



**UNIVERSITY OF THE PHILIPPINES
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MASTER OF ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT

MARIAN JOY C. LIMPIADO

**COASTAL RESOURCE MANAGEMENT ASSESSMENT OF AWARENESS,
PARTICIPATION, KNOWLEDGE AND ATTITUDE, AND PERCEIVED
IMPORTANCE TO SENIOR HIGH SCHOOL STUDENTS FROM SELECTED
PUBLIC HIGH SCHOOLS IN VALENZUELA CITY**

Special Problem Adviser:

PEDCRIS M. ORENCIO, PHD
Faculty of Management and Development Studies

23 March 2026

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Acceptance Page

This Special Problem of **MARIAN JOY C. LIMPIADO** titled: “**COASTAL RESOURCE MANAGEMENT ASSESSMENT OF AWARENESS, PARTICIPATION, KNOWLEDGE AND ATTITUDE, AND PERCEIVED IMPORTANCE TO SENIOR HIGH SCHOOL STUDENTS FROM SELECTED PUBLIC HIGH SCHOOLS IN VALENZUELA CITY**” is hereby accepted by the Faculty of Management and Development Studies, U.P. Open University, in partial fulfillment of the requirements for the **Master of Environment and Natural Resources Management**.

PEDCRIS M. ORENCIO, PHD
Faculty-in-charge, ENRM 290 (Special Problem)

(Date)

KARL ABELARD EDBERTO L. VILLEGAS, JR.
Program Chair

(Date)

FINAFLOR F. TAYLAN, DPROFST
Dean
Faculty of Management and Development Studies

(Date)

DECLARATION

This is to certify that:

- I. The special problem comprises only my original work towards the MENRM except where indicated in the Preface
- II. Due acknowledgment has been made in the text to all other material used
- III. The special problem is fewer than 25,000 words in length, exclusive of tables, maps, bibliographies and appendices.

Marian Joy C. Limpiado

Acknowledgement

I can't even begin to express how grateful I am to God, the Lord above, for carrying me through this entire study. There were days when I felt overwhelmed, on the verge of giving up, but His grace gave me the peace and strength to push forward. This work truly feels like a blessing from Him.

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My high school teachers, wow, thinking back fills me with nostalgia and gratitude. You planted the seeds of curiosity and hard work in me years ago, and here I am, living that out. Your lessons weren't just academic; they shaped who I am today. Thank you from the bottom of my heart.

A massive, heartfelt thank you to the experts who validated my survey questionnaires. Your honest, detailed comments weren't just suggestions, they were game changers that made my research stronger and more credible. I was nervous sharing my work, but your encouragement meant everything.

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Abstract

This study investigates the levels of awareness, participation, knowledge, and attitudes toward Coastal Resource Management (CRM) among Senior High School students in Valenzuela City, a landlocked urban area with indirect links to coastal ecosystems. Employing a mixed-methods approach, quantitative data from surveys revealed moderate awareness of CRM, with strengths in recognizing coastal ecosystem importance and pollution impacts, but notable gaps in knowledge of specific mechanisms like Marine Protected Areas (MPAs). Qualitative insights highlighted barriers to participation, including academic workloads and limited opportunities, underscoring the need for hands-on initiatives such as field trips and clean-up drives.

Demographic analyses showed no significant differences between Grade 11 and Grade 12 students, aligning with Kitolelei and Sato (2016). However, variations emerged across academic strands, with STEM and social science students exhibiting higher participation, knowledge, and perceived importance. Gender differences were evident, as female students displayed greater awareness and commitment, consistent with prior studies (Kitolelei & Sato, 2016). Positive correlations among awareness, participation, knowledge, attitudes, and perceived importance affirmed their interconnectedness, supporting Libelo and Tracy (2022) on awareness campaigns fostering responsible behaviors.

Recommendations include integrating CRM modules into curricula, promoting experiential activities, developing gender-sensitive campaigns, tailoring programs to academic strands, fostering collaborations with local organizations, and leveraging social media. These strategies aim to empower inland youth as stewards of coastal

sustainability, bridging urban-rural divides for effective Integrated Coastal Management (Sabai, 2023).

Keywords: Coastal Resource Management; CRM awareness; student participation; environmental knowledge; Senior High School; Valenzuela City

I. INTRODUCTION

Coastal Resource Management (CRM) is a critical interdisciplinary approach aimed at ensuring the sustainable use and conservation of coastal ecosystems while balancing the socio-economic needs of human populations (Pomeroy & Douvere, 2008). Effective ICM encompasses strategies such as pollution prevention, habitat protection, and community engagement, addressing the multi-faceted challenges faced by coastal ecosystems (Sabai, 2023). The urgency of CRM initiatives has been underscored by global environmental challenges including climate change, coastal erosion, and marine pollution, which threaten coastal ecosystems and adjacent communities (Alongi, 2015). Community education plays a crucial role in enhancing students' understanding by linking their daily experiences to coastal ecosystem health, even within urban settings where direct contact with coastal areas may be limited (OneOcean.org, n.d.).

Valenzuela City, located within Metro Manila, Philippines, offers a distinctive context for exploring CRM awareness and participation among Senior High School students. While Valenzuela is geographically landlocked, it maintains significant connections to coastal ecosystems through its watershed links, urban runoff, and its role within the greater Manila Bay watershed. The city's urban landscape is particularly vulnerable to flooding, a situation exacerbated by its geographical positioning and high density of development. Research indicates that urban poor communities in riverine flood-prone areas, including Valenzuela, face heightened exposure and vulnerability, reflecting trends observed in similar urban environments where social and environmental factors are intertwined (Porio, 2011). Additionally, rapid urbanization has led to a decline in natural drainage and water absorption capacities, further

increasing flood risks during heavy rainfall events (Hammond et al., 2013). As a highly urbanized and industrial city situated in a low-lying area bordered by three interconnecting rivers—the Tullahan, Polo, and Meycauayan, all draining to Manila Bay (Mateo & Lagdameo, 2015), Valenzuela's geographical context underscores the necessity of promoting awareness about coastal stewardship, even among inland populations that indirectly affect coastal health. Therefore, understanding the perceptions and engagement of Valenzuela Public Senior High School students in CRM is essential for fostering a wider discussion on environmental responsibility even in a highly urbanized area.

Targeting Senior High School students as the study's population is strategic given their pivotal role as emerging leaders, decision-makers, and agents of change within their communities. Environmental education at this stage cultivates knowledge, values, and practices essential for sustainable development and societal resilience. By assessing their awareness, participation, knowledge, and perceived importance of CRM, this study aims to generate actionable insights to enhance educational curricula and community engagement strategies tailored to this demographic.

