Satavethin, 1997).

Knowledge can be categorized into two types as tacit and explicit. Tacit Knowledge is embedded within a person and acquired through personal experiences, intuition, or the spiritual essence of individuals in understanding various things. This type of knowledge is not easily transferable into words or written language. Examples include skills in performing tasks, craftsmanship, or analytical thinking. Tacit knowledge is sometimes referred to as implicit knowledge. Explicit Knowledge is clear and codified knowledge that can be collected and transferred through various methods such as documentation, theories, and manuals. Explicit knowledge is sometimes called formal knowledge. Knowledge management can be used as a tool to achieve at least four objectives including 1) Achieving work-related goals, 2) Developing individuals, 3) Advancing organizational learning, and 4) Fostering a sense of community and collaboration in the workplace.

Knowledge management involves at least six critical activities related to knowledge including 1) Identifying fundamental or crucial knowledge necessary for group or organizational tasks or activities, 2) Seeking the required knowledge, 3) Enhancing, modifying, or creating some knowledge to make it suitable for use, 4) Applying knowledge at work, 5) Exchanging and learning from work experiences and applying this knowledge, condensing 'knowledge nuggets,' and 6) Documenting 'knowledge nuggets' and 'knowledge cores' for use and improvement into more complete, in-depth, and interconnected knowledge sets that are increasingly suitable for use. These six activities are a synthesis of knowledge that encompasses both explicit knowledge in the form of general symbols or written language and tacit knowledge which resides in people in their hearts (Beliefs and Values), their minds (Reasoning), and in other parts of the body (Practical Skills).

Knowledge is connected to organizational culture (Auernhammer, & Hall, 2001). Tacit Environmental Knowledge and Environmental Management are relevant by the physical proximity, the relevance or participation, and the need to react. Tacit and explicit knowledge cannot be substituted for one another (Boiral, 2002). The findings of the study determined that Tacit Knowledge or deep-seated knowledge possessed by environmental workers who have experience and familiarity while performing their duties, can be utilized to benefit environmental management in three main aspects as identifying sources of pollution, managing emergencies, and developing preventive solutions.

3.2 Concept Framework

Tacit Knowledge affects the Environmental Practice of Populations in the Bangkok Metropolis and Vicinity. Geographical information was collected through a literature review to determine relevant concepts and theories. The fundamental contextual factors related to information perception, environmental management knowledge, and environmental management behavior of the population were investigated, leading to environmental management behavior at different life stages. Data collection via surveys identified key issues and factors relevant to the environmental management behavior of the population in the Bangkok Metropolis and Vicinity, as shown in Figure 2.
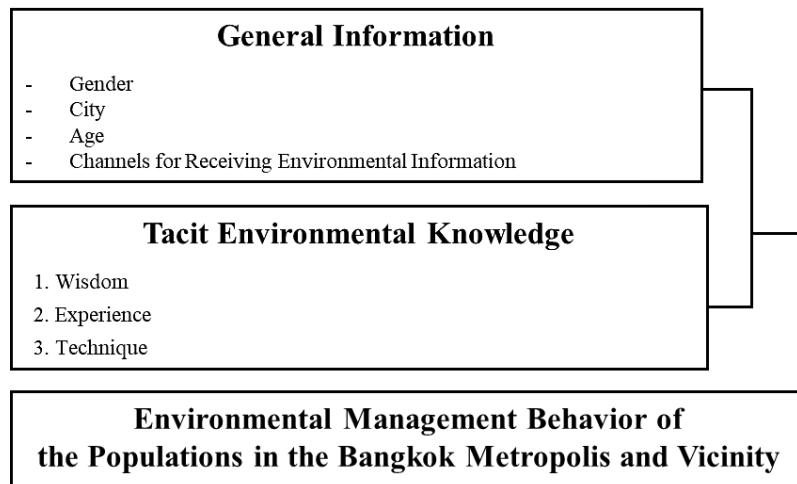
General Information

- Gender
- City
- Age
- Channels for Receiving Environmental Information

Tacit Environmental Knowledge

1. Wisdom
2. Experience
3. Technique

Environmental Management Behavior of the Populations in the Bangkok Metropolis and Vicinity

Figure 2 The Concept Framework

The research methodology and workflow comprised the study of Secondary Data on Environmental Management Knowledge and Environmental Management Behavior of the population. Results were used to develop a tool for quantitative Data Collection to analyze and compare the factors influencing the environmental management behavior of the population in the Bangkok Metropolis and the surrounding area.

Secondary Data were collected by studying documents, research reports, and articles both nationally and internationally related to the factors influencing learning and environmental management behavior.

