WEIGHING THE IMPORTANCE OF TRUST IN MAXIMISING STAKEHOLDER ENGAGEMENT: A CASE STUDY FROM COLOMBIA ON A PLASTIC PACKAGING WASTE MANAGEMENT SYSTEM

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ABSTRACT

Colombia's 2018 Resolution 1407 extended manufacturers' responsibility for recycling packaging waste, requiring industry stakeholders to coordinate their efforts across the production, consumption and recycling system to improve sustainability. Such collaboration can be imposed externally but is assumed to require a measure of trust to operate authentically. This case study from Colombia's plastic packaging waste management system examines two critical issues affecting stakeholders' willingness to trust and engage in sustainability initiatives. The first is the problem of stakeholders having asymmetrical needs and capabilities. The second is unequal access to information, including uncertainty in the reliability of information exchange between stakeholders.

The business ecosystem comprising plastic packaging manufacturing and recycling in Medellín reflects the characteristic complexity of socio-technical systems, the complicated interaction between the system's human and technical elements posing varied barriers to trust-building and engagement. Significant literature examines the drivers of engagement and trust-building in sustainability initiatives, arguing that individual, organisational and system-level factors drive stakeholders' rational and emotional decisions to trust and engage. Strong governance and solid and transparent institutions further encourage this. Still, few studies investigate engagement and trust-building in countries with weak governance, with no reviewed publication offering a holistic analysis of the two critical issues that affect trust and engagement in the case.

The case study is the product of 27 semi-structured qualitative interviews and the review of 151 pieces of Colombian government legislation linked to solid waste management. It reports a critical case that makes a significant original contribution to knowledge by revealing underlying motivations to trust and engage, combined with patterns of behaviour among stakeholders that question assumptions about the relationship of trust to stakeholder engagement in sustainability initiatives. Despite Colombia's entrenched corruption and weak governance, combined with the many challenges specific to the case context, the case shows that stakeholders in Medellín's plastic packaging waste management system build trust and engage spontaneously, progressively and dynamically. They are driven by the prospect of project success and the satisfaction of varied material and non-material needs, including pursuing a purposive life. The case reveals that stakeholders will

build collaborative communities in low-trust contexts if they weigh their objectives and broader sustainability goals against the value of engaging, which is a form of trust. In examining what is known and thought about stakeholder engagement and trust, the thesis draws on a broad range of fields, its main contribution being to environmental and stakeholder management.

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I hope that what I did during my research helps this world be better.

CANDIDATE DECLARATION

I, Lucas Rafael Ivorra Peñafort, declare this thesis is my original work. This thesis contains no material previously published or written by a third party to my best knowledge. The material found in this thesis has not been previously published unless it is cited accordingly. I also declare that this thesis does not breach any third party's intellectual property rights or copyrights. Lastly, I declare that the material found in this thesis contains no material that has been accepted for the award to the candidate of any other degree or diploma at any other university or learning institution.

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ABBREVIATIONS

- ANLA: Asociación Nacional de Licencias Ambientales.
- CONPES: Consejo Nacional de Política Económica y Social.
- CRA: Comisión de Regulación del Agua.
- NGO: Non-Governmental Organisation.
- OECD: Organisation for Economic Co-operation and Development.
- PET: Polyethylene Terephthalate.
- SDA: Secretaría del Medio Ambiente.
- SDM: Secretaría de Movilidad.
- SME: Small and Medium Enterprise.
- UESP: Unidad Ejecutiva de Servicios Públicos.
- W2O: Waste to Opportunity.

INTRODUCTION

Sustainability challenges typically emerge from tension between the needs and interests in protecting the environment in a specific context and stakeholders' needs, capabilities and motivations to do it. Addressing sustainability challenges through human intervention is thus a context-dependent activity that involves understanding the structure and dynamics of socio-technical systems concerning stakeholder values, needs, capabilities and goals. Stakeholders in this thesis are any individual, formal or informal group or organisation invested in making change, deciding on change, or being affected by the change discussed in the case study, thus being invested in part or the whole project outcomes. There are different types of stakeholders (Freeman, Kujala, Sachs, and Stutz, 2017), **Figure 1** identifying the majority of those that interact with the plastic packaging waste management system in Medellín and each other in complying with Resolution 1407/2018: Extended Producer Responsibility in packaging.

Figure 1. Types of stakeholders.

Informed by Friedman and Miles (2006)

As a basis for understanding the social and technical barriers and drivers for successful engagement in sustainability initiatives, the thesis examines stakeholder engagement and trust concerning the plastic packaging waste management system in Medellín concerning the Colombian government's declaration of Resolution 1407/2018. Colombia provides a critical context to examine stakeholder engagement and trust issues as a middle-income developing country noted for its weak governance, corruption, high criminal activity and social inequality. These factors are typically seen as fundamental barriers to stakeholder engagement and trust to the extent that they would be expected to jeopardise most civil society initiatives, regardless of the legislation underpinning them.

Counter to expectation, however, trust emerges from the case study as an essential quality in the interaction between stakeholders, aiding their commitment to involvement in Medellín's plastic packaging waste management system and decision-making processes around this. Although many factors are shown to negatively affect trust-building and collaboration between stakeholders in the case, other considerations drive stakeholders to engage in the system despite unequal power relations and a lack of reliability in available information. The significant original contribution of the thesis is thus in revealing how unlikely combinations of stakeholders' material and non-material needs satisfaction can see engagement and trust-building arise spontaneously, progressively and dynamically in a sustainability initiative despite an array of challenges.

The case of the plastic packaging waste management system in Medellín examines the asymmetrical conditions of individual and organisational stakeholders and their effects on engagement and trust in a sustainability project. Here, the asymmetrical conditions of the stakeholders refer to the differentiated and, sometimes, unbalanced conditions people and organisations must deal with sustainability challenges during a project. For example, some individuals may have their needs better satisfied than others, influencing their capabilities and power to participate in discussion boards where decisions need to be made about the scope of a sustainability project. Different organisations may also have differentiated access to reliable information about the waste management system, undermining their possibility to be in a levelled playfield when negotiating a project scope. These stakeholder groups are expected to comply with Resolution 1407/2018 to develop a circular waste framework for Colombia through extended producer responsibility while driving stakeholder collaboration across the packaging business ecosystem. The case study is built on interviews with 27

participants from 19 organisations, spanning private companies manufacturing and processing plastic packaging, cooperatives of waste pickers, government institutions and end-consumers. A rapid review of Colombian laws, decrees, resolutions and agreements concerning solid waste management from 1973 to 2020 also informs the case.

The review establishes the general objectives of the legislation, with a focus on how the Colombian government has worked to foster stakeholder engagement and trust in solid waste management initiatives. To report the case study findings, I provided the 'History of the inquiry' (Robson, 2002) by presenting my previous experience that motivated and informed this research and the sequence of research methods and activities as illustrated in this chapter. I provide in a standard and linear way the theoretical approach to identify the knowledge gap and frame data collection and analysis, the research design, two chapters to present the research findings, one chapter to critically discuss the findings and conclusions (Yin, 2014). As documented in different Colombian technical and media reports, Medellín's plastic waste management has faced significant issues that limited stakeholder and public trust (Edelman, 2020; El Tiempo, 2019; Leal Acosta, 2020; Revista Arcadia, Confama, World Values Survey, Invamer, and Raddar, 2019). In managing plastic packaging waste in Medellín, system stakeholders have had to meet differentiated costs of upgrading technical capabilities and knowledge to gain access to new business opportunities. The interviewees from this business ecosystem have also had to tackle corruption (Departamento Nacional de Planeación and Instituto Global de Crecimiento Verde, 2016) and work in a context where there is little trust in the actions and motives of others or the strength of government oversight, and inequality and poverty as major social disruptors.

The 2015 Environmental Democracy Index data showed that Colombia ranked tenth in a sample of seventy countries in terms of the strength of the country's legal system for protecting the environment (World Resources Institute, 2015). Paradoxically, the Environmental Justice Atlas put Colombia in the sixth position of sixty-seven countries concerning the number of conflicts related to environmental challenges (Martinez-Alier, Temper, and Del Bene, 2020). Corruption has been a critical barrier to the development of Colombia (Alto Comisionado de las Naciones Unidas para los Derechos Humanos, 2020; Araújo, Ardila, Gutiérrez, and Herrera, 2018; OCDE, 2017a), eroding the trust within the Colombian society as described by different local reports (El Tiempo, 2019; Noticias Caracol, 2019; Portafolio, 2018; Pring, Vrushi, and Peiffer, 2019; Redacción El Tiempo,

2020; Revista Semana, 2019; Vanguardia, 2019). The Departamento Administrativo Nacional de Estadística (2019) reports that inequality decreased in Colombia according to GINI and Palma indexes, but more than 30% of Colombians still lived in poverty. According to the Human Development Index from the Programa de las Naciones Unidas para el Desarrollo (2018), Colombia improved its development. Still, it faced challenges in inequality and environmental problems (United Nations Development Programme, 2021). With the onset of the COVID-19 pandemic, poverty at a national level increased from 35% to 42.5% (Unidad de Datos de El Tiempo, 2021).

Understanding trust and engagement in sustainability projects

Building trust between people and organisations to engage in sustainability projects is seen to require stakeholders to establish reciprocal relationships (Hearn, 2015) where they can collaborate and learn from each other (Capra, 2004; Geels, 2004). Building trust and engagement is seen to occur at different system levels and depends on whether a system reaffirms the value of the trust or the perception of a lack of reliability. Trusting and engaging are influenced by different drivers and barriers, both social, like the cohesion of a stakeholder network, and technical, like the efficacy of waste processing technology. The complex dynamics and structure of socio-technical systems, such as waste processing business ecosystems, are seen as an implicit barrier to engaging and building trust (Bowd et al., 2018; van der Bijl-Brouwer, 2018).

It is widely argued that comprehending the relationship between people and nature needs a systemic approach (Castillo Sarmiento, Suárez Gélvez, and Mosquera Téllez, 2017; Parnell, 2012; Vining, Merrick, and Price, 2008) in which humans are considered a part of nature (Bai, 2012). When individuals, organisations and nature interact, they exchange materials, energy and information (Saravia-Pinilla, Daza-Beltrán, and Ivorra-Peñafort, 2020) that inform new decisions and behaviours as stakeholders pursue their goals (Seemann and Marinova, 2010). In examining Medellín's plastic packaging waste management system, I drew on the complex socio-technical systems literature to understand the different sustainability challenges present in the case study, which examines the relationship between human beings in everyday and work contexts as these are contingent on complex social and technical factors.

During these interactions, Morin (1992a) highlights how new conditions and events can emerge in a system, such as the promulgation of new legislation, as in the case of Medellín's plastic packaging waste management system, affecting stakeholders' understanding of what they and others are required to do, necessitating adaption to change. In understanding the interaction between stakeholders in Medellín's plastic packaging waste management system, approaches like the Triple Bottom Line of Sustainability (Elkington, 2004) added to my understanding of the interdependence between human activities and environmental dynamics. These approaches also assisted me in comprehending the adverse effects of developing fragmented strategies to address sustainability challenges, like focusing on the environmental quality only, which does not account for the systemic relationships between people, or between people and nature (Sridhar and Jones, 2012; Tullberg, 2012).

In the complex socio-technical systems literature, connections between humans and nature are described as networks with nodes — E.g., people and organisations — and the social or operational connections between them, such as new business partnerships (Barabási, 2003; Borgatti, 2018). Understanding a network requires analysis of the attributes of its components, such as stakeholders' values and behaviour (Morin, 2014; Oluwole Akadiri and Olaniran Fadiya, 2013; Pedwell, 2017; Schwartz, 1994). Although humans and nature operate in interconnected networks, social and environmental networks differ in the behaviour of their nodes (Bijlsma, 2014; Cai, Cui, and Jo, 2015; Escobar, 1999). For example, language and human self-reflective capabilities differentiate human societies from other groups of living beings (González Ladrón de Guevara and Cuéllar, 2013; Habermas, 1989; Lafont, 1993). The rational dimension of human intelligence also allows people to consciously and proactively assess their decisions when adapting to system change (Betancur, 1939; Capra, 2004).

It is argued that arriving at a holistic solution to an environmental challenge, such as maintaining a plastic packaging waste management system, nature/society and mind/matter dualisms must be considered (Lozano, 2014). It is only being to understand stakeholder behaviour and motivation by factoring in stakeholder values (Antunes and Franco, 2016), affections and emotions (Echeverría, 2009) and other non-rational and spiritual aspects of being human (Melucci, 1980, 1999; Tversky and Kahneman, 1974). It is argued that the non-rational dimensions of human interaction best explain how to increase

empathy among stakeholders (Burcea, 2015; Muff, 2017; Tam, 2013), improve educational strategies to support sustainability initiatives (Fisher, 2001; Oberski, 2011), enhance stakeholders' pursuit of project purposes (Frankl, 1959), increase people's freedom to act (Patten, 1999) and build more authentic and trustworthy stakeholder relationships (Betancur, 1939).

The role of trust in the thesis is studied from the perspective of complexity, where trust is seen as an attribute of both stakeholders and system processes, helping individuals and organisations assess the benefits of project involvement and make decisions about the nature of their involvement (Jucevicius and Juceviciene, 2015; Manning, 2017). Acknowledging stakeholders as relationship builders (Bilodeau, Podger, and Abd-El-Aziz, 2014) elucidates their challenges, improving the likeliness of success in sustainability initiatives (Ellen MacArthur Foundation, 2013). Engaging in sustainability projects assumes a mindset, values and motivations for sustainable practices (Lasrado and Zakaria, 2019), hence the importance of understanding peoples' attitudes toward a particular sustainability challenge (Amore, Bennedsen, Larsen, and Rosenbaum, 2019; Baden and Prasad, 2014), their expectation for successful project outcomes (Echeverría, 2009; Provasnek, Schmid, and Steiner, 2016) and their individual and organisational goals (Anastasi, 2018; Arend, 2013; Baden and Prasad, 2014; Buysse and Verbeke, 2003; Shams, 2019). Stakeholders' capabilities and needs satisfaction (Agreli et al., 2019; Growiec, Growiec, and Kamiński, 2018; T. Jackson, 2016), their ethical framework (Anastasi, 2018; Muff, 2017) and how they make decisions (Hunt, 2012) are seen as other factors that influence stakeholder engagement (Lasrado and Zakaria, 2019; Shams, 2019).

Researcher expertise and motivation

My interest in caring for the environment began as a child in Venezuela, strengthened by my academic and industry career in Colombia. With qualifications in industrial design, environmental management, environmental law and project management, in my career, I have focused on developing sustainable business models and production and consumption strategies, including circular economy, sustainable lifestyles, education for sustainable development and stakeholder engagement. In this, I have worked with varied stakeholders, including Colombian indigenous communities, cooperatives of waste pickers, NGOs and local and national government agencies in Colombia. I have held various junior technical positions and senior managerial roles that have given me a comprehensive perspective on

how system effects influence stakeholders' behaviour in sustainability initiatives and project success or failure. The constant challenge in most of the sustainability projects I have worked on has been better engaging stakeholders in contexts where corruption and social inequality are rife, government oversight is weak or suspect and the threats to the rights of the environment and indigenous people are high.

My professional experience has alerted me to practical ways to meet stakeholders' expectations and balance the tensions between individuals and organisations during projects to achieve success. The diverse organisations I have worked for have alerted me to a broad range of drivers and barriers that individuals and organisations face when engaging in sustainability projects. As an academic working with undergraduate and graduate students, I have learned about the vital role of education in building an understanding of the needs of the environment, coming to see the importance of building a solid base of research to inform the success of sustainability projects with academic colleagues and community and industry partners. As a speaker at academic and industry events and having conversations with audience members, I have been able to build additional insight into the importance of context-dependent learning processes in the success of sustainability initiatives, inspiring me to undertake case study research into this challenge.

My interest in completing a doctoral thesis on the plastic packaging waste management system in Medellín was specifically prompted by my participation in the Waste to Opportunity project (W2O), which held the first of its three workshops in June 2018. My participation in the workshop highlighted the relationship between stakeholder needs and capabilities, challenges, and the issue of trust in Colombian sustainability initiatives. The Waste to Opportunity project began in 2016, led by Mr José González of the Colombian company Plastines S.A.S. and Dr Carlos Serrano, a Colombian recycling expert, to improve waste management in the plastic packaging industry in Medellín. Contributing to the project were design researchers from the Swinburne University of Technology, Melbourne. After participating in Workshop One in June 2018, I enrolled at Swinburne University of Technology in their PhD program to investigate what drove stakeholders to engage in sustainability projects despite often steep contextual challenges.

The Waste to Opportunity project shared some aspects of its scope, approach, method and network of stakeholders with my research, as shown in **Figure 2**.

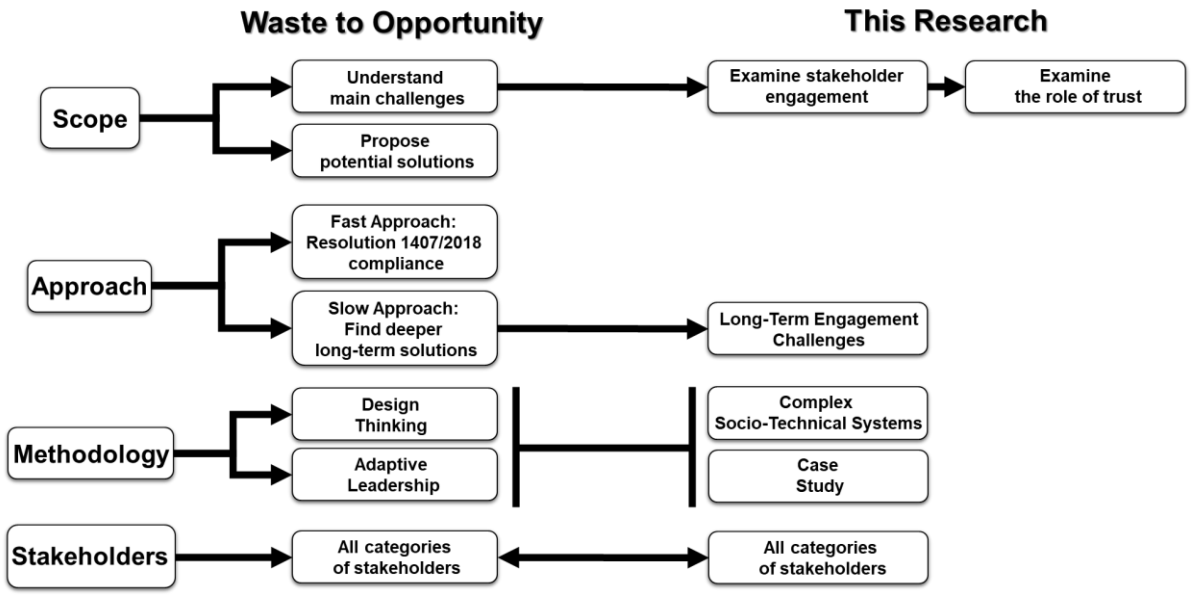


Figure 2. Relationship between Waste to Opportunity and my thesis

In both, Colombian Resolution 1407/2018 established new requirements for different industry stakeholders, such as forcing collaboration between organisations, this having the effect of introducing new tensions to the plastic packaging waste management system due to the asymmetrical conditions of the different stakeholders' needs and capabilities, especially when amplified by a lack of trust in the reliability of information exchange. However, my research followed a unique research path. As an example of 'Experiential qualitative research' (Braun and Clarke, 2013a, p.21), my research focused on understanding the experiences and perceptions of stakeholders about the system as valid despite their complexity and often contradictory nature (McMillan and Chavis, 1986) rather than being focused on improving the system as was the focus of W2O. My participation in W2O was essential to see that unless there is a deep understanding of stakeholders, the strategies for building engagement and trust in sustainability projects might elude project managers.

The significant original contribution to examining the role of trust in stakeholder engagement

Waste management is identified as critical in greening the growth of developing countries (OECD, 2012), with stakeholder collaboration being seen as a vital ingredient in project success (Planeación and Instituto Global de Crecimiento Verde, 2016). Here, the proclamation of Resolution 1407/2018: Extended Producer Responsibility in Packaging forced stakeholders in the plastic packaging waste management system in Medellín to

collaborate around common goals, including increasing the awareness of end-consumers on the importance of waste sorting to better manage packaging waste downstream. However, engaging stakeholders in sustainability projects is seen to require an environment of trust (United Nations, 2018) and a strong understanding between people and organisations about how they can contribute to a project (Nussbaum, 2011), such understanding being seen to empower them (Aparcana, 2017; Bai, 2012; Kaatz, Root, and Bowen, 2007; Kollmuss and Agyeman, 2002).

The case study findings show that stakeholders faced two specific challenges in this. The first barrier to collaboration is the stakeholders' needs and capabilities asymmetry. The second is the challenge for stakeholders in processing the information being exchanged in the system concerning legislation compliance, which is more onerous for small, under-resourced organisations than large, well-resourced ones. Local reports identifying challenges of poverty and weak governance helped affirm two hypotheses born out of the initial findings of this research. Although it is not typical to formulate hypotheses in qualitative research, assumptions in the literature regarding the disruption of collaboration by the asymmetry in stakeholders' needs and capabilities and doubt over the reliability of information validated the need for the study and the value of exploring it via a case study. I approached the research design, first unfolding the research hypotheses that validated the relevance of this research to then formulate my research questions as early as possible (Perry, Sim, and Easterbrook, 2006; Yin, 2014).

The first hypothesis related to the influence of the stakeholders' needs satisfaction on their engagement, assuming that even if a stakeholder is aware of the importance of engaging in sustainability projects, they would be less keen to proactively trust and engage if they are struggling to satisfy their needs. The second hypothesis is built on the characteristics of the plastic packaging waste management system in Medellín, assuming that even if an individual or an organisation were willing to trust others to engage in a sustainability project, a trust-lacking structure and other problematic system dynamics would prevent individuals and organisations from trusting and engaging.

Studies on sustainability projects with waste management initiatives being the focus examine stakeholder engagement and trust-building in developed countries (E.g., Ball, Burt, De Vries, and MacEachern, 2018; Bush, Jung, Connell, and Freeberg, 2018; Glackin and

Dionisio, 2016; Muff, 2017; Pawsey, Nayeem, and Huang, 2018; Provasnek et al., 2016; Sulkowski, Edwards, and Freeman, 2017; van der Ven, 2017; Welfens, Nordmann, and Seibt, 2016). Although numerous reports focus on the problem of waste, only a few investigate engagement and trust-building dynamics in projects in middle-income developing countries with weak governance (de Koning, Ta, Crul, Wever, and Brezet, 2016; Institute for Global Environmental Strategies, 2014; Jürisoo, Lambe, and Osborne, 2018; J. A. Mayer, Borchardt, and Medeiros Pereira, 2016; Mkutu, Mkutu, Marani, and Ekitela, 2019; Poulton et al., 2013). Only six examine Colombian cases (Aparcana, 2017; Chaves Villegas, 2016; Gunsilius et al., 2011; Molano and Ortegón-León, 2017; Serrano, Tiuzo, and Martínez, 2019; Terraza and Sturzenegger, 2010). None of these studies focuses on understanding the complexity of stakeholders' attributes and interactions at the different system levels. The examination of the effect of reliability in information exchange between stakeholders against their differential needs, capabilities and goals is also underexplored in terms of its effects at the different system levels.

Counter to what different reports say about the difficulty of building trust in Colombia, the thesis makes a significant original contribution to knowledge in arguing for a shift from a simplistic question like 'Is it possible to trust in Colombia?' to more empowering questions like 'For what purposes can someone build trust with others?' or 'Under what conditions can individuals and organisations trust and engage with others?' In examining the barriers and drivers to better stakeholder engagement in projects, the thesis challenges prejudices about the capability of individuals and organisations in countries whose societies are prone to corruption and weak governance to make progress in enabling sustainable outcomes. The assumption that no progress is possible has a corrosive effect on the sustainability of urban and natural environments. The thesis thus provides academia and project managers with fresh, creative ways to approach engagement and trust-building in sustainability projects. The rapid review of legislation suggests to policymakers how stakeholder engagement and trust-building might be better fostered through policy development and programs.

The structure of the thesis

After this Introduction, the thesis is comprised of six chapters and a Conclusion. The chapters examine a sequence of themes integral to understanding stakeholder engagement

and trust in sustainability projects, elucidating stakeholders' adaptation strategies in the face of asymmetrical needs, capabilities and access to reliable information.

Chapter One, *The Role of Trust in Stakeholder Engagement*, explores sustainability projects through the stakeholder lens, examining the broad literature on stakeholder engagement and sustainable behaviours. The chapter analyses how literature currently understands the relationship of trust to engagement, examining how stakeholders adapt to change, pursue their goals and learn to make better-informed decisions in sustainability initiatives. The chapter identifies a critical deficit in knowledge and understanding of how this happens in contexts where governance is weak and inequality and corruption are high, establishing the general research question: *What drives stakeholders to engage when the motivation to trust is low and the distribution of power and resources unequal?* Chapter One illustrates the value of the Medellín Plastic Packaging Waste Management case study, with Colombia being a nation with weak governance due to problems ranging from corrupt institutions, the absence of evenly solid government institutions, rampant economic inequality and pervasive criminal activity due to the influence of drug trafficking.

Chapter Two, *Stakeholder Engagement in Complex Socio-Technical Systems*, explores how complex socio-technical systems thinking provides a framework for navigating the barriers to engagement and trust in sustainability initiatives. Systems thinking and social network theory further contribute to establishing the thesis's holistic position on stakeholder engagement, trust-building and adaptation to constraints and emergent situations in sustainability initiatives. The chapter reinforces the significant original contribution of the thesis by introducing the proposition that trust and engagement do not necessarily exist in a binary relationship but rather can exist in complex, emergent relationships with each other. Chapter Two also contributes to framing the collection and analysis of the case data.

Chapter Three, *Research Design and Methods*, sets out the data collection and analysis approaches. It argues for the choice of qualitative case study and the supporting methods of semi-structured interview and rapid legislative review as a valid approach to examining the drivers and barriers linked to trust-building and stakeholder engagement in sustainability initiatives. The chapter explains the strategies used to manage the interviewees, secure their trust and align data collection and analysis with research ethics and integrity principles.

Chapter Four, *The Plastic Packaging Waste Management System in Medellín, Colombia*, provides the context for the case study. It introduces the network of stakeholders linked to the plastic packaging waste management system and the government's legislative position on stakeholder engagement and trust. It explains how recent solid waste management legislation has introduced new dynamics and requirements into the system. It examines how these intersect with an existing and diverse range of purposes driving stakeholders to engage in sustainability projects, asymmetries in stakeholder needs and capabilities, the effects of weak governance and uncertainty in the reliability of information exchange.

Chapter Five, *'Strengthening the bond' helps stakeholders adaptively build trust and collaborate in sustainability projects*, continues to report on the case of the plastic packaging waste management system in Medellín. It provides empirical evidence of how stakeholders, as represented by the interviewees, build trust and engage in sustainability initiatives despite the various barriers. The chapter focuses on the interviewees' comments on adapting to recently introduced sustainability legislation while pursuing individual and organisational purposes. It demonstrates the importance of stakeholder agency and ongoing learning in interactions with others as a counter to weak governance, the effects of corruption, poor information access and sharing, and unbalanced power relations between stakeholders. In providing the leading rendering of the significant original contribution of the thesis, Chapter Five presents a case beset with trust issues to show that stakeholder engagement in complex sustainability initiatives is not wholly dependent on solid generalised trust.

Chapter Six, *A Dance of Trust Supporting Engagement in Projects*, critically discusses the research findings and revisits the significant original contribution of the thesis from a theoretical and practical perspective. It argues that projects can succeed even when the scope to build stakeholder trust in sustainability initiatives is low. The chapter presents three patterns of behaviour that conceptualise how stakeholders build trust and engage in uncertain, asymmetrical conditions. These have significant practical implications for the integrated management of sustainability initiatives. The patterns show that stakeholder engagement and trust-building occur spontaneously, progressively and dynamically, suggesting a *dance* between stakeholders according to which stakeholders continuously assess their decisions based on their current purposes, needs and capabilities and the best, latest information they possess.

The *Conclusion and Recommendations* to the thesis provide some last deep insights into the nexus of trust and engagement in sustainability initiatives in middle-income developing countries with weak governance from a complex socio-technical systems perspective. This discussion highlights a range of meta and micro challenges identified in the case study to argue that learning can be inherent in any project and situation. The conclusion underscores the primary knowledge production from the thesis in comparing current thinking about the role of trust in stakeholder engagement in sustainability initiatives to the case findings. It evaluates the qualitative case study approach to understand stakeholders' behaviour in meeting project and system challenges. Lastly, it assesses the approach to the case study, discussing the scope to improve research into sustainability initiatives to better understand stakeholder engagement and trust-building processes.

CHAPTER ONE
THE ROLE OF TRUST IN STAKEHOLDER ENGAGEMENT

Chapter One presents a critical analysis of what is known and thought about stakeholder engagement in sustainability initiatives in three sections. The section *The diversity and interconnectedness of stakeholders and the uncertainty in projects make their engagement in sustainability initiatives complex* illustrates that sustainability projects are complex due to the uncertainty created by emergent events, such as a change in legislation, requiring project stakeholders to maintain their motivation and have the capabilities to collaborate in uncertain scenarios. In the section *Rational and emotional drivers and material and non-material needs motivate stakeholders to engage in sustainability projects*, the relevance of rational and emotional drivers to stakeholder engagement in sustainability projects is examined, with material and non-material needs shown to be critical to better understanding stakeholder motivations to engage, especially in being more empowered to engage. In the section *The role of trust in stakeholder engagement in sustainability projects*, trust is revealed as a vital pillar for better engaging project decisions. However, in middle-income developing countries with weak governance, project stakeholders deal with asymmetrical conditions, such as their needs satisfaction, capabilities and access to reliable information, making engagement more challenging.

Chapter One establishes that literature on sustainability initiatives sees high engagement and trust as essential ingredients for project success. However, most empirical studies investigating the role of engagement and trust in sustainability initiatives derive from economically developed nations with robust public policy and governance at the local, regional and national levels. There is an insufficient examination of this complex understanding for middle-income developing countries where trust is likely to be low due to poor governance, asymmetrical needs, capabilities and access to reliable information, adding to the complexity of sustainability projects. Chapter One examines relevant debates from business and marketing, design and engineering, sociology, urban studies and livelihoods on how individuals, groups and organisations interact in sustainability projects. It also examines the scholarly debate on sustainable behaviours from design, environmental studies, education, psychology and sociology on the emotional and rational drivers of stakeholders' decision-making in response to sustainability challenges.

Literature search strategy

This narrative literature review took a pluralistic and integrative approach to the synthesis of knowledge (Easman, Abernethy, and Godley, 2018; Efron and Ravid, 2018; Grant and Booth, 2009; Torraco, 2016), drawing on varied disciplines that examine stakeholder theory and the drivers of trust-building and stakeholder engagement. It includes references in English and Spanish. My background in sustainability management and design for sustainable behaviours informed the initial stages of the literature search. The technique of citation pearl growing was then used to identify additional sources to build the scope of the review (Efron and Ravid, 2018) until a saturation point in relevant themes was reached (Eisenhardt, 1989), following the sequence in **Figure 3**.

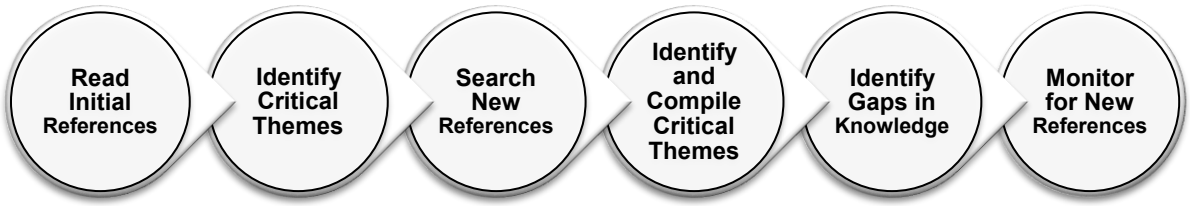


Figure 3. The literature review process

In addition to peer-reviewed journal articles and books on stakeholder engagement in sustainability management, I also sought grey literature, technical reports and news items from Colombia. **Table 1** shows the keywords in English and Spanish used to search for relevant published sources and filter the results. The best equivalent to 'Stakeholder engagement' in Spanish is 'Participación de los interesados.' To increase the number of results, the search in Spanish included the additional keyword 'Residuos plásticos', which means 'Plastic waste' in English.

Table 1. Keywords for the literature search

English	Spanish
Stakeholder engagement	Participación de los interesados
Sustainable behaviour	Comportamiento sostenible
Complementary booleans operators in 'any field'	
English	**Spanish**
Plastic waste management	Gestión de residuos plásticos
	Residuos plásticos

Model	Modelo

A literature search in July 2019 yielded 218 items (see **Table 2**). The small number of Spanish documents was consistent with Fritz and Silva (2018) who noted the low visibility of sustainability studies from Latin America, underscoring the original contribution of the thesis to knowledge. **Appendix 2** lists the sources identified during the literature search.

Table 2. Results from the literature search

English	
Search items	**# Of found references**
Stakeholder Engagement + plastic waste management + model	144
Sustainable Behaviour + plastic waste management + model	72
Spanish	
Search items	**# Of found references**
Participación de los interesados + gestión de residuos plásticos + modelo	0
Comportamiento sostenible + gestión de residuos plásticos + modelo	0
Participación de los interesados + residuos plásticos	1
Comportamiento sostenible + residuos plásticos	1

Analysis of the literature

I analysed the main themes I found in the literature iteratively, organising them into a network of themes that was also informed by my initial sense of stakeholder engagement issues in sustainability projects derived from my experience in W2O Workshops One and Two. **Figure 4** shows a network of themes in the literature review built with the software Kumu (https://kumu.io/). For example, some writers examined stakeholder needs as influenced by their shared values, with **Figure 4** showing a connection between the nodes *Stakeholder Needs/Powers/Interests/Knowledge* and *(Shared) Values/Ethic*. In **Figure 4**, the more a theme is connected to others, the larger it appears. For example, the themes circled in red — *Stakeholder Needs/Powers/Interests/Knowledge*, *Virtuous/Sustainable Behaviours* and *Shared Values/Ethic* — were mentioned more often and had more connections with other themes in the literature than those circled in blue such as *Education* or *Cognitive Domain*.

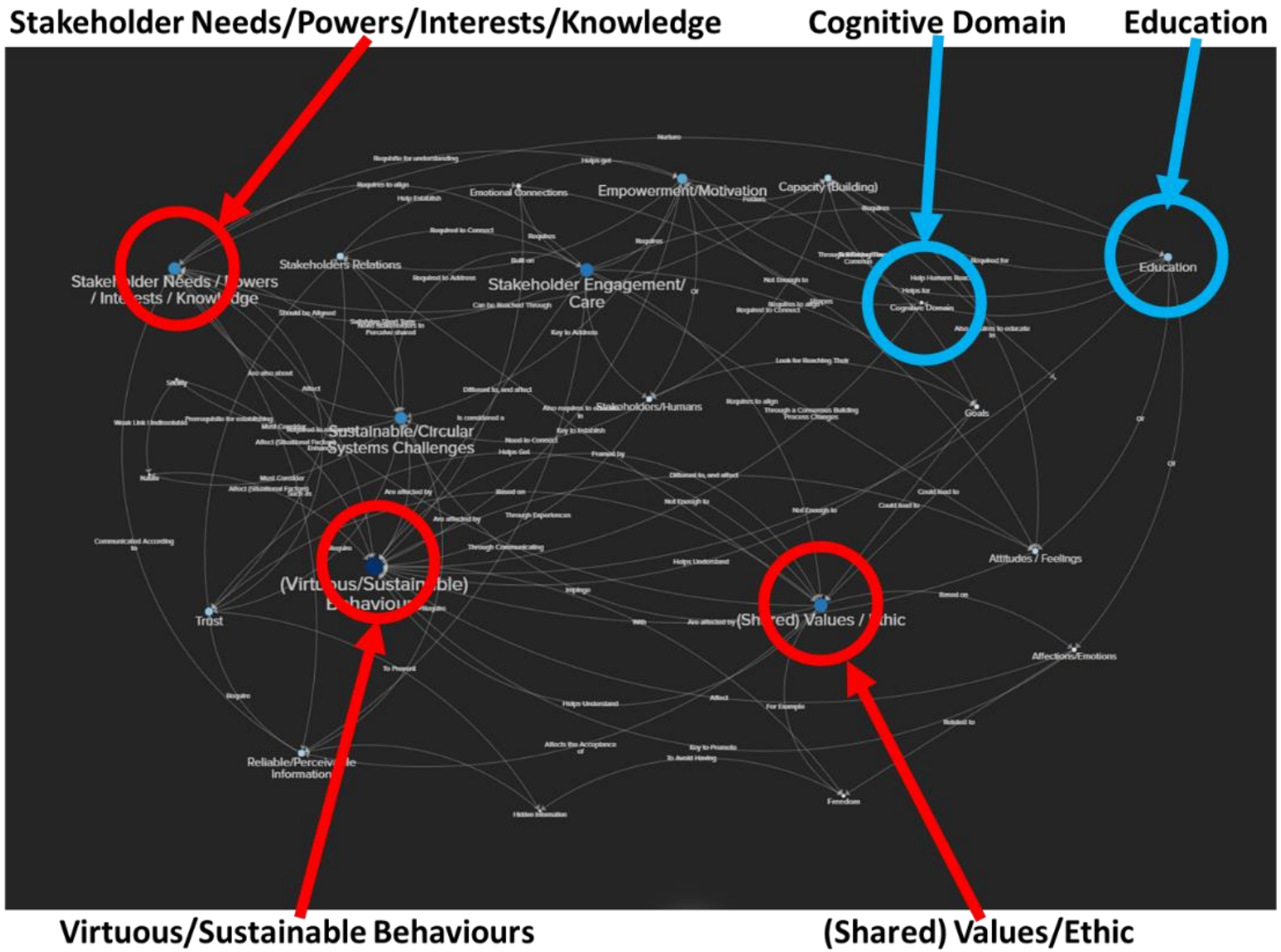


Figure 4. Key themes identified in the literature

The mapping themes from the initially reviewed literature helped define the critical themes for examining the complete literature about stakeholder engagement and sustainable behaviours in sustainability initiatives, these being set out in **Table 3**.

Table 3. Main themes identified in the literature

Capabilities and needs
Trust
Freedom
Uncertainty
Motivation
Learning feedback cycles
Structure and dynamics of the system

I searched for variations of the main themes to broaden the literature analysis. For example, these included synonyms such as *Capacities* for *Capabilities* and *Liberty* for *Freedom*. The search included fragments of some words, like *Capacit*, *Capabilt*, *Free*, *Motivat*, *Learn* and *Uncertain* to capture nouns and verbs in the search. When examining literature in Spanish, I followed the same process with translated versions of the themes such as *Capacidad* for *Capability* and variations of the themes such as *Aprend* and *Aprendizaje* for *Learning*. A thematic analysis contributed to disassembling and organising the main themes found in the literature (Ezzy, 2003; Ritchie and Spencer, 1994; Yin, 2010). As shown in **Figure 5,** a word count in NVivo 12 helped validate the main themes from the literature, where the size of the boxes shows the relative proportion of words found in the literature.

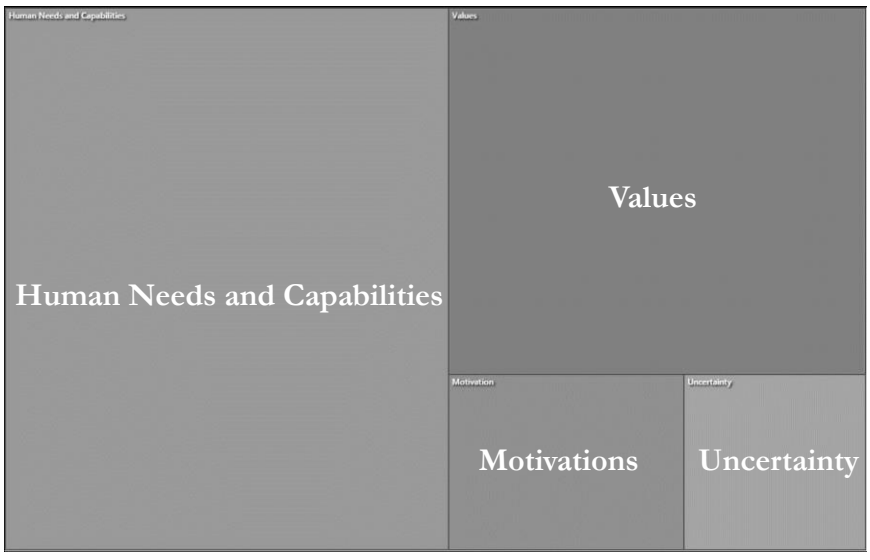


Figure 5. Main themes from the literature [Image modified from NVivo 12]

Mapping the data with Kumu and NVivo helped identify higher-order themes (Ezzy, 2003; Ritchie and Spencer, 1994). Keeping a degree of informality in the coding process made the literature analysis flexible and open to emergent themes (Yin, 2010). To examine the literature on stakeholder engagement and sustainable behaviours to identify gaps in knowledge, I established the rubric shown in **Table 4**.

Table 4. The rubric for the literature examination

Value	Meaning
2	The literature mentions the theme and offers clear guidance to address it
1	The literature only mentions the theme or a similar one
0	The literature does not mention the theme.

This rubric aimed to identify whether each source mentioned the main themes in relation to stakeholder engagement and included assessing whether each source considered the stakeholders' needs and capabilities, their trust in others, their freedom to make choices, their motivations to engage, their adaptation to uncertain conditions, their learning strategies and the influence of the structure and dynamics of the system on stakeholders. In a relevant example for the thesis, a source would achieve a value of two if it indicated that governments should bring stakeholders together in a shared and neutral venue to get to know each other and build trust to work on a shared sustainability project. The analysis of the sources is compiled in **Appendix 2**. **Table 5** shows a section of this table.

Table 5. A section of the literature assessment

#	Year	Model	Capabilities	Needs	Trust	Freedom	Uncertainty	Motivation	Learning Feedback Cycles	Structure and Dynamics
1	2016	Aday, J. B., & Phelan, K. V. (2016)	0	0	0	0	0	1	0	0
2	2019	Agreli, H., Barry, F., Burton, A., Creedon, S., Drennan, J., Gould, D., . . . Hegarty, J. (2019)	0	1	0	1	0	2	2	1
3	2013	Akadiri, P. (2013)	1	1	0	1	1	0	0	1
4	2019	Aksoy, L., Alkire, L., Choi, S., Kim, P. B., & Zhang, L. (2019)	1	1	1	0	1	1	1	2
5	2015	Alvarez, S., & Rubio, A. (2015)	0	0	0	0	0	0	0	0
6	2019	Amore, M. D., Bennedsen, M., Larsen, B., & Rosenbaum, P. (2019)	1	0	1	0	0	0	1	1
7	2013	Amran, A., Zain, M., Sulaiman, M., Sarker, T., & Ooi, S. (2013)	1	1	0	1	0	0	1	2
8	2016	Antunes, A., & Franco, M. (2016).	1	1	1	1	0	1	1	1
9	2014	Aparcana, S. (2017).	2	1	2	1	1	2	0	2
10	2013	Aparcana, S., & Salhofer, S. (2013)	0	0	0	1	0	0	0	1

The diversity and interconnectedness of stakeholders and the uncertainty in projects make engagement in sustainability initiatives complex

Sustainability projects are not discrete entities but are seen as context-dependent (Maloutas, 2003; Savaget, Geissdoerfer, Kharrazi, and Evans, 2019). Due to the diverse nature of project contexts, the varied characteristics of and relations between stakeholders, combined with the changeability of project processes, sustainability initiatives are also seen to be characterised by their complexity (Herszon and Keraminiyage, 2014). Complexity inhabits the interactions between combinations of people, organisations, technological artefacts, other life forms and natural resources (Barabási, 2003; Borgatti, 2018; Capra, 2004). The complexity of the structure and dynamics of systems influence the intricate network of factors in addressing sustainability challenges, which is seen to make them impossible to solve entirely or with one-fits-for-all solutions, requiring stakeholders to continually adapt to the embedded uncertainty in sustainability projects (Australian Public Service Commission, 2007; Giraldo Nohra, Pereno, and Barbero, 2020; Innes and Booher, 2004; Rittel and Webber, 1973). In sustainability projects, people and organisations need to assess each project's characteristics and circumstances to adapt to project challenges and increase the likeliness of project success (Fernandes and Araújo, 2019).

Project stakeholders need to understand the complex system structure in which projects operate by identifying the diverse types of project stakeholders (Morin, 1999). Examining the complexity of the evolving interactions between a system's human and organisational components is seen as relevant because their characteristics constantly change, adding to the uncertainty of people's decisions (Morin, 2014). To translate this understanding to this thesis, a small city in a middle-income developing country with weak institutions and a hot climate will have diverse needs and challenges in managing waste compared to a large city in a developed nation with solid government institutions in a cold climate.

The embedded complexity in sustainability projects is also evident in the emergent situations that add uncertainty to new projects (S. Clegg, Australian, and Pacific Researchers in Organization Studies, 2002; Liao, Chuang, and To, 2011; Morin, 1992a; Muff, 2017). Project stakeholders are continuously exposed to the demands of others, such as meeting organisational goals or responding to new consumer expectations. Gong, Simpson, Koh, and Tan (2018) argue that making project decisions become especially challenging in situations outside the project stakeholders' control. Such emergences

influence a system's dynamics, increasing ideas' tensions, uncertainty and subjectivity to stakeholder engagement (Eason, 2014; L. F. Martínez, Toro, and J. León, 2019; Pedwell, 2017). It is argued that examining the emergences and uncertainty in systems moderates how people behave when facing challenges (Welfens et al., 2016) and interacting with others (Capra, 2004; Fogg, 2009; Geels, 2004).

The emergences affecting people's behaviours and interactions can come from external situations. For example, emergent events can follow burdens related to countries' level of development, such as making their economy more sustainable (Ezeah, Fazakerley, and Roberts, 2013; Guerrero, Maas, and Hogland, 2013) while dealing with pressures over natural resources, such as lacking raw materials to manufacture a product due to government restrictions concerning the protection of nature (Ikhlayel, 2018; OECD, 2012). Emergences can also come from market drivers, such as new sustainable consumption trends (Minghua et al., 2009; Velis et al., 2012; D. C. Wilson, Velis, and Cheeseman, 2006). In middle-income developing countries with weak governance that are seen to depend more on natural resources for their development (OECD, 2012), stakeholders might face specific critical challenges when growing their businesses while respecting the ecological limits and related legislation.