II. REVIEW OF LITERATURE

Coastal Resource Management (CRM) in the Philippines refers to the integrated and sustainable management of coastal and marine resources, encompassing a range of activities designed to conserve the ecological health of coastal ecosystems while supporting the socio-economic needs of local communities. This management approach is essential given the Philippines' extensive coastline, rich marine biodiversity, and reliance on coastal resources for livelihoods, food security, and economic development Lowry et al. (2005).

CRM emphasizes a participatory framework that involves local communities, government agencies, and various stakeholders working collaboratively to achieve management goals. Local Government Units (LGUs), community-based organizations, and non-governmental organizations play pivotal roles in enforcing laws and facilitating compliance with conservation efforts (Calva, 2018). Thus, underlines the necessity for comprehensive education programs that encompass ecological knowledge and socio-economic dimensions of coastal management to foster informed participation.

Kitolelei & Sato (2016) explores how perceptions and knowledge surrounding coastal resource management can differ based on demographic factors and local cultural frameworks, impacting community participation in sustainable practices. The study emphasizes the importance of collective perceptions shaped by environmental awareness, which influences engagement in sustainability initiatives—demonstrating how demographic and psychographic variables inform environmental behavior among coastal populations.

Senior High School students represent a formative demographic for environmental education, given their cognitive development, social influence, and readiness to engage in civic responsibilities. Pramiana & Laksono (2021) suggest that instilling a pro-environmental ethos early in students' academic careers is critical for fostering a culture of sustainability. Schools that implement proactive measures, such as maintaining gardens or organizing clean-up activities, create a conducive environment for students to practice these pro-environmental attitudes. Similarly, Wang et al. (2022) demonstrate how a strong foundation in environmental knowledge enhances students' awareness and influences their behaviors toward environmental sustainability.

Libelo & Tracy (2022) found that targeted environmental awareness campaigns can cultivate responsible environmental behavior among high school students. These campaigns encourage active participation in managing and preserving coastal resources, reinforcing the notion that knowledge translates to action. However, empirical data on CRM-specific awareness and participation among senior high school students remains limited, particularly in non-coastal urban settings like Valenzuela City.

Most existing literature emphasizes coastal or rural communities with direct exposure to marine environments. This geographic bias limits understanding of inland youth's potential contributions to coastal sustainability. Addressing this gap is essential for developing targeted programs that mobilize youth as active custodians of coastal resources even if they are in an urban environment.

III. STATEMENT OF THE STUDY

This study aims to address the existing gap in literature regarding the awareness, participation, knowledge and attitude, and perceived importance to Senior High School students in Valenzuela City regarding Coastal Resource Management (CRM). By focusing on this urban demographic, the research seeks to enhance understanding of inland youth's potential contributions to coastal sustainability.

IV. OBJECTIVES OF THE STUDY

This study provides critical insights for educators, policymakers, and environmental managers seeking to enhance environmental education and coastal stewardship among inland youth populations. Specifically, this study will:

1. Identify the demographic characteristics of the respondents.
2. Determine the differences in level of awareness, extent of participation, knowledge, and perceived importance of CRM based on demographic factors.
3. Qualitative interpretation for CRM awareness, participation, knowledge and attitude, perceived importance and identify which aspects received the most consistent ratings among students.
4. Determine the relationships between awareness, participation, knowledge, and the perceived importance of CRM of the respondents based on correlation analysis.

The findings are expected to inform curriculum development, community outreach, and policy frameworks that harness the potential of Senior High School students as catalysts for sustainable coastal resource management, even from non-coastal urban areas.

V. RATIONALE

This study aims to explore the awareness, participation, knowledge and attitude, and perceived importance to Coastal Resource Management (CRM) of Senior High School students in Valenzuela City, Philippines. Despite being landlocked, these students play a crucial role in fostering environmental stewardship. Current research largely overlooks inland youth's perspectives on coastal issues, creating a gap in these aspects. By addressing this gap, the study seeks to inform educational practices and promote targeted interventions that enhance environmental consciousness among young people in a highly urbanized city, ultimately contributing to sustainable development and the protection of coastal resources for future generations.

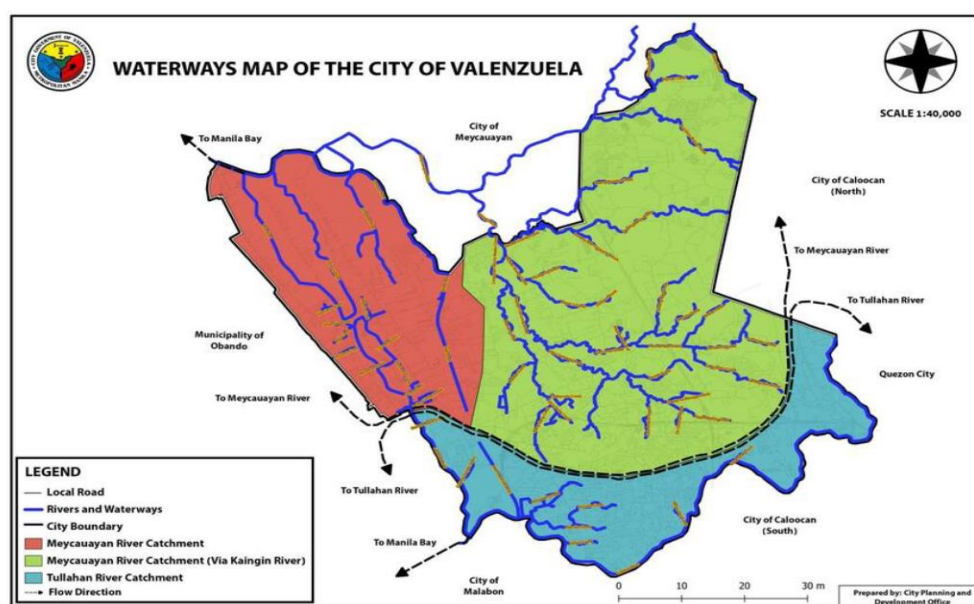
VI. SCOPE AND LIMITATIONS

This study focuses on assessing the awareness, participation, knowledge, attitudes, and perceived importance of Coastal Resource Management (CRM) among Senior High School students in selected public high schools in Valenzuela City, Philippines. It seeks to understand how these students, despite being landlocked, engage with coastal ecosystems. The research analyzes demographic characteristics and explores relationships between various CRM-related factors. While the study is limited to Valenzuela City's Public Senior High School Students, which may not fully represent coastal experiences, it provides valuable insights into the perceptions of inland youth regarding CRM.

