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Shaping Social Practices and Behaviors to Implement Community-Based Organic Waste Management Strategies

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Abstract

Mexico faces the inability to meet their intended objectives at governmental level particularly stemming from the centralized waste management system. The regulatory framework mandates waste reduction, recycling, and disposal under the supervision of SEMARNAT. However, transparency on penalty enforcement remains lacking, exacerbating the inefficiencies of centralization. The centralized model also limits community engagement and participation, hindering local support and unique community needs.

While public awareness is high, practical sustainable behavior change remains a challenge. To address these challenges, this study suggests exploring intervention approaches through the lens of social practice theory (SPT) and the theory of planned behavior (TPB) to bridge the gap between awareness and action within community-based approach.

The objective of this research was to identify factors that can shape residents' social practices and behaviors towards organic waste management. Furthermore, the research aimed to determine the potential social behaviors and practices necessary to implement a community-based waste management model in a high-income neighborhood, namely Lago Esmeralda located in Atizapán de Zaragoza, Mexico. The research was conducted through a survey intended for the residents of the neighborhood and by interviewing an NGO specialist and the Administrator of Lago Esmeralda condominiums. The results show that the elements of SPT and TPB significantly influence residents' social practices and behavior; for Lago Esmeralda, materials, competences, and perceived behavioral control hinder such practices, while meaning and subjective norms enhance them, underlining the importance of interplay among these elements. Social facilitators and barriers for a community-based strategy (CBS) in Lago Esmeralda were identified; the condominium's board of directors can either enable or hinder collective sustainability efforts, emphasizing the necessity of trustworthy environments and peer interactions. Notably, Lago Esmeralda's strengths include resource flexibility and environmental initiative prioritization. Insights from challenges and benefits inform potential social practices and behaviors within a customized community-based strategy, specifically a group-composting CBS in Lago Esmeralda.

The contribution of this research refers to a new framework developed with the intention of facilitating the assessment made for the entire study case and adding to the existing literature on social behavior towards waste management, particularly organic waste management.

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List of Acronyms

MSW	Municipality Solid Waste
OWM	Organic Waste Management
OWT	Organic Waste Treatment
SDGs	Sustainable Development Goals
SEMARNAT	Spanish acronym for Mexico's Secretariat of Environment and Natural
OW	Organic Waste
INEGI Geography	Spanish acronym for Mexico's National Institute of Statistics and
EPI	Environmental Performance Index
HCH	Holland Circular Hotspot
LGPGIR	Acronym in Spanish for The General Law for the Prevention and Integral
Management of Wastes	
CBS	Community-based Strategy/Strategies
SPT	Social Practice Theory
TPB	Theory of Planned Behavior
PBC	Perceived Behavioral Control
AC	Administrator of the condominium
ES-NGO	Environmental Specialist from NGO
BD	Board Director of the Community
GDPR	General Data Protection Regulation
BMS	Behavioral, Management and Social Science Faculty
USW	Urban solid Waste
CBO	Community-Based Organizations

Chapter 1: Introduction

The purpose of this chapter is to provide a clear understanding of the current state of waste management systems in Mexico and their inability to meet their intended objectives at governmental level. Additionally, it will explain some findings regarding the lack of proposed models based on shaping social practices that may improve the social engagement among communities towards sustainability.

This chapter serves as the basis for questioning two things: the potential relationships between behavioral and social practices towards waste management in communities, and secondly, to question if a centralized approach regarding municipality solid waste (MSW) is the ideal for the current state of Mexico's situation.

Furthermore, it exposes a detailed Research Objective, provides the Research Questions, and finally, it mentions the Organization of the overall Research Proposal.

1.1 Background

1.1.1 The global context: Sustainable Development Goals (SDGs) 11: Sustainable Cities and Communities and 13: Climate Action and the relation with waste management

Sustainable Development Goal (SDG) 11 is dedicated to create inclusive, safe, resilient, and sustainable cities and human settlements. It places emphasis on sustainable practices encompassing waste management, energy efficiency, and disaster risk reduction within urban areas (United Nations, 2022).

Aligned with this objective, SDG 13 aims to tackle climate change and its impacts. It focuses on enhancing resilience, adapting to climate-related hazards, integrating climate measures into policies and planning, and fostering awareness and capacity for climate change mitigation and adaptation (United Nations, 2022).

Cities bear the weight of around 70% of global greenhouse gas emissions, contributing significantly to challenges like climate change (United Nations, 2022). Yet, despite ongoing efforts managing municipal solid waste, merely 55% of it is currently controlled globally, as per the United Nations (2022). Additionally, the report notes that a staggering 99% of the urban population is exposed to air pollution.

To enhance urban residents' quality of life, safeguard public health, and establish more sustainable, resilient urban spaces (SDG 11), cities need to adopt effective waste management strategies. Proper waste management, including recycling, composting, and energy recovery, can curtail greenhouse gas emissions (SDG 13) by diverting waste from landfills. Successful waste management systems also contribute to pollution reduction, climate change mitigation, and the promotion of sustainable consumption and production patterns. These endeavors align with the goals of Sustainable Development Goal 11: Sustainable Cities and Communities, and SDG 13: Climate Action (United Nations, 2022).

1.1.2 The Mexican context: Current situation on Waste Management

In line with the findings presented in a report by Mexico's Secretariat of Environment and Natural Resources (SEMARNAT) in 2019, the nation's annual production of municipal solid waste stands at over 44 million tons (SEMARNAT, 2019 as cited on HCH, 2021, p. 1). Regrettably, only approximately 12% of this waste is handled sustainably. The report further revealed that a significant proportion, approximately 40-50%, of Mexico's overall solid waste is comprised of organic waste (OW) types, which include food waste, yard waste, and agricultural waste (SEMARNAT, 2019 as cited on HCH, 2021, p. 1).

Andrés Manuel López Obrador, the elected president and the current administration (2018-2024) does not consider the promotion of clean and affordable energy as a significant priority (Holland Circular Hotspot [HCH], 2021, p. 1). Therefore, it is difficult to enhance enforcement and prioritize sustainable actions among the Mexican territory.

Waste collection, disposal, and recycling

Mexico has a total of 2,516 waste collection service providers, with 87% being public entities, 10% private, and 3% belonging to the informal sector. (HCH, 2021, p. 1-2) Unfortunately, 7% of the total of 2,467 municipalities receive no waste collection services. Following Holland Circular Hotspot investigation, they found that 28% of the waste collected ends in illegal dumping. At the same time, of the deposited waste, 40% ends up in landfills, and 1,440 out of 2,203 landfills are already full, leaving 29% of municipalities with no dumpsite at all (HCH, 2021, p. 2). Given that landfilling is the predominant waste disposal method in Mexico, it is crucial to prioritize recycling methods.

In terms of organic waste treatment (OWT), there are only 24 OWT plants nationwide that can treat approximately 22 million tons of organic waste generated. Only four of these plants are composting plants, and they are all located in the State of Mexico. (HCH, 2021, p. 2) In comparison to other countries with similar populations to Mexico (Redes Sociales, 2023), Japan, for instance, has 229 industrial composting facilities (ENF, 2023), highlighting a significant difference.

At the same time, regarding citizenship behavior towards MSW is relevant to note that greenhouse gas emissions in residential areas in Mexico City constitutes around 10% of the total emissions (Plasencia et al., 2019). A 2021 survey conducted by the National Institute of Statistics and Geography (INEGI) revealed that a majority of Mexican households, amounting to 82.7%, engage in waste separation practices for recycling or composting purposes. This finding suggests a high level of awareness among the general public regarding responsible waste management practices. Nevertheless, despite this apparent awareness, Mexico continues to face significant environmental challenges. In fact, according to the Environmental Performance Index (EPI) developed by Yale University, Mexico ranked 76th out of 180 countries in 2020, highlighting the need for further improvements in addressing environmental concerns in the country.

1.2 Problem Statement

1.2.1 The Centralized System; a problematic

The responsible institution for enforcing the laws regarding MSW is SEMARNAT, the regulatory framework that outlines the stipulated requirements for waste reduction, recycling, and disposal is established by The General Law for the Prevention and Integral Management of Wastes (LGPGIR). LGPGIR assigns the federal government with the responsibility of creating national policies for managing waste, with state and local governments charged with implementing them. Municipal governments are tasked with collecting organic waste and transporting it to central facilities or landfills for proper processing. Failure to comply with the LGPGIR's regulations supposedly results in penalties being levied (Gobierno de Mexico, 2016). However, there is no transparency on the data that demonstrates if penalties are being carried out throughout the years. This represents a present-day problem for waste management in Mexico due the centralization of the system and its mentioned flaws.

Firstly, decision-making regarding waste management practices is centralized at the federal level, leading to a uniform approach that may not be suitable for the diverse regions and communities within the country. Secondly, the centralization of waste management has led to insufficient investment in local waste management infrastructure and facilities. This may cause many municipalities to struggle with the implementation of effective waste management practices, leading to issues such as open dumping, burning of waste, and inadequate collection and disposal systems (HCH, 2021, p. 2).

Lastly, the centralized nature of waste management has led to limited community engagement and participation in waste management programs. With decision-making concentrated at the federal level, it can be challenging to involve local communities in planning and implementation, resulting in a lack of support and failure to address the unique needs and concerns of different communities. This can be sustained with the last survey conducted in 2019 by the World Wildlife Fund (WWF), who found that 85% of Mexicans believe that climate change is a serious problem, and 87% believe that the government should take action to address it. However, as noted earlier, the government's failure to enforce their policies at the local level raises questions regarding the effectiveness of government-led initiatives. Therefore, in the case of Mexico, the private sector and community-based efforts can also play a critical role in achieving sustainable development. While acknowledging that improvements are necessary at the governmental level, the focus may also be on expediting the adoption of solutions that can enhance the sustainability of waste-related behaviors by the Mexican population.

1.2.2 Public awareness and locked behaviors and practices

The unavoidable question here is **WHY** are Mexican residents still failing in carrying sustainable practices and behavior despite the apparent awareness?

Some people may be resistant to change and may not be interested in adopting new practices, especially if it goes against their traditional ways of disposing of waste (Celestino et al., 2022). Celestino et. al (2022) conducted a systematic review of 74 articles sample which concluded that only 23% of the reviewed articles addressed one or more psychosocial factors. The paper ends by

encouraging scholars to conduct more research regarding social behavior towards waste management.

Trying to understand this awareness in theory but failure in practice, it was the conclusion's paper that led me reflecting (Celestino et al., 2022): *“articles do not measure the extent to which convenience¹ and social norms² affect citizens' behavior, nor do they provide reasons why some people are reluctant to participate in waste management programs even when the programs are more convenient.”* (p. 19)

On another hand, when referring to citizens behavior changes addressed by individual psychosocial factors, there is a counterargument that highlight that the effectiveness of commonly used methods of interventions³ from a behavioral perspective is not necessarily being questioned (Strengers & Maller, 2015). Rather, the focus should *also* be on exploring new alternative approaches to intervention that may arise when different theories and disciplines are given priority, particularly when viewed through the lens of social practice. (Strengers & Maller, 2015)

In summary, despite a high level of awareness regarding responsible waste management practices among the general public in Mexico, the country continues to face significant environmental challenges. While some scholars suggest that individual psychosocial factors may be responsible for the gap between awareness and action, there is a lack of research on the extent to which convenience and social norms affect citizens' behavior. Additionally, there is a need to explore new alternative approaches to intervention that may arise from different theories and disciplines, particularly when viewed through social practice's theories.

1.3 Research Objective and Contributions

The objective of this research is to identify factors that can shape residents' social practices and behaviors towards organic waste management. Furthermore, the research aims to determine the potential social behaviors and practices necessary to implement a community-based waste management model in a neighborhood.

This study centers on the "Lago Esmeralda Neighborhood" a high-income urban settlement within the upscale Zona Esmeralda enclave in Atizapán de Zaragoza, Mexico. Known for its high living standards and diverse housing, Zona Esmeralda attracts affluent families seeking modern amenities and proximity to Mexico City (Sofitec, 2022).

Lago Esmeralda is a gated community around a serene dam, with housing soaring from 269 to 3,000 units within six years (Admin, 2023), capturing the area's rapid development. The research narrows down to three condominiums within Lago Esmeralda, “Francia”, “Bélgica” and “Holanda”, exploring waste management practices, for further purposes these three condos are mentioned as Lago Esmeralda among the document.

¹ According to Shove (2012), convenience is an idea or concept that is related to the effort, time, and skill needed to carry out a particular task or activity. It refers to the level of difficulty or ease of performing a behavior or task, and is influenced by factors such as social norms, technology, and infrastructure.

² According to Ajzen (1991), social norms refer to the perceived expectations or pressure from others to perform or not perform a behavior.

³ According to Strengers & Maller (2015), interventions refer to deliberate and targeted actions aimed at changing people's behaviors and practices to achieve specific outcomes.

This research objective can contribute firstly, adding to the existing literature on social behavior towards waste management, particularly organic waste management. The study's focus on a high-income urban settlement can provide insights into how social practices and behaviors towards waste management differ across different socioeconomic groups. This information can be valuable for policymakers and urban planners who are seeking to develop more effective waste management strategies.

Secondly, the research objective can contribute to the development of community-based waste management models. By identifying the social behaviors and practices necessary for the implementation of such a model, the study can provide practical guidance for community leaders and waste management professionals.

1.4 Research Question

The nature of the Research Objective can be considered as explanatory research; therefore, an explanatory Research Question was built to establish a baseline for the whole thesis.

- How does shaping social practices and behaviors towards organic waste management lead to the implementation of a community-based strategy (CBS) in Lago Esmeralda Neighborhood?

To be able to answer the main research question, the following sub-questions are conducted:

- What are the factors that influence residents' social practices and behavior?
- What are the social practices and behaviors that need to be applied in a community-based strategy?
- Which social facilitators and barriers need to be identified for a community-based strategy?

1.5 Organization of Thesis

This document is organized into several chapters. Chapter 1 provides an Introduction that includes Background, Problem Statement, Research Objectives and Contributions, Research Questions, and this section.

Chapter 2 covers the Theoretical Frameworks (Literature and Document Review) that are relevant to this study. This chapter includes section on Behaviors and Practices towards Waste Management, Social Practice Theory, The Planned Behavior Theory, Lens of a Joint Approach, Psychosocial Factors and Community-Based Theory.

Next chapter (3) details the Methodology for the thesis including the Research Strategy, Research Limitations, Research Framework, Presenting the study case: Lago Esmeralda Neighborhood, Data Collection, Data Analysis, Research Planning and Ethics.

Furthermore, Chapter 4 presents the relevant findings and subsequently the Discussion Chapter can be found. Finally, the document includes Chapter 6: Conclusion, a list of references and appendixes.

Chapter 2: Theoretical Frameworks: Literature and Document Review

This section provides an overview of existing models, concepts, and theories related to the research topic. Key findings from previous studies on behaviors and practices are presented to inform the study in Lago Esmeralda. Theories on social practices, behaviors, and community-based strategies are also examined, with relevant elements of each theory described to support the explanatory nature of the main research question.

2.1 Behaviors and Practices towards Waste Management

Waste management attitudes and practices are influenced by a range of factors, including social structures and experiences, emotions, and socio-cultural norms (Liang et al., 2021). For example, studies suggest that individuals often discard food when it spoils or exceeds its expiration date, with vegetables and fruits being the most common types of food wasted (Katajajuuri et al., 2014). Such behavior is compounded by consumers frequently purchasing more food than they need, as shown in studies conducted in South Manchester, United Kingdom, and Italy (Evans, 2012; Setti et al., 2018).

Scholars have also found that the disposal of goods is often influenced by symbolic meaning, with sentimental items being saved from the waste stream (Appadurai, 1986; Hetherington, 2004). Negative emotions, such as guilt, can play a role in individuals' waste management behaviors and may be predictive of good intentions to reduce food waste (Russell et al., 2017; Principato et al., 2015; Schanes et al., 2018).

Another study conducted by C. Ong et al. (2019) on Singaporean households provided valuable observations; socioeconomic factors, such as income, education, and age, play a role in waste management practices. For example, residents with lower income and education levels may be less likely to support paying for separate food collection and treatment facilities (Lane et al., 2009). Younger individuals with higher education and income levels may be more supportive of waste reduction campaigns and may be more likely to offer advice to others on reducing waste (Tonglet et al., 2004). However, studies have also shown that younger adults may profess more sustainable attitudes and values, but older adults may exhibit more sustainable behaviors in practice due to generational norms and lifestyle factors (Stanes et al., 2015).

Moreover, the study indicated individuals who lack knowledge about the recyclability of certain items are less likely to recycle them. Similarly, even those who frequently recycle may limit themselves to a few types of familiar items, such as paper and specific plastics. Conversely, those who possess information about what can be recycled were more inclined to recycle a wider range of materials more frequently. Therefore, it is crucial to ensure that the public is well-educated about all the materials that can be recycled (C. Ong et al., 2019).

Furthermore, authors also deepened on socio-cultural theories and suggest that the adoption of sustainable routines can disrupt household organization and exacerbate role strains for women (C.

Ong et al., 2019), illustrating the complex associations between sustainable routines and other social roles (Gibson et al., 2011; Head et al., 2013).

Additionally, the research has highlighted the impact of the built environment on promoting sustainable behavior, specifically regarding recycling participation (Barr 2007; Lane et al. 2009). For instance, the type of dwelling, such as apartments, has been identified as a significant obstacle to recycling participation (C. Ong et al., 2019). Waste disposal systems in apartment buildings can be a deterrent to recycling participation since recycling bins are often located far from the individual units (Jesson et al., 2014). As a result, apartment dwellers have less convenient access to recycling facilities compared to those living in landed properties, which reduces their motivation to recycle (Barr et al., 2011). The space limitations of apartments reduce householders' ability to store used items for planned recycling or donation, further disincentivizing recycling participation as well (Lane et al. 2009; Jesson et al. 2014). This is an important insight for the study because Lago Esmeralda Neighborhood is a combination of dwelling apartments and single-family's dwellings (See Figure 5 in Section 3.4, Presenting the study case for detailed explanation)

C. Ong et al. (2019) finished adding that for the Singaporean context; access to recycling facilities and knowledge about recycling can play a crucial role in prompting individuals to adopt sustainable behavior. People who exhibit a greater concern for the future consequences of their actions are also more inclined to engage in sustainable practices.