The emergent events influencing stakeholder decisions in projects can also stem from the varied responses of the people and organisations involved in an initiative (Bijlsma, 2014), such as their hopes and fears in response to new opportunities (Teece, 2007), with their previous experiences influencing their current decisions (Echeverría, 2009; Muff, 2017; Sanz De Santamaría, 1998). The general view is that fostering engagement within sustainability projects faces various hurdles due to the diverse stakeholder characteristics (Baden and Prasad, 2014; Damghani, Savarypour, Zand, and Deihimfard, 2008; Winkler, Brown, and Finegold, 2018). A diverse range of stakeholder characteristics and behaviours are discussed in respect of stakeholder engagement, from stakeholder's emotional responses (Gifford, 2014; Kang, 2014) to the cultural frameworks of individuals and organisations (Boesso and Kumar, 2016; Rapp, Marino, Simeoni, and Cena, 2017; United Nations Environment Programme, 2019).

To manage the different stakeholder characteristics in projects, fostering stakeholder engagement is seen to require people to reach an agreement on the critical objectives of a

project (Innes, 1996; Innes and Booher, 1999), with defining a project's scope being seen as essential to effectively coordinating project activities later (Capra, 2004; Janmaimool, 2017; Latif, Omar, Bidin, and Awang, 2012). Stakeholder preparedness to align their contributions to build shared and coordinated knowledge and resource base is seen as vital to project success (Capra, 2004). Individuals and organisations are seen to be joined together in sustainability projects by the shared challenges involved, a view of themselves as unified at some level in having shared interests or pursuing similar goals being vital (Barabási, 2003). It is argued that individuals and organisations also need to be familiar with each other to be able to navigate the potential instability and uncertainty in sustainability projects introduced by the complex interaction of social and technical factors (Maríñez Sánchez, 2018; Morin, Vallejo-Gómez, Girard, and Vallejo-Gómez, 1999; Trist, 1977).

Sustainability projects sit within larger natural and socio-technical systems (Herszon and Keraminiyage, 2014; Linger and Owen, 2020). It is argued that stakeholders cannot achieve their project goals nearly by recourse to practical technical solutions, such as acquiring new equipment. Solutions also need to include social innovations and consider soft, human factors such as emotional drivers and barriers (Christensen, Drysdale, Hansen, Vanhille, and Wolf, 2014; Geels, 2010; E. A. Morgan and Grant-Smith, 2014; Rowley, 1997; Sulkowski et al., 2017). It is argued that focusing on technical solutions alone can affect the behaviour of a system and interactions between stakeholders (Parnell, 2012; Walker, Stanton, Salmon, and Jenkins, 2008). The studies on socio-technical systems examine how to improve the performance of systems by designing interconnected social and technical solutions (C. W. Clegg, 2000; Molleman and Broekhuis, 2001; Savaget et al., 2019), these typically focusing on people's well-being (Trist and Bamforth, 1951) and approaches to helping stakeholders navigate project uncertainty (Walker et al., 2008).

In navigating uncertainty, it is claimed that stakeholders need to invest additional resources in projects, a requirement that might be hard for those in developing countries or where project stakeholders have highly asymmetrical conditions, such as their needs and capabilities (Buysse and Verbeke, 2003; Riley and Solic, 2017; Rowlinson and Cheung, 2008; Zollo and Winter, 2002). Organisations are also considered to need to coordinate their activities through the support of strong leadership (Anastasi, 2018; Boyle, 2016; Capra, 2004; Crittenden, Crittenden, Ferrell, Ferrell, and Pinney, 2010), a leader's role helping motivate stakeholders to work autonomously and unanimously towards project

success (Baden and Wilkinson, 2014; Brehm and Brehm, 1981; Paillé, Raineri, and Boiral, 2017; N. Tromp and Hekkert, 2017).

Literature links stakeholders' motivation to engage in sustainability projects to a diverse range of stakeholder and system characteristics and events, extending from individual or organisational factors such as goal sharing to external forces, such as complying with sustainability legislation. Stakeholders also find the motivation to engage with a shared initiative in their common characteristics (Aday and Phelan, 2016; Arend, 2013; Barreto et al., 2014; Baumeister and Leary, 1995; Lazarus, 1991; Olafsen, Deci, and Halvari, 2018; van der Bijl-Brouwer, 2018). Authors examining the diversity of stakeholder characteristics affecting stakeholder engagement note that human interaction has rational and emotional dimensions (Bush et al., 2018; Muff, 2017; Urbano and Yuni, 2014), with emotional reasons to engage often being frustrated by rational factors (Chaplin and Wyton, 2014; Kollmuss and Agyeman, 2002; Tilley, 1999). For example, stakeholders' motivation to tackle a new sustainability opportunity might be frustrated by the need to consider the operational costs in a project, driving decisions about engagement rather than sustainability challenges and opportunities (Ceschin, 2012).

Rational and emotional drivers and material and non-material needs motivate stakeholders to engage in sustainability projects

The drivers of stakeholder engagement in the initial stages of a project are regarded as especially critical in triggering or inhibiting stakeholder participation in sustainability initiatives (Lilley, 2009), with the need to work expansively on stakeholder engagement before embarking on a project being recommended (Anastasi, 2018; Echeverría, 2009; Manetti, 2011; Provasnek et al., 2016). The literature argues that in effective engagement, project managers need to consider the motivating and demotivating factors at both the individual and organisational level (Fukuyama, 1995; Gifford, 2014; Lepsius, 2017), a complex mix of factors being seen to explain why some individuals and organisations choose to engage with some stakeholders but not others (Blok, Wesselink, Studynka, and Kemp, 2015; Shams, 2019). Fostering better engagement in projects can require different strategies (Anastasi, 2018; Freeman, 2010; Glackin and Dionisio, 2016; Greenwood and De Cieri, 2007; Tencati, Pogutz, Moda, Brambilla, and Cacia, 2016), including adaptive plans for information exchange tailored to different stakeholders and circumstances (Bush et al., 2018; Glenorchy City Council, 2017; Shams, 2019; Vildåsen and Havenvid, 2018).

When designing adaptive stakeholder engagement strategies, people and organisations must be conscious of the diversity of their motivations to engage before embarking on a project. In the field of complex systems, Capra (2004) argues that the reflective component of rational thinking increases people's consciousness, helping them formulate their values and goals to better suit their interests. A rational motivation to engage in a sustainability project could be securing a supply of raw materials (Hardin, 2002). Most authors, however, argue that emotional and rational motivations are equally likely to influence stakeholder engagement in sustainability projects (Echeverría, 2009; Niedderer, 2017). An emotional motivation to engage in sustainability projects could be pursuing inner peace by protecting the environment (T. Jackson, 2016; Parnell, 2012). Despite recognition of the role of emotions in inspiring a commitment to environmental sustainability (Krettek, 2018, 2019; Maturana and Bunnell, 1999), science is seen to have prioritised the rational dimension of humankind over the emotional (Kang, 2014; Lazarus, 1991; Paillé et al., 2017).

Whether rational or emotional, the literature on stakeholder engagement and sustainable behaviours acknowledges the complexity of motivations influencing stakeholders' willingness to engage in new projects. These include stakeholders' emotional connection to a place or organisation (Rashid and Mohammad, 2012), their feelings about a project or another stakeholder (Kang, 2014), the risks involved in a lack of action in response to a sustainability challenge (Baden and Prasad, 2014), the opportunities offered by sustainable behaviours (Janmaimool, 2017) and the stakeholder biases, weaknesses and strengths (Christensen et al., 2014; Kaffashi and Shamsudin, 2019; Teece, 2007). People's values, beliefs and demographic profile (Gifford, 2014; Johar and Razak, 2015; St. Pierre, 2015) and the effects of organisational cultures, norms and goals (Lasrado and Zakaria, 2019; Simões and Sebastiani, 2017) are also seen to influence their motivations to engage in sustainability projects.

While emotional responses are seen to significantly influence engagement dynamics in sustainability projects, managing these are seen to be difficult because stakeholders might want to avoid conflict with others or be reticent to impose their values on others (Patel, Pettitt, and Wilson, 2012; Shephard, 2008; Tang, Moro, Sozzo, and Li, 2019; Williams, 2001). Ratner (2004) argues that 'Values frame all social action, whether consciously acknowledged or not' (p. 7). Steg (2016) discusses the conflicting values that come into play to the detriment of the environment, such as an individualistic desire to satisfy personal

needs counteracting the altruistic value of protecting nature. In developing countries, the urgency for people to satisfy their most basic needs can force people to prioritise the need to survive. Conflicting values at the individual, organisational and system-level are equally seen to influence decision-making processes around engagement (Anastasi, 2018; Blok et al., 2015; Hunt, 2012; Muff, 2017; Pedwell, 2017). Hence, the relevance of identifying stakeholders' motivations to engage and how engagement will happen before and across a project (Antunes and Franco, 2016; Bijlsma, 2014), fostering shared social norms across the whole of an initiative's business ecosystem is seen to enhance engagement (Hunt, 2012; Kaffashi and Shamsudin, 2019; Shi, Lu, Hou, Zhen, and Hu, 2021; Shields, 2002).

Values and emotions influence stakeholder attitudes and concerns in response to sustainability challenges and opportunities (Barreto et al., 2014; Molano and Ortegón-León, 2017; Teece, 2007) and, in turn, stakeholder sense of empowerment to act (Amran, Zain, Sulaiman, Sarker, and Ooi, 2013; Betancur, 1939; Bloom, Engelhart, Furts, Hill, and Krathwohl, 1956; Durán, Alzate, López, and Sabucedo, 2007; Kang, 2014). For example, people with environmental awareness (Baden and Prasad, 2014) and altruism (Janmaimool, 2017) are seen to be more open to dialogue with others in sustainability initiatives while having a greater propensity to adapt to change (Blok et al., 2015; Illia, Romenti, Rodríguez-Cánovas, Murtarelli, and Carroll, 2015; Muff, 2017). Stakeholders' emotional resilience is seen as critical in dealing with tensions during collaboration but also in simply facing sustainability challenges (Desmet and Pohlmeyer, 2013; Ölander and Thøgersen, 1995; Rashid and Mohammad, 2012; Spinoza and Runes, 2014; van der Bijl-Brouwer, 2018). Collaborating is seen to help stakeholders build a strong vision of what they want to achieve (Kruijsen, Owen, and Boyd, 2013) and see their involvement in a project as meaningful (Anastasi, 2018; Capra, 2004; Guerrero et al., 2013; Shams, 2019).

Stakeholders are largely seen to determine if a sustainability challenge is worth engaging in based on either perceived threats and benefits to their individual and organisational needs (Niedderer, 2017) or their goals (Janmaimool, 2017; Jürisoo et al., 2018; Michie, van Stralen, and West, 2011; ölander and ThØgersen, 1995; Sovacool, 2013). Stakeholders are seen to weigh their engagement based on how a project aligns with their intrinsic motivations (Ciocirlan, 2017; Nisbet and Gick, 2008) and how capable they perceive themselves to be in delivering what is expected in a project (Fogg, 2009; Kollmuss and Agyeman, 2002). Barriers to engagement could be whether they must improve their

knowledge to make project decisions (Shephard, 2008) or commit more resources and develop new capabilities to perform as expected in a project (Mair and Laing, 2013; Serrano et al., 2019; W. K. Smith and Lewis, 2011).

Stakeholders might invest their efforts and resources in a project if they see that they can seize a market opportunity (Arend, 2013) or ensure the viability of their businesses through compliance with government legislation (Buysse and Verbeke, 2003; Crittenden et al., 2010; Williamson, Lynch-Wood, and Ramsay, 2006). Conversely, the perception that it will be challenging to ensure the viability of a project could stop stakeholders from committing to sustainability initiatives (Bilodeau et al., 2014), such as when donating to reforestation activities on top of paying a product's price Shams (2019) highlights in this example the frequent dissonance between what people think and feel about sustainability and what they do. In middle-income developing countries with weak governance, challenges in asymmetrical needs and capabilities could discourage stakeholders from engaging in new projects because the effort required to broker stakeholder relations to build engagement is simply too high (Jeffery, 2009). Similarly, Bowles, Hollander, Steenwerth, and Jackson (2015) note that the effort to comply with technical standards can derail established projects, sapping the commitment of project stakeholders, as in complying with compulsory sustainability-related legislation.

Material and non-material needs satisfaction drives stakeholder engagement

In the granular discussion around what motivates stakeholders to engage, understanding stakeholder needs is seen to help comprehend the utilitarian and non-utilitarian drivers to act (Busalim, Hussin, and Iahad, 2019; Fukuyama, 1995). The work of Manfred Max-Need, Abraham Maslow, Martha Nussbaum and Marvin Harris on human needs has been an important influence here, with the work of Saks (2011) stressing the need for a holistic understanding of human needs ranging from the material to the emotional to the spiritual to foster better stakeholder engagement.

In examining the influence of human needs in their decisions and behaviours, Victor Frankl's anthropological approach is of value in framing the relationship of needs satisfaction to stakeholder engagement. Frankl (1905-1997), an Austrian neurologist, psychiatrist and philosopher who founded logotherapy, uses a logotherapy approach to argue that humans experience life by pursuing a meaningful purpose in what they do. In

Mans' search for meaning, Frankl (1959) situates this pursuit concerning the spiritual dimension of the human being as a complement to people's biological and psychological dimensions, as Gengler (2009) also notes. Acevedo (1998) expands the work of Frankl, arguing that spiritual and transcendental dimensions are included in the human behaviour drivers, as is the search for a meaningful life. Various writers examine the influence of human spirituality on engagement in sustainability initiatives (Dhiman, Marques, and Mitroff, 2016; Rezapouraghdam, Alipour, and Arasli, 2018), Echeverría (2009) arguing that fulfilling a purpose and having a meaningful life is a condition for human existence.

Examining human needs depends on the various contexts according to which stakeholders operate in projects. Hence the perception of stakeholders' needs and their satisfaction is subjective. The work of the Chilean economist and politician Manfred Max-Neef (1932–2019) emphasises the importance of 'human scale development' in arguing for a differentiated approach to understanding needs in middle-income developing countries in comparison to those in developed nations. In his book, *Desarrollo a escala humana. Una opción para el futuro*' Max-Neef (1986) represents interactions between nature and society in specific contexts as influencing the complexity of human needs. In addressing challenges in Latin America, Max Neef recognises how people must often deal with social, cultural and political crises, ineffective political institutions, poverty and power differences. In the face of these challenges, people need to make sacrifices and assume extra social costs to support the environment while dealing with the frustration of finding it hard to satisfy their basic needs. The actions of reactive populist governments amplify this difficulty.

Max-Neef separates human needs into axiological and existential categories while acknowledging that material and non-material needs are equally important. He also recognises there are material and non-material means of satisfying them. For Max-Neef, however, non-material needs are often prioritised over material needs in contemporary societies. For example, an affluent member of a society can buy a specific brand of jeans to satiate the higher-order emotional desire to belong to a particular social group rather than to satisfy the material need to protect the body. For Max-Neef, the process of satisfying human needs is a complex balancing act. He explains how human necessities can operate as the lack of something, such as not having food, or the potential to achieve something, such as a motivation to engage in a new business opportunity to be able to get food. Some authors criticise Max-Neef for taking a mechanistic approach to understanding human

needs and their satisfaction, his work being accused of lacking deeper analysis of cases when people are not conscious of what they need (Elizalde, Martí Vilar, and Martínez Salvá, 2006). However, his work helps understand how to build more empowered communities in middle-income developing countries with weak governance (Martínez Sepúlveda, Gómez Gutierrez, and Florentino Márquez Ospina, 2018).

A better comprehension of stakeholder needs and motivations to act in sustainability projects could enable a better understanding of how stakeholders' goals and priorities influence their behaviours and decisions when engaging. The American psychologist Abraham Maslow (1908–1970) proposed an interconnected hierarchy of human needs to understand the motivations driving people's behaviour. In his 1943 article 'Theory of human motivation', Maslow argues that people establish their priorities and focus their capabilities on what they consider to be the most relevant needs to be satisfied. For example, if someone lacks what is required to live, such as the nutrients found in food, this would primarily drive them to get those nutrients. Maslow's work aligns with Max-Neef's to the extent that both identify material and non-material needs, which exist in some tension with each other and a diversity of ways to satisfy them. They also see that understanding people's behaviours is contextually specific in every case.

Maslow provides a scale of factors that motivate people to act, ranging from the fundamental and material to the transcendental and non-material. He proposed that people move to satisfy new, higher needs only when ones lower on his hierarchy of human needs have been met. For example, Maslow contended that people find it easier to satisfy their self-actualisation needs, such as following a purposive life or becoming 'Everything one is capable of becoming' (Maslow, 1943, p. 382) if they have previously found the means to meet their physiological and safety needs in terms of food and shelter. Building on this understanding, stakeholders are seen to assess their short- and long-term priorities based on incentives they identify for engagement in projects (Lasrado and Zakaria, 2019; Steg, 2016), such as earning money to live being weighed up against the impact of neglecting environmental issues (Corral Verdugo, Frias Armenta, and Gonzalez Lomeli, 2003).

Maslow has been criticised for the perceived reductionism of his self-actualisation concept with respect to needs fulfilment. Geller (2016) argues that Maslow's work lacks sufficient analysis of the dynamic influence of contextual factors in shaping stakeholder motivations

and behaviours, these not necessarily following the hierarchical sequence of needs satisfaction Maslow established. For example, in a case where stakeholders such as waste pickers lack some basic material needs, would they still engage in a sustainability initiative (Molano and Ortegón-León, 2017). However, Maslow's work is still seen as applicable when understanding where the pursuit of self-actualisation might drive people's behaviours. Zu (2019) argues, for example, that organisations wanting to succeed in their business should prioritise their employees' well-being. Maslow's approach also accounts well for why a lack of satisfaction with immediate, material needs might prevent some stakeholders from engaging in sustainability initiatives by blocking their ability to see higher needs fulfilment in investing effort in the environment.

People and organisations deal with tensions in projects when negotiating their immediate needs, such as increasing a business profit and long-term outcomes, such as strengthening employees' capabilities in sustainability projects (Fassin, 2005; Parker, Redmond, and Simpson, 2009). In analysing the relationships between people's behaviours in a specific context and the available resources they can access to fulfil their needs, the American anthropologist Marvin Harris (1927–2001), known for his work on the influence of material conditions across cultures, examines how people adopt primitive behaviours when satisfying immediate basic needs. In *Cannibals and Kings: Origins of Cultures,* Harris (1977) proposes four ways of understanding the origins of war: the role of war in creating a sense of community, as a competitive sport, as evidence of the criminal nature of humans, or a strategy to increase the political, social and economic well-being of a people. In respect of this, he argues that an underlying motivation for wars is a quest to keep the size of societies under control to secure a quality of life above a minimum level for survival. Harris's and Maslow's approaches align in terms of how accessing limited resources determines how people prioritise their activities. Some authors criticise Harris' work, Kowalewski (1979) arguing that his claims lack supporting evidence. However, a range of writers argues that Harris's work is of value in explaining human behaviour in the context of limited resources (Bates Graber, 2014; Obioha, 2018; Walle, 2016), such as where people engage in deforestation to get wood to build a shelter or cook food.

However, it is important to note that the literature reviewed in this section mainly examines human needs as these relate to individuals. In projects, individual and organisational stakeholders are seen to have needs that influence the propensity to engage (Freeman,

2010; Project Management Institute, 2017). Strong likenesses are seen to exist between the behaviours and motivations to act of individuals and organisations (Atkins, Atkins, Thomson, and Maroun, 2015) and their interactions within a specific context (Maturana, 2002). Some writers stress that people within organisations determine their operation and decisions rather than organisations operating as transcendental organisms (Katamba et al., 2012; Rousseau, 1983; Stacey and Griffin, 2005). Others describe organisations as living organisms using different biological metaphors. For example, some refer to organisations' structure and behaviours as their DNA (Chidiac El Hajj, Abou Moussa, and Chidiac, 2017; Heifetz, Linsky, and Grashow, 2014) and the duration of their ongoing operation as their lifespan (Geus, 1999). Others parallel an organisation's operation to that of living organisms (G. Morgan, 1997; Teece, 2007), Chertow (2000) describing the function of organisations through the concept of symbiosis, that is, in terms of the exchange of materials and energy with others.

The characteristics of individuals and organisations are seen to affect each other in the engagement in sustainability initiatives, such as when organisational decisions influence employees' activities and the employees' well-being influence the organisation's performance (Gifford, 2014; Jia, Evans, and Linden, 2019; Lasrado and Zakaria, 2019; Winkler et al., 2018). Similarly, organisational norms are seen to affect the behaviour of individuals while individual motivations can influence corporate decisions (Beer, 2017; Patel et al., 2012; Wright, Mukherji, and Kroll, 2001; Zaheer, McEvily, and Perrone, 1998). Here, Echeverría (2009) sees a tight relationship between what people and organisations do when interacting to satisfy their needs in projects. This tight relationship helps comprehend whether people and organisations respond reactively or proactively to sustainability challenges, as Borella and Barcellos (2015) and González-Benito and González-Benito (2006) note and whether they act collaboratively or individually (Dodgson, 1993) or voluntarily (Gunarathne and Lee, 2019).

Stakeholder empowerment, community-building and learning

The satisfaction of stakeholders' needs is seen to help stakeholders be more capable of acting. For example, an individual having their need for food satisfied today could be more capable of looking for food the next day. In a sustainability project, an organisation with employees having the required knowledge to engage in a joint project with the government could be more capable of achieving project success. Fogg (2009), writing around behaviour

design, supports this position in arguing that to engage in certain behaviours, people need to have the capabilities to behave as expected, a situation that could be more challenging for some stakeholders in middle-income developing countries with weak governance. Here, the work of the American philosopher Martha Nussbaum (1947–) is recognised for its analysis of human dignity in examining human capabilities and stakeholder empowerment.

Stakeholders having the control to meet their goals while satisfying their needs and building their capabilities is a state often referred to as empowerment, being seen as critical to engagement (Jucker, 2002; Maeda and Hirose, 2009; Nussbaum, 2011; Page and Czuba, 1999; Rappaport, 1987). Empowering stakeholders is seen as a dynamic process that can be motivated by varied factors, alone and in combination (Buades Fuster et al., 2013; Rowlands, 1997; Sen, 2001). Fostering dialogue between stakeholders is seen to help identify what aspects influence every individual and organisation's empowerment. Stakeholders are reported to feel more empowered when they believe they can voice their concerns (Antunes and Franco, 2016; Martínez Sepúlveda et al., 2018; Rowlinson and Cheung, 2008) and receive support from others (Lamm, Tosti-kharas, and King, 2015).

In her book, *Creating capabilities: The human development approach*, Nussbaum (2011) contributes to understanding the relevance of satisfying human needs to be better capable of engaging in different activities that nurture human dignity. For example, people need access to good-quality food to satisfy their hunger, have a healthy life and perform better at work. Similarly, Schreyögg and Kliesch-Eberl (2007) argue that an organisation needs access to knowledge to improve its capabilities, such as understanding new legislation requirements to better design compliance strategies. Nussbaum defines ten central capabilities that governments should put in place to allow their citizens to pursue a dignified and free life. These capabilities align closely with the human needs proposed by Max-Neef and Maslow, spanning human material and non-material dimensions. For example, Nussbaum argues that individuals need resources to live and have a healthy life to have the agency to make decisions to pursue a goal. To participate in all the dimensions of society and enjoy a dignified life, Nussbaum argues that people need the chance to use their senses and imagination to their full extent, have their intellect nurtured by education and use their reflective capacity to plan their lives. Individuals must also be able to freely build relationships with other humans and non-human species, this establishing emotional connections that help people enjoy life.

According to Nussbaum (2011), at the most fundamental level, individuals and groups of people need agency and freedom to fully function daily, conditions that stakeholders might find more complicated to meet in some contexts due to constrained and unbalanced access to resources. In the literature on stakeholder engagement, freedom typically refers to having the possibility and scope to make well-informed decisions (Oberski, 2011). Some authors argue that having the opportunity to choose how to behave lends authenticity and transparency to stakeholders (Betancur, 1939; Heuser, 2005; Langer and Moldoveanu, 2000; Maturana and Bunnell, 1999), which can be challenging in contexts where trust is low. For Nussbaum, acting autonomously and fulfilling a purpose in life has four critical aspects: the capability for people to improve their well-being, the activities humans do to improve their well-being, the agency to pursue goals and the freedom to base decisions on reason and will. Patten (1999) and Shields (2002) endorse Nussbaum's emphasis on exercising free will in decision-making as a fundamental social value. Other writers adapt Nussbaum's position to argue that acting autonomously in sustainability projects enhances engagement and adaptation to change (Antunes and Franco, 2016; Ball et al., 2018; Pearce, Barbier, and Markandya, 2000; Pedwell, 2017).

Some authors argue that Nussbaum's work is pertinent to stakeholder engagement due to her examination of the relationship between the pursuit of stakeholders' well-being and sustainable development (Guillen-Royo, 2019) and the stakeholders' empowerment and sustainability of cities (Martínez Sepúlveda et al., 2018), the work of Holland (2008) expanding the work of Nussbaum to sustainability fields. However, as is common in scholarly debate, her framework has attracted criticism for the lack of inclusion of multi-dimension variables beyond the influence of language-mediated interactions. Maxwell (2006) highlights the challenge of fostering emotional-based relationships such as pretending to strengthen empathy in projects between people different from family or close friends with only educational strategies. Stein (2009) argues that building citizen capabilities requires a massive investment of effort from governments.

Government is identified in the literature on stakeholder engagement as a critical player in driving or blocking collaborative relationships in sustainability projects, well-framed legislation, effective programs and adequate project funding being vital for this (Fukuyama, 1995; Ospina, 2009). The relevance of government legislation as a critical driver or barrier to stakeholder engagement in sustainability projects is widely discussed (Anastasi, 2018;

Guerrero et al., 2013; Oluwole Akadiri and Olaniran Fadiya, 2013; Tilley, 2002; Williamson et al., 2006). Ball et al. (2018) note the positive boost to stakeholder engagement when government agencies in developed nations with strong government institutions implement voluntary programs, thus avoiding the potentially daunting tensions of compliance. Government agencies are seen as having the capability to bring individual and organisational stakeholders together to seed sustainability projects (Glackin and Dionisio, 2016; Hardin, 2002). However, there is little research on strategies to foster legislation compliance with sustainability projects in the case of weak governments in developing countries.

Government intervention to seed projects or broker project partnerships, if accompanied by weak oversight, is seen to jeopardise stakeholder engagement in extant or future projects (Çetin and Demiral, 2018; Sagoff, 2013). Since not all the stakeholders looking to engage in a project are seen to have the minimum capabilities and capital to engage in sustainability projects (Chaplin and Wyton, 2014; Fogg, 2009; Patel et al., 2012; Steg, 2016), some governments design specific strategies to satisfy stakeholder needs. Yet some writers depict government intervention in seeding sustainability initiatives as paternalistic, reducing the viability of projects or delaying the point at which viable sustainability projects emerge independently in the marketplace. Barnett (2015) argues that sometimes such efforts can ignore communities' real needs and capabilities, going against people's freedom to choose the best way to build sustainable practices into everyday life. Government intervention is also argued to exacerbate asymmetries of power between stakeholders, reducing the tendency of some types of stakeholders to commit, cooperate and exchange information transparently (Amran et al., 2013; Kosters and Van der Heijden, 2015; Martínez Sepúlveda et al., 2018; Pedwell, 2017).

Stakeholders' asymmetrical conditions are seen to negatively affect their involvement in a project (Chaves Villegas, 2016; Paillé et al., 2017), especially when people and organisations need to reach a consensus on project decisions (Davila, Rodriguez-Lluesma, and Elvira, 2018). The power of stakeholders and the consequent level of stakeholder interactions are identified as an integral drag on the propensity to engage, especially when differential power relationships come into play (Borgatti, 2018; Felipe-Lucia et al., 2015; Project Management Institute, 2017; Winkler et al., 2018). These asymmetries are also seen to affect stakeholders' power to act when they need access to different project resources

(Felipe-Lucia et al., 2015) or make better-informed decisions (García-Sánchez and Noguera-Gámez, 2017). Differentiated access to information is also seen to affect stakeholder engagement, such as when there are semantic differences in how project stakeholders discuss a project (Bush et al., 2018), which could result in diverse interpretations of information (Kaatz et al., 2007).

It is argued that stakeholders looking to collaborate on sustainability projects should establish common ground before considering putting additional resources into a new initiative (Anastasi, 2018; Betancur, 1939; Deci and Ryan, 2002; Marín-Idárraga and Losada Campos, 2015). In this process, a sense of connectedness between the stakeholders is seen to emerge between individuals sharing different attitudes and values (Borgatti, 2018). A variety of factors is seen to drive a sense of connectedness, ranging from realising they share needs (McMillan and Chavis, 1986; Scotto di Luzio, Isoard-Gautheur, Ginoux, and Sarrazin, 2019), that they could strengthen each other's capabilities (Martínez Sepúlveda et al., 2018; Nussbaum, 2011), learn from each other (Nooteboom and Six, 2003; Wenger, 2000), or foster innovation in projects (J. S. Brown and Duguid, 1991; Manzini, 2015; Meza Rios et al., 2018; Tandon, 2014). A mutual sense of solidarity with nature (Capra, 2007; Gifford, 2014; Heuser, 2005; Paillé et al., 2017; Rashid and Mohammad, 2012), sharing emotions about a project (Chaves Villegas, 2016) and spiritual values (Ashmos and Duchon, 2000; Rezapouraghdam et al., 2018) are also seen to create a sense of connectedness.

Nurtured by a sense of connectedness in finding common ground, 'communities of practice' with strong learning dynamics are seen to form among stakeholders (Lave, 1991; Sloman, 2017). In this, stakeholders are seen to be afforded an opportunity to better know others and learn about their motivations to engage in a sustainability initiative and behaviours (Pedwell, 2017). Learning is also seen as a means to satisfy stakeholder needs and build their capabilities, as identified by Max-Neef (1986), Maslow (1943) and Nussbaum (2011). Communities of practice are seen to prompt a propensity to collaborate (Buades Fuster et al., 2013; Meppem, 2000; Shields, 2002) and mitigate risks derived from individualistic behaviours (Rodríguez-Pose and Storper, 2006). A sense of community in a sustainability project is seen to foster critical trust-building between stakeholders (Greenwood and De Cieri, 2007; Innes and Booher, 2004; Nooteboom and Six, 2003), this facilitating stakeholder engagement (Fukuyama, 1995; Hardin, 2002; van der Bijl-Brouwer,

2018), aligning stakeholder efforts to tackle sustainability challenges (Borella and Barcellos, 2015; Janmaimool, 2017; Jürisoo et al., 2018) and increasing the efficacy of stakeholder activities (Robert D. Putnam, 2001).

Building a community of practice around a project is seen to enhance the scope for project success by motivating genuine stakeholder engagement (Betancur, 1939; Fukuyama, 1995), this being seen as a spontaneous development sparked by working collaboratively on solutions to sustainability challenges. However, it is seen as possibly challenging in contexts where trust is low (Ospina, 2009). Different writers discuss how shared characteristics between individuals and groups positively influence information exchange and learning in various situations (Capra, 2004; Chaves Villegas, 2016; Habermas, 1989). Emphasising stakeholders' shared characteristics to establish a common ground is seen to be beneficial in building a community or strengthening an existing one (Buades Fuster et al., 2013; Lalot, Falomir-Pichastor, and Quiamzade, 2017; McMillan and Chavis, 1986; Muff, 2017), building consensus around project decisions (Innes and Booher, 1999) and fostering communication between stakeholders deepening engagement in collective action (Habermas, 1989).

An unwillingness to openly communicate and discuss ideas can harm engagement (Mathur, Price, and Austin, 2008; Sanz De Santamaría, 1998). Keeping fluent communications with others is seen to help stakeholders build and strengthen their capabilities to facilitate their engagement, learning and decision-making in projects (Bstieler, 2006; Crittenden et al., 2010; Mousavi and Bossink, 2017; Schreyögg and Kliesch-Eberl, 2007; Zollo and Winter, 2002). For example, effective communication can enable individuals and organisations to become more aware of other stakeholders' needs and priorities at an individual and organisational level to improve engagement in projects (de Bruijn and Lulofs, 2001; Echeverría, 2009; Janmaimool, 2017; Parker et al., 2009; Teece, 2007). Such capabilities are seen to develop more effectively if stakeholders have access to a reliable system of people and organisations working on shared projects (United Nations Environment Programme, 2019; van der Bijl-Brouwer, 2018). To effectively participate in sustainability projects, individuals and organisations are seen to need to foster two-way communications where stakeholders can have conversations that facilitate project negotiation (Holmberg and Samuelsson, 2006; Meynell, 2016; Sulkowski et al., 2017) and access a reliable base of knowledge to learn and be more capable of innovating (Anastasi, 2018; Fonzar, 2013; Janmaimool, 2017).

Having access to reliable information can also help stakeholders increase their control over the development of project activities, allowing them to engage more actively and keep learning to improve their capabilities (Ahmad and Abu Talib, 2016; Anwar and Frings-Hessami, 2020). The state of empowerment is seen to influence building long-lasting trust relationships and helps stakeholders adapt and act together in the face of change (Innes and Booher, 1999). How stakeholders are aware of the sustainability challenges and opportunities they face (Baden and Prasad, 2014; Bilodeau et al., 2014) and their attitudes toward the requirements of new sustainability projects (Blok et al., 2015; Bush et al., 2018; Echeverría, 2009; Steg, 2016) is seen to influence the process of engaging in sustainability projects and building trust. Engagement and trust are seen to be interwoven because the level of trust stakeholders have in a system and other groups of interest is identified as a fundamental influence on engagement (Growiec et al., 2018; Heuser, 2005; Jörg, Sandra, Bryan, and Sandra Sutherland, 2002; Lange, Wodon, and Carey, 2018; Yee and White, 2016).

The role of trust in stakeholder engagement in sustainability projects

The case study reported in this thesis examines the degree of trust and the priority placed on it needed to build collaborative relationships to ensure the success of sustainability projects. There is no single definition of trust despite it being identified as a critical value in the success of sustainability projects (Australian Government Department of the Environment and Heritage, 2005; Chaplin and Wyton, 2014; Kang, 2014; Tuli and Shankar, 2014; Wu, Liao, Tseng, and Chou, 2015). Rather, trust is used as both a noun and a verb to describe interactions between stakeholders (Armstrong et al., 2022; Rotter, 1971) and an outcome of communication and learning processes (Bstieler, 2006; Corazzini, 1977; Hardin, 2002; Lane, Salk, and Lyles, 2001; Nooteboom and Six, 2003; Pettit, 1995) when stakeholders interact with others (Burt and Knez, 1995; Echeverría, 2009; Hardin, 2002; Kramer, 1999; Schoorman, Mayer, and Davis, 2007). There is more agreement in the literature on stakeholder engagement on the characteristics of trust. Some stakeholders are seen as those who trust (trustors) while others are the recipients of the trust (trustees), with trust-building processes being seen as contingent on the characteristics of individuals, organisations and systems (Hardin, 2002; Mishra, 1996; Nooteboom and Six, 2003).

Stakeholders' capacity to build trust is seen to rest on their inclination to assume the risks of trusting others. In managing risks, stakeholders are seen to find in trust-building a

mechanism to avoid deceptions when interacting with others (Möllering, 2008) and increase the benefits derived from their relationships (Norman, 2007; Rousseau, Sitkin, Burt, and Camerer, 1998; Sako and Helper, 1998; Teicher, Alam, and Gramberg, 2016; Tilley, 1999). However, stakeholders might have to invest extra effort to avoid deception in contexts where trust is low. Whether to build trust or repair it, writers on trust-building argue that these processes help overcome global crises (Bachmann and Inkpen, 2011). For example, in engaging in sustainability projects, building trust could increase public participation (Çetin and Demiral, 2018; Hardin, 2002; Lepsius, 2017; van der Bijl-Brouwer, 2018) in the design of better solutions to sustainability challenges (Bstieler, 2006; Muff, 2017; Munns, 1995).

Individuals and organisations could also find in building trust opportunities to establish new business partnerships (Buckley and Casson, 2010; Bunduchi, 2013; Healey, Hillier, Healey, and Hillier, 2008), to improve project communications (Cheshire, 2011; Dodgson, 1993), governance (Fukuyama, 1995; Hearn, 2015) and performance (Hunt, 2012; Patel et al., 2012; Zaheer et al., 1998). Stakeholders are seen to find in trust-building an opportunity to foster their motivations for and agency when engaging in projects (Butler, 2016; Hosmer, 1995; Maríñez Sánchez, 2018; Munns, 1995; Zaheer et al., 1998), increasing their capacity to adapt to change and deal with uncertainty reducing the inherent risks in projects (Amir and Kant, 2018; Antunes and Franco, 2016; Cheshire, 2011; Robinson, 1996). Managing risks in a project also requires stakeholders to have different capabilities to respond to challenges (Shams, 2019) and deal with conflicts derived from their interactions (Anastasi, 2018; Goleman, 2005). In doing so, individuals and organisations are seen to need to be confident in how they engage in a project (Kaplan and Kaplan, 2009; N. Martínez and Cardona, 2019) to be motivated to assume the inherent risks. Stakeholder self-trust is seen to be critical in establishing connections with others and building dialogue in projects to reach a consensus about shared goals (Butler, 2016; N. Martínez and Cardona, 2019; C. Rogers, 2011; Urbano and Yuni, 2014).

However, self-trust is seen to be insufficient for managing risks and building trust in sustainability projects. For example, contextual complexity (Jucevicius and Juceviciene, 2015; Parnell, 2012; Zaheer et al., 1998) and the work conditions in a project (Dodgson, 1993) are seen to negatively influence trust-building. People and organisations need a robust system of trust to withstand inevitable conflicts and uncertainty around stakeholders' actions (Acemoglu and Wolitzky, 2014; Maríñez Sánchez, 2018), raising the

question of how stakeholders in countries where trust is low face conflicts and deal with uncertainty. A robust system of trust is seen to be supported by stakeholders fulfilling their promises (Echeverría, 2009) and being willing to comply with project agreements (Bstieler, 2006). With a diversity of stakeholder and system characteristics, a robust system of trust should also facilitate equal access to reliable information (Manning, 2017) and mechanisms to facilitate reaching a consensus about collective concerns, opinions and values (Hardman, 2009; Lepsius, 2017; Parnell, 2012; Nynke Tromp, Hekkert, and Verbeek, 2011), Baden and Wilkinson (2014) and Hunt (2012) exploring how the perception of shared values contributes to a sense of trustworthiness in others.

Not all the authors agree that trust is integral to fostering engagement or establishing cooperative relationships. For example, when one stakeholder has more power than another, as in a negotiation between a powerful buyer and a less powerful seller, some stakeholders might feel forced to go along with a deal to avoid losing a business opportunity (Butler, 2016; R. C. Mayer, Davis, and Schoorman, 1995; Schoorman et al., 2007). Nevertheless, even in these cases, stakeholders might find themselves in a situation where they expect others to fulfil their commitments as agreed, which is a form of trust. In other words, they might trust others to a certain extent, even if the decision to trust was made somehow forced. Hence, writers see trust as being built in diverse ways, both through emotional relationships or the rational calculation of the potential benefits of a project (Armstrong et al., 2022; Kramer, 1999; Nooteboom and Six, 2003; Zaheer et al., 1998). Some authors equate trust-building with the dynamic shape of a spiral (Cheshire, 2011; Covey, 2006; Munns, 1995; Tang et al., 2019; Woolcock, 1998), where individuals and organisations decide to trust progressively as they come to know each other (Cowan and Todorovic, 2000) and manage conflicts and tensions during a project as they arise (Acemoglu and Wolitzky, 2014; Jucevicius and Juceviciene, 2015). The idea of the dynamism and compounding character of trust-building processes is supported by varied authors (Armstrong et al., 2022; Munns, 1995; Panyathanakun, Tantayanon, Tingsabhat, and Charmondusit, 2013; R.D. Putnam, Leonardi, and Nanetti, 1994; Shams, 2019).

While stakeholders build trust, spontaneous events might reinforce or degrade their level of trust in a project (Armstrong et al., 2022; Lewicki, McAllister, and Bies, 1998; Sol, Beers, and Wals, 2013). While strengthening the ties of trust between project stakeholders, this process can change dynamically (Maríñez Sánchez, 2018; Vildåsen and Havenvid, 2018)

according to the outcomes of their interactions (Bstieler, 2006; Tang et al., 2019). For example, two individuals representing two different organisations could have doubts about trusting each other at the beginning of a project. However, after resolving doubts and conflicts, their trust could increase in a constructive spiral to the point where they decide to keep working together. Thus, building trust in a project is seen to dynamically depend on stakeholder perceptions about others' motivations for engaging (Kramer, 1999). These perceptions can be influenced by stakeholder's attachment to a specific context (Bachmann and Inkpen, 2011; Manzo and Perkins, 2016; Ospina, 2009), increasing the complexity of trust-building because geographical proximity is noted to more readily foster closer collaboration (Bönte, 2008; Bunduchi, 2013; Panyathanakun et al., 2013; Yakovleva, Reilly, and Werko, 2010) and trusting relationships (Borgatti, 2018; Hoevenagel and Wolters, 2000; Patel et al., 2012; Russo and Perrini, 2009).

The complexity of trust-building is seen to demand the investment of effort to establish a safe environment for both present and future partnerships (Cheshire, 2011; Dodgson, 1993; Glackin and Dionisio, 2016). Whether through formal strategies such as setting up contracts (Martínez Sepúlveda et al., 2018) or less formal procedures (Bstieler, 2006; Manning, 2017; Muff, 2017), it is seen to be necessary to keep the focus on people's well-being when building trust in projects (Barnes, 1981). Stakeholders might feel safer sharing information in projects by having a shared space (Patel et al., 2012) where they could interact more spontaneously (Heuser, 2005; Pedwell, 2017; Primeaux, 1998) and conduct discussions in careful and sincere language (Arend, 2013; Habermas, 1989; Mohr and Spekman, 1994). Thus, stakeholders are seen to establish different mechanisms to build trust in a project (Hardin, 2002; Zaheer et al., 1998), such as finding support from trusted third parties to mediate in trust-building (Nooteboom and Six, 2003) or from particular information sharing strategies (Armstrong et al., 2022; Botsman, 2017).

In relevant literature about trust, it is argued that stakeholders should continue to find innovative ways to share information in projects by designing tailored communication strategies (Bush et al., 2018) and varied communication channels (Armstrong et al., 2022; Spence, 2003). However, project change and the diversity of stakeholders add complexity to project communication and could spark the emergence of conflicts that jeopardises trust-building (Acemoglu and Wolitzky, 2014; Araújo et al., 2018; Fukuyama, 1995; Sanz De Santamaría, 1998). Information can be filtered, modified or lost as it flows through projects

due to individual subjectivity and different organisational characteristics and relations to a project (Barabási, 2003; Heifetz et al., 2014; Hooft, 2004). For example, asymmetries in the stakeholder conditions, such as their needs and capabilities are seen as potentially trust-destroying, even risking project failure, this effect being specially reported in case studies from middle-income developing countries with weak governance (Amran et al., 2013; Chaves Villegas, 2016; Keefer and Scartascini, 2022; Kramer, 1999; N. Martínez and Cardona, 2019; United Nations Environment Programme, 2019).

This situation reinforces the question of what drives stakeholders to keep engaging in sustainability projects in contexts where trust is low. In these situations, stakeholders need to continuously validate the reliability of the information to better engage (Buades Fuster et al., 2013; Cochrane and Cundill, 2018; Project Management Institute, 2017). It could require stakeholders to invest more effort, potentially adding more tension in contexts where stakeholders already face constraints in accessing resources to satisfy their needs and build their capabilities. In contrasting and validating information, individuals and organisations are seen to typically learn with every new experience (Marrewijk, 2003; Rapp et al., 2017), with the presence of both formal and informal educational strategies in the conduct of a project seen to have a positive influence on engagement and trust-building in sustainability projects (Holmberg and Samuelsson, 2006; P. W. Jackson, 2012; Kaatz et al., 2007; Muff, 2017; Pedwell, 2017).

There is a specific body of literature on the role of trust in sustainability projects. It argues that building trust in sustainability projects is dependent on effective learning processes and access to reliable information (Bush et al., 2018; de Koning et al., 2016; Jürisoo et al., 2018; Serrano et al., 2019). However, different writers who examine stakeholder engagement in sustainability projects neglect trust as a critical dimension of the successful participation of stakeholders in joint projects, as in the studies of Agreli et al. (2019), Brennan, Scott, Connelly, and Lawrence (2019), Cevallos-Muñoz, Alcocer-Quinteros, and Abreu-Ledón (2019), Fox, Iriste, and Bezeljak (2019), Gunarathne and Lee (2019), Hodgkins, Rundle-Thiele, Knox, and Kim (2019), Jia et al. (2019), Kaffashi and Shamsudin (2019), Lasrado and Zakaria (2019), Nelson, Partelow, and Schluter (2019) and Sánchez-Muñoz, Cruz Cerón, and Giraldo Uribe (2019). Other authors see trust as vital to successful stakeholder engagement in waste management projects, as Belyakov (2021), Di Vaio, Varriale, and Trujillo (2019), Gómez-Soto, Sánchez-Toro, and Matallana-Pérez (2019) and Pandebesie,

Indrihastuti, Wilujeng, and Warmadewanthi (2019). Still, they do not offer clear strategies for fostering or evaluating its presence. For example, some writers argue that participatory processes help build trust among stakeholders (Aksoy, Alkire, Choi, Kim, and Zhang, 2019; Fuldauer, Ives, Adshead, Thacker, and Hall, 2019; Téllez-Bedoya and Bernal-Rodríguez, 2019), and help improve learning processes (H. S. Brown and Cohen, 2019) and facilitate innovation strategies (Cochrane and Cundill, 2018), but do not identify the specific strategies individuals and organisations undertake to build trust in specific contexts. Only a few writers examine how stakeholders build trust to improve engagement in sustainability projects by designing tailored communication strategies to better reach different audiences (E.g., Bush et al., 2018; Shams, 2019).

Trust in middle-income developing countries with weak governance

Most studies on sustainability projects examine stakeholder engagement and trust-building in developed countries, with waste management initiatives being the focus as in the work of Ball et al. (2018), Bush et al. (2018), Glackin and Dionisio (2016), Muff (2017), Pawsey et al. (2018), Provasnek et al. (2016), Sulkowski et al. (2017), van der Ven (2017) and Welfens et al. (2016). Few studies report projects or conditions in middle-income developing countries with weak governance from engagement and trust-building dynamics. Fritz and Silva (2018) argue the need to research sustainability in developing countries' business ecosystems from a whole-system perspective. There are some important exceptions where trust is identified as essential for collaboration (J. A. Mayer et al., 2016). The lack of trust is acknowledged as a barrier to better stakeholder connectedness (de Koning et al., 2016). The government is seen as a critical stakeholder in promoting better trust-based relationships (Institute for Global Environmental Strategies, 2014). Some authors recognise that to build trust it is critical to share information transparently (de Koning et al., 2016; Jürisoo et al., 2018; J. A. Mayer et al., 2016), find support in trusted local parties (Jürisoo et al., 2018; Mkutu et al., 2019) and foster community-building (Poulton et al., 2013).