VII. DESCRIPTION OF THE STUDY AREA

Valenzuela City, officially the City of Valenzuela, is a highly urbanized city located at the northern edge of Metro Manila in the National Capital Region of the Philippines. Positioned at the estuary where the Polo River meets Manila Bay, it forms part of an estuarine environment linked to coastal wetlands and marshes, which has profoundly influenced its development, vulnerabilities, and resilience strategies in recent decades (Cash, 2021). As a key component of the CAMANAVA urban corridor (Caloocan, Malabon, Navotas, and Valenzuela), the city experiences rapid population growth with 714,978 residents recorded in the 2020 census, expanding housing footprints, and intensifying pressures on land, water, and air resources (City Government of Valenzuela, n.d.). This shared urban continuum is marked by interdependencies among housing, transport, industry, and informal settlements, all situated within a climate- and hazard-prone littoral zone (Espinoza et al., 2018).

Figure 7.1. Waterways Map of the City of Valenzuela (City Government of Valenzuela, 2023).



VIII. METHODOLOGY

The study utilizes a purposive sampling method, descriptive-quantitative and qualitative analysis through the use of validated questionnaire developed by the researcher design to assess the awareness, participation, knowledge, attitudes, and perceived importance of coastal resource management (CRM) among senior high school students in selected public high schools in Valenzuela City.

The primary data collection tool was a structured survey questionnaire to address the objectives of the research. The questionnaire was composed of five parts: Part I focused on the personal profile of the respondents and gathered demographic data, including age, gender, and grade level. Part II assessed the respondents' awareness of CRM through ten carefully constructed questions. Part III evaluated participation in CRM activities with twelve items that examined the frequency and nature of respondents' engagement in related programs. Part IV measured knowledge and attitudes toward CRM via eleven questions, while Part V solicited the respondents' perception of the importance of protecting coastal resources through a single-item query. To facilitate inclusivity and comprehension, the survey was prepared in English with Filipino translation along with an introduction stating the study's objectives, a brief information section about the researcher, and a consent form ensuring confidentiality and the voluntary nature of participation.

To ensure the validity of the survey instrument, the initial draft of the questionnaire was subjected to validation by professionals with expertise relevant to the study. The validators included Mark Gabriel B. De Guzman, RPF, Forester II at the Production Forest Management Section, Conservation and Development Division of Department of Environment and Natural Resources; Ma. Clarissa D. Morano, LPT,

Master Teacher I in the Filipino Department and Jennifer A. San Diego, LPT, Master Teacher I in the English Department both from Bignay National High School; and Engr. Emitterio C. Hernandez, EnP, Department Manager III of the Environmental Regulations Department at the Laguna Lake Development Authority. These experts provided substantive feedback and recommendations regarding the content, structure, and clarity of the questionnaire. Their inputs were reviewed and integrated to enhance the instrument's validity and reliability.

Prior to the actual administration of the survey, a pilot test was conducted with a random sample of senior high school students who were not included in the study. This pilot run served to evaluate the reliability of the questionnaire, with results yielding a Cronbach's Alpha of 0.925 for the Part II questions, 0.866 for Part III, and 0.943 for Part IV. These values indicate good to excellent internal consistency, thus affirming the reliability of the constructed survey questionnaire (George & Mallery, 2003). The data collected from this pilot test were excluded from the main data of the survey questionnaire responses.

Following instrument validation and reliability testing, formal permission to conduct the survey was sought by sending an email to the Schools Division Office of Valenzuela City. Upon receiving approval, school heads and teachers were informed regarding the research. The survey questionnaire was disseminated via a Google Form link supplied to senior high school teachers, who assisted in distributing the instrument to their respective students. The online administration of the survey was intentionally selected to minimize classroom disruptions and to allow students to participate at their convenience. Ultimately, a total of 195 senior high school students from selected public high schools in Valenzuela City participated in the study, all of whom provided informed consent prior to answering the survey.

Upon completion of data collection, the responses were compiled and statistically analyzed using IBM SPSS Statistics software version 25 aligning with the study's research objectives and the nature of the collected data using the statistical analyses Mann-Whitney U Test and the Kruskal-Wallis Test at 0.05 significance level, and Spearman's Rho Correlation at 0.01 level of significance. The interpretation of the composite mean score results for awareness, participation, knowledge, attitudes, and perception on the importance of CRM is measured using the Interval Width formula below.

$$\text{Interval Width} = (\text{Maximum Value} - \text{Minimum Value}) / \text{Number of Categories}$$

IX. RESULTS

A total of 195 senior high school students from selected public high schools in Valenzuela City participated in the study, all providing informed consent prior to completing the survey. The following presents and discuss the key findings on respondents' awareness, participation, knowledge, attitudes, and perceived importance of coastal resource management (CRM).

Figure 9.1. Age of the respondents.

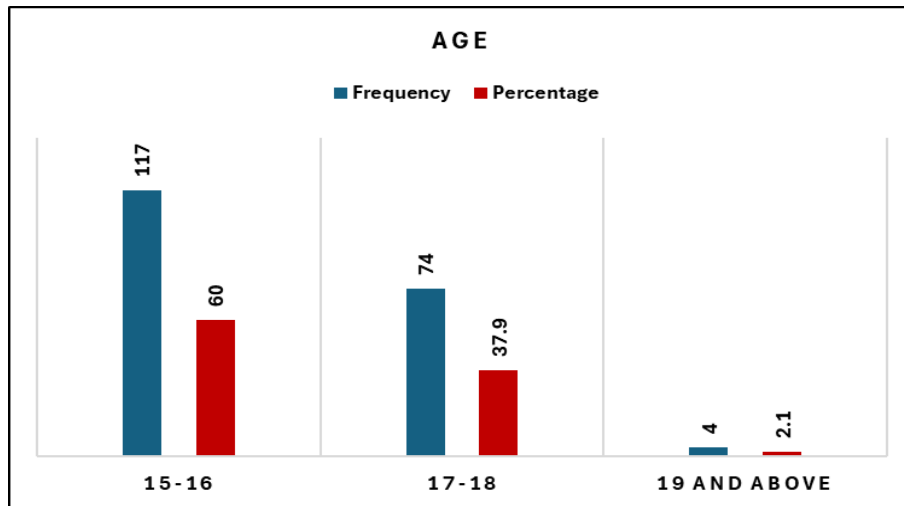


Figure 9.2. Gender of the respondents.