Primary Data, as the key factors influencing the environmental management behavior of the survey respondents, were collected through a quantitative research survey. This survey asked about the fundamental aspects of environmental management in different age groups, the backgrounds of the participants, and how they acquired environmental knowledge, Tacit Knowledge, and the practice of environmental management. The survey was conducted on a sample group in the Bangkok Metropolis and Vicinity.

The sample population size was determined according to Taro Yamane's formula (Yamane, 1967) from a population residing in Bangkok and the surrounding areas comprising 10,605,191 people (Department of Provincial Administration, 2022). With a margin of error of 0.05 at a 95% confidence level, the population of the sample group required for the study was 400 individuals. This sample population was divided into those living in urban areas in the Bangkok Metropolis and the surrounding area as Bangkok, Nakhon Pathom, Nonthaburi, Pathum Thani, Samut Prakan, and Samut Sakhon Provinces.

The sampling strategy for data collection involved several methods including Multistage Sampling, Quota Sampling, and Convenience Sampling. Data were gathered from 400 individuals in the Bangkok Metropolis and Vicinity, subjected to Correlation Analysis using SPSS software, and summarized into descriptive statistics including frequency distribution, percentage, and item analysis to compare factors affecting environmental management behavior.

This study was approved by the Ethics Committee in Human Research (IRB) COA No. 2022/0076. To ensure that the quantitative tools were accurate, several validation steps were followed including Checking the Coverage of Questions and ensuring that the questions were comprehensive and covered the relevant aspects of the research. Language Validation verified the appropriateness of the written or spoken language for the questions.

Content Validation by Experts validated the relevance of the content, and Content Consistency Validation checked the internal consistency of the content of the questions. Six experts assessed the alignment of the questions with the research objectives, rating each question with a score of 1 (In Alignment), 0 (Uncertain), or -1 (Not in Alignment). Questions with an Item Objective Congruence (IOC) Index score higher than 0.5 were selected for use, while questions scoring lower than 0.5 were modified and improved. The Item Objective Congruence Index results indicated that all questions had an IOC value greater than 0.5.

4. Result and Discussion

The study results were as follows.

Information on the Population in the Bangkok Metropolis and Vicinity

The population sample in the Bangkok Metropolis and the surrounding area consisted of 410 individuals,164 males, 245 females, and one non-binary person. They resided in different areas, with 200 people in Bangkok, 38 in Nonthaburi, 48 in Pathum Thani, 42 in Nakhon Pathom, 40 in Samut Prakan, and 42 in Samut Sakhon. The largest age group in the sample was 27-43 years (Generation Y), with 117 individuals accounting for 28.54% of the sample. The next largest group was aged 13-26 years (Generation Z), with 103 individuals making up 25.12% of the sample. The smallest group was aged 44-58 years (Generation X), with 89 individuals constituting 21.71% of the sample.

Most subjects completed undergraduate education, totaling 204 individuals or 49.76%. The next group had a high school education comprising 63 individuals or 15.37%. The smallest group had a degree higher than a bachelor's degree at 18 individuals or 4.39%.

Regarding the sources of environmental knowledge, most (273 people or 66.59%) obtained information through social media. The next group, 149 people or 36.34%, acquired environmental knowledge through radio and broadcasting. The smallest group, 73 people or 17.80%, obtained information through newspapers. The demographic population details are listed in Table 1.

Table 1 Demographic Information of Populations in the Bangkok Metropolis and Vicinity

Information	Total	%
Gender		
- Male	164	40.00
- Female	245	59.76
- LGBTQ+	1	0.24
Area		
- Bangkok	204	49.76
- Nonthaburi Province	62	15.12
- Pathum Thani Province	41	10.00
- Nakhon Pathom Province	63	15.37
- Samut Prakan Province	22	5.37
- Samut Sakhon Province	18	4.39
Age		
59-77 years (Baby Boomer Generation)	101	24.63
44-58 years (Generation X)	89	21.71
27-43 years (Generation Y)	117	28.54
13-26 years (Generation Z)	103	25.12
Environmental Learning Pathway		
- Newspaper	73	17.80
- Brochure	130	31.71
- Journal	127	30.98
- Television	120	29.27
- Magazine	120	29.27
- Library/Library/Bookstore (Books)	104	25.37
- Radio	149	36.34
- E-Book	130	31.71
- Various Exhibitions	141	34.39
- Social Media	273	66.59
Total	**410**	**100**

Tacit Environmental Knowledge

For Tacit Environmental Knowledge of the sample population, the highest level was related to the skill of conserving water resources, with an average score of 0.94, equivalent to 93.66%. The next in line was the knowledge that environmental conservation is a responsibility for everyone, with an average score of 0.89, or 89.27%, and the lowest level of knowledge was related to distinguishing between "ozone" and "clean air", with an average score of 0.10, or 9.76%. Details of Tacit Environmental Knowledge are listed in Table 2.

