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Knowledge, Attitudes, and Practices of Stakeholders Towards Sustainable Development Goals 4, 6, And 17 At Antong Falls, Sison, Pangasinan

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Abstract — This study examined the knowledge, attitudes, and practices (KAP) of stakeholders toward Sustainable Development Goals (SDGs) 4 (Quality Education), 6 (Clean Water and Sanitation), and 17 (Partnerships for the Goals) at Antong Falls, Inmalog, Sison, Pangasinan. Tourism has boosted local economic activity, but challenges such as improper waste disposal, limited environmental education, and weak governance threaten sustainability. The research aimed to determine how demographic profiles, age, sex, occupation, frequency of visits, and stakeholder type influence stakeholders' KAP, and to propose a community-based sustainability engagement model.

A quantitative descriptive-correlational design was employed, using a structured survey questionnaire administered to 200 respondents, including residents, tourists, and tourism-related stakeholders. Data were analyzed using frequency counts, percentages, weighted mean, and standard deviation, while inferential statistics, such as ANOVA and Pearson's r, were used to identify differences and relationships among variables.

Findings revealed that stakeholders generally possessed moderate to high knowledge of sustainability concepts and favorable attitudes toward conservation and collaboration. However, practices were inconsistent, particularly in waste management and water conservation, confirming the existence of an "implementation gap." Demographic variables influenced KAP outcomes, and significant relationships among knowledge, attitudes, and practices validated the KAP Model and Theory of Planned Behavior.

Keywords: Knowledge, Attitudes, Practices, Sustainable Development Goals, Eco-tourism

I. INTRODUCTION

Tourism has become one of the fastest-growing industries worldwide, contributing significantly to economic development but also exerting increasing pressure on natural resources and ecosystems. Sustainable tourism, defined as tourism that minimizes environmental impacts, preserves local cultures, and supports local economies, has emerged as a global priority in response to these challenges (Guo et al., 2023). Despite widespread recognition of its importance, issues such as environmental degradation, improper waste management, and weak governance continue to hinder sustainability efforts. This situation underscores the need to examine the knowledge, attitudes, and practices (KAP) of stakeholders in eco-tourism destinations, particularly in developing regions where sustainability frameworks are often underutilized.

International studies highlight the gap between awareness and actual practices in sustainable tourism. Gössling and Hall (2019) emphasized that while tourists often express positive attitudes toward sustainability, their behaviors, such as waste disposal and resource use, do not consistently reflect this awareness. Suntikul and Jachna (2016) further demonstrated that community participation is critical to the success of sustainable tourism initiatives, noting that demographic factors influence levels of engagement. More recent analyses show that governance and partnerships are increasingly central to sustainability research, aligning with Sustainable Development Goal (SDG) 17 on partnerships (Nogueira and Montenegro, 2024). These findings suggest that effective sustainability requires not only knowledge but also collaboration among diverse stakeholders.

In the ASEAN region, the ASEAN Tourism Strategic Plan (2016 – 2025) and the ASEAN Action Roadmap for Sustainable Tourism Development (2024) emphasized integrating sustainability principles into tourism development. However, localized studies remain scarce, especially in lesser-known destinations. Research in Malaysia revealed that while tourists expressed strong attitudes toward sustainability, practices such as water conservation and waste management were inconsistent (Hamzah and Khalifah, 2019). This reflects the importance of SDG 6 (Clean Water and Sanitation), particularly in eco-tourism contexts where water resources are central attractions.

Similarly, studies in Indonesia and Thailand highlighted the need for environmental education programs to strengthen the link between knowledge and practice, aligning with SDG 4 (Quality Education). Nogueira and Montenegro (2024) further noted that global sustainable tourism research increasingly focuses on governance, partnerships, and community-based approaches, aligning directly with SDG 17 (Partnerships for the Goals). Building on these regional insights, the Philippine experience presents its own sustainability challenges.

In the Philippine context, tourism contributes significantly to the economy but faces persistent sustainability challenges, including biodiversity loss, waste management, and community displacement. The Department of Tourism and the Department of Environment and Natural Resources (DENR, 2024) emphasized the importance of environmental education and community participation in the National Ecotourism Strategy, directly linking to SDG 4.