As has been established by this literature review, an optimal process for fostering stakeholder engagement also adapts to the complexity of each project through continuous learning from the stakeholders (Chaves Villegas, 2016) and satisfying the stakeholders' needs. The levels of trust between people and organisations (Bunduchi, 2013; Manzo and Perkins, 2016) and the governance in a project (Bachmann and Inkpen, 2011; Innes and Booher, 2004) are seen to affect the success of engaging stakeholders in sustainability

projects. In contexts with a weak record of government institutions in terms of corruption and transparency, government involvement can be a barrier to stakeholder engagement (Bilodeau et al., 2014; Guerrero et al., 2013; Sulkowski et al., 2017; Vildåsen and Havenvid, 2018), thus fostering an inherent wariness in stakeholders (Hearn, 2015; Muster and Schrader, 2011; OECD, 2017b; United Nations Environment Programme, 2019; US Agency for International Development, 2020).

Of the extant case studies from middle-income developing countries with weak governance where trust is identified as vital for improving engagement in waste management sustainability projects, six are linked to Colombia. The work of Serrano et al. (2019) and Terraza and Sturzenegger (2010) provides some ideas on how to build trust in these contexts. For example, Serrano et al. highlight the relevance of providing 'emotional support' while building collaboration and associativity between project stakeholders. Terraza and Sturzenegger acknowledge that in a case in Brasil a government-backed campaign to improve waste sorting in a municipality helped officialise and legitimise the waste management program, which contributed to increasing trust among the citizens.

Trust is also seen as relevant to fostering collaboration in the waste management business ecosystem (Molano and Ortegón-León, 2017). Some studies acknowledge the intrinsic relationship between trust and power relationships and between trust and how safe the stakeholders feel sharing their emotions (Chaves Villegas, 2016). However, the general perception is that there is mistrust in this system, including a lack of trust in the government (Aparcana, 2017; Molano and Ortegón-León, 2017), amplified by cultural prejudices (Molano and Ortegón-León, 2017). Here, Chaves Villegas (2016) argues for the need to promote frequent stakeholder participation while building a sense of community, while Gunsilius et al. (2011) emphasise the need to encourage transparent information sharing. Two additional studies are worth mentioning here because they link to Colombia, waste management and community governance. Villegas Pinuer, Valenzuela-Fernández, Llonch Andreu, and López Belbeze (2021) discuss trust to explain why some small and medium enterprises have decided to work with informal waste pickers. The work of Soto-Vallejo, Villarraga-Lozano, and Cardona-Acevedo (2020) focuses on community governance in managing local aqueducts, with building trust in joint sustainability projects being shown to have a critical influence.

Sustainability projects in Colombia are seen to be mired in the challenges of weak governance (Planeación and Instituto Global de Crecimiento Verde, 2016), a lack of trust in the Government (Soto-Vallejo et al., 2020), corruption and asymmetries of power (Alcaldía de Medellín, 2018b; Muñoz Grisales, 2017; Portafolio, 2020a; Pring et al., 2019; Revista Arcadia et al., 2019; Superintendencia de Servicios Públicos Domiciliarios, Departamento Nacional de Planeación, and Universidad Nacional de Colombia, 2018). In discussing stakeholder engagement and trust in waste management initiatives in Colombia, some authors study trust in parallel with the effect of stakeholder needs and capabilities in pursuing their goals (Aparcana and Salhofer, 2013; Chaves Villegas, 2016; Gunsilius et al., 2011; Serrano et al., 2019; Terraza and Sturzenegger, 2010). Others examine the effect of promoting participatory activities and designing consistent communication strategies in increasing the perception of transparency (Aparcana and Salhofer, 2013; Gunsilius et al., 2011; Molano and Ortegón-León, 2017). Others focus on the effects of complex legal requirements or corruption in blocking better strategies for formalising waste workers and improving waste management (Aparcana and Salhofer, 2013; Gunsilius et al., 2011).

There is a discussion of known barriers to improving collaboration between stakeholders in Latin America, notably distrust, competition, a lack of reliable information (Aparcana, 2017; Gunsilius et al., 2011; Molano and Ortegón-León, 2017) and differences in stakeholders' power (Chaves Villegas, 2016). An example provided is the presence of informal waste pickers not being registered as a formal organisation (Gunsilius et al., 2011), the inequality in the satisfaction of stakeholder needs and capabilities concerning their poverty, poor access to job opportunities, the destruction of families due to criminal activities (Serrano et al., 2019) and an unbalanced distribution of the value added to the materials along with the waste business ecosystem, where waste pickers are denied a fair portion of the earnings despite their efforts in recovering waste (Terraza and Sturzenegger, 2010). Chaves Villegas (2016) recognises the ongoing daily problems the stakeholders face that increase their fatigue and diminish their interest in engaging in new projects. A lack of motivation to engage in new projects is seen as linked to a lack of coordination (Soto-Vallejo et al., 2020).

In fostering stakeholder engagement, relevant literature identifies trust as a motivator for less powerful stakeholders to get organised, such as by forming cooperatives of waste pickers (Gunsilius et al., 2011). Trusting others is seen to facilitate that waste streams

continue to flow in waste management systems (Molano and Ortegón-León, 2017), such as when a community decides to give their waste to a cooperative of waste pickers because the community feel they trust the cooperative. Trust is seen to help stakeholders improve project governance, manage resources, and collaborate (Soto-Vallejo et al., 2020). Despite what different reports say about the difficulty of building trust in Colombia and Latin America in general (Keefer and Scartascini, 2022), all authors examining stakeholder engagement in sustainability projects and the experience of trust in Colombia provide evidence of stakeholders building trust to interact with others in the waste management systems to some extent despite local challenges. However, these authors do not provide an integrated understanding of stakeholder motivations driving engagement despite the presence of asymmetrical needs, capabilities and access to reliable information.

In response to obstacles to engaging and building trust in sustainability projects, some authors identify different strategies to improve the quality of interactions between people and organisations. These strategies focus on creating new incentives, building capabilities and promoting better emotional connections with waste pickers. For example, financial incentives such as helping waste pickers establish stable incomes could overcome inherent mistrust among less powerful stakeholders (Aparcana, 2017). Increasing the propensity to engage in Colombia is argued to also be achieved by improving stakeholder capabilities (Chaves Villegas, 2016) with participatory activities to build a sense of community with 'high levels of self-organisation' and 'high tolerance for 'failure' (p. 98). Here, educational strategies are seen to contribute to increasing the efficiency of the waste management system in Colombia (Terraza and Sturzenegger, 2010). Dedicated educational strategies and regular meetings with stakeholders are identified as effective in developing capabilities and a sense of connectedness about stakeholders having shared concerns (Gunsilius et al., 2011). Fostering interactions between stakeholders and helping them know and support each other (Molano and Ortegón-León, 2017) while promoting the voluntary association of stakeholders is seen to improve stakeholders' engagement, the levels of trust among them and their well-being (Serrano et al., 2019).

However, in discussing the challenges and opportunities in managing waste in Colombia, the literature lacks an understanding of the complexity created by the interactions between a network of different stakeholders with various levels of involvement in a project and asymmetrical conditions, such as their needs, capabilities and access to reliable information.

Most sources focus on issues with specific stakeholders, such as associations of waste pickers or private businesses. In failing to take a holistic approach to examine how individuals and organisations' diverse needs and capabilities in sustainability initiatives play out, the engagement dynamic and complex nature is overlooked.

Relevant literature also lacks a comprehensive perspective of the full range of human needs when examining their influence on stakeholder behaviours in engagement processes, including non-material needs and the human spiritual dimension. Most authors link stakeholder engagement and trust to the satisfaction of material needs only. The exception is Chaves Villegas (2016) who highlights how leveraging stakeholders' spiritual connection to nature can positively influence engagement. Others address the need to provide emotional support in networks of organisations (Serrano et al., 2019) and avoid the prejudices against waste pickers (Molano and Ortegón-León, 2017) but lack a deeper examination of the complexity of the diverse range of human needs driving their behaviours in sustainability projects. Grey literature recognises the lack of transparency in Colombia concerning the perception of the deficient performance of the government and major companies (Leal Acosta, 2020; Ministerio de Ambiente y Desarrollo Sostenible, 2018a; Ospina, 2009; Revista Arcadia et al., 2019; US Agency for International Development, 2020). Different authors acknowledge transparency in information exchange between stakeholders as a critical pillar when engaging and building trust in sustainability projects (Aparcana, 2017; Chaves Villegas, 2016; Gunsilius et al., 2011). However, a lack of transparency in Colombia due to corrupt stakeholders, the loss of Colombians' self-confidence and the history of internal armed conflict make it more difficult for stakeholders to build trust and make well-informed project decisions.

Here, the role of the Colombian government here is seen to be critical in raising awareness about the characteristics of the contexts and the stakeholders to facilitate flexible governance mechanisms and foster collaboration (Soto-Vallejo et al., 2020) and motivate some stakeholders, such as waste pickers, to become formal and registered organisations (Terraza and Sturzenegger, 2010). However, Government legislation could discourage stakeholder engagement and trust-building dynamics in sustainability projects in contexts with weak governance, weak legislation enforcement and a perception of a lack of transparency in the information exchanged between stakeholders. The difficulty in building trust in sustainability initiatives in Colombia lacks granular examination in respect of

stakeholders' differential levels of trust concerning their specific needs, capabilities, goals and perceptions of others as illustrated by different reports about trust in Colombia (Edelman, 2020; El Tiempo, 2019; Revista Arcadia et al., 2019; Rojas, 2020; Semana, 2020; US Agency for International Development, 2020). In summary, the reviewed literature on sustainability initiatives in Colombia lacks a depth of evidence and theorisation of what drives a complex, asymmetrical network of stakeholders to respond to emergent situations in a context characterised by low trust and weak governance in terms of their propensity to engage and build trust in sustainability projects.

Research questions

In the reviewed literature in Chapter One, engagement and trust are seen as indispensable and intertwined factors influencing the success of sustainability initiatives. The level of trust among stakeholders is seen to encourage or discourage project stakeholders from collaborating, increasing their capabilities and learning to overcome the challenges derived from the complexity of sustainability projects. The literature on stakeholder engagement and trust-building in sustainability projects provides a range of recommendations on encouraging individual stakeholders and stakeholder organisations to better engage, including bringing people together based on similar characteristics and fostering dialogue. The literature reviewed in Chapter One highlights the many barriers to stakeholder engagement and trust-building contingent on contextual factors. Chapter One thus establishes the value of the case study on the plastic packaging waste management system in Medellín reported in Chapters Four and Five of the thesis.

In the literature on stakeholder engagement and trust-building, the implication is that projects cannot be successful without solid motivation to engage and trust. Nevertheless, in Colombia, sustainability projects go ahead where highly problematic dynamics exist in the waste management business ecosystem. In examining what seems to be a paradox concerning published thought and knowledge, the thesis provides a case study on what drives stakeholders to engage in unequal relationships of mistrust in the plastic packaging waste management system in Medellín serving as the base for the general research question:

Main Research Question: What drives stakeholders to engage when the motivation to trust is low and the distribution of power and resources unequal?

As I explained in the Introduction of this thesis, the PhD position I applied for was open to bringing research support to the W2O initiative. This relationship with W2O helped inform this research and frame its general context. Although W2O and my PhD shared some aspects, they followed different tracks, as illustrated in **Figure 2**. The focus of the PhD position was to better understand the stakeholder engagement dynamics in sustainability projects, with particular challenges of the city of Medellín and Colombia. However, as agreed with my former and current supervisory team, the main research question was too general and needed to be grounded on more specific issues to focus the data collection and analysis. After doing the initial literature review and having insights from my self-reported experience in some W2O activities (Braun and Clarke, 2013b), as I explain in Chapter Three, I formulated two more specific additional research questions or 'operational questions' as my former supervisory team called them.

Literature holds that stakeholders in sustainability projects, especially in middle-income developing countries with weak governance, must overcome or acclimatise themselves to diverse challenges and uncertainty to maintain engagement and trust. These challenges are seen to stem from the typical complexity of sustainability projects, including the dynamics that can emerge between stakeholders due to asymmetry in their needs and capabilities, compounded by the additional specific challenges of the local context. Still, the stakeholders in Colombia mostly continue to interact with others. When I formulated the main research question, I had initial literature, experience and insights from my participation in some W2O activities that suggested the stakeholders' needs and capabilities influenced the willingness to engage and trust in sustainability initiatives. However, I did not know how it did it. Following what Crowe et al. (2011) say about what type of questions a case study could help answer, I needed to understand how the stakeholders' needs and capabilities impacted this case's engagement and trust-building dynamics. Hence the importance of the following more specific additional research:

How do needs driving the pursuit of stakeholders' goals affect their motivation to engage and trust where collaboration is required?

The initial literature I reviewed and my experience and perceptions derived from some W2O activities illustrated that access to reliable information also impacted the willingness to engage and trust. Asymmetries of power and access to reliable information in middle-

income developing countries with weak governance pose barriers to engagement and trust-building in sustainability projects. The literature identifies the main challenges here as the perception of corruption leading to justified suspicions about the integrity of information and unequal information sharing between project stakeholders. Yet, no individual or organisation can thrive alone in sustainability initiatives that span a substantial business ecosystem, meaning that collaboration is required for stakeholders to take up opportunities and make the system work. Here, I did not know how access to reliable information and local challenges affected the stakeholders' motivation to collaborate on projects. Thus, the third research question aims to understand how the pursuit of reliable information that helps the stakeholders make well-informed project decisions influences their motivation to engage:

How does the reliability of communication and information affect stakeholders' willingness to engage and trust in sustainability initiatives?

Chapter summary

Chapter One has examined a broad literature on stakeholder engagement and trust in sustainability initiatives to establish the state of thought and knowledge on the influence of different stakeholder characteristics such as their values, needs and capabilities on engagement dynamics. It has identified deficits in the literature around how stakeholders engage in multi-stakeholder sustainability initiatives with how these stakeholder characteristics play out in the face of the specific challenges in middle-income developing countries with weak governance, receiving little attention. For example, with the asymmetries in the stakeholder needs and capabilities, it is unclear why some people and organisations engage in a sustainability project despite having many weakened positions due to the involvement of considerably more powerful stakeholders. Regarding the uncertainty of information exchange reliability, the chapter has shown that there is an insufficient examination of how stakeholders make project decisions and learn despite having suspicions about the reliability of information exchanged.

Stakeholders in sustainability initiatives face different social and technical challenges. Due to the varied characteristics of stakeholders, the diverse nature of project contexts and the changeability of project processes, sustainability initiatives can be characterised by their complexity. Chapter Two examines complex systems and socio-technical systems theory to

frame data collection and analysis in the case study to understand what drives stakeholders to engage in sustainability projects in unequal, trust-lacking contexts such as those frequently encountered in middle-income developing countries with weak governance, this being the significant original contribution to the knowledge of this research.

CHAPTER TWO
STAKEHOLDER ENGAGEMENT IN COMPLEX SOCIO-TECHNICAL SYSTEMS

Chapter Two sets out the theoretical position adopted in the thesis on trust among stakeholders as a vital pillar when engaging in sustainability initiatives. Complexity inhabits the relationship between individuals and organisations at both the macro and micro levels when contributing to a business ecosystem that extends from manufacturing plastic packaging through the multiple stages of use to the ultimate disposal and recycling of packaging. The thesis uses complex socio-technical systems theory to inform the research design. Theories of complexity and socio-technical systems shed light on the diverse challenges in such an extended and complicated endeavour. Complexity and the nature and operation of socio-technical systems are discussed in various fields, including biology, ergonomics and engineering, human behaviour, philosophy, psychology and social networks. When the matter at hand is a sustainability challenge and the research approach is case-based, insights from this diverse literature help explain the effects of stakeholder diversity and systemic tensions in a complex and extended business ecosystem such as the plastic packaging waste management system in Medellín. Complex systems theory and socio-technical systems theory enable a more profound, conceptual analysis of how stakeholders inform their decisions and behave in projects when navigating the diverse challenges involved in collaboration and accessing resources to engage in projects.

The complexity of sustainability projects requires a systemic approach to understanding stakeholder relationships

As discussed in Chapter One, the systems in which stakeholders interact in sustainability projects are complex (Manzini, 2016; Marshall, 2012; Rezapouraghdam et al., 2018). In the thesis, complex systems refer to groups of individuals, organisations and non-human life forms that interact during daily activities, exchanging information and resources, and exhibit self-organising dynamics that make it impossible to predict the system's behaviour and its components. To better examine the dynamics between people, organisations and nature in sustainability projects, this research project adopted complex socio-technical systems theory to inform the research design with a systemic approach (Castillo Sarmiento et al., 2017; Parnell, 2012; Saravia-Pinilla et al., 2020; Vining et al., 2008) in examining the main issues concerning the stakeholder engagement in the plastic packaging waste

management in Medellín following the declaration of Resolution 1407/2018: Extended Producer Responsibility in Packaging.

The critical complexity theorists whose work informs the thesis are Edgar Morin and Humberto Maturana. The French philosopher and sociologist Edgar Morin (1921–) provides a profound examination of complex systems through his paradigm of complexity compared to the general theory of systems. In his article *From the concept of system to the paradigm of complexity*, Morin (1992b) argues that recursive thinking is needed to broaden the understanding of how systems operate, the interaction and emergent properties of system components transforming systems in iterative, looping ways. To provide an example relevant to this thesis, issuing Resolution 1407/2018 influenced how stakeholders build relationships around compliance through different sustainability initiatives. Simultaneously, the stakeholder interactions in those sustainability initiatives affected how the plastic packaging waste management system was reorganised to facilitate or block Resolution 1407/2018 compliance. For example, stakeholders working together to comply with this Resolution could create new organisations to provide support to conform to this norm, modifying the system's structure and dynamics.

As discussed in Chapter One, sustainability projects are seen to be context-dependent (Maloutas, 2003; Savaget et al., 2019). Understanding the unfolding of stakeholder relationships when engaging and building trust also involves comprehending the complex structure (Morin, 1999) and dynamics (Morin, 2014) of the plastic packaging waste management system in Medellín. For example, examining the operation of this system required understanding the distinct types of stakeholders and how they organised themselves around legislative compliance and the challenges and opportunities Resolution 1407/2018 afforded. Other writers, in addition to Morin, stress the importance of examining how the structure of a system influences its general dynamics and the behaviour of its components (Aksoy et al., 2019; Capra, 2004; Tandon, 2014). To understand what drives stakeholders to engage in a sustainability project when the motivation to trust is low and the distribution of power and resources unequal, following my general research question, data collection and analysis had to focus on what rules and roles of the stakeholders drove their behaviour (Geels, 2004; Lepsius, 2017). I also focused on how the stakeholders' power and dependence relationships affected their interactions (Amran et al., 2013; Antunes and Franco, 2016; Patel et al., 2012), what 'situational factors' influenced

their engagement (Hines, Hungerford, and Tomera, 1987, p. 8) and how they learned and informed their project decisions (Campuzano, 2011; Innes and Booher, 1999; Nye and Hargreaves, 2010; Tandon, 2014).

In examining the structure and behavioural dynamics of the plastic packaging waste management system in Medellín, Morin's approach helped capture the system's varied components. As discussed in Chapter One, Morin's understanding of the complex dynamics between the system's components also assisted in better comprehending the interactions between individual and organisational stakeholders and how emergent events stem from their relationships because of their changing attributes. This system's dynamism is seen to add uncertainty to people's decisions (Morin, 2014), the work of Morin contributing to understanding how project stakeholders deal with the uncertainty in the reliability of the information being exchanged in this case. Morin's approach to complexity is also valuable in examining how the emergent situations and uncertainty stakeholders must navigate within a complex system's self-organisation dynamics can inevitably produce conflicts and tensions that project stakeholders must deal with to increase the likeliness of project success. To provide an example relevant to this thesis, two individuals from different organisations looking to collaborate on a sustainability initiative and discovering they have diverse short-term goals will face tensions that need to be resolved if they want to work together to comply with Resolution 1407/2018. Morin's complexity theory is criticised for lacking empirical evidence to support his claims (Rodríguez Zoya, 2017). However, his approach is seen as integral to understanding a complex system's autopoiesis — how the attributes of a system and its sub-systems work to self-reproduce and continually evolve without losing their identity (Niklas Luhmann and Barrett, 2012).

In their book *Autopoiesis and cognition: The realisation of the living,* Maturana and Varela (1980) propose the concept of autopoiesis to clarify how a complex system continues to operate and self-develop in the face of ongoing disturbances. Like Morin, Maturana and Varela argue that the diversity of disruptions will tend to move recursively from a chaotic to a stable state in a self-organising process, complex systems having the simultaneous tendency to seek balance as they continue to develop (Muff, 2017; Rapp et al., 2017). In understanding a system's self-organising processes, Maturana, alone and with various co-authors, is known for analysing complex systems from the perspective of living systems (Maturana and Varela, 1980). In examining living systems and the relationships between

their components, Maturana's work discusses the significance of the human emotional domain in defining human existence and providing people with the drivers to act (Maturana, 2002). Maturana and Bunnell (1999) argue that emotions such as love help stakeholders solve their challenges by fostering innovation through dialogue (Maturana, 2002). In highlighting the relevance of emotions in developing new project opportunities, Maturana's approach underscores that not only are the rational and technical aspects of socio-technical systems essential, but the emotional and social drivers are equally significant influences on stakeholders' motivations and behaviour. Maturana's work is criticised for investing in stakeholder views that could be counterproductive to a system's operation (Berman, 2016; Popper, Havel, and Gombrich, 2002). However, his work on the subjectiveness of human communications and interactions continues to be applied in literature on system complexity (E.g., Romeu, 2018).

Another pragmatic way of understanding the functioning of complex systems and stakeholder interactions within them is by examining complex systems as networks (E.g., Bortoleto and Hanaki, 2007; H. S. Brown and Cohen, 2019; Capra, 2004; Chesbrough, Vanhaverbeke, and West, 2006; Das and Teng, 2001; E. M. Rogers, 1983). Here, a system's components are represented as a collection of nodes and sub-systems (Maturana, 2002; Morin, 1999). When stakeholders interact with each other in a sustainability initiative, this is represented as a critical process for the formation of system networks (Barabási, 2003; Morin, 1999; Tilley, 2002), with a system's structure and dynamics simultaneously influencing the flows of information and trust-building processes between stakeholders (Granovetter, 2017; Manning, 2017). Understanding a network requires analysis of both its structure and parts (Marín-Idárraga and Losada Campos, 2015) and how stakeholder attributes (their values, needs, capabilities and motivations to engage) influence network dynamics (Borgatti, 2018; Morin, 2014; Pedwell, 2017). It is argued that how stakeholder negotiate project challenges is closely linked to their capabilities (Health and Safety Professionals Alliance, 2012; Hoevenagel and Wolters, 2000; Mena and Chabowski, 2015; Teece, 2007).

Some writers describe systems in which people interact with technology as socio-technical systems (Le Coze, 2019; Walker et al., 2008), with many writers on socio-technical systems seeing complexity as integral to their nature and operation (E.g., Appelbaum, 1997; C. W. Clegg, 2000; Eason, 2014; Emery and Trist, 1973; Foster, Plant, and Stanton, 2019;

Molleman and Broekhuis, 2001; Trist, 1977). The theoretical underpinnings of socio-technical systems theory are broad, emerging from Trist and Bamforth's (1951) examination of the working conditions and performance of systems in organisations built on Kelly's (1978) analysis of labour performance about job conditions. Many authors on socio-technical systems limit their studies to workplace dynamics. In contrast, others extend this discussion to encompass the broader concept of the stakeholder through their interest in client-customer relationships, notably C. W. Clegg (2000), Eason (2014), Savaget et al. (2019), and Teram (1991). Another group of writers argue that the underlying conceptualisation of the structure and dynamics of complex socio-technical systems needs to be expanded (Eason, 2014; Gorejena, Mavetera, and Velempini, 2016), especially where sustainability challenges are involved (Shi et al., 2021). For example, in the 'Wicked problems' approach (Australian Public Service Commission, 2007; Rittel and Webber, 1973), the varied scenarios in which stakeholders interact with each other, technological artifacts and nature, comprehending the effects and challenges in a socio-technical system negate the possibility of identifying one-fits-for-all approaches to ensuring a system's effective performance (Kajzer Mitchell and Walinga, 2017).

The thesis uses complex socio-technical systems theory to inform the research design, acknowledging that the systemic structure and dynamics of complex systems are likely to influence the conduct of sustainability initiatives (Emery and Trist, 1965; Trist, 1981). It provided me with a framework to identify and analyse data about the stakeholder's interrelated technological and social challenges (von Bertalanffy, 1950; Walker et al., 2008). It made me alert in this to how the stakeholders adapted to challenges (Geels, 2010; Savaget et al., 2019; Trist and Bamforth, 1951) in the face of the tensions emerging between a diverse network of stakeholders who were required to collaborate by Resolution 1407/2018 and embrace extended producer responsibility for the effective recycling of plastic packaging waste.

Examining stakeholder diversity and tensions contributes to an understanding of behaviours in sustainability projects

Resolution 1407/2018 extends the producer's responsibility to improve packaging waste management to achieve the Colombian government's aim of fostering a circular economy. A range of literature argues that a circular economy framework is an optimal approach to understanding the complexity of the exchange of materials, energy and information in

sustainability projects (Ellen MacArthur Foundation, 2013; Fleischmann, 2019; Gobierno de Colombia, 2019; Kopnina, 2018; Staicu and Pop, 2018). In projects that seek to enable a circular economy, fostering stakeholder engagement is seen to address the emergent challenges and improve the possibilities of collaboration and success (Ellen MacArthur Foundation, 2013; Innes and Booher, 1999; Mendoza, Gallego-Schmid, and Azapagic, 2019; Schröder et al., 2019). As stakeholders interact with each other in complex systems and engage in sustainability initiatives, different challenges are seen to emerge (González Ladrón de Guevara and Cuéllar, 2013), particularly in contexts where project stakeholders navigate interconnected networks of diverse individuals and organisations.

Complex systems are considered open with the interaction between their components operating simultaneously at the level of the individual, the organisational, within parts of the system or across the system. It means it can be difficult for stakeholders to understand patterns of stakeholder and system behaviour (Growiec et al., 2018; Kinnie and Swart, 2020; Parnell, 2012; Tushman and Scanlan, 1981). For example, stakeholders might find it hard to find common ground with others and determine the likeliness of success when building collaborative relationships within projects. When patterns of stakeholder and system behaviour are subject to external influences, such as the issuing of Resolution 1407/2018 with a national reach in the case study examined in the thesis, defining the boundaries of a project to gain some conceptual understanding of what is happening can be fraught for stakeholders (Eoyang, 2012). Worse, there are likely tensions between stakeholders' attachment to a specific place and the broader national socio-political context when engaging in projects (Manzo and Perkins, 2016). Hence, defining system boundaries in case study research can go against understanding complicated stakeholder behaviour when engaging in projects (Capra, 2004; Fukuyama, 1995; Geels, 2004). For this reason, I had to have a balanced approach when understanding the system limits, such as the local and national legislative framework of Resolution 1407/2018, while looking for a flexible approach to acknowledging the relationships the research participants had with other stakeholders (Chen, Abramson, Becker, and Megdal, 2015; Growiec et al., 2018; Lin, 2001; Russo and Perrini, 2009) in Medellín, Colombia and other countries.

Examining the diversity of stakeholder attributes is seen as integral to understanding the motivations driving the stakeholders to engage in projects (Bilodeau et al., 2014; Muff, 2017; Rapp et al., 2017; Jerry J. Vaske and Donnelly, 1999). Goals are one of the critical

aspects of complex socio-technical systems, being seen as driving stakeholder interactions (C. W. Clegg, 2000; Emery and Trist, 1973; Jia et al., 2019; London, 2012; Wenger, 2000). When engaging and building trust in collaborative sustainability projects, unexpected situations can affect stakeholder behaviours and the performance of stakeholder relationships (S. Clegg et al., 2002; Liao et al., 2011; Morin, 1992a; Muff, 2017). It adds a level of unpredictability to the system and makes it difficult for stakeholders to make decisions in the pursuit of their goals or response to challenges (Ma'ayan, 2017). Unexpected situations, often referred to as emergences in complex systems theory, are defined as new attributes and behaviours at higher levels in a socio-technical system (Cotsaftis, 2006), such as changed compliance requirements for the reorganisation of the plastic packaging management system in Colombia after the introduction of Resolution 1407/2018, or in lower levels, such as changes in stakeholder circumstances or relationships (Chiappelli et al., 2015; Graafland, van de Ven, and Stoffele, 2003).

The emergent properties of systems stem from varied factors (Bijlsma, 2014), including people's hopes and fears in response to new opportunities to engage in projects (Teece, 2007), stakeholders' emotional responses being seen as grounded in their previous experiences (Echeverría, 2009; Muff, 2017; Sanz De Santamaría, 1998). Emergent events can also stem from the increasing risk of stakeholder tensions and conflicts arising during a project (Acemoglu and Wolitzky, 2014) due to the differences between the stakeholder cultures (Shams, 2019) and priorities (Lindenberg and Steg, 2007). Others argue that stakeholders still have the scope to learn and overcome emergent challenges, enabling them to innovate and identify new project opportunities (Baumeister, Bratslavsky, Finkenauer, and Vohs, 2001; Tandon, 2014; van der Bijl-Brouwer, 2018). In projects where stakeholders face asymmetrical challenges but are expected to collaborate, conflicts and tensions typically emerge from short-term events (Fukuyama, 1995; Heide and Miner, 1992; Teece, 2007) such as the need to secure the financial stability of the organisations. These tensions are seen to affect how individuals and organisations adapt to change (Acemoglu and Wolitzky, 2014; Beech, Burns, de Caestecker, MacIntosh, and MacLean, 2004), how information flows through stakeholder networks (Capra, 2004; Dodgson, 1993; Geels, 2004), engagement and trust-building being affected by tensions, uncertainty and subjective thinking among stakeholders (Eason, 2014; L. F. Martínez et al., 2019; Pedwell, 2017).

These arguments about how complex socio-technical systems operate alerted me to the importance of examining the priorities stakeholders assigned to social or technical challenges (Andriopoulos and Lewis, 2009; Ceschin, 2012), considering how these priorities related to stakeholder values (Goodwin, 2012; Jucevicius and Juceviciene, 2015; Lepsius, 2017; D. T. Wilson, 1995). Furthermore, a range of writers argue for the importance of evaluating the impact of the tensions between the stakeholders on their underlying systems of beliefs and values (Jucevicius and Juceviciene, 2015; van der Bijl-Brouwer, 2018; Vildåsen and Havenvid, 2018). To facilitate consensus-building in projects, an effective engagement process is considered to need the clear establishment of shared and transparent goals and expectations among individuals and organisations (Bush et al., 2018; Patel et al., 2012). Effective stakeholder engagement is also seen to need dedicated coordination efforts to help stakeholders identify and manage opportunities and risks (Arora, Bakshi, and Bhattacharjya, 2018; Bilodeau et al., 2014; Maríñez Sánchez, 2018). Hence, I focused data collection and analysis on how stakeholders dealt with conflicts and tensions while engaging and building trust in a shared sustainability initiative to comply with Resolution 1407/2018.

Inspecting stakeholder learning dynamics helps comprehend approaches to solving complex challenges

Dealing with conflicts and tensions while engaging and building trust in a shared initiative is difficult because stakeholders' differential motivations to engage are often not self-evident to other stakeholders (Parnell, 2012). It is argued that to effectively collaborate in projects, stakeholders first need to reach a consensus through discussion about critical aspects of engagement (Anastasi, 2018; Baden and Wilkinson, 2014; Capra, 2004; Kagawa, 2007; Maríñez Sánchez, 2018; Mathur et al., 2008). To achieve such consensus and provide a stable base for the development of stakeholder relationships, it is argued that stakeholders need to possess a well-defined framework delineating their objectives and the scope for their involvement in a project (Bilodeau et al., 2014; Blok et al., 2015; Lepsius, 2017; A. Smith, Stirling, and Berkhout, 2005). For stakeholders to develop shared solutions, it is also seen as helpful if stakeholders have some understanding of system-level drivers and barriers in sustainability projects (Kajzer Mitchell and Walinga, 2017; Martínez Sepúlveda et al., 2018; Maxton-Lee, 2018; Muff, 2017; Shams, 2019; Yukalang, Clarke, and Ross, 2018), although as already discussed, the complexity of socio-technical systems and the many levels on which they operate can make this difficult, if not impossible.

In front of the complexity the stakeholders face in tackling sustainability challenges, stakeholder collaboration is seen as critical to increasing the possibility for a system to continue to operate, such as the plastic packaging waste management system in Medellín. One essential aspect of promoting stakeholder collaboration is the institution of an integrated policymaking approach (Milios, 2018; United Nations, 2018) that accounts for the complexity of a system. I noted the importance of examining how the Colombian government approached the diversity and asymmetry in stakeholder needs (Planeación and Instituto Global de Crecimiento Verde, 2016) and the barriers to accessing reliable information due to corruption (Edelman, 2020). Stakeholders with leading roles in a system such as government institutions and large organisations are seen to have a responsibility to facilitate collaboration (Anastasi, 2018), including in helping others to understand system dynamics (Butterfoss, Goodman, and Wandersman, 1996; Christensen et al., 2014; Shams, 2019), and the terms of legislative compliance (Geels, 2010; Pedwell, 2017).

The role of government, in particular, should be to empower people and fill gaps in knowledge (Amran et al., 2013; Fritz and Silva, 2018), which requires them to invest effort in understanding the functioning of project ecosystems and their stakeholder networks (Robyn, 2004; Shi et al., 2021; Staicu and Pop, 2018). Understanding stakeholder behaviours and empowering them could help them interact more actively with governments and other leading stakeholders to solve sustainability challenges (Fogg, 2009; Geels, 2004; Martínez Sepúlveda et al., 2018; Pedwell, 2017). To do so, Governments need to help stakeholders feel confident about their participation to help change their habits (Geels, 2004). It confirmed the relevance of examining in this research how the government legislation played a critical role in empowering stakeholders and providing an environment of trust to improve their learning and engagement.

The need for the stakeholders to capitalise on the information exchange in their decision-making processes (Beer, 2017; Geels, 2010; Martínez Sepúlveda et al., 2018; Teece, 2007) alerted me to the relevance of looking for what the interviewees had to say about how they learned by capturing and processing information and what motivated them to share knowledge (Rashid and Mohammad, 2012). Learning processes are seen to be strengthened by fostering two-way communication between project stakeholders (Bortoleto and Hanaki, 2007; Nussbaum, 2011; Savaget et al., 2019; Verplanken and Wood, 2006), these being seen to build new capabilities to access required knowledge (Dodgson, 1993; Patel et al., 2012)

and act (Muff, 2017). Stakeholders' capacity to learn is seen to be closely related to their behaviour in projects (Anastasi, 2018; Burcea, 2015; Chaplin and Wyton, 2014; Checkel, 2005; Easman et al., 2018; Pedwell, 2017), informing their sense of purpose (van der Bijl-Brouwer, 2018) and values (Tang et al., 2019) while improving their self-confidence (Toner, Gan, and Leary, 2012).

How stakeholders learn and behave in projects is also seen to be influenced by the approaches to learning models. The rationalist model established by the West's Cartesian heritage argues for the possibility of describing the world objectively with activities based on the implicit rationality of the human mind (Capra, 2004). However, biases driven by stakeholder emotions and previous experiences are seen to be critical to comprehending stakeholder communications (Baden and Prasad, 2014; Bijlsma, 2014; Echeverría, 2009) and the complexity of building trust (Nooteboom and Six, 2003). To sustain systems over time, some authors emphasise the need to transcend rationality (Bijlsma, 2014; Holmberg and Samuelsson, 2006; Parnell, 2012), influencing me to focus on how the interviewees' emotions influenced their motivations and values.

To understand how the interviewees learned to navigate the plastic packaging business ecosystem in Medellín, I approached this from an integrated or a whole-person perspective (Bloom et al., 1956; Muff, 2017; Oberski, 2011). A whole-person learning approach is often recommended both at an individual and organisational level, in bringing the elements that define the human, such as feelings and intuition, to the learning and decision-making process (T. Jackson, 2016; Muff, 2017; Oberski, 2011; Sulkowski et al., 2017). In addition, an integrated approach to understanding learning adjusts for the character of the learning context, bearing in mind that cultural influences, as well as technical issues, influence how stakeholders behave in a socio-technical system (Ceschin, 2012; Frick, Kaiser, and Wilson, 2004; Martínez Sepúlveda et al., 2018). Depending on the character of the learning contexts and characteristics of the stakeholders in a project, the information stakeholders exchange can transform when moving from one individual or organisation to another (Escobar, 1999). This transformation of information is seen to affect the stakeholders' learning and their perceptions about their priorities, expectations and challenges when engaging with others (Geels, 2010; Kang, 2014; van der Bijl-Brouwer, 2018). Instead of my research focusing on standard solutions to sustainability challenges, I sought to reveal the richness of the interviewees' perceptions of their challenges and how they dealt with them. I paid

attention to the intersubjective processes of building knowledge in social networks where individuals share their perspectives (García Jaramillo et al., 2011; Meynell, 2016) and contrast their perceptions (Husserl, 2002; Illia et al., 2015) and build trust and consensus for making project decisions (Echeverría, 2009; Liebrucks, 2001).

As discussed in Chapter One, trust plays a vital role in helping stakeholders provide reliable information to each other (Jucevicius and Juceviciene, 2015), this improving stakeholder engagement (Bilodeau et al., 2014; Gutberlet, 2012; Muff, 2017). In socio-technical systems, information exchange takes place as learning feedback loops where stakeholders keep informing their decisions to meet their goals (Daniels and Walker, 1996; Vildåsen and Havenvid, 2018), adapt to emergent situations (Amran et al., 2013; Gadamer, 1997) and adjust their behaviours to new projects (Hunt, 2012; Lilley and Wilson, 2013; Russo and Perrini, 2009; Teece, 2007). Reliable information exchange is seen to be clear (Anastasi, 2018), consistent (Bostrom and Fischhoff, 2001), coordinated (Bortoleto and Hanaki, 2007) and adapted to the needs of the context and stakeholders (H. S. Brown and Cohen, 2019; Bush et al., 2018). To maintain a sense of the credibility of information, it is argued that information needs to be continually validated (Lepsius, 2017; Nisbet and Gick, 2008).

Trust is also elevated as a vital aspect of project activities in the literature on socio-technical systems. Where there is sufficient trust between stakeholders to facilitate their engagement, this is seen to typically be because of a voluntary sharing of information (Amir and Kant, 2018; Clark, 2016; Molleman and Broekhuis, 2001) or the establishment of clearly defined protocols for sharing information (Parnell, 2012). The level of trust in a project is similarly signalled by the sense of the validity of information (Martínez Sepúlveda et al., 2018; Smylie and Webb, 1993), the accessibility of information and the speed with which information is shared across a network of stakeholders (Nooteboom and Six, 2003), the quality of information sharing facilitating the ability of stakeholders have to learn (Appelbaum, 1997) and explore new ideas to solve challenges (Eason, 2014). Studies on socio-technical systems inspect how to solve challenges by examining interconnected social and technical solutions (C. W. Clegg, 2000; Molleman and Broekhuis, 2001; Savaget et al., 2019). Focusing on one aspect only, such as technical solutions, can increase the tensions and uncertainty in the behaviour of a system and the interactions between the stakeholders (Parnell, 2012; Walker et al., 2008).

Chapter summary

Chapter Two has explored the complexity and socio-technical systems thinking as a theoretical and philosophical lens for understanding the complexity of relationships between project stakeholders, technological systems and businesses and social ecosystems when they engage in sustainability projects. The chapter has argued that the combination of complexity and socio-technical systems theory provides a helpful framework for understanding stakeholder theory's multifaceted aspects in emphasising the influence of structural and relational situations over stakeholder behaviour. It has shown how socio-technical systems thinking situates the contingent tensions for stakeholders between macro system pressures, individual and collective stakeholder needs and goals, and contextual circumstances.

Chapter Three presents the rationale for the case-based approach and specific data collection and analysis methods used in the study. Chapter Two established that data analysis will focus on how the structure and dynamics of the plastic packaging waste management system in Medellín influenced system stakeholders to build trust and engage following the introduction of Resolution 1407/2018: Extended Producer Responsibility in Packaging with its emphasis on stakeholder collaboration as a key component of compliance.

CHAPTER THREE
RESEARCH DESIGN AND METHODS

Chapter Three sets out the case-based research design, describing and defending the methods for collecting and analysing the case data, their sequence and their combination in answering the research questions. Maloutas (2003) argues that in understanding the challenges in sustainability projects, the nature and range of challenges are highly context-dependent. The case underpinning the thesis is the plastic packaging waste management system in Medellín and the challenges stakeholders have faced following the implementation of Resolution 1407/2018, the Colombian government's 2018 legislation for the packaging industry, which extended producer responsibility for the life cycle of packaging. The research data comprises 27 interviewees representing the main stakeholder categories in Medellín's plastic packaging waste management system.

A rapid review of 151 pieces of Colombian government legislation passed between 1973 and 2020 also informed the analysis of the interview data, this including the specific policies for waste management and more general environmental protection policy where waste management was considered. I used a thematic analysis approach to process the empirical data and compare it to the objectives of government legislation and the literature review findings. Complexity theory and socio-technical systems theory assisted in focusing data collection and analysis on the effects of emergences and stakeholder attributes in influencing engagement and trust-building in the conduct of the case study.

Case selection

Before I enrolled in my PhD, I participated in a workshop in Colombia exploring environmental and social issues in waste management from the stakeholder perspective. The workshop, and two subsequent ones after I had begun my doctoral candidature, helped me develop an early understanding of the issues for stakeholders, informing my research design. The workshops also helped me think about collaboration scenarios (Eason, 2014) and gain the trust of some workshop participants, who later became research participants. The study is an example of experiential qualitative research (Braun and Clarke, 2013a), which has aimed to build a sense of community with research participants (McMillan and Chavis, 1986). In the data analysis process, I approached their experiences as authentic expressions of their values, needs and capabilities, as suggested by Cassell and Symon

(2004) and Martínez Sepúlveda et al. (2018). As a participant in the workshops, identifying the barriers to stakeholder engagement in sustainability projects became the motivation for my research. I saw that while the legislation compelled stakeholders to collaborate in projects, they could only genuinely do so by overcoming the significant differences in their values, needs and capabilities, these being exacerbated by many economic, political and social factors particular to Colombia and Medellín.

Resolution 1407/2018: Extended Producer Responsibility in Packaging, a central piece of recent legislation for the Colombian Ministry of Environment, requires stakeholders to implement packaging waste management plans supported by collaborative activities. For example, it requires that producers of packed products 'Support the [packaging/resins] manufacturer in innovation and eco-design for the manufacture of containers and packaging with sustainability characteristics.' It requires retailers to 'Support producers in the implementation of the environmental management plans for packaging and packaging waste of the producers as presented to the National Authority for Environmental Licences.' Resolution 1407/2018 presented immediate hurdles to stakeholder collaboration in terms of short-term implementation and profound challenges to the long-term sustainability of plastic packaging waste management. I selected the case for its relevance to understanding the role of stakeholder engagement and trust in a sustainability project, with the case contributing additional insights for being situated in a middle-income developing country with weak governance.

Colombia, particularly the city of Medellín, provided an ideal context for examining the interrelated issues of stakeholder engagement and trust in sustainability initiatives. Literature establishes that in Colombia, trust rarely extends beyond an individual's family and close friends (El Tiempo, 2019; Revista Arcadia et al., 2019). Yet Colombian people and organisations continue to enter business partnerships (Portafolio, 2021b; Semana, 2021). The case of the plastic packaging waste management system in Medellín is of independent interest, but it is used in the thesis as an instrumental case (Cassell and Symon, 2004; Stake, 2005). It exemplifies the challenges of stakeholder engagement and trust in implementing sustainability initiatives, especially where asymmetrical stakeholder conditions are an issue, as is the diversity of stakeholders.

Colombia's 2018 census showed that Medellín had 2,427,129 residents (Departamento Administrativo Nacional de Estadística, 2018), making it Colombia's second-largest city. People in Medellín have experienced the city's transition from a metropolis known internationally for the scourge of drug trafficking to becoming noted for innovation in 'Social, urban and economic transformation' and 4.0 technologies (Distrito de Innovación Medellín, 2020; Marulanda, 2019). Innovation is embedded in the City Development Plan for 2020-2023, being mentioned more than 400 times, with strategies for innovation in solid waste management being mentioned more than 200 times (Alcaldía de Medellín, 2020). The city has a dedicated plan for improving solid waste management, with a 'Research, Development and Innovation subcommittee' developing strategies for connecting stakeholders from the public and private sectors, academia and industry to waste management initiatives (Alcaldía de Medellín, 2019). The amount of waste recovered in Medellín increased substantially in 2020 and 2021 (Gaviria, 2021), although there was scope for further improvement (Zapata Quinchía, 2020). In looking to improve the waste management system, fostering collaboration and integration have been seen as critical (Orozco Duque, 2019), aligning with the expectations of Resolution 1407/2018: Extended Producer Responsibility in Packaging.

Socio-technical systems do not operate within well-defined limits but defining a system's boundaries is critical to understanding system dynamics and structure. Defining the boundaries of a case is also seen as integral to case study research, seeing me adopt (Appelbaum, 1997) argument that a socio-technical system is defined by technology, territory, or time. To determine the boundaries and scope of this case study, I limited my research to investigate the plastic packaging waste management system in Medellín after the introduction of Resolution 1407/2018 on 26 July 2018. However, as discussed in Chapter 2, I kept a flexible approach considering the interconnectedness of the research participants with stakeholders outside Medellín by acknowledging the stakeholder diversity elevating the need to examine how collaboration occurs (Innes and Booher, 1999; Lilley and Wilson, 2013) and the richness of their positions during the interviews (Braun and Clarke, 2013a). **Figure 6** illustrates the scope of the case study.

