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# The Role of Place Attachment in Building Community-Based Solid Waste Management Practices in the Municipality of Calauan, Laguna

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## Abstract

Place attachment has been studied over the past years in the realm of environmental psychology and social sciences. The study explores the place attachment of the residents of Calauan, Laguna, a second-class municipality in the Philippines which faces a very challenging waste problem. Further, the study aims to characterize the degree of place attachment of the residents, determine residents' environmentally responsible behavior in accordance with their place attachment, and explain the role of place attachment in building community-based solid waste management (SWM) practices in the locality. The study used a 5-point Likert scale questionnaire incorporating socio-demographic characteristics, three (3) parameters of place attachment (place identity, nature bonding, and community ties), and concept of environmentally responsible behavior. Findings revealed that place attachment of the residents, as determined by the three parameters used, were at a high level — a means in having a positive role in building SWM practices. Consequently, decision-making influenced by active citizenry and participatory planning will eventually trigger a holistic and ecologically sound intervention towards the environment.

**Keywords**— environmentally responsible behavior, place attachment, sense of place, solid waste management

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## 1 Introduction

Waste generation is a global concern that seeks serious attention. As the world population continues to increase with rapid urbanization taking place, billions of tons of wastes were also expected to be generated [1]. The waste generation process, particularly poor solid waste disposal, contributes to climate change, biodiversity loss, and various kinds of pollution [2]. Since development is multidimensional, solutions in reducing wastes require an extensive yet transformational shift in terms of action planning, policy implementation, reforms, and behavioral and social changes [3]. Efficient solid waste management (SWM) when put into practice by government administrators can be an indicator of good governance. An effective SWM practice will help reduce mitigation impacts to various sectors such as health, economy, and environment [4].

## 1.1 Waste Management in Calauan, Laguna

In the Philippines, Republic Act No. 9003 or “Ecological Solid Waste Management Act of 2000” is a national legislation in response to the continuous waste mismanagement in the country which was enacted to provide a systematic and comprehensive program creating a blueprint of ecologically sound interventions and maximize widespread conservation and protection of resources [5]. However, years after RA 9003’s implementation, the Philippines still ranks as one of the top polluters in terms of waste generation globally. The country produces at least 61,000 million metric tons of waste daily, 24% of which are plastic wastes [6]. Lack of political will, which undermines the drive for sustainable development and achieving zero-waste movement, was identified as one the underlying factors to poor SWM implementation [7]. According to the Asian Development Bank [7], local government units (LGUs) play a critical role in spearheading programs, projects, and activities (PPAs) relating to minimizing the waste problem.

Like other areas, LGU Calauan still struggles with increasing waste generation, with an annual projected waste generation of 23,047.41 metric tons. Solid wastes in Calauan are collected in both household and non-household sources, with the Municipal Environment and Natural Resources Officers (MENROs) leading the coordination and facilitation of SWM. Further, the municipality implements ordinances including regulating the use of plastic, total banning of styrofoam packaging, and proper waste segregation which have corresponding penalties on offenders [8]. With repetitive practices and lack of discipline in waste management starting from source (household level), LGU Calauan continues to struggle in adopting best SWM practices from neighboring towns. Thus, in addressing these pressing issues, a whole-of-society approach must fuel individuals’ basic motivation of place attachment and improve community participation towards a healthier environment.

## 1.2 Concept of place attachment

Communities are a significant source of social cohesion that influences an individual’s well-being. As time passes by, people tend to digest psychological resources from their peers, including the location they are in. The situation can be identified as matters relating to the human geographical setting wherein people and places are amongst the two crucial elements to focus on. Sense of place is not only seen in the physical and/or built-up environment but is also psychological in nature [7, 9]. As it varies per individual from time to time, it may delve into very subjective judgments which are associated with community dynamics affecting environmental behaviors of people living in a specific place since the beginning [10].

Because place attachment is multi-dimensional, it does not directly translate into a cause and effect relationship or perhaps a causal circular circumstance. Hence, a harmonized relationship of the one exposed in the environment taking the behavior and experiences equates to either a positive or negative treatment [11].

Place attachment is a testament to spending time in one’s neighborhood, to build relationships, and to talk to locals. Social capital allows a deeper understanding of people effectively working together to achieve a goal. These efforts often lead in a social capital development, mainly a communal agreement to improve community setting.