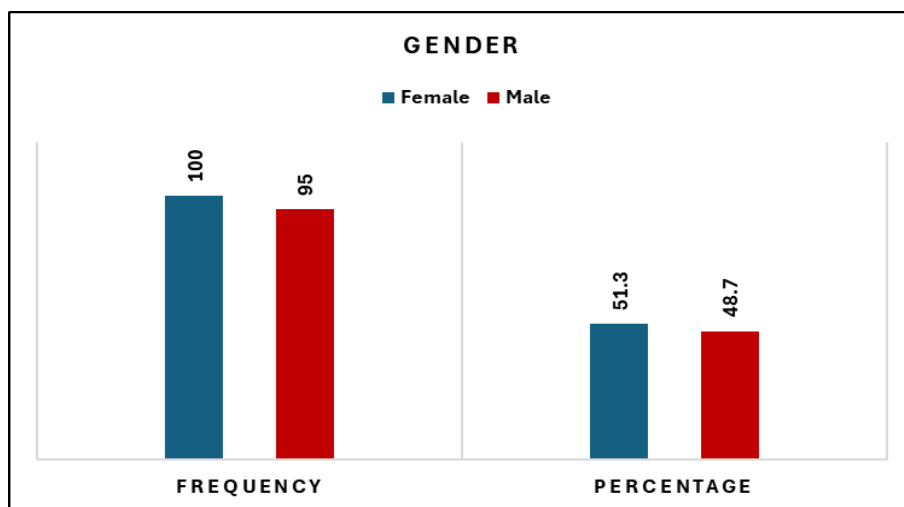


Figure 9.1 reflects respondents' age which the majority were aged 15–16 years, accounting for 117 individuals or 60% of the sample. This was followed by the 17–18 age group, comprising 74 respondents (37.9%), while only 4 respondents (2.1%) were aged 19 and above.

Figure 9.2 shows that the gender distribution was nearly balanced, with females representing 100 respondents (51.3%) and males 95 respondents (48.7%).

Figure 9.3. Grade level of the respondents.

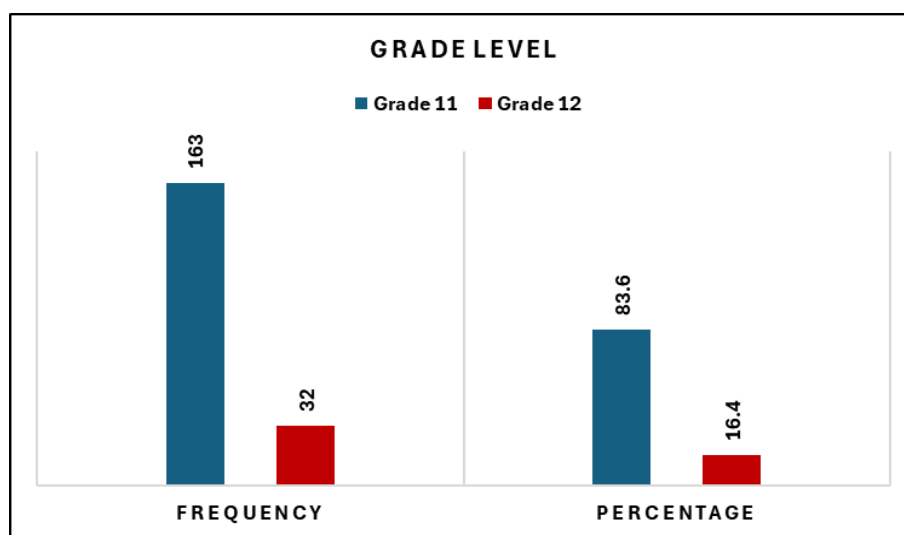


Figure 9.4. Strand of the respondents

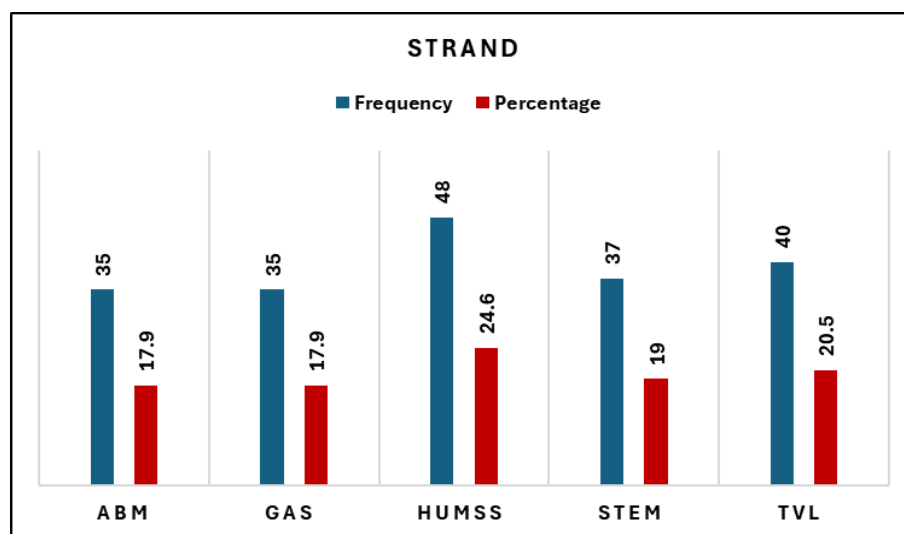


Figure 9.3 indicates significant majority of the respondents were in Grade 11, totaling 163 students (83.6%), while only 32 students (16.4%) were in Grade 12.

Figure 9.4 shows the respondents distribution across various academic strands: HUMSS (Humanities and Social Sciences) had the highest representation with 48 students (24.6%), followed by TVL (Technical, Vocational, Livelihood) with 40 (20.5%), STEM (Science, Technology, Engineering, and Mathematics) with 37 (19%), ABM (Accountancy, Business, and Management) and GAS (General Academic Strand) both with 35 (17.9%) each.

Figure 9.5. Frequency of coastal visits of the respondents.