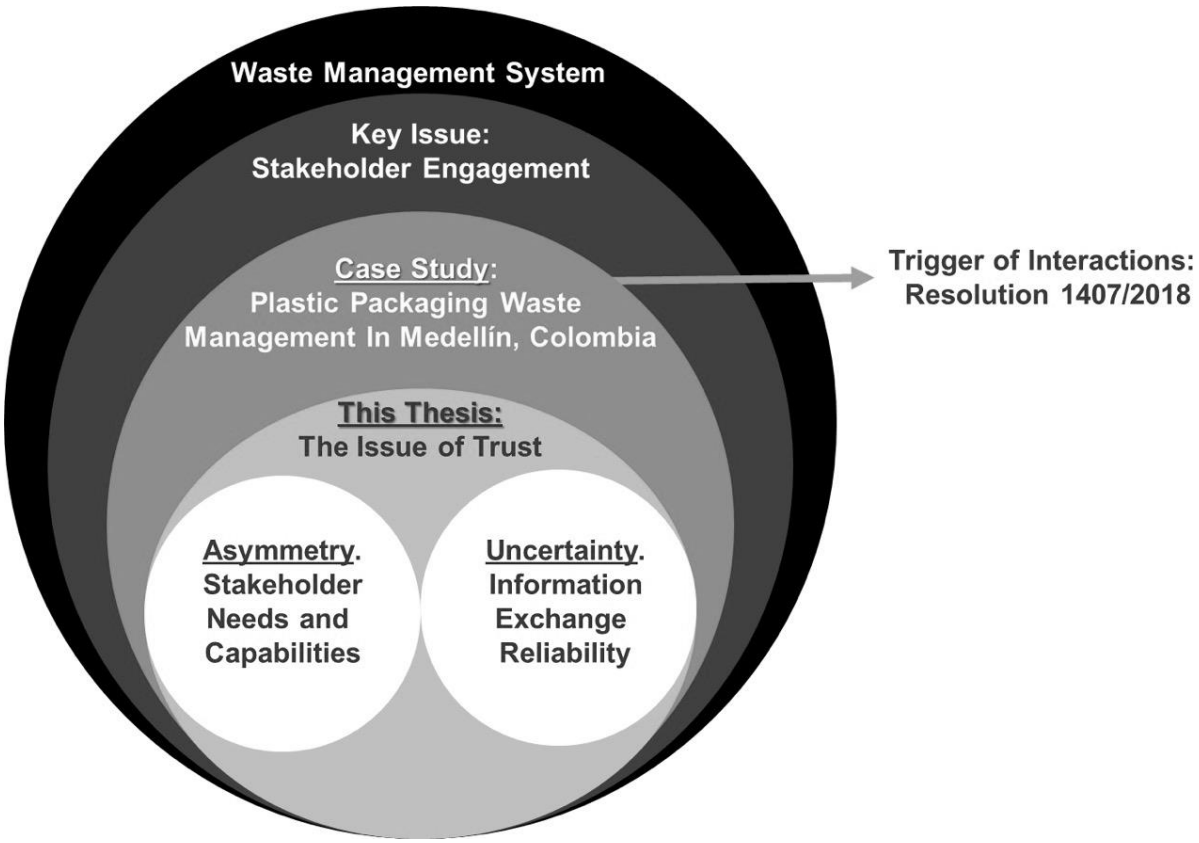


Figure 6. The scope of the case study

Many writers argue that stakeholder engagement and trust should be examined at the individual, organisational and contextual levels (Holmberg and Samuelsson, 2006; van der Bijl-Brouwer, 2018; Withisuphakorn, Batra, Parameswar, and Dhir, 2019). For example, Bal, Bryde, Fearon, and Ochieng's (2013) case study on the complexity of engaging stakeholders in the construction sector in the United Kingdom and Aparcana's (2017) case study on the formalisation of organisations of waste pickers in middle-income developing countries, including Colombia, provide instances examining stakeholder engagement and trust in the context of sustainability initiatives. Below, I summarise insights gained from the W2O workshops, which helped to inform case selection and research design.

W2O Workshop One – General challenges and opportunities in waste management

This workshop brought together stakeholders from the packaging industry and waste management sectors in Medellín to discuss challenges in managing waste in the city and propose ways to improve its efficiency. Participating in the workshop made me aware that some stakeholders experienced significant fear in working with others and deciding whether to become involved in new business ventures linked to the waste management

system in Medellín. The workshop participants' concerns strongly converged, a majority voicing concern about Colombia's weak governance when enforcing sustainability legislation and what the high level of corruption in Colombia meant for the success of sustainability efforts. These insights identified the role of trust in working with others on sustainability projects as a topic worthy of investigation. I also identified differences in the characteristics of stakeholders as they interacted with others as an additional factor, with Resolution 1407/2018 also emerging as a critical element in engagement in sustainability initiatives in Colombia. **Table 6** describes the main insights gained from my experience of participation in Workshop One.

Table 6. W2O Workshop One outcomes

Aspect	Comments
Date	26 June 2018
Main outcomes	1. Initial insights into the value of different types of stakeholders as a source of the complexity of working in sustainability projects. 2. The relevance of the diverse stakeholder characteristics and interactions concerning sustainability challenges and solutions. 3. Initial insights into the value of the plastic packaging waste management business ecosystem in Medellín as encapsulating the general challenges and solutions in sustainability initiatives. 4. Identification of Resolution 1407/2018 compliance requirements as a complicating factor in the stakeholder interaction.

Table 7 describes the background of the 47 participants in W2O Workshop One to illustrate the diversity of stakeholders linked to the plastic packaging waste management system.

Table 7. Workshop One participants

Background	Number
Cooperatives of waste pickers	9
Environmental consultants	2
Food and personal care manufacturers/brands	6
Manufacturers of flexible packaging	9
Manufacturers of plastic pigments	1
Manufacturer of polypropylene resin	1
Manufacturers of raincoats	2
Manufacturers of rigid plastic containers	3
National Plastic industry association	1

Not-for-profit public innovation organisation	1
Packaging recycling company	2
Plastic collector foundation	1
Plastic collector NGOs	2
Plastic recycling company	3
Recycling consultants	2
University lecturers	2

W2O Workshop Two: General challenges and opportunities linked to Resolution 1407/2018

Resolution 1407/2018 was central to this workshop, with participants discussing their interest in the opportunities offered and the challenges introduced by compliance requirements. These issues suggested that a deep dive was needed into the relationship of government legislation to the orientation and operation of solid waste management in Colombia, especially in relation to stakeholder engagement. During Workshop Two, I learned that unequal access to resources and limited capabilities for some categories of stakeholders were significant disincentives to participating in sustainability projects. Workshop Two also provided insights into the disruptive influence of corruption, particularly in the local context for many stakeholders, underscoring the value of case study research in understanding stakeholder decision-making processes around engagement in sustainability initiatives in light of trust issues. **Table 8** describes the main insights gained from my experience of participation in W2O Workshop Two.

Table 8. W2O Workshop Two outcomes

Aspect	Comments
Date	2 and 3 April 2019
Main outcomes	1. Initial insights into the challenges and opportunities in Resolution 1407/2018. 2. Initial insights into local challenges such as unequal access to resources and reliable information. 3. The relevance of a case study for examining stakeholder engagement in the plastic packaging business ecosystem in Medellín. 4. The relevance of reviewing Colombian solid waste management legislation concerning its role in stakeholder engagement and trust in waste management projects. 5. An initial sense of community with potential interview participants. 6. Initial insights into potential research opportunities for my PhD.

Despite the stakeholders' challenges, I noted that the workshop participants still discussed forming relationships with others if new business opportunities arose. Here, I recognised the value of examining the effects of the diversity of stakeholder characteristics and how these might influence their motivation to engage and build trust in sustainability initiatives. **Table 9** sets out the background of the 49 participants in W2O Workshop Two.

Table 9. W2O Workshop Two participants

Background	Number
City Government representative	1
Cooperatives of waste pickers	8
Environmental consultants	3
Food and personal care manufacturer/brands	6
Manufacturer of additives	1
Manufacturers of flexible packaging	10
Manufacturer of polypropylene resin	1
Manufacturers of rigid plastic containers	2
Not-for-profit public innovation organisation	1
Plastic collector foundation	1
Plastic industry association	1
Plastic recycling companies	8
Public utilities organisation	2
Recycling consultant	1
University lecturer	1
University students	2

W2O Workshop Three: Specific challenges and opportunities in Resolution 1407/2018

In this workshop, the participants were more specific in identifying challenges and strategies for compliance with Resolution 1407/2018. However, I noted little detail in the proposed solutions, with many participants doubting their ability to comply, mainly because they were unsure how much they could trust available information about the performance of the waste management system. Participant discussion in the workshop identified in increasing detail the complexity of the plastic packaging waste management system in Medellín, painting a picture of an intricate network of drivers and barriers to trust-building and engagement, confirming the potential value of a case study built on this

example in understanding stakeholders' propensity to engage and trust. **Table 10** describes the main insights gained from my experience of participation in W2O Workshop Three.

Table 10. W2O Workshop Three outcomes

Aspect	Comments
Date	22 November 2019
Main outcomes	1. The relevance of my research opportunity and the Plastic Packaging Waste Management case study in Medellín. 2. A more profound sense of community with potential interviewees.

W2O Workshop Three had fewer attendees due to a strike in Colombia, the rescheduled date of the event meaning that some original contributors could not attend. The range of participants was not representative of the different stakeholder categories in the plastic packaging waste management system in Medellín as in Workshop Two. However, as set out in **Table 11**, the 21 participants who attended exemplified much of this diversity.

Table 11. W2O Workshop Three participants

Background	Number
Cooperatives of waste pickers	4
Food manufacturers/brands	2
Manufacturers of flexible packaging	4
Manufacturers of raincoats	2
Manufacturer of rigid plastic containers	1
Manufacturer of woven polypropylene bags	1
PET bottle recyclers	2
Plastic recycling companies	4
Public utilities organisation	1

Case-based research design in socio-technical systems

After I participated in the W2O workshops, I recognised the need to have, as Runeson and Höst (2008) argue, a 'deeper understanding of the phenomena under study' (p. 132). Due to the seemingly paradoxical relationship between ongoing stakeholder interactions around new business opportunities despite the lack of trust in the business environment in Medellín, I looked to explore the underlying drivers and barriers motivating the research participants' interactions (Flyvbjerg, 2006), by inquiring into their actual experiences when collaborating in projects in this system (Klein and Myers, 1999). In seeking to understand

this seeming enigma, to comprehend the challenges the stakeholders faced and how they overcame them, I sought to collect information at the individual, organisational and system levels (Robson, 2002). As set out in **Figure 7**, this case study focused on two units of analysis: the network of interviewees as representative of the stakeholders in this case and the group of solid waste management legislation from the Colombian government.

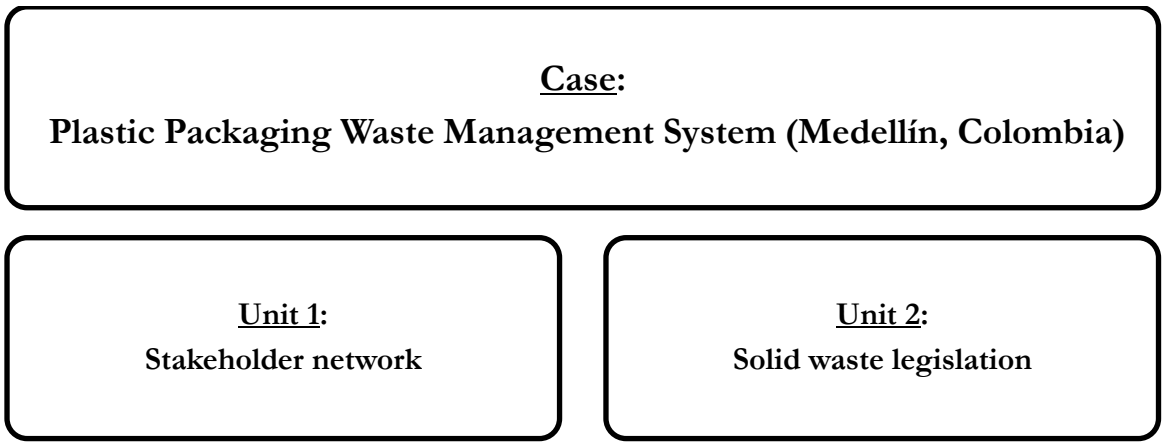


Figure 7. Units of analysis

The case study methodology allowed me to better examine the complexity of stakeholder collaboration (Crowe et al., 2011) in front of asymmetrical and trust-lacking scenarios in a specific context. Defining a case study helped explore and describe the structure and dynamics of the studied system (Yin, 2014). An approach from a case study methodology contributed to interpreting the richness of the interviewees' positions concerning their approach to collaborating on sustainability projects in a specific context (Stake, 1995) while deductively field-testing theories about stakeholder engagement and trust-building (Yin, 2014). This research focused on the diversity of the interviewees' positions about their challenges and strategies to overcome them when required to collaborate, as in complying with Resolution 1407/2018. A case study methodology also helped me develop a 'thick description' (Geertz, 1973) of the complexity of the stakeholders' behaviours when engaging and building trust in sustainability projects to better understand their underlying motivations. As has been illustrated in this chapter, specific contextual factors, such as the issuing of a new sustainability norm, a particular social and political context, context-dependent sustainability challenges and specific local problems the stakeholders faced, made it relevant to focus the research on a particular case study.

Case study research is also of interest to researchers in the field of socio-technical systems and sustainability projects, with some authors referring to 'socio-technical case studies' as their methodological approach to their studies (Lowe, Chiu, and Oreszczyn, 2018; Raisinghani and Rahman, 2005; Simpson, 2017). For example, Espegren, Damman, Pisciella, Graabak, and Tomasgard (2021) examine the drivers and barriers to the socio-technical transition to the adoption of hydrogen as a significant energy source in Norway, analysing tensions between the protection of nature and the need to maintain or increase economic growth. Similarly, Simpson (2017) studies a case study of the challenges in the socio-technical transition to a decentralised energy generation network. In the field of sustainable design, Lowe et al. (2018) find a socio-technical case study helpful to better comprehend the complex dynamics between buildings and their inhabitants as input to improve the evaluation of buildings' sustainability. Case studies have also helped design experiments in sustainable design from a socio-technical perspective in innovation processes (Ceschin, 2014, 2015).

Generally, authors using case studies to examine sustainability-related objects of study from a socio-technical system approach find case studies helpful in getting insights into the specific characteristics of the stakeholders operating in a particular context. It also contributes to a better understanding of their challenges to transition to a more sustainable status and the opportunities the stakeholders must overcome those challenges. The socio-technical case studies tend to follow a standard approach to designing and conducting case studies in terms of defining and selecting a case, collecting, analysing, interpreting and reporting the outcomes (Crowe et al., 2011). Following the example of Lorenzetto's (2019) thesis, I provide the case study design summary in **Table 12**.

Table 12. Summary of the case study research design

Case study type	**Intrinsic case study used as Instrumental case study**		
The case study	The role of trust in maximising stakeholder engagement in a plastic packaging waste management system in Medellín, Colombia, to comply with Resolution 1407/2018 where collaboration was expected.		
Units of analysis	Challenges in engaging and building trust in projects	Strategies to overcome the challenges in engaging and building trust in projects	Government's efforts to foster trust-building and stakeholder engagement

Recruitment	Representatives of all the stakeholders involved in the plastic packaging business ecosystem from the W2O workshops	N/A
Sampling	Convenience sampling. 27 interviewees from 19 organisations	151 legislation documents
Data sources	Interviews	Rapid review
Data collection method	Semi-structured interviews	
Data management	Excel, Kumu and NVivo	Excel
Data analysis	Deductive thematic analysis	

Scope of data collection

The case draws on two bodies of data: solid waste management legislation from Colombia and the outcome of 27 interviews with research participants linked to the plastic packaging business ecosystem in Medellín. Examining a case at different system levels has been applied in studies on stakeholder engagement, such as those of Buades Fuster et al. (2013) and Glackin and Dionisio (2016). The interview data represents information collected at the individual and organisational levels. In reviewing solid waste management legislation from Colombia as a framework for examining the interaction between stakeholders, I sought insights at the contextual level as an expression of the system level (Trist, 1977). **Table 13** sets out the nature of the data sources and their purpose in the research design.

Table 13. Data sources used in my research

	Rapid Legislation Review	**Interviews**
Data Source	151 documents from 1973 to 2020	27 interviews
Purpose	Examine how legislation addresses stakeholder engagement and trust-building in sustainability initiatives to understand the framework of the role of the government in fostering collaboration.	1. Develop a deeper understanding of drivers of engagement and trust-building in complex sustainability initiatives. 2. Establish stakeholder behaviour patterns concerning their motivation to engage in sustainability projects.

Waste management legislation rapid review

I undertook a rapid legislation review (Efron and Ravid, 2018) to understand the context of interviewees' responses concerning their engagement in sustainability projects. In complex socio-technical systems, legislation is one of the contextual factors determining

the parameters within which stakeholders interact (Emery and Trist, 1973). Understanding the legislative landscape is seen to help explain stakeholder behaviours in projects, such as in adapting to system change since legislation is prone to intermittent change, ushering in contextual changes that are sometimes substantial (Anastasi, 2018; Fukuyama, 1995; Pedwell, 2017; A. Smith et al., 2005), or as in implementing learning strategies based on individual and organisational capabilities (Bowles et al., 2015) without necessarily depending on governments (Bijlsma, 2014; Fukuyama, 1995). Tencati et al.'s (2016) study on packaging waste legislation shows that reviewing legislation can shed light on stakeholder attitudes to sustainability challenges. Anastasi (2018) shows that compliance can substantially influence stakeholders' access to resources.

The rapid review of legislation identified 151 relevant policy items. Colombia's Ministry of Environment and Sustainable Development issued Resolution 1407/2018, but the legislation around environmental protection can be traced back to 1993 when the Colombian government created the first Ministry of Environment. The earliest piece of legislation reviewed was Law 23/1973, it being one of the first instances of a Colombian Government establishing a broad norm for environmental protection. The scope of the review extended to 2020 when Resolution 1407/2018 was updated by Resolution 1342/2020. To establish the set of documents for review, I searched the available legislation on the Internet, including repealed norms. If a norm specifically addressed waste management and referred to other norms, I included those new norms. If the norm did not explicitly address waste management, I focused the analysis on the specific aspects of waste management but did not extend this to new norms. I excluded legislation linked explicitly to construction and demolition, electric and electronic, and hazardous and organic waste because each category has a specific legislative framework in Colombia. I also omitted 'Circulars' that disseminated information on specific technical requirements from the review on the basis that they had limited relevance to the orientation of my research. **Table 14** sets out the different types of legislation considered in the rapid review. **Table 15** provides the complete list of legislation documents reviewed

Table 14. Types of legislation of the rapid review

Type	Number
Agreements	10
CONPES (National Council for Economic and Social Policy, in English)	4

Decrees	73
Decree/Law	1
Directives	1
Law	24
National Constitution	1
Policies	2
Resolutions	35

Table 15. Legislation documents (as named in Spanish)

#	Document	#	Document	#	Document
1	Ley 23/ 1973	**52**	Decreto 4317 / 2004	**102**	Resolución 1529 / 2010
2	Decreto Ley 2811/ 1974	**53**	Decreto 1200 / 2004	**103**	Política Nacional de Producción y Consumo Sostenible
3	Ley 9 / 1979	**54**	Decreto 190 / 2004	**104**	Decreto 587 / 2010
4	Decreto 2104 / 1983	**55**	Decreto Distrital 400/2004 (Bogotá)	**105**	Decreto 456 / 2010 (Bogotá)
5	Decreto 1601 / 1984	**56**	Resolución 477 / 2004	**106**	Ley 1450 / 2011
6	Constitución Nacional de Colombia 1991	**57**	Decreto 1220 / 2005	**107**	Decreto 575 / 2011 (Bogotá)
7	Decreto 1842 / 1991	**58**	Decreto 2078 / 2005 (Medellín)	**108**	Decreto 675 / 2011 (Bogotá)
8	Ley 99 / 1993	**59**	Decreto 707 / 2005	**109**	Resolución CRA 541 / 2011
9	Ley 60 / 1993	**60**	Decreto 2762 / 2005	**110**	Decreto 3565 / 2011
10	Conpes 2750 / 1994	**61**	Decreto 838 / 2005	**111**	Ley 1454 / 2011
11	Decreto 1600 / 1994	**62**	Resolución 1390 / 2005	**112**	Resolución 6981 / 2011 SDM/SDA
12	Decreto 966 / 1994	**63**	Resolución 351 / 2005	**113**	Decreto 141 / 2011
13	Decreto 1524 / 1994	**64**	Resolución 352 / 2005	**114**	Ley 1549 / 2012
14	Decreto 1753 / 1994	**65**	Directiva 9 / 2006 (Bogotá)	**115**	Decreto 82 / 2012 (Bogotá)
15	Ley 142 / 1994	**66**	Acuerdo Metropolitano 4/ 2006 (Itagüí)	**116**	Decreto 178 / 2012
16	Decreto 548 / 1995	**67**	Acuerdo Municipal 46 / 2006 (Medellín)	**117**	Resolución 65 / 2012 UESP
17	Decreto 605 / 1996	**68**	Decreto 312 / 2006 (Bogotá)	**118**	Decreto 082 RD 4847/2012 (Bogotá)
18	Ley 286 / 1996	**69**	Resolución CRA 405 / 2006	**119**	Decreto 2981 / 2013

19	Ley 388 / 1997	**70**	Resolución Metropolitana 879 / 2007 (Itagüí)	**120**	Decreto 412 / 2013 (Bogotá)
20	Resolución 940/1997 (Bogotá)	**71**	Acuerdo Distrital 287 / 2007 (Bogotá)	**121**	Decreto 920 / 2013
21	Ley 491 / 1999	**72**	Ley 1151 / 2007	**122**	Decreto 113 / 2013 (Bogotá)
22	Ley 511 / 1999	**73**	Acuerdo Metropolitano 30 / 2007	**123**	Ley 1715 / 2014
23	Decreto 1124 / 1999	**74**	Decreto 409 / 2007 (Medellín)	**124**	Decreto 2041 / 2014
24	Ley 632 / 2000	**75**	Decreto 545 / 2007 (Bogotá)	**125**	Resolución 754 / 2014
25	Resolución 1096 / 2000	**76**	Decreto 617 / 2007 (Bogotá)	**126**	Decreto 1074 / 2015
26	Resolución 133 / 2000	**77**	Ley 1176 / 2007	**127**	Decreto 1077 / 2015
27	Resolución 120 / 2000	**78**	Resolución 0964 / 2007	**128**	Ley 1753 / 2015
28	Decreto 2695 / 2000	**79**	Decreto 330 / 2007	**129**	Decreto Nacional 1736 / 2015
29	Ley 715 / 2001	**80**	Decreto 620 / 2007 (Bogotá)	**130**	Decreto 469 / 2015 (Bogotá)
30	Acuerdo 23 / 2001 (Medellín)	**81**	Resolución 429 / 2007	**131**	Resolución 720 / 2015
31	Ley 689 / 2001	**82**	Acuerdo Distrital 344 / 2008 (Bogotá)	**132**	Conpes 3874 / 2016
32	Resolución 151 / 2001	**83**	Ley 1259 / 2008	**133**	Decreto 596 / 2016
33	Decreto 005/2003 (Medellín)	**84**	Resolución 1684 / 2008	**134**	Resolución 668 / 2016
34	Decreto 1713 / 2002	**85**	Conpes 3530 / 2008	**135**	Resolución 0276 / 2016
35	Decreto 289/2002 (Medellín)	**86**	Decreto 818 / 2008 (Medellín)	**136**	Decreto 1784 / 2017
36	Acuerdo Distrital 61 / 2002 (Bogotá)	**87**	Decreto 3200 / 2008	**137**	Decreto 130 / 2018 (Bogotá)
37	Política Nacional de Educación Ambiental	**88**	Decreto 2778 / 2008	**138**	Conpes 3918 / 2018
38	Decreto 1728 / 2002	**89**	Ley 1263 / 2008	**139**	Resolución 1407 / 2018
39	Decreto 891 / 2002	**90**	Decreto 175 / 2009	**140**	Ley 1938 / 2018
40	Decreto 1604 / 2002	**91**	Decreto 440 / 2009 (Medellín)	**141**	Decreto 2412 / 2018
41	Decreto 514 / 2003 (Medellín)	**92**	Decreto 2600 / 2009	**142**	Acuerdo Metropolitano 23 / 2018 (Valle de Aburrá)
42	Acuerdo 114 / 2003 (Bogotá)	**93**	Resolución 1822 / 2009	**143**	Resolución 1397 / 2018

43	Decreto 1180 / 2003	**94**	Decreto 2350 / 2009	**144**	Resolución CRA 853 / 2018
44	Decreto 061 / 2003 (Bogotá)	**95**	Ley 1333 / 2009	**145**	Decreto 285 / 2019 (Bogotá)
45	Decreto 1505 / 2003	**96**	Resolución 1117 / 2010 (Bogotá)	**146**	Acuerdo Metropolitano 23 / 2019 (Valle de Aburrá)
46	Decreto 1140 / 2003	**97**	Resolución 726 / 2010	**147**	Resolución 1558 / 2019
47	Resolución 1045 / 2003	**98**	Decreto 261 / 2010 (Bogotá)	**148**	Ley 1977 / 2019
48	Decreto 216 / 2003	**99**	Decreto 2820 / 2010	**149**	Resolución 2184 / 2019
49	Resolución CRA 271/2003	**100**	Decreto 1666 / 2010	**150**	Resolución 938 / 2019
50	Decreto 1669 / 2003	**101**	Decreto 446 / 2010 (Bogotá)	**151**	Resolución 1342 / 2020
51	Resolución 0643 / 2004				

Semi-structured interviews

My participation in the W2O workshops provided valuable insights into the structure and dynamics of the plastic packaging waste management system in Medellín. Still, that insight was anecdotal in not involving systematic data collection and analysis. I recognised that determining the barriers or drivers of stakeholder engagement in sustainability projects required focused research because the social pressures at play in the context of workshop-based participatory activities can influence participants' words and behaviour (Betancur, 1939; Borgatti, 2018). Sustainability issues have become highly politicised in recent years, there being scope for workshop participants to fear being judged when expressing their true thoughts in the presence of others. Hence, I decided to use a semi-structured interview to elicit genuine experiences and opinions from the research participants on stakeholder engagement and trust in the plastic packaging business ecosystem in Medellín.

In conducting the interviews, I sought more profound, less mediated insights into the nature of stakeholder involvement in Medellín's waste management system. I was interested in how the open attitude of the interviewees to dialogue and know others influenced their awareness of the attributes of the system and its components (Barabási, 2003; Borgatti, 2018; Ma'ayan, 2017) and the diverse solutions to sustainability challenges (Dent, Higgins, and Wharff, 2005; Gentry, Weber, and Sadri, 2016; Kajzer Mitchell and Walinga, 2017; Muff, 2017). It is essential, however, to note that an interview is still a socially mediated situation in which an interviewee will not necessarily reveal what they think (Yin, 2010).

Structured interviews collect the most readily comparable responses while having minimal interference in the production of participants' responses but limit the possibility that novel insights can arise during the interview process through dialogue between the interviewee and the researcher. To elicit authentic insights, I carefully balanced my interests in the interview outcomes with what the interviewees wanted to say (Merriam and Tisdell, 2015; Stake, 1995).

In March 2020, I sent invitations to 101 people I had met through the W2O workshops. In participating in the three W2O workshops before conducting the interviews, I established a rapport with potential interviewees (Ezeah et al., 2013) to improve their engagement in my project (Buysse and Verbeke, 2003; Glenorchy City Council, 2017; Manzo and Perkins, 2016; Rowlinson and Cheung, 2008; Zollo and Winter, 2002), their agreement to be interviewed reflecting a level of trust in me as a researcher (Darlington and Scott, 2002). The possibility of early building a sense of community with the research participants allowed me to disclose my research intentions before conducting the interviews (Runeson and Höst, 2008). Those who agreed to make themselves available were filtered to ensure that the sample included at least one interviewee to represent each type of stakeholder in the plastic packaging waste management system in Medellín. This process produced a participant sample of 27 interviewees from 19 organisations as set out in **Table 16**.

Table 16. Interviewees background

#	Stakeholder type	Background	Role and gender	From	Age
1	City Government	Sanitary Engineer, specialisation in cleaner production, master's in engineering	Leader of solid waste. Female.	Medellín	40
2	City Government	Environmental engineer, specialisation in project management and environmental management	Head of education and good environmental practices. Female.	Antioquia	41
3	Food Manufacturer/Brand	Mechanical engineer, master in technological management, specialisation in technology and science of food.	Coordinator of Product Development. Female.	Medellín	35
4	Food Manufacturer/Brand	Agronomist engineer, PhD in biological sciences	Chief of sustainability Female.	Bogotá	51

5	National Government	International business, environmental management	Businesswoman. Female.	Netherlands	40
6	Organisation of waste pickers	Environmental Engineer, specialisation in project formulation	Coordinator. Female.	Medellín	39
7	Organisation of waste pickers	Business administration	Co-founder and manager. Female.	Caldas	58
8	Organisation of waste pickers	Technical studies in natural resources. Philosophy and Letters.	Director. Male.	Yarumal	41
9	Plastic Industry Association	Economist, master in econometry	Executive president. Male.	Medellín	38
10	Plastic Industry Association	Lawyer and master's in international relationships	Executive director. Male.	Medellín	52
11	Plastic Packaging Manufacturer	Environmental Management	Head of environmental management. Male.	Northern coast of Colombia	38
12	Plastic Packaging Manufacturer	Chemical engineer	Head of technical support. Male.	Medellín	39
13	Plastic Packaging Manufacturer	Business administration	Commercial and finances. Male.	Medellín	45
14	Plastic Packaging Manufacturer	Business administration, specialisation in marketing	Manager. Male.	Medellín	34
15	Plastic Products Manufacturer	Environmental Engineer, specialisation in administrative and process management of transformation of plastic and rubber	Coordinator of research and development. Female.	Medellín	31
16	Plastic Waste Processor	Technical studies: microwave and infrared	Leader. Male.	Antioquia	57
17	Plastic Waste Processor	Business administration and international businesses	Leader of R&D. Male.	Medellín	42
18	Public utilities organisation	Environmental Engineer, specialisation in integrated project management	Professional in waste business project operations. Male.	Medellín	38
19	Public utilities organisation	Environmental engineer, specialisation in project management	Technician in solid waste management. Female.	Medellín	35
20	Public utilities organisation	Civil engineering, specialisation in projects and finances, master's in business administration	Professional in management, development and	Bogotá	38

			innovation. Head of solid waste. Female.		
21	Plastic Resin Manufacturer	Political sciences	President. Male.	Medellín	43
22	Sustainability Consultancy	Chemical engineer, specialisation in environmental management	Co-founder, Head of research and development. Female.	Medellín	31
23	Sustainability Consultancy	Technical studies in costs and audits, public accountant, specialisation in finances.	Chief of operations in circular economy. Male.	Medellín	29
24	Sustainability Consultancy	Environmental engineer, specialisation in top management and environmental businesses	Varied roles. Male.	Medellín	41
25	University lecturer	Technical studies in architecture and engineering, graduate in plastic arts and marketing management, master's in design management and regional projects management	Researcher and lecturer. Female.	Medellín	57
26	Waste Processor	Technical studies in environment and organisation management	Legal representative. Female.	Antioquia	50
27	Waste Processor	Technical studies in customer service and environmental control	Promoter and environmental technic. Female.	Antioquia	41

Due to the COVID-19 pandemic, I mainly conducted synchronic virtual interviews, with three interviewees sending their responses by email due to limited availability. Some participants representing the same organisation asked to be interviewed together. During such interviews, I asked the same questions to both interviewees. Before each interview, I sent consent instruments via email to prospective interviewees and asked them if they had any additional questions. At the start of each interview, I reconfirmed the interviewees' consent to participate. I started the conversation by recording the consent and the interview in separate audio files to protect the interviewees' privacy. I conducted the interviews between March 2020 and late May 2020, lasting between 45 and 60 minutes each.

The interview questions sought to understand each interviewee's perceptions of the role of sustainability in their lives, the challenges in the plastic packaging waste management system in Medellín from both an individual and organisational perspective, and their

engagement and level of trust in others. **Table 17** sets out the prompt questions as approved by Swinburne's Research Ethics Committee. My perception that I had already built trust with the interviewees allowed me to ask difficult questions (Brennen, 2012). For example, in the interview guide, I included questions about individuals with whom the interviewees felt they had a good or bad relationship. When I asked difficult questions, I reminded the interviewees that they had the freedom to choose whether to respond or not and whether to respond by mentioning the name of an individual or organisation.

Table 17. Interview prompt questions

#	Question
1	What are your main concerns right now about your business? About the new regulations? How would you say these concerns affect your personal life?
2	With whom you have better relationships in your business? Why? And what about bad relationships? Why?
3	Which would be your key and most important stakeholders within your value chain? Why? The least important ones? Why?
4	Regarding the environment protection, do you believe in its importance? Really? Why?
5	What do you like the most about the way waste is managed in your industry? Why? What do you like the least?
6	Why is the waste management system not better now, in your opinion?
7	In your opinion, what should be done now to improve waste management across all your value chain? Which are the key stakeholders that should be more responsible in the solutions? Why?
8	Please tell me what has your organisation done for improving the waste management system?

The prompt questions were in place very early in the research on the ethics application, as illustrated in **Appendix 1** of this thesis. Back then, I focused the research on better comprehending the stakeholder engagement dynamics in a sustainability initiative where collaboration was expected to comply with government legislation, as in the case of Resolution 1407/2018. As explained in this chapter in the section *Case selection*, trust was revealed as a critical issue to better examine the dynamics of collaboration between project stakeholders later in my research. After my self-reported experience (Braun and Clarke, 2013b) in three workshops, I could confirm my research's relevance and focus the research activities on the issue of engagement and trust. From the beginning, although I had insights about the challenges in building trust in Colombia and the benefits of having trust-based relationships in projects, I did not encourage looking for trust as an issue to be investigated from the beginning.

My former supervisory team suggested formulating broad, prompt interview questions to guide the interviews. Based on the prompt questions, we discussed more precisely a list of potential interview questions addressing the trust issue. Yet, we agreed to keep the interview guide as flexible as possible since the semi-structured interview was the primary method to collect data from the research participants. The flexible interview guide had two revisions from my former supervisors, both in English and Spanish. Below, I provide examples of more specific interview questions from the interview guide and how they related to the prompt interview questions:

1. *Tell me your idea of what trust means*: this question is derived from the interview prompt question #4, where I inquired about what the interviewees thought about a concept. I asked them about sustainability and trust.
2. *In your context, which is the key people/organisations that you trust the most? Why?*: This question is derived from the interview prompt question #2 and #3, where I asked about their relationships with other stakeholders, with a focus on trust, and their roles in the plastic packaging waste management system in Medellín.
3. *Which of all the stakeholders in the system of the plastic packaging industry do you trust the least? Why?*: same as the above, with a focus on distrust.
4. *What would it need to happen so that you would feel more willing to work together with other organisations/people in your system?*: This question is derived from the interview prompt question #5, #6 and #7. Here I inquired about the current state of the plastic packaging waste management system and the potential strategies the interviewees identified could improve it.

Data quality assurance

Several writers caution researchers to recognise the potential assumptions their previous experience can bring to their work, encouraging them to continually reflect on the possible intrusion of confirmation bias (Braun and Clarke, 2013b; Chaplin and Wyton, 2014; Meynell, 2016). I bring five potential biases to this study, describing below how I sought to exclude these from the research process. First, I have worked in private organisations where profit was the primary driver for engaging in projects. In looking for a holistic range of motivations to engage in sustainability projects, I sought insights from across the spectrum of possible stakeholders in the case study. Second, before embarking on this research, I lived in Colombia for most of my life, this helping me understand the culture and social positioning of the stakeholders. To avoid perception bias because of this, I searched for

literature on cases in countries on all five continents and discussed waste management cases in different countries with peers. Third, most of my experience has been in sustainability-related challenges, focusing on waste management and stakeholder engagement. The challenge of engaging stakeholders in projects is not exclusive to waste management initiatives. Hence, I reviewed literature about stakeholder engagement in other contexts such as sustainability projects related to climate change, health and well-being, and written from the perspective of various fields of knowledge.

Fourth, although I have had experience in operational positions, most of this is in the context of managerial positions. In my research, I collected data from people with jobs at different organisational levels, collecting data from people across a range of operational, middle-management and executive roles providing a broad perspective of the drivers and barriers to engagement and trust. Fifth, Catholicism and inter-religious dialogue influenced my motivation to work on this research, Gifford (2014) recognising the debate around religious perspectives driving sustainable behaviours. The following passage from the Bible inspired my interest in trust-building dynamics: 'If you are faithful in little things, you will be faithful in large ones. But if you are dishonest in little things, you will not be honest with greater responsibilities' (Luke 16:10, *New Living Translation*). My spiritual life moved me to examine the stakeholders' purpose in life as a driver of stakeholder engagement. To avoid my bias here, I reviewed literature about trust-building and stakeholder engagement from different authors, including but not limited to those examining the spiritual domain as a driver for interactions between individuals and organisations in sustainability projects.

Given the relationship between my research and the W2O initiative, I also bring the following three potential biases to my research. I describe below how I managed them to avoid their negative impact on the quality of this research. Before delving into these biases, I note that very early in my research, I formulated two hypotheses to anticipate potential assumptions in the rationale of the need for my study and manage them before continuing with my research activities. The first hypothesis concerned the influence of the stakeholders' needs satisfaction on their engagement: even if a stakeholder is aware of the relevance of engaging, they would be less motivated to build trust and engage if they are struggling to satisfy their needs. The second hypothesis was about access to information: even if a stakeholder is motivated to build trust and engage, a trust-lacking environment

and other system problems could prevent stakeholders from trusting and engaging. The six potential biases and the strategies to avoid their influence in my research are:

1. *Stakeholder engagement is a critical challenge for the success of sustainability projects*. To tackle this potential bias, I contrasted my experience during the workshops with my previous professional experience in sustainability projects and the initial literature I reviewed. I also participated in the three W2O workshops to validate the consistency of what the workshop participants expressed concerning their challenges when collaborating on sustainability initiatives. I kept searching and reviewing literature about stakeholder engagement in different domains of sustainability, not limited to waste management projects only.
2. *Social inequality is a barrier to better stakeholder engagement in sustainability initiatives*. This claim became the first hypothesis of my research. To avoid being biased by my previous experience and what the workshop participants expressed, I searched for literature about the barriers stakeholders found when engaging in sustainability initiatives in different countries and different sustainability areas. I also searched for literature and technical reports about the central problems Colombia faced in its development. During the interviews, I kept the interview questions as open as possible concerning the stakeholders' needs and capabilities to avoid biasing the interviewees' answers. Although I confirmed that social inequality was a barrier to better stakeholder engagement in sustainability initiatives, I did not know how it affected the engagement dynamics, hence the relevance of the first research question about needs and capabilities.
3. *Having problems when accessing reliable information could jeopardise stakeholder engagement in sustainability initiatives*. This statement became the second hypothesis of my research. I managed this potential bias like the previous point about social inequality. In my experience during the workshops, the main issue around access to reliable information was related to corruption and secrecy. However, I kept the interview questions as open as possible concerning the barriers to access to information. Although I confirmed that accessing reliable information was critical to better understanding the stakeholder engagement dynamics in sustainability initiatives, I did not know how it affected the stakeholders' relationships, hence the relevance of the second research question about needs and capabilities.

I relied on three techniques to ensure the validity of my research and manage the influence of potential biases (Runeson and Höst, 2008). As Braun and Clarke (2013b, p. 350) argue, in qualitative studies, 'ecological validity is about whether research captures meaning in a way closely related to real-life situations', it being vital to ensure case study research is aligned with real-world conditions. I reached data saturation by interviewing 27 individuals from varied types of stakeholders and reviewing 151 legislation documents (Eisenhardt, 1989). I compared data looking for similarities and dissimilarities (Ezzy, 2003; Yin, 2010) by contrasting what the interviewees said during the interviews with the main concepts in the reviewed legislation. I ensured the reliability of research outcomes by implementing a robust and well-defined process to collect and analyse data, as explained in this chapter.

I did not pursue data source triangulation, Yin (2010) arguing that triangulation can be less critical when data is collected directly, as in the case of the interviews and legislation. Although I did not collect or analyse any research data from the W2O workshops for the thesis, Braun and Clarke (2013b) argue that self-reported experiential data validates individual experiences in each context. The experiential component of my research allowed me to identify and validate the different perspectives and experiences of the stakeholders. Following Mathison (1988), I did not expect to arrive at a standard way of understanding what drove stakeholders to engage when the motivation to trust was low and the distribution of power and resources unequal. Instead, I explored what Stake (1995) describes as a systematic analysis of multiple views of the case as provided by the different research participants.

Ethical approval

The data gathering for the study was considered low-risk and required ethical approval only from the Swinburne University of Technology Human Research Ethics Committee. It also needed to comply with Colombian legislation for managing personal data (Congreso de la República de Colombia, 2008, 2012b). Evidence of approval from the Swinburne University of Technology to begin data collection is provided in **Appendix 1** of the thesis. I used consent information statements and consent forms to secure participant consent. All interviewees and their comments are de-identified in the thesis. Efforts to nurture the relationships and build trust with stakeholders to foster engagement were critical to the research (Buades Fuster et al., 2013; Kruijsen et al., 2013; Manzo and Perkins, 2016), involving early and ongoing activities to share reflections derived from my research with

stakeholders in the form of reports, informal conversation and 28 public presentations at academic, industrial and civil-society events during my candidature.

To build more profound relationships with the stakeholders before collecting data with the interviews, I carried out different activities to build trust. Below, I briefly describe the strategies I used to build trust with my research participants and what signs suggested I could keep building trust with them before doing the interviews. As part of my self-reported experience before the interviews, I:

1. *Participated in one workshop before enrolling in my PhD*. Here I could get to know the stakeholders as a workshop participant myself and let them know there was a chance for me to enrol in a PhD position to do research. My former co-supervisor introduced me to the stakeholders and I was able to hold dialogues with many of the workshop participants. I could share lunch with some workshop participants and talk about themes unrelated to the workshop, like my experience in Medellín. Here, I perceived a level of trust enough to hold dialogues around the workshop activities. The workshop activities developed as planned.
2. *Participated in two additional W2O workshops*. I had a different role in these two workshops because I was now part of the W2O initiative team and acted as a workshop facilitator. Many organisations from the first workshop attended the second and third workshops. It allowed me to keep building a relationship with the stakeholders. I had the chance to do a small presentation to the workshop's participants, where they could see me talking about themes of my expertise. I could also share lunch and other break times. During the workshops, the participants knew I would invite them to be interviewed later. The workshop activities developed as designed, even after a national strike that occurred by the time the third workshop took place. Despite the problems, the W2O team and I were able to deliver as expected, which improved our trustworthiness.
3. *Visited stakeholders*. Before my enrolment in the PhD, the W2O team did a study tour to see different stakeholders. After my enrolment, we did another couple of visits to stakeholders. The visits helped increase the W2O's trustworthiness, which I later became part of. It facilitated me to keep having conversations with the stakeholders to better know each other. When I invited the stakeholders to the interviews, most had already known or heard about me for more than a year. Participating in the interviews was voluntary and outside the scope of the W2O initiative, as explained in Chapter

One and this Chapter. As a sign of the trust I had built, more than 25% of the potential interviewees accepted to be interviewed.

4. *Shared with some stakeholders in non-work-related activities*. As explained before concerning my participation in three workshops, at some point during the three workshops, spontaneous conversations about non-related workshop themes became more frequent during lunch and other break times. For example, some people shared with me some problems they were facing daily, and other workshop participants felt more secure sharing personal thoughts about their purpose in their lives. I also corresponded by sharing personal matters and reflections to facilitate building deeper relationships.
5. *Kept proactive communication*. Before I conducted my interviews, I aligned with the W2O initiative governance. It means all the contacts took place through the W2O team leaders. During this process, I supported the W2O team in different tasks to keep a proactive communication in terms of the planning of the workshops and sharing of the workshop reports and other information the W2O team considered worthy of sharing (e.g., relevant news about the plastic packaging business). Around the third workshop, my former co-supervisor thought I could share insights about learnings from my PhD with the network of workshop participants. This activity was outside the scope of my research and was part of the W2O initiative communication strategies, but it allowed me to keep building trust with potential interviewees. On some occasions, I received positive feedback from some workshop participants about the information I shared. I kept sharing my learnings during the rest of my candidature.
6. *Attended industry and academic events*. I kept attending different sustainability-related events, whether to give presentations or listen to experts in related fields. With this strategy, I could keep knowing peers and meet a few workshop participants and interviewees in contexts different to the workshops or the interviews. These events allowed me to show those whom I met my presentations or discuss sustainability-related issues.

Data analysis approach

Following the process set out in **Figure 8**, I deductively collated the codes identified during the literature review.

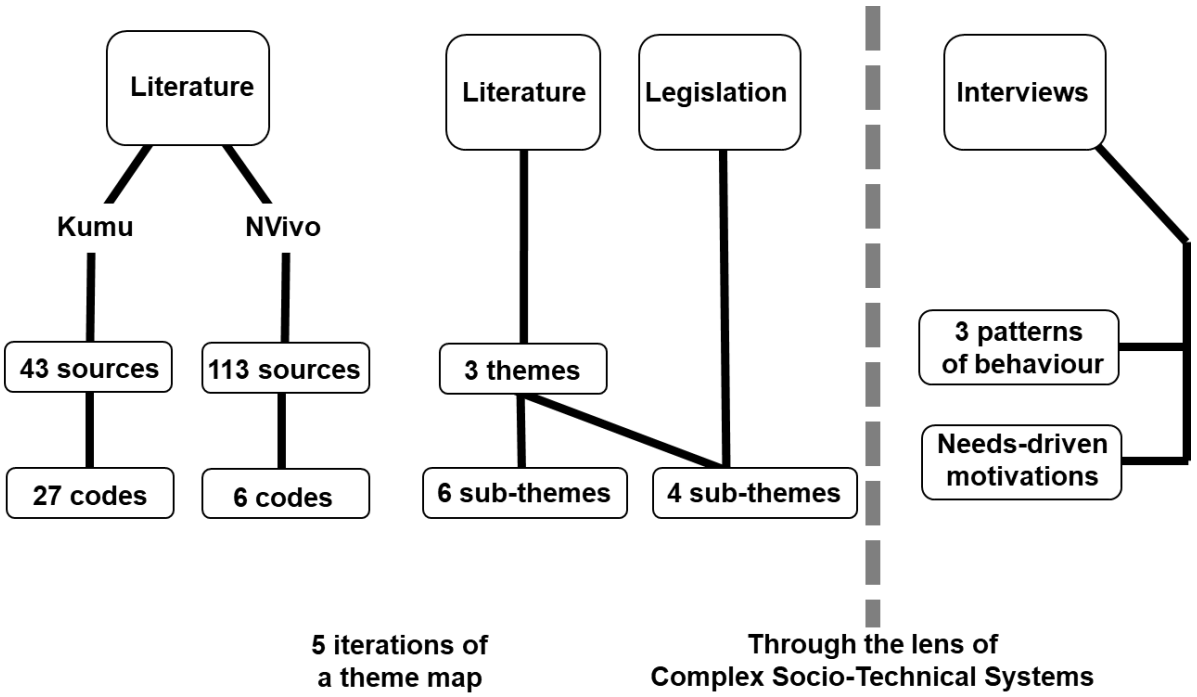


Figure 8. The data analysis process

As described in Chapter Two, I used a framework combining insights from complexity theory and socio-technical systems theory to analyse how the interviewees discussed uncertainty and tensions when making project decisions, adapting to system change and pursuing their goals. Reviewing the literature on stakeholder engagement helped me deductively identify critical themes about engaging in sustainability projects. I built a coding map, grouping codes in higher-order themes based on similarities, such as the relationship between stakeholder perceptions of their agency to act in projects and their needs and capabilities. This process validated common higher-order themes, such as the influence of project uncertainty as a barrier to trust-building and engagement. I compiled the themes in a map until I identified three main themes, six sub-themes for analysing interview data and four for the rapid legislation review as set out in **Table 18**. The themes helped me analyse contextual factors affecting stakeholder engagement and trust.