The median income from work per person for each Singaporean household member is S\$3,287 (Department of Statistics of Singapore, 2023). Therefore, households' socioeconomic characteristics can be very similar to Lago Esmeralda Neighborhood households as stated in Section 1.3 Research Objective and Contributions, the study focuses on a high-income urban settlement. (See Section 3.4. Presenting the Case Study for more detailed information about Lago Esmeralda).

The present findings offer a preliminary foundation for addressing the sub research question, which seeks to identify the determinants that shape residents' social practices and behaviors. But also, to question if behaviors and routines may be related in generating positive or negative impact to the actual implementation of more sustainable actions, that in the case of this study, it searches specifically for the community-based models for OWM. While the insights gained from this investigation are informative, they do not constitute an exhaustive literature review, nor do they provide a complete set of arguments to fully address the research question. As such, in the forthcoming sections of the thesis, additional theoretical perspectives pertaining to social practices and behaviors will be discussed to enhance and supplement the initial groundwork for this study.

2.2 Social Practice Theory (SPT)

In this section, we will examine the fundamental components of the theory of social practices, and the interconnections between them as expounded by Shove et al. (2012) and Strengers & Maller (2015). It is the first chosen theoretical framework for addressing the determinants that shape residents' practices. It is worth noting that, in contrast to traditional behavioral studies, the constituent elements of practices are tracked and analyzed to discern the various configurations of practices that may change over time.

Practices are composed of various elements such as physical and mental actions, the use of objects, knowledge, emotions, and motivation that are interdependent with each other (Shove et al., 2012). At the same time, practices are reproduced and performed by their ‘carriers⁴’. (Strengers & Maller, 2015)

Social practices are reproduced over time through a combination of recruitment (the adoption of new practitioners), defection (the loss of existing practitioners), and the reproduction of existing practitioners. (Shove et al., 2012)

Reproduction needs flexibility and adaptability as practices and their supporting systems need to be able to respond to changing circumstances and contexts. It also involves feedback loops between the performance of practices and the broader systems in which they are embedded. These feedback loops can reinforce or undermine the sustainability and equity of practices, depending on the particular configurations of **infrastructure, technologies, policies, and cultural norms**. (Shove et al., 2012)

Furthermore, it is crucial to analyze the mechanisms that drive the recruitment, defection, and reproduction of social practices over time:

- **Path Dependence:** Social practices are often characterized by path dependence, meaning that past patterns of recruitment and defection can create self-reinforcing feedback loops that make it difficult to change established practices.
- **Practice Migration:** Social practices can be migrated from one context to another and highlights the importance of understanding the factors that enable or constrain this process.
- **Practice Hybridization:** Social practices are often hybridized as they migrate across different contexts and argues that this can lead to the creation of new practices that combine elements of different existing practices.
- **Practice Scale:** The importance of understanding the scale of social practices, noting that practices can range from individual behaviors to institutional and systemic arrangements.

2.2.1 Elements of Social Practice Theory

The first of the three elements under consideration are "Materials", which includes objects, infrastructure, tools, hardware, and the body. (Shove et al., 2012) The main concern is whether the development of such infrastructure is significant "in practice", meaning whether it has an impact on maintaining or disrupting current living standards. (Strengers & Maller, 2015)

The second element is “Competence”, refers to the various types of knowledge and practical skills, without making any distinction between them. Distinguishing between two types of knowledge, i.e., the knowledge needed to evaluate a performance and the knowledge required to perform the task, is crucial in certain contexts. (Shove et al., 2012) The key for competences is treating them like a send-receive message but depending on the broader social context of each receiver that competences themselves shape to understand how to complete a task. (Shove et al., 2012)

⁴ According to Shove et al., 2012 individuals who act as "carriers" of the practices.

Lastly, the third element is "Meaning", this term captures the social and symbolic importance of participating in a particular practice, meaning includes emotions, mental activities, and motivation. As more and different people become involved, the social significance of participation and the meaning can change, merge or be substituted. (Shove et al., 2012) The evolution and transformation of the components of significance rely on a series of complex and interconnected actions that involve categorizing and re-categorizing them across multiple locations and contexts.

The assumption behind this theory's perspective is that the elements that make up practices exist independently and need to be connected to form a practice. Accordingly, to Shove et al. (2012), there are two possibilities that arise from this view: firstly, that the elements required for a practice may exist but are not yet connected named as proto-practice; secondly, that practices can fall apart when the links between their elements are no longer maintained and become ex-practices. See Figure 1 for visual representation.

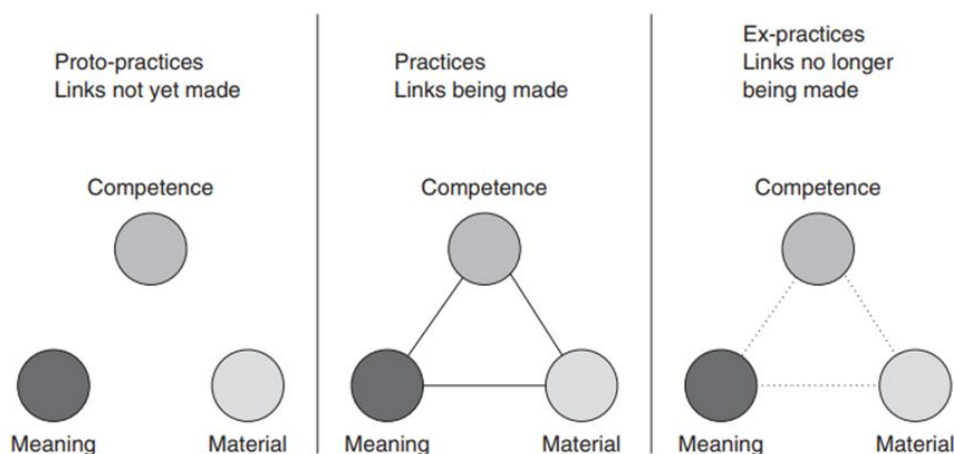


Figure 1. Connections between STP's elements, (Shove et al., 2012)

2.2.2 Connection of practices

The theory emphasizes the importance of connection, suggesting that for particular arrangements to persist, the links between elements must be continuously re-established.

At the same time, social practices are not discrete or isolated, but rather interconnected and interdependent. Practices are often performed in conjunction with other practices, and the performance of one practice can influence or depend on the performance of others. (Strengers & Maller, 2015)

To understand and reflect in these connections Shove et al., highlights the need for systemic analysis and reflexivity in understanding how practices shape our social and environmental outcomes. Underpinning the following considerations:

- **Tensions and Contradictions:** The interconnectedness of practices can also lead to tensions and contradictions, particularly in situations where different practices have conflicting

goals or requirements. Shove et al. (2012) highlights the need to understand and address these tensions to promote more sustainable and equitable social practices.

- **Scale and Scope:** Connections between practices can operate at different scales and levels of abstraction. For example, practices may be connected through shared values or cultural meanings, or through shared infrastructures or technologies. Understanding these connections requires analysis at multiple scales and a recognition of the ways in which practices are nested within broader socio-technical systems.
- **Pathways and Transitions:** Connections between practices can facilitate transitions to more sustainable and equitable forms of social organization. By identifying the connections between existing practices and the potential for new practices to emerge, practitioners can develop pathways for transitioning to more desirable outcomes.
- **Reflexivity:** The importance of reflexivity in understanding the connections between practices. By recognizing and reflecting on our own practices and the broader systems in which they are embedded, we can develop a more critical and nuanced understanding of how practices are interconnected and how they shape our social and environmental outcomes.

2.2.3 How to conduct interventions in SPT?

Interventions in the material element might involve changing the design or availability of materials to encourage more sustainable or equitable practices. For example, providing easily accessible recycling bins in public spaces can encourage people to recycle more often.

Interventions in the meaning element might involve changing the cultural narratives or discourses surrounding certain practices, to encourage more sustainable or equitable attitudes and behaviors. For example, campaigns to promote the social status associated with cycling or using public transport can help shift cultural attitudes towards more sustainable modes of transportation.

Interventions in the competence element might involve providing training or education to help people develop the necessary skills and knowledge to perform practices in more sustainable or equitable ways. For example, offering courses or workshops on sustainable gardening techniques can help people to develop the skills and knowledge they need to grow their own food and reduce their reliance on industrial agriculture.

Overall, this theoretical framework aims to elucidate and comprehend human behavior within the scope of social practices. Social practices are construed as patterns of behavior that are shared by individuals within a given social context (Shove et al., 2012). Rather than considering human behavior as a collection of isolated actions or decisions, SPT perceives it as a set of patterns that are rooted **in broader social systems**. This section can provide useful insights for assertively addressing how to identify, analyze, and intervene in a social practice towards OWM, but it also may give helpful acumen for testing not only on an individual scale but in a collective one.

2.3 Theory of Planned Behavior (TPB)

According to this theory, human behavior is determined by three factors: attitude, subjective norm, and perceived behavioral control (Ajzen, 1991). **Attitude** refers to an individual's positive or negative evaluation of the behavior in question. **Subjective norm** is the perceived social pressure to perform or not perform the behavior, while **perceived behavioral control (PCB)** refers to an individual's belief in their ability to perform the behavior (Ajzen, 1991). TPB posits that these three factors combine to form an individual's intention to perform conduct, which ultimately predicts the actual behavior. Intentions are signs of the level of effort and willingness individuals have to perform a behavior. Typically, the stronger their intention to engage in the behavior, the more likely they are to actually perform it (Ajzen, 1991).

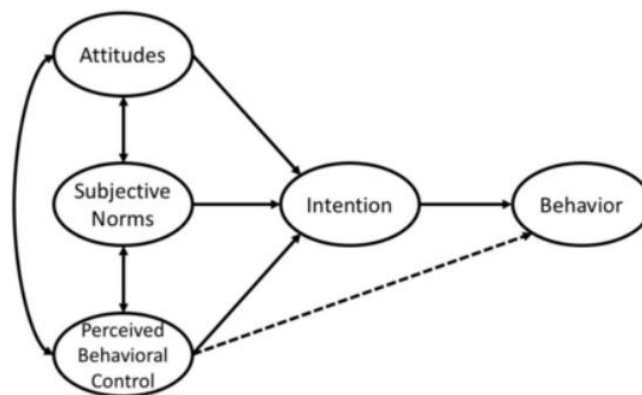


Figure 2. Factors of TPB, (Ajzen, I., 1991)

The success of individuals largely depends on external factors such as having the necessary resources and opportunities. These factors, which include time, money, skills, and support from others, represent a person's actual control over their behavior (Ajzen, 1991). According to the author, individuals with access to these factors and the intention to perform the behavior are more likely to succeed in doing so. Therefore, it is anticipated that intentions will have an impact on performance if the individual has control over the behavior, and performance will increase as the level of control over the behavior increases, provided that the person is motivated to attempt it.

In TPB, the concept of perceived behavioral control, or self-efficacy belief, is situated in a broader context that includes attitudes, beliefs, intentions, and behavior. As you can see in Figure 2, PBC has a direct possible impact on behavior. This theory proposes that by considering both perceived behavioral control and behavioral intention, it is possible to **predict** actual behavior. An important highlight to this hypothesis is when assuming the intention to perform a behavior is the same, the amount of effort exerted to achieve success is likely to increase with the level of perceived control over that behavior (Ajzen, 1991). For example, if two individuals have the same level of intention to learn how to surf, the one who feels confident in their ability to do so is more likely to persist compared to someone who doubts their ability.

However, it is anticipated that the significance of attitude, subjective norm, and perceived behavioral control in forecasting intention will differ depending on the behavior and circumstances (Ajzen, 1991). Therefore, in some instances, it may be discovered that only attitudes have a meaningful effect on intentions, while in other cases, attitudes and perceived behavioral control are adequate to explain intentions, and in some cases, all three predictors have unique contributions.

To conclude, the Theory of Planned Behavior (TPB) proposes that behavior is determined by attitude, subjective norm, and perceived behavioral control (PBC). These three factors combine to form an individual's intention to perform the behavior, which ultimately predicts the actual behavior. The importance of attitude, subjective norm, and PBC may differ depending on the behavior and circumstances.

Numerous studies (e.g., Ajzen, 1988; Canary & Seibold, 1984; Sheppard et. al, 1988) have investigated the correlation between intentions and actions for various types of behaviors, literature reviews on this research are available from multiple sources in an extensive way. Thus, the theory has been widely applied in various domains, including environmental conservation, to understand and predict human conduct/habits and to develop effective interventions to change behavior which is one of the main objectives of this research.

2.4 The Lens of a Joint Approach

According to Strengers and Maller (2015), policy making tends to be influenced by behavioral aspects rather than social practices. In other words, contemporary policy making is deeply rooted in economic and behavioral models of decision-making, which may not necessarily be compatible with theories of practice (Strengers & Maller, 2015). However, if policy makers were to take practices as the focus of intervention, practice theories could be of great value (Shove et al., 2012). This would require designing programs based on a thorough understanding of the practices that require change, identifying interventions that can shift these practices, engaging all relevant stakeholders, and implementing a coordinated program of change (Shove et al., 2012).

Rather than arguing for the relevance of practice theory in environmental issues in general, it may be more useful to demonstrate how environmental approaches are already entangled with what people do every day. Policymakers often overlook entrenched practices that drive behaviors, and therefore do not fully understand the reasons behind the behaviors they aim to change. (Shove et al., 2012) For instance, rather than simply calling for a 30% or whatever goal in reduction in hot water usage, stakeholders in policy making should also consider why people use hot water in the first place. Understanding the co-evolution of practices can lead to more effective interventions that address the root of the problem (Shove et al., 2012).

Nevertheless, behavioral theories cannot just be let out of the game, as they are also driving for understanding individual psych. The Theory of Planned Behavior (TPB) has emerged as a critical framework for developing analytical models aimed at effective waste management, particularly in the context of collective practices in OWM, which is the focal point of this thesis.

However, contributions in the Social Practice Theory (Shove et al., 2012; Strengers & Maller, 2015) have raised questions about the narrow focus of TPB in analyzing behavior, advocating

instead for broader perspectives on social practices. It is important to note, however, that this thesis does not seek to assess the validity of either theory. Rather, its aim is to comprehensively understand both theories and develop an optimal approach for addressing entrenched behaviors in the pursuit of sustainable waste management practices. That is why, in this section, I identify some similarities and differences between them, that can help the further discussion of this research.

2.4.1 Differences between them

Social Practice Theory focuses on the larger social practices that shape individual behavior, while the Theory of Planned Behavior examines the cognitive factors that influence behavior. The units of analysis also differ, with SPT viewing behavior as embedded within larger social practices and the TPB emphasizing individual-level phenomena.

Habitual behavior is a key element in SPT, as it recognizes the role of routine and repetition in shaping individual behavior. Conversely, the TPB does not explicitly account for habit. Furthermore, SPT places a significant emphasis on the social and material contexts in which behavior occurs, while the TPB focuses on individual attitudes, subjective norms, and perceived behavioral control.

Regarding temporality, Social Practice Theory views behavior as a process that is shaped by past experiences, current practices, and future aspirations, whereas the Theory of Planned Behavior assumes that behavior is largely determined by conscious decision-making and focuses on the intentions that drive immediate behavior.

It is important to note that behavior, in this context, refers to the observable actions performed by individuals, but does not provide a comprehensive explanation for why these actions are performed (Shove et al., 2012). These two theoretical frameworks offer differing perspectives on the nature and determinants of behavior, with Social Practice Theory emphasizing the role of social practices and context, as well as the importance of habitual behavior and temporal processes. Conversely, the Theory of Planned Behavior focuses on individual-level cognitive factors such as attitudes and perceived behavioral control in determining behavior.

2.4.2 Similarities between them

There are few similarities among them but is worth to remark them; the two frameworks under discussion share a common focus on the understanding and explanation of human behavior. In this regard, they recognize the significance of cognitive factors, such as attitudes and beliefs, and social influence, such as social norms and pressure, in shaping behavior. Additionally, both frameworks assume that intention plays a critical role in driving behavior, whether it is an intention to conform to a social practice or an intention to perform a particular behavior.

2.5 Psychosocial factors

To comprehensively grasp the effect of psychosocial factors on behavior, four dimensions are identified through the literature review that are helpful for the objective of understanding the current state of behaviors in this research. These dimensions include:

- Sociodemographic Characteristics

Which have been found to be linked to increased resource consumption and waste generation due to improved living standards and incomes, especially in industrialized and developed nations. (Knickmeyer, 2020) Interestingly, individuals in these groups are more willing to pay for food waste management services. (Liang et al., 2021)

- Convenience

Recognizing the importance of having a convenient location within a household for separating and storing waste is crucial. However, most people who are willing to separate waste will only do so if they have easy access to designated collection points (Celestino et al., 2022).

- Social Norms

The behavior and attitudes of neighbors can impact and inspire each other. The willingness of citizens to change their behaviors towards waste management is also influenced by the availability of facilities and governmental incentives (Zhang et al., 2019). Even after becoming aware of a problem, citizens may need additional motivation to move from intention to action (Sharma et al., (2020). Therefore, it is necessary to increase public awareness of waste management programs in households and urban areas, which can indirectly affect citizen behavior and promote adherence to social norms.

- Education

To decrease household food waste and promote responsible consumption practices, educational programs must be developed. These programs should encourage citizens to become more aware of their buying and consumption habits, as well as teach them about food storage and reuse methods. It is important to extend these educational campaigns beyond just schools and involve social organizations and public companies (Celestino et al., 2022).

Alternatively, waste prevention and segregation programs should be effectively communicated through clear and easily accessible campaigns that are disseminated through appropriate communication channels. The primary focus of these campaigns should be waste prevention, as it is considered the most effective strategy for managing waste. (Dagiliene et al., 2021)

2.6 Community-Based Approach

In countries with a significant population in the developing world (like Mexico), the potential for development lies in their human resources. Human resources are crucial for the effective management of solid waste in these countries (Dhokhikah et al, 2015). Despite expressing a willingness to recycle waste, citizens often do not engage in recycling practices due to various situational factors (Corraliza and Berenguer, 2000; Borsgstede and Biel, 2002). As noted in the problem statement of this document, the several problems, which are the results of the centralized system in the country, are the main factor for searching and identifying alternatives for this current situation.

Community-based approaches are perspectives on environmental management that recognize the critical role of community involvement in decision-making and the implementation of environmental policies and programs (Mongkolnchaiarunya, J., 2003). Unlike traditional centralized approaches that rely solely on government or private sector efforts, community-based strategies emphasize empowering local communities to act on the environmental issues that directly affect them (Mongkolnchaiarunya, J., 2003).