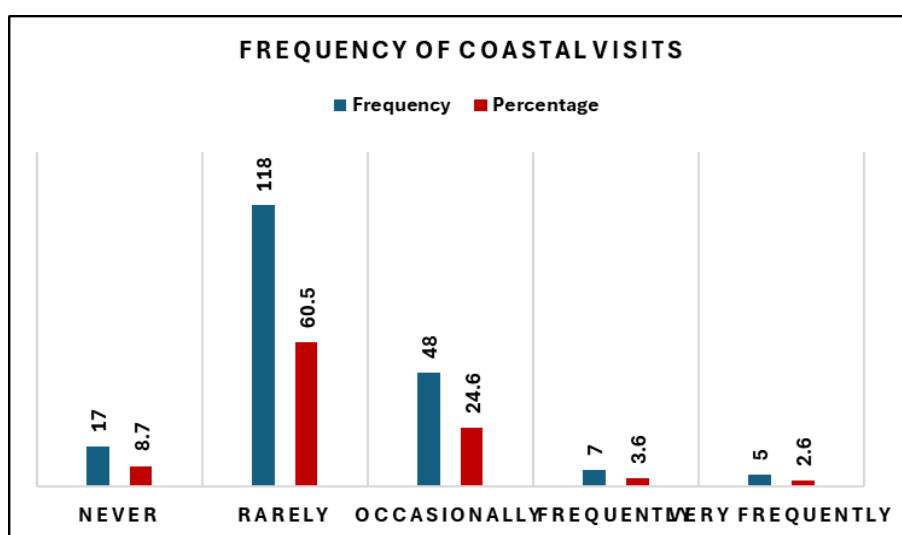
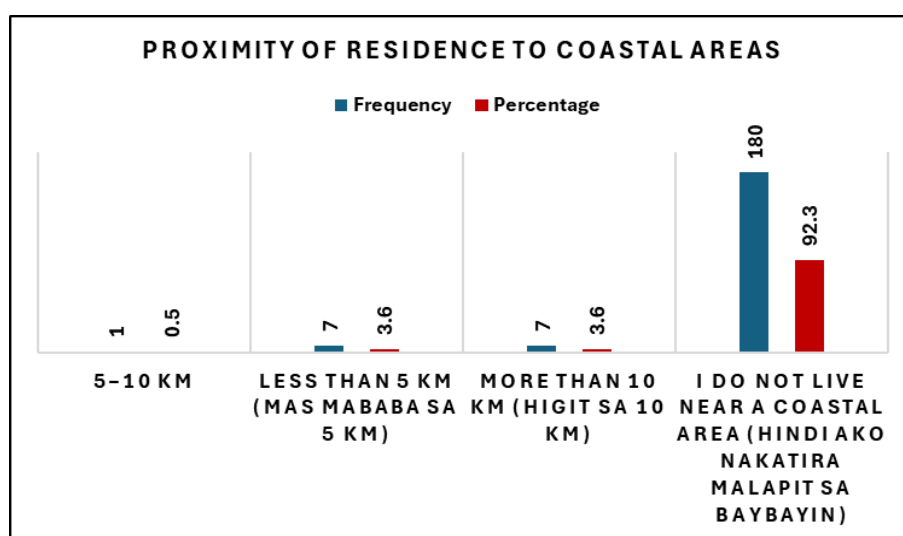


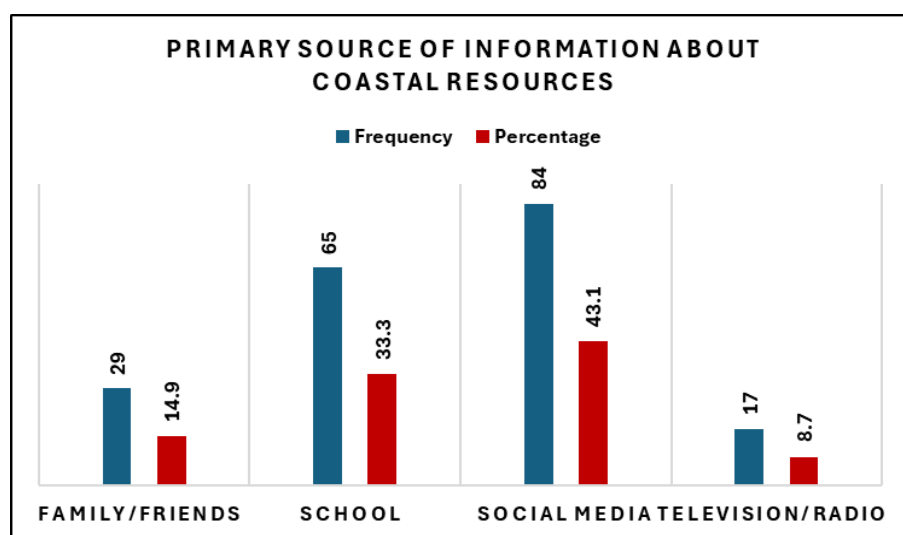
Figure 9.5 reflects that the majority of the respondents rarely visits coastal areas (118 respondents, 60.5%), while 48 (24.6%) visited occasionally. Only 7 (3.6%) visited frequently, and 5 (2.6%) very frequently. Notably, 17 respondents (8.7%) had never visited a coastal area.

Figure 9.6. Proximity of residence of the respondents to coastal areas.



The majority (180 respondents, 92.3%) of the respondents reported were not living near a coastal area. Only 7 (3.6%) lived less than 5 km away, another 7 (3.6%) lived more than 10 km away, and just 1 respondent (0.5%) lived 5–10 km from the coast as shown in Figure 9.6.

Figure 9.7. Primary source of information of the respondents about coastal resources.



Lastly, Figure 9.7 indicates that social media was the most common source of information, with 84 respondents (43.1%). School was the next most frequent source

(65 respondents, 33.3%), followed by family and friends (29 respondents, 14.9%), and television/radio (17 respondents, 8.7%).

These results reveal that the study population is predominantly young, with a balanced gender distribution and a majority from Grade 11. Respondents are well-represented across academic strands but have limited direct exposure to coastal areas, both in terms of residence and frequency of visits. Most students rely on social media and school for information about coastal resources.

The statistical analyses conducted in the following tables 1 to 4 utilized the Mann-Whitney U Test and the Kruskal-Wallis Test at a significance level of 0.05 to examine differences and statistical significance in awareness, participation, knowledge, attitudes, and perceived importance of coastal resource management across various demographic and academic categories.

Table 9.1

Hypothesis Test Summary for Gender

Null Hypothesis	Sig.	Decision
The distribution of awareness of coastal resource management is the same across categories of gender	0.018	Reject the null hypothesis.
The distribution of participation in coastal resource management activities is the same across categories of gender	< 0.005	Reject the null hypothesis.
The distribution of knowledge and attitudes towards coastal resource management is the same across categories of gender	0.067	Retain the null hypothesis.
The distribution of perceived importance of protecting coastal resources is the same across categories of gender	0.013	Reject the null hypothesis.

Note: Asymptotic significances are displayed. The significance level is .05.

The analysis of gender differences in coastal resource management is summarized in Table 9.1. The results indicate significant gender differences in awareness, participation, and perceived importance of coastal resource management, while knowledge and attitudes appear similar across genders.

The null hypothesis regarding awareness was rejected ($p = 0.018$), revealing a statistically significant difference between male and female respondents. This result coincides in the study of Niu et al. (2024) where males are often encouraged to engage in more active and adventurous pursuits that foster a direct connection to nature, potentially leading to higher levels of environmental awareness. In contrast, girls may be directed towards teamwork-oriented projects that, while valuable, might not yield the same level of direct engagement with environmental challenges (Batool et al., 2024). This finding suggests that gender influences awareness levels, highlighting the need for targeted educational interventions to address specific awareness gaps.