Table 18. Themes and subthemes

Subthemes for interviews	Themes	Subthemes for legislation review
The needs driving the stakeholders' pursuit of goals	**Asymmetrical stakeholders' needs and capabilities**	Differentiated strategies in fostering legislation compliance
The capabilities affecting the stakeholder engagement		A human network approach to foster adaptive compliance

Uncertainty in the information exchange reliability	**Uncertainty in making project decisions**	The clarity on how to comply with legislation
Making decisions in complex human networks		
Making free decisions in collaborative projects	**Free motivation to engage**	Command and control or incentive-based strategies for legislation compliance
Underlying motivations driving the stakeholder engagement		

This set of themes focused the data analysis on stakeholder experience and behaviour patterns and their relationship to engaging and building trust in sustainability projects. The themes also contributed to understanding how the government legislation influenced vital aspects of stakeholder engagement in achieving legislative compliance where collaboration was expected. I processed data using https://sonix.ai/es for the transcriptions of the interviews as approved by Swinburne Research Ethics. I followed Braun and Clarke's (2013b) process for thematic analysis to identify what the interviews revealed about participants' motivation to engage with others in sustainability projects despite various systemic and local challenges.

I adopted a constructionist approach in the data analysis process to preserve the heterogeneity and richness of the interviewees' perceptions and meanings (Braun and Clarke, 2013a). I continually linked the collected and analysed data to the research context due to the context-dependency of examining sustainability projects' dynamics (Robson, 2002). I focused on what the research participants said about their situation, values, needs, capabilities and goals concerning their underlying motivations to engage. I grouped relevant extracts of the stakeholder responses based on their relationship to my research questions (Stake, 2005), using a spreadsheet to organise the analysis around patterns of meaning Braun and Clarke (2013b, p. 342). I then grouped relevant quotes using NVivo 12 to identify the higher-order themes in the interviewees' responses. Chapter Four presents the complete analysis of the interview data and the legislation.

Theorisation from the case

As Flyvbjerg (2006) argues, looking for generalisations is only one-way case study research extends the boundaries of knowledge, providing a descriptive case being a valuable way to provide new knowledge. The case study did not aim to build theory, provide generalisable

knowledge about stakeholder engagement and trust in sustainability projects, or identify causal relationships in the stakeholder behaviours. The deductive conduct of the case study sought to field test existing theories about stakeholder engagement and trust-building through the lens of the complexity theory and socio-technical systems theory. The case study sought to build interpretations from the insights of individual research participants (Ezzy, 2003) on how stakeholders engage and build trust despite the challenges of the context in which they operate. The circumstances of the stakeholders in Medellín are likely like those in other regions in Colombia. However, more research is needed to reach the point where generalisations can be made about this research outcomes, or the findings are applied more broadly to understanding stakeholder engagement and trust in sustainability projects in middle-income countries with weak governance in general.

Chapter summary

Chapter Three has presented the research design and methods for the plastic packaging waste management case study in Medellín. The chapter illustrates how the complex socio-technical systems approach framed data collection and analysis to respond to my research question. It has also set out the techniques for assuring the quality of the research findings. Chapter Four presents the Medellín plastic packaging waste management case study in which I introduce the stakeholder network and perspectives on sustainability challenges. It also analyses the recently updated legislative context created by the declaration of Resolution 1407/2018 and Resolution 1342/2020 concerning stakeholder collaboration in sustainability projects.

CHAPTER FOUR
THE PLASTIC PACKAGING WASTE MANAGEMENT SYSTEM IN MEDELLÍN, COLOMBIA

Chapter Four examines the challenges of engagement and trust between stakeholders in waste management from a whole-system perspective. The chapter introduces the plastic packaging waste management case from Medellín, highlighting the human and structural factors impinging on stakeholder engagement and trust. The case examines the reality of a group of stakeholders with diverse needs and capabilities concerning the challenge of keeping abreast of legislative expectations. The authenticity of the research participants' individual experiences and perceptions challenges the abstract notions that typify the idea of the stakeholder in the literature on stakeholder engagement and trust-building. Examining the role of government legislation concerning stakeholder engagement and trust demonstrates the adverse effects of weak government performance. Chapter Four addresses the research questions from the stakeholders' experience of system challenges. Chapter Five addresses the research questions from how stakeholders seek to overcome these challenges.

Chapter Four has five interconnected parts. The first section sets out the case context, establishing the scene for the circumstances influencing the case of the plastic packaging waste management system in Medellín. This section closely examines the raft of sustainability legislation that sets out diverse compliance expectations for stakeholders in the city's plastic packaging waste management system, focusing on the effects of Resolution 1407/2018: Extended Producer Responsibility in Packaging. This section reveals that trust is vital in examining stakeholder engagement in the case reported in the thesis, based on the coding of the interview data. The second section of the chapter discusses the diverse drivers of stakeholder engagement in sustainability projects in examining the variety of purposes motivating individual and organisational stakeholders to collaborate in such initiatives. The third section of the chapter discusses stakeholder needs, illustrating the complex and conflicting material and non-material needs affecting stakeholders' motivations for engaging in sustainability projects. The fourth section of the chapter discusses the government's possibly paradoxical role in promoting stakeholder engagement, government actions potentially blocking rather than promoting trust-building and collaboration. The fifth and final section of the chapter examines how the cultural

barriers and the complexity of the plastic packaging waste management system in Medellín is an inherent barrier to trust-building trust and engagement.

The case context

This first section presents the case context, where I refer to the findings of the legislation review and illustrate how the coding process revealed trust as vital to better comprehend the stakeholder engagement in sustainability initiatives to comply with Resolution 1407/2018. The case focuses on the plastic packaging waste management system in Medellín and its underlying business ecosystem, investigating the circumstances and interactions of the different individual and organisational stakeholders in that system. This network of stakeholders spans the companies that manufacture the materials for plastic packaging and the packaging itself, the businesses that use plastic packaging for their products and the organisations that collect and process plastic packaging waste (See **Table 19**). Each stakeholder needs to comply with Resolution 1407/2018. This Resolution pursues the goal of sustainability by seeking to develop a closed-loop, solid waste framework for Colombia through extended producer responsibility while requiring stakeholder collaboration across the packaging business ecosystem. The criteria of extended producer responsibility expect product manufacturers and the producers of packaging or packed products to embrace their responsibility for reducing the impact of their products over their lifecycle. The interview data reveal how the differing circumstances of the stakeholders, in this case, differentially influence their motivation and scope to engage and trust and add complexity and barriers to their engagement in sustainability initiatives, with differences in power relations leading to stakeholders operating as single or interconnected interdependent agents.

Table 19. Case study stakeholder groups

Additives and raw materials suppliers	Cooperatives of street collectors	Environmental consultants
Food and personal care manufacturers	Local and National Government	NGOs and not-for-profit innovation organisations
Plastic collector foundation	Plastic industry associations	Plastic products and raw materials manufacturer
Plastic recycling companies	Public utilities	Universities[1]

[1] Resolution 1407/2018 does not directly discuss the role of universities. However, it tacitly suggests that universities could play a role in this system by discussing the need for implementing research and development strategies.

The interviewees represent formally constituted organisations that comply with Colombia's tax, licensing and labour regulations. Other stakeholders in this system operate within the informal economy, reflecting general conditions in Colombia, where 87.6% of businesses are informal and 75% lack proper tax registration (Economía y Negocios, 2020b). Being part of the informal economy risks penalties for failing to comply with taxation legislation while individuals risk encountering social security problems, stakeholders' differentiated circumstances being a problem not only for them but also for the plastic packaging waste management system in Medellín. The Colombian government's Decree 596/2016 legislates to formalise businesses involved in sustainability processes. It has formalised the operation of waste picker cooperatives to an extent, but its adoption is far from universal.

Essential to understanding the implementation of Resolution 1407/2018 is that Colombia has a national government rather than a federal structure. The mode of government is presidential, with the country organised into departments and municipalities, Medellín being one Municipality in the Department of Antioquia. Resolution 1407/2018: Extended Producer Responsibility in Packaging applies to the whole of Colombia, being enforced in Medellín by the Secretariat of Environment and the Autoridad Nacional de Licencias Ambientales (ANLA).[2] Despite national coverage, Resolution 1407/2018 was implemented through a transition scheme spanning 2022 to 2028. This transition has staged compliance across Colombia's different departments so that 'Producers with national coverage must gradually and permanently expand the coverage of environmental management plans.' The staged implementation process, combined with the diversity of local conditions, creates compliance challenges and barriers for industry stakeholders and those monitoring compliance at the national, department and municipal levels.

The Department of Antioquia, of which Medellín is the capital, represents 20% of Colombia's gross domestic product, having approximately 25,000 manufacturing companies that see the region positioned third nationally in creating new businesses (Medellín, 2019; Portafolio, 2021a). Medellín is known for its nation-leading innovation culture (Distrito de Innovación Medellín, 2020; Marulanda, 2019; Ospina Zapata, 2019), providing a rich scenario to examine how stakeholders engage in a challenging context. However, according to the Departamento Administrativo Nacional de Estadística (2019), 14% of the citizens of Medellín live in poverty (Serrano et al., 2019). The prevailing

[2] In English, it is the National Authority of Environmental Licences.

economic conditions add uncertainty for business, with interviewees finding it hard to know which initiatives to invest resources in to maintain their operation.

Poverty and disempowerment limited some stakeholders' scope to participate in the waste management system as the Colombian government would like. Such inequalities are typical of Colombia (Dini and Stumpo, 2018; Economía y Negocios, 2020b), a packaging manufacturer commenting, 'the inequality we have is at all levels, social and cultural, economic.' Between 2017 and 2018, the Gini Coefficient, which measures national income distribution, showed that inequality increased in Colombia (Araújo et al., 2018; Departamento Administrativo Nacional de Estadística, 2019), with Colombia consistently rated as one of the most unequal countries in Latin America (United Nations Development Programme, 2020). Business conditions for small and medium enterprises in Colombia worsened during the COVID-19 pandemic. Approximately 10% of SMEs went bankrupt, 53% experienced a drop in revenue of over 50% and 27% suspended their activities temporarily (Forbes Staff, 2020; Solórzano C., 2021). 91% of Colombians feared unemployment before the pandemic (Edelman, 2020; Portafolio, 2020b), with 32% feeling the pandemic increased the likelihood of losing employment (Economía y Negocios, 2020a).

There is a history of legislation providing the legal base for tackling sustainability challenges in waste management systems in Colombia (Gobierno de Colombia, 2019; Tecnalia, 2017). The Environmental Democracy Index evaluates the opportunities afforded to citizens of a country to participate in environmental protection (World Resources Institute, 2015). This index rates Colombia highly for the reliability of government institutions in protecting the environment. Colombian governments have a long history of considering sustainability in national development plans, Colombia establishing its first Ministry of Environment in 1993 (Rodríguez Becerra, 2009). Colombia has continued to lead international initiatives to protect the environment (Araújo et al., 2018) as in the examples of CONPES 3874/2016, which established the National Policy for the Integral Management of Solid Waste and the creation of a National Strategy for a Circular Economy (Concejo Nacional de Política Económica y Social, 2016; Gobierno de Colombia, 2019).

However, the perception of corruption in government institutions and weak government performance are significant issues in Colombia (Alto Comisionado de las Naciones Unidas para los Derechos Humanos, 2020; El Tiempo, 2019; Noticias Caracol, 2019; Redacción El Tiempo, 2020; Revista Semana, 2019; Vanguardia, 2019). Typically, Colombians trust family and close friends but have little or no trust in the government, the Catholic Church, large organisations or the military (Edelman, 2020; Leal Acosta, 2020; Pring et al., 2019; Revista Arcadia et al., 2019; Rojas, 2020). A Gallup survey during the COVID-19 pandemic found that Colombians saw corruption as a more significant problem than dealing with the virus (Portafolio, 2020a), dealing with corruption being a critical issue during the Colombian presidential election from May to June 2022.

As reported by the interviewees, as illustrated in this Chapter in the section *Poor government intervention and communication between stakeholders block better collaboration to engage in legislative compliance*, a lack of trust in institutions reduced their willingness to collaborate, principally because they doubted the information made available to them when making project decisions. The interview findings, as shown in this Chapter in the section *Cultural barriers and the complexity of the plastic packaging waste management system make trusting others more complicated*, show that a lack of up-to-date information about waste management legislation, combined with a lack of trust in others, was a critical hurdle to the operation of Medellín's plastic packaging waste management system, reducing the willingness of individuals and organisations to become involved. For one food manufacturer, for example, to achieve compliance and a financially and technically sustainable operation, the network of system stakeholders needed to genuinely collaborate. She gave an example of her organisation where they were aware of the relevance of fostering dialogues and collaboration to complement each other's knowledge when developing new projects. For the interviewees, ensuring that all system stakeholders were aware of relevant legislation and would act uniformly on it was critical for making project decisions across the plastic packaging waste management system. A waste pickers cooperative representative noted that most are oblivious to the hard-won legal recognition of their role in the Colombian waste management system, commenting, 'if you do not know what you have won, how will you defend it?'

Colombia's solid waste management legislation tends to make generalised compliance more difficult

To understand the impact of Resolution 1407/2018 in the case, I reviewed Colombia's solid waste management legislation. I approached this rapid legislation review from a historical perspective (Cassell and Symon, 2004), examining Colombian agreements, decrees, laws and resolutions concerning solid waste management from 1973. It was the year in which the Colombian government issued Law 23/1973, one of the first instances of a Colombian government establishing a broad norm for environmental protection. The search for legislation yielded 151 online documents and included national, regional and municipal norms. The search included repealed legislation to understand the historical context for later norms. Resolution 1407/2018: Extended Producer Responsibility in Packaging is the basis for the interaction of the interviewees as representatives of the plastic packaging business ecosystem in Medellín. Resolution 1407/2018 obliges stakeholders to 'support' each other in the implementation of 'environmental management plans for packaging waste from producers.' My review of Colombian solid waste management legislation revealed that legislation lacks adequate measures to drive compliance and collaboration among stakeholders on four critical standpoints:

1. The use of command and control or incentive-based strategies.
2. Addressing information to specific stakeholders or networks of stakeholders.
3. Tailoring strategies to the needs and situations of different stakeholders.
4. Sufficient clarity on legislative compliance.

Appendix 3 of the thesis provides an assessment of the 151 legislative documents against the four standpoints, including Resolution 1407/2018. **Table 20** exemplifies what is found in **Appendix 3**:

Table 20. Example of the legislation assessment found in Appendix 3

#	Type	Legislation	Year	Command and Control (C) strategies or Incentive Design strategies (I) or Both (B) or None (N) for enforcin	Specific stakeholder (S) or a network of stakeholders (N)	Differentiation in the strategies (Y) considering the different types of organisations or not (N)	Offer clear guidance (Y), offer some guidance (S) on how to comply with the regulation or not (N)
1	Ley	Ley 23 de 1973	1973	c	n	n	s
2	Decreto Ley	Decreto Ley 2811 de 1974	1974	c	s	n	n
3	Ley	Ley 9 de 1979	1979	c	n	n	n
4	Decreto	Decreto 2104 de 1983	1983	c	n	y	s
5	Decreto	Decreto 1601 de 1984	1984	c	s	n	n
6	Constitution	Constitución Nacional de Colombia 1991	1991	b	n	n	s

I established a rubric to assess each legislative document as explained below:

The use of command and control or incentive-based strategies.

- **C** was assigned if the norm established **C**ommand and **C**ontrol mechanisms, or obligations, to force stakeholders' behaviour.
- **I** was assigned if the norm proposed **I**ncentives to motivate stakeholder behaviours.
- **B** was assigned if the norm defined **B**oth obligations and incentives to motivate stakeholder behaviours.
- **N** was assigned if the norm provided **N**o reference to obligations or incentives.

Addressing information to specific stakeholders or networks of stakeholders.

- **S** was assigned if the norm focused only on a **S**pecific stakeholder.
- **N** was assigned if the norm referred to more than one type or a **N**etwork of stakeholders.

Tailoring strategies to the needs and situations of different stakeholders.

- **Y**, for '**Y**es', was assigned if the norm differentiated the diversity of requirements from different stakeholders.
- **N**, for '**N**o', was assigned if the norm did not differentiate the diversity of requirements from different stakeholders.

Sufficient clarity on legislative compliance.

- **Y**, for '**Y**es', was assigned if the norm offered clear guidance about complying.
- **S** for '**S**ome' was assigned if the norm provided **S**ome guidance about complying.
- **N**, for '**N**o', was assigned if the norm did not guide compliance.

Many legislative norms acknowledge the need for stakeholder engagement. For example, Decree 312/2006 is a Master Plan for the Integral Management of Solid Waste for Bogotá. It recognises the relevance of 'solidarity' and the need to 'collaborate to reduce the consumption of natural resources' and improve waste management. In Medellín, Metropolitan Agreement 23/2018 describes waste management in a business ecosystem as being supported by 'processes of participation and consultation with various stakeholders of the chain.' However, these statements do not ensure legislative compliance on the part

of stakeholders in the solid waste management process or collaboration or trust among stakeholders, as further illustrated in this section.

Stakeholder engagement and Colombia's solid waste management legislation

The use of command and control or incentive-based strategies.

Most legislation includes compulsory requirements and strategies to force change in stakeholder behaviour, 110 norms reflecting command and control strategies. For example, Decree 285/2019, which concerns 'private non-hazardous solid waste recycling and utilisation facilities', determines the time limit for framing an Action Plan for those specific facilities. Resolution 1558/2019 'prohibits the entry of single-use plastics in the areas of the National Natural Parks of Colombia.' Only seven pieces of legislation nominate incentives to change stakeholder behaviours to more sustainable ones in contrast to the general tendency for legislation to mandate obligations. For example, Decree 2412/2018 concerns the 'incentive to use solid waste' and how to implement it. Decree 1505/2003 concerns the most efficient strategies for using waste, including 'reuse, recycling, incineration for energy generation purposes, composting or any other modality.'

28 norms include command and control and incentive-based strategies, with only six clarifying the principles for waste management and defining communication requirements for improving waste management. For example, Agreement 287/2007 provides guidelines that 'guarantee the inclusion of trade waste pickers in conditions of poverty and vulnerability in the management processes and integral management of solid waste.' My literature review established no consensus on the best strategies to motivate sustainable behaviours. However, the interview findings suggest that the research participants tend to favour voluntary and proactive behaviours over mandatory obligations. For example, a representative of a waste pickers cooperative commented, 'to prohibit for the sake of prohibiting, it has already been shown that in many cases it is not the measure.' A representative of an industry association argued one must be 'a little bit of cautious with the projects about prohibiting.' He explained that his associate organisations prefer to be 'proactive in terms of what we consider to be the paths or regulatory pathways to advance the circular economy of plastics.' For some interviewees, including obligations in legislation without understanding the complexity of the context was detrimental and posed a hurdle for improving the waste management system, a manufacturer of packaging giving an example of a norm about plastic bags, 'the single-use plastic ban policy proved

counterproductive because they realised that these reusable bags are more polluting and require more plastic and generate more impact than paper bags.'

Addressing information to specific stakeholders or networks of stakeholders.

Some legislation acknowledges the presence and interaction of complex stakeholder networks, as in the National Policy of Sustainable Production and Consumption and the National Strategy for a Circular Economy. This is typically only in national policies or strategies, rarely filtering down to lower-level legislation such as decrees and resolutions, thus posing extra barriers when the stakeholders need to design their compliance strategies in detail. 88 norms refer to two or more stakeholder groups, illustrating that complying with legislation impacts more than one type of stakeholder, hence the need to have differentiated compliance strategies. For example, Resolution 1397/2018, which rules on the use of plastic bags, considers the need to change 'production and consumption patterns in Colombian society', including through the actions of the distributors of plastic bags. Decree 596/2016 looks for formalising waste pickers organisations considering the relationship between end-consumers and government institutions.

Managing waste requires support from many stakeholders across product life cycles due to the complex flows of materials, products and waste across industries and societies. Nevertheless, 63 norms focus on one stakeholder category alone, suggesting a lack of awareness among those drafting legislation on the interaction between different stakeholder groups, making compliance more difficult. For example, Decree 130/2018 sets out obligations for 'the owners, tenants or holders of private solid waste recycling warehouses', neglecting the interaction between these three groups and other stakeholders in the waste management business ecosystem. Resolution 0276/2016 focuses on those who work on the use of waste in the 'the activity of management of the public cleaning service', neglecting their dependence on others for successful waste recovery, such as the stakeholders generating the waste.

Tailoring strategies to the needs and situations of different stakeholders.

Most legislation lacks differentiation in its requirements concerning stakeholders' different situations, such as their size and capacities, with 113 norms failing to provide segregated compliance strategies. For example, Resolution 668/2016 rules the 'the rational use of plastic bags.' Although it acknowledges that the goals for compliance with this norm

depend on the organisations' size, it does not recognise the differences in the capabilities between small and large plastic bag distributors and or how these differences need to be factored in when building a comprehensive program for the use of plastic bags. Decree 1666/2010, which establishes measures related to the replacement of animal-drawn vehicles to transport waste, does not provide precise guidance on how to help stakeholders purchase new vehicles in light of their financial capabilities and the scale of their operation.

The legislative review reveals little coordinated effort to foster collaboration between stakeholders, given their different circumstances and motivations. It suggests that for some stakeholders complying with legislation where collaboration is expected could be more challenging, as in Resolution 1407/2018. How most legislation defines how stakeholders should approach sustainability ignores stakeholders' different priorities in their daily activities. Only 38 norms provide differentiated compliance strategies for the different types of stakeholders. For example, Resolution CRA 720/2015 and Resolution CRA 853/2018 provide mechanisms to help public cleaning companies calculate operating costs. Resolution 0938/2019 provides different criteria for identifying the locations where landfills can be built across four types of landfills. However, this does not consider the implications of these differences for other stakeholder groups.

Sufficient clarity on legislative compliance.

Typically, Colombian legislation is written so that some laws establish general principles and high-level requirements, while other norms translate these general requirements into specific compliance requirements. This means that to comply with all requirements defined in a law, stakeholders must become familiar with a raft of decrees, resolutions and other norms. Most legislation examined in my review lacks specific guidance for stakeholders in operationalising norms, creating inbuilt challenges and barriers for stakeholders in developing compliance strategies. Of the 151 norms, 26 offer weak or no guidance for compliance. For example, Law 1715/2014, which concerns 'non-conventional renewable energies', includes stipulations on the use of waste in generating energy without providing specific technical standards to help stakeholders comply. Law 1549/2012, which seeks to strengthen the institutions involved in the National Policy of Environmental Education, provides general principles about how this should happen without detailing how the principles might translate to specific programs and projects across the country.

Many interviewees described the complex array of legislation and related information as difficult to keep track of. A public utility representative, for example, commented on administrative barriers to complying, 'many times, what prevents us from going ahead with projects is that regulation has some obstacles.' A manufacturer of packaging was more specific here, broadly explaining how the complexity of legislation made it difficult for stakeholders to move forward with compliance and commit to projects, seeing them observe, 'as we are in the country of laws, norms and little norms, then you find many obstacles when it comes to wanting to do projects.' This situation made it confusing for his organisation to know if they were complying with Resolution 1407/2018.

The interview findings reveal the many doubts about how organisations can comply with Resolution 1407/2018 to tap into the perceived business opportunities it offered. A manufacturer described his confusion over administrative processes Resolution 1407/2018 imposed on organisations in seeking to become authorised packaging waste managers, explaining, 'we do not know if it has to be done in the [name of organisation] or if you have to request it from the municipality or the metropolitan area or the cleaning company.' He argued that this complexity made it very hard for waste pickers to formalise their involvement in plastic waste management.

In the reviewed legislation, 88 norms offer some guidance without providing complete clarity on implementing a norm to ensure compliance. For example, Decree 596/2016, which concerns the 'transitional regime for the formalisation of ex-officio waste pickers', includes different requirements to help informal waste pickers organise into cooperatives or similar formal organisations. For example, waste pickers must report 'technical, administrative, commercial, operational and financial information' as established by the Superintendency of Domiciliary Public Services. However, Decree 596/2016 does not clarify how waste pickers with differentiated needs and strengths will learn and build their management system to draft those reports. Decree 596/2016 does not clarify how waste pickers might build the capabilities to prepare these reports either. 37 norms offer more detail on achieving compliance. For example, Decree 920/2013, which rules on the 'incentives to municipalities where sanitary landfills and regional transfer stations for solid waste are located', provides formulas to calculate incentives. Law 1333/2009 'establishes the environmental sanctioning procedure', detailing how the procedure should be carried out. When reviewing the legislation, I did not expect that all norms would be equally

detailed in explaining compliance. However, the extent of subsequent norms drafted to clarify, correct, or add to existing legislation imposes unreasonable expectations on stakeholders in terms of keeping abreast of legislation.

Strengths and weaknesses of Resolution 1407/2018

Resolution 1407/2018: Extended Producer Responsibility in Packaging provides the norms 'by which the environmental management of paper, cardboard, plastic, glass, metal packaging waste is ruled and other determinations are made.' As with other Colombian sustainability legislation, Resolution 1407/2018 lacks sufficient critical information to support stakeholder compliance. I assigned Resolution 1407/2018 a **B** concerning command and control or incentive-based strategies since it establishes both. For example, companies that manufacture, assemble, import or market packaged products or single-use packaging are obliged to 'formulate, implement and keep updated a Packaging Waste Environmental Management Plan.' Resolution 1407/2018 also makes collaboration compulsory but ignores the nuances driving stakeholder engagement and trust-building, as explored in setting out the interview findings later in this chapter. Stakeholders formulating such a plan need to have it approved by the National Authority of Environmental Licences, accruing compliance points by showing conformity with the assessment criteria of their packaging waste management plans. Stakeholders are also incentivised to invest in research and development in sustainable packaging design. The more they invest, the more points they can accrue within the compliance established by Resolution 1407/2018.

Resolution 1407/2018 acknowledges that improving the packaging waste management system through strengthening the extended producer responsibility requires collaboration from different stakeholders in the packaging business ecosystem. I assigned Resolution 1407/2018 an **N** in addressing the formation of a network of stakeholders, the norm lacking an explicit reference to the academic institutions that could support or undertake research and development. Still, it provides an excellent example of how a network of stakeholders should be included in a norm in addressing obligations and requirements for collaboration for the producers, the retailers, the manufacturers and importers of packaging, the end-consumers, the packaging waste managers, the waste processors and the environmental, municipal and district authorities.

I assigned Resolution 1407/2018 a **Y** for tailoring strategies to the needs and situation of different stakeholder groups, considering differences such as the size of the stakeholders' operation, the geographic range of the packaging waste management plan and the amount of money a business can invest in research and development, and education programs. However, Resolution 1407/2018 does not consider nuances in stakeholders' needs and situations, which underplays the ease with which different stakeholders can comply with the full extent of the legislation. There is insufficient information to help organisations in various industries understand how the Resolution applies to specific cases. For example, a small bakery selling bread packed in paper bags in a small town would have different compliance requirements than a home appliance manufacturer sending packed products across Colombia in cardboard boxes filled with Styrofoam and covered in stretch film, but neither Resolution 1407/2018 nor supporting information from government teased out the specificities of compliance for individual organisations through indicative cases.

I assigned Resolution 1407/2018 an **S** because it clarifies legislative compliance, but this is not enough to help stakeholders understand the specificities of compliance. For example, the Resolution provides different formulas to calculate material recovery goals. However, it lacks critical information to help stakeholders clarify how to comply, such as providing specific strategies to help them align their circumstances with the Resolution's expectations, making it difficult for them to make informed decisions. Some stakeholders would not be clear about who they could engage in fulfilling the research and development criterion of Resolution 1407/2018 or whether it would be valid to do in-house research.

The government addressed shortcomings in Resolution 1407/2018 when the Ministry of Environment and Sustainable Development issued Resolution 1343/2020 on 24 December 2020, updating the compliance requirements in response to stakeholders' criticism, but as the interview findings show, this did not resolve all issues. For example, Resolution 1342/2020 clarified which packaging is included in the extended producer responsibility strategies but still lacks clarity about technical aspects such as the requirements for treating primary, secondary, or tertiary packaging in logistic chains. It provides more specifications for developing packaging waste management plans regarding how producers can certify recovered waste. Still, it does not clarify how the government checks compliance across a potentially vast stakeholder network. Resolutions 1407/2018 and 1342/2020 fail to guide the diversity of organisations coming under its umbrella in how to proactively align their

efforts, circumstances and objectives to achieve effective collaboration. Neither Resolution guides how collaboration as a compulsory requirement in the norm should be organised among the stakeholders.

Trust as core to waste management systems

This section elaborates on the coding process where this research's main themes emerged, as shown at the end of this section. To develop the findings about the interviewees' experience of the collaboration expectations set out in Resolution 1407/2018, data analysis started from the three main themes identified in the literature review, as explained in Chapter Three. First, I examined whether stakeholder needs and capabilities differences affected their behaviour in sustainability projects to pursue their goals. Second, I explored whether uncertainty in making project decisions and access to reliable information influenced stakeholder engagement decisions. Third, I scrutinised whether stakeholders felt free to engage in sustainability projects and whether this was linked to their proactiveness, reactiveness or other factors particular to the plastic packaging waste management system in Medellín. I undertook the first coding round in Spanish, the language in which I conducted the interviews. This round looked for preliminary themes related to stakeholder engagement, including challenges and adaptation strategies. **Figure 9** identifies the main themes:

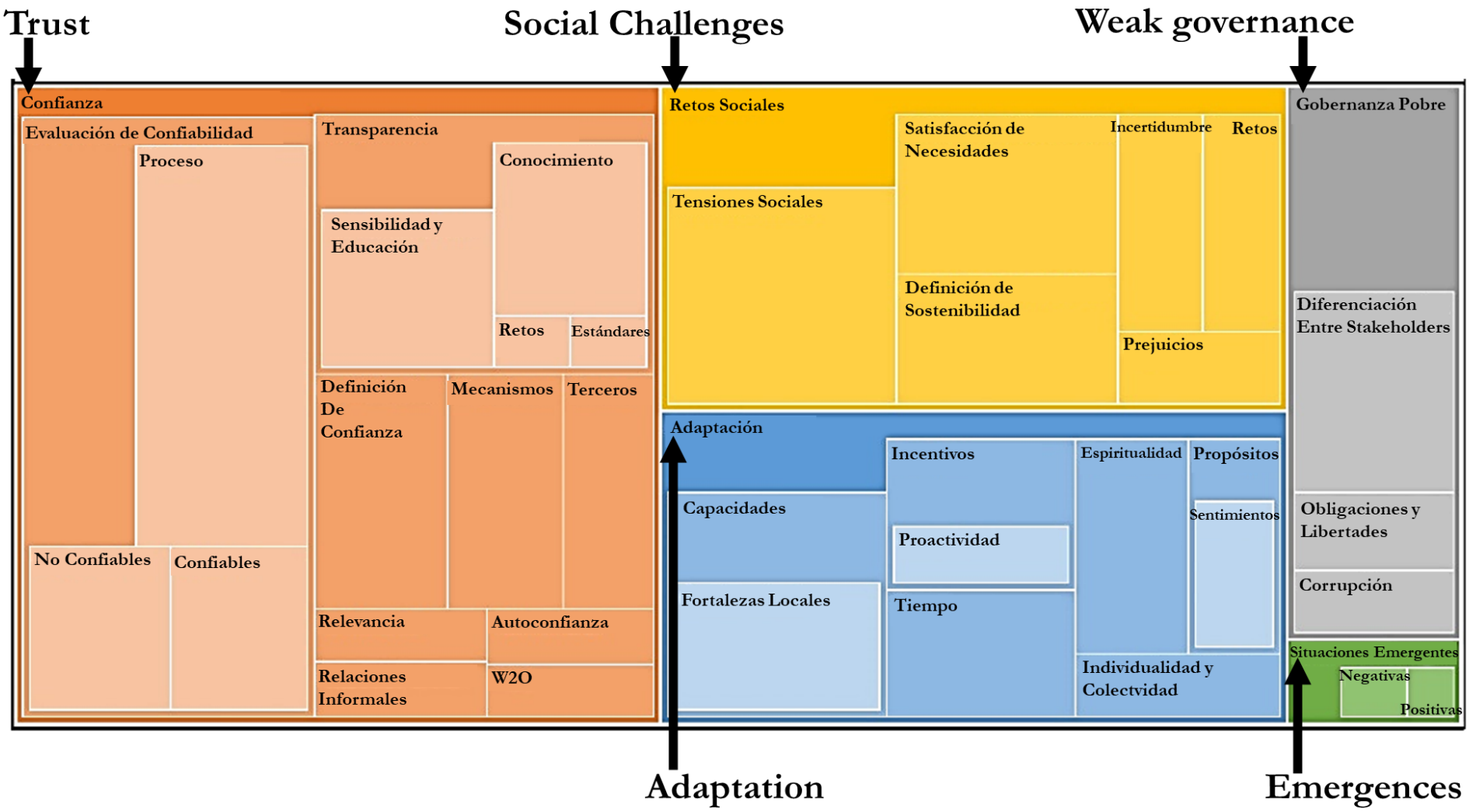


Figure 9. The first coding round [Image created with NVivo 12]

After the first round of coding, I translated the codes into English. During this first round, I perceived that the interviewees, as a sample of stakeholders in the plastic packaging waste management system in Medellín, had diverse needs and capabilities. It is further illustrated in this Chapter in the section *Stakeholders' asymmetrical and subjective needs and priorities add tensions and obstruct stakeholder engagement in sustainability projects*. For example, while some interviewees felt they had their basic needs covered, others acknowledged the gap in social equality in Colombia and the vulnerability of some stakeholders in the system, such as the waste pickers, a representative of a cooperative of waste pickers arguing, 'the waste picker is always last in the chain.' I also learned that the interviewees had different levels of motivation to engage in sustainability projects, as it is further shown in this Chapter in the section *Diverse individual and collective, pragmatic and transcendental drivers to participate in sustainability initiatives add complexity to projects,* indicating the barrier to forming shared goals across the business ecosystem. For example, some interviewees explicitly mentioned their interest in increasing revenue as an incentive to work on sustainability projects and others focused on improving their families' wellbeing as a key motivation. Despite the diversity in motivations to engage in sustainability projects, most interviewees seemed to share that they remained motivated to look for project opportunities due to their perceived purposive value in engaging in sustainability initiatives.

The first coding round provided a general view of the diversity of interviewees' positions, bringing general insights into their challenges in sustainability projects and how they overcame them. To reveal and preserve the richness of the interviewees' positions, I focused during the second coding round on the nuances in their experiences and perceptions about a sustainability initiative and how trust influenced their engagement. To do so, I broke down codes that were still too broad into more specific codes that helped me identify critical sub-themes about the stakeholders' challenges, motivations to engage in a sustainability challenge, and strategies to keep building trust and engagement. For example, in the theme of trust, codes such as *Trustworthiness Assessment*, which concerned mechanisms to decide whether to trust others, as illustrated in Chapter Five, proved too general. **Figure 10** shows how I broke broad themes into more specific codes to understand what drives collaboration in sustainability projects, in which conditions they are driven to do it and how stakeholders overcome individual and collective challenges.

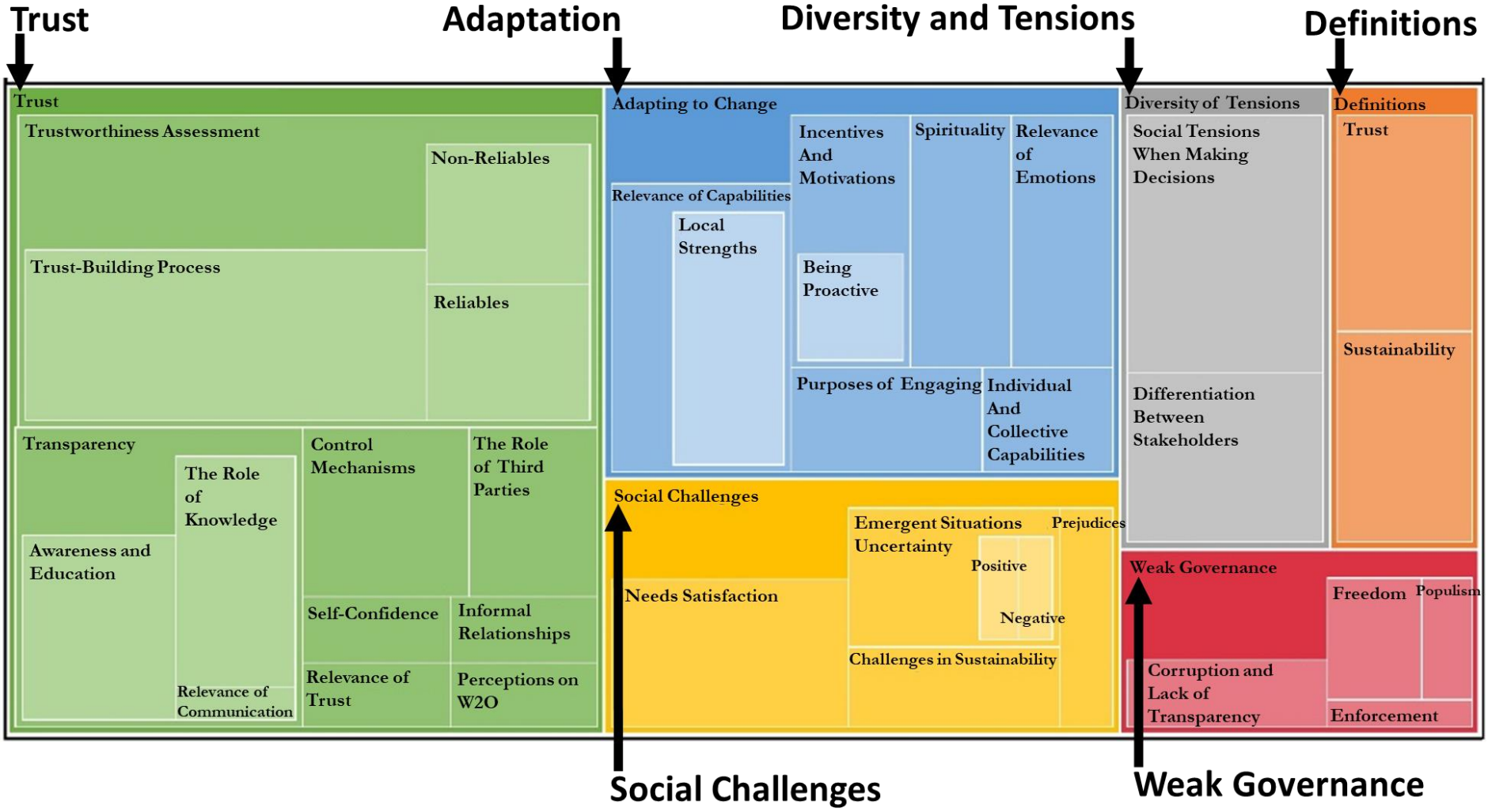


Figure 10. The second coding round [Image created with Nvivo 12]

In developing the codes, I focused on where the development of trust might face more barriers, examining their discussion of the uncertainty they faced in front of system tensions, such as where a sense of corruption, a lack of trust and differences in power in negotiating sustainability projects were raised to the effect of dampening trust and motivation to collaborate. It is further elaborated in the section *Poor government intervention and communication between stakeholders block better collaboration to engage in legislative compliance*. This process revealed that some interviewees perceived cultural barriers to engagement and secrecy eroding trust-building, as it is discussed in the section *Cultural barriers and the complexity of the plastic packaging waste management system make trusting others more complicated*. While the interviewees nominated different material and technical issues as influencing the operation of the plastic packaging waste management system in Medellín, the coding process also identified the importance of social, non-material drivers and barriers, including spiritual connections to nature and people and having a purposive life as vital to understanding the interviewees' motivations to engage and trust. It is evident in the section *Stakeholders' asymmetrical and subjective needs and priorities add tensions and obstruct stakeholder engagement in sustainability projects*. As identified in the legislative review at the beginning of this Chapter, weak governance, complex, inconsistent and unclear legislation, and poor communication emerged as primary barriers to trust and engagement. The coding process established the complex interaction between stakeholder needs and capabilities and their goals in participating in Medellín's plastic packaging waste management system. It is noted in the section *Cultural barriers and the complexity of the plastic packaging waste management system make trusting others more complicated*. The second coding round also noted differences in the interviewees' proactiveness and reactiveness when engaging in projects and facing challenges in sustainability challenges, which is illustrated mostly in Chapter Five.

A final coding round reviewed the codes, checked that all quotes were correctly attributed and removed repetition. **Table 21** illustrates how some sub-themes were further disaggregated into more specific codes. The main strategy to disaggregate sub-themes into more specific codes was by identifying similarities and differences in the quotes from the interviewees. For example, within the *Process of Building Trust*, as further elaborated in Chapter Five, interviewees referred to different types of attributes of the process of building trust with others in projects. In this example, the interview participants described how the trust-building process occurred in the early stages of a relationship and how it continued to build or disintegrate. From here, three patterns emerged about the behaviours

associated with building trust, as further elaborated in Chapter Five, in the section *Stakeholders build differentiated trust gradually by adapting to unexpected events*:

Splitting the higher codes revealed the relevance of monitoring and control mechanisms and the strategies used by stakeholders to reduce trust-related project risks. A sub-theme that became more relevant in the final coding round was the perception of the government as populist due to a seeming lack of technical expertise when making decisions concerning sustainability. It is illustrated in this Chapter's section *Poor government intervention and communication between stakeholders block better collaboration to engage in legislative compliance*. The coding showed that this perception, combined with perceptions of poor legislation enforcement, further eroded confidence in compliance with Resolution 1407/2018 while affecting collaboration. The final coding consolidated findings around strategies to overcome a lack of trust, such as a shared feeling of pride in their city or a spiritual commitment to nature. The third coding round produced the following list of main themes:

1. **Definitions**: The thoughts and feelings of the interviewees about what trust and sustainability meant for them.
2. **Adapting to change**: Stakeholders' and local strengths. Drivers of collaboration, such as pursuing the satisfaction of material and non-material needs. The issue of persistence.
3. **Diversity and tensions**: The complexity and diversity of contextual factors and stakeholder attributes. The effect of dealing with the uncertainty in projects.
4. **Trust**: Its relevance, the initial conditions for trusting, drivers and barriers, information management, mechanisms for building trust, perceptions about the trustworthiness of other stakeholders and the plastic packaging business ecosystem. Patterns of behaviour when building trust.
5. **Weak Government performance**: Negative perceptions of government performance, challenges in legislation enforcement including managing compulsory or voluntary measures. Populism and corruption.

Table 21. The third coding round [NVivo 12]

Name	Created on	Modified on
Adapting to change	**5/11/2021 6:40 PM**	**22/11/2021 10:05 PM**
Incentives-Motivations to engage	**5/11/2021 7:58 PM**	**23/04/2022 9:08 AM**
Emotional influences	22/11/2021 5:53 PM	23/04/2022 9:08 AM
Place attachment	22/11/2021 5:54 PM	23/11/2021 3:04 PM
Stakeholders' proactivity	5/11/2021 8:39 PM	23/04/2022 9:08 AM
Individual-Collective tensions	7/11/2021 5:40 PM	23/04/2022 9:08 AM
Purposes for engaging	5/11/2021 10:17 PM	22/11/2021 9:21 PM
Spirituality and transcendence	5/11/2021 8:10 PM	3/12/2021 9:59 PM
Stakeholders' capabilities	**5/11/2021 8:41 PM**	**23/04/2022 9:06 AM**
Local strengths	5/11/2021 6:33 PM	23/11/2021 3:01 PM
Time and persistence	5/11/2021 8:41 PM	23/04/2022 9:09 AM
Definitions	**22/11/2021 3:58 PM**	**15/04/2022 9:14 PM**
Sustainability	5/11/2021 6:30 PM	22/11/2021 4:04 PM
Trust	5/11/2021 6:28 PM	22/11/2021 4:04 PM
Diversity and Tensions	**22/11/2021 3:56 PM**	**15/04/2022 9:14 PM**
Complexity of Needs	5/11/2021 6:37 PM	22/11/2021 10:27 PM
Disparity between stakeholders	5/11/2021 6:57 PM	22/11/2021 10:07 PM
Prejudices-Cultural Barriers	5/11/2021 8:01 PM	23/04/2022 9:10 AM
Social tensions in decisions	5/11/2021 6:35 PM	23/04/2022 9:10 AM
Technical challenges	22/11/2021 9:45 PM	22/11/2021 9:46 PM
Unexpected-Uncertain events	**5/11/2021 6:45 PM**	**23/04/2022 9:10 AM**
Negative	5/11/2021 6:39 PM	23/11/2021 3:21 PM
Positive	5/11/2021 6:39 PM	22/11/2021 10:00 PM
Trust	**5/11/2021 6:50 PM**	**22/11/2021 10:38 PM**
Informal relationships	5/11/2021 7:02 PM	22/11/2021 10:47 PM
Level of Self-confidence	5/11/2021 8:01 PM	23/04/2022 9:11 AM
Perceptions on W2O	5/11/2021 8:08 PM	22/11/2021 10:57 PM
Relevance of Trust	5/11/2021 7:03 PM	23/11/2021 3:07 PM
Role of third-parties	5/11/2021 8:49 PM	23/11/2021 5:19 PM
Transparency and Reliability	**5/11/2021 7:45 PM**	**23/04/2022 9:12 AM**
Awareness and education	5/11/2021 8:03 PM	23/11/2021 1:32 PM
Consistency of data	23/11/2021 11:48 AM	23/04/2022 9:12 AM
Role of Knowledge	5/11/2021 7:45 PM	23/04/2022 9:12 AM
The secrecy in communications	23/11/2021 11:42 AM	23/04/2022 9:13 AM
Trustworthiness assessment	**5/11/2021 6:50 PM**	**31/10/2022 8:01 PM**
Assessment complexity	23/11/2021 1:49 PM	23/04/2022 9:16 AM
Dynamism and continuous care	22/11/2021 9:57 PM	23/04/2022 9:22 AM
Monitor and control	*5/11/2021 7:05 PM*	*23/04/2022 9:15 AM*
Gradualness and progressiveness	22/11/2021 8:26 PM	23/04/2022 9:21 AM
Initial conditions	23/11/2021 1:37 PM	23/11/2021 5:36 PM
Finding common ground	*23/11/2021 1:48 PM*	*23/04/2022 9:13 AM*
Non-reliable stakeholders	5/11/2021 6:52 PM	23/04/2022 9:16 AM
Reliable stakeholders	5/11/2021 6:52 PM	23/04/2022 9:16 AM
Role of dialoguing	23/11/2021 5:05 PM	23/04/2022 9:16 AM
Role of emotions-values	23/11/2021 1:50 PM	23/04/2022 9:15 AM
Unexpected, coincidental and spontaneous	22/11/2021 9:24 PM	23/04/2022 9:17 AM
Weak government performance and governance	**5/11/2021 6:56 PM**	**23/04/2022 9:20 AM**
Corruption and lack of Transparency	5/11/2021 9:44 PM	23/11/2021 5:17 PM
Lack of legislation enforcement	22/11/2021 4:14 PM	23/04/2022 9:20 AM
Negative impacts of populism	22/11/2021 4:20 PM	23/04/2022 9:20 AM
The issue of freedom and obligations	5/11/2021 6:58 PM	23/04/2022 9:20 AM

Diverse individual and collective, pragmatic and transcendental drivers to participate in sustainability initiatives add complexity to projects

The stakeholders, in this case, proved to be both diverse regarding their characteristics and relationships. Still, some interviewees shared a general understanding of the value of participating in a sustainability activity. As shown in **Table 22**, many interviewees understood sustainability much like the framework of the Triple Bottom Line (Elkington, 2004), which links the environmental, social and economic dimensions of sustainability.