Recent studies provide further insights: Sarinas et al. (2023) conducted a gap analysis of an LGU-managed eco-tourism project in Rizal and Laguna, finding that, while the site aligned with ecotourism principles, issues such as community involvement and environmental education required improvement. Olivar et al. (2025) found significant gaps in awareness among tourists in Davao, while Gamboa and Mendoza (2025) reported active stakeholder engagement in Coron, Palawan, though demographic differences were not statistically significant.

These findings highlight the variability of KAP across different eco-tourism sites and the need for localized research to capture unique dynamics. While these national studies provide valuable insights, localized research is essential to capture the unique sustainability dynamics of specific destinations such as Antong Falls.

Locally, Antong Falls in Inmalog, Sison, Pangasinan, has emerged as a popular eco-tourism destination, attracting both local and international visitors. While tourism has boosted the local economy, issues such as improper waste disposal, unregulated visitor activities, and limited environmental education threaten the site’s sustainability. Sison, Pangasinan, faces a critical challenge: balancing economic benefits with the protection of natural attractions. Environmental education programs offer one effective way to promote sustainable tourism practices.

These programs aim to educate locals and tourists about the environmental significance of sites such as Antong Falls and the importance of responsible behavior, including waste management, resource conservation, and wildlife protection (DENR, 2024). Despite growing studies on sustainable tourism in the Philippines, empirical research on stakeholder KAP toward SDGs 4, 6, and 17 in emerging eco-tourism destinations in Pangasinan, particularly at Antong Falls, remains limited.

The falls exemplify the challenges identified in both global and local literature: the gap between knowledge and practice, the need for community partnerships, and the importance of environmental education (Guo, Zhang, and Li, 2023; Hamzah and Khalifah, 2020). Legal frameworks such as the Philippine National Ecotourism Strategy (DENR, 2024) and the United Nations' 2030 Agenda for Sustainable Development (United Nations, 2020) provide the basis for aligning local initiatives with global sustainability goals.

However, the lack of empirical data on stakeholder KAP in Antong Falls presents a challenge for local government units and tourism operators in designing effective sustainability programs. This study addressed these gaps by assessing stakeholders' knowledge, attitudes, and practices regarding SDGs 4, 6, and 17 at Antong Falls.

Literature Review

This study is anchored on two major theories that provide the scientific basis for investigating knowledge, attitudes, and practices in the context of sustainable development and tourism management. Primarily, the research is grounded on the Knowledge-Attitude-Practice (KAP) Model, which posits that acquiring knowledge leads to a change in attitude, which ultimately results in the adoption of good practices.

According to Launiala (2020), this model suggests that information dissemination creates awareness and understanding, which influences an individual's way of thinking, thereby driving behavioral change and action. Consequently, this theory legitimizes the research questions by validating the need to measure these three distinct but interconnected variables.

It supports the study's design by explaining why gaps exist between what people know and what they do. Recent applications of the KAP model in tourism, such as the study by Olivar et al. (2025), confirmed that, although local tourists in Davao had high awareness of the Sustainable Development Goals (SDGs), their practices were not fully aligned with their knowledge, highlighting a persistent gap between awareness and behavior.

Furthermore, the study is complemented by Ajzen's Theory of Planned Behavior (TPB), which remains highly relevant in contemporary social science research. This theory suggests that behavior is influenced not only by attitude but also by subjective norms and perceived behavioral control. As emphasized by Sharifah et al. (2021), in tourism settings, an individual's intention to perform sustainable practices relies heavily on their confidence and social environment.

More recently, Wut et al. (2023) conducted a systematic review of sustainable tourism research and found that TPB remains a dominant framework for explaining the attitude-behavior and intention-behavior gaps among tourists. Their findings revealed that sustainable tourist behavior is mediated by both attitudes and intentions, reinforcing the importance of TPB in analyzing how demographic and contextual factors influence sustainable practices. Similarly, post-pandemic tourism studies have revisited TPB to explain shifts in tourist behavior, emphasizing its adaptability to evolving contexts (Springer, 2023).