Table 2 Tacit Environmental Knowledge

Tacit Knowledge	x̄	%	Level
1. Recognition of Environmental Duties	0.12	11.95	Low
2. Contrast Between "Ozone" and "Clean Air"	0.10	9.76	Low
3. Public Responsibility for Waste Segregation	0.81	80.73	High
4. Knowledge of Causes of Environmental Problems	0.20	19.51	Low
5. Distinguish between "Environmental Problems" and "Developed Countries"	0.17	16.83	Low
6. Conservation of The Environment is a Public Responsibility	0.89	89.27	High
7. Relate between "Private Vehicle Popularity" and "Environmental Impact"	0.82	81.71	High
8. Knowledge of Environmental Awareness	0.88	87.80	High
9. Efficient Consumption for Reduce Global Warming	0.84	83.66	High
10. Skills for Saving Water Resources	0.94	93.66	High
Total	0.57	57.49	Medium

Note: 0.00-0.33=Low / 0.34-0.66=Medium / 0.67-1.00=High

Environmental Practice

For the Environmental Practice of the sample population, the highest level of Tacit Knowledge was related to Repair Practice, with an average score of 1.85, equivalent to 92.44%. The next in line was Using Energy-Efficient Products Behavior, with an average score of 1.67, or 83.66%, and the lowest level of knowledge was related to Taking Public Transportation Instead of a Personal Car Behavior, with an average score of 0.38, or 19.02%. The details are listed in Table 3.

Table 3 Environmental Practice

Environmental Management Practice	x̄	%	Level
1. Repair Practice	1.85	92.44	Very High
2. Organic Waste Management	1.61	80.49	Very High
3. Reduce Elevators' Energy Using the Stairs Instead of The Passenger Elevator	1.39	69.51	High
4. Using Reusable Paper	1.37	68.41	High
5. Cloth Bags Reduce Plastic	1.51	75.73	Very High
6. Refusing to Accept Plastic Bags from Stores	1.60	79.88	Very High
7. Participating in Activities Related to Environmental Management	1.41	70.37	High
8. Utilization of Plastic Bags by Reusing	1.56	77.93	Very High
9. Reuse or Refuse Drinking Straws	0.47	23.54	Low
10. Eating Out Without Waste	1.65	82.44	Very High
11. Saving Water While You Brush Your Teeth	1.67	83.54	Very High
12. Online Shopping More Environmentally Sustainable	1.56	78.17	Very High
13. Using Energy-Efficient Products	1.67	83.66	Very High
14. Sorting out Household Waste	1.58	79.02	Very High
15. Setting The Time to Turn Off The AC during The Night	1.58	78.90	Very High
16. Taking Public Transportation Instead of a Personal Car	0.38	19.02	Low
17. Turn Off The Conditioner In The Hotel Room When Do not Stay In The Room	0.48	23.78	Low
18. Dispose of Garbage Sorted.	0.40	19.76	Low
19. Waste Sorting	1.67	83.54	Very High
20. Turn on The Power Saving Mode on Appliances	1.59	79.51	Very High
Total	1.35	67.48	Medium

Note: 0.00-0.49=Low / 0.50-0.99=Medium / 1.00-1.49=High / 1.50-2.00=Very High

Results of Environmental Practice Factors Analysis

The Correlation analysis found that factors affecting the Environmental Practice of the Population in the Bangkok Metropolis and the surrounding area included Education, Environmental Learning Pathway, and Tacit Environmental Knowledge was positively related to the Environmental Management Practice of Populations in the Bangkok Metropolis and the surrounding area, with statistical significance at α = 0.01 (Table 4).

Table 4 Environmental Practice Factors Analysis

Variable	Age	Gender	Area	Education	Pathways	Tacit Knowledge	Practice
Age	1.00						
Gender	-.054	1.00					
Area	-.008	.051	1.00				
Education	-.453**	.123*	.008	1.00			
Pathways	-.372**	.115*	.088	.508**	1.00		
Tacit Knowledge	-.132**	.031	-.029	.062	.056	1.00	
Practice	-.564**	.065	-.080	.443**	.364**	.157**	1.00

Note: **. Correlation is significant at the 0.01 level.