Table 22. Interviewees' similar approaches to understanding sustainability

Interviewee	Definitions of sustainability
Consultant	'Three fundamental aspects: Basically, it is the environmental, social and economic part.'
Public utility 1	'The triad of economic growth, social equity and environmental conservation.'
Public utility 2	'A balance between generating profit through resources, seeking to close the cycle.'
Waste processor 1	'The balance point that is sustainable, environmentally and socially.'
Waste processor 2	'An innovation process that will serve the social, environmental and economic part.'

However, the interviewees revealed a more diverse range of understandings when linking the relevance of collaborating in sustainability initiatives to their daily life. Although Resolution 1407/2018 includes a standard interpretation of sustainability in the Colombian packaging industry, the interviewees' interpretations ranged from social and transcendental to technical and pragmatic. Some interviewees discussed sustainability projects as a technical way of managing resources based on their practicality in managing their daily operations. A preference for a technical solution was indicative of how a particular group of interviewees saw sustainability pragmatically linked to the needs of their organisations to better tackle the market's requirements. For instance, one packaging manufacturer noted that in their experience, 'environmental impacts are focused on post-consumption and production' with a particular focus on the need to 'investigate technologies such as degradable oxo materials' to improve sustainability in the whole packaging industry. This emphasis on technical and pragmatic solutions aligned with a representative of an industry association of varied industries linked to the value chain of plastic products. He argued that 'single-use products must be manufactured with biodegradable additives', illustrating the relevance of taking sustainability to a practical application in a manufacturing process.

Some interviewees' interest in approaching sustainability from a technical perspective aligned with the requirements from Resolution 1407/2018 concerning sustainable packaging design and ecodesign strategies. The Resolution sets out different ways for a broad range of stakeholders in the packaging value chain, preferably in a collective way, to implement eco-design strategies in their manufacturing processes and products, with a particular focus on technical attributes of materials in stating that investment in applied research to innovate eco-design strategies could aim for: '1. The use of industrially recyclable or compostable materials. 2. The incorporation of materials from renewable natural resources. 3. The reduction in the amount by weight of container and packaging material placed on the market. 4. Changes to recyclable or compostable mono-material containers and packaging.'

For some interviewees, a focus on technical approaches to sustainability challenges and opportunities was related to the practical efficiency of product development processes. An industry association representative spoke of a need of many organisations to create 'a more efficient product in using materials so that it is easier to recycle.' Similarly, a packaging manufacturer argued for the necessity to guarantee that 'what is being done is under a balance, seeking not only to produce, not only to generate value but also conserve and use resources efficiently.' In discussing the importance of being efficient as a requirement for meeting a sustainability standard, some interviewees simultaneously highlighted the need to ensure the real financial viability of their individual organisations. The goal to save money or increase revenue is like what is discussed by different authors concerning the motivations driving sustainable behaviours and corporate practices (Baden and Prasad, 2014; Ceschin, 2012; Lilley, 2009; Sulkowski, Edwards and Freeman, 2017). One consultant explained, 'if the organisation is not profitable, you will never be able to make it sustainable.'

Similarly, a packaging manufacturer posited that 'whatever you do, make sure it makes money and, on top of that, it helps society and the environment.' For these interviewees, the pursuit of profit is harnessed to engagement in sustainability projects, but if ensuring profitability is left up to individual companies, recycling rates might be lower if financial viability is not built into the legislation. In illustrating how some interviewees approached sustainability from a pragmatic individual perspective, a waste processor noted, 'it may be

something that can be recycled, but if [name of company] is not going to make money by recycling it, it is tough for them to do so.'

The concerns of many interviewees about the financial viability of sustainability projects were linked to their recognition that system stakeholders need resources to engage. Sustainability projects in Colombia often lack proper resourcing, with one local government representative confirming that in achieving 'a harmonious environmental development, we would need many more resources.' Some interviewees doubted whether greater resources for the conduct of sustainability projects could be fairly distributed in Colombia if available. A manufacturer of plastic products commented with a grounded position about their need to be 'very responsible with the resources one uses, neither spending more nor less but using resources the right way.' Other interviewees felt that the mandatory dimension of waste management legislation in Colombia, including the obligations established by Resolution 1407/2018, lacked reason and ignored the real conditions of different stakeholders across Colombia at times, thus being primed to waste financial resources, a packaging manufacturer commenting, 'in San Andrés, recycling is difficult. Maybe it is not sustainable because transporting a kilo of plastic from Leticia to Bogotá, Medellín, Cali, or the nearest recycling plant is not profitable.'

Not all interviewees raised profitability as a driver to engage in sustainability projects, but their comments suggested a degree of expedience and pragmatism was involved. Most surprisingly, a national government representative commented on Resolution 1407/2018, 'to be able to enter the OECD, we had to issue this rule.' Other interviewees saw sustainability legislation as a good way to build technical capabilities, a representative of an industry association arguing that sustainability offers business opportunities to 'develop more infrastructure and more installed capacity for recycling.' In referring to needs at a system level to improve their business opportunities, some interviewees illustrated their interest in improving the collective wellbeing and not only that of their organisations. Some interviewees argued their own profitability would lead to sharing the benefits of business opportunities with others, a packaging manufacturer arguing, 'as long as [name of company] prospers, our collaborators will prosper', a national government representative noting the value of 'sharing all resources in the best possible way.'

In discussing their financial, technical and pragmatic motivations for engaging, some interviewees discussed wider social and environmental incentives flowing from involvement in sustainability projects. Some interviewees also illustrated that practical and more transcendental drivers motivated them to participate in sustainability initiatives. Here, transcendental drivers refer to those that go beyond the daily, concrete, material or technical drivers. A majority saw good environmental outcomes closely related to a solid social collective dimension. One packaging manufacturer commented, 'there is no greater satisfaction when the work is to help the environment' and added that his company looked to 'harmonise this society in which we live, harmonise it with the environment.' The interviewees often framed the environmental and social dimensions of sustainability projects in terms of living a more purposive life, a representative of a cooperative of waste pickers commenting on her individual experience in recycling, '20 years ago, I did not know anything about the job and when we set out to create [name of cooperative], this got under my skin. It went from my degree project with which I intended to graduate as a business administrator to being my life project.'

Some interviewees were more focussed on their individual wellbeing when describing their motivation to collaborate in sustainability projects, with one waste processor commenting, 'my greatest concern comes from total and absolute selfishness and, it is, that I have to live in this world and I prefer to live in a healthy world.' However, it did not exclude the possibility for them to be aware of the relevance of the wellbeing of others, their motivations going beyond self-interest and being largely future-oriented. The same waste processor continued, 'if I do a transaction, what will I leave to my son, on which planet they will live?' Linking their involvement in sustainability projects to the well-being of others introduced a dimension of collective altruism for many interviewees, as Blok, Wesselink, Studynka and Kemp (2015) discuss concerning pro-environmental behaviour. Here, a waste processor connected 'transcendence and what one is generating in a society' to the positive outcomes possible in effective waste management. The interest in others' well-being went beyond family and close friends, a consultant reasoning that 'our actions do not affect the quality of life of others in social, economic and environmental terms. It is a matter of acting so that we all have the same possibilities… to develop our actions', a representative of a waste picker cooperative with a sense of transcendence similarly arguing involvement in sustainability initiatives was a way for societies to 'continue to grow but in a fair way with the environment.'

The interviewees' tendency to care about others or the environment revealed the presence of higher-order, less pragmatic, individual motivations when engaging in sustainability projects. Many interviewees expressed a motivation to satisfy profound non-material needs through such involvement, a representative of a waste picker cooperative linking this to the importance of having 'emotional stability in terms of being able to face day after day.' A representative of an industry association described his motivation to be involved in sustainability work, observing 'I have always tried to maintain a certain integrity in my personal life mixing a little of everything, both in the family, personal, intellectual, work, even leisure and sports matters.' In commenting on the pursuit of a balanced life, he noted the relevance of satisfying individual needs to be best positioned to work on sustainability projects that benefitted others, with other interviewees seeing work in sustainability as allowing them to transcend and feel part of a bigger picture in contributing to the well-being of their society.

For some, this feeling of making a combined environmental and social contribution served as a call to action, a waste processor reflecting, 'I am very concerned about my city. I am very concerned about my country. I am very concerned about the world.' In feeling they could transcend and be part of something bigger than themselves through their involvement in sustainability projects, a manufacturer of packaging observed that this was a strong motivation to improve the performance of the waste management system, seeing him comment, 'we want to be an active part of this issue, which we think is very important for the matter of the economy of plastics.' In underscoring the importance of satisfying non-material needs, many interviewees reported that participating in sustainability initiatives increased their personal and organisational/collective esteem, receiving public recognition for a commitment to sustainability being an important motivator. For some interviewees, positive emotions and experiences reinforced their commitment to sustainability, the recognition received to date spurring one manufacturer to want to move into a leading position in the plastic packaging waste management system in Medellín.

The interviewees revealed a diverse range of drivers to get involved in sustainability projects, as illustrated in **Table 23**, making it more difficult to find common ground in sustainability projects that could facilitate trust-building and engagement.

Table 23. Diverse drivers to engage in sustainability initiatives

Category	Sub-Category	Description
Scope	Individual	The wellbeing and the satisfaction of needs of a single person or organisation.
	Collective	The wellbeing and the satisfaction of needs of a group of people or organisations.
Type	Pragmatic	Technical, practical, material and financial motivations to engage in a sustainability project.
	Transcendental	Non-technical, non-material, social, environmental and purposive motivations to engage in a sustainability project.

Stakeholders' asymmetrical and subjective needs and priorities add tensions and obstruct stakeholder engagement in sustainability projects

As set out in the section above, the interviewees discussed varied motivations to engage in sustainability projects, these ranging from the pragmatic, financial and technical to the non-material and transcendental. In doing so, they revealed a conceptual division between material and non-material needs underlying stakeholder behaviour and decisions when engaging, in line with the work of Max-Neef (1986) and Maslow (1943) concerning human needs and motivations. This is not to suggest that most interviewees were unconcerned about satisfying their most fundamental and immediate material needs through involvement in the plastic packaging business ecosystem in Medellín, a consultant commenting that she could not prioritise higher goals in her work in sustainability over 'the simplest things to live, which translates into shelter, food and clothes.' However, the interview findings indicate that observing this distinction in understanding stakeholders' perceptions of engagement is important to better understand their engagement.

Some interviewees observed that for stakeholders with the lowest level of agency in the system — the waste pickers — their relationship to material needs as a motivation to become involved in the waste management process had changed over time. One representative of cooperatives of waste pickers commented on a waste picker 20 years ago, 'if you asked a waste picker why he recycled, he answered 'because I have to eat or because I have to bring food to my children." By contrast, a colleague argued that some waste pickers are in a good financial position today to pass up additional opportunities to participate in waste management initiatives. She related how when she told some waste pickers that she had secured an agreement to increase the scope of their waste collection, they had turned her down, explaining, 'with what I earn, I already have enough to pay for

the room today and eat.' In concluding that some waste pickers are 'not interested. They reach a comfort zone and do not want to move from there' this interviewee showed how diverse stakeholders in the business ecosystem operated according to different needs, which can extend to the unproductive judgement of others.

In discussing the needs motivating stakeholder engagement, most interviewees saw the waste pickers as the most disadvantaged group in the business ecosystem, as noted by Superintendencia de Servicios Públicos Domiciliarios and Departamento Nacional de Planeación and Universidad Nacional de Colombia (2018). A representative of a cooperative of waste pickers argued a waste picker 'is the one who does the most difficult task but is the one who earns the least.' As the lowliest contributors to the plastic packaging business ecosystem, waste pickers were seen as the most buffeted by business conditions and relations. A national government representative acknowledged that 'some stakeholders are very vulnerable.' Despite some observation that waste picking was a somewhat less financially precarious activity today, a representative of a cooperative of waste pickers noted waste pickers' lack of scope to make free decisions to participate in recycling, observing, 'hardly anyone chooses to be a waste picker. You become a waste picker due to many circumstances in life. For those who fall into addiction and then go to the streets, the first thing they find to recover is recycling.' Another representative of a cooperative of waste pickers described waste picking as the only means of financial support for many Colombians, especially those forced to leave their region for the cities, explaining that once these internal economic refugees 'arrive in a city, the first thing they do is pick up a bag and go out to collect bottles.' Yet for several interviewees, the situation of the waste pickers was simply the most graphic illustration of power relations in the waste management business ecosystem, seeing them argue that the relative scale and power of stakeholders largely determined access to new business opportunities for some while stifling growth for most others. A waste processor commented that, compared to some, 'other stakeholders have much more influence, financial muscle and recognition.'

The precarious financial situation of many Colombians was seen as a significant barrier to the success of sustainability initiatives on the part of the interviewees. For some, this demoted waste management to the status of a non-essential activity for many Colombians, a local government representative explaining, 'there are people in very complex social conditions and, sometimes, the last thing they are thinking about is how they sort their

waste if they sort it well or not because they are thinking only a day-to-day basis.' A consultant concurred, noting that 'if one does not have their basic needs resolved, then one cannot think of changing the world, because the first thing you have to solve, the first thing is to eat.' In discussing the challenging social situation in Colombia and the harsh financial conditions many people and organisations face, some interviewees saw this as a hurdle that simply had to be factored into the operation of the waste management system, a representative of a cooperative of waste pickers arguing, 'poverty will always be there. It seems there is a very marked imbalance.' In commenting on the challenges faced by the most vulnerable stakeholders, some interviewees argued that this made their difficulties seem less onerous. A representative of a cooperative of waste pickers observed that 'when I live in everyday life, with the socio-economic realities of a population as vulnerable as waste pickers, one inevitably makes the comparison. I feel privileged.' The feeling of being privileged was shared by other stakeholders, a representative of another cooperative acknowledging her good fortune in comparison to others: 'I could have four or five pairs of shoes, but when I came to the cooperative, I saw that the shoes people regarded as new, were those they found in the recycling.' She then started 'to think differently' about her situation, seeing herself as being lucky relative to the situation of others.

Perceiving relativity in stakeholder needs was common across the interviews. For example, although the waste pickers were recognised as the most vulnerable group of stakeholders, this did not mean they were a uniform group which made it more difficult for a diverse network of stakeholders to engage in sustainability projects to comply with a standard norm. A representative of a cooperative of waste pickers explained that 'there is the waste picker who is disciplined, hard-working and committed and there is the waste picker who does the minimum and, if he gets food, well, he stays with that and he also tries, like other associations of people, to seek help from the government.' The interviewees' perceptions of the relative needs of system stakeholders revealed how needs satisfaction could be dynamic rather than unilateral. For example, a local government representative observed their experience during the COVID-19 pandemic, 'one of the important analyses that I believe this situation has left us with is to see how often we believe we need more than what is really needed.' Several interviewees reflected that access to abundant material means did not equate with a fulfilling or happy life, a representative of a waste pickers cooperative arguing that a more meaningful life today might involve 'avoiding as much as

possible using or consuming things that are not so necessary.' At the same time, a consultant similarly called for moderation in 'additional' needs.

For some interviewees, needs satisfaction was wholly subjective, whether material or non-material, similar to what Desmet and Pohlmeyer (2013) discuss about human well-being. A representative of a cooperative of waste pickers commented, 'I am a woman from a low-income family, but I never lacked for anything… Materially, I have nothing, but I do not need it. My priorities are others.' Similarly, a local government representative argued, 'personally and even though I am not a billionaire, far from it, I think that, fortunately, I have my basic needs and even more so, I have them satisfied.' While illustrating the richness of the interview participants' thoughts and feelings about needs satisfaction, their various positions demonstrate the difficulty of finding common ground in sustainability projects. Regional differences were also raised by the interviewees as blocking Colombia's conversion to a circular economy. Although Resolution 1407/2018: Extended Producer Responsibility in Packaging presented a transition scheme for achieving this, as with most Colombian sustainability legislation, the norm takes a broad-brush approach that does not factor in conditions at the local level. Regional differences mean that some stakeholder organisations are less capable of adapting to the requirements introduced in Resolution 1407/2018, jeopardising their initiatives and viability. The interviews showed this disadvantage to be amplified when a stakeholder organisation depended on others in the system or some aspect of its involvement in the system, a waste processor commenting about buying and selling waste, 'the first echelon in the chain is the waste pickers, who collect, store and sell it. They depend on the amount of generated waste, what the industry buys and its price.'

Dependent relationships were seen by some interviewees as creating a vicious cycle of effects acting against change, a government official explaining, 'if we are now going to put in place the best technologies to recycle plastics, it could be that we will end thousands and thousands of people's incomes.' In moving to a more sustainable society, a representative of a waste picker cooperative argued that for the plastic packaging business ecosystem to function effectively, some marginal businesses would require external resourcing, the vagaries of Colombian politics making small businesses vulnerable. He observed that for organisations already starved of public support, there might be 'a change due to political circumstances and the organisation dies, goes bankrupt or disappears.' A representative of

the industry association argued there had been a failure to consider the full implications of the unilateral imposition of Resolution 1407/2018 on the part of the government:

> The OECD talks to the Colombian ministers about the creative destruction of employment. It is to end jobs in industry 'X' to migrate to another industry, more friendly to the environment than they are currently doing. For example, with coal or plastic. But in Europe, they have unemployment subsidies and some investments to generate new jobs in wind energy and solar energy and a thousand others. Colombia does not.

Many interviewees argued that the obstacles to business survival were more significant for SMEs, as illustrated by Dini and Stumpo (2018), a consultant arguing about her organisation, 'it is still tiny. There are still very, very difficult decisions to make, especially in these conditions that we are in.' For many interviewees, local factors made it much harder for smaller organisations to experience fair competition than larger ones. One waste processor observed how some large organisations can manipulate the system to their advantage, describing how 'the monopoly that sets the prices of the large companies, such as those that handle PET, plays with the price at will, leaving the waste picker completely unprotected.' For an employee of a food manufacturer, the financial precarity of the business ecosystem underscored the unbalanced conditions for many system stakeholders, posing additional challenges for implementing sustainability initiatives.

The challenges in implementing sustainability projects were described as suffocating some stakeholders' commitment, a consultant observing, 'businesses continue to be reluctant. Firstly, because the environmental issue has always been seen more as a tax burden than something that creates long-term profitability.' A national government official described how in Colombia committing to long-term sustainability goals seemed 'much more difficult than in some other countries' because 'Colombia has a larger gap, the largest economic gap in all of Latin America.' The economic gap dragged on the success of organisations and the possibility of maintaining long-term sustainability efforts, seeing a food manufacturer representative comment that 'there are many initiatives that need a tenacious push.' However, for a representative of an industry association, only the largest businesses had the resources to be tenacious and adopt a 'long-term vision.' Yet other interviewees argued that an expedited transition to sustainability was the only solution to the survival of people and

the planet, one consultant commenting that 'being sustainable also implies that it can be achieved in time.'

Differing perceptions of the urgency of engaging in sustainability projects added pressure to the operation of the plastic packaging waste management system, one consultant noting, 'there will always be people who will have disagreements, who think we should expect more, not just financially.' The disparity between legislative objectives and stakeholders' differential perspectives and situations suggests naivety on the part of the government in achieving legislative compliance in both the medium and long term, the same consultant arguing that for them, sustainability involved 'thinking about the current and the future collective.' Some interviewees stressed the importance of short-term objectives, a public utility representative contending that working in sustainability meant satisfying 'the present's needs without compromising the capability of future generations.' By contrast, a national government representative stressed taking a long-term view so that 'future generations can live like us.' To achieve this outcome, however, a packaging manufacturer argued would require 'the responsible management of the resources we currently have so that in the future we can count on them as we are doing today.'

The tension between timeframes for stakeholders in achieving sustainability goals suggests why many stakeholders in Colombia tend to seek short-term benefits when engaging in sustainability projects. For one waste processor, 'we in Colombia are very immediate. We want to start a company and that, after two years, it becomes very profitable.' Confirming this impulse to achieve fast results, a local government representative perceived that 'the gradualness that waste management requires might be a little slow for what we would like.' However, for a representative of an industry association, building collaborative relationships and strengthening trust, especially when adapting to system change, 'is very time-consuming and complicated', a representative of a cooperative of waste pickers similarly describing it in his experience as 'a complex and time-consuming process.' Expecting successful project outcomes in the short term, particularly factoring in stakeholder perceptions and behaviours, could frustrate some stakeholders when changes do not happen as expected. A representative of an industry association illustrated this with an example of cleaning beaches, saying that sometimes one 'did a cleaning activity and one feels good and says, 'Well, cool'. However, I do not know, after six months, maybe that beach is the same. So, sometimes it is a bit frustrating.'

For some stakeholders, pursuing short-term benefits leads to a Catch-22 situation where long-term initiatives that could improve the packaging waste management system were neglected or wholly overlooked. An industry association representative argued that in terms of compliance with Resolution 1407/2018, what the government was expecting 'has been a very, very accelerated process of adjustment within the industries and the industry association'. A local government official stressed the need for a staged approach to the achievement of ultimate goals in sustainability projects, arguing that the government typically ignored the need for long-term time frames because 'for the governing official, it is within short periods that they need to show some stronger and more solid impacts.' A local government representative argued that for waste management business ecosystems to flourish, education around cultural change was often the missing ingredient in terms of sustaining outcomes while recognising that these 'are long-term issues that in a period of administration are not very measurable and which then do not attract much attention.'

In scenarios where complying with government legislation was difficult to the challenges described in the previous paragraph, some stakeholders simply did not want to collaborate, especially those with more power, an industry association representative recognising that 'sometimes, you have huge companies that want to do things on their own.' Acting without considering the impact on others was frequently identified as jeopardising project success in raising suspicions about the goals of some stakeholders, an industry association representative noting that 'their highest clients in the private sector want to be ministers, so they ingratiate themselves with the current government.' There was also a strong perception of collusion between the government and some stakeholders to rig the system, a representative of a cooperative commenting that 'when Decree 596/2016 arrived, many waste picker organisations emerged. However, it was a lie. They are not waste picker organisations. They only show up when the issue of tariffs [for processing waste] is discussed.' The interviewees argued that while they themselves preferred to follow ethical principles and work within legal frameworks, overwhelming financial and social pressures meant that some stakeholders sadly involved themselves in unscrupulous or outright illegal activities. For a representative of an industry association, despite the suppression of drug trafficking in recent years, 'in Colombia, the possibility of making easy money still exists.'

Given the ethics, financial and compliance challenges in sustainability projects, one waste processor described the effort to stay in business as 'a constant struggle' and another as a

'fight.' A third waste processor described the financial pressure as constant, commenting, 'the last thing that comes is money and that financial tranquillity. Let us say that I confess to you within these spaces… for how long, I have been getting into it, staying up late, getting up early.' Only by making constant adjustments to one's need and expectations did business survival seem possible to many of the interviewees, a waste processor commenting, 'if it were not for the fact that we have made the sacrifices we have made, we would not have what we have', as also illustrated by Chaves Villegas (2016) in her work about collaboration in sustainability projects in Colombia. The marginal scope for profit made business expansion fraught for this interviewee, seeing him comment, 'what do I do? What do I do? Do I sell the car? Do I sell the van? Do I get into debt?' A lack of access to financial and other forms of support from the government exacerbated this stress, often requiring needless ingenuity, with this waste processor adding that if 'I cannot buy a washing machine [for processing plastic waste]… I look for the scrap dealer who charges me little for welding. I end up developing a machine in a year when [the government] have them in stock.' For many interviewees, if the government declared an enduring commitment to existing sustainability ventures, this would give them greater confidence that their short- and long-term goals would be fulfilled. Only time will tell if the incoming president and vice-president can change things here.

The interviewees discussed how the differentiated and unbalanced needs, capabilities and power affected their priorities when participating in sustainability projects, making it more difficult to build trust and engage with others. **Table 24** summarises the critical aspects that made collaboration in sustainability projects to comply with government legislation more difficult.

Table 24. Barriers to better trust-building and engagement dynamics (1)

Diverse, subjective and asymmetrical needs, capabilities and power.
Diverse, subjective short- and long-term priorities and urgencies.
Constrained freedom to make long-term decisions.
Unbalanced dependence relationships.
Tensions and pressures on the stakeholders.

Poor government intervention and communication between stakeholders block better collaboration to engage in legislative compliance

For the interviewees, the government added friction to the operation of the plastic packaging waste management system by intervening in paternalistic, populist and inconsistent ways that failed to accommodate the complexity of stakeholder circumstances or relationships, ensuring there was no possibility of fair handling when it came to compliance, thereby adding worries to people's lives. For example, the government segments the Colombian population into a six-level strata scale based on income and other demographic variables, assigning people to strata one if they have the least income and access to resources than the rest of the population and assigning people to strata six if they have the most income and access to resources by comparison to the rest of the population. Yet for many interviewees, this process was a poor indicator of how people lived, an academic arguing that 'depending on where you live, it is the strata. You can live in strata six and be very poor.' She noted that some people in higher strata did not receive government subsidies despite not being wealthy: 'There is help for strata 1, 2 and 3, which are the poorest, the ones needing the most. Strata 4 is an intermediate level. In other words, we are not poor, but we are also not rich.' She stressed how this imbalance impeded the success of waste management initiatives: '80% of the population of Medellín lives in marginal neighbourhoods. They do not have the things they should for a decent life. In that sense, asking them to positively respond to environmental education is difficult.'

Although some interviewees acknowledged opportunities to receive government support to improve their performance in response to managing plastic packaging waste, many observed how challenging it was to see the government as an ally. Different interviewees saw the government norms as unfair in not considering the diversity of stakeholder needs and circumstances. Some interviewees reported that they struggled to meet legislative requirements, feeling the government focused only on punishing stakeholders instead of helping them comply. A waste processor provided the example of tax payments, commenting, 'as a businessman, we find ourselves quite abandoned because the treasury feels very comfortable with tough punishments for late payments.' A national government representative observed that in Colombia, 'we lack sufficient public policy based on social inclusion.' If the expectation were for a genuine circular economy, a representative of an industry association called for 'truly fair, timely, balanced, efficient, effective laws.' A waste processor similarly that for a sustainable economy and society in Colombia, 'the State needs

to create clear policies that are easy for individuals to comply with.' Without such conditions, a representative of an industry association argued that it was hardly surprising that 'there is widespread nonconformity in the Colombian business sector.'

Within that nonconformity, many interviewees perceived that corruption was endemic in political institutions in Colombia, with an industry association representative referring to the 'corrupt political class.' A local government representative acknowledged that 'unfortunately, the public sector generates that perception. There is not much trust.' Politics was not the only segment of Colombian society seen as corrupt, an industry association representative observing that in 'the private sector, obviously there are also corruption issues.' For many interviewees, the prospect of being caught up in suspicious or illegal activity made them reticent to become involved in new business opportunities. A waste processor explained the nature of this problem, observing, 'they tell you: 'I assure you I can get you a portion of money through 'X' individual, but remember that you must give something back." He reported that he would almost surely lose the business opportunity if he rejected paying an inducement. The sense of Colombia as a corrupt society contrasted with the interviewees' sense that in their business dealings they operated ethically and within the law but were suspicious of the position of others. Representatives of two different waste picker cooperatives noted their scepticism at the statistics reported by other organisations. One argued that some waste collection organisations were 'reporting amounts of material they obviously did not capture.' Worse, the other representative argued that falsified performance results meant 'an important part of the resources being collected are not reaching waste pickers.'

In building a picture of the corrosive influence of manipulated data in a context with poor or no accountability for shared information, one packaging manufacturer commented, 'the figures with which we work … say, 17 per cent, 9 per cent of recycling, I think this is not a reality.' Local factors were seen to magnify these effects, a representative of a waste pickers cooperative contending, 'recycling has been 'borrowed', becoming part of all the grey issues of money laundering', with the effect of reducing any trust in the performance of the waste management systems in Colombia. Historical problems also make it difficult to have faith in the integrity of information passed between stakeholders. An industry association representative noted how Colombia's painful history of drug trafficking had complicated trust-building, describing it as the 'hidden scourge buried underground.' The

lack of trust in the waste management system made some interviewees worry about the scope of successfully navigating their involvement in sustainability projects. A packaging manufacturer voiced his fears about the lack of transparency in certifying recovered waste as set out in Resolution 1407/2018: Extended Producer Responsibility in Packaging, commenting, 'I am very concerned with this resolution, associated with the issue of circular economy, the issue of transparency in materials when talking about recyclability and talking about packaging safety.'

For stakeholders, the lack of credible, accessible information prevented them from understanding the basis on which they would be engaging in a sustainability project, one packaging manufacturer arguing there was 'such a lack of information for people or companies it stopped everyone from doing more things.' Perceptions of a lack of credible, accessible information were not all related to corruption. The interviewees also raised the issue of poor communication between stakeholders, a representative of a cooperative of waste pickers arguing, 'many of the activities are not disclosed, so, unfortunately, they lose relevance.' A few interviewees argued that information dissemination around the genuine performance of waste management was critical to fostering both stakeholder and public investment in recycling. A representative of a public utility company observed that publicising the achievements of the plastic packaging waste management system in Medellín would strengthen the stakeholder commitment to heightened performance in waste management. A consultant argued that broadcasting the science around effective waste management was equally important, discerning that 'if there is no dissemination of science to the rest of society… nothing will be done.'

In the face of challenges in information sharing, a packaging manufacturer observed that Resolution 1407/2017 had made very little difference, seeing him comment, 'I still do not see an organisation showing results at a substantial level.' Some interviewees argued that legal and technical factors also had an impact on information sharing, a representative of an industry association noting that 'obviously, other companies do not come to share information on the latest development, because they are subject of intellectual property constraints.' A waste processor reported his experience of others stealing information from him, describing it from some Colombians, 'as a way of doing business, it is an idiosyncrasy that we have.' In other cases, poorly developed communication strategies in the dissemination of information, especially to those who needed to be encouraged to recycle

to make the system work increased confusion about how to act, a sustainability academic venting his frustration over unclear messages around sorting waste, contending that 'even I do not understand the signage. I do not understand the criteria for separation.'

The interviewees saw the lack of clear information from all levels of government as damning. One packaging manufacturer argued that some government institutions were 'politicised', a perception of secrecy and conflict of interest making stakeholders dubious about government communications and information, including whether the information was often deliberately withheld from general distribution. Another packaging manufacturer expressed their doubts over the publicisation of the information provided concerning the pilot projects that had been used to test Resolution 1407/2018 compliance, observing, 'of those pilots, well then, I do not know if the information is hidden, or it is not at everyone's hands.' Conflicts of interest were also seen to pervade the technical justification supporting government decisions, a consultant arguing, 'in the public sector, there are many interests involved. There is always a political interest' casting doubts about what motivates the decisions made by government officials.' A packaging manufacturer concurred, explaining that it was difficult to trust 'certain senators or members of the House of Representatives because one knows they have more political interests than the scientific studies they use to support their decisions. In fact, they never show them.'

Suspicion about the motives behind the government's actions and decisions was attributed to 'populism' by a representative of an industry association. He argued that making decisions to please a perceived majority of citizens was far more common than basing decisions on technical criteria, meaning that 'decisions are made without thinking very well and consulting you [as an expert].' A packaging manufacturer concurred, observing that 'there is always the risk that decisions will be made on a populist base and not on scientific grounds.' Worse, a representative of another industry association argued that the government's populism subverted sustainability efforts, commenting, 'we are in a situation where sustainability rests on a populist speech.' For some interviewees, populism in government decisions also influenced how the government sought to control stakeholder behaviour. Here, the same representative of an industry association saw populism as skewing government decisions around which groups had to change their waste management behaviour, citing as an example, 'the inability of Colombian government officials to make the unpopular decision to punish those who do not sort at the source.'

For many interviewees, the Colombian government had ignored what stakeholder groups had to say about Resolution 1407/2018, a situation that has happened before in Colombia (Rodríguez Becerra, 2009). This neglect fed suspicion about what was behind government decisions in designing sustainability standards. A packaging manufacturer observed that 'they do not listen when they make decisions … We do not know the technical criteria they use because the decisions that are made are often seem to be simply politically convenient ones.' The interviewees were critical of the extent, complexity and inconsistency of government legislation, Resolutions 1407/2018 and 1342/2020 being the latest instances of legislation in this case requiring them to reorganise their practices and adapt to change, making change seems to be the default position. A representative of an industry association expressed his deep annoyance with this pattern of constant legislative changes, remarking that people in the government 'do not have their feet on the ground. They are not acting in consideration of what is happening in reality.' The feeling that the government ignored technical and social factors affecting stakeholders on the ground was shared by a packaging manufacturer, who argued that in making decisions about environmental legislation, 'normally, they do not rely on scientific data. [Sustainability legislation] has become a topic linked to marketing and advertising.' It is thus not surprising that a waste processor declared, 'the great decision-makers of this country are generalists, that is, a sea of knowledge one centimetre deep. Everyone knows everything, but no one knows anything, and no one has studied anything.' A consultant thought that 'you can find slightly more qualified profiles in the private sector than in the public sector.' However, this minor difference was not enough to convince organisations to commit to sustainability projects, a clear, data-grounded, consistent policy framework being needed to make confident business decisions.

For many interviewees, the government's intervention in proclaiming Resolution 1407/2018 appeared wrong in most scenarios, its general mismanagement of policy and programming reducing the possibility of a positive impact on the performance of individual stakeholders and the waste management system overall. For one waste processor, the funding provided to system stakeholders by the government seemed to be frequently misdirected, diminishing its impact, seeing him comment on the selection of government funding beneficiaries, 'the government pays and does consider a generalised criterion, which really impacts collection.' A public utility representative similarly noted that the resources to cope with waste, 'are managed in an inadequate way given the few resources

allocated to the activity [we operate] under a poor context in terms of regulation, tariffs and environmental concerns.' Government mismanagement was attributed to the depth of the perception of government ineffectiveness, which was attributed to short-term thinking, a third waste processor arguing, 'governments, because they are temporary, do not work in an articulated manner.' Even a local government representative acknowledged how government actions in Colombia often worked to block the development of sustainability initiatives. She compared the support provided by a foreign government to sustainability programs to what happened in Colombia in equivalent projects, commenting, 'there was a very significant contribution from the State, which, here, truncated any possibility of developing this initiative.'

Poor government action was also raised as an issue by the stakeholders when the government sought to enforce legislation, this ineffectiveness discouraging stakeholders who wanted to do the right thing from proactively complying with sustainability-related norms. A few interviewees gave examples of poor legislation enforcement as a barrier to compliance with Resolution 1407/2018. A representative of a cooperative of waste pickers described the government's inaction when stakeholders report suspicious activities, observing that government agencies are usually already aware of doubtful happenings, their response being 'yes, we are already monitoring them', but nothing happens, as if their hands were somehow tied. A national government representative provided three examples of the 'lack of implementation and control and monitoring.' On the lack of control mechanisms, she commented, 'if people do not comply with it, there is no fine in 1407.' Of the lack of government enforcement skills, she noted, 'in 1407, some studies say there are 400,000 companies. How will the government review the plans of 400,000 companies? In practice, it is not possible.' She also apportioned blame for the lack of observance on the unsophisticated nature of some stakeholders, arguing of waste pickers that 'policies do exist, but in practice, the guy is still here with a tricycle going house to house' picking waste. She thus strongly questioned the tendency to keep adding to Colombia's sustainability legislation, commenting, 'if you get rules for getting rules and you know that it is not possible to implement them, then think again.'

For the interviewees, more thought was needed before Resolution 1407/2018: Extended Producer Responsibility in Packaging was promulgated because it only seemed to exacerbate the existing imbalance between stakeholders in the plastic packaging waste

management system because. A presentative of a public utility organisation argued, 'intermediaries and retailers are the ones who make the least effort, manage the market and have the bargaining power, low investments, low risks, greater profit.' Other interviewees argued that Resolution 1407/2018 favoured the already advantaged, this being huge private companies. A cooperative representative of waste pickers argued that 'in Medellín and Río Negro, private companies are taking over recycling that for years has belonged to waste pickers.' A waste processor explained how the waste management system was increasingly stacked against the least advantaged due to the disparity of resources between stakeholders, the ability to record company performance being an example, seeing him comment, 'the big companies that are capable of reporting are the ones that report, charging much money [for their performance], but in reality the people who should be receiving [recompense], they do not have what is needed because they do not have that infrastructure.'

The disparate circumstances of stakeholders looking to comply with Resolution 1407/2018 were also seen by the interviewees as a problem in relation to a perceived lack of clarity in information about compliance, even after issues with Resolution 1342/2020 were addressed in Resolution 1407/2018. The lack of clarity was seen as mainly evident in two critical ways. Interviewees found the information inconsistent, a representative of a cooperative of waste pickers observing, 'as always happens, the first question people ask is 'and where did that information come from?'.' Interviewees also doubted the transparency of information, a packaging manufacturer pointing to confusion for the consumers around what to do with plastic packaging due to false or misleading information on food packaging, seeing him comment, 'I am very concerned about this resolution about the issue of circular economy, the issue of transparency in materials when discussing recyclability and safety.'

Many interviewees expressed confusion about their role in the plastic packaging waste management system, clarity being critical when assigning and monitoring responsibilities and holding stakeholders accountable. A food brand manufacturer wondered who companies should collaborate with under Resolution 1407/2018, commenting on behalf of waste processors, 'me, as a processor, to who do I assign how much of what I transform in my plant.' She was also unclear about the process of certifying recovered waste, a requirement of Resolution 1407/2018, inquiring, 'who will certify the tons collected? Is it going to be the waste processor? Will it be the collective?' A food manufacturer had many

lingering questions about the operation of Resolution 1407/2018, including in relation to pilot projects, commenting, 'we do not know where it will be if it will be an independent entity or if we will do it through [name of industry association].' Some interviewees were unclear about how to qualify for registration under Resolution 1407/2018, a packaging manufacturer noting the challenge of finding 'the information for all that regulation and how then, how do you become a manager?'

The combination of corruption, populism, poor government policy and oversight eroded the interviewees' confidence in the obligations established by Resolution 1407/2018, including those forcing collaboration. Yet there was little consensus among the interviewees as to whether compulsory or voluntary compliance with recycling legislation would result in a more effective plastic packaging waste management system. Some interviewees criticised the government for adding more compulsory requirements through Resolution 1407/2018. One waste processor commented on Colombia, 'this is the country of prohibitions', seeing sustainability regulation as forcing behaviour change to suppress people's autonomous motivations to act sustainably. While acknowledging it was not an ideal strategy, a representative of a cooperative of waste pickers commented, 'Decree 596 of 2016[3] has made a big change because now, it is an obligation for the municipalities to recycle. Then — it is sad to say it — but when it is an obligation, I must do it.' She felt that mandating behaviour could risk people's genuine long-term commitment to sustainability. The uninspiring way in which politicians and government agencies instigated sustainability measures made her doubt whether their interest in driving sustainability was authentic:

> Too much has been lacking… most government officials think that door-to-door training with a boy or girl they hire for two or three months, who knows nothing about waste, is simply fulfilling an obligation to put a sticker on the door and say that that person is trained.

Most interviewees felt that affording greater freedom in legislative compliance would improve the effectiveness of the waste management system in Medellín. Contrasting the generally oppressive framing of sustainability legislation in Colombia, a representative of an industry association spoke of his experience travelling in Europe, commenting, 'it seemed wonderful to me to realise that the feeling of freedom and democracy there was

[3] This Decree looked for formalising waste pickers, among other goals for improving waste management.

not a hymn to the flag, but a reality.' Other interviewees reasoned that having individual freedom to decide to engage in sustainability initiatives would increase Colombia's sustainability effort. The interviewees illustrated how the challenging access to reliable, clear and consistent information added barriers to better trust-building and engagement in sustainability projects to comply with government legislation. **Table 25** illustrates the main barriers the interviewees found when looking to make better-informed decisions when engaging in sustainability initiatives.

Table 25. Barriers to better trust-building and engagement dynamics (2)

Category	Description
Government Related	Lack of connection with reality, forcing to comply without considering the nuances of the stakeholder conditions, and unfair norms.
	Corruption, politization and inconsistent, unclear and dubious information.
	Extent, complexity and ineffectiveness of government enforcement.
	Paternalism and populism.
Generalised	Lack of credible information, poor communication and secrecy.
	Conflicts of interests, suspicion.
	Drug trafficking.

Cultural barriers and the complexity of the plastic packaging waste management system make trusting others more complicated

Most interviewees attributed the complexity of the plastic packaging waste management system in Medellín to the diversity of stakeholders contributing to the system, their disparate characteristics, when not addressed by the government, leading to power imbalances and stakeholder disconnection that disrupted the operation of the system. Some interviewees highlighted the disconnection between system factors and the satisfaction of the needs and goals of individual stakeholders. A packaging manufacturer explained, 'I believe that globally almost nobody could say that they have all their needs [satisfied] because many are related to the environment, safety, health, development and they are inevitably collective and affect one as an individual.'

In navigating the complexity of sustainability projects in the context of Medellín's plastic packaging waste management system, several interviewees discussed how complexity created inherent uncertainty in the system, which impacted stakeholders' viability, a representative of a cooperative of waste pickers observing, 'nothing is stable. Nothing is

ensured. Nothing is static.' A national government representative argued that system complexity was exacerbated by the nature of life in Colombia according to which 'having your plan, having your life, I think it is challenging.' She gave an example of her organisation, commenting, 'here, things always happen at the last minute whereas in other countries you can program everything with great certainty because people know that you arrive on time. Here, it is impossible.' The risks linked to system complexity and the need to rapidly adapt added extra pressure on stakeholders, especially the less well-resourced ones who could not cope with the speed of change, leading to unfair competition. The volatility of the prices for recovered materials was identified as a factor impacting business stability, with a representative of a waste pickers cooperative commenting, 'today cardboard is worth five pesos but tomorrow, three.'

The COVID-19 pandemic amplified the perception that engaging in sustainability projects linked to Medellín's plastic packaging waste management system would only face greater hurdles in future, a waste processor commenting, 'the road looks tough and even more with this impasse of the pandemic.' A packaging manufacturer concurred, observing that, 'this situation that is happening generates much uncertainty.' For some stakeholders, a shared experience of complexity and uncertainty in the system increased the sense of solidarity between some stakeholders, a waste processor commenting that in Colombia, 'we go through the same jobs, problems and uncertainties, family issues.' The interviewees felt, however, that there were limits to strengthening relations between stakeholders in the plastic packaging waste management system due to entrenched cultural barriers that negatively affected trust. A national government representative made an analogy here with the example of a love relationship between individuals in which jealousy and suspicion lead to the destruction of the relationship. A waste processor drew attention to prejudices against waste pickers, as also noted by Ezeah, Fazakerley, and Roberts (2013), remarking, 'is the recycler not well seen by society? He is not.' A representative of a waste pickers cooperative argued that prejudice was personally crushing for waste pickers, but also affected the success of Medellín's plastic waste management system, seeing him report, 'a waste picker does not greet someone on the street, not because, as I say, he is drugged, stoned or drunk, but because there is a decisive cultural issue of stigmatisation and rejection that makes him somewhat limit himself to lowering his head and rummage through a garbage bag.'

Suspicion of others caused the interviewees to be cautious in their business dealings, a waste processor noting, 'everyone is trying to knock you down because they know they will never see you again. In other words, relationships are not built, only a transaction.' Despite these problems, some interviewees felt that Colombians were inherently primed to take advantage of an opportunity, a national government representative arguing, 'a Colombian is not capable of saying no!' This sense was not shared by all interviewees, however, a packaging manufacturer suggesting, 'we Colombians are very lazy and we leave the garbage there dripping in the garbage chute', while a representative national of the government representative accused Colombia of 'lacking a civic culture.' For a local government representative, 'to achieve substantial changes, [the government] had to have an even greater impact through culture change and training', a representative of a cooperative of waste pickers similarly noting, 'there is an extensive pedagogy work still to be undertaken.'

In discussing needed improvements to Medellín's plastic packaging waste management system, the interviewees focused on waste pickers as they had in discussing structural issues in the business ecosystem. It was argued that improving the reputation of waste pickers was a critical priority for improving the system, the waste pickers attracting frequent criticism from many levels of Medellín society. A representative of a waste pickers cooperative argued, 'you cannot imagine the problem these poor men have' because other members of society say, 'they smell bad and they do not have teeth, they are seen as if they were thieves.' Due to this intolerance of the waste pickers, this interviewee described how Medellín residents reported them to the police or municipal compliance officers, oblivious of the important waste management work they did, a representative of another waste pickers cooperative commenting:

> Many times, the barrier is purely cultural. Waste pickers are sometimes thought to have very little social value. It is assumed they are all have some kind of addiction but it is not true. Many times, it is purely a matter of perception, a very negative perception of their activity.

Prejudice and intolerance, including the close association of the waste pickers with the problem of waste itself, had been a drag on the system for the representatives of the waste pickers cooperatives who were interviewed, one noting:

> When we arrived 20 years ago to propose to the waste pickers of Ríonegro to organise ourselves into a cooperative. I tell you, it was not easy at all. They thought that we came to take away what little they had, that we would take advantage of them. And, because? Because they had had bad experiences.

The plastic packaging waste management system itself also suffered from stigma, negatively affecting the potential for innovation and improvement. A representative of an industry association commented, 'it is not an easy sector. Sometimes has media attacks us and there is much rejection.' Interviewees discussed the problem of people's rejection of recycled plastics compared to products made of virgin material despite the benefits of recycling. A manufacturer of plastic products described the challenge of even 'convincing our sales force that being recycled does not mean a product is cheap.' A packaging manufacturer observed that although 'recycled plastic existed long ago, it has been undervalued [as a material]. It has a bad reputation.'