The KAP Model effectively describes the progression from awareness to attitudes and ultimately to practice. However, TPB complements this model by showing that sustainable behavior is also shaped by social norms and perceived behavioral control, which will help show that knowledge and attitudes alone will not suffice in promoting long-term practices, as social factors and the ability to implement them will determine the outcome. The two models, therefore, have aspects that augment each other (KAP combines awareness, knowledge, and practice while TPB takes in social norms and perceived control).

Statement of the Problem

The study aimed to determine the knowledge, attitudes, and practices (KAP) of stakeholders toward Sustainable Development Goals (SDGs) 4 (Quality Education), 6 (Clean Water and Sanitation), and 17 (Partnerships for the Goals) at Antong Falls, Inmalog, Sison, Pangasinan. It examined how stakeholders' demographic profiles influenced their levels of knowledge, attitudes, and practices, and identified creative activities that could enhance local engagement with these SDGs.

Specifically, it sought to answer the following questions:

1. What is the demographic profile of the stakeholders at Antong Falls in terms of:
    a. age;
    b. sex;
    c. occupation;
    d. frequency of visits; and
    e. type of stakeholder?
2. What is the level of stakeholders' knowledge, attitudes, and practices (KAP) in relation to:
    a. SDG 4: Quality Education;
    b. SDG 6: Clean and Water Sanitation; and
    c. SDG 17 Partnership for the Goals?
3. Are there significant differences in stakeholders' KAP levels when grouped according to their demographic and stakeholder profiles?

4. What significant relationships exist among stakeholders' knowledge, attitudes, and practices toward SDGs 4, 6, and 17?

5. Based on the findings, what sustainability engagement model may be proposed?

II. METHODOLOGY

This chapter discussed research design and strategy, the population and locale of the study, data-gathering tools, data-gathering procedures, and data treatment.

Research Design and Strategy

This study adopted a quantitative descriptive-correlational research design, chosen for its effectiveness in describing current conditions and analyzing relationships among variables. The approach was particularly suited to investigating the knowledge, attitudes, and practices (KAP) of local residents, tourists, and other stakeholders regarding sustainable development, specifically SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), and SDG 17 (Partnerships for the Goals), within the context of sustainable tourism and environmental conservation at Antong Falls in Sison, Pangasinan.

The descriptive aspect focused on capturing respondents' existing behaviors, awareness levels, and perceptions regarding sustainability efforts at the site. It offered a clear picture of how different groups understood and participated in conservation initiatives. The correlational component, meanwhile, examined how knowledge, attitudes, and practices were interrelated and how these factors varied according to demographic characteristics such as age, gender, occupation, visit frequency, and stakeholder type.

This helped uncover patterns that influence engagement in sustainable actions and conservation participation. Data were collected using a structured survey questionnaire designed to generate numerical measurements of KAP. These responses were analyzed statistically to

identify significant associations and variations across groups, ensuring an objective assessment of the data.

This research design is well-supported in academic literature. Kurniawan (2024) and de Bruyn (2023) highlight its widespread use in non-experimental studies that aim to describe real-world conditions and explore relationships among variables without intervention. It has proven valuable in revealing behavioral trends that can inform policy and program planning. Polit and Beck (2017) emphasize its appropriateness for studies focused on understanding prevailing attitudes and practices, while Field (2013) underscores its utility in shaping interventions based on empirical findings.

In this study, the design directly addressed the research objectives: assessing the extent of stakeholders' KAP related to SDGs 4, 6, and 17; examining how these vary by demographic profile; and recommending innovative activities to support sustainable tourism and environmental protection at Antong Falls. By linking demographic data with behavioral insights, the study revealed how personal and social factors shape sustainability engagement.

The findings provided a foundation for designing targeted initiatives that promote environmental education, water resource conservation, and multi-stakeholder collaboration, key elements in advancing the selected SDGs locally.

Population and Locale of the Study

The population of this study included three distinct groups: residents of Sison, Pangasinan; tourists visiting Antong Falls; and tourism stakeholders, such as local tour guides, business owners, and government representatives. This diverse target population was necessary to acquire a comprehensive understanding of the differing viewpoints and practices concerning sustainable tourism and environmental conservation at Antong Falls.

To obtain a representative sample from each group, the researchers employed stratified random sampling. The population was stratified by characteristics (locals, tourists, and tourism-

related stakeholders), and random sampling was conducted within each stratum. This ensured a balanced representation of each group's perceptions and experiences.