The focus of this research is the case study of Lago Esmeralda (further detail is explained in Section 3.4 Presentation of the case study), which is in the municipality of Atizapán de Zaragoza. Despite the efforts to recycle and produce compost as well as generate biogas to generate electricity, these actions alone cannot address the issue of inadequate law enforcement and a lack of incentives to encourage citizens to separate their waste in this municipality (Medellín, 2015, as cited on Plasencia et al., 2021). The disposal of waste solely in landfills can lead to contamination of water and a shortage of space for waste disposal. Nevertheless, this can also be seen as a chance to establish community-based strategies (CBS) like composting initiatives, biodigesters, or urban gardening, etc., which are projects that can help reduce the amount of organic waste being dumped into landfills.

Conceptual frameworks within the community-based approach, that are the interest in Lago Esmeralda Case, can comprise:

Home Composting: is a long-standing practice in several countries and is recognized as a crucial waste management approach in international policies. Its benefits include eliminating the need for waste transportation and providing gardens with nutrients (Körner et al., 2008). Additionally, it can have an educational role in promoting environmental consciousness. However, the limitations to its implementation include space availability for composting and application, as well as the lack of knowledge regarding proper composting methods such as selecting appropriate substrates and ensuring suitable process conditions for home composting (Körner et al., 2008).

Community Urban Agriculture and Garden: Urban agriculture is an approach that promotes sustainable and community-oriented solutions for enhancing access to fresh food plants for various reasons, such as social or recreational purposes, as well as to address economic needs (Nowysz et al., 2022). Moreover, urban gardens can have great emotional, psychological, healing, and spiritual value, as suggested by Dunnett and Quasim (2000). Brown (1985) notes that gardens can foster a sense of community by encouraging interaction and relationships among neighbors.

Finally, zero waste communities are those that aim to reduce waste to zero by maximizing waste reduction, reuse, and recycling efforts. This approach involves engaging community members in all stages of waste management, from waste reduction and source separation to collection and processing. Encouraging zero waste practices can promote sustainable production and consumption, facilitate the recovery and recycling of waste, and limit the use of incineration and landfills (Zaman, 2015, as cited on García-Franco et al., 2021)

2.6.1 From Theory to *~Community-based~* Practice

The study seeks a basis for the foundation of a new framework that can tie behavioral theories like SPT and TPB applied in community-based approaches to enhance and improve their

implementation among the Lago Esmeralda residential. Although this study searches to identify this possible new framework for answering the research question with the upcoming methodology, some relevant insights have been found in previous studies that help complement the analysis.

The notion of Community-Based Organizations (CBOs) is intricately linked with the ideas of community-based initiatives or grassroots innovations (Middlemiss & Parrish, 2010 as cited in Veress et al., 2023). In these instances, community members pool their abilities and resources to collaboratively establish and execute endeavors focused on delivering communal benefits or services. Such endeavors are characterized by citizens having authority over the objectives, methods, and the effective execution of their undertakings (Edelenbos et al., 2021, p. 1692 as cited in Veress et al., 2023).

Kiss et al. (2018) and Smith et al. (2020) concur that the dynamics within communities and their members interactions constitute significant driving factors in the shift towards sustainability. Emphasizing that civil society and social movements have demonstrated their role as agents that stimulate transformative change.

Various barriers and facilitators that can be inferred concerning community-based strategies (CBS) are highlighted in the reviewed literature; this approach often faces challenges due to their limited resources and influence, posing a hurdle to their capacity-building efforts (Middlemiss & Parrish, 2010 as cited in Veress et al., 2023). Their effectiveness is closely tied to their ability to attract and sustain voluntary participants, which proves to be challenging in a society dominated by individualism (Hoffman & High-Pippert, 2010 as cited in Veress et al., 2023). Managing stakeholder expectations becomes crucial for CBS, especially as they transition from informal networks to more structured forms (Ornetzeder & Rohrer, 2013 as cited in Veress et al., 2023). However, the authors also illuminate the positive aspects of CBS, highlighting their potential to raise awareness, foster social cohesion, and empower individuals for cooperative change. Notably, CBS members exhibit higher engagement in sustainable practices and civic events compared to non-members, showcasing the role of group norms and shared meaning in motivating pro-environmental behavior (Hofmeister-Toth et al., 2012; Staats et al., 2004 as cited in Veress et al., 2023). Thus, while CBS face challenges due to their resource limitations and the dominance of individualism, they also serve as spaces of potential empowerment and social influence, contributing to sustainable community development.

Veress et al. (2023) centered their attention on the functions that Community-Based Organizations (CBOs) or Community-Based Initiatives (CBS) play in fostering peer interactions that shape sustainable behavior, necessitating the adoption of a meso-level perspective. This perspective revolves around communities, groups, and organizations that serve as arenas for the negotiation and construction of meaning (McAlexander et al., 2002 as cited in Veress et al., 2023), diverging from a macro-level societal focus and a micro-level individual emphasis. The collective meaning generated within such groups and community norms can significantly influence individual conduct (Lewin, 1947 as cited in Veress et al., 2023). However, there exists a research gap, as pointed out by Reid et al. (2010, p. 315 as cited in Veress et al., 2023), regarding the comprehension of group-based sustainable behavior. Similarly, Keller et al. (2016, p. 82 as cited in Veress et al., 2023)

argue that the domain of social interaction and communication remains insufficiently theorized within the framework of social practice theory.

Nevertheless, Veress et al. (2023) insist that a parallel approach at the meso-level can be facilitated through the application of social practice theory (SPT), focusing on practices that encompass tangible objects and environments, socio-cultural connotations, and the abilities and proficiencies required for group participation.

The following paragraphs summarize an interesting case of community-based composting in a Mexican residential settlement that shares similar characteristics with Lago Esmeralda. The study case was carried out by Plasencia et. al (2019) and it gave significant insights into the factors that can either facilitate or hinder the successful implementation of such a project.

Club de Golf Bellavista is a residential area located in Atizapán de Zaragoza. It has 80 hectares and 345 houses, and it is considered a high-income urban settlement as well (Plasencia et. al, 2019).

This research focused on the challenges and potential solutions for urban solid waste (USW) management in Mexico City, with a particular emphasis on grassroots initiatives and community-based composting. The study highlighted the issues related to the municipal administration period, space shortage for landfills, and the inadequate operation of existing landfills. This can be backed up with the problem statement described in Chapter 1.

The findings indicate that social participation is a crucial factor in grassroots initiatives, especially in the source generation of USW. While respondents demonstrate positive attitudes towards composting and recognize the benefits associated with it, their lack of familiarity with composting techniques and other contextual barriers hinder the implementation of organic waste management practices. In addition, according to the compost manager, there is a perception among citizens that, despite their efforts in waste separation, the waste ends up getting mixed up again once it reaches the landfill. The research emphasizes the need for improved design, availability of materials, and designated separation points for organic waste within collective spaces to overcome these barriers.

Furthermore, the study emphasizes the importance of creating a circular economy and achieving zero waste to landfill through the reduction and recycling of residues. It suggests disseminating the community composting program, ensuring the quality of the compost, providing suitable production areas, and institutionalizing the activities through good practice manuals and annual reports. The establishment of a community compost network is recommended to facilitate knowledge-sharing and provide technical and economic support to new composting initiatives.

Some notable outcomes of the project include the voluntary management of the compost plant by the neighbors' association of Club de Golf Bellavista. Prior to the implementation of the composting program, the typical monthly maintenance costs for amounted to approximately \$2,750 USD. However, with the establishment of the compost plant, these costs were eliminated and replaced with the use of organic residues as inputs for compost production. After two years of operation, the savings were \$2,250 USD. As a result, Plasencia et al. recommend that other neighborhoods consider this proposal as a viable option to be implemented without incurring additional costs.

The study finalizes highlighting the potential replication of the community compost scheme in similar residential areas, with recommendations for creating a compost network and partnering with municipal authorities to secure land for waste treatment. The research suggests that overcoming the barriers associated with local composting systems could pave the way for an industrial composting system in the future. Although some parts of the case are not the final goal for this document, such as improving industrial composting systems or coordinating with local authorities. There are several significant learnings that can be taken to implement this type of model in Lago Esmeralda that has more to do with the community itself and the connection with their behaviors and practices.

Chapter 3: Methodology

This section outlines the approach for answering the research question and sub-questions. It includes the Research Strategy, Research Limitations, presents the Research Framework, and determine Data Collection and Analysis methods. The Case Study: Lago Esmeralda is also introduced, followed by the Research Planning outline and Ethics section.

3.1 Research Strategy

For answering the research questions, in this study, I conduct a comprehensive examination of sustainable waste management behaviors and practices in households located in Lago Esmeralda. To achieve this, I utilize descriptive analyses of organic waste management activities by surveys and interviews based on the Theoretical Framework (Chapter 2).

The data collected from these sources is then analyzed to identify practices and behaviors that are found to be resistant to change and require new interventions. Moreover, I investigate community-based implementations to determine how such an approach can be implemented as well in the neighborhood.

Based on these findings, I propose a framework that includes key considerations for shaping social practices and behaviors towards a community-based approach to sustainable waste management in Lago Esmeralda which answers the main research question.

3.2 Research Limitations

The research is limited to the three condos in the residential area, namely "Bélgica", "Francia", and "Holanda," and the 534 residents (+18) living there. The study focuses specifically on organic waste, including food waste and plant material, as it was not feasible to cover all types of waste due to the limited time for the research.

The study acknowledges the limitations of the research, including the lack of data on the exact amount of waste generated by Lago Esmeralda, therefore is difficult to determine and exact amount of waste that would not reach the landfills, and the challenges of finding empirical evidence to support the application of social practice theory in environmental and sustainable policies. As Strengers & Maller (2015) mentioned “...*there is no empirical evidence to suggest one way or the other how effective change programs informed by theories of practice are, and if they are able to move beyond the critiques levelled at programs premised on theories of behavior.*” (p. 73).

However, the framework developed at the end of the research is based on a thorough theoretical review and observations and findings from the information gathered through surveys, interviews, and field observations. The study aims to provide a basis for future research and to deliver a framework that can inform the development of community-based waste management strategies by identifying how to shape current social practices and behaviors among the community in the residential area.

The survey was limited to individuals who had access to social media platforms where the survey was shared (neighbors group chat). Consequently, those without access to the selected social media were unable to participate and were therefore excluded from the study.

The initial total number of survey respondents by the planned closing date (7th of June 2023) was 263. However, after applying specific criteria to analyze the respondents' data, the final number of considered answers was 200. It is important to note that not all respondents answered every question, resulting in varying response rates ranging from 175 to 200 for different questions. The margin of error for the analyzed data set was calculated to be approximately 0.063 using Slovin's formula. This should be considered when interpreting the survey results. Additionally, certain questions (Q19, Q21, Q36, and Q37) allowed respondents to select multiple options. As a result, the total number of responses to these questions may exceed 200 responses. Moreover, open-ended questions (Q10 and Q11) had limited responses as they were suggested only to those who answered "YES" to specific criteria.

Although the desired number of interviews was initially planned to be three, only two interviews were conducted due to time constraints and the availability of interviewees. However, the interview with the Administrator of Resources provided valuable insights regarding project prioritization, budgeting, and perspectives of the board directors, as the Administrator also serves as a board member. It can be inferred that similar answers and perspectives were expected from the Board Director.

3.3 Research Framework

The research unit of this project is the residential areas in Lago Esmeralda “Francia”, “Bélgica” and “Holanda”. For easy understanding of the report, these three areas are referred to as Lago Esmeralda Neighborhood.

The research objects of this project are the current behaviors and practices towards organic waste management and how they can be assertively shaped to enhance a community-based strategy.

This research provides a literature review of several theoretical frameworks; Social Practices Theory, Theory of Planned Behavior and Psychosocial factors regarding practices and attitudes towards organic waste management and Community Based Theories for developing a shared framework that can enhance the implementation of community-based strategies in Lago Esmeralda Residential Area.

The sources of the research perspective are determined in Table 1.

Table 1. Key concepts

KEY CONCEPTS	THEORETICAL FRAMEWORKS
Social Practices	<ul style="list-style-type: none"> • Social Practice Theory
Social Behaviors	<ul style="list-style-type: none"> • Theory of Planned Behavior • Psychosocial factors
Community-based strategies	<ul style="list-style-type: none"> • Community-based theories and cases analysis

A schematic presentation of the Overall Research Framework can be observed in Figure 3.

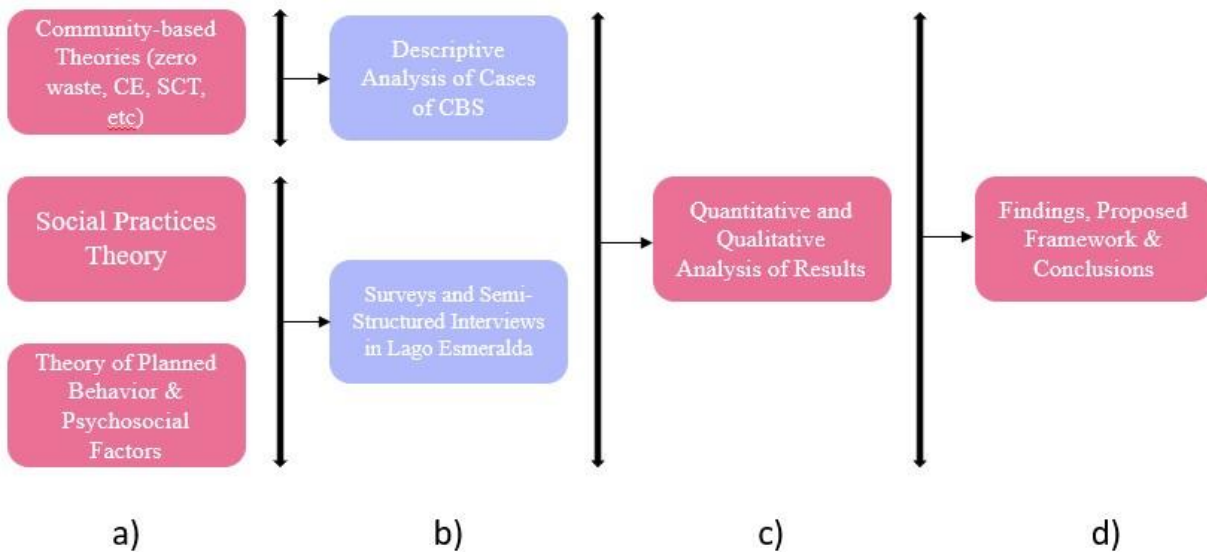


Figure 3. Schematic Research Framework

Where from the figure above (Figure 3):

- Conduct a literature review from the selected theories that suit best to answer the research questions to understand key concepts and elements for further steps in the research.
- Gathering data through; descriptive analysis among community-based strategies (CBS), surveys, and semi-structured interviews among the residents of the three

condominiums in Lago Esmeralda Residential area, namely "Francia", "Bélgica", and "Holanda", to assess their attitudes and daily practices towards organic waste management.

- c) Conduct mixed-method analysis of the data collected.
- d) Identify key findings to propose a framework and give a conclusive summary of the study for future research in this field.**

3.4 Presenting the study case: Lago Esmeralda Neighborhood

The selection of the study case's object refers to the familiarity and accessibility offered by the neighborhood itself due time restrictions.

State of Mexico

The population of State of Mexico, estimated at 16.9 million people (INEGI, 2023), produces an average of 1.43 kg per day per person. (Tsydenova et. al., 2018) Food waste constitutes the largest fraction, accounting for 27.77% of the total waste generated. The city's municipal solid waste (MSW) management system includes 4 composting plants, and the informal sector contributes to the recycling of 14% of the waste. However, almost all the collected waste is transported to five landfills located outside the city in a nearby state, which creates a significant challenge due to the high transportation costs involved. (Tsydenova et. al., 2018) Generally, waste is gathered using tools that are in inadequate condition and unsuitable for collecting waste that has been separated at the source. (HCH, 2021)

Lago Esmeralda

Zona Esmeralda is an upscale residential area located in the municipality of *Atizapán de Zaragoza* in the State of Mexico, Mexico. It is situated in the northern part of the city, just a few kilometers away from Mexico City. It has a variety of residential neighborhoods that offer different styles of housing, including apartments, townhouses, and single-family homes. The area is popular among upper-middle-class and wealthy families due to its high-quality living standards, modern amenities, and proximity to Mexico City. Of the 41,547 housing units projected for 2023, 46% have recorded monthly family incomes of more than \$3,500 USD, another 40% recorded incomes between \$1500 and \$3500 USD (Sofitec, 2022). The average income rate in Mexico according to Statista (2021) is \$1300 USD.

Lago Esmeralda is a residential neighborhood located in Zona Esmeralda. It is a gated community that is situated around a dam, which gives it a scenic and tranquil atmosphere. The year 2016 marked the confirmation of the construction of 269 houses in the area. However, by 2022 there have already been 3,000 houses built and the projection raises to 15,000 houses once the whole construction project is complete by 2030 (Admin, 2023). Refer to Figure 5 for a visual representation of the entire residential area.

For the purposes of this research, the population under study comprises of three fully developed condominiums, namely "Francia", "Bélgica", and "Holanda," which are located within the larger residential area of Lago Esmeralda (as depicted in Figure 6). It is noteworthy that the neighborhood consists of both dwelling apartments and single-family houses.