The null hypothesis concerning participation in coastal resource management activities was also rejected ($p = < 0.005$), indicating a significant difference in participation rates between genders. This suggests that a curriculum which lacks a gender-sensitive approach can lead to disparities in engagement between boys and girls (Bergman, 2015). Awareness campaigns and community programs may not adequately address the distinct needs and interests of each gender, leading to lower or higher participation rates (Pazoto et al., 2023). This disparity may reflect societal norms that shape how males and females engage with environmental initiatives.

Additionally, the null hypothesis regarding the perceived importance of protecting coastal resources was rejected ($p = 0.013$), showing a significant difference in how male and female respondents value coastal resource protection. A study of

Glass et al. (2015) shows that women are more likely to prioritize sustainability and express a greater commitment to environmental protection, often linking it to community well-being and the preservation of resources for future generations while Tien & Huang (2023) shows that men may prioritize direct economic benefits or the practical usability of coastal resources over broader sustainability concerns.

In contrast, the null hypothesis for knowledge and attitudes was retained ($p = 0.067$), indicating no significant gender difference in this area, suggesting that both genders possess similar levels of knowledge and attitudes toward coastal resource management. This result aligns with the findings of Kuchinka et al. (2018) where both genders often share similar levels of attitudes regarding environmental matters, reflecting a growing understanding of the importance of sustainability and resource management in contemporary society.

Table 9. 2

Hypothesis Test Summary for Grade Level

Null Hypothesis	Sig.	Decision		
The distribution of awareness of coastal resource management is the same across categories of Grade Level	0.307	Retain hypothesis.	the	null
The distribution of participation in coastal resource management activities is the same across categories of Grade Level	0.608	Retain hypothesis.	the	null
The distribution of knowledge and attitudes towards coastal resource management is the same across categories of Grade Level	0.486	Retain hypothesis.	the	null
The distribution of perceived importance of protecting coastal resources is the same across categories of Grade Level	0.696	Retain hypothesis.	the	null

Note: Asymptotic significances are displayed. The significance level is .05.

Reflected in Table 9.2 is the summary of grade level differences in relation to coastal resource management. The p-value results are above p-value 0.05 indicating that there are no significant differences in awareness, participation, knowledge, attitudes, or perceived importance between Grade 11 and Grade 12 students suggesting that these areas related to coastal resource management are uniform across students of both grades. This can be attributed to the similar educational curriculum that both grades typically receive which cover coastal resource management (Kitolelei & Sato, 2016). As both groups may have access to similar extracurricular activities, projects, or community engagement opportunities related to coastal management, this shared exposure further diminishes potential differences between the two grades.

Table 9.3

Hypothesis Test Summary for Age

Null Hypothesis	Sig.	Decision
The distribution of awareness of coastal resource management is the same across categories of age	0.777	Retain the null hypothesis.
The distribution of participation in coastal resource management activities is the same across categories of age	0.619	Retain the null hypothesis.
The distribution of knowledge and attitudes towards coastal resource management is the same across categories of age	0.752	Retain the null hypothesis.
The distribution of perceived importance of protecting coastal resources is the same across categories of age	0.388	Retain the null hypothesis.

Note: Asymptotic significances are displayed. The significance level is .05.

Similarly, the p-values obtained for age differences in relation to coastal resource management as shown in Table 9.3 are above p-value 0.05 which indicates no significant differences across age groups in terms of awareness, participation, knowledge, attitudes, or perceived importance of coastal resource management which imply that educational and outreach efforts related to coastal resource management are consistent in terms of level of understanding and engagement regardless of age category.

Table 9.4

Hypothesis Test Summary for Strand

Null Hypothesis	Sig.	Decision
The distribution of awareness of coastal resource management is the same across categories strand	0.229	Retain the null hypothesis.
The distribution of participation in coastal resource management activities is the same across categories of strand	0.022	Reject the null hypothesis.
The distribution of knowledge and attitudes towards coastal resource management is the same across categories of strand	0.044	Reject the null hypothesis.
The distribution of perceived importance of protecting coastal resources is the same across categories of strand	0.031	Reject the null hypothesis.

Note: Asymptotic significances are displayed. The significance level is .05.

Furthermore, the results for the differences across academic strands in relation to coastal resource management reveal both areas of uniformity and significant variation among students from different strands as summarized in Table 9.4.

The null hypothesis for awareness of coastal resource management was retained ($p = 0.229$), indicating no significant difference in awareness levels across the various academic strands. This suggests that, regardless of academic specialization, students have similar levels of awareness about coastal resource management, likely due to shared educational experiences or access to common information sources within the school.

In contrast, significant differences were observed in participation, knowledge and attitudes, and perceived importance of coastal resource management. The null hypothesis for participation was rejected ($p = 0.022$), indicating that students' involvement in coastal resource management activities varies significantly by strand. Similarly, the null hypothesis for knowledge and attitudes was rejected ($p = 0.044$), as was the null hypothesis for perceived importance of protecting coastal resources ($p = 0.031$). These findings suggest that students' academic backgrounds influence not only their engagement in related activities but also their depth of understanding and the value they place on coastal resource protection. Targeted education enhances students' knowledge, leading to greater engagement and a deeper appreciation of the subject matter as discussed by Setiamurti et al. (2023). For example, students enrolled in strands with a focus on science, technology, or social sciences may have often receive tailored curriculum that explicitly address environmental issues including coastal resource management, leading to higher

participation rates, greater knowledge, and a stronger sense of the importance of coastal resource management compared to those in other strands.

Table 9.5

Interpretation of Coastal Resource Management Composite Mean

Range	Awareness	Participation	Knowledge and Attitudes	Perceived Importance
1.00 - 1.80	Not Aware	Never	Strongly Disagree	Not Important
1.81 - 2.60	Slightly Aware	Once or twice a year	Disagree	Slightly Important
2.61 - 3.40	Moderately Aware	A few times a year	Neutral	Moderately Important
3.41 - 4.20	Much Aware	Monthly	Agree	Important
4.21 - 5.00	Very Aware	More than Once a Month	Strongly Agree	Very Important

Table 9.6

Standard Deviation and Central Tendency for Awareness

	N		Mean	Median	Mode	Std. Deviation
	Valid	Missing				
AQ1	195	0	3.33	3.00	5	1.401
AQ2	195	0	3.47	4.00	5	1.329
AQ3	195	0	2.96	3.00	3	1.290
AQ4	195	0	2.25	2.00	1	1.207
AQ5	195	0	3.27	3.00	5	1.366
AQ6	195	0	2.59	2.00	2	1.291
AQ7	195	0	2.51	2.00	2	1.274
AQ8	195	0	3.69	4.00	5	1.288
AQ9	195	0	3.33	3.00	5	1.326
AQ10	195	0	3.36	3.00	5	1.326
Composite Mean			3.08	Moderately Aware		

Note: AQ1... - awareness of coastal resource management item 1 on the survey questionnaire and so on.