The study focused on a sample of 200 participants, determined using Slovin's formula with a 95% confidence level and a 5% margin of error, based on an estimated population of approximately 400 stakeholders (residents, tourists, and tourism-related stakeholders combined). The formula applied was:

$$n=N/(1+Ne^2)$$

Where: n – sample size, N – population size, and e – margin of error (0.05)

Substituting the values:

$$n=400/(1+400〖(0.05)〗^2)=400/(1+400(0.0025))=400/(1+1)=400/2=200$$

Thus, the required sample size was 200 respondents. This computation ensured that the results were statistically reliable and representative, providing useful insights into the knowledge, attitudes, and practices of the respective groups regarding sustainable tourism and conservation.

Data Gathering Tool

The primary data collection tool was a structured questionnaire, designed to obtain quantitative information from respondents. It consisted of closed-ended questions, organized in a checklist format, to ensure systematic recording of details. The instrument was developed through a review of the literature on sustainable tourism and conservation to ensure relevance and comprehensiveness.

The questionnaire was divided into two parts. Part I gathered demographic data, including age, sex, occupation, and frequency of visits to Antong Falls. Part II assessed sustainable tourism and conservation practices, focusing on awareness, attitudes, and behaviors. A Likert scale was used to measure attitudes toward conservation, sustainability, and environmental protection. Items also examined practices such as waste disposal, resource use, and participation in sustainable activities, as well as perceived challenges to implementing sustainability.

To establish content validity, the questionnaire was reviewed by an expert panel using the Survey/Interview Validation Rubric for Expert Panel (Simon and White, 2016). Feedback was incorporated into the final version before pilot testing. Following the validation process, the instrument's reliability was also examined to ensure that the items consistently measured the intended constructs.

Reliability was established through Cronbach's Alpha during the pilot test with 30 respondents. The coefficients ranged from 0.8436 to 0.9156, all exceeding the minimum threshold of 0.70 recommended by George and Mallery (2003). According to their guidelines, values between 0.80 and 0.89 are considered Good, while values ≥ 0.90 are Excellent.

The instrument yielded a Cronbach's Alpha of 0.9156 for knowledge (Excellent/ Highly Reliable, 0.8677 for attitudes (Good/Reliable), and 0.8436 for practices (Good/Reliable), indicating good to excellent reliability overall. These results provide strong evidence of internal consistency, reinforcing that the instrument was dependable for capturing stakeholders' perspectives.

Aspects	**Number of Items**	**Cronbach's Alpha**	**George and Mallery Interpretation**	**Transmuted Rating**
Knowledge	10	0.9156	Excellent	Highly Reliable
Attitudes	10	0.8677	Good	Reliable
Practices	10	0.8436	Good	Reliable

The questionnaire was pilot tested with 30 respondents to ensure clarity, consistency, and reliability before full implementation. Results of the reliability analysis confirmed that the instrument was appropriate for deployment in the main study.

For reference, the reliability benchmarks proposed by George and Mallery (2003) are presented below, extended with transmuted ratings for clarity:

Cronbach's Alpha Value	George & Mallery (2003) Interpretation	Transmuted Rating
≥ 0.90	Excellent	Highly Reliable
0.80 – 0.89	Good	Reliable
0.70 – 0.79	Acceptable	Moderately Reliable
0.60 – 0.69	Questionable	Low Reliability
0.50 – 0.59	Poor	Very Low Reliability
< 0.50	Unacceptable	Not Reliable

Data Gathering Procedure

After the questionnaire checklist was finalized, Sison's local government granted permission for the research to proceed. The mayor's office signed off on it, too, together with an endorsement letter addressed to Barangay Inmalog, home of Antong Falls. With those permits and endorsements secured, everything unfolded in accordance with the ethics guidelines and community expectations.

Before administering the questionnaire, participants were provided with an informed consent form. This form explained the purpose of the study, which was to determine the demographic profile of stakeholders in terms of age, sex, occupation, frequency of visits, and type of stakeholder; to assess their knowledge, attitudes, and practices toward SDGs 4 (Quality Education), 6 (Clean Water and Sanitation), and 17 (Partnerships for the Goals); to examine differences and relationships across demographic variables; and to propose creative activities that promote sustainable tourism and environmental conservation. It clarified why they were chosen,

noting that they were either residents of Sison, tourists visiting Antong Falls, or stakeholders in tourism management such as tour guides, business owners, or government representatives.