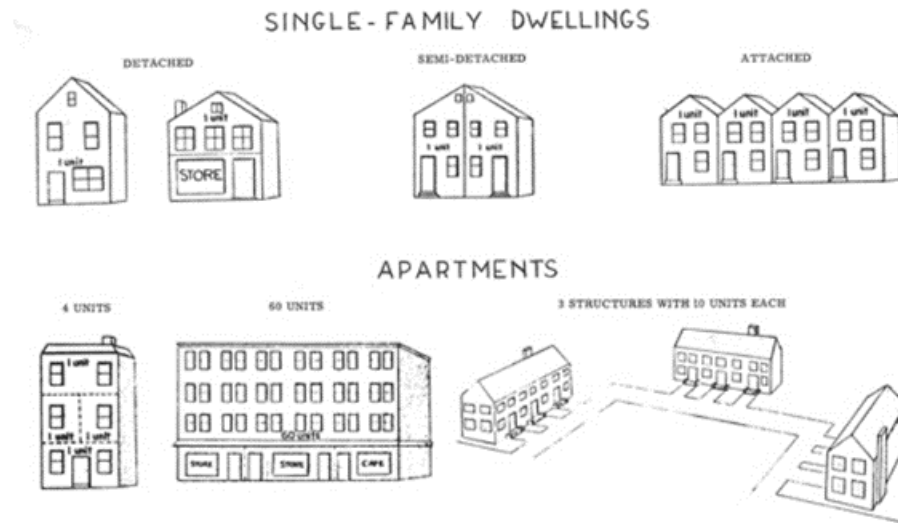


Figure 4. Graphical Representation of dwellings, (Rosenthal, 1960)

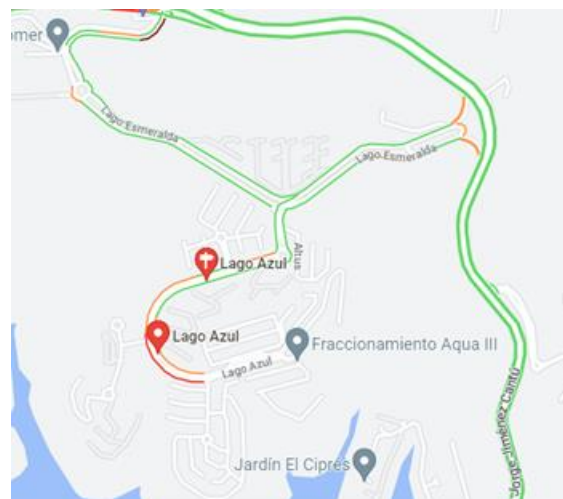


Figure 5. Territory of whole Lago Esmeralda Residential, (Google Maps, 2023)

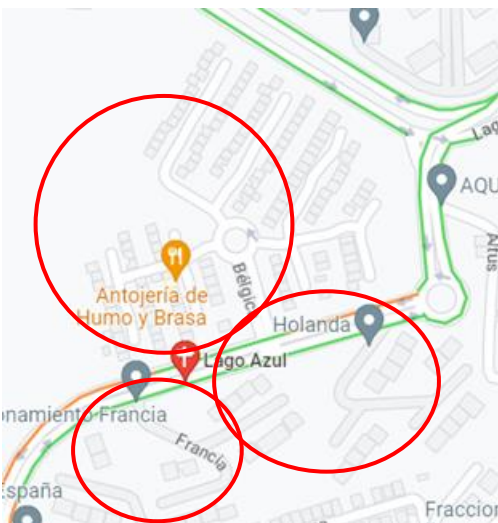


Figure 6. Delimited Case Study by 3 condos: “Bélgica”, “Francia” and “Holanda”, (Google Maps, 2023)

Despite being an upscale neighborhood, Lago Esmeralda, like other areas in Zona Esmeralda, has faced some environmental challenges due to the management of waste in nearby landfills. It is worth mentioning that the nearest landfill to this municipality is Puerto de Chivos. This landfill receives 500 tons of waste daily but can only recover 0.8% of it. (INE, 2010, as cited on Plasencia et al., 2021)

3.5 Data Collection

This section provides a detailed explanation of the methods used for collecting data for the overall research objective.

Table 2 presents a general scheme outlining the desired information, sources, and access methods required to address the sub-questions identified in Section 1.4. The aim is to provide comprehensive concepts and findings to answer the main Research Question.

- How does shaping social practices and behaviors towards organic waste management lead to the implementation of a community-based strategy (CBS) in Lago Esmeralda Neighborhood?

Table 2. Data Collection General Scheme

Research Question	Desired Information	Sources	Accessing Method
1. What are the factors that influence residents' social practices and behavior?	The set of factors and steps that can shape social practices and behaviors towards sustainability & OW.	<ul style="list-style-type: none"> • Scientific papers. • Grey literature. • Publicly accessible articles. 	<ul style="list-style-type: none"> • Desk Research • Surveys • Semi-structured interviews
2. What are the social practices and behaviors that apply to a community-based approach?	A current state of practices and behaviors regarding OWM from Lago Esmeralda's residents is needed to set a basis.	<ul style="list-style-type: none"> • Residents from Lago Esmeralda over 18 years old. • Administrator of the three condos in Lago Esmeralda 	<ul style="list-style-type: none"> • Observation in field • Surveys • Semi-structured interviews
3. Which social facilitators and barriers need to be identified for implementing a community-based approach?	<p>Understanding the elements needed regarding community-based approach to implement it.</p> <p>A top-down perspective regarding general and specific neighborhood administration is needed.</p>	<ul style="list-style-type: none"> • Research cases that implemented Community-based strategies. • Scholars and expertise on related matters. • Scientific papers. • Grey literature. • Publicly accessible articles. • Administrator of the three condos in Lago Esmeralda 	<ul style="list-style-type: none"> • Desk Research • Semi-structured interviews

3.5.1 Content Analysis

The first method of data collection was content analysis for elaborating all the sections in Chapter 1 and 2 of this document.

Background and Problem Statement Sections were developed with grey literature, articles, and reports from public institutions as well as government documentation, journals, and blogs that were consulted on the web, the intention was to give a clear understanding of the current state of the MSW, specifically in organic waste matters among the global and Mexican context. Important to note that some official documentation was in Spanish, and the information was translated into English.

For the Theoretical Frameworks selected to be examined and mentioned in Chapter 2, scientific papers and books were identified in Scopus Database and Google Scholar, key words utilized: waste management behavior, household organic waste, psychosocial factors, recycling behavior, food waste, household food waste, sustainability, household waste management, waste minimization, social practices theory, compost, residential areas, organic waste, community management; recycling, behavioral practices, waste behavior, behavioral theories (See the list of References for detailed bibliography). The criteria for selecting the papers were: a) open access and b) for avoiding reworking on the language, papers should be in English.

3.5.2 Surveys

Surveys are the second method of data collection, designed based on the theoretical frameworks examined in Chapter 2. One survey with 45 questions was created with Qualtrics software. The survey includes questions about sociodemographic characteristics to understand the profile of the respondents, TPB, some psychological factors and SPT. Different types of questions were created such as: multiple choice, open-ended, yes/no and Likert scale.

These surveys are conducted among the 534 residents (+18-year-old) of the three condos in Lago Esmeralda Residential area, namely "Francia," "Bélgica," and "Holanda," to understand the current practices and behaviors towards organic waste management. The surveys also provide valuable data that can be transformed into quantitative data for further analysis (as detailed in Section 3.6 Data Analysis).

No discrimination in gender, education, income, or ethnicity is held, as also these variables can be useful for the purpose of the data gathering. The survey is distributed virtually through the specific chat group of the community for condominium matters.

It is important to note that surveys are conducted in Spanish as respondents are from Mexico and it is not possible to assure that everyone understand English language.

For further information on ethics, privacy policies, and data management of the survey, refer to Section 3.8 Ethics. The survey (English and Spanish version) can be found in Appendix 2.

3.5.3 Interviews

The third method of data collection is semi-structured interviews, these are conducted face-to-face with two crucial actors to understand the implications of implementing CBS in a residential area like Lago Esmeralda from a top-down perspective. The first criterion for selecting them is their ability to provide insights and feasibility for possible implementation of CBS. The second criterion is their authority and responsibility regarding condominium matters, as they can provide a general perspective of the perceived behaviors and practices among the residents but also the priorities of the neighborhood towards sustainability in terms of budget, time, space, willingness, etc.

The two selected actors are: Administrator of the Resources of the condominium and a Waste Management Specialist working for an NGO in Mexico City. An interview was created for each actor, considering the characteristics of their specific roles.

Important to note that interviews were conducted in Spanish because both actors are Mexican, and it is not possible to assure that they can conduct the interview in English language. Appendix 1 includes the interviews (English and Spanish version). See Section 3.8 Ethics for further information on privacy policies and data management.

3.6 Data Analysis

In the final stage of this research, the overall data gathered from the previous steps is analyzed in detail to identify key findings. First, a descriptive analysis is carried out to gain fruitful insights into the essential considerations required for implementing community-based strategies (CBS) by examining a Mexican case that have already gathered important information regarding the subject

in another residential area, complementing with grey literature regarding community-based in general that can clarify some social facilitators or barriers.

Secondly, a qualitative analysis is conducted for the semi-structured interviews by summarizing them with the aim to gain significant insights regarding two main things; a) the implications and feasibility for implementing CBS; and b) the general perspective they have on practices and behaviors among the residents towards OWM and the level of importance they give to such matter.

Thirdly, a mixed-method analysis of the survey results is conducted. The purpose of these analyses is to gain a better understanding and to identify the attitudes and practices that may need to be changed among the condominiums.

Finally, based on these findings, a new framework, it explores the possibility to set a group of steps that can serve as basis to identify weaknesses and strengths in current practices and behaviors to further combat or excite them for implementing CBS in Lago Esmeralda. Additionally, a conclusive summary of the research is presented to provide insights and recommendations for future research in this field.

3.7 Research Planning

The Research Proposal was due on April 14th, followed by the complete Thesis submission on July 7th. The colloquium is scheduled for August 23rd. A Gantt Chart outlining the Thesis plan is included in Appendix 3 for further details.

3.8 Ethics

As stated from the Behavioral, Management and Social Science Faculty (BMS), *“Informed participation is an ethical and legal requirement for research involving human participants. Consent for research ethics is composed of providing information regarding study, purpose, risks, benefits, voluntary participation, as consent as a legal basis can be used for the processing of personal data under GDPR.”* Therefore, as interviews are conducted in this research, a consent form (Appendix 4) is handled for the people that are going to be interviewed. Interviewees have the option to maintain their identity anonymously and just be referred as: Administrator of the condominium (AC), Environmental Specialist from NGO (ES-NGO) and the Board Director of the Community (BD).

In the case of the surveys, it is ensured complete anonymity by not asking for names. Participants are free to choose whether they want to answer the questions once they receive the survey link. To clarify the intentions and the anonymous nature of the survey, an introductory paragraph will be provided at the beginning of the survey. Additionally, to secure participants' willingness to participate, it is included a Yes/No question at the end of the survey asking for their consent to use their responses.

3.8.1 Data Management and Privacy

Following the General Data Protection Regulation (GDPR) Principles:

- Notice – Subjects of research are notified before conducting the interviews and surveys that the data is going to be collected for research purposes.

- Purpose – The data gathered is only used for research purposes.
- Consent – Refer to previous section for the detailed explanation of this point. Consent forms are delivered and signed by interviewees before the questionnaire and respondents from the surveys are free will to answer or not. At any point of the research, data subjects can change their opinion of the researcher using their data.
- Security – Data is held on personal device without making hard copies, for the purpose of the study data may be kept until 10 years after the thesis is finished for future research, according to the guidelines of BMS Datalab. This will be informed to the participants.
- Disclosure - Data subjects are informed as to who is collecting their data.
- Access - Data subjects are allowed to access their data and make corrections to any inaccurate data.
- Accountability - Data subjects have a method available to them to hold data collectors accountable for not following the above principles.

Chapter 4: Findings

This chapter presents an in-depth analysis of the research findings obtained from the content analysis, survey, and interviews data. The aim of this chapter is to answer the sub-research questions, therefore, the main research question of this research and to set the basis for the discussion section.

4.1 Factors that influence residents' social practices and behavior.

To address this question, I first refer to Chapter 2: Theoretical Framework, which is based on the selected theories employed in this research. These theories provide insights into the factors or elements that can exert an influence on an individual's behaviors and practices: Firstly, materials, competences and meanings for SPT (Shove et. al, 2012). According to SPT it is essential that the three elements (materials competence and meaning) intertwine and link among each other so practices can be adopted deflected or reproduced (Shove et. al, 2012).

Secondly, attitudes, subjective norms, and perceived behavioral control according to Ajzen (1991) for TPB. He stated that the stronger the individual's intention to perform the behavior, the higher the likelihood of them carrying it out.

Additionally, some scholars also infer that level of convenience to carry out an action (Celestino et al., 2022), sociodemographic characteristics (Liang et al., 2021; Knickmeyer, 2020) and level of education on the subject (Dagiliene et al., 2021; Celestino et al., 2022; Barraza & Walford, 2000) can inhibit or excite and action.

4.1.1 Insights from the Survey

The results stemming from the survey conducted on the behaviors and practices of the present respondents in relation to organic waste management yield intriguing insights that can effectively complement the response to this initial sub-question. Certain factors, such as the absence of theoretical components, demonstrated an adverse effect on the extent of influence for cultivating these behaviors or practices. Conversely, the substantial prevalence of these components can also exert a positive influence on them. While it might appear self-evident, the research revealed that certain factors possess a greater degree of influence than others despite their consistent presence in the residents' daily routines.

4.1.1.2 General Data of Respondents

The respondents in this study exhibit a diverse profile. The majority of participants (67%) have resided in the condominium for more than five years, indicating a long-term residency. In terms of occupation, the largest group (48%) consists of full-time employees, while 18% are homemakers, 20% are entrepreneurs, and there are smaller percentages of part-time employees (7%), students (4%), and unemployed individuals (3%). Regarding age, respondents are distributed across various age groups, with the highest proportion (44%) falling within the 45-65 years category, followed by 26-35 years (29%), 36-45 years (12%), 18-25 years (6%), and those over 65 years (9%). In terms of gender, most participants identify as women (66%), while 34% identify as men. In a correlation exercise with the Fisher's Exact Test, gender (Q5) presented statistic

significant relationship with willingness to participate in capacitation, being the women who had the most willingness (66%) of 154 people that answered “yes” (Q14). Interestingly, all homemakers (100%), most of unemployed (60%) and part-time employers (75%) are women. This may indicate that they spend more time in or near the condominium thus more time to receive the capacitation.

		Q14: Si...itaci3n?		
Q5: ¿Cu3l e...su g3nero?		S3	No	Total
Mujer		63.6%	2.4%	66.1%
Hombre		29.7%	4.2%	33.9%
Total		93.3%	6.7%	100.0%

P-Value	0.0459
Effect Size (Cram3r's V)	0.168
Sample Size	165

Figure 7. Correlation between genre and willingness of receiving capacitation.

4.1.1.3 Current State

Firstly, a significant proportion of participants (69%) have designated separation points for organic waste within their homes. However, in the condominium, only 33% of respondents have designated separation points for organic waste. Additionally, most participants (88%) are not aware of any waste management programs, campaigns, or initiatives in the condominium, indicating a lack of communication or participation in such initiatives. Moreover, only 41% believe that these initiatives effectively communicate the importance of waste management and how to participate in responsible consumption practices. Furthermore, while a majority of respondents (58%) separate their organic waste on a daily basis, a significant portion (26%) never separate their organic waste. Similarly, a majority (82%) do not engage in composting practices (Q16).

Q16 -How often do you currently compost your organic waste?

One a week, 2-3 times per week, daily, never

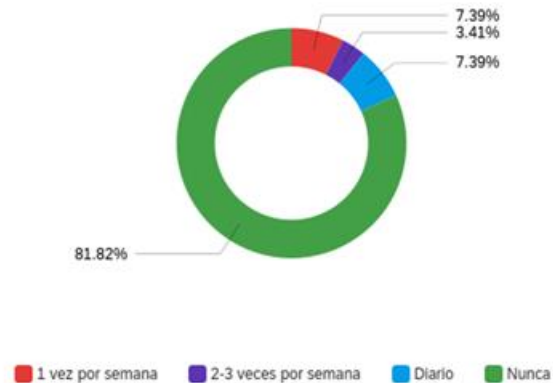


Figure 8. 82% of respondents do not engage in composting practices.

4.1.1.4 Materials, Competences and Meaning from Social Practice Theory

In this section of the survey the intention was to identify if the elements for each theory exist or not and what is the impact of them among existent and possible new practices and behaviors towards a community-based approach, including separation, composting and disposal.

It was interestingly found that the lack of some elements of SPT contributed to inhibiting sustainable practices regarding OWM (specifically composting) playing as an important factor that needs to be addressed if a higher level of influence is desired.

Materials

As mentioned in the current state a significant percentage of participants have designated separation points for organic waste within their homes (68.9%), suggesting the presence of infrastructure and tools necessary for waste separation practices individually. However, a lower percentage of participants have designated separation points for organic waste in the condominium (33%), indicating a potential gap in the availability of infrastructure at the community level.

Q8 - Do you have designated separation points for organic waste in the condominium?

Yes/No

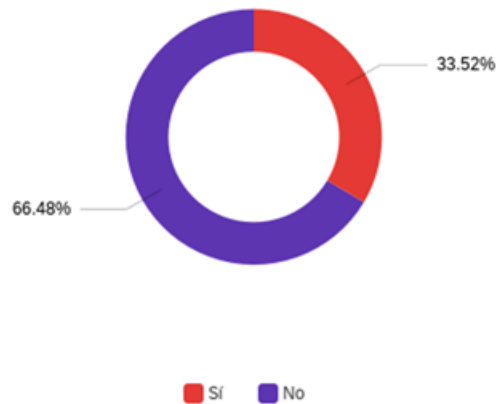


Figure 9. 33% have designated separation points in the condominium.

In terms of desired materials for composting, participants expressed a preference for a composting manual (30%) and containers (29%). Moreover, when asked about the materials they could obtain themselves, a significant percentage of participants expressed the ability to acquire gardening tools (24%) and gloves (29%), indicating that individuals may already possess some of the necessary material resources for composting.

Competences

A significant percentage of participants (46%) have received education or training on organic waste management, indicating that they possess certain knowledge and practical skills related to this area. However, a notable portion of participants (54%) have not received such education or training. Interestingly, when asked if they would be interested in receiving education or training on the subject, a large majority of participants (93%) expressed interest (Q14).

Furthermore, only a quarter of participants (25%) reported being familiar with composting techniques, indicating a lower level of competence in this specific area. This suggests a need for further education and training to enhance participants' competences and increase their familiarity with composting practices.

Q14 – If not, would you be interested in receiving such education or training?

Yes/No

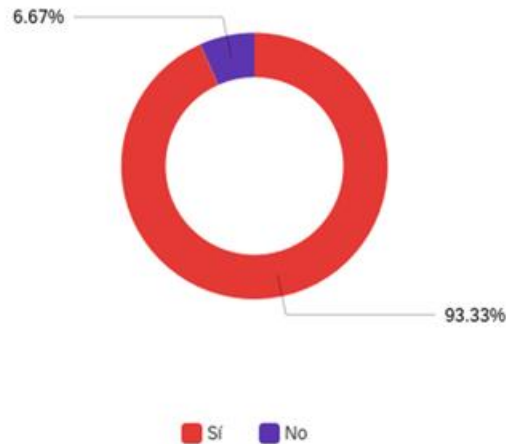


Figure 10. 93% of respondents will be willing to receive further capacitation.