Table 9.7*Standard Deviation and Central Tendency for Participation*

	N		Mean	Median	Mode	Std. Deviation
	Valid	Missing				
PQ1	195	0	1.72	1	1	0.95
PQ2	195	0	1.92	2	1	1.047
PQ3	195	0	1.85	1	1	1.102
PQ4	195	0	2.28	2	2	1.199
PQ5	195	0	1.95	2	1	1.163
PQ6	195	0	2.42	2	1	1.295
PQ7	195	0	2.61	2	2	1.359
PQ8	195	0	2.76	2	2	1.331
PQ9	195	0	3.48	4	5	1.375
PQ10	195	0	2.97	3	2	1.526
PQ11	195	0	3.52	4	5	1.517
PQ12	195	0	3.12	3	5	1.503
Composite Mean			2.55	Once or twice a year		

Note: PQ1... - participation in coastal resource management activities item 1 on the survey questionnaire and so on.

Table 9.8*Standard Deviation and Central Tendency for Knowledge and Attitudes*

	N		Mean	Median	Mode	Std. Deviation
	Valid	Missing				
KQ1	195	0	4.12	5	5	1.353
KQ2	195	0	3.51	4	4	1.211
KQ3	195	0	3.70	4	5	1.325
KQ4	195	0	3.86	4	5	1.385
KQ5	195	0	4.03	5	5	1.356
KQ6	195	0	3.98	5	5	1.324
KQ7	195	0	3.84	4	5	1.337
KQ8	195	0	3.70	4	4*	1.275
KQ9	195	0	3.69	4	5	1.354
KQ10	195	0	3.41	4	4	1.294
KQ11	195	0	3.78	4	5	1.35
Composite Mean			3.78	Agree		

Note: KQ1... - knowledge and attitudes towards coastal resource management item 1 on the survey questionnaire and so on.

** Multiple modes exist. The smallest value is shown.*

Table 9.9

Standard Deviation and Central Tendency for Perceived Importance of CRM

N		Mean	Median	Mode	Std. Deviation
Valid	Missing				
195	0	4.6	5	5	0.756
Very Important					

The analysis of central tendency and dispersion for awareness, participation, knowledge and attitudes, and perceived importance of coastal resource management reveals important patterns in students' perspectives and behaviors. The composite mean for awareness is 3.08, interpreted as Moderately Aware, with the most frequent response (mode) being 5 (Very Much Aware) for several items, such as awareness of the importance of coastal ecosystems (AQ1), the impact of pollution (AQ2), and the economic benefits of sustainable coastal tourism (AQ5). This suggests that a substantial proportion of students possess a high level of awareness in these key areas.

However, it is notable that for awareness of the role of Marine Protected Areas (AQ4), the mode is 1 (Not Aware), indicating a significant gap in students' knowledge of specific regulatory and conservation mechanisms. This can be attributed to educational systems which do not prioritize marine science, resulting in students receiving little formal education about coastal ecosystems and the importance of MPAs (Wen & Lu, 2012). Social media and school are identified as the primary sources

of information about coastal resources, with 43.1% of respondents citing social media and 33.3% indicating school as their main channels, underscoring the importance of these platforms for awareness-raising efforts.

For participation, the composite mean is 2.55, corresponding to Once or twice a year. While the highest mode of 5 (More than Once a Month) is observed for items related to proper trash disposal (PQ9), compliance with local rules (PQ11), and supporting sustainable local businesses (PQ12), the mode for most participation items is 1 (Never). This pattern highlights that, although some responsible behaviors are practiced regularly, the majority of students have never engaged in organized coastal resource management activities such as clean-up drives, tree planting, or volunteering for marine conservation organizations. This limited participation is further explained by qualitative data on barriers to involvement, where the most frequently cited reasons for non-participation include lack of time due to schoolwork, lack of awareness of opportunities, and transportation difficulties. These findings suggest that structural and informational barriers, rather than a lack of interest or negative attitudes, are the primary constraints to student engagement in coastal management activities. These can further be contextualized by the fact that most respondents rarely visit coastal areas and do not reside near the coast, which may significantly restrict their opportunities for direct participation in coastal resource management activities.

In terms of knowledge and attitudes, the composite mean is 3.78, interpreted as Agree, with the mode being 5 (Strongly Agree) for most items. This reflects a strong consensus among students regarding the importance of coastal resources, the necessity of education and law enforcement, and the value of personal responsibility in coastal resource management. Specific items such as KQ1 (the importance of

protecting coastal resources) and KQ3 (the role of education in promoting awareness) received particularly high agreement. The prevalence of the highest mode in these items indicates that positive attitudes and a sense of responsibility are widely shared, even if actual participation is limited. Students expressed a desire for more educational initiatives, such as seminars and hands-on activities, to enhance their understanding and engagement with coastal issues. Suggestions included organizing field trips to coastal areas, conducting awareness campaigns, and implementing programs that promote responsible waste disposal and the protection of marine ecosystems.

For perceived importance, the mean score is 4.6, with both the median and mode at 5 (Very Important), and a relatively low standard deviation of 0.756. This demonstrates overwhelming agreement on the critical importance of protecting coastal resources for future generations.

Table 9.10

Spearman's Rho Correlation Analysis between awareness, participation, knowledge, and the perceived importance of CRM

	Awareness	Participation	Knowledge and Attitude	Perception on Importance of CRM
Correlation Coefficient	1	.509**	.487**	.331**
Awareness Sig. (2-tailed)	.	< 0.001	< 0.001	< 0.001
N	195	195	195	195

Participation	Correlation Coefficient	.509**	1	.334**	.205**
	Sig. (2-tailed)	< 0.001	.	< 0.001	0.004
	N	195	195	195	195
Knowledge and Attitude	Correlation Coefficient	.487** < 0.001	.334** < 0.001	1	.367**
	Sig. (2-tailed)			.	< 0.001
	N	195	195	195	195
Perception on Importance of CRM	Correlation Coefficient	.331**	.205**	.367**	1
	Sig. (2-tailed)	< 0.001	0.004	< 0.001	.
	N	195	195	195	195

Note: ** Correlation is significant at the 0.01 level (2-tailed).