## 1.3 Community action and place attachment

Place attachment resonates positively-factored community bonds, capping experiences and awareness experienced over time. It is therefore interlinked with community-based cognitions. People who are often exposed to environmental domains have natural outlook relating to behaviors, especially when placed under environmental scenarios [12]. Community attachment primarily occurs when bonds to places and people are aggregated [13]. Oftentimes, communication is a factor influencing social cohesion to which those with high sense of attachment (tenure, sustainability,

design, among others) enables community trust and room for strengthened relationships through coordination and collaboration [14]. Actions done by individuals in one place is considered a strong output of the integration of perceptions across identities in communities which synergize each other [15].

Accordingly, the municipality was chosen since it has been a resettlement area of informal settlers from Metro Manila through the 'Bayan ni Juan and Kapit-Bisig para sa Ilog Pasig Project' by ABS-CBN Foundation, resulting in doubling its population from 74,890 (2010) to 87,693 (2020). Additionally, one of the dumpsites in Calauan located in Barangay Dayap is not operational due to problems on its land use as it is prone to liquefaction [16]. Hence, municipal wastes are being collected and disposed of in other areas due to the area's unabling carrying capacity in handling municipal wastes. Segregating wastes from source has been a long concern of the management since then [17].

In terms of land use, the materials recovery facility (MRF) has the least percentage with 0.02%, meaning that the locality still experiences scarce facilities when it comes to managing wastes.

The paper sought to understand the importance of place attachment of local residents of LGU Calauan. It aims to characterize the degree of place attachment of the residents and to determine residents' environmentally responsible behavior regarding SWM, as the community practically experiences waste reduction and segregation measures to produce a positive response meant for their own practices towards the environment.

In this study, the interplay of person, place, and environment can be coupled towards shared attainment of pro-environmental behaviors and community action. It will allow SWM practices to prosper in a community-based manner, adding to the mitigation efforts of the locality.

#### 1.4 Place attachment and solid waste management

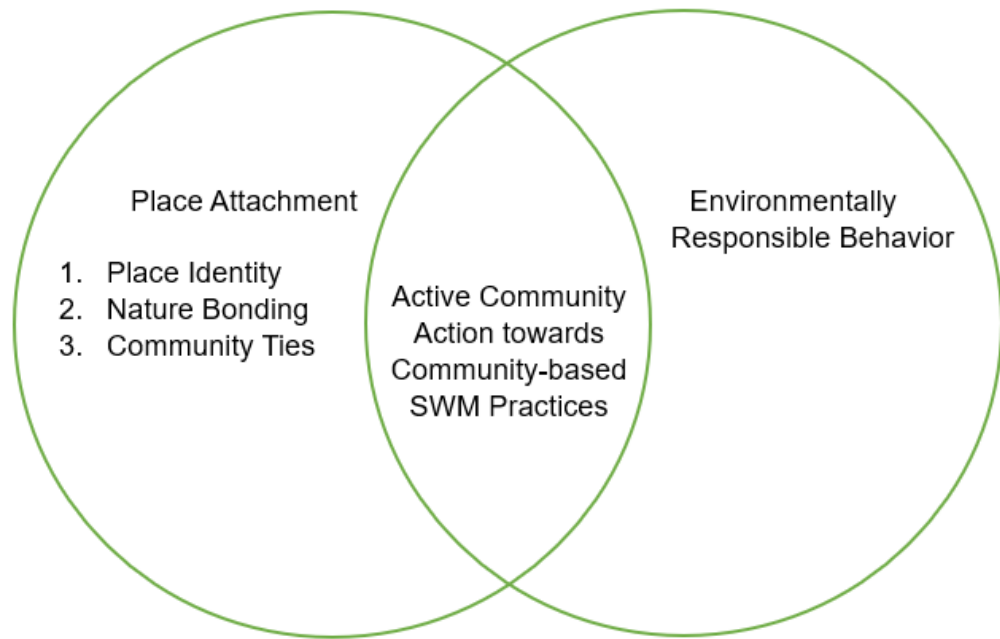
Place attachment can be an important antecedent on developing an individual's attitude and pro-environmental behavior. Hence, place attachment radiates a positive effect and intentions when applied in place proactive programs such as SWM where everyone is involved [18]. Although the Philippines has a dedicated provision for its waste situation, its implementation on the ground by frontliners (LGUs) seems weak, needing progress in terms of imposition. As LGU Calauan is a rural area, it may influence the fact that communities may take in stronger attachment in enhancing ecological well-being and create a sense of environmental responsibility for the greater good [19].