The interviewees felt that Medellín's plastic packaging waste management system suffered unfairly from the public's negative perception of the damage of the environmental impact done by plastic products, a representative of another industry association contending, 'we are being demonised and pointed out as an environmentally harmful actor. And we are quite the opposite and we are proving it.' A packaging manufacturer expressed their determination to show people that plastic packaging can be a sustainable industry although, 'unfortunately, the issue of plastic is called the 'Bad guy in this film' but we want to show people that things can be done with this waste.' For the interviewees, properly resourcing environmental measures was affected by such attitudes, with another packaging manufacturer arguing, 'it is easier to blame plastic or another human being or something other than me than to accept our responsibility.'

For many interviewees, conditions endemic to Colombia made engaging and building trust inherently problematic, as illustrated by different local reports (El Tiempo, 2019), a consultant arguing that finding 'an organisation or someone, let us say that one can place their trust in transparently, is difficult.' Many interviewees reported that it was not possible to trust people or organisations outside the family and close friends, a representative of an industry association referring to the 'narco'[4] culture that broke trust across Colombian

[4] A local word to describe the culture around drug trafficking.

society to the extent that 'social capital in Colombia is minimal.' A waste processor explained that trust 'fell apart in the 1980s with the issue of drug trafficking', although he reported that before this Medellín was a place in which people trusted the word of others. For some interviewees, drug trafficking meant that even those closest to them could not be trusted, a waste processor commenting that he found trusting painful, explaining. 'it happened to me with a goddaughter that I put to work in the company and she started stealing from us.' Another waste processor provided insight into how the depth of mistrust in Colombia affected all social relations by saying, 'one is not trusting at once … [in case] your heart breaks halfway.'

In business contexts, trust was an equally fragile quality for the interviewees, typically treated with uncertainty, straining the way business ecosystems worked, with a consultant explaining, 'I work with people I trust. But yes, I can lose it with something very simple' so that she cannot work with that individual or organisation anymore. Engagement and trust-building, she explained, required constant assessments of the trustworthiness of others often being harsh as a self-protection measure. When asked about whom she trusted, a public utility representative hesitated before responding, 'well, it is not that I do not want to answer this, but I do not know how to answer it.' She added that even in the case of NGOs and foundations, you could trust some, 'but not all of them because, as always, there are foundations that might steal the money meant for children.' A representative of an industry association answering the same question exemplified the complexity of building trust by stating, 'I would not say there is more or less mistrust in some institutions than others.' For him, an effect of poor institutional governance combined with corruption, trusting depended on the people within an organisation. He explained that he had had excellent relationships with government organisations, but if the person he dealt with changed, the ability to trust would automatically deteriorate. A public utility representative encapsulated the need to be cautious in extending trust by explaining, 'there are always people you can trust more and people you might not trust that much.'

The interviewees commented on many cultural barriers and complex issues of the plastic packaging waste management system in Medellín, which made building trust and engaging in sustainability projects where collaboration was expected more complicated, as summarised in **Table *26***.

Table 26. Barriers to better trust-building and engagement dynamics (3)

Endemic mistrust and uncertainty
Suspicion and prejudices
Intolerance with and poor reputation of waste pickers
Stigmas against waste pickers, recycled products and plastic products

Some interviewees, however, ventured that maybe trust was not so brittle in Colombia, a waste processor commenting, 'normally, negative things make much noise. So, that is why one sometimes believes that many people abuse trust.' To support the idea that building trust in the plastic packaging waste management system in Medellín was possible, a representative of a cooperative of waste pickers commented on private companies, which often attract immediate suspicion regarding their trustworthiness, 'just as I set aside some companies and declare them *non grata* to our association, we also have other companies that have been total allies in our work and we have to respect them.'

Chapter summary

Chapter Four has established that the interviewees faced four key barriers and challenges that made it complicated to collaborate and build trust in sustainability projects linked to the plastic packaging waste management system in Medellín as expected according to compliance with Resolution 1407/2018. First, the interviewees had to navigate the diversity of stakeholder goals to establish a common ground for collaboration. Second, the presence of unequal or incommensurate stakeholder needs introduced tension into the stakeholder relationships. Third, imbalances of power and weak government intervention made it difficult for some stakeholders to access the clear and consistent information needed to make informed project decisions, some stakeholders' propensity for secrecy, poor government oversight of sustainability legislation and the perception of widespread corruption amplifying this effect. Fourth, the diversity and disparity of stakeholder characteristics and cultural barriers introduced significant complexity into the operation of the plastic packaging waste management system, this effect being intensified by the negative attitudes and prejudices often attached to differences.

If these four effects made collaboration under the expectations of Resolution 1407/2018: Extended Producer Responsibility in Packaging difficult, in discussing their daily challenges, the interviewees revealed that they continuously interacted with the other people and organisations that formed the plastic packaging business ecosystem in Medellín.

In doing so, the case reveals that collaboration, including in the absence of generalised trust is possible. Chapter Five focuses on what drove the interviewees to engage in sustainability projects when the motivation to trust was low and the distribution of power and resources unequal.

CHAPTER FIVE
'STRENGTHENING THE BOND' HELPS STAKEHOLDERS ADAPTIVELY BUILD TRUST AND COLLABORATE IN SUSTAINABILITY PROJECTS

Chapter Five presents original insights into the role of trust as a determinant for stakeholders in engaging with sustainability projects where collaboration is a legislative obligation. The 27 interviews explored the research participants' perceptions of why stakeholders continue to engage in the plastic packaging waste management system in Medellín despite the many obstacles to this due to the interaction of the macro socio-technical context of the case with more local issues and individual stakeholder's values, needs, skills and access to information.

Chapter Five has four interconnected parts. The first section of the chapter examines how the strengths of the local context facilitate stakeholder interaction, encouraging people and organisations to build opportunities and focus their efforts on what works in the plastic packaging business ecosystem in Medellín. The second section of the chapter examines how for the stakeholders, the high priority they give to meeting their needs makes them feel they must continue interacting with others. The third section of the chapter examines how the interviewees overcome local obstructions to find help from people they know and others they come to trust to better inform their project decisions. This section examines the lively process of building trust in sustainability projects. The fourth section of the chapter discusses how the interviewees assess the circumstances for trusting others and collaborating on projects. Here, the interview findings demonstrate three patterns of behaviour when stakeholders build trust, with collaboration meaning more to them than simple compliance with Resolution 1407/2018: Extended Producer Responsibility in Packaging. The interview findings show that unexpected events in the system can prompt stakeholders to build trust and engage. However, they typically adopt a cautious approach to engagement by continuously assessing others' trustworthiness.

Local awareness and attributes foster stakeholder collaboration

Despite the difficulties in building trust for the interviewees, as set out in Chapter Four, all interviewees were motivated to interact with others in sustainability projects. Beyond Resolution 1407/2018 establishing stakeholder collaboration as a compulsory requirement,

the interviewees identified — whether explicitly or tacitly — stakeholder networking across the plastic packaging business ecosystem as vital to satisfy their needs and build their skills and expertise. Some interviewees reported that extensive collaboration was already happening, a representative of a waste pickers cooperative summarising the importance of interacting with others from the perspective of their organisation:

> It is a cooperative that has always had a group of professionals nearby, sometimes an advisory committee, sometimes linked through a contract, but there has always been someone from the social area. There has always been an environmental professional. There has always been someone from the administrative, financial side and we have counted on the people who preceded me [as supporters] who are leading, pulling, knocking on doors. It is a cooperative that has had many ties with academia, not only with you in this project, but with the [name of university] in an electric vehicle development project.

For the interviewees, connecting with others across the stakeholder network was seen to foster new project opportunities, a public utility representative arguing that in the plastic packaging business ecosystem they were 'the service providers, who, in the end, are the ones who may have the highest chance to execute the logistics of collection, transport and sorting.' Considering the available business opportunities, however, the interviewees' differential agency and needs and power presented obstacles to establishing agreements about project scope and priorities. For example, interviewees reported that some stakeholders in the plastic packaging waste management system had no option but to prioritise everyday needs over legislative compliance. In illustrating this, a representative of a waste pickers cooperative described the life of a waste picker, observing he 'lives from one day to another. His life horizon is: 'How do I get breakfast, lunch? Moreover, who knows if I have enough for a room and dinner."

In a network of stakeholders with diverse needs, power and priorities, it is hard to understand why the national government established collaboration as an obligation of Resolution 1407/2018 without considering the nuances of building trust and collaborating in sustainability projects. Here, a representative of an industry association contended, 'do not follow the trend of banning, banning and banning. Start with the trend that we will manage waste to generate employment, generate wealth, to stop buying garbage.' A

representative of a waste pickers cooperative similarly argued for the need to be flexible, considering the stakeholder needs, observing that 'the rigidity of a mould or a scheme is being questioned more and more because the character of the day-to-day is showing a variation, which means that even if certain things are projected and planned with a vision of the future, there is the day-to-day that must be resolved.'

For the interviewees, a flexible compliance scheme would include effective compliance enforcement, which they saw frequently lacking with Resolution 1407/2018. This flexibility resembles the lack of consensus about whether command and control or incentive-based strategies are better for solving sustainability challenges Harrington and Morgenstern (2007). Here, a representative of an industry association contrasted the slackness of what happened in Colombia to waste management in other countries, commenting, 'in Europe and the United States, in many places, if you do not dispose of garbage on the day it is, at the time it is, at the designated schedules and the designated place, you will be fined.' The interviewees expected legislative enforcement to be consistent, a waste processor wanting recycling legislation to include 'permanent policies' that 'require companies to comply with these requirements.' Some interviewees thought the government should conduct an inclusive program to educate stakeholders about the process of legislative compliance as was already happening in Medellín. For many interviewees, education was seen as a central conduit for improving the operation of the waste management system in Medellín, this beginning from the ground up, a manufacturer of plastic products highlighting the ever-present need to 'educate people on how to handle plastic correctly.'

Several interviewees argued that the level of capacity and knowledge required to comply with Resolution 1407/2018 could only be gained through continuous learning over time. A public utility representative contended that dealing with everyday compliance challenges in a business context while also seeking to pursue long-term sustainability opportunities required 'competence and experience.' In many cases, gaining these depended on lessons learned through stakeholders' lived activities, a representative of a food manufacturer commenting about working with some other stakeholders and the public, 'we must learn a lot to manage communities, communities that do not have that business language.' A manufacturer of plastic products argued that only by learning by doing could stakeholders adapt to the ongoing flux of managing short-term tasks and long-term objectives, a proactive outlook being vital to 'exploring and attending to new opportunities.' Her advice

to stakeholders in the plastic packaging waste management system was to 'think a lot about future businesses, not just today's.'

The importance of proactivity was emphasised when the interviewees discussed their motivation to collaborate on projects, as illustrated by Buysse and Verbeke (2003) and González-Benito and González-Benito (2006) in their work on proactivity and sustainability strategies. An industry association representative commented on their experience in waste management discussions with varied stakeholders that in these, 'it seemed important to us to generate the debate.' A packaging manufacturer argued for the need to be 'more active in compliance with the norm already in plans, speaking of a consumption plan and possible alternatives in research and development at the level of waste recovery.' In the face of the requirement in Resolution 1407/2018 to invest in research and development, different interviewees acknowledged the need to actively invest more than was specified to be well-placed to capitalise on project opportunities, a representative of an industry association commenting on their research:

> We are funding research projects to have information on the quantities being recycled, who is recycling what materials, what type of products they are recycling and at what price they are paying or buying. Now we have information. We can know more about who the players are, what the actual figures are and what we must do to increase them.

As a vital pillar for increasing research and development and improving the impact of information management in the plastic packaging waste management system, some interviewees highlighted the need for significant education to strengthen stakeholder capabilities for the system's good. Several argued that while education on higher-level technical matters such as criteria for eco-design was useful to some stakeholders, to foster compliance with Resolution 1407/2018 stakeholder education needed to focus on the non-technical, social aspects of the legislation, a representative of an industry association declaring that 'education is not just mathematics, geography, biology. Education is civility. Education is charity. Education is good manners, respect for others, respect for the value of work and what has been honestly achieved.'

In the face of Colombia's social problems, the interviewees argued that technical solutions had proved insufficient for addressing sustainability challenges, focusing on people's attitudes and behaviour being critical. The balance between technical and social aspects of solving sustainability challenges is consistent with the work from different authors around socio-technical systems (Emery and Trist, 1973; Trist, 1977). A packaging manufacturer argued that embracing sustainability 'starts from the conscience of each person', observing that people do not recycle at home 'because they do not have a clue… because they are too lazy to sort waste and take it to the bins.' To improve the rate at which consumers recycled plastic packaging, a representative of an industry association argued that 'changing people's minds should be the focus. Change the chip, change the frame, the mindset.' A packaging manufacturer stressed that effectively educating the public had to be 'a daily task of communicating with the person. We talk about plastic. We tell him about it and he is touched and this changes the idea of plastic for him.' In what seems to be a paradox given the government's urgency to foster compliance with Resolution 1407/2018, the interviewees mostly agreed that a sense of permanence increased the chance of success with sustainability initiatives. For a representative of a cooperative of waste pickers, environmental education was fundamental to the system's operation, seeing them argue that 'source separation training has to be a permanent process.' A waste processor underscored how in sustainability initiatives the need to 'give it more continuity and give it more prominence to have better results.' As set out in **Table 27**, three other interviewees addressed the issue of ongoing education and learning strategies.

Table 27. The need for permanent education and learning

Interviewee	Their comments
Cooperative 1	'Training in source sorting must be a permanent process. It does not end because another tenant might go into that house, another person. So that must be a constant training process.'
Cooperative 2	'Permanent strategies of reinvention in the speech and message.'
Waste processor	• 'The educational issue for me will always be paramount. Education will never be lacking.' • 'For people to learn, for us to learn. The more you repeat, [the more] you learn.'

In describing the relevance of learning and education, all interviewees acknowledged that varied skills were needed to participate in projects. A packaging manufacturer commented on their work in places in Colombia where recycling was more difficult than in Bogotá or

Medellín, two cities in which residents were 'doing the right thing' because they had 'managed to develop recycling capabilities in those regions.' In other instances, interviewees emphasised social skills such as leadership and persuasiveness as vital to building trust-based relationships in the plastic packaging waste management system. A waste processor, for example, argued that although his company had the 'capability, coverage and scope to deliver what is a good product, a good service' as managers of the waste recovery process, they also needed 'the capability as a consolidated company that inspires the trust when responding to these [activities].'

Generally, interviewees with well-established businesses were confident to take on new initiatives, a waste processor explaining, 'being more organised, one does feel more confident. For example, in launching this new development.' He explained that despite the lack of support from the government to support innovation projects, being confident about organisational capabilities supported them to risk investing a significant amount of money in designing new products and launching them in the market. Such interviewees also argued that confidence to make business decisions was also linked to understanding what was involved in compliance with Resolution 1407/2018, requiring a capacity for nuanced interpretation. Here, a food manufacturer observed that for his company, being aware of the context for compliance was vital: 'We know what the challenges are, we know what opportunities we have, we know the difficulties.'

Some interviewees argued that the structure of organisations made a difference when acting on opportunities in the context of the plastic waste management business ecosystem in Medellín. A packaging manufacturer argued that managing compliance, for example, was always better if the 'attitude from top management towards the norm' was proactive. Others recommended having a dedicated team with the skills to seek out the most trustworthy suppliers. A food company representative explained how a department in their organisation undertook 'a super important job' that they call 'supplier development', applying a range of 'filters' in selecting business allies. Another suggested strategy was to have a dedicated department to develop optimum sustainability strategies, a packaging manufacturer arguing that his company had become a leader in legislative compliance in having 'a solid department' for this.

While the interviewees generally expected the government to support organisations with compliance with Resolution 1407/2018, a number argued that it was better to be on the front foot here if organisational resources allowed, mere compliance with Resolution 1407/2018 being insufficient to enable a company to thrive. Moreover, where an organisation was overreaching in terms of it was argued that this put organisations in a better position to negotiate with the government. One packaging manufacturer explained their organisation's attitude to legislation, commenting, 'We constantly analyse it. We constantly try to have an influence on local policies in the Council. We were in the Congress of the Republic last year giving our concepts to the Ministry.' Some interviewees reported approaching government authorities directly to ask for funding, a waste processor describing pitching a proposal for waste collection to the Municipality, explaining that 'we have told the Municipality that we can present some proposals for a vehicle that provides part of the service.' Other interviewees looked to bring stakeholders in the plastic packaging waste management system together to collaborate on shared initiatives, a representative of a waste picker cooperative commenting:

> We are already approaching the [name of government institution] and, behind us, we are like one of the most significant [organisations]. It is a genuine and legitimate job with waste pickers. We want the others, which are smaller, to be able to start working as a consortium with new things here and go one step ahead, not staying in what we have always done.

When the interviewees described such approaches to government, many argued they were not just looking for funding but for opportunities and support to build capacities and skills, a waste processor declaring, 'do not give us anything, give us the way to do things', like Maeda and Hirose's (2009) discussion on empowerment and citizen participation in waste management initiatives. Despite the interviewees' mostly negative position on government actions regarding sustainability, many reported that they still worked with government entities and saw the government as a collaborator, some feeling that they had a significant measure of agency here. Some interviewees saw themselves sufficiently well placed to propose new legislation to the government, a representative of an industry association declaring, 'I am going to put together a popular initiative bill that will impose fines on the final disposal of solid waste.' Some saw themselves as bold enough to criticise the government, this industry association representative commenting that he could voice

'things very loudly to the National Board for the Management and Sustainability of Plastics, such as wondering why we keep talking about banning plastics and not fining people.'

While some interviewees saw how the government managed waste management operations under its legislative frameworks as poorly designed to foster stakeholder agency and autonomy, others reported that things had recently improved. A waste processor cited a government program that aimed to bring industry stakeholders together to collaborate, explaining how over 'the last two years we have worked on a national government program called Productivity Factories. It has been an exciting program in which we have been a pioneering company.' Thanks to the program, his company 'had been invited to talk with other companies.' A local government representative outlined the dedicated programs the government had developed to build skills, such as the certification in labour competencies, which included a program in recyclable waste use. She described the robustness and scope of an initiative in which 'more than 300 waste pickers from the Aburrá Valley [near Medellín] and three neighbouring municipalities were summoned. Everything was given to them to study, the certification requiring them to attend 100% of the training.'

Several interviewees acknowledged the specific work of government agencies to foster collaboration. A waste processor described their experience of successful relationship-building with government institutions, describing how it had led to them having 'real dialogue with government entities around Colombia.' For some interviewees, being part of an industry association or a large organisation was more likely to lead to a collaboration with the national government. By contrast, local government was seen to be supportive of organisations of all sizes, a small waste processor observing, 'I think that in Medellín, which is what one knows, the entrepreneurial ecosystem is cool. You raise your hand. You get into programs. They support you in a way that looks professional to me.' For some interviewees, Resolution 1407/2018 had been supportive of innovation, linked funding supporting SMEs to lead new business opportunities, a consultant reporting how 'last year we presented a project focused on designing new packaging to [name of government institution] with two research groups from [name of university].'

A consensus emerged among the interviewees that collaborating in Medellín was easier and safer than in other regions of Colombia, a waste processor perceiving that in Medellín,

'everyone wants to do business with each other.' Other interviewees attributed the greater ease of collaboration in Medellín to more than openness and trustworthiness. It was related to an innovative mindset, with a university lecturer commenting that 'every city mayor brings fantastic ideas' while a representative of the national government argued that in Medellín, 'people are flexible, people here are much more, I do not know, open when you get to know them. Very creative.' Being open to collaboration was acknowledged by many interviewees as crucial to improving waste management in Medellín. A packaging manufacturer reported that 'there is much awareness [of the need for collaboration] at the industry level. There are already established plans for the integral management of solid waste.' A food manufacturer observed that in improving plastic packaging waste management at the system level, 'People now want to talk more about their problems.' In openly discussing challenges of business operation, the interviewees argued that stakeholders became more amenable to trusting and collaborating in their local context, a waste processor explaining, 'I think that in a society like Antioquia, but also many others, they have been generating among them a certain level of trust by overcoming difficulties.'

The paisa culture, which includes Antioquia and Medellín and the departments of Risaralda, Quindío and Caldas, is often perceived as arrogant and exclusionary (Larraín González and Madrid Garcés, 2020). However, for the interviewees, pride in their region was a strong motivation to collaborate on sustainability projects. Three representatives of the same public utility spoke of 'a sense of belonging and sometimes anger at people who do not take care of public goods.' Growing trust was seen by a waste processor as an artefact of Medellín moving away beyond the scourge drug trafficking, which had begun to subside in recent times. Once the drug problem began to abate, he commented, 'People began to become supportive of each other again, understanding that a society could not survive with the level of barbarity that we had. So, now Medellín has become an utterly supportive society and in that solidarity is where there begins to be certain levels of trust.'

The restored paisa culture was seen by the interviewees as influencing how people protect their city and collaborate, a packaging manufacturer observing how in Medellín there was now 'a collective conscience around the subway as a means of public transport and all citizens love it. All citizens take care of it.' He hoped that a similar sense of collective pride and responsibility would develop around waste management, commenting, 'I believe that this is what we as humanity must begin to do. Begin to make a collective conscience about

waste management.' Other interviewees felt hopeful about Colombia's national culture, a national government representative observing that, 'Colombia is a country that offers you anything … Colombians are very nice … They are very friendly, very open, very party-like.' Such characteristics of the Colombian people gave several interviewees faith in the country's future, an industry association representative commenting, 'there must be a very high percentage of good and honest Colombians', illustrating that not all the country's population is tainted with corruption, hostility and treachery.

Many interviewees provided examples of successful initiatives of trust-building and stakeholder engagement in sustainability projects. For example, a local government representative mentioned a successful local training program for waste pickers where respect-based and empowering relationships helped build trust, commenting 'the training sessions were held at [name of a university] and it was super exciting.' She explained that for the waste pickers who attended, the program gave them hope through the greater skills and different ways of operating on offer. She related how some waste pickers commented that with these greater skills, 'others would [now] respect us more. They will recognise that we are essential to this society and that our work is vital.' Sharing a motivation to overcome business challenges also seemed to inspire the interviewees to want to build trust and collaborate to the point that a national government representative observed that 'there are now thousands and thousands of initiatives, forming what could be called a circular economy.' She noted that the initiatives were diverse, including projects spanning 'composting, biomass, plastics, recycling and tourism.' In a couple of other successful experiences, some interviewees suggested an opportunity to continuously learn from current successful initiatives as vital to keep building trust and collaboration in new project opportunities. For example, a representative of a waste picker cooperative observed they learned about better engaging in sustainability initiatives because they 'have moved to smaller territories such as the municipalities in the east [of Medellín] that have wonderful recycling experiences.' A representative of another waste picker cooperative described the development of 'very significant [recycling] initiatives that have continuity and processes that are demonstrable and scalable.'

The interviewees suggested many aspects at a local level helped them be motivated to build trust and engage in sustainability initiatives, despite the barriers and challenges illustrated in Chapter Four, as illustrated in **Table 28**.

Table 28. Local aspects motivating trust-building and engagement

Category	Description
Local positive aspects	Local existing success cases and local pride.
	Local government positive initiatives.
	Colombians' cheerful attitudes.
	Having shared barriers.
Shared awareness	The need to be persistent, proactive and flexible.
	The need to collaborate, learn and do research.
	Relevance of social aspects.
	Relevance of the stakeholders' capabilities.

Stakeholders' needs motivate them to build trust and collaborate on projects

The previous section showed that successful collaboration depends on intrinsic motivation, favourable local conditions and human characteristics, this combination potentially overcoming significant disparity in stakeholder capacities and circumstances. Although many interviewees shared an enthusiasm to be proactive in participating in sustainability initiatives, the motivations driving their activities were varied and being influenced by different combinations of their needs, such as their financial and material, and emotional and non-material needs. At the most basic level, income generation was a motivation for most interviewees to seek new business opportunities, a representative of a waste picker cooperative commenting that compared to receiving government subsidies, for 'waste pickers, who have been getting their motorcycle, their tiny house, who have their children studying, they see [waste picking] as an economic activity and a job that gives them a different family economy.'

Financial motivations, however, were not always seen by interviewees as a positive influence on the plastic packaging waste management system in Medellín. A packaging manufacturer argued, 'the garbage collector companies are paid by the amount of garbage they collect', that is, as a waste processor noted, 'per ton collected and taken to the landfill.' For the manufacturer, if these companies increase their earnings when they collect and dump increasing amounts of waste, 'they are not going to be interested in increasing the recycling rate.' A consultant similarly noted that garbage collectors should be required and motivated 'to take more tons to the landfill.' For some interviewees, the government needed to take control of improving recompense for waste management, a representative

of a public utility commenting, 'a market must be generated around the issue, with incentives for the reincorporation of this type of material into industry.'

While many interviewees saw financial incentives as critical to improving the plastic packaging business ecosystem in Medellín, at a personal level other motives drove their participation in sustainability initiatives. A public utility representative reflecting on her life commented, 'I consider that I have everything I need at this time to live well and this motivates me to continue in the constant fight for my personal, work and professional growth.' Different interviewees voiced their commitment to transcending material motives, a representative of a cooperative of waste pickers declaring that her 'ambitions are not the accumulation of wealth and excesses.' A representative of an industry association engaged in sustainability projects 'sometimes for the credit, sometimes simply because it seems the right thing to do.' A representative of an industry association observed about committing to sustainability projects for members of his organisation, 'we have almost reached a point whether you want to be part of this club or do not want to be part of this club. The club of the good ones, who do things well.'

Such non-material motives for involvement in sustainability initiatives equated with having a purpose in life for many interviewees, a packaging manufacturer arguing, 'because of how one sees life, one no longer conceives working without purpose.' He explained that he and his colleagues when working to make their organisation more sustainable, they wondered 'how are we going to put a purpose to this and where we will go as we begin to transform the company.' For some interviewees, the higher purpose driving participation in sustainability issues was caring for others' well-being through care for the environment. A packaging manufacturer spoke of providing 'a greater service for the community.' For a waste processor, the purpose of his organisation's sustainability education in the community was 'not to solve problems. It is to resolve the life of that person.' Some interviewees reported that they derive comfort from working to improve others' well-being. Commenting on working to counter the environmental crisis, a different waste processor helped him 'calm down' in front of the scale of the problem. In putting the needs of others before your own, some interviewees even saw the basis for building trusting relationships, a representative of a cooperative of waste pickers reasoning that 'a relationship of trust is where one gives but does not necessarily expect something in return but gives knowing that giving can serve others.'

In pursuing a transcendental purpose beyond their own needs, many interviewees revealed that their spiritual dimension intersected positively with their professional life. The relevance of the human spiritual dimension in sustainability initiatives has also been noted by different authors, such as Dhiman, Marques and Mitroff (2016) and Rezapouraghdam, Alipour and Arasli (2018). A packaging manufacturer commented how he and his work colleague were 'happy', appreciating 'every moment and every situation… on a material level, on a spiritual level, on a work level, whatever situation occurs, whether it is good or bad.' He added that 'a path travelled on a spiritual level' led him and his colleagues 'to feel satisfied.' Some interviewees reported that their spiritual dimension drove them to improve as an individual and to improve their organisations, to take on the risk of new projects, the same packaging manufacturer explaining that one follows a 'spiritual path and walks it constantly, which is the ability to look at oneself, to reflect on oneself. One develops the ability to get up despite things being difficult. One always knows that it will dawn. One has the certainty and faith that things will come around if we are doing the right thing.'

In embracing their spiritual dimension to keep the faith when working through the challenges of environmental sustainability, some interviewees argued help them stay true to their values, a waste processor describing being loyal to his 'essence' enabling him to trust others when projects became difficult. Some interviewees referred to their spiritual dimension when discussing why their organisation took a more sustainable approach to business or involved itself in waste management. Here, a food manufacturer argued that to collaborate in the plastic packaging waste management system 'we all need to take that leap of faith and get all involved.' To solve the many problems of waste management in Medellín, a representative of an industry association argued for the need to approach involvement in the system 'with a strong sense of good.'

Discussion of spiritual motives often led interviewees to reveal their emotional investment in their work, seeing them speak of painful challenges or exciting new opportunities. A waste processor related how 'it was harrowing for me' working on certain projects, adding setting facing project challenges, 'one goes through many feelings.' A food manufacturer commented on how excited she felt when meeting people who could potentially become a new ally, enthusiastically telling her team about the encounter and what it might mean for their work. For the interviewees, emotions strongly came into play when making decisions to collaborate with others, a manufacturer of plastic products commenting that she did not

like to work with companies that focused on profit because, for her, 'the numbers are too cold. No matter how hard they try to do things, these companies do not feel close.' Some interviewees admitted that emotions made it more difficult to build trust and collaborate, underscoring the relevance of the human emotional domain to better understand their behaviours (Lazarus, 1991) and engagement in sustainability initiatives (Morgan and Grant-Smith, 02014). A public utility representative commented on the uncertainty she often felt in entering new initiatives: 'You feel something, but I do not know how to express it to you. I do not know how it feels to know that you can trust.' For others, taking the first steps to trust was easier but still happened at an intuitive level, a food company representative commenting that she had 'a significant sense to perceive when a person is straight about what he has or if he is making things up … If there is chemistry, if there is that connection, empathy, a very peaceful means of communication is established.' In a similar way, a waste processor described trust as straightforward, being 'a matter of empathy.' On the importance of promoting empathetic relations between stakeholders, a local government representative described a successful instance of this at the neighbourhood level in a sustainability project:

> What seemed most beautiful to me about this project was that much more trust was generated between the citizens and the population of waste pickers because the project's objective was to go door by door with the waste pickers to train residents on source sorting, but above all, to help them to relate to the waste pickers.

For a consultant, the qualities one projected to others were more important in collaboration than the emotions one felt, whether painful or gratifying, the trust of others being won by giving out the sense of 'being a responsible and respectful person.' The interviewees illustrated that their material and non-material needs served as drivers to build trust and engage in sustainability projects, even in unequal scenarios. In doing so, many interview participants revealed the relevance of their non-material needs, as **Table 29** shows.

Table 29. Stakeholder needs driving trust-building and engagement

Material, financial needs: e.g., getting a house.
Pursuing personal purposes: e.g., helping others.
Spiritual/transcendental human dimension.

Emotional, empathetic relationships.

Strengthening bonds in stakeholder communities facilitates trust-building

The interview findings show that trust is more than a transactional element of a business ecosystem driving effective working relations between stakeholders. Still, the range of views was very complicated in this respect, illustrating the complexity of trust (Corazzini, 1977). For some stakeholders, trust was a key ingredient that determined whether the plastic packaging waste management system would function, a consultant contending that 'all interpersonal relationships are basically based on trust.' An industry association representative also described trust as 'something deserved, a symbol of our society.' Other interviewees were more specific, another consultant arguing that when trust 'begins to fail is when organisations and people begin to act in ways that are not within institutional principles.' For a waste processor, 'trust is part of loyalty, honesty and sincerity, giving each one ensures the best for the growth of the business and the human being.'

In some cases, some interviewees described the importance of trust as subject to the need to resolve daily challenges, where it could be expected to be manifest in everyday interactions, a representative of a waste picker cooperative arguing, 'there is a day to day that has to be solved and, in resolving it, well, trust takes on very significant importance.' However, most interviewees seemed to be aware of the relevance of trust in the early stages of stakeholder interactions. As a waste processor argued, stakeholders must 'build relationships based on that premise.' Four additional interviewees shared their perception that trust is critical for collaborative relationships and that the lack of trust could be sufficient to halt a potential collaborative relationship, as illustrated in **Table 30**.

Table 30. Trust as vital for and distrust as critical to avoid better collaboration

Interviewee	Their comments
Consultant	If there is distrust: 'One will never do business with a person one does not trust.'
Food brand	If there is trust: 'Being confident that it is time to learn from each other, sit at the same table and listen to the interests of the processors and the interests and the regulation that applies to us as producers. And say, well, how do we handle this.'
Local government	If there is trust: 'To generate trust, you must have a comprehensive action in the different life situations and act transparently. Act with transparency to be able to generate that trust towards others or that others generate in me the trust I require to be able to work together.'

Manufacturer of plastic products	If there is distrust: 'It is tough for me to work with someone I do not trust.'

Fostering trust-based collaboration in the plastic packaging waste management system in Medellín was seen by the interviewees to have the potential to increase collective know-how and chances of business success. Here, a waste processor explained, 'there are still many design flaws of which the industry is unaware and the relationships are fragile, between waste generators and between generators and waste pickers.' A packaging manufacturer argued that improving social connections across the plastic packaging waste management system between stakeholders would increase the sense of solidarity in facing system challenges such as when stakeholders 'see their business somehow threatened.'

For the interviewees, a strengthened social connection between stakeholders might see competing stakeholders helping each other. A representative of an industry association gave an example by using the word 'Coo-petence', which for them meant 'competing and cooperating at the same time.' He explained how his organisation 'invites all kinds of companies, affiliated and non-affiliated, to sit at the same table' to promote the attitude of 'sharing and building', even between system stakeholders who are in direct competition with each other. Potential tensions inevitably exist in doing business, such as when a supplier sells materials to two competing organisations, but for a waste processor, these can be resolved through openness, seeing him comment of a supplier, 'we understand that we are businessmen' and maintain a good relationship. Different interviewees argued that accepting the complex and mutual nature of relations in the plastic packaging waste business ecosystem had benefits, helping them build knowledge and skills, a representative of a food manufacturer commenting, 'we have learned because bringing the processors and the producers together already sets a huge precedent.' She exemplified the benefit in terms of compliance with Resolution 1407/2018 in observing, 'our competition in many production lines is [name of organisation]. Well, there we are sitting together, looking at what we will do with something that surpasses the competition.' Similarly, a representative of an industry association argued that even in a competitive environment, discussion contributes to 'understanding that, even though there are certain rivalries in certain aspects, there is much more that unites us.'

For many interviewees, successful collaboration was based on the recognition of stakeholder interdependence, with no interviewee arguing for the possibility of prospering in isolation. A representative of a public utility exemplified this interdependence by commenting:

> The plastic market fluctuates contingent on the conditions of plastics. Many times, it is cheaper to have new raw materials from countries such as Venezuela than to use recovered plastic. These conditions mean that the waste pickers are not interested in recovering this material and so the entire utilisation chain falls.

Even before Resolution 1407/2018 was issued, making collaboration mandatory, some interviewees had experienced the benefits of building strong, enduring relationships, a waste processor reporting the successful outcomes when five townships formed a partnership to combat waste many years ago. A waste processor observed that 'the easiest thing is always, always, to trust people who have interests like one.' He argued that collaboration itself built familiarity, this potentially leading to the establishment of a measure of trust in observing of his collaborators, 'because we know each other's shortcomings and all the difficulties we have had on a day-to-day basis' we can work together. A public utility representative equated the complex effects of collaboration on trust-based relationships to that of relations within a family, commenting, 'I trust my family, parents and siblings, partner and some friends. I do it because over time they have shown me that I can count on them.' Hence, for many interviewees trust was not an attribute of business and professional relationships in the plastic packaging waste management system that they could take for granted. Instead, as a waste processor argued, 'trust alone does not exist if it is not built within societies, meaning it is a social construction.' Given the difficulties of the Colombian context, for this interviewee, 'trust is not guaranteed. Trust is earned.'

Many interviewees noted that helpful information was available from other stakeholders, information exchange building trust, with a presentative of a waste picker cooperative commenting, 'there is knowledge outside the sphere of academia. In its everyday exchange, trust is generated.' For some interviewees, interacting with prominent stakeholders in the plastic packaging business ecosystem was a means of accessing new information on improving their own organisation's business and technical performance, as similarly

illustrated by the study of Dodgson (1993) about collaborating in technological activities. A food manufacturer recommended participation in pilot projects to learn from others how to comply with Resolution 1407/2018: 'There are some people from our team who attend the [name of organisation] meetings. They are participating in the work boards. From here, first-hand information has been obtained. Based on this, we have been developing work plans.' Other interviewees observed that the small stakeholders had valuable information to share up the business chain, a representative of a cooperative of waste pickers noting, 'who better knows how to recycle than a waste picker? The waste picker tells you what you can use.'

For some interviewees, fostering more and better communication between the stakeholders was important to building trust, as Butler (2016) also notes, a packaging manufacturer arguing that stakeholders 'need resources, not necessarily monetary, but communication capabilities to expand the message we are giving.' In Medellín, this was happening in some instances. A packaging manufacturer gave the example of the varied support they received from universities to improve their performance, explaining, 'we began to transform the company using research from [university 1] and [university 2], particularly a research group from [university 2] where a friend worked. It helped us understand a little more about plastic.' He also reported that universities could help identify new business opportunities, their research clarifying the business's sense there are other 'places where recycling can happen.' The interviewees recommended different strategies to improve sharing of information. Some stakeholders had developed an online platform to share technical information, a manufacturer of plastic products explaining 'it was born as an education platform because we train our clients extensively on waste management and sorting issues.' Other interviewees engaged in public outreach to promote the values of recycling, a representative of an industry association commenting, 'we are in schools and at local festivities promoting citizen awareness regarding the proper disposal and sorting of waste. We do cleaning brigades. We are on social networks.'

Communication and stakeholder interaction were seen as vital to the ability of organisations to move ahead with joint initiatives around waste management, enabling stakeholders to establish common ground. For a manufacturer of plastic products, such strategies might not lead to full-blown trust, but it was enough if it resulted in stakeholders 'respecting agreements.' For a representative of a food manufacturer, sharing knowledge

about stakeholders' different roles was a way to establish common ground and form alliances as a prelude to building trust. A representative of an industry association explained how the members of the association had come to better appreciate the nature and purpose of the role of a representative of an NGO they interacted with through ongoing dialogue, commenting 'she is a bit radical in her criticism of the negative impact of plastic products, but we now have an excellent relationship. I understand her role. She understands ours and we try to build things.'

The interview findings show that different interviewees understood the need for dialogue to foster trust building needed to happen at the different levels of the plastic packaging waste business ecosystem, between individuals, within organisations, between organisations and across the whole system, with dedicated strategies for facilitating stakeholder alignment and dialogue being needed at each system level. A public utility representative argued for the importance of 'bringing together all the sectors in the chain because everyone will have specific sector-related needs that other sectors may not know about.' Fostering open discussion was identified by the interviewees as vital to collaboration and eventual trust-building in individual sustainability projects and across the whole plastic packaging waste business ecosystem. However, it was acknowledged that achieving this was not straightforward. A representative of a cooperative of waste pickers argued, 'in the construction of trust, the first thing is having an understanding of the dialogue of knowledge.' A packaging manufacturer underscored how the conditions needed to be right for stakeholders to genuinely identify shared interests and begin to trust, seeing him contend, 'when there is an opportunity to make a connection without a profit motive based on a common interest, I think the objectives are good and the results outstanding.'

Despite stakeholders' diverse characteristics and circumstances in the plastic packaging waste business ecosystem, the interviewees identified a common purpose: fostering preparedness to collaborate and trust. A waste processor commented on developing a solid relationship with a business partner, 'definitely we realise that we are both looking for the same. We are connected there and I think that has allowed us to continue being partners and doing interesting projects between us.' A representative of an industry association contended that having a sense of shared purpose with project partners — 'looking for the issues that unite them' — helped stakeholders overcome the challenges in sustainability projects. Inevitably, however, many interviewees reported preferring to partner in new

business opportunities with stakeholders they knew, a representative of an industry association highlighting the proliferation of business relationships within their association. A consultant gave a notable example of stakeholders relying on their existing networks. After leaving a previous role, he reported that his former employees kept coming to him for advice: 'They have problems and automatically the person they are going to tell is me.' A food manufacturer reported their preference to work with stakeholders who had become 'great allies' through previous projects, especially those who had shown a generous attitude when they 'shared information with us about their suppliers, about new findings, about technologies they would acquire.'

However, Resolution 1407/2018 aims to foster collaboration between stakeholders in solid waste management across Colombia, expecting the forging of new relationships and initiatives to achieve a circular economy with respect to solid waste. While many interviewees reported trusting those they had previously worked with, building new relationships was seen as more challenging, often requiring intervention from a third party such as an industry association. A waste processor argued, 'For a company to receive funding, it has to have a tutor, a genuine businessman, verified, who oversees this process.' A packaging manufacturer reported that a validator had given his business the confidence to embark on an innovation project with other partners to make plastic bags more sustainable. Another packaging manufacturer argued for new initiatives to emerge in the plastic packaging waste management system 'A mediator, a cluster or someone who can act as a connector is needed because sometimes, we see that it is difficult to connect two companies.' A consultant argued that such mediators were already in existence, consultants being experts in articulating business opportunities to companies and in 'weaving networks… those networks that we weave always being framed in trust.'

Only some organisations in the plastic packaging waste management system, however, had the funds to call in expert consultants. When the interviewees lacked a third party to act in their interests, some interviewees saw that creating new collective bodies to represent organisations at this system level was a way of developing a more powerful and informed basis for negotiation and collaboration. A representative of a cooperative of waste pickers reflected that to develop some agency in the waste management system in Medellín, 'the waste pickers had to be organised as an association and had to establish an organisation that represented them, that was worthy, that watched over their rights, which defended

their interests.' Similarly, a waste processor reported the intention to have companies in their field become organised, 'we have been meeting and we have thought about forming a second level organisation that represents us, that speaks, that sits with the government.'

To establish industry associations that overcame the reticence between stakeholders to work together, three interviewees discussed the importance of building emotional and social connections first, a representative of a cooperative of waste pickers arguing the relevance of friendship to 'strengthening the bond' between stakeholders. A consultant invested effort in getting to know collaborators instead of only interacting with them to solve specific technical project: 'What I did was sit down with them, understand them, be with them in a certain way, solve the problems they have.' A manufacturer of plastic products described the value of establishing a local innovation hub to build stakeholder relations explaining, 'the philosophy of this community is that we become friends and that as soon as we become friends, we will generate bonds of trust and from there we will be able to work together.'

The interviewees showed a range of critical aspects that helped them build trust and engage in sustainability initiatives based on shared interests, previous connections and more profound relationship building, as summarised in **Table 31.**

Table 31. Pillars for strengthening relationships, trust-building and engagement

Awareness of the need for building trust, collaborating and having better relationships.
Recognising the interdependence.
Learning about others, improving communication and information sharing.
Finding common ground and shared interests.
Finding support in existing connections and third parties.
Knowing others deeper with emotional connections.

Stakeholders build differentiated trust gradually by adapting to unexpected events

Building strong relationships with more profound emotional connections to facilitate engagement and trust-building in sustainability projects was described by the interviewees as not always easy in the context of the plastic packaging waste management system in Medellín. The interviewees revealed a diversity of perceptions about the trustworthiness of others, this adding complexity to engagement and trust-building dynamics. A consultant

summarised the diverse perception of other stakeholders' trustworthiness by describing her relative perceptions, commenting that 'I would think that government organisations would be the ones I suspect the most, as everything that comes out of public entities, I look at suspiciously. However, there are private organisations with which I also have suspicions.' Although many interviewees stressed their lack of trust in the government, others acknowledged their lack of confidence in other stakeholders, this being varied. Some interviewees did not trust organisations that showed themselves as sustainable but did not live up to this expectation, a packaging manufacturer commenting that some organisations 'took plastic as a battle horse and one has arguments and data and everything [to challenge this perception]', but these environmentalists would say 'no, no, no. Plastic is super bad.' The climate of mistrust extended to all categories of stakeholder organisations, showing a strong background level of mistrust, a waste processor voicing his suspicions that there are 'many non-profit entities that one is not so sure that they are non-profit.'

The interviewees described a complex landscape of trust, characterised by many subtle drivers for the assessment of the trustworthiness of others. For example, some stakeholders used the perception that an individual or organisation did not care about others as a barometer of trustworthiness, a manufacturer of plastic products contending she did not trust the 'financial sector.' Two waste processors doubted the trustworthiness of large organisations, one reflecting that this was because 'those big companies that report all those tons [of collected waste], I do not trust them because I do not see the impact below.' Some large organisations were perceived as threatening, another waste processor arguing, 'we are mistrustful of the large private company that manages the sanitation issue because we see it as a company that can quickly absorb us or take us out of the market.' However, other interviewees from small companies perceived that large private companies were trustworthy. A representative of a cooperative of waste pickers commented 'there are private companies that we also trust a lot because we have felt their full support, the support of the industry.' Two interviewees provided quite specific reasons to trust private companies more, a packaging manufacturer reflecting, 'it does generate a little more confidence in me due to the effectiveness of the plans of private industry. I also believe in the private industry because of its motivation towards profitability.' In seeing the motives of large corporates as transparent, a waste processor reported having more trust 'in the private ones, where everything is for financial benefit.'

While discussing the interviewees' perceptions about the trustworthiness of other stakeholders in the plastic packaging waste management system in Medellín, I noticed there was no consensus about who the interviewees considered trustworthy or not. This lack of consensus revealed that trust is grounded in the perceptions of the beholder, with the discussion about trust demonstrating the interviewees' multifaceted and, at times, contradictory perceptions. In discussing finding trustworthy partners as collaborators in projects, some interviewees were more confident about finding trustworthy project partners than others. A national government representative proclaimed, 'I feel very confident with all the stakeholders I know from Medellín.' In contrast, others had little faith in establishing the trustworthiness of the institutions they had to work with, an industry association representative arguing that 'trustworthy institutions in Colombia could be counted on the fingers of one hand.'

Given the varied perceptions about others' trustworthiness, it is not surprising that the interviewees dealt with a high degree of uncertainty when engaging in sustainability projects, making it more challenging to collaborate the way Resolution 1407/2018 expected. For this reason, a waste processor contended, 'you should not show trust like at first sight. One must take the time to really know and perceive others' intentions.' Some interviewees identified taking the time to better know and understand each other as critical. To overcome sustainability challenges, some interviewees identified the need for continuous communications, a representative of a waste pickers cooperative contending that sustainability projects 'can extend over a long time, so you have to be reinventing the discourse and the campaign.' In the absence of frequent and effective communication between stakeholders at all system levels, a representative of a different waste pickers cooperative observed that, in their experience, involvement in a sustainability project could become a slow process. She gave the example of achieving collective rights for waste pickers, explaining that this 'did not happen overnight, or because a magistrate woke up today with a very caring attitude… it is because we have fought for it.' A packaging manufacturer also supported the importance of persistence to improve the system for plastic waste management, arguing that if one were determined, 'sooner or later, things will reverse.'

Still, finding fellow stakeholders seemed to be difficult for some in Colombia, introducing a high degree of complexity into the operation of the plastic packaging waste management system in Medellín. A representative of an industry association described the initial uncertainty of some of

their associates when building relationships to work on an innovation project, saying that sometimes people are 'a little sceptical, like: 'No, no, but wait, is the industry association promoting a new sector? How is that going to work? That would imply that it is competing with us." Hence a packaging manufacturer recommended that in any new business relationship, 'there must be the first approach and a relationship to be able to establish, in one way or another, any activity.'