The informed consent outlined the procedures, stating that participants would answer a structured questionnaire covering demographic profile, knowledge, attitudes, and practices, which would take approximately 20 to 30 minutes in one session. Risks and benefits were explained, emphasizing that the study posed minimal risk, with possible discomforts such as time burden or hesitation to answer questions, but that participants could skip any item.

While direct benefits were not guaranteed, the findings were expected to contribute to a deeper understanding of sustainable tourism and environmental conservation practices, strengthen awareness in schools, and guide the local community in making informed decisions. The form highlighted that participation was voluntary, withdrawal was allowed at any time without penalty, and confidentiality would be strictly maintained.

Names were optional, responses were coded whenever possible, and data were securely stored in password-protected files accessible only to the researcher, adviser, and authorized members of the research team. Contact details for the researcher and the Urdaneta City University (UCU) Research Ethical Review Committee were provided for questions or concerns. At the end of the form, participants signed a consent statement confirming that they understood the study and voluntarily agreed to participate.

III. RESULTS AND DISCUSSION

This chapter presents the results and discussion of the data gathered to address the problems stated in previous chapters. The statistical findings are organized, interpreted, and given implications.

Demographic Profile of Stakeholders at Antong Falls

To establish the respondents' background, the study determined their demographic profile, including age, sex, occupation, frequency of visits, and stakeholder type. This information provided the basis for analyzing differences and relationships in their knowledge, attitudes, and practices (KAP) toward SDGs 4, 6, and 17.

Table 1 presents the frequency and percentage distribution of stakeholders at Antong Falls by age, sex, occupation, visit frequency, and stakeholder type.

As observed in Table 1 on the following page, many of the surveyed subjects were aged 16-25 (59%). Youth participation in eco-tourism was much higher than in the older category, underscoring the need for learning methods tailored to young people. Learning about nature often shifted their views on conservation. Still, actions didn’t always match those beliefs when outside factors got in the way. The KAP framework fit well, showing knowledge led to changed thinking, but real behavior depended on the situation.

Females made up a bit more than half the participants, 55%, compared to 45% male. Although both sexes were present, earlier work by Rahman and Karim in 2022 found that women typically care more about environmental issues. So, chances are, their answers helped lift the general level of eco-awareness seen here, shaping how people knew, felt, and acted on sustainability topics. Students stood out among occupations, taking nearly half the total at 45%; next came those labeled "other" at 16%.

TABLE 1
DEMOGRAPHIC PROFILE OF STAKEHOLDERS AT ANTONG FALLS

Variable	Categories	Frequency (f)	Percentage (%)
Age	16 – 25	118	59
	26 – 35	42	21
	36 – 45	17	8.5
	45 and above	23	11.5
Sex	Male	87	43.5
	Female	110	55
	Prefer Not to Say	3	1.5
Occupation	Student	90	45
	Teacher/ Academic	10	5
	Local Resident	18	9
	Business Owner	15	7.5
	LGU Employee	12	6
	Tourist	17	8.5
	Environmental Advocate	6	3
	Others (OFW, BHW, Employee, Finance, Catechist, Housewife, Delivery, TESDA Trainer, Electrical Engr., Maintenance, Construction Worker, Accounting Officer, SK Chairman)	32	16
Frequency of visits	First Time	68	34
	Once a Year	27	13.5
	2 – 3 Times a Year	48	24
	4 or More Times a Year	35	17.5
	Monthly	22	11
Type of Stakeholder	Tourist	116	58
	Local Community Member	33	16.5
	Government Official	20	10
	Business Operator	7	3.5
	Environmental Organization Member	8	4
	Academe	2	1
	Others (Tourism Labor Unions, Restaurant Workers, Local Farmers, Craftsmen)	14	7

When young learners show up this strongly in the data, it suggests that schools could be key places to plant deeper habits around sustainable living. Teaching these ideas early may help close the space between knowing what's right and doing it.