Meaning

The majority of participants expressed a belief that composting organic waste is the responsibility of each household (With a mean of 4.2 in the Likert Scale Q38.1) and should be a shared responsibility among neighbors and the community in the condominium (mean= 4.2 for Likert Scale Q38.2). Furthermore, there is a high level of interest and motivation to learn and adopt more sustainable waste management practices (Mean= 4.2 for Likert Scale Q38.4), emphasizing the importance of environmental concerns (Mean=4.3 for Likert Scale Q38.5) and future generations (Mean= 4.4 for Likert Scale Q38.6). Additionally, if the condominium were to implement collective rules for organic waste management, the respondents overwhelmingly indicated a positive stance (Mean 4.57 for Likert Scale Q38.8).

On the other hand, a small proportion of respondents expressed a lack of importance placed on the sustainability of the condominium (With a mean of 1.7 for Likert Scale Q38.7). This contrasting view may indicate a divergence in meanings and motivations among community members, suggesting the presence of varying perspectives and values regarding sustainable practices.

Regarding the perception of composting's impact on the community, an overwhelming majority of participants believe that composting can have a positive impact (Q20), indicating a positive and shared meaning associated with this practice.

When participants were asked about the main reasons for not composting at home, a variety of factors were mentioned. These include a lack of time (16%), concerns about unpleasant odors (16%), a lack of knowledge on how to do it (26%), a lack of tools (17%), and a lack of space inside

their homes (25%). Finally, regarding the willingness to compost indoors, most participants expressed interest (75%) if they were to learn an efficient, easy, and odor-free method. This, again, indicates that the availability of appropriate material resources and knowledge can motivate individuals to adopt sustainable practices.

4.1.1.5 Attitudes, subjective norms, and perceived behavioral control (PBC) from Theory of Planned Behavior

According to the Theory of Planned Behavior, an individual's intention to engage in a particular behavior is determined by the combination of three factors (attitudes, subjective norms and PBC. This intention, in turn, serves as a predictor of their actual behavior. Equally than previous section, the intention for this part of the survey is to identify such elements and the impact they have on transforming behaviors towards OWM.

Attitudes

The respondents' answers indicate positive attitudes towards composting and the importance of managing organic waste as the majority of participants (60%) are aware of the benefits of composting (Q17) and 83% of the population sample perceive it as an important practice (Q18).

The perceived benefits of composting, such as improving soil quality, reducing waste, saving on fertilizer costs, reducing pollution, and promoting biodiversity, further reinforce the positive attitudes towards composting (Q19).

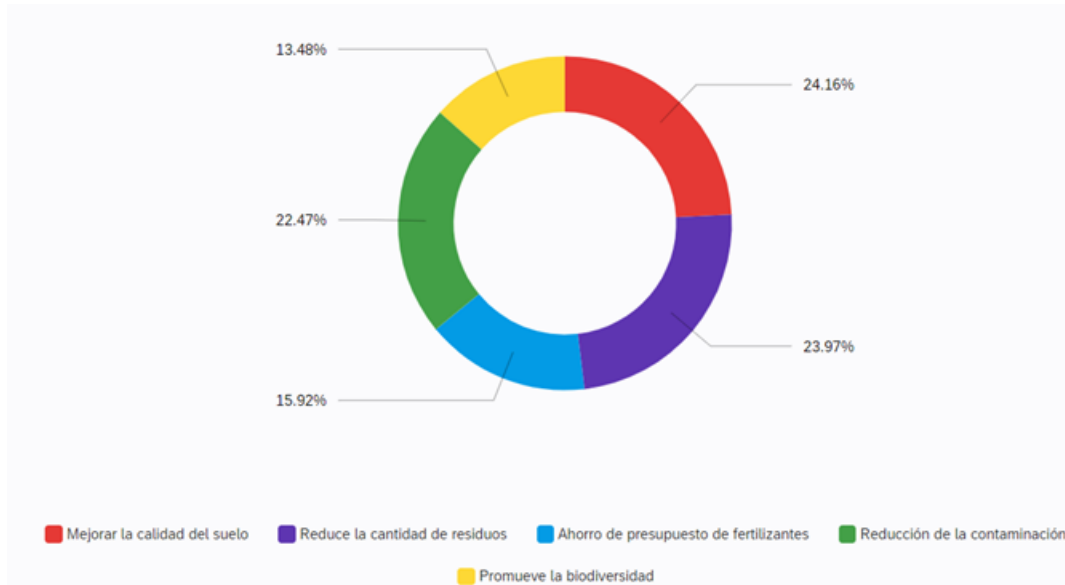


Figure 11. Perceived benefits of composting

When considering the reasons for not composting at home (Q21), practical constraints, such as lack of time, fear of unpleasant odors, lack of knowledge, limited tools, and space constraints, are mentioned. These external factors may influence attitudes towards composting. Participants also express a moderate sense of personal responsibility for managing their organic waste (Mean 3.7 of a Likert Scale for Q22). This reinforces the fact that while there is a degree of personal accountability, other factors such as practical constraints and external influences may also shape

their attitudes towards composting. Moreover, a significant majority of participants (89%) believe that individual actions can make a difference in reducing organic waste (Q23).

Q23 - Do you believe individual actions can make a difference in reducing organic waste?

Yes/no

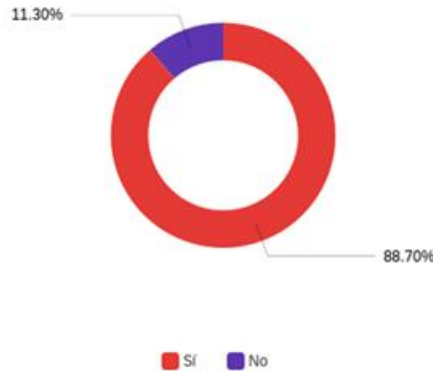


Figure 12. 89% of respondents believe individual actions can make a difference in OWM.

Subjective Norms

The respondents' answers reflect the perceived social norms and pressures regarding sustainable behaviors for organic waste. The participation of friends and family in sustainable behaviors for organic waste (Q24) is reported by a moderate percentage of respondents (37%), with a significant number of participants indicating unfamiliarity with their friends and family's behaviors (41%). Similar patterns are observed for neighbors' participation in sustainable behaviors for organic waste (Q25). A relatively low percentage of respondents report their neighbors' participation (12%), while a significant proportion is uncertain about their neighbors' behaviors (61%).

Despite this, the scenario changes when considering the influence of the closest social group and the condominium community. If the closest social group starts composting (Q26), a majority of respondents express willingness to follow their example (63%), indicating a strong influence of their closest social group on their own behavior which can be a determinant factor for shaping the behavior.

Q26 - If suddenly, your closest social group starts composting, would you follow their example?

Yes, No, Maybe

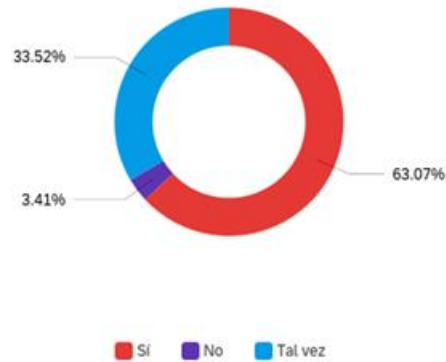


Figure 13. Most respondents will follow subjective norms.

Additionally, when the condominium provides an open space for composting and offers vegetables, seeds, and fruits for internal consumption (Q27), a high percentage of respondents (92%) expressed interest in participating. Similarly, if the condominium provides fertile soil to maintain optimal green spaces and reduce maintenance costs (Q28), most respondents (92% as well) express interest in participating. Furthermore, if the condominium implements separate trash bins for organic waste (Q29), an overwhelming majority of respondents (99%) indicate their intention to separate their waste. Reinforcing what Ajzen (1991) suggests, the greater the intention, the greater the change in the behavior. Until now, regarding TPB, subjective norms have been demonstrated to play a crucial factor in shaping behavioral aspects of individuals in Lago Esmeralda.

Q27 - If suddenly, the condominium provides an open space to compost everyone's waste and offers vegetables, seeds, and fruits for internal consumption, would you be interested in participating for 2-3 weekends per year and managing the compost?

Yes, No

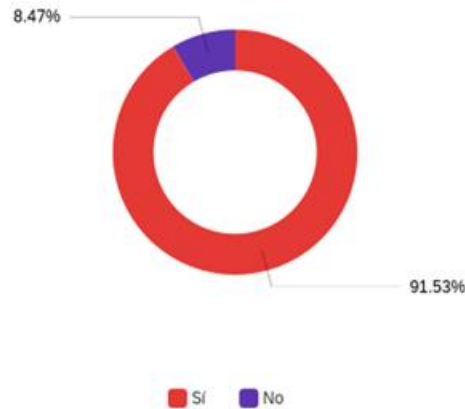


Figure 14. 92% of respondents would engage in group composting.

Perceived Behavioral Control PBC

The responses to the questions regarding perceived behavioral control provide insights into the individuals' beliefs about their ability to perform composting behaviors.

Regarding familiarity with composting techniques (Q31), a substantial majority of respondents (75%) report not being familiar with composting techniques. This suggests that many individuals do not perceive themselves as having the necessary knowledge or skills to engage in composting practices.

Nonetheless, in response to the question about their willingness to compost if they learned an efficient, easy, and odor-free method for indoor composting (Q30), a significant percentage of respondents (75%) express their willingness to engage in composting. Only a small percentage (6%) outright state that they would not compost, suggesting a lack of interest or other barriers beyond perceived behavioral control. The "Tal vez" (maybe) response from 19% of the respondents may indicate some uncertainty or conditional interest.

Q30 - If you learned an efficient, easy, and odor-free way to compost inside your home, would you be encouraged to compost?

Yes/No/Maybe

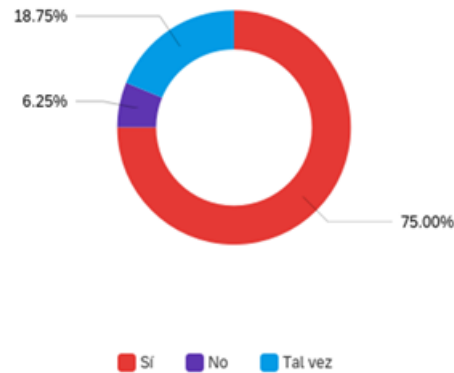


Figure 15. Most neighbors would engage in composting if they perceived behavioral control.

4.1.2 Insights from the Interviews

Addressing our initial sub-question, the insights garnered from interviews with both the condominium's administrator and the NGO specialist offer a multifaceted understanding of current attitudes and practices concerning organic waste management (OWM) within Lago Esmeralda condominiums. I found this top-down perspective invaluable for two compelling reasons:

Firstly, the insights provided by the NGO specialist afford an impartial assessment of the factors influencing OWM practices and behaviors within such residential domains. Their external viewpoint brings objectivity to the analysis, shedding light on underlying determinants that might not be immediately apparent.

Secondly, the administrator's viewpoint, being part of the condominium's governance, encompasses not only residents' behaviors but also extends to a broader spectrum of decision-making and administrative considerations. This holistic overview is crucial in comprehending how actions at a higher organizational level can impact residents' sustainable behaviors and practices (if any). Given the research's objective of formulating a community-based strategy, the board's role emerges as pivotal. Their involvement becomes paramount in fostering participation among neighbors, as they possess the tools essential for nurturing OWM practices—such as materials, competences, meanings, and subjective norms.

In essence, these invaluable insights lay the groundwork for our ensuing discussion, centered on the third sub-question and question what measures should be undertaken to effectively shape behaviors and social practices within the community? The interview transcripts are presented in Appendix 6 in their original language and translated into English.

The findings highlight the following key points:

4.1.2.1 Population: The Lago Esmeralda condominium has approximately 3000 households, with a projected density of 6,300. By 2025, when construction is completed, about 15,000 houses are going to be built. The large number of residents can indicate a significant potential impact in terms of waste generation and management. Consequently, there exists a substantial opportunity to foster a cohesive community that can bolster composting practices across the entire locality, yielding a pronounced effect not only within the condominium area but also extending to the broader municipality of Atizapán de Zaragoza.

4.1.2.2 Identified Elements from SPT and TPB

Previously, the condominiums that comprise the study case “Francia”, “Bélgica” and “Holanda” had designated separation points for organic waste. However, due to the involvement of maintenance personnel and unauthorized individuals scavenging through the separated waste, the practice was discontinued to prevent these occurrences (Administrator, personal communication, May 2023). As a result, the condominiums no longer separate waste, including organic waste, nevertheless the administrator stated that they have these containers and consider that they could use them again if necessary.

At the same time, in “Holanda” a past attempt to implement internal composting faced issues such as odor problems, indicating the importance of proper organization and knowledge. For this reason, the project stopped. Furthermore, the condominium has not actively pursued initiatives to involve residents in improving waste management practices. This is due to the perception that waste collection is already taken care of through the monthly maintenance fees for a private company taking out the waste weekly. The focus has been lately on addressing water-related issues.

In the administrator’s perspective the main barriers to implementing sustainable waste management practices in the condominium include the need to organize residents, break their routines, and educate them about the importance of waste separation. Additionally, there is a lack of awareness and compliance with basic rules, such as pet waste management (Admin, personal communication, May 2023).

To complement some of these findings, the NGO specialist mentioned that lack of information and awareness among residents is a significant barrier to promoting sustainable waste management practices. Additionally, unreliable public services for waste management and the absence of accessible collection centers contribute to residents' skepticism and lack of motivation to separate waste.

“...People thinks ‘why I separate my waste if government is not going to handle it according to the established rules?’” (NGO Specialist, personal communication, May 2023)

The aforementioned points substantiate the findings from the survey, highlighting the absence of elements such as materials, competences, and perceived behavioral control within the condominiums. Consequently, the current scenario in Lago Esmeralda reveals a dearth of sustainable practices, both in a general context and specifically in terms of organic waste management.

In summary, these findings underscore the intricate interplay of elements within the community environment that significantly impacts the feasibility of sustainable composting practices and behaviors, answering the first sub-question: What are the factors that influence residents' social practices and behavior? The absence of certain elements, such as materials, competences and perceived behavioral control evidently hampers the potential for such practices. Conversely, a robust presence of an element, as demonstrated by the meaning element, or the positive attitudes or the apparent compliance of subjective norms holds promise and hope for practice engagement. However, this singular emphasis falls short unless all elements are strongly intertwined and linked, as emphasized by Shove et al. (2012). In the context of Lago Esmeralda, attributing significant meaning or a positive attitude to sustainable practices alone does not suffice to encourage participation in composting activities.

4.2 Social facilitators and barriers need to be identified for a community-based strategy.

To answer this question, I refer to Section 2.6 Community-Based Approach and further complement with the expert and stakeholder opinion in the subject regarding the interviews' responses.

Firstly, it is imperative to recognize the critical role of community involvement in decision-making and the implementation of environmental policies and programs. The empowerment of communities can be beneficial when they act on the environmental issues that directly affect them (Mongkolnchaiarunya, J., 2003; Veress et al., 2023).

Secondly, among the scholars, they agree that several CBS need a dedicated space for the intended activity, vast knowledge in the subject, and need the constant encouragement to interact and relate among neighbors (Körner et al., 2008; Nowysz et al., 2022; Dunnett & Quasim, 2000; Dhokhikah et al., 2015; Brown, 1985; Veress et al., 2023).

Thirdly, Veress et al. (2023) explore the role of Community-Based Organizations (CBOs) in shaping sustainable behavior through peer interactions, emphasizing a meso-level perspective that considers community dynamics and meaning creation. This contrasts with macro and micro-level approaches. The collective meaning established within these groups significantly influences individual behavior. Yet, a research gap exists regarding group-based sustainable behavior understanding. Social practice theory lacks comprehensive theorization of social interaction and communication. Veress et al. suggest applying social practice theory to examine practices involving tangible objects, socio-cultural aspects, and competencies for group engagement at the meso-level. I find this notion resonating with Veress's perspective, as indicated by the survey results concerning individuals' willingness to partake in group composting when equipped with space, knowledge, and resources—where the majority displayed a high level of willingness. Similar trends emerged when residents were questioned about their inclination to engage in composting if initiated by their immediate social circles.

In a comprehensive analysis, I find that the aforementioned information partially addresses sub-question 2 by highlighting certain barriers to CBS implementation. It becomes apparent that to effectively address these barriers, it is imperative to investigate sustainable practices and behaviors from a meso-level perspective. This approach will facilitate a deeper understanding of the actual

community needs. Aligning with the survey's findings, it is evident for Lago Esmeralda context that a singular element alone cannot sufficiently induce desired behaviors; rather, the interconnection and reinforcement of all elements are crucial. Nonetheless, there are opportunities for facilitation that CBS can capitalize on. Cultivating a sense of belonging within a group that shares similar values with individuals, and affording them the opportunity to exchange expertise, experiences, and resources towards common objectives, such as sustainable practices in organic waste management, can empower an organized and committed community. This, in turn, can define the role of CBS itself. This perspective echoes Veress et al.'s assertion that these peer-interactions are fundamental within the CBS framework.

4.2.1 Insights from the Interviews

In addition to the scholars' literature, some elements that are found in CBS are promotion of sustainable practices, recycling, composting, and waste management programs. Organizations like NGOs can offer support, but there is a need for more grassroots initiatives addressing waste management issues (NGO Specialist, personal communication, May 2023). While the specialist's organization primarily focuses on the public sector, there are local grassroots organizations that address waste management issues. However, such organizations are limited in number and often concentrate on rural communities according to the expert. Examples of larger organizations include WWF and parent-led climate advocacy groups, but their scope may not directly address individual behavior change.