The Spearman's Rho correlation analysis reveals significant positive correlations among the variables, indicating that increased awareness is associated with higher levels of participation, knowledge, and a stronger perception of the importance of coastal resource management (CRM), as illustrated in Table 9.10.

The correlation coefficient between awareness and participation is 0.509, which is statistically significant ($p < 0.01$). This suggests that higher levels of awareness are associated with increased participation in coastal resource management activities. This finding aligns with previous observations that while students exhibit moderate to high awareness of coastal issues, their actual participation remains limited. The barriers to participation, such as lack of time and awareness of opportunities,

may hinder the translation of awareness into action.

Furthermore, the correlation between awareness and knowledge and attitudes is 0.487 which is also significant. This indicates that students who are more aware of coastal issues tend to have more positive attitudes and greater knowledge regarding CRM.

The analysis also reveals a correlation coefficient of 0.334 between participation and knowledge and attitudes, suggesting that students who actively participate in CRM activities are likely to possess more favorable attitudes and a better understanding of coastal issues.

Lastly, the correlation between the perception of the importance of CRM and awareness, participation, and knowledge and attitudes is noteworthy. The correlation coefficients of 0.331, 0.205, and 0.367, respectively, indicate that students who perceive CRM as important are more likely to be aware of coastal issues, participate in related activities and hold positive attitudes towards conservation efforts.

These findings align with Putri et al. (2018) which identifies that education significantly shapes community perceptions and involvement in managing coastal resources, emphasizing that when community members understand the importance of sustaining these ecosystems, they are more likely to engage proactively in conservation efforts.

X. ANALYSIS AND DISCUSSION

This study highlights the critical importance of Coastal Resource Management (CRM) awareness, participation, knowledge, and attitudes among Senior High School students in Valenzuela City, a landlocked urban area with indirect connections to coastal ecosystems. The findings reveal a moderate level of awareness among students regarding CRM, with notable strengths in understanding the significance of coastal ecosystems and the impacts of pollution. However, gaps exist, particularly in knowledge about specific conservation mechanisms such as Marine Protected Areas (MPAs), as indicated by low awareness scores associated with these topics. This aligns with Pomeroy & Douvere (2008), who emphasize that effective CRM requires a comprehensive understanding of both ecological and socio-economic dimensions.

Qualitative data collected during the study further illuminate the reasons behind the limited participation in CRM activities. Many students cited structural barriers, such as time constraints due to academic workloads and a lack of awareness regarding available opportunities for engagement. For instance, students expressed a desire for more hands-on activities and educational initiatives, such as field trips to coastal areas and community clean-up drives, which could enhance their understanding and involvement in CRM. This gap between awareness and participation emphasizes the need for targeted educational initiatives that not only improve students' knowledge about CRM but also encourage them to actively engage in CRM practices. As Sabai (2023) notes, effective Integrated Coastal Management (ICM) strategies must address the multifaceted challenges faced by coastal ecosystems, which can be achieved through community education that links students' daily experiences to coastal health, even in urban settings.

Demographic factors, particularly age and academic strand, significantly influence awareness and participation levels. The study found no significant differences in awareness, participation, knowledge, attitudes, or perceived importance of CRM between Grade 11 and Grade 12 students, suggesting that both groups receive similar educational experiences related to CRM (Kitolelei & Sato, 2016). However, significant variations were observed across different academic strands. Students enrolled in strands focused on science, technology, or social sciences exhibited higher participation rates, greater knowledge, and a stronger sense of the importance of CRM compared to those in other strands. This indicates that targeted education can enhance students' understanding and engagement, as discussed by Setiamurti et al. (2023).

Moreover, the analysis revealed significant gender differences in awareness and participation levels. Female students demonstrated higher levels of awareness and perceived importance of CRM, consistent with findings from Kitolelei & Sato (2016), which indicate that demographic factors can shape environmental perceptions and behaviors. This suggests that educational programs should consider gender-specific approaches to foster greater engagement among all students.

The positive correlations observed between awareness, participation, knowledge, attitudes, and perceived importance of CRM further emphasize the interconnectedness of these factors. The results indicate that enhancing awareness can lead to increased participation and a stronger commitment to coastal stewardship. This is supported by Libelo & Tracy (2022), who found that targeted environmental awareness campaigns can cultivate responsible environmental behavior among high school students.

XI. CONCLUSION AND RECOMMENDATION

This study shows that Senior High School students in Valenzuela City, despite living in a landlocked and highly urbanized area, still hold an important role in Coastal Resource Management (CRM) because every day urban activities remain connected to coastal health through waste, waterways, and consumption. The results reflect a moderate level of CRM awareness: students generally understand the importance of coastal ecosystems and the effects of pollution, but many remain unfamiliar with specific conservation strategies such as Marine Protected Areas (MPAs).

Participation in CRM-related activities is relatively low, not mainly due to lack of concern, but because of practical barriers such as heavy academic demands and limited information about available opportunities; at the same time, students clearly express interest in hands-on learning like field trips, clean-up drives, and workshops, highlighting a gap between what they know and what they get to do.

Differences between Grade 11 and Grade 12 are minimal, suggesting similar exposure to CRM content across year levels, while differences across academic strands are evident, with students in STEM and HUMSS strands showing higher participation, knowledge, and perceived importance of CRM.

Gender differences also appear, as female students report higher awareness and perceived importance, pointing to the value of approaches that engage all learners effectively.

Overall, the positive links among awareness, participation, knowledge, attitudes, and perceived importance suggest that improving learning content and creating clearer avenues for involvement can strengthen students' commitment to

environmental stewardship even from an inland setting.

Based on these findings, curriculum enhancement becomes a practical priority by expanding CRM coverage beyond general concepts and including clearer, student-friendly discussions on MPAs, habitat protection, pollution prevention, and how inland cities contribute to coastal problems and solutions. Learning experiences can be made more engaging through regular, doable activities such as school and community-based clean-up drives, waste audits connected to marine litter, watershed to coast projects, and well-planned exposure trips or virtual field experiences that fit academic schedules.

Information about CRM opportunities can be made more visible through coordinated school announcements and active use of social media, where many students already get their information, including student-led campaigns and discussion spaces. Strand-based activities can be developed to connect CRM with students' interests and competencies (e.g., STEM-focused monitoring projects or HUMSS-centered advocacy and community organizing), while gender-responsive strategies can be integrated to widen participation and sustain interest across groups.

Stronger collaboration with LGUs, NGOs, and community organizations can also open safer, more consistent, and more structured opportunities for student involvement, allowing Valenzuela learners to contribute meaningfully to CRM efforts even without direct access to coastal areas.

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