It turned out that quite a few people coming to Antong Falls were there for the very first time, about 34%. Some showed up now and then, stopping by twice or three times each year, making up nearly a quarter of those asked. Often, they came even more regularly. Because most guests stayed briefly, care for the place relied heavily on passing actions rather than on steady local involvement.

Level of Knowledge, Attitudes, and Practices of along SDG 4: Quality Education, SDG 6: Clean and Water Sanitation, and SDG 17 Partnership for the Goals

SDG 4: Quality Education

To determine how stakeholders understood and applied sustainability concepts in education, the study assessed their knowledge, attitudes, and practices related to SDG 4: Quality Education. This dimension focused on awareness of sustainable tourism and biodiversity conservation, as well as on integrating sustainability into learning.

In analyzing Table 2, it became clear that people connected to Antong Falls showed a strong understanding and favorable views, because they often acted in line with SDG 4: Quality Education. Right away, the scores on knowledge points ranged from 4.31 to 4.39, falling under "Agree" when translated into words. This places respondents at the “Knowledgeable” to “Highly Knowledgeable” level, suggesting they grasped what sustainable tourism meant, saw how tourism affected nature, and valued efforts to protect diverse life forms.

Awareness included understanding limits at tourist spots, as well as learning initiatives focused on long-term environmental care. Knowledge came first, at least according to the KAP idea backed by these results (Launiala, 2020). That knowing something tends to shift how people

feel, or act, wasn't new. In Malaysia, visitors often understood green ideas - Hamzah and Khalifah found that much in 2019. Yet what they did didn't always match up. Behavior lagged behind belief, as seen here.

TABLE 2
LEVEL OF KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARD SDG 4: QUALITY EDUCATION

Dimension	Indicators	Weighted Mean	SD	Verbal Interpretation
Knowledge	I understand the concept of sustainable tourism.	4.33	47.50	Agree
	I know the environmental impacts of tourism activities.	4.32	46.48	Agree
	I understand the importance of biodiversity conservation.	4.39	50.75	Agree
	I am aware of the carrying capacity and its importance in tourism sites.	4.35	46.89	Agree
	I know educational programs related to environmental sustainability.	4.31	45.95	Agree
Attitudes	Educational programs are necessary to promote sustainability.	4.44	54.40	Agree
	Schools and universities should integrate sustainable tourism education into curricula	4.40	52.72	Agree
Practices	I attend environmental awareness programs.	4.04	35.44	Agree
	I promote sustainable tourism practices through social media or community engagement.	4.26	43.15	Agree
	Average Weighted Mean	**4.32**	**47.03**	**Agree**

Legend: 4.50-5.00 – Strongly Agree; 3.50-4.49 – Agree; 2.50-3.49 – Neutral; 1.50-2.49 – Disagree; 1.00-1.49 – Strongly Disagree

In addition, the attitude scores came out a bit higher, 4.40 and 4.44, both still falling under "Agree". This corresponds to a "Positive" to "Very Positive Attitude", showing deep belief among participants in the need for education programs to advance sustainability. Support was strong for bringing lessons on sustainable tourism into schools. This aligns with what Suntikul and Jachna found back in 2016: real progress requires people to be involved, especially through communities and classrooms. The outcomes mirror something else, too: the ASEAN tourism plan for 2016-2025, which made clear that teaching sustainability must become part of how students learn. Because of these upbeat views across groups, SDG 4 is gaining weight as a tool for weaving eco-awareness into every kind of learning space.

Most of the time, actions were rated 4.04 to 4.26, pegged as "Agree". This falls under the "Frequent Sustainable Practice" level, with respondents joining eco-awareness events and promoting green travel tips online or locally. Even so, these numbers trailed behind their knowledge and attitude scores. This confirms the intention–behavior gap: knowledge and attitudes are strong, but practices remain frequent rather than consistent. What shows up here backs what Gössling and Hall (2019) noticed: caring and knowing run deep, yet actual habits sometimes lag. Still, the solid performance hints suggested people tried to turn what they knew into real steps, notably through advocacy and outreach.

Table 3 shows differences in stakeholders' knowledge, attitudes, and practices toward SDG 4: Quality Education, grouped by age, sex, occupation, frequency of visits, and stakeholder type.