“...There is definitely a gap in understanding what individuals really need in order to break old habits and sustain practices in the long term, I have not seen many colleagues analyzing from that lens, possible solutions for waste management in general” (NGO Specialist, personal communication, May 2023)

The NGO specialist highlights effective waste management practices such as private composting services and voluntary waste collection centers that are already happening in residential areas with similar characteristics as Lago Esmeralda condominiums. The specialist mentions the "Vive Composta" company, which is gaining popularity in residential areas with similar characteristics to “Bélgica”, “Holanda” and “Francia” (Lago Esmeralda). It offers a convenient service for residents to have their organic waste collected for a low fee. There is also a voluntary waste collection center in a neighboring condo named “Chiluca”, where residents take turns to ensure proper waste separation, which is subsequently sold to the waste collection truck. Surprisingly, it is becoming a big community-based collection center without authorities involved because residents outside Chiluca take their waste to this collection center too. The NGO Specialist suggested visiting the center and talking to the residents in charge for copying the model in Lago Esmeralda. As seen in “Chiluca” and “Club de Golf Bellavista” case, these successful implementations give hope that community-based models can work in residential areas.

The specialist also highlights several emerging practices that could be implemented in the condominium to enhance waste management. These include improved composting technologies, reducing food waste throughout the supply chain, and promoting home composting as a solution. The specialist emphasizes the importance of addressing food waste at the household level and educating individuals on proper planning and grocery management. For reducing organic waste,

the specialist insists that composting is a good solution for it because it is also an efficient, cheap model. The specialist also mentions the benefits of composting in diverting waste from landfills, reducing transportation and logistical costs at national level, and benefiting the community in the long run.

“Another important thing is to focus on solutions for food waste at the household level because it is the root of the problem. People can waste food because they even planned their groceries poorly. It may sound very basic, but it is super important.” (NGO Specialist, personal communication, May 2023)

From neighborhood governance’s perspective, currently, there is no specific budget allocation for waste management initiatives. However, if prioritized, the condominium board would agree to allocate resources, preferably for proposals that generate savings or utility (Admin, personal communication, May 2023). The Administrator also commented that water capture is no longer a priority, unlike in the past. Therefore, any proposal that benefits the environment, including organic waste management, would be welcome. The administration board members are conscious of the issues and have maintained the maintenance fees without an increase, allowing flexibility to consider projects.

Conversely, barriers to sustainable waste management CBS can include lack of information, unreliable public services, and the absence of accessible collection centers (NGO Specialist, personal communication, May 2023). This information can be backed up with the findings previously made found in the “Club the Golf Bellavista” case. Both cases agree that government has little or no credibility among citizens which at the same time can cause tiredness and apathy regarding organic waste.

Moreover, lack of resident engagement, awareness, and compliance of basic rules pose barriers to implementing sustainable waste management practices (Administrator, personal communication, May 2023). The administration board is receptive to the environmental issues caused by residents and is open to proposals and is willing to reallocate budget for organic waste management projects like collective compost. However, they have not initiated any specific measures, the administrator thinks that without their example or active encouragement, it is challenging to motivate residents to adopt sustainable waste management practices.

In conclusion, the analysis of the expert and administrator’s opinions underscores the importance of community involvement in addressing environmental challenges. Community-based approaches have shown promise in promoting sustainable waste management practices, including recycling, composting, and waste reduction initiatives. Successful implementations in similar residential areas provide hope for the effectiveness of these models. However, there are barriers that need to be addressed, such as the lack of information, unreliable public services, and the absence of accessible collection centers. Government credibility and resident engagement also play significant roles in the success of community-based initiatives. The administration board of Lago Esmeralda has expressed willingness to support organic waste management projects, but further action is needed to drive and promote these initiatives. Overall, with increased awareness,

resident engagement, and supportive policies, the implementation of community-based models can lead to more sustainable waste management practices in residential areas.

4.3 Social practices and behaviors that need to be applied in a community-based strategy.

For addressing this sub-question, I draw upon an examination of the prevailing behaviors and practices pertaining to organic waste management among the surveyed participants and some inputs derived from the actors engaged in the interviews, while concurrently integrating the valuable insights garnered from the preceding sub-questions.

4.3.1 Insights from the Survey and the Interviews

4.3.1.1 SPT elements that need intervention for CBS implementation.

The study indicates that a majority of neighbors have apparently adequate **materials** for waste separation at the household level. This may indicate a high level of engagement in waste separation. Contrasting results, however, showed that the condominium does not count with separation containers suggesting a lower level of infrastructure, tools, and materials, thus practices for organic waste separation at the collective level. This indicates a potential mismatch between individual practices and collective practices within the condominium setting.

Furthermore, most residents wanting a composting manual and a container as provided materials emphasize the role of material resources in supporting and facilitating composting practices. The main reason for not composting might not be the lack of tools, however it was the third most voted reason, highlighting the importance of having access to guidance and proper equipment if the community desires to home-compost.

In terms of **competences** and skills, slightly more than half of the population sample indicated that they do not possess the knowledge for organic waste management, in addition only a quarter of the respondents were familiar with composting techniques. These results show an important gap in this key element. Moreover, participants addressed lack of knowledge as the main reason that stopped them for home-composting. Interestingly, these results are like Dhokhikah et. al (2015) findings where Indonesian homeowners' main reason for not composting were lack of time and lack of knowledge. These responses highlight the importance of competence in shaping individuals' behaviors. Participants who lack the knowledge and practical skills required for composting may be hesitant to engage in the practice due to various concerns and perceived barriers. However, Mexican respondents showed an overwhelmingly positive willingness to acquire competences and further develop their knowledge and practical skills in composting practices.

The respondents' answers indicate a strong sense of **meaning** and importance attached to composting and sustainable waste management practices within the community. This suggests a shared understanding and social significance attributed to individual and collective actions in waste management. Furthermore, most of the respondents showed concern about the sustainability of the condominium due to the environmental situation and for the future generations. These responses may indicate that participants attach meaning to their actions, considering the broader social and environmental implications of their behaviors.

Respondents threw a positive stance when asked about implementing collective actions to enhance the sustainability of the whole community, reflecting the shared meaning and importance attributed to collective action and community involvement which can be key for implementing a community-based model. At the same time, neighbors positively perceive composting practices. As mentioned in Section 2.4.2 Similarities between them, the two theories recognize that intention plays a critical role in conducting behaviors or/and practices (Ajzen, I., 1991; Shove et. al., 2012; Strengers & Maller, 2015) Therefore, it can be taken as an advantage for proposing tailor-made solutions to the condominium.

4.3.1.2 TPB elements that need intervention for CBS implementation.

The respondents' answers indicate positive **attitudes** towards composting and the importance of managing organic waste, also suggest that they have a positive evaluation of composting behavior. The perceived benefits of composting, such as improving soil quality, reducing waste, saving on fertilizer costs, reducing pollution, and promoting biodiversity, further reinforce the positive attitudes towards composting and may indicate that participants recognize the value and positive outcomes associated with composting. Additionally, participants answer in its majority that individual actions can make a positive difference. This positive attitude towards the impact of individual behaviors may suggest a recognition of personal agency and the belief that their actions can contribute to organic waste reduction efforts.

However, it is important to note that a positive attitude alone did not translate into actual engagement in organic waste management practices in this study. A large proportion of participants reported not practicing home-composting. The reasons for this lack of engagement, as mentioned earlier, are not primarily attributed to attitudes or lack of awareness, but rather stem from broader contextual factors such as space limitations, time constraints, lack of necessary tools, or insufficient knowledge. These factors may influence attitudes towards composting as they present perceived barriers or concerns that potentially hinder individuals from actively participating in composting behavior.

Regarding the **perceived subjective social norms** and pressures, a significant portion of respondents reported being unaware of the behaviors and practices of their families and neighbors in relation to organic waste management. This suggests that social norms regarding organic waste management may not be widely shared within their immediate social circles. However, this does not necessarily imply that they would not be influenced by positive practices demonstrated by others. In fact, the dynamics changed when considering the influence of the closest social group and the condominium community. A majority of participants expressed a willingness to adopt home-composting practices in these contexts. This observation highlights two important points: firstly, there is a lack of shared current practices between different social groups, which may contribute to the limited dissemination of social norms related to organic waste management. However, if these practices were shared, it is likely that strong social norms could be established within participants' immediate social circles and be replicated among community members.

When queried about their willingness to engage in a community-based model, specifically collective composting, which requires time and effort, neighbors exhibited a positive inclination. This may highlight the influence of the social context and communal activities on individual

behavior and may suggest that the perceived social norms within the condominium community strongly influence respondents' willingness to engage in composting activities.

The responses to the questions regarding **perceived behavioral control** provide the following insights into the individuals' beliefs about their ability to perform composting behaviors:

A notable finding of the study is the limited familiarity among respondents with composting techniques. This lack of knowledge and experience may contribute to a reduced sense of perceived behavioral control, as individuals may feel uncertain about their ability to effectively engage in composting. This observation aligns with the identified weaknesses in terms of competences from Social Practice Theory. However, it is noteworthy that when participants were presented with a non-smelly, easy, and efficient composting approach, most neighbors expressed a willingness to adopt such a practice. This finding supports the notion that positive attitudes towards an action may require additional external influences, such as convenience, availability of time, and adequate support, to facilitate the migration of practices, as suggested by Shove et al. (2012).

In summary, in the context of the Lago Esmeralda settlement, it has been firmly established that the most influential factors shaping behaviors and practices towards organic waste management are the presence or absence of the essential elements as outlined by the theoretical framework. This, coupled with a comprehensive understanding of the barriers and facilitators that can either hinder or promote the establishment of a Community-Based Strategy (CBS) for organic waste management, brings this study to a pivotal juncture. For Lago Esmeralda is imperative to address the elements of materials, competences, and perceived behavioral control. Equally important is initiating a discourse and advocating for trustworthy forums within both the Board and the community. These platforms would facilitate the peer interactions necessary for fostering community-based strategies in a more impactful manner.

Chapter 5: Discussion

An inquiry into the methodologies and approaches required for the CBS implementation complements the entire research effort, culminating in a comprehensive analysis and deliberation of the main research question in this chapter and Chapter 6: Conclusion. Additionally, the proposal of a framework can also be found at the end of the chapter. The intention of this new framework is to serve as a basis for future research that wants to address similar study subject with their own inputs.

5.1 How does shaping social practices and behaviors towards organic waste management lead to the implementation of a community-based strategy (CBS) in Lago Esmeralda Neighborhood?

The existing literature exhibits a scarce study clarifying the transition from individual behaviors to collective group behaviors. However, in alignment with the outcomes obtained from this research, it is posited that equipping individuals with appropriate competences, materials, and a structured code of conduct serving as "social norms" within the community can potentially augment engagement in sustainable practices and behaviors. Simultaneously, as expounded by Veress et al. (2023), community-based strategies must undertake various roles within community's members, encompassing translation, reinforcement, and contribution. This symbiotic relationship may form a cyclical process that facilitates the cultivation and dissemination of sustainable behaviors and practices, bridging the gap between individual and communal levels.

It is hard to disregard the notion that within the extensive body of literature and the insights gleaned from the surveys and interviews, the pursuit of fostering collective sustainable behaviors and practices may not be underpinned by a solitary concealed formula or a singular key determinant. Instead, in my own perspective, it seems crucial to identify the distinct elements lacking within specific social contexts, and subsequently address these deficiencies by creating an innovative and new amalgamation of these components. Through this methodical approach, the prospect of advancing community-based strategies can be envisaged.

An imminent gap in the elements of materials, competence and perceived behavioral control was found among the research. Although participants have positive attitudes towards composting and recognize its importance and benefits, practical constraints and external factors can influence these attitudes. By addressing the practical concerns and emphasizing the positive outcomes of composting, interventions and initiatives can help strengthen and promote positive attitudes towards composting practices and behavior. At the same time, the identification of strengths within the condominium's context, coupled with the insights gleaned from the literature review and expert opinions, presents a positive perspective that undoubtedly should be acknowledged as an advantageous foundation for promoting the composting Community-Based Strategy (CBS).

The preceding discourse has provided me with an opportunity to formulate certain recommendations for both the board members and the residents of Lago Esmeralda.

First, capitalize on the high environmental awareness among the residents by organizing awareness campaigns and workshops that highlight the benefits of community composting, showcase how composting contributes to reducing waste, enriching soil, and supporting a sustainable ecosystem. Advocated by the NGO Specialist, targeted education has the potential to significantly enhance individuals' competences, address their concerns, and encourage the adoption of sustainable organic waste management practices. This effectiveness could be further heightened if such campaigns are spearheaded by community groups or homeowners' associations, such as the Neighbor's Board or proactive neighbors willing to share their newly acquired knowledge compared to initiatives led by governmental bodies. The efficacy of such efforts hinges on the quality of information dissemination, the choice of communication channels, and the provision of pragmatic solutions tailored to the unique circumstances of each condominium (NGO Specialist, personal communication, May 2023).

Secondly, build on the willingness of residents to learn sustainable practices by establishing regular educational programs. These programs could include hands-on composting demonstrations, expert talks, and online resources. Encourage residents to join workshops that cover composting techniques, troubleshooting, and best practices. Utilize the already established communication channels, such as WhatsApp groups, to regularly share information, updates, and progress on the community composting initiative creating a sense of community involvement.

Thirdly, take advantage of the positive attitude towards collective composting by forming a dedicated community composting group. Use the existing monthly neighbors' meetings to introduce the concept, address concerns, and garner support. Develop a clear plan outlining the composting process and how residents can actively contribute and identify enthusiastic residents who are passionate about sustainability and composting to act as leaders or champions for the initiative. These individuals can help organize events, share knowledge, and motivate others to actively participate in the community composting project.

Furthermore, capitalize on the understanding that others' actions influence individual behaviors. Share success stories of the neighboring residential area that has successfully implemented group composting. Use these stories to inspire and motivate residents of Lago Esmeralda to embrace composting as a collective effort.

In order to address the challenges, it is recommended to implement modifications in the design and accessibility of waste management materials, as well as establish dedicated collection points for organic waste within communal areas. These suggestions align with the recommendations put forth by Shove et al. (2012) regarding the need to disrupt existing living standards. The existence of a noticeable tension between individual and collective waste management practices implies the presence of inherent contradictions that necessitate resolution (Shove et al., 2012). It is worth noting that the condominiums still retain their previous waste containers (Administrator, personal communication, May 2023), thereby alleviating the need for additional expenditure in this regard. However, the presence of unauthorized waste scavengers poses a significant obstacle in effectively addressing this tension, as highlighted by the administrator. Nevertheless, I strongly encourage the community and the Board to enforce regulations and protocols pertaining to this issue. It is

important to emphasize that waste separation is a fundamental initial step in the overall collective waste management process (Dhokhikah et al., 2015).

Another barrier to address is that despite the apparent enthusiasm of Board members for embracing sustainable practices and prioritizing relevant projects, there has been a lack of proactive action to drive their implementation. It would be beneficial for the Board to take a more active role by initiating campaigns to encourage residents to propose initiatives or, if necessary, to initiate proposals themselves. Given their position at the top of the condominium hierarchy, the Board has the potential to play a pivotal role in fostering sustainable practices and promoting a culture of environmental responsibility within the community.

Finally, for a possible group-composting implementation, utilize the available space in Lago Esmeralda for composting by setting up designated composting areas. Arrange regular hands-on composting sessions where residents can actively participate and contribute their kitchen waste. Provide guidance and supervision during these sessions to ensure correct composting practices. In the long term collaborate with local experts in composting and sustainability to provide guidance, support, and insights. Finally, keep track of the amount of waste diverted from landfills and the quality of compost generated, celebrate milestones and achievements within the community to reinforce the positive impact of residents' collective efforts.

In my analysis, the establishment of secure and reliable spaces for neighbors to cultivate these roles over time could foster a cycle wherein sustainable organic waste management practices and behavior experience augmentation. This, in turn, could facilitate feedback loops, decision-making processes, and the creation of value. But not only between Lago Esmeralda residential but with others group with same interests such as NGOs dedicated to grassroot initiatives or neighboring condominiums. In alignment with Veress et al. (2023), CBS present a potentially promising platform for synergistic collaborations between experts and communities, with the aim of fostering environments conducive to sustainable behavior. Numerous scholars have concluded that community-based organizing has demonstrated its effectiveness in both cultivating and disseminating sustainable behavior (e.g., Bernal et al., 2023).

5.2 Break, Intervene, Collab (BRINCO)

Through the thorough analysis conducted in this research, valuable insights and experiences have emerged, the previous section showcases a possible solution tailored-made for the specific context of Lago Esmeralda neighborhood which I believe can be replicated in similar residential areas in the future. The purpose of this section is to consolidate and synthesize the accumulated knowledge and considerations from the study, aiming to propose a brand-new framework (BRINCO) that I believe may enable condominiums' stakeholders, researchers or NGOs consultants interested in the subject to break and intervene current practices and behaviors and finally, to foster collaborative community-based projects among neighborhoods, that have similar characteristics as Lago Esmeralda, facilitating sustainable and impactful initiatives.

I based the foundation of the BRINCO Framework, for this case study, on SPT (Shove et. al, 2012: Strengers & Maller, 2015) and TPB (Ajzen, I., 1991) theories interconnecting with community-based approach, however I consider that this framework is moldable for other behavioral and

practices theories regarding waste management practices in general, thus making it very flexible for use. This implies that other behavioral or social practice theories can be suitably employed within the BRINCO framework. Moreover, residential areas sharing resemblances with Lago Esmeralda's characteristics can utilize BRINCO as an effective tool to evaluate and advocate for organic waste management or alternative waste management systems.

The following visual representation is intended to give a basic understanding of the framework. Further explanation for each step is found below.