5. Conclusions

This article examined the relevance of Tacit Environmental Knowledge in the environmental management behavior of populations in the Bangkok Metropolis and the surrounding area. This study presented the factors affecting environmental behavior as an important issue of environmental problems in the Bangkok Metropolis and the surrounding area. These factors affected the environmental management behavior of people in Bangkok and the surrounding area. Data were collected by studying documents and reviewing relevant literature, both domestic and international. Through the literature review, the researchers recognized the importance of certain Tacit Knowledge factors since this knowledge is unique to everyone in understanding various elements that affect their behavior and actions (National Science and Technology Development Agency, 2010). Individuals in the Greater Bangkok area and its suburbs had different life experiences and lifestyles, influenced by changes in social structures, values, economic growth, political changes, and technology. All these factors contributed to developing behavior, thoughts, perspectives, and abilities to analyze the Tacit Environmental Knowledge factors and study the Environmental Management Practice of the sample population in the Bangkok Metropolis and the surrounding area. A questionnaire was used to collect the data, which was summarized and presented as frequency distributions and percentages to categorize issues and compare the factors influencing environmental behavior across different age groups.

Results showed that most of the sample population preferred to acquire environmental knowledge through social media, accounting for 66.59%. The next preference was radio at 36.34%, and the least preferred source was newspapers at 17.8%. The highest level of tacit knowledge of the population who lived in the Bangkok Metropolis and the surrounding area was saving water resources skills, with an average score of 0.94, equivalent to 93.66%. The next preference was the knowledge that The Conservation of The Environment is a Public Responsibility, with an average score of 0.89, equivalent to 89.27%, and the lowest level of Tacit knowledge was related to The Contrast Between "Ozone" and "Clean Air", with an average score of 0.10, equivalent to 9.76%. Results aligned with the environmental management behavior, showing that the sample population exhibited the highest level of environmental management behavior in The Repair Practice, with an average score of 1.85, equivalent to 92.44%. The second was Using Energy-Efficient Products Behavior, with an average score of 1.67, equivalent to 83.66%, and the lowest level of environmental behavior was Taking Public Transportation Instead of a Personal Car Behavior, with an average score of 0.38, equivalent to 19.02%. The data from correlation analysis by the SPSS program showed that individual factors of the population in the Greater Bangkok Area and its suburbs, such as education and information sources for environmental news, had statistically significant effects on environmental management behavior at α = 0.01. Furthermore, the Tacit Environmental Knowledge factor significantly correlated with environmentally friendly service usage behavior at a statistically significant level of α = 0.01. If the population receives more education or has more channels to learn about the environment or has more tacit environmental knowledge, the results are an increase in the frequency of environmental behavior among

the population. The Tacit Environmental Knowledge and environmental behavior of the population living in the Bangkok Metropolis and the surrounding area were at the medium level with an average score of 0.57 or 57.49%, and an average score of environmental practices of 1.35, or 67.48%. Therefore, the factors related to Tacit Environmental Knowledge impacted the environmental behavior or practice of the population, concurring with Yao, and Bell (2022) and Boiral (2002). They revealed that individuals with a comparative advantage in Tacit Environmental Knowledge, due to more conducive environments, showed increased learning opportunities with greater skills and experience in environmental management. Similarly, Conor, James, and Chris (2020) found that SMTE (Science, Math, Technology and Environment) managers motivated customers by transferring pro-Tacit Environmental Knowledge to engage in pro-environmental behavior. Having knowledge of the environment in the form of Tacit Knowledge cannot be directly communicated or transmitted through lessons but is crucial for influencing environmental behavior, and a significant indicator in fostering environmentally friendly behavior including actions such as waste sorting, energy conservation, and participating in environmental conservation activities. Individuals with Tacit Knowledge about the environment understand the importance of environmental impact and resource conservation, which contributes to their active involvement in these initiatives.

6. Suggestions

The findings of this research offer Environmental Practice Factors as guidelines and information support to agencies, departments, and ministries involved in managing the environment to effectively benefit the people living in the Bangkok Metropolis and Vicinity. The pro-environmental behavior of population support guideline from the government department, that would tacit environmental knowledge for information create include a sense of responsibility, wisdom, experience, technique, and more of potential in pro-environmental behavior of themselves, When public relations for various campaigns. This tacit environmental knowledge, in addition to sustainable and reduced environmental issues, is also for cultivating the social responsibility of the population to lead to creating respect for the rules of the new Thai culture.

The suggestions for future studies could also explore the involvement of natural and environmental disturbances in sectors affecting environmental issues, such as industry, business, and civil society, for stakeholder analysis or factor analysis of environmental disturbance. Which is to study guidelines with tacit environmental knowledge integration for pro-environmental behavior for another sector, for example, a study of guidelines for kindergarten school students to the growth of pro-environmental behavior by connecting with natural experience activity, a study of guideline to the potential of pro-environmental behavior development of business employees by CSR activity, etc.

Those are activities the indirectly tacit environmental knowledge created for environmental experiences, that for relationship creating between natural or environmental with whom knowledge receiving, have tacit pro-environmental behavior.

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