Differences in Stakeholders' Knowledge, Attitudes, and Practices When Grouped by Age, Occupation, Frequency of Visits, and Type of Stakeholder Toward SDG 4: Quality Education

Profile Variable	Categories	F-value	p-value	Ho	VI
Age	16 – 25	9.788	0.013	R	S
	26 – 35	4.179	0.073	FR	NS
	36 – 45	1.024	0.414	FR	NS
	45 and above	1.475	0.301	FR	NS
Sex	Male	34.039	0.0005	R	S
	Female	13.155	0.0064	R	S
	Prefer Not to Say	2.556	0.157	FR	NS
Occupation	Student	23.374	0.001	R	S
	Teacher/ Academic	3.543	0.096	FR	NS
	Local Resident	7.776	0.022	R	S
	Business Owner	11.730	0.008	R	S
	LGU Employee	1.848	0.237	FR	NS
	Tourist	6.737	0.029	R	S
	Environmental Advocate	2.541	0.159	FR	NS
	Others	26.008	0.001	R	S
Frequency of visits	First Time	27.409	0.001	R	S
	Once a Year	13.271	0.006	R	S
	2 – 3 Times a Year	4.396	0.067	FR	NS
	4 or More Times a Year	13.163	0.006	R	S
	Monthly	7.588	0.023	R	S
Type of Stakeholder	Tourist	19.093	0.003	R	S
	Local Community Member	11.430	0.009	R	S
	Government Official	1.029	0.413	FR	NS
	Business Operator	16.615	0.004	R	S
	Environmental Organization Member	0.556	0.601	FR	NS
	Academe	1.815	0.242	FR	NS
	Others	8.739	0.017	R	S

Table 3 revealed that age significantly influenced KAP levels, wherein younger participants, ages 16 to 25, showed noticeably stronger understanding and more positive views on sustainable tourism education than older ones - age made a clear difference in outcomes ($F = 9.788$, $p = 0.013$).

Evidence led researchers to abandon the assumption of no effect; instead, it pointed to real variation across age groups. Awareness stood out most in those under 26, suggesting early adulthood may be a key window for learning. The pattern aligns with the idea behind the KAP framework (Launiala, 2020): knowledge tends to precede attitude shifts. Learning first helps shape how people feel about actions later. Support also came from recent work by Sanchez et al. (2025), whose data showed that organized teaching efforts were linked to better behavioral choices in school settings. Even so, those aged 26 to 35 ($F = 4.179$, $p = 0.073$), 36 to 45 ($F = 1.024$, $p = 0.414$), and 45 and above ($F = 1.475$, $p = 0.301$) did not show meaningful variation.

IV. CONCLUSIONS AND RECOMMENDATIONS

The study of Antong Falls in Barangay Inmalog, Sison, Pangasinan, demonstrated that the sustainability of this eco-tourism site depends on bridging the gap between stakeholders' awareness and their actual practices. Residents, tourists, government personnel, and business operators showed a clear understanding of sustainability concepts and expressed favorable attitudes toward conservation. However, practices such as waste management, water conservation, and participation in organized programs were not consistently observed. This "implementation gap" places the ecological integrity of Antong Falls at risk and requires structured reinforcement. On the demographic profile of stakeholders: Age, sex, occupation, frequency of visits, and stakeholder type play a decisive role in shaping knowledge, attitudes, and practices (KAP) toward sustainability. Younger respondents and frequent visitors exhibit stronger awareness and attitudes, while residents and business operators show greater practical involvement. These variations highlight the importance of community-wide cooperation that accounts for demographic and stakeholder diversity. On the level of knowledge, attitudes, and practices toward SDGs 4, 6, and 17: Stakeholders demonstrated Knowledgeable awareness and Positive Attitudes across all three SDGs. For SDG 4 (Quality Education), awareness and values are strong, but practices such as training participation and attendance in awareness programs occurred less frequently, pointing to the need for reinforcement through education. For SDG 6 (Clean Water and Sanitation), knowledge and attitudes were high, and practices such as proper waste disposal, compliance with ordinances, and participation in clean-ups are consistently strong, making sanitation the most