Despite the doubts and suspicions, the interviewees showed they kept building new business relationships and strengthening existing ones because businesses and projects might appear. Opportunities could come from fortuitous events, as Heuser (2005) discusses the way voluntary associations build. A packaging manufacturer described a business opportunity during the COVID-19 pandemic from an off-the-cuff conversation with an ally that led him to 'establish a commercial relationship selling a type of waste because I saw the opportunity to generate greater value from the material. Casually, with this contingency happening he called me these days [to pursue the opportunity].' In some cases, incidental opportunities could appear in planned situations such as at industry events, a packaging manufacturer explaining how, 'in the previous workshops that we did together with a company called [name of organisation], later we did some trials with them as a result of the coincidental meeting.' A waste processor similarly commented that it was good luck to see someone he already knew 'in that first W2O workshop of 2018. It was very interesting for us because we were also seated at the same table, allowing us to strengthen our relationship.' In other cases, interviewees reported unexpected opportunities appearing in the course of everyday life, a representative of a waste pickers cooperative remembering when she 'left university and started working in an organisation of waste pickers to have a job, but I stayed here', suggesting that working in such an organisation was not part of her original career plan, but in taking up the opportunity had changed her perspectives on how to work in the sustainability field.

To be ready to tackle new opportunities required the interviewees to be aware of the need to have an overview of the plastic packaging waste management system and monitor their relationships with other stakeholders. A waste processor commented on project relationships, 'interests are always going to come to the forefront, whether they are good or bad.' In preparing for unexpected events, the interviewees provided insights into how they would approach opportunities and seek to turn negative situations into positive ones. For

example, another waste processor argued there were opportunities even in crises such as the COVID-19 pandemic. He explained how the pandemic had allowed his company to develop 'some products for the health sector. We then got six, seven significant [product] references in a short time.' In another example, some cooperatives of waste pickers saw their financial sustainability threatened by new competitors, a cooperative representative acknowledged, 'when we saw our interest in food packaging waste threatened by a third party that has nothing to do with recycling, which united us much more as an association.' However, not all the coincident or casual opportunities came from crises or difficult situations. Other interviewees commented on how new businesses started with someone they met in a non-industry-related activity, a consultant describing how while volunteering to clean up the city she struck up a casual conversation with representatives of another company:

> That is when we started talking. I asked, 'You guys, what are you doing?' [The other person said] 'We do this.' From there, an exciting relationship began to form between the two companies. It has ended up in the fact that now we measure the carbon footprint of all their events and we have a very cool relationship of trust through the many projects that we have done together.

The possibility of new opportunities suddenly appearing seemed significant based on the different examples that the interviewees provided, suggesting that the plastic packaging business ecosystem in Medellín was quite dynamic. For example, stakeholders meeting and discussing their interests and objectives could find entry capabilities and goals to collaborate with on new sustainability initiatives. A manufacturer of plastic products gave an example of forging a business partnership with a manufacturer of containers explaining that 'we provided our design capability because quite frankly their containers are very ugly since they do not have a product development team.' However, she acknowledged that the technical capabilities of the company were significant. After meeting and conversing, some interviewees discovered they could address needs they had long hoped to satisfy, a food manufacturer reporting how at industry events, 'it is very cool to open up to other attendees in these contexts because one finds suppliers that can help us a lot.'

While acknowledging the opportunities in the plastic packaging business ecosystem in Medellín, many interviewees revealed the need to invest thought and effort in managing

first encounters because of the uncertainty around building new collaborative relationships. In some cases, organisations developed comprehensive selection processes for new potential allies, a food manufacturer acknowledging that when they took on a new business partner, they carried out a 'horrible, horrible, very long super audit.' She explained further that 'practically, we ask absolutely everything. You cannot imagine the number of things we ask a third party.' A potential business partner's reputation often drives the decision-making process in the early stages of engagement, with a consultant commenting that in 'a business, let us say of two billion pesos, you would never mess with someone you do not believe could be capable or trustworthy.' It is easier for organisations with an established reputation to capitalise on new business opportunities, the same food manufacturer noting that a good reputation, being a known quantity, 'gives you support and somehow makes a filter.' Some interviewees saw their business track record as an asset in helping to facilitate new business opportunities. A representative of an industry association noted how the organisation's longevity helped association members, commenting, 'we are 60 years old and for 60 years we have understood that we must trust each other.' For small organisations with a short record in business, things could be more complicated, with a consultant observing the difficulties in securing new business opportunities, 'In the beginning, the reputation is really being formed, because obviously, when you are just starting, you do not have a reputation.'

Due to the diversity of the interviewees' characteristics and perceptions of others' trustworthiness, many interviewees noted the importance of applying standards, whether technical or social to reduce uncertainty when taking up new opportunities. A national government representative argued for 'minimum standards' in business behaviour. A representative of an industry association reported seeking to make arrangements with other stakeholders 'as standard as they can be.' Most interviewees stressed the importance of maintaining principled standards in all aspects of their interaction with others in the plastic packaging waste business ecosystem, a representative of a food manufacturer noting that for their organisation, 'the standards for relations with suppliers or with third parties are very much established within our corporate governance model.' The interest in observing social civility for the interviewees in negotiating new projects seemed to be both motivated by securing a project, vetting potential business partners to see if they shared their values and keeping the operation of the plastic packaging waste business ecosystem respectful, a

packaging manufacturer observing, 'there will be a certain cordiality between companies even if there is not an interest in working together on a goal.'

Despite the need for having standards in collaborative relationships, building trust was seen as situational and context-dependent, a waste processor commenting, 'everything depends on a time, a history, a behaviour, which does not happen from one day to the next.' Hence, for some interviewees it was not easy to have a standard way of working with others, identifying the need for stakeholders to selectively determine who to trust based on each project's specific conditions and purposes. For this reason, a waste processor argued that getting to know new people and organisations was a requisite for moving forward in projects. A waste processor summarised the relevance of assessing the trust placed in others by first commenting on the trust placed in his family, 'trust' he explained 'can be delimited at different levels. The trust that I have with my family is one. The trust that is generated between people. Exactly, my trust with my family is generated by blood ties and because we depend on each other.' He further reflected on social trust, arguing:

> Another very different thing is the development of trust that is generated in society from good deeds. When you have a society doing good deeds in general, you begin to trust. An example, up to today, Medellín has behaved in an exemplary manner with this whole issue of the Coronavirus.

Engagement with other stakeholders required the interviewees to constantly deal with daily obstacles that could serve to erode trust. For a waste processor, adjusting to changes in the plastic packaging waste management system in Medellín was a process of dealing with a continual sequence of challenges. A packaging manufacturer acknowledged that for him, 'there are more activities to be done to the point that one is constantly looking for one way or another to solve them.' In the thick of constant challenges, the interviewees needed to keep faith that their determination would eventually pay off. Many interviewees reported this to be the case for them. A packaging manufacturer described the moment when there was a 'click' after many meetings in a negotiation process when a potential client finally got serious about a product they were selling. Some interviewees reported using perseverance as part of an adaptation process to improve their skills, a local government representative highlighting how they routinely involve themselves in looking 'for all the options, which we have managed to develop as a work methodology' for new sustainability projects.

Perseverance in engagement as a potential path to building trust revealed an understanding of the gradual nature of relationship building among the interviewees. A waste processor discussed the evolution of an innovation culture in Medellín as 'part of a transformation' although he also noted that 'we are still on the way.' To maintain faith in the possibility of project success, some interviewees noted the need to be patient when building a relationship with other stakeholders in the plastic packaging waste business ecosystem, as a waste processor arguing that the best relationships tend to be built through a process that is 'slow, very slow.' A representative of a waste pickers cooperative equally described forging business partnerships as a 'silent, slow, very patient, very patient job.' A consultant similarly contended that 'trust is only acquired over the years.' A representative of a waste pickers cooperative reflected on their gradual, ongoing positive interaction with the City Council to collaborate on a sustainability initiative, observing 'this exercise has provided some brushstrokes and some fundamental stitches in the configuration of that chain because we still see ourselves in the process of the construction of trust.'

The patient development to build engagement and trust between stakeholders contrasted with the expectation of an expedited compliance process with Resolution 1407/2018. In following a patient, gradual process to engage and perhaps trust, the interviewees found sharing knowledge a vital strategy to build collaborative relationships. A representative of a cooperative of waste pickers observed that 'gaining trust is like all the knowledge and experience you have.' A representative of an industry association vigorously argued, 'there can be no trust without knowledge.' Managing and sharing knowledge for a waste picker cooperative representative meant 'that all the participants are woven into a strategy, a project, an alliance, can make the experience and knowledge available to everyone to come up with an idea or a joint project.' To achieve such solidarity across the plastic packaging waste business ecosystem in Medellín, a public utility representative recommended 'strengthening the dissemination of news of achievements and the successful interaction mechanisms between the different contributors to a project.' A consultant illustrated the need to have supporting evidence to back up the perceptions about stakeholders' trustworthiness, declaring, 'come on, I have trust in you, but also transmit it with the facts.' A representative of a waste picker cooperative noted that it had been helpful to show positive results in building their stakeholder network, reporting 'when we started to show benefits, new partners started arriving on their own.'

In evaluating the information being shared in sustainability initiatives linked to the plastic packaging waste management system in Medellín, a consultant noted the importance of taking 'a few small steps, as in everything, even in interpersonal relationships. You tick off a small thing with another person and that person responds to you and you start watching and see 'look, yes, it is trustworthy, or no, it is not trustworthy." Testing and validating the expectations of trustworthiness in a relationship was critical for some interviewees, as Botsman (2017) examines how building trust unfolds. Here, some were more focused on evaluating the technical capabilities of project partners, a waste processor explaining how they did 'laboratory tests' on the materials provided to them to check their quality. Another packaging manufacturer reported how before committing to a supplier, they delivered 'approximately 500 kilos of plastic to [name of organisation] to carry out tests and trials to see how this material can improve the value of our packaging.' Many interviewees recognised that some challenges in the plastic packaging waste management system were not technical or technical in straightforward way, a local government representative arguing that:

> Waste management has a vital element, which is gradualness. This issue of gradualness is a bit distressing if you will. It is because we always want changes in society and in any situation that is of general interest, we want it to happen very quickly, but waste management depends so much on aligning the actions of each of the inhabitants of a community and society.

The interviewees knew that unforeseen changes could disrupt the gradual learning process to engage and build trust. Changes could come from a shift in a project partner's circumstances or objectives, a waste processor acknowledging that 'one's interests change over time' even for individuals and organisations who are committed to sustainability. Unanticipated events could derive from changes within organisations, another waste processor commenting that, after agreeing to start working together with another company in a project, 'the employee who was leading the project did not continue their employment with the company because she was not the owner. Once she left, we did not continue with the project.' Changes could also come from adverse events, a consultant acknowledging how disclosures about project partners can derail projects by commenting, 'one realises these things because a scandal came out, or because recorded audios are found, I do not know where.' This experience of unexpected adverse events was reported by the

interviewees to reduce the enthusiasm to engage, a waste processor contending that one might choose to form a partnership and trust, 'but when one least thought, halfway through the project, a partner can turn everything upside down' through an abrupt revelation or another trust-damaging event.

To protect themselves from deception and other significant project risks, the interviewees reported continuously evaluating what other stakeholders said as well as the coherence of their behaviour, in line with how Armstrong et al. (2022) illustrates the vivid process of keeping trust. Suchman (1995) describes coherence or the perception of consistency between stakeholder actions and their values, beliefs and norms as a form of 'legitimacy.' A representative of a food manufacturer argued the importance of 'coherence' between 'saying and doing' on the part of project partners. A representative of a cooperative of waste pickers similarly argued, 'speaking of the trust we have been working on and building, that trust has a lot to do with this matter of legitimacy and authenticity.' A waste processor described his frustration with some politicians who visited his organisation just for 'the pictures, the video' without providing real help. A public utility representative stressed that 'the exchange of information to get to know one another period between the parties should be encouraged to generate the necessary trust to be able to carry out joint work.' To deal with the frustration of unexpected events damaging their trust in others when collaborating on projects, different interviewees stressed the importance of self-confidence in their values as a basis for making better business decisions, a manufacturer of plastic products commenting:

> To be able to work with someone, it is what inspires me, that they are going to do things well, that they are a correct person and that what we agree on what is going to be fulfilled and that I would have no reason to doubt them. Maybe it is a little naive, but I am not good enough to be doubting.

In being confident in their values, the interviewees felt better positioned to negotiate the scope of their relationships, a representative of an industry association observing his attitude when working on projects, 'I cannot allow myself to say something here that I am not convinced of. And, when I see pointless speeches and cheap philosophy, I do try to get straight to the point.' Believing in oneself and one's values is nominated by Botsman (2017) as necessary to take the 'leap of faith' in business relationships, with a waste processor

commenting on his decision to keep trusting, 'for me, it has been one of the things they have frustrated me, that I have made a mistake for my trust and I have defended that position believing that I should not change. Those who have abused my trust must change.'

Although many interviewees showed it was possible to keep faithful to their values, it was not easy for them to navigate the barriers to engaging and building trust in sustainability projects. Worse, Resolution 1407/2018 did not support the negotiation of the risks affecting trust in relationships. Many interviewees kept a cautious attitude when engaging, not only at the beginning of a relationship but in continuously assessing the differentiated levels of trust placed in every relationship as a project moves forward. A representative of a public utility commented, 'I rather trust and as I get to know the person, I know how far I can go with that person, how far I can trust that person and what topics I can share with that person, or what I definitely would not like to share with that person.' A consultant argued for cautiousness in developing a relationship in projects through an example:

> In a relationship between friends or when dating, first, they must get to know you and I believe these first things are done with caution and, later, as you get to know more, let us say in business, you also give a little more trust to the organisation or the company or person.

The interviewees concurred on the importance of assessing the information derived from others' behaviours because, as a consultant noted, when building trust 'as a citizen, one must not eat everything that politicians deliver, that an organisation gives you or that a company tells you.' The interviewees argued that project stakeholders needed to protect themselves and their relationships, as a representative of a cooperative of waste pickers commented 'by taking precautionary measures' or, as a consultant noted, having 'controls and follow-ups' to improve the transparency in the stakeholder relationships. The interviewees' protection mechanisms were diverse, with a consultant describing her strategy to evaluate others' behaviours by commenting, 'what one does is try things out, saying, 'well, look, he did tell me the truth', then you compare it to his behaviour. In the end, at some point, things fall off their own weight', suggesting that the truth is eventually revealed after a continuous validation of what others say and do.

Establishing mechanisms for monitoring and controlling projects, such as contracts and standardised processes, could protect the relationships between stakeholders from deception and project risks and increase trust. Nevertheless, despite these benefits, too many monitoring and control mechanisms seemed counterproductive to the efficiency of the stakeholder activities. For example, to explain why it took too much time to show success in a sustainability initiative, a public utility representative described her frustration in trying to promote new project opportunities in her organisation, saying, 'it is too big a company, so it needs many prior approvals, many points of view, to agree.' The interviewees showed that they deal with uncertain conditions to build trust and tackle potential opportunities in sustainability projects, following a continuous and constant process, as illustrated in **Table *32***.

Table 32. Attributes of the trust-building dynamics

Category	Description
Initial Conditions	Complex context of trust: Situational and context dependent.
	Initial suspicions, uncertainty and lack of agreement on who is trustworthy.
Awareness of the need for	Having self-confidence first.
	Tackling opportunities and satisfy needs.
	Investing time in knowing others.
	Having standards.
	Assessing trustworthiness.
Tactics	Initial approach with caution.
	Inform decisions: e.g., reputation of others.
	Be perseverant and keep continuous communication.
	Keep control mechanisms and test the relationship.

Chapter summary

In navigating the challenges in the plastic packaging waste management system in Medellín to engage and perhaps build trust, the interviewees found motivation in satisfying their material and non-material needs. In this, Chapter Five has responded to my first research question: *How do needs driving the pursuit of stakeholders' goals affect their motivation to engage and trust where collaboration is required?*. The interviewees relied on their existing connections and third parties to make better decisions when collaborating on sustainability projects. In doing so, they also found an additional motivation to collaborate at times in monitoring the behaviour and the consistency of information from other stakeholders to assess their trustworthiness, this responding to my second research question: *How does the reliability of*

communication and information affect stakeholders' willingness to engage and trust in sustainability initiatives?. In turn, this understanding of this case responded to my general research question: *What drives stakeholders to engage when the motivation to trust is low and the distribution of power and resources unequal?*.

Chapter Five has revealed three patterns of stakeholder behaviour when building trust to engage in sustainability projects in middle-income developing countries with weak governance. As illustrated in the following Chapter, these patterns contradict the emphasis in relevant literature on the importance of having a solid system of trust for successful stakeholder engagement, as is further discussed in the section *The Dance of Trust is Spontaneous, Progressive and Dynamic*. Chapter Five has shown that coincidental or casual opportunities appear when stakeholders interact in planned or unplanned ways. Second, building trust is gradually nurtured by stakeholder expectations about the outcomes of their relationships in a project. Third, engaging and building trust is informed through continuous monitoring and validation of others' behaviour, objectives and values. In revealing these behaviour patterns, the interviewees in the case seemed to behave as engaged in an extended *dance* with other stakeholders in the plastic packaging waste management system in Medellín, this dance forming the foundation for operating in a business context. I examine these three patterns concerning relevant literature in Chapter Six.

CHAPTER SIX
A DANCE OF TRUST SUPPORTING ENGAGEMENT IN PROJECTS

For the interviewees, engaging in the plastic packaging business ecosystem in Medellín was demanding due to weak governance, this compounded by the asymmetrical nature of the stakeholders' needs, capabilities and access to reliable information. Despite these barriers to engaging and trusting, the interviewees — as representatives of the stakeholders in this business ecosystem — did trust and engage, often in the quest for a purposive life. The interviewees adapted dynamically to conditions in the ecosystem by investing differential levels of trust in relationships with others based on perceptions of the value of engagement to their needs and goals. The dynamics of these adaption and negotiation activities can be likened to *dance* in pursuing trust and business opportunities. I drew the metaphor of *dance* for stakeholders developing their relationships in the context of projects from Senge et al.'s (1999) book *Dance of Change*, which discusses adaptation and learning dynamics among the stakeholders, and Echeverría (2009) concept 'Dance of the promises', which examines how people manage expectations of trust in interaction.

Chapter Six examines the importance of trust in the stakeholder engagement process in light of the case study, arguing that even in circumstances where there is little reason for stakeholders to trust and engage, stakeholders will continue to commit to projects and work with each other. The significant original contribution of the thesis in response to my research question lies in identifying four drivers of stakeholder engagement when the motivation to trust is low and the distribution of power and resources is unequal. The drivers relate to the satisfaction of both stakeholders' material and non-material needs, emergent opportunities developing from stakeholder interaction and the evolving outcomes of stakeholder relationships.

Chapter Six critically revisits the research findings in relation to the broad literature on the role of trust in stakeholder engagement, identifying three patterns of stakeholder behaviour in the case study that diverge from what is currently known and thought about the requirements for successful stakeholder engagement. First, the case findings show that individuals and organisations build trust spontaneously by adapting to unfolding events. Second, the case findings show that individuals and organisations build trust progressively

by gradually strengthening their relationships. Third, the case findings show that individuals and organisations build trust dynamically by continuously assessing the nature and performance of their relationships. Combined, these three characteristics suggest that stakeholders are engaged in a *dance* with each other, adapting their moves with every new experience, drawing on these experiences and each other's moves to inform project decisions.

Stakeholder material and non-material needs and developing relations drive engagement in sustainability projects

In finding inspiration in the metaphor of dance, my thesis adds to the literature where the *dance* has been used to examine stakeholder behaviour. Here, I mostly draw on the work of Echeverría (2009) and Senge et al. (1999). Rafael Echeverría, a sociologist from Chile, is acknowledged for his work on the meaning of being human and language-based human interactions. In his book, *Ontología del Lenguaje* (2009), Echeverría uses the dance metaphor to understand how people coordinate their actions in complex systems. Echeverría describes a 'Dance of the promises' in which people assert their future actions and influence the decisions others make to collaborate in initiatives. For example, the interviewees committing to collaborate in a shared sustainability initiative to comply with Resolution 1407/2018. In accepting promises, people trust that others will deliver as expected on the outcome of a specific activity. Echeverría's examination of the process of making and fulfilling promises helps understand how people adapt to change, such as when some interviewees described the challenge of understanding how to comply with Resolution 1407/2018 but still had to find ways to comply with it by looking for help in third parties. The idea of the 'Dance of the promises' contributes to understanding how conflicts emerge and trust is negatively affected in projects where a stakeholder fails to deliver an expected outcome, such as when one interviewee described how they told the government about others' suspicious activities and nothing happened.

In discussing project dynamics where stakeholders are required to adapt to challenges and change, the work of Peter Senge also uses the *dance* metaphor. Senge, an engineer from the United States of America, is known for his work on how organisations learn and adapt to change, examining the functioning of organisations from the perspective of complex systems. In *The Dance of Change* (1999), Senge and his co-authors use the dance metaphor to illustrate how project stakeholders deal with the complexity and tensions that arise from

factors limiting the pursuit of project goals and which lead them to reconsider their objectives and decisions. The authors describe the example of a cell in which a 'mysterious dance of proteins' occurs that enables the cell to function as a parallel to what happens in an organisation. As with Echeverría (2009), Senge et al. see project stakeholders coordinating their actions and being flexible in the face of obstacles, discussing how stakeholders can see their fears and uncertainty reduce and their creativity in tackling challenges increase when they find support from 'trusted colleagues', or third parties. Different interviewees described finding help from third parties to facilitate collaboration with others and, as Wenger (2000) argues happens in communities of knowledge and practice. Despite Echeverría and Senge addressing the trust issue, they do not go deeply into the complexity of trust-building dynamics, as in this case, where the significant, original contribution to the knowledge of my case study resides.

The dance metaphor has been used in different domains of science to understand how living organisms interact with nature and each other to adapt to change (Capra, 2007), have conversations (Guavita Moreno and Peñafort Camacho, 2001) and manage conflicts (Fiol et al., 2009). This metaphor has also helped analyse different parameters of complex systems (Heifetz, 2014) and people's motivations for their behaviours (Haken, 2011). For example, in addressing challenges in complex systems, Heifetz et al. (2014) see the need to move away from the 'Dance floor' to better understand the stakeholders' challenges. Escobar (2016) sees a dynamic movement of ideas in how people create possibilities for their future. In examining the dynamics of trust for the interviewees through the *dance* metaphor, I provide original insights into what drives stakeholders to build trust and engage despite the many disincentives to do so, as illustrated throughout Chapter Four.

The interviewees faced a wide range of challenges. They operated in a diverse network of stakeholders with different values, goals and motivations to engage. Simultaneously, they needed to find common ground to collaborate on sustainability projects. They had to deal with shared challenges and asymmetrical needs and capabilities, making engagement and collaboration more difficult. This situation resembles someone wanting to *dance* with different people at a social event and finding that while he knows the basics of *dancing,* everyone dances slightly differently, causing general awkwardness. This situation is like some interviewees struggling to adapt to new sustainability legislation because they did not have the same resources as big companies, such as a dedicated legal department. In their

complicated business ecosystem, the interviewees were forced to comply with a standard norm, Resolution 1407/2018. Here, collaboration was compulsory, as if someone were obliged to *dance* with other people without being asked if they wanted to or were able to do it.

In facing their challenges, the interviewees mentioned third-party support's relevance to improving stakeholder collaboration. One of the interviewees mentioned that third parties could help bring stakeholders together and facilitate their engagement. It could be likened to needing the help of a friend to be introduced to a person with whom you would like to *dance*. As part of the contribution to the knowledge of this thesis, the interview findings identify the need to focus the initial efforts in a project on building a sense of community between the stakeholders to facilitate engagement and trust-building to increase confidence in project success. Third parties can help here in different ways. For example, a mediator can resolve conflicts or provide information for making decisions, the interviewees mentioning various third parties who could serve here, such as external consultants, industry peak bodies with good reputations, universities and NGOs with a perceived capacity to act neutrally.

Many interviewees acknowledged the possible role of government in creating the conditions for trust and engagement, although many considered government actions to date to be fraught. Different interviewees accepted that the government lacked the resources and capabilities to properly enforce legislation and foster desired stakeholder behaviours. Worse, much of the relevant Colombian waste management legislation lacked critical means to foster collaboration. Most legislation was judged to not provide sufficient clarity on legislative compliance nor have the balance between command and control and incentive-based strategies. This outcome is context-dependent, but the interviewees preferred a balanced compliance scheme with compulsory and voluntary requirements, albeit without consensus on the specifics.

Most legislation was perceived as failing to provide compliance strategies tailored to the needs and situations of different stakeholders. In ignoring stakeholder differences, Resolution 1407/2018 does not offer stakeholders the scope to self-regulate, revealing its limited relevance to the reality of its social context. Despite the shortcomings of Resolution 1407/2018, the interviewees did report collaborating with other stakeholders,

finding alternative motivations to do so until they could trust, this suggesting a situation in which someone is reticent to *dance* but overcomes their fear of social judgement due to the greater attraction of enjoying life. The interviewees identified both material and non-material engagement as motivating engagement in the absence of a generalised trust. At an individual level, interviewees described their needs to secure food or their desire to receive recognition through their effort. At an organisational level, some interviewees described the need to increase their technical knowledge to design sustainable packaging or improve their reputation in the market as motivations to engage. In examining material and non-material needs as drivers for stakeholder decisions and behaviour in projects, as illustrated in Chapter Five in the section *Stakeholders' needs motivate them to build trust and collaborate on projects*, the thesis contributes to understanding the complex influence of human needs on stakeholder engagement in sustainability projects.

The interviewees discussed practical needs and financial interests as motivators to engage, such as accessing government funding, improving their knowledge about designing more sustainable packaging or pursuing a business opportunity. Most also discussed social motivators for engagement, such as overcoming corruption or unbalanced power relationships. Social motivators extended to sharing knowledge with other stakeholders to improve the operation of the plastic waste management system. When analysing the interviewees' needs, interests and motivations to engage — a holistic approach to understanding human needs that identifies what defines a human being and what the interviewees considered meaningful — helps explain what drives stakeholder engagement. **Figure 11** sets out a possible sequence of motivations for stakeholder decisions and behaviours based on what they consider meaningful and essential in their lives. It stresses the significance of non-material needs, including those linked to people's emotional and spiritual domains. For example, someone looking to transcend by teaching others what he knows to improve others' lives, as one interviewee said, illustrates an emphasis on pursuing a purposive life instead of acquiring more goods to satisfy their material needs. The relevance of spirituality and transcendence is important in explaining why the interviewees continued to collaborate on projects despite a lack of trust, such as when an interviewee described his motivation to keep looking for project opportunities to leave a better world to his son.

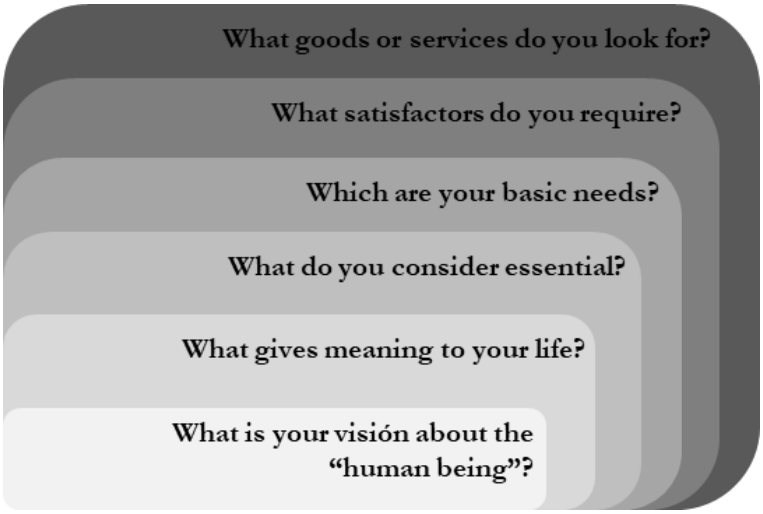


Figure 11. The meaning of being human and human needs

Informed by Capra (2004), Frankl (1959) and Max-Neef (1986). Modified from https://www.researchgate.net/publication/341161816_Cual_es_tu_idea_de_lo_que_significa_ser_human

The satisfaction of non-material needs, beyond the technical scope of a sustainability project, suggests why the interviewees often regarded events happening to them, even adverse ones, to keep learning or as tests to pass. Different interviewees gave examples of this, as one waste processor who learned to be more careful with his business after being robbed. Although not all the interviewees explicitly linked their activities with social or transcendental goals, they all revealed they pursued a purpose when engaging in sustainability projects, such as leaving a legacy for the world to give meaning to their lives or learning something new to improve their performance. The emotional domain of the interviewees was also critical to understanding their motivation to engage and solve sustainability challenges. Here, the cultural characteristics of Colombians — how they express their feelings and behave in their relationships — drove a tendency to foster better interactions, as the national government representative described. Examining both the stakeholders' material and non-material needs, the social and technical aspects and the rational and emotional drivers to collaborate in the plastic packaging waste management system provides a rich framework to understand how stakeholders interact with learning in projects and making decisions. For example, an organisation might develop the capacity to design new sustainable packaging because they see this as part of their business model relevant to compliance with Resolution 1407/2018. However, doing so also aligns with their motivation to protect the environment, as some waste processors described the nature of their business.

Figure 12 illustrates stages of learning dynamics, where the combination of rational and emotional dimensions brings a richer understanding of stakeholder decisions in sustainability initiatives. In **Figure 12**, the diversity of scenarios suggests how asymmetrical capabilities, circumstances and needs among stakeholders see some stakeholders making more sacrifices than others to engage. For example, one waste processor described the sacrifices he made to keep their business ongoing and keep learning.

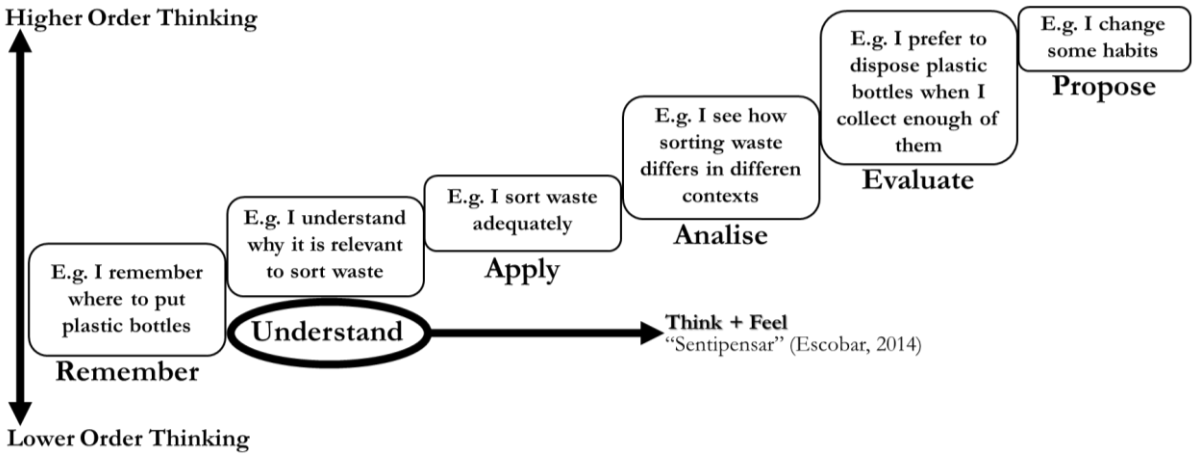


Figure 12. Learning through understanding and feeling

Informed by Bloom et al. (1956) and Escobar (2014). Modified from:
https://www.researchgate.net/publication/339710391_Aprendizaje_diferenciado_en_sostenibilidad_es_un_proceso_y_toma_tiempo

Having better access to resources, higher needs satisfaction and more robust capabilities to participate in sustainability projects helped some interviewees have more power when negotiating different initiatives. It was more evident in the interviewees who worked in large organisations than in small or medium companies. However, asymmetrical stakeholder conditions introduced tensions for interviewees when choosing whether to engage in a new initiative. Some interviewees discussed having to choose between whether to continue doing business as usual or comply with Resolution 1407/2018. **Figure 13** illustrates some of these tensions through the example of a plastic waste processor who wants to take up a new business opportunity to process biopolymers from packaging waste, only to realise that he does not have the money to buy new equipment needed to do it because he had to keep cash flowing to secure the operation of his organisation in the short term.

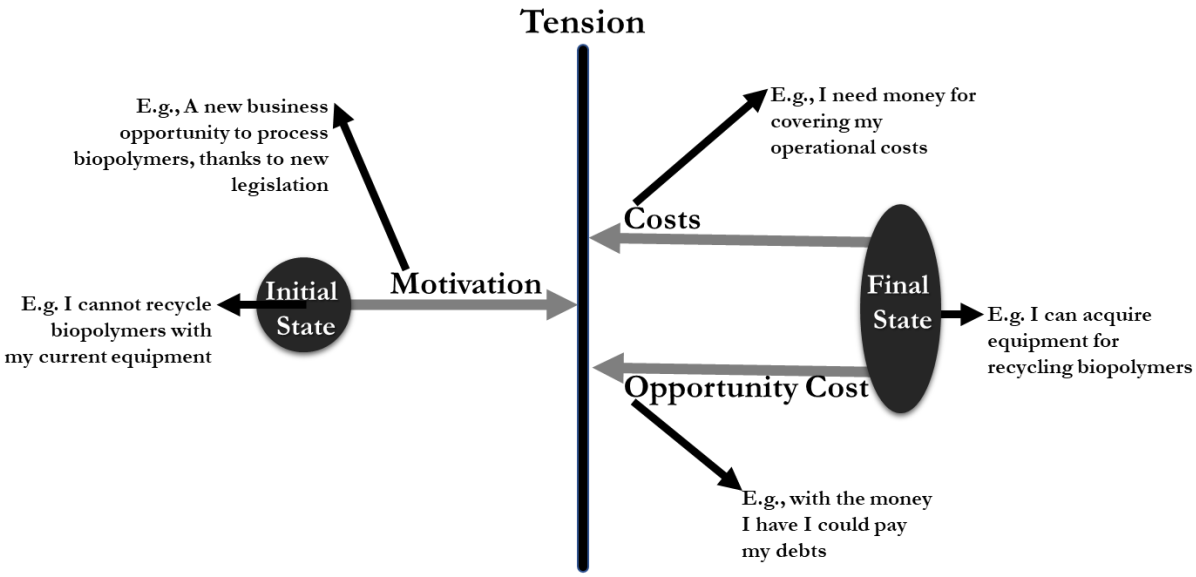
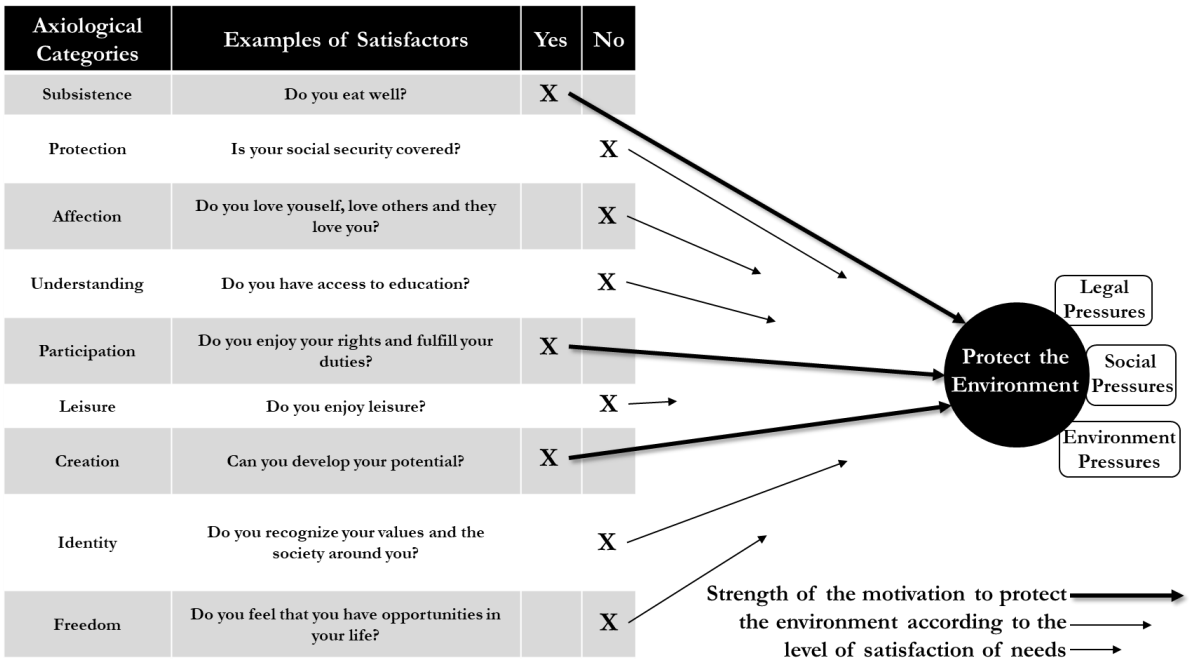


Figure 13. Tensions when pursuing new project opportunities

Modified from:

https://www.researchgate.net/publication/339439096_Algunos_Obstaculos_en_la_Economia_Circular_Motivacion_Costos_y_Costo_de_Oportunidad

To expand on this example, **Figure 14** illustrates how differentiated needs satisfaction can drive or block stakeholders' motivation to engage in sustainability projects.



Axiological Categories	Examples of Satisfactors	Yes	No
Subsistence	Do you eat well?	X	
Protection	Is your social security covered?		X
Affection	Do you love youself, love others and they love you?		X
Understanding	Do you have access to education?		X
Participation	Do you enjoy your rights and fulfill your duties?	X	
Leisure	Do you enjoy leisure?		X
Creation	Can you develop your potential?	X	
Identity	Do you recognize your values and the society around you?		X
Freedom	Do you feel that you have opportunities in your life?		X

Figure 14. Needs satisfaction driving and blocking engagement

Informed by Max-Neef (1986). Modified from

https://www.researchgate.net/publication/338990452_Necesidades_Basicas_Humanas_y_Proteccion_del_Ambiente

For example, one interviewee discussed how some waste pickers felt satisfied with their lives daily but acknowledged they had to fight every day to secure their necessary income to pay for food and shelter. They could have the scope to develop their human potential but might not be motivated to engage in long-term sustainability initiatives. This individual could feel the pressure from Resolution 1407/2018 to improve the efficiency of their waste management activities but find no motivation to engage in a shared project that requires a sustained commitment to comply with the norm. These tensions reveal the interviewees' challenge when looking to satisfy their immediate needs while pursuing long-term goals concerning compliance with Resolution 1407/2018: Extended Producer Responsibility in Packaging. Some interviewees were better positioned to plan for long-term goals due to their more significant resources and capabilities. However, all interviewees reported the pressure to deal with short-term priorities that undercut their ability to focus on long-term objectives, revealing an opportunity to find common ground between stakeholders in sustainability.

In discussing the sacrifices some interviewees had to make to participate in sustainability projects in the short and long term, it became apparent that the decision to engage was not entirely free for all interviewees. For these stakeholders, the decision to engage was often based on the realisation that not engaging would pose higher risks, such as going bankrupt and thus having sufficient resources to satisfy their most basic material needs. The research findings show that different risks operate at different levels of the plastic packaging waste business ecosystem. It was shown at an individual level when perceptions and prejudices came into play regarding who to consider trustworthy. At an organisational level, this was shown when the values of a cooperative of waste pickers determined their strategic direction. At a system level, this was shown when stakeholders had to battle consumers' reluctance to separate plastic packaging waste from other recyclables or to use products made of recycled plastic.

Some interviewees doubted the value of investing proactive effort in fostering collaboration to comply with Resolution 1407/2018, especially when the resolution provided little insight into how to go about this, leading them to adopt an individualistic position. The research findings show that in being individualistic, the loss of connection jeopardises their ability to operate effectively in a socio-technical system. For example, as described by a couple of interviewees, when waste collectors fail to sensitise people about

the need to sort waste properly because these companies are paid per ton collected, or when some waste pickers choose not to collect a specific recyclable material because they do not get paid enough per kilogram collected.

However, the research findings show despite their doubts about other stakeholders or the actions and sincerity of the government, most interviewees attempted to comply with the expectation to collaborate established in Resolution 1407/2018. Yet the research findings also show that due to stakeholders' asymmetrical capabilities, circumstances and objectives, it is almost impossible to afford all stakeholders equal agency in the plastic packaging waste management system or equal access to clear and consistent information unless dedicated effort is invested in this. The findings established that some stakeholders would never express their true feelings to other stakeholders because they could not trust others or the feelings they wanted to speak about were too sensitive to communicate. To encapsulate the discrepancies between what stakeholders say and do, **Figure 16** shows how two individuals can have different opinions, motivations to interact and sources of information influencing their actions.

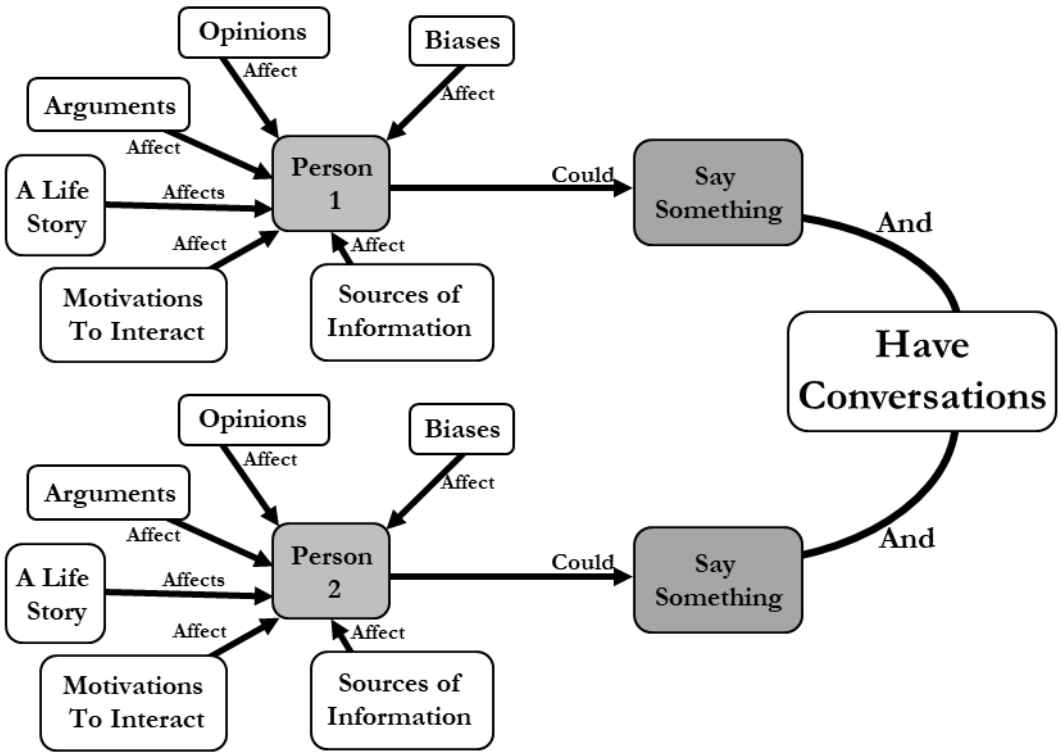


Figure 15. The complexity of stakeholders' attributes during conversations

Adapted from:

https://www.researchgate.net/publication/340570242_Comunicacion_y_Credibilidad_Confianza_en_Red

Two stakeholders might meet at an industry event and strike up a conversation, as described in Chapter Three, as happened during the workshops. **Figure 17** illustrates how explicit and tacit stakeholder characteristics might influence the direction of the conversation in respect of trust-building and engagement. The concentric circles around the individuals represent the different layers of motivations to engage, some being quite straightforward and others being related to deep and complex perceptions, reflecting Cowan and Todorovic's (2000) examination of how surface, hidden and deep values operate. Interviewees reported that in attending some events, they encountered others with similar motivations to them who they recognised as possible future allies. For example, a representative of an NGO described how she built a new business relationship after meeting a business partner in an event where they could better know each other. Such emergent situations can lead stakeholders to explore the potential to collaborate, with new business partnerships eventuating and genuine trust being built if stakeholders' expectations correlate with each other's actions.

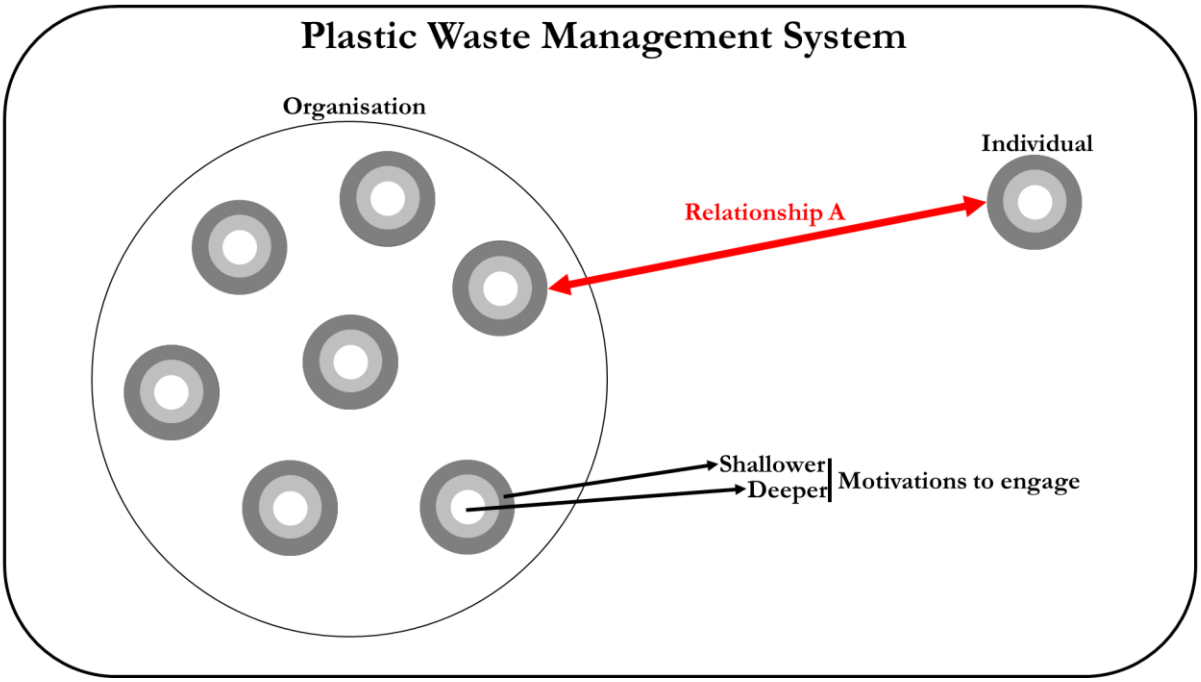


Figure 16. Deep and shallow motivations to engage

Different interviewees argued that when relationships are established between people, the decision to collaborate can be influenced by both contextual factors or qualities of the individual or the organisation. For example, a representative of a large organisation described how her perception of others' trustworthiness was influenced by how well