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**Figure 1.**

The interrelationship of the dimensions of place attachment, environmentally responsible behavior, and community action

Figure 1 shows a diagram that underpins place attachment (with its parameters) when combined with the concept of environmentally responsible behavior, resulting in an active citizen action towards community-based SWM practices.

Place attachment developed into a behavioral aspect can be incredibly impactful in an individual. Meanwhile, the behavioral dimension of attachment can be seen through actions. Later on, environmentally responsible behavior will be attained coming from direct contact with the environment.

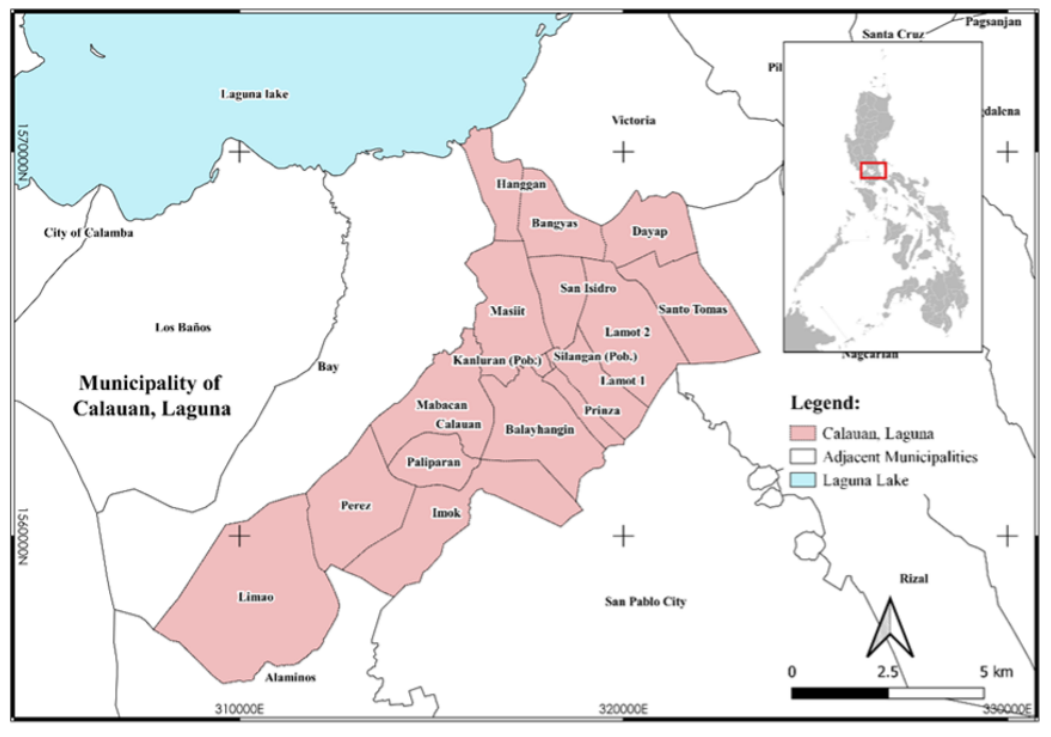
## 2 Methodology

### 2.1 Research Design

The study employed a descriptive type of research through quantitative methodology which was used to identify the place attachment among the residents of LGU Calauan. Survey questionnaires measured by a 5-point Likert scale (strongly disagree to strongly agree) containing statements on three parameters namely place identity, nature bonding, and community ties and a five-question item about environmentally responsible behavior were arranged.

### 2.2 Locale of the Study

LGU Calauan (Figure 2) has a land area of 7,651.99 hectares. It is confined North by Laguna de Bay, South by San Pablo City, East by the Municipality of Nagcarlan, and West by the Municipality of Bay. It is 75 kilometers from Manila, 21 kilometers from Sta. Cruz, Laguna, and five (5) kilometers from its neighboring town, Bay. It is conveniently accessible by land transportation [8]. It has 17 barangays, two (2) urban barangays and 15 rural barangays. As of 2020, the municipality has a population of 87,693 [20].



**Figure 2.**  
Map of Calauan, Laguna

### 2.3 Site Selection

In February 2002, a community survey was conducted in the municipality, identifying its main problems. Since then, waste management has emerged as a top problem needing interventions. Predominantly, the municipality's main source of solid waste comes from household, commercial, and industrial activities [8].

### 2.4 Data Collection Methods

A survey questionnaire was disseminated through convenience sampling. It was employed for three weeks, from 13 to 31 October 2021. The primary data collected from the online survey was merged accordingly. Secondary data were also collected [8].

### 2.5 Respondents of the Study

LGU Calauan's youth population, ages 15 to 30, were the study's respondents. Likewise, the 17 barangays were represented in the survey. The youth populace was chosen as they are an important member of the society, can make vital contributions for greater good, and prompt engagement as future practitioners and decision-makers.

### 2.6 Survey Questionnaire

Written in five sections, the survey questionnaire was based on two (2) research studies. The intention was to test a model of place attachment that integrates multiple approaches (personal, community, and natural environment contexts) [21] and seeks emotional bonding as a positively relatable dimension on low or high-effort behavioral intentions [22].

## 2.7 Data Analysis

The data gathered through a 5-point Likert scale were presented in a tabular and graphical form with statements laid out, specifying the responses per level of agreement to a statement and its corresponding percentage. Radar graphs were used to show plots and relationships of place attachment parameters and environmentally responsible behavior. Descriptive statistics was analyzed using JASP, an open-source program for statistical analysis.

The scale established by Li & Wu [22] was applied incorporating adjustments relating to waste reduction and segregation. This implies a link between environmentally responsible behavior concept and the respondents' place attachment.

For the last objective, thematic analysis was utilized since it is critical to see whether place attachment has a role in building community-based SWM practices in LGU Calauan.

## 3 Results and Discussion

### 3.1 Degree of place attachment of the respondents

Five statements were laid out into the place identity parameter, giving an essence about how people ascribe a place they live in and to what extent a subjective social construct can be given to a location.

As observed, many respondents have established their identity in the locale with an agreed score (52.9%). Table 2 shows the descriptive statistics of the place identity parameter and reveals that the respondents are firm to the belief that they identify themselves within the study locale.

Table 1. Frequency table of the place identity parameter

Place Identity	Level of Agreement				
	Strongly Agree (5)	Agree (4)	Neither (3)	Disagree (2)	Strongly Disagree (1)
I feel that I am a part of my barangay.	33.7%	52.9%	10.6%	1.0%	1.9%
I have a lot of beautiful memories in my barangay.	35.6%	47.1%	12.5%	3.8%	1.0%
I strongly connect with the people in my barangay.	20.2%	44.2%	21.2%	13.5%	1.0%
I cannot live in other places because my barangay is special.	11.5%	31.7%	27.9%	17.3%	11.5%
Being an active member of my barangay means that it is my home.	20.2%	52.9%	16.3%	6.7%	3.8%

Table 2. Descriptive statistics of the place identity parameter

	Valid	Missing	Mode	Mean	Std. Deviation	Min.	Max.
<i>Place Identity</i>							
I feel that I am a part of my barangay.	104	0	4.000	4.154	0.798	1.000	5.000
I have a lot of beautiful memories in my barangay.	104	0	4.000	4.125	0.844	1.000	5.000
I strongly connect with the people in my barangay.	104	0	4.000	3.692	0.976	1.000	5.000
I cannot live in other places because my barangay is special.	104	0	4.000	3.144	1.186	1.000	5.000
Being an active member of my barangay means that it is my home.	104	0	4.000	3.788	0.972	1.000	5.000

Table 3. Frequency table of the nature bonding parameter

Nature Bonding	Level of Agreement				
	Strongly Agree (5)	Agree (4)	Neither (3)	Disagree (2)	Strongly Disagree (1)
The environment is of high priority in my day-to-day life most especially in terms of solid waste management.	57.7%	37.5%	1.9%	1.9%	1.0%
I throw my garbage in the right places because I do not want my barangay to become dirty.	64.4%	29.8%	3.8%	1.9%	0%
My household always segregates the garbage into their respective labels because I want to help the community for easy collection.	41.3%	41.3%	8.7%	6.7%	1.9%
I think that reducing waste contributes to minimizing environmental problems.	82.7%	13.5%	1.0%	1.0%	1.9%
I do not burn our garbage for easy disposal.	41.3%	14.4%	16.3%	18.3%	9.6%



Table 4. Descriptive statistics of the nature bonding parameter

	Valid	Missing	Mode	Mean	Std. Deviation	Min.	Max.
<i>Nature Bonding</i>							
The environment is of high priority in my day-to-day life most especially in terms of solid waste management.	104	0	5.000	4.490	0.724	1.000	5.000
I throw my garbage in the right places because I do not want my barangay to become dirty.	104	0	5.000	4.567	0.665	2.000	5.000
My household always segregates the garbage into their respective labels because I want to help the community for easy collection.	104	0	4.000	4.135	0.966	1.000	5.000
I think that reducing waste contributes to minimizing environmental problems.	104	0	5.000	4.740	0.710	1.000	5.000
I do not burn our garbage for easy disposal.	104	0	5.000	3.596	1.425	1.000	5.000
I feel peace within my barangay if I see that it is clean and green.	104	0	5.000	4.625	0.791	1.000	5.000

Meanwhile, as seen in Table 3, all six statements of the nature bonding parameter were in high percentile in the strongly agree column. The nature bonding parameter also indicated a much higher mode, averaging to 5 (strongly agree score), which implies that the respondents have built a perspective of nature bonding over time concerning their emotional response diversities in their community in connection to SWM (Table 4). When advocating proper SWM in the community to help people’s knowledge and practices, the respondents showed an increased percentage of strongly agreeing with the statement. Moreover, Table 6 suggests that the respondents’ answers are aligned towards experiencing the feeling of fitting in into a specific place, thus adding some sense of fulfillment.

Table 5. Frequency table of the community ties parameter

Community Ties	Level of Agreement				
	Strongly Agree (5)	Agree (4)	Neither (3)	Disagree (2)	Strongly Disagree (1)
Inclusive planning is what my barangay should do to have a better environment to live in.	54.8%	41.3%	2.9%	1.0%	0%
Proper solid waste management must be advocated in the community to enhance people's knowledge and practices.	79.8%	17.3%	1.0%	1.0%	1.0%
I have the ability to lead and teach my fellow residents towards proper waste segregation processes.	21.2%	48.3%	29.8%	5.8%	0%
I encourage my neighbors to give importance to proper waste segregation to help our barangay towards having a good environment.	26%	44.2%	18.3%	7.7%	3.8%

Table 6. Descriptive statistics of the community ties parameter

	Valid	Missing	Mode	Mean	Std. Deviation	Min.	Max.
<i>Community Ties</i>							
Inclusive planning is what my barangay should do to have a better environment to live in.	104	0	5.000	4.500	0.607	2.000	5.000
Proper solid waste management must be advocated in the community to enhance people's knowledge and practices.	104	0	5.000	4.740	0.623	1.000	5.000
I have the ability to lead and teach my fellow residents towards proper waste segregation processes.	104	0	4.000	3.798	0.840	2.000	5.000
I encourage my neighbors to give importance to proper waste segregation to help our barangay towards having a good environment.	104	0	4.000	3.808	1.034	1.000	5.000

The respondents from LGU Calauan identify themselves within their existing immediate neighborhoods. This shared identity of the respondents triggered a strengthened position in identity raising towards their places determined by having many memories captured from the past and present and by the company of their existing kins, friends, and family members. Place identity has been a flexible notion since the beginning, relating to human-environment schemes [21]. It is, therefore, right to infer those cognitions about the physical world in which people live have a higher relationship to people's place identity. Individuals feel a robust sense of belongingness and identification, not just limited to one but in various ways [23].

Meaning-making is linked to an individual's psychology and social activities that produce perception [21]. The developed place attachment over time affects reflections about the location and its imageability towards oneself and others [24]. In addition, a location provides data about one's uniqueness from others or perhaps some similarities. Physical or social characteristics guide all of these and can be realized in a neighborhood setting, which is the leading example among others. In general, individuals can relate to a place such that it comes to represent who they are, where they come from, and to whom they share sentiments [25].

Similarly, the respondents have both high nature bonding and community ties within their community. This is driven by having to prioritize the conditions happening in the environment they live in, especially in the matters concerning SWM and the thought that inclusive planning must be exercised to enhance the conditions of their surroundings. Exposure to the natural world, explicitly in one's community, seems to be a first step towards environmental awareness. Nature is a favoring place, an important setting to an individual's health and well-being. It has been concluded that nature bonding is essential for integrating people and the natural environment.

On one side, collective identity is seen and recognized by an individual or a group with which they have common intentions. The need to feel attachment or a sense of belongingness to a community is inherently available, mainly when motivation and confidence are high at its core. People's perceptions of their environment highly influence community ties at the onset. However, at some point, community attachment tends to differ across people because of specific differences in points of view experienced in daily life. But it is also important to note that those with local involvement are most likely to form sentimental bonds within the place. Therefore, the relationship can be instilled with symbolic meaning to fuel self-worth and support identity-raising projects. It is deeply affiliated with social integration and comes from spontaneous bonds with family and friends. It plays a vital role in place attachment measures as they can relate to one's sentiments and personal ideals.

Over time, people belong somewhere, a place they will eventually be comfortable in, where they call home — may be shaped by the social, cultural, and environmental aspects. It will then gradually start to set off an effect on one's emotional commitment. This will help the general public garner transformation and set the tone for lifting the community throughout the course of time.

### 3.2 Environmentally responsible behavior

Five questions based on Li & Wu [22] were adopted giving the environmentally responsible behavior section a glimpse into any action toward the improvement of the environment. Correspondingly, it typically shows that the residents lean toward having good intentions for the environment.

Table 7. Frequency table of the environmentally responsible behavior concept

Environmentally Responsible Behavior	Level of Agreement				
	Strongly Agree (5)	Agree (4)	Neither (3)	Disagree (2)	Strongly Disagree (1)
I comply with the regulations especially in waste segregation to not destroy my community's environmental quality.	49%	45.2%	4.8%	0%	1.0%
I try not to add up to the existing waste problem of my community.	57.7%	38.5%	1.9%	1.0%	1.0%
When I produce garbage every time in my barangay, I put it in the right trash can.	62.5%	29.8%	5.8%	1.0%	1.0%
If there are environment improvement activities in the community, I am willing to attend.	34.6%	49%	14.4%	1.9%	0%
I try to convince others to protect my community's natural environment.	31.7%	45.2%	18.3%	2.9%	1.9%

Table 8. Descriptive statistics of environmentally responsible behavior concept

	Valid	Missing	Mode	Mean	Std. Deviation	Min.	Max.
<i>Environmentally Responsible Behavior</i>							
I comply with the regulations especially in waste segregation to not destroy my community's environmental quality.	104	0	5.000	4.413	0.677	1.000	5.000
I try not to add up to the existing waste problem of my community.	104	0	5.000	4.510	0.683	1.000	5.000
When I produce garbage every time in my barangay, I put it in the right trash can.	104	0	5.000	4.519	0.737	1.000	5.000
If there are environment improvement activities in the community, I am willing to attend.	104	0	4.000	4.163	0.739	2.000	5.000
I try to convince others to protect my community's natural environment.	104	0	4.000	4.019	0.892	1.000	5.000

Environmentally responsible behavior refers to the willingness of an individual or a group of people to promote sustainable development of the environment, reducing severe environmental impacts and taking the best ways to spearhead actions that are beneficial to the environment. Environmentally responsible behavior is a dynamic factor that ensures growth and attains sustainability in all aspects, including matters about waste management. Behavior is naturally understood as how people act towards something they see outside their zone. It is deciphered as active responsiveness to current environmental issues made for the progress of the environment, motivating people to develop active citizenship and participation [26].

The environmentally responsible behavior of the respondents shows a positive response that translates to a good level of agreement. These can initially suggest that people are more likely to think about themselves as individuals who are socially responsible and deferential, hence causing people to shift into altruistic acts [27]. People with optimistic behaviors are highly involved in environmental conservation initiatives such as waste management. Scholars noted that environmental knowledge and proper facilities and systems contribute to the so-called pro-environmental behavior. Accustomed habits and interest in political aspects, such as laws, exacerbate behavioral intentions to the extent that people prefer to prevent environmental damage over time. Additionally, social capital is exclusively linked to the perception that citizens can participate in environmental planning efforts, fueling the pro-environmental behaviors of almost everyone involved [28].

### 3.3 Three parameters of the study and environmentally responsible behavior concept

In this part, the three parameters of the study and environmentally responsible behavior statements were put together to see establishment of commonality in the following features:

#### **Place attachment and Calauan's social capital**

Nowadays, institutions perceive the importance of place attachment, which can be used as a basis for obtaining points of view on finding solutions to community problems [28, 29]. These inclusions provide a stance for the social capital to embrace perceptions, giving room for the social capital's place attachment to be recognized.

Sense of place and social capital are intertwined with each other. These two form an interchangeable force to which it complements progressively. Social capital is essential for collaborative action and triumph among communities. Therefore, with social capital present, positive impacts on place attachment denote greater engagement in participation processes. Social capital allows modern-day settlements to prosper efficiently by their capability to "get by" even though challenges arise. Yet, as these matters are multidimensional, they may restrict individuals to do what is right due to differences. Therefore, organizing agendas facilitates higher success in ensuring that the social capital blends in working together to produce desired changes in the system.

As shown in the results, it can be inferred that the residents are aware of the existing waste problem in the town. However, the social capital in LGU Calauan does not readily accept the challenge of the identified problem. SWM is perhaps one of the most difficult programs to execute. To ignite people's initiatives and to bridge the gap of working together, awareness campaigns are needed to gain citizens' recognition of the programs included in the locality's development plan.

#### **Place attachment and the natural environment context**

In the natural environment context, the involvement of exercised practices is aimed at care and cleanliness of places. As we know, sustainable development presumes nature conservation, cooperation, and soft, sustainable mechanisms. It involves citizen participation in decision-making, especially in person-environment relationships.

LGU Calauan principally nurtures the agricultural sector and remains the chief source of livelihood and income from crop production, livestock and poultry raising, fishing and forest-related

activities. It is also surrounded by various sectors, including residential, commercial, institutional, infrastructure/utilities, recreational spaces, agro-industrial, tourism, buffer zones, cemeteries, and sanitary waste management facilities, all producing waste in any amount possible. Yet, the highest percentage of land use was then dedicated to agriculture, which houses various wastes.

As dictated by the locality's 10-year SWMP, the municipality shall strive to put forth dynamism in achieving the desired mission and vision. Policy reforms shall arise by this time, allowing a more vivid look at seeking people's commitments towards involvement in environmental-related efforts for the municipality.

### 3.4 Place attachment and local initiatives in SWM

As place attachment is the affective side between a person and a place, it helps in giving color to a larger context rather than meaningless claims [30]. The same is the concept of environmentally responsible behavior which is a useful tool to expound concrete actions directly and indirectly.

They are sorting garbage at source, from the basic biodegradable and non-biodegradable materials up to the extent of reusing and recycling. However, other generated wastes were buried on the ground, burned, or thrown in the población area. Therefore, the whole idea of segregation is not practiced by the community. On the other hand, waste segregation started in the municipal offices after a seminar on SWM, focusing on implementing RA 9003, was organized.

The municipality's 10-year SWMP undermines major strategies that dictate segregation and reduction at source. Backyard composting is further encouraged for those who can still practice it as much as they can. As for the collection and transport process, the municipality will continue to implement the "no segregation, no collection policy," and those who do not follow it will be penalized. Establishing a disposal facility per RA 9003 is highly required, and creating an MRF in every barangay should be necessary. Meanwhile, the last two objectives, which are to promote participation in SWM planning among key stakeholders in the municipality and to formulate and legitimize a systematic and comprehensive 10-year SWMP for the next few years are a crucial manifestation of completing necessary changes and developments around the municipality.

Lastly, obtaining a cohesion between place attachment and community action is far within reach. How people identify themselves with a place, have emotional sense with, and to whom they are socializing are all indicators that place attachment is intertwined with that feeling of embodying the geographical psychology and sociological side of this aspect. In this way, fostering a community life that accepts the idea of an active evolution of the system through a transdisciplinary and ecological perspective can be realized during community development planning [35,36]. Nevertheless, it is important to advocate for consensus building that includes collaborative action and long-term efforts in seeking agreement among individuals. This allows the public to be informed and remain primary agents in awareness-spreading to fellow stakeholders. Such practices are what many social scientists identify as a better approach to honing successful participatory planning processes [31].

## 4 Conclusion and Recommendations

SWM has been a global issue since time immemorial and has contributed to increasing community problems. By looking at what the social capital can do, especially neighborhoods that reside in a particular place, place attachment develops and influences how people act. Individual connection with a place is not as simple as it may seem. Still, with community ties and finding their own identities, it may be inferred that these are all part of the residents' shared spatial experiences that developed through time. Consequently, it catalyzes change and positively affects pro-environmental behaviors, leading to active citizen participation. With this, it can be concluded that place attachment has a role in building up community-based SWM practices in LGU Calauan.

In the planning lens, SWM in the Philippines has yet to be fully improved in implementation



starting from the local level. It is an indispensable service and duty needed by society to address the waste problem further and deeply understand where these root causes start. The primary goal of waste management is to reduce and eliminate adverse impacts of waste on human health so that the environment should also support decent quality of life. Now that the world is filled with advancements, solutions to extreme problems are transforming from traditional to a holistic kind of view. Therefore, integrated SWM should be laid in the foreground to enable proper application of programs in a collaborative way [32]. Smart and inclusive planning will provide a network linking both the government and people to a steadfast development, increasing the possibilities of creating a sustainable environment and a community with volunteer acts designed to protect it. This will only be achieved if effective planning is practiced at all costs.

Additionally, in the human ecological perspective, the need to be equipped with a critical approach is a better start. For this reason, human ecologists should have access to different programs and platforms that enable collaborative efforts and discussions when dealing with waste management. Moreover, the study of place attachment shall go beyond the social and environmental context. Thus, it should emphasize more people's perspectives and ability to construct bonds with places and further facilitate fundamentals of acting upon urgency and cautiousness with their surroundings. In line with this, unique and integrated solutions are advantageous to improve SWM worldwide and allow a meaningful purpose for an individual or group of people to reach a certain degree of place attachment. Enhanced citizen participation must be channeled out to make people realize how the situation around them is interrelated, maybe in public health and social welfare, among others.

In general, place attachment and SWM provide an avenue to welcome the idea of having an important relationship with people and places. People's affection towards the living environment is key to incorporating pro-environmental behavior. Hence, if people would exhibit a consistently high place attachment and environmentally responsible behavior, the outcome would be clear and direct. With this, LGUs should encourage its people, especially the youth, to share their knowledge and lead best practices. Adolescents represent the future generation. As key societal actors, their behaviors may translate into good actions for themselves, their community, and the greater good. Psychology in the years of adolescence plays a critical role in advancing the formation of identity and attachments not just in one's immediate family but in the horizon of ecological impacts. This can be translated into a higher analysis of youth's cultural and social unity and well-being [33].

The study helped in bringing the different parameters of place attachment into play. As the results came out with a positive and high level of place attachment, the residents will now tend to become more proactive and upbeat in programs regarding environmental protection and conservation. Moreover, the study proposes that people are leaning into the emotional side, and this is a great way to start noticing how it can spark a change in environmental planning as a whole.

As LGUs are responsible for implementing an effective and efficient SWM, they must mainstream and make practical and systematic SWM strategies in rural and urban settlements to help attain sustainable development. Today's rapid urbanization and overpopulation are evident, making it enormously challenging to address world problems. Accordingly, the government at all scales should pioneer inclusive programs to improve waste management and reduce harmful emissions.

Furthermore, the study enables us to grasp the significant presence of the people. With the right political will and active citizenry, proper application and coordinated SWM will follow across generations.

Future research could expand several place attachment models, especially when dealing with localities in a specific region. As the broad concept of place attachment is not a new construct, however, unique to some, the need for better awareness and groundwork should be put into play, allowing people to be transparently engaged in its depth analysis. With this, building up residents' sense of community identity is necessary to help shape and influence behavioral actions.

## Statements and Declarations

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### **Compliance with Ethical Standards**

In compliance with the Data Privacy Act of 2012 (Republic Act No. 10173), the information collected was primarily used in the study and remains confidential.

### **Data Availability Statement**

The data in this study are available upon request from the authors.

### **Authors Contribution**

The study was written by Gene Sophia D. Constantino, with supervision of her adviser, Sharon Feliza Ann P. Macagba, and panelists, John Ceffrey L. Eligue, and Fevi Rose C. Paro.

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