sustained area of engagement. For SDG 17 (Partnerships for the Goals), knowledge and attitudes toward collaboration were positive, but practices were less frequent compared to sanitation. Overall, awareness and attitudes are strong, but practices remain inconsistent, requiring reinforcement to sustain long-term outcomes. On differences in KAP across demographic and stakeholder profiles: Variations were evident for SDG 4 and SDG 6, while SDG 17 showed fewer differences. Younger respondents and frequent visitors engaged more strongly in education, while older respondents and regular visitors were more involved in sanitation practices. Occupation also shaped outcomes, with residents and business operators more practically engaged. These variations indicate that education and sanitation benefit from differentiated strategies responsive to demographic factors, while partnerships depend more on governance and inclusive structures. On relationships among knowledge, attitudes, and practices: Associations varied across SDGs. For SDG 4, attitudes were strongly linked to practices, highlighting the role of values in sustainability education. For SDG 6, knowledge was moderately linked to attitudes and weakly to practices, showing that awareness supports sanitation but requires reinforcement to translate into consistent behavior. For SDG 17, knowledge was moderately linked to practices, demonstrating that understanding partnership principles directly influences collaboration. These associations indicate that sustainability engagement requires different approaches: attitudinal reinforcement for education, structural mechanisms for sanitation, and knowledge-centered strategies for partnerships.

Stakeholders at Antong Falls demonstrated diverse demographic and stakeholder characteristics that shaped their sustainable participation. They showed good knowledge and positive attitudes toward SDGs 4, 6, and 17, yet practices were frequent but not uniform, requiring tailored responses. Variations across sex, age, occupation, frequency of visits, and stakeholder type illustrate that sustainability engagement is heterogeneous. Moreover, the links among knowledge, attitudes, and practices differ by SDG: attitudes drive practices in education, knowledge supports sanitation but needs reinforcement, and knowledge directly influences partnership practices. Sustainable management of Antong Falls rests on informed participation that considers demographic differences, strengthens attitudes and practices through education and behavioral strategies, and reinforces knowledge-based components in partnerships. Together, these elements provide a foundation for community-based stakeholder participation in sustainability. Based on

the study's findings and conclusions, the following recommendations are presented to address the identified gaps and strengthen the sustainability of Antong Falls, Barangay Inmalog, Sison, Pangasinan. These recommendations propose specific, workable interventions tailored to stakeholders' demographic characteristics, reinforcing the knowledge-attitude-practice (KAP) connection, individualizing activities, and enhancing collaboration through knowledge-driven mechanisms. Local Government Units (LGUs) should lead in strengthening sustainability at Antong Falls. They can conduct periodic audits and annual KAP reassessments to monitor progress. Ordinances on waste management and water conservation must be strictly enforced, with penalties and incentives clearly defined. At the same time, LGUs can build inclusive governance by fostering partnerships among residents, schools, businesses, and advocacy groups. Schools play a vital role in shaping environmentally responsible citizens. Integrating sustainability concepts into curricula, with emphasis on values and attitudes, can reinforce awareness. Organizing educational tours to Antong Falls will provide experiential learning opportunities, while student-led campaigns can promote eco-tourism and conservation. These initiatives strengthen the knowledge-attitude-practice connection and instill lifelong responsibility. Tourists must be engaged as active partners in conservation. They can adopt responsible behaviors by minimizing plastic use, complying with local ordinances, and participating in clean-up drives. Tourists are also encouraged to support eco-friendly businesses and promote sustainable practices through peer influence and social media. By doing so, visitors directly contribute to preserving the ecological integrity of Antong Falls. Business operators hold a central role in ensuring eco-tourism remains both profitable and sustainable. They can implement waste segregation, water conservation, and eco-friendly packaging. Collaboration with LGUs and schools on sustainability programs, along with offering incentives to customers who support green initiatives, ensures that business practices align with conservation goals. Finally, future researchers are encouraged to extend this study by conducting longitudinal research to track changes in KAP over time, applying qualitative approaches to capture deeper insights into stakeholder motivations, and undertaking comparative studies across eco-tourism sites in Pangasinan. These strategies will broaden the understanding of sustainability dynamics and strengthen engagement models, ensuring that research continues to inform evidence-based eco-tourism management.

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