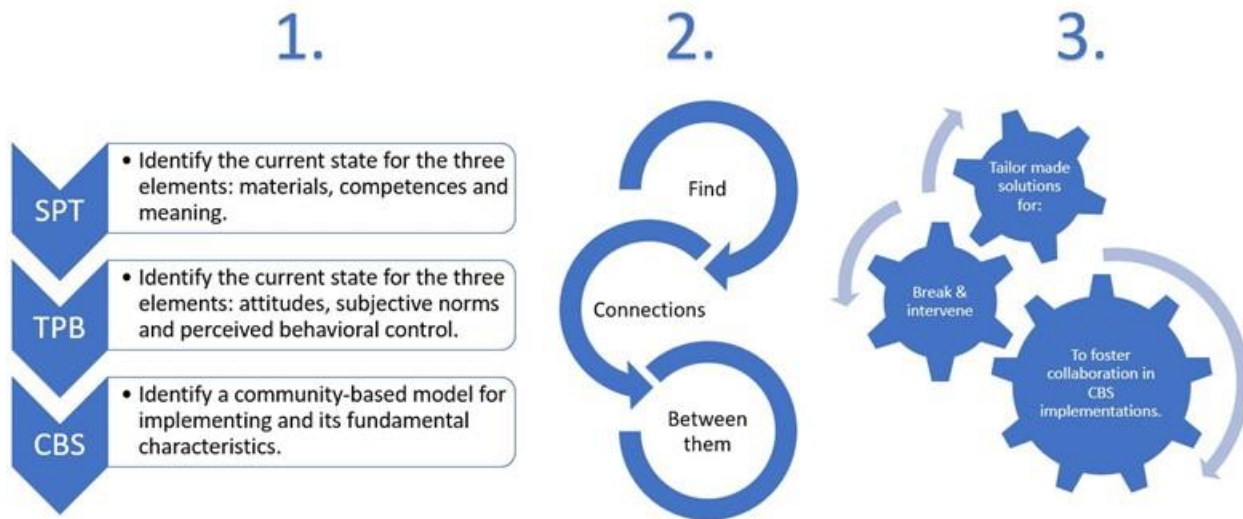


Figure 16. Proposed new Framework: BRINCO

Step 1: Identify the current state of the elements for the selected theories. Two theories, SPT (Social Practice Theory) and TPB (Theory of Planned Behavior), were selected for this study. The existing elements to identify within the community are materials, competences, meanings, attitudes, subjective norms, and perceived behavioral control. A concrete example of applying this step in this case study is that the data analysis revealed a weakness in the materials element, as the overall infrastructure of the condominium does not facilitate waste separation, including organic waste.

Step 2: Identify the possible connections that exist or could exist between these elements and/or with the chosen community-based model based on the selected theories. It is recommended to use graphics to visualize and highlight how these elements interact and influence each other more efficiently. In the case of Lago Esmeralda, the results indicated that home composting is not practiced due to a lack of knowledge and suitable materials. However, there is a high degree of positive attitude if collective composting were proposed, opening a new opportunity to transition from individual to collective practice. An illustrative instance of progressing to this subsequent stage is the comprehensive examination conducted on the components of material, competences, and perceived behavioral control. This analysis solidified a distinct adverse impact on elevating both individual and collective practices within the condominium. A specific conclusion drawn from this stage, which seamlessly leads into the next, is that the mere presence of a single element from the theories will not adequately suffice to induce the residents' sustainable behavior.

Step 3: Generate tailor-made solutions to break the conflicts and barriers observed in the connections from step 2, and subsequently intervene in current habits to allow the creation/existence of the identified missing elements from step 1. In the case of Lago Esmeralda, and based on the analysis of the previous step, it is proposed to engage the board of directors and the entire community in generating possible tailor-made solutions for three aspects: the lack of knowledge in environmental and composting topics among residents, with an environmental education and home composting campaign generated and shared by the community itself with experts in the field; the implementation of stricter rules for service workers to prevent illegal scavengers and reinstate waste separation, which is crucial for waste management; and finally, a highly suggested project of a collective composting initiative, by including the analysis of the challenges as well as strengths observed.

In summation, BRINCO aims to consolidate the favorable outcomes of this study, thereby facilitating the evaluation of communities residing in settings akin to Lago Esmeralda. However, I strongly advocate for not only employing the framework for assessment but also supplementing it with contemporary literature concerning behavioral facets and social practices implemented in communities. This approach is particularly important as these aspects are likely to evolve over time due to the current scarcity of research in this domain.

Chapter 6: Conclusion

The objective of this thesis was to analyze in-depth how to address the factors that may shape and influence practices and behaviors towards organic waste management (OWM) in the collective context of a specific high-income urban settlement, namely Lago Esmeralda to enhance a CBS. Within this chapter, a condensed presentation of the research question's outcomes is summarized, accompanied by research contributions and recommendations for future investigations.

Regarding the factors that influence residents' social practices and behavior, it was discovered that the elements of SPT and TPB hold significant significance across various contexts. For Lago Esmeralda, the key elements impeding these practices and behaviors are materials, competences, and perceived behavioral control. Conversely, meaning, and subjective norms emerge as factors contributing to the enhancement of these behaviors. Nonetheless, the conclusion drawn is that the synergy and mutual reinforcement of all these elements are imperative for the potential advancement of sustainable practices and behaviors.

Regarding on social facilitators and barriers identified for a community-based strategy, the examination revealed that the board of directors at Lago Esmeralda, responsible for crucial decisions concerning the condominiums, plays a pivotal role either as an enabler or a barrier in establishing a secure environment for the community's collective endeavor towards enhanced residential sustainability. The significance of cultivating this atmosphere of trust underscores a fundamental aspect of CBS, namely, peer interactions. Furthermore, Lago Esmeralda exhibits notable strengths such as flexibility in allocating resources and the prioritization of environmental initiatives within their budgetary framework.

Regarding the social practices and behaviors that need to be applied in a community-based strategy, the integration of insights gained from the challenges and benefits highlighted in the preceding discussions suggests the potential formulation of a customized solution, particularly for a group-composting CBS in Lago Esmeralda. However, due to limitations in time, the suggested CBS project remains at the proposal stage, precluding definitive conclusions about the enduring nature of these practices and behaviors over time. The assumptions presented rely solely on the responses garnered from surveys and interviews, as well as the literature reviewed.

6.2 Future Research Recommendations

In order to gain a more comprehensive understanding of the subject matter, future research should consider exploring larger sample sizes with similar characteristics to the population sample, specifically focusing on the high-income group residing in urban settlements. Additionally, conducting additional interviews would provide valuable insights and deepen our knowledge on the topic. By increasing the sample size, it would be possible to conduct more robust statistical analyses, including correlations and regressions, which would greatly enhance the validity and reliability of the proposed framework. It is important to acknowledge that while some agreements between different studies and the case of Lago Esmeralda were found, contradictions also emerged. As a result, a definitive statement regarding the key practices and behaviors for shaping overall perspectives cannot be confidently made at this stage.

Conversely, the results presented in this study are specific to the unique characteristics of the Lago Esmeralda settlement. To further expand our understanding, it would be valuable to explore other types of urban settlements, as well as rural settlements, and compare their findings to the conclusions drawn in this study. This would allow for the identification of interesting findings that may either support or challenge the existing conclusions, adding depth and breadth to the research in this field.

I encourage scholars to engage in the refinement of the proposed framework, as BRINCO can currently serve effectively for smaller-scale assessments like that of the studied residential area's nature and size. However, for more expansive assessments, it's vital to recognize potentially overlooked factors. It remains crucial for the community to persist in the examination of concrete instances where SPT is employed, both at individual and group levels.

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Appendix 1: Interviews (English and Spanish translation)

Person in Charge of Administration of Economic Resources for the Condo (Administrator)

1. Approximately how many people live in Lago Esmeralda?
2. What are the current waste management practices in the condominium, particularly with regards to organic waste?
3. Have there been any challenges or issues with waste management in the past?
4. How do you prioritize waste management initiatives in terms of budget allocation?
5. Is there a plan to engage residents in improving waste management practices?
6. Have there been any initiatives or discussions around transitioning to more sustainable waste management practices?
7. Are there any barriers or challenges you foresee in implementing more sustainable waste management practices in the condo?
8. How do you see the role of the condo administration in promoting more sustainable waste management practices among residents?
9. If there were any initiatives that needed to reallocate budget to this matter, which level of priority would it have?

Spanish Translation

1. ¿Aproximadamente cuántas personas viven en Lago Esmeralda
2. ¿Cuáles son las prácticas actuales de gestión de residuos en el condominio, especialmente en lo que respecta a los residuos orgánicos?
3. ¿Ha habido algún desafío o problema con la gestión de residuos en el pasado?
4. ¿Cómo priorizan las iniciativas de gestión de residuos en términos de asignación de presupuesto?
5. ¿Existe un plan para involucrar a los residentes en la mejora de las prácticas de gestión de residuos?
6. ¿Ha habido alguna iniciativa o discusión sobre la transición hacia prácticas de gestión de residuos más sostenibles?
7. ¿Existen barreras o desafíos que prevea en la implementación de prácticas de gestión de residuos más sostenibles en el condominio para el futuro?
8. ¿Cómo percibe el papel de la administración del condominio en la promoción de prácticas de gestión de residuos más sostenibles entre los residentes?
9. Si hubiera alguna iniciativa que requiriera reasignar presupuesto a este asunto de residuos orgánicos, ¿qué nivel de prioridad tendría?

Environment Specialist from an NGO in the City (ES-NGO)

1. What are some of the most effective waste management practices you have seen in residential areas?
2. In your experience, what are some common barriers or challenges in promoting sustainable waste management practices in residential areas?
3. How do you think awareness about waste management can be increased among residents?
4. What kind of support or resources can organizations like yours offer to residential areas interested in improving their waste management practices?
5. Are there any local or national policies or initiatives that the condominium could leverage to support more sustainable waste management practices in Mexico or the State of Mexico, or in the municipality of Atizapán?
6. Are there any innovative or emerging practices that could be implemented in the condominium to improve waste management?

Spanish Translation

1. ¿Cuáles son algunas de las prácticas de gestión de residuos más efectivas que has visto en áreas residenciales?
2. En tu experiencia, ¿cuáles son algunas barreras o desafíos comunes para promover prácticas de gestión de residuos sostenibles en áreas residenciales?
3. ¿Cómo crees que se puede aumentar la conciencia sobre la gestión de residuos entre los residentes?
4. ¿Qué tipo de apoyo o recursos pueden ofrecer organizaciones como la tuya a las áreas residenciales interesadas en mejorar sus prácticas de gestión de residuos?
5. ¿Existen políticas o iniciativas locales o nacionales que el condominio podría aprovechar para apoyar prácticas de gestión de residuos más sostenibles en México o en el estado de México, o en el municipio de atizapán?
6. ¿Existen prácticas innovadoras o emergentes que se podrían implementar en el condominio para mejorar la gestión de residuos?

Appendix 2: Surveys (English and Spanish Translation)

Spanish Version

Estimado/a lector/a: Estoy llevando a cabo un estudio sobre comportamientos y rutinas diarias hacia la gestión de residuos orgánicos para mi tesis de maestría. El objetivo de la investigación es comprender las prácticas actuales e identificar, si las hay, posibles intervenciones para lograr una forma más sostenible de hacer las cosas en nuestra comunidad. Es completamente anónima, ya que no pedimos nombres ni direcciones. Usted es libre de decidir si desea participar. Gracias por tomarse el tiempo para proporcionar sus valiosas respuestas. Tiempo de respuesta 7 min.

1. ¿Al terminar la encuesta, usted permite el uso de sus respuestas para propósitos meramente académicos?
2. ¿Cuánto tiempo ha vivido en este condominio?
3. ¿Cuál es su ocupación?
4. ¿Cuántos años tiene?
5. ¿Cuál es su género?
6. ¿Está dispuesto/a a pagar por servicios de gestión de residuos de alimentos?
7. ¿Tiene puntos de separación designados para residuos orgánicos dentro de su hogar?
8. ¿Tiene puntos de separación designados para residuos orgánicos en el condominio?
9. Si la respuesta anterior es sí, ¿qué tan fácil es para usted acceder a estos puntos de recolección?
10. ¿Tiene alguna sugerencia para mejorar la disposición de los contenedores de reciclaje para la recolección de residuos en el condominio?
11. ¿Está al tanto de algún programa, campaña o iniciativa de gestión de residuos en el condominio? Si la respuesta es sí, especifica cuáles...
12. ¿Crees que (en general) estos programas, campañas o iniciativas comunican de manera efectiva la importancia de la gestión de residuos y cómo participar en prácticas de consumo responsable?
13. ¿Ha recibido alguna vez educación o capacitación sobre el manejo de residuos orgánicos?
14. Si no, ¿estarías interesado/a en recibir dicha educación o capacitación?
15. ¿Con qué frecuencia separas tus residuos orgánicos actualmente?
16. ¿Con qué frecuencia compostas actualmente los residuos orgánicos?
17. ¿Conoces los beneficios de compostar residuos orgánicos?
18. ¿Crees que es importante compostar residuos orgánicos?
19. ¿Cuáles crees que son los beneficios de compostar? (Puedes seleccionar varias opciones)
20. ¿Crees que el compostaje puede tener un impacto positivo en la comunidad?
21. Si no... ¿Cuál sería la razón principal por la que no te gustaría compostar en tu hogar? (Puede seleccionar varias opciones)
22. ¿En qué medida te sientes personalmente responsable de manejar tus propios residuos orgánicos? (siendo 5 muy responsable y 1 nada responsable)
23. ¿Crees que las acciones individuales pueden marcar la diferencia en la reducción de los residuos orgánicos?
24. ¿Tus amigos y familiares participan en comportamientos sustentables para residuos orgánicos?
25. ¿Tus vecinos participan en comportamientos sustentables para residuos orgánicos?
26. Si de repente, tu grupo social más cercano comienza a compostar, ¿seguirías su ejemplo?

27. Si de repente, el condominio dispone de un espacio abierto para compostar los residuos de todos y proporcionar verduras, semillas y frutas para consumo interno, ¿estarías interesado/a en participar 2-3 fines de semana al año y gestionar el compost?
28. Si de repente, el condominio dispone de un espacio abierto para compostar los residuos de todos y proporcionar un suelo fértil que eventualmente ayude a mantener los espacios verdes óptimos y ahorrar algunos costos de mantenimiento, ¿estarías interesado/a en participar 2-3 fines de semana al año y gestionar el compost?
29. Si de repente, el condominio implementa contenedores de basura separados para residuos orgánicos, ¿separarías tus residuos?
30. Si aprendieras una forma eficiente, fácil y sin malos olores de compostar en el interior de tu hogar, ¿te animarías a compostar?
31. ¿Estás familiarizado/a con las técnicas de compostaje?
32. ¿Con qué frecuencia generas y desechas tus residuos orgánicos?
33. ¿Cuál es tu método preferido para desechar residuos orgánicos?
34. Si haces compostaje, ¿qué tipo de compost utilizas?
35. Si haces compostaje, ¿alguna vez has tenido problemas con el compostaje o la gestión de residuos orgánicos en tu hogar?
36. Si quisieras hacer compostaje, ¿qué materiales te gustaría que se te proporcionaran? (Puedes seleccionar varias opciones)
37. Si quisieras hacer compostaje, ¿qué materiales podrías conseguir tú mismo/a? (Puedes seleccionar varias opciones)

En tu opinión, ¿en qué medida estás de acuerdo con las siguientes afirmaciones? (siendo 5 muy de acuerdo):

1. Compostar los residuos orgánicos del hogar es responsabilidad de cada hogar.
2. Compostar los residuos orgánicos del hogar debería ser responsabilidad de todos los vecinos/comunidad del condominio.
3. Compostar los residuos orgánicos del hogar debería ser responsabilidad de la autoridad de vivienda y la ciudad.
4. Estoy interesado/a en aprender y seguir prácticas de gestión de residuos más sostenibles.
5. La sostenibilidad del condominio es importante para mí debido a cuestiones ambientales.
6. La sostenibilidad del condominio es importante para mí debido a las generaciones futuras.
7. La sostenibilidad del condominio no es importante para mí en absoluto.
8. Si de repente, el condominio implementa reglas colectivas para la gestión de residuos orgánicos, ¿cuál sería tu postura?

English Version

Dear reader, I am conducting a study on behaviors and daily routines towards organic waste management for my master's thesis. The objective of this research is to understand current practices and identify, if any, possible interventions to achieve a more sustainable approach within our community. Participation in this survey is completely anonymous, as we do not ask for names or addresses. You are free to decide whether you wish to participate. Thank you for taking the time to provide your valuable responses. Estimated response time is 7 minutes.

1. By completing the survey, do you permit the use of your answers for purely academic purposes?
Y/N
2. How long have you lived in this condominium?

3. What is your occupation?
4. How old are you?
5. What is your gender?
6. Are you willing to pay for food waste management services?
7. Do you have designated separation points for organic waste within your home?
8. Do you have designated separation points for organic waste in the condominium?
9. If the previous answer is yes, how easy is it for you to access these collection points?
10. Do you have any suggestions to improve the placement of recycling containers for waste collection in the condominium?
11. Are you aware of any waste management programs, campaigns, or initiatives in the condominium?
If yes, please specify...
12. Do you think these programs, campaigns, or initiatives effectively communicate the importance of waste management and how to engage in responsible consumption practices?
13. Have you ever received education or training on organic waste management?
14. If not, would you be interested in receiving such education or training?
15. How often do you currently separate your organic waste?
16. How often do you currently compost your organic waste?
17. Are you aware of the benefits of composting organic waste?
18. Do you believe it is important to compost organic waste?
19. What do you think are the benefits of composting? (You can select multiple options)
20. Do you believe composting can have a positive impact on the community?
21. If not, what would be the main reason for not wanting to compost at home? (You can select multiple options)
22. To what extent do you feel personally responsible for managing your own organic waste? (With 5 being very responsible and 1 being not responsible at all)
23. Do you believe individual actions can make a difference in reducing organic waste?
24. Do your friends and family participate in sustainable behaviors regarding organic waste?
25. Do your neighbours participate in sustainable behaviors regarding organic waste?
26. If suddenly, your closest social group starts composting, would you follow their example?
27. If suddenly, the condominium provides an open space to compost everyone's waste and offers vegetables, seeds, and fruits for internal consumption, would you be interested in participating for 2-3 weekends per year and managing the compost?
28. If suddenly, the condominium provides an open space to compost everyone's waste and offers fertile soil that helps maintain optimal green spaces and saves some maintenance costs, would you be interested in participating for 2-3 weekends per year and managing the compost?
29. If suddenly, the condominium implements separate bins for organic waste, would you separate your waste?
30. If you learned an efficient, easy, and odor-free way to compost inside your home, would you be encouraged to compost?
31. Are you familiar with composting techniques?
32. How often do you generate and dispose of your organic waste?
33. What is your preferred method of disposing of organic waste?
34. If you compost, what type of compost do you use?
35. If you compost, have you ever encountered problems with composting or managing organic waste at home?
36. If you were to start composting, what materials would you like to be provided with? (You can select multiple options)
37. If you were to start composting, what materials could you obtain yourself? (You can select multiple options)

In your opinion, to what extent do you agree with the following statements? (with 5 being strongly agree)

1. Composting household organic waste is the responsibility of each household.
2. Composting household organic waste should be the responsibility of all neighbors/condominium community members.
3. Composting household organic waste should be the responsibility of housing authorities and the city.
4. I am interested in learning and following more sustainable waste management practices.
5. The sustainability of the condominium is important to me due to environmental issues.
6. The sustainability of the condominium is important to me for future generations.
7. The sustainability of the condominium is not important to me at all.
8. If suddenly, the condominium implements collective rules for organic waste management, what would be your stance?

Appendix 4: Consent Letter

Interview Lago Esmeralda Neighborhood Thesis Consent to take part in research study interview

Dear participant, you have been selected for the following interview regarding your role in the **condominium**/community, the aim of this interview is to gain valuable insights for a master thesis towards organic waste management in residential areas and the social practices and behaviours regarding it. Your birthname can be disregarded from the data analysis, however for the results part of the thesis your role will be addressed. For example: Administrator of the Condominium, Specialist from an NGO, or Director of the Condo Board.

- I, , voluntarily agree to participate in this research study interview.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview after it, in which case the material will be deleted and informed to me.
- I have had the purpose and nature of the study explained to me and I have had the opportunity to ask questions about the study.
- I agree to my interview being audio-recorded.
- I understand that all information I provide for this study will be treated confidentially.
- I understand that in any report on the results of this research my identity will remain anonymous if preferred to be so. This will be done by not explicitly mentioning my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.
- I understand that I am entitled to access the information I have provided after the interview, information that will be held just for research purposes on the personal device of the researcher for a period of time of 1 year, and be deleted after it.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Here follow the names of the people involved in this research who guarantee the agreed use of this consent and the answers provided during the interview.

Researchers: Daniela Ruiz

Project Supervisor: Dra. Laura García, Dr. Steven McGreevy

Participant:

Signature of participant and date:

Appendix 5: Carta de consentimiento (Spanish Translation)

Entrevista Tesis Condominio Lago Esmeralda Consentimiento para participar en la entrevista del estudio de investigación

Estimado participante, usted ha sido seleccionado/a para la siguiente entrevista relacionada con su papel en el condominio/comunidad. El objetivo de esta entrevista es obtener información valiosa para una tesis de maestría sobre la gestión de residuos orgánicos en áreas residenciales y las prácticas y comportamientos sociales relacionados con ella. Su nombre de nacimiento será descartado en el análisis de datos, sin embargo, en la parte de resultados de la tesis se mencionará su rol. Por ejemplo: Administrador/a del condominio o Especialista de una ONG

- Yo,, voluntariamente acepto participar en esta entrevista del estudio de investigación.
- Entiendo que, aunque acepte participar ahora, puedo retirarme en cualquier momento o negarme a responder cualquier pregunta sin ninguna consecuencia de ningún tipo.
- Entiendo que puedo retirar el permiso para utilizar los datos de mi entrevista posteriormente, en cuyo caso el material será eliminado y se me informará al respecto.
- Se me ha explicado el propósito y la naturaleza del estudio y he tenido la oportunidad de hacer preguntas sobre el mismo.
- Acepto que mi entrevista sea grabada en audio.
- Entiendo que toda la información que proporcione para este estudio será tratada de forma confidencial.
- Entiendo que, en cualquier informe sobre los resultados de esta investigación, mi identidad se mantendrá en anonimato si así lo prefiero. Esto se logrará no mencionando explícitamente mi nombre y ocultando cualquier detalle de mi entrevista que pueda revelar mi identidad o la identidad de las personas de las que hable.
- Entiendo que tengo derecho a acceder a la información que he proporcionado después de la entrevista, la cual se conservará únicamente con fines de investigación en el dispositivo personal del investigador durante un período de 1 año y se eliminará después de ese tiempo.
- Entiendo que puedo ponerme en contacto con cualquiera de las personas involucradas en la investigación para buscar mayor clarificación e información.

A continuación, se mencionan los nombres de las personas involucradas en esta investigación que garantizan el uso acordado de este consentimiento y las respuestas proporcionadas durante la entrevista.

Investigadores: Daniela Ruiz

Supervisor/a del proyecto: Dra. Laura García, Dr. Steven McGreevy

Participante:

Firma del participante y fecha:

Appendix 6: Interviews Transcripts (English and Spanish Version)

Administrator Interview Transcript

1. ¿Aproximadamente cuántas personas viven en Lago Esmeralda? 3000 viviendas construidas y densidad según profusa 6300 para cuando terminen de construir 15K belgica 185 41 holanda, francia
2. ¿Cuáles son las prácticas actuales de gestión de residuos en el condominio, especialmente en lo que respecta a los residuos orgánicos? Para residuos los condominios pagan 1800 cada uno y en total para que un camión privado se lleve la basura, al inicio se separaba pero desafortunadamente las personas de mantenimiento del condominio o los mismos policías empezaron a fungir como pepenadores ilegales y una vez que se llenaban los contenedores, éstos se llevaban el plástico y el cartón ya separado por conveniencia, la empresa privada pidió que dejara de separarse la basura para evitar esto y por eso actualmente no se separa la basura ya.
3. ¿Ha habido algún desafío o problema con la gestión de residuos en el pasado? Lo anterior mencionado (pepenadores ilegales) aunado había un proyecto de todos los condominios, pero solo para agua, sin embargo, no lo autorizó el gobierno, al inicio otros condominios pagaban 2000 MXN por vivienda para venir a recoger la composta sin embargo a los vecinos se les hizo muy caro solo por este servicio y se dejó de hacer.
4. ¿Cómo priorizan las iniciativas de gestión de residuos en términos de asignación de presupuesto? Actualmente no existe alguna, pero si se tuviera que priorizar estaría toda la mesa de acuerdo en darle prioridad solo que les gustaría una propuesta que pueda generar utilidad o recorte de gastos, Un condominio fuera del scope pero en la misma zona propuso hacer composta en 2017 pero no se siguió porque generó malos olores, lo cual habla de una mala organización y/o falta de conocimiento.
5. ¿Existe un plan para involucrar a los residentes en la mejora de las prácticas de gestión de residuos? se ha dejado de lado porque no ha sido un problema ya que para los vecinos es muy fácil pagar su mantenimiento mensual normal y la basura se irá cada semana y ahorita se tienen problemas de agua por lo que están muy metidos en eso.
6. ¿Ha habido alguna iniciativa o discusión sobre la transición hacia prácticas de gestión de residuos más sostenibles? En el pasado han existido algunas iniciativas de composta sin embargo ocasionó desorganización con el tiempo y no se hicieron ya que no estaban capacitados para manejar el compost.
7. ¿Existen barreras o desafíos que prevea en la implementación de prácticas de gestión de residuos más sostenibles en el condominio para el futuro? Hace falta organizar a los vecinos, existen varios contenedores que se pueden utilizar para separar basura, espacio existe también para composta, pero hay que romper las rutinas de cada vecino y educarlos pues es difícil que cambien su estilo, también hace falta concientización ya que a veces no respetan ni las reglas básicas del condominio como la gestión de heces de los perritos el cual tiene su espacio denominado y aun así las dejan donde quieren o simplemente no las recogen.

8. ¿Cómo percibe el papel de la administración del condominio en la promoción de prácticas de gestión de residuos más sostenibles entre los residentes? la mesa está “on board” con los problemas ambientales que ocasionamos como residentes y están abiertos a cualquier propuesta sin embargo ellos no han propuesto nada por lo que podría hablar un poco de que sin el ejemplo de ellos o la incentivación de la mesa es difícil que los vecinos sigan por ese camino.
9. Si hubiera alguna iniciativa que requiriera reasignar presupuesto a este asunto de residuos orgánicos, ¿qué nivel de prioridad tendría? R: captación de agua no sería prioridad ya, como lo fue en su momento, entonces cualquier propuesta del **beneficio** del ambiente es bienvenida. Los de las mesas directivas son mas conscientes y un plus es que no hemos aumentado el mantenimiento en los últimos años. Se pagan \$2000 MXN, lo que permite jugar con los proyectos.

English Translation

1. Approximately how many people live in Lago Esmeralda? There are currently 3,000 built houses with a density projection of 6,300 residents when the construction of 15,000 houses is completed. Bélgica has 185 residents, Francia has 41, and Holanda has a similar number.
2. What are the current waste management practices in the condominium, particularly with regards to organic waste? The condominiums pay 1,800 MXN each for waste collection, and the total cost for a private truck to collect the waste is shared among them. Initially, waste separation was practiced, but it was discontinued due to illegal scavengers who took the separated plastic and cardboard. The current practice is to not separate waste to avoid this issue.
3. Have there been any challenges or issues with waste management in the past? In addition to the issue of illegal scavengers, there was a previous project for water management among the condominiums, but it was not authorized by the government. There was also a compost collection initiative from neighboring condominiums, but it was discontinued due to high costs for the residents.
4. How do you prioritize waste management initiatives in terms of budget allocation? Currently, there is no specific budget allocation for waste management. However, if prioritization were required, the board members would agree to prioritize it, but they would prefer a proposal that generates cost savings or utility. Previous compost initiatives faced challenges, indicating a need for better organization and knowledge.
5. Is there a plan to engage residents in improving waste management practices? Currently, waste management has not been a significant concern for residents as they find it convenient to pay their monthly maintenance fees. However, there is a need for awareness and education on waste management.
6. Have there been any initiatives or discussions around transitioning to more sustainable waste management practices? There have been some compost initiatives in the past, but they faced organizational issues and lack of expertise in compost handling, which led to discontinuation.
7. Are there any barriers or challenges you foresee in implementing more sustainable waste management practices in the condo? Organizing the residents and breaking their established routines pose challenges. There are available containers and space for waste separation and composting, but changing residents' behaviors and raising awareness are difficult tasks. Basic rules, such as managing pet waste, are sometimes not followed by the residents.

8. How do you see the role of the condo administration in promoting more sustainable waste management practices among residents? The condo administration is aware of the environmental issues caused by residents and is open to proposals. However, they have not taken the lead in initiating such practices, which can impact residents' willingness to follow suit.
9. If there were any initiatives that needed to reallocate budget to this matter, which level of priority would it have? With the reduced priority of water collection projects, any proposal related to environmental benefits is welcomed. The board members are conscious of environmental concerns, and the maintenance fees have not increased in recent years, providing flexibility to allocate budget for waste management projects.

NGO Specialist Interview Transcript

1. ¿Cuáles son algunas de las prácticas de gestión de residuos más efectivas que has visto en áreas residenciales? “vive composta” es una empresa privada, que está ganando mucha fama en residenciales como las de tu estudio, a la gente que tiene un “income” más alto se le hace más fácil pagar para que estas tareas las haga alguien más. Existe un centro de acopio voluntario en “chiluca” que ya lleva unos 2-3 años, consiste en que los colonos se turnan y dedican una mañana de un fin de semana para revisar que todo esté en orden con la separación de residuos que posteriormente venden al camión de la basura, para la parte orgánica le pagan a “vive Composta” para que los miércoles se lo lleva, el cual es un servicio relativamente barato, 2 euros cada vez que se llevan la basura orgánica por colono.
2. En tu experiencia, ¿cuáles son algunas barreras o desafíos comunes para promover prácticas de gestión de residuos sostenibles en áreas residenciales? La información del tema que hace muchísima falta, concientización, a la gente no le pasa por la mente siquiera. Otro problema es que los Servicios públicos no ofrecen servicios confiables para la gestión o separación, la gente piensa “para que la separe sino lo cumplen a la hora de que se los llevan”, aunado que el municipio no tiene centros de acopio accesibles, en toda la zona de residenciales de Atizapán el centro de acopio más cercano está muy lejos. Definitivamente existe una brecha en la comprensión de lo que las personas realmente necesitan para romper viejos hábitos y mantener prácticas a largo plazo. No he visto a muchos colegas analizar desde esa perspectiva las posibles soluciones para la gestión de residuos en general.
3. ¿Cómo crees que se puede aumentar la conciencia sobre la gestión de residuos entre los residentes? Campañas de comunicación, pero depende quién las lleva, si es un grupo de colonos del mismo condominio puede que hagan mas caso que a los servidores públicos, ya que ya no existe confianza al gobierno. Lo importante también es ¿Qué tipo de información se comparte y cómo?, ¿a través de qué canales para que se difunda bien?, también hemos visto que se necesita no solo informar, pero si se quiere hacer un cambio se Tiene que llegar también con soluciones aterrizadas a los condominios.
4. ¿Qué tipo de apoyo o recursos pueden ofrecer organizaciones como la tuya a las áreas residenciales interesadas en mejorar sus prácticas de gestión de residuos? Nosotros nos enfocamos con el sector publico sin embargo estamos buscando combatir los GEI desde los ciudadanos, pero sí existen organizaciones “de base” o locales que atienden temas más locales. Sin embargo, son pocas en todo el país y por lo general este tipo de organizaciones se enfocan en comunidades rurales. Me da la impresión de que no existen tantas con el comportamiento de los individuos, un buen ejemplo es

WWF sin embargo el scope ya es muy grande, “mamás y papás por el clima”, “voto por el clima” son algunas que te puedo mencionar.

5. ¿Existen políticas o iniciativas locales o nacionales que el condominio podría aprovechar para apoyar prácticas de gestión de residuos más sostenibles en México o en el estado de México, o en el municipio de atizapán? Existe la ley general de los residuos a nivel nacional pero no funciona en la práctica como dice en la ley, existen muchas barreras para hacerlas funcionar, al municipio le corresponde la gestión, pero no hay recursos ni coordinación. Del sector residuos falta mucho por hacer, pienso yo que se necesita crear normativas o renovarlas para incrementar posibles soluciones, sin embargo, esto es muy burocrático además de que los datos disponibles son muy escasos y eso es una brecha porque no son precisos los análisis que se pueden hacer para sustentar. Faltan el vínculo con normas y presupuesto sin embargo sí hay casos de éxitos, pero son muy aislados. Los vertederos ilegales siguen siendo muchos, el servicio de recolección es ineficiente.
6. ¿Existen prácticas innovadoras o emergentes que se podrían implementar en el condominio para mejorar la gestión de residuos? Sí las hay, tecnologías emergentes como composta mejorada, reducción de pérdida de alimentos, pero tiene que analizarse toda la cadena desde sector agropecuaria, luego los supermercados, transporte, etc. Otra cosa importante es fijar soluciones en el desperdicio de alimentos a nivel hogar porque es la raíz del problema, la gente puede desperdiciar porque incluso planeó mal sus “groceries”, suena muy básico, pero es super importante. Y por último hablando de reducción la composta es la principal en el tema de hogares, ya que las composteras que existen a nivel nacional no tienen la capacidad suficiente para compostar todo lo que llega. Por eso es importante impulsar a los individuos a hacerlo en casa, tiene muchos beneficios ya que tiene un costo moderado accesible a nivel local, y sí se tiene el conocimiento de cómo hacerlo, y se les da la facilidad a los residentes es muy fácil de llevar a cabo y no debería causar ni plagas ni olores. Aunque es verdad que tengo que decirte que estimaciones que hemos hecho, la composta no mitiga tanto las emisiones por energía, sin embargo, tiene otros beneficios que ayudarán primero a la comunidad, pero también en el largo plazo a evitar que esa basura llegue a rellenos sanitarios, lo cual a su vez reduce gastos en transporte y logística a nivel nacional. Todo suma.

English Translation

1. What are some of the most effective waste management practices you have seen in residential areas? "Vive Composta" is a private company that is gaining popularity in residential areas like the one in your study. It offers waste management services for residents who find it convenient to pay for such services. There is also a voluntary waste collection center in "Chiluca" that has been operating for about 2-3 years. Residents take turns dedicating a weekend morning to ensure proper waste separation, which is later sold to waste collection trucks. For organic waste, residents pay "Vive Composta" a relatively low fee of 2 euros each time their organic waste is collected.
2. In your experience, what are some common barriers or challenges in promoting sustainable waste management practices in residential areas? Lack of information and awareness is a significant challenge. People often don't even consider waste management as an important issue. Another problem is the lack of reliable public services for waste management and separation. Residents may feel reluctant to separate waste if they believe it will not be properly managed. Additionally, the absence of accessible collection centers in the residential area poses a challenge. There is definitely

a gap in understanding what people truly need to break old habits and maintain sustainable practices. Few colleagues have analyzed possible solutions from that perspective.

3. How do you think awareness about waste management can be increased among residents? Communication campaigns can be effective, especially if initiated by fellow residents rather than public officials. Trust in government authorities is low, so campaigns led by residents themselves tend to have a stronger impact. It is important to consider the type of information shared, the channels used for dissemination, and the need to provide practical solutions tailored to each condominium.
4. What kind of support or resources can organizations like yours offer to residential areas interested in improving their waste management practices? While our organization focuses on the public sector, we are seeking to engage citizens in combating greenhouse gas emissions. However, there are "grassroots" or local organizations that address more localized issues. These organizations are relatively scarce in the country, and they mainly focus on rural communities. Notable examples include WWF, but their scope is broader. "Mamás y Papás por el Clima" and "Voto por el Clima" are other organizations worth mentioning.
5. Are there any local or national policies or initiatives that the condominium could leverage to support more sustainable waste management practices in Mexico or the State of Mexico, or in the municipality of Atizapán? There is a national general waste management law, but its practical implementation faces many barriers. Municipalities are responsible for waste management, but they lack the necessary resources and coordination. There is still much to be done in the waste sector. It is necessary to create or update regulations to increase potential solutions. However, the bureaucratic process and limited available data pose challenges in making informed decisions. There is a need for stronger linkages between regulations and budget allocation. While there have been some successful cases, they remain isolated, and illegal dumping sites are still prevalent, indicating the inefficiency of waste collection services.
6. Are there any innovative or emerging practices that could be implemented in the condominium to improve waste management? There are emerging technologies such as improved composting and food waste reduction. However, it is essential to analyze the entire chain, including agriculture, supermarkets, and transportation. Addressing household food waste is particularly crucial as it is at the root of the problem. People may waste food due to poor planning, so addressing this issue is fundamental. In terms of waste reduction, home composting is a key practice, but existing composting facilities at the national level are not sufficient to handle all the waste. Therefore, it is important to encourage individuals to compost at home, as it has many benefits, including moderate costs, ease of implementation, and minimal concerns about pests or odors. While composting may not have a significant impact on energy emissions, it can help the community in the short term and reduce waste sent to landfills, resulting in cost savings in transportation and logistics at the national level. Every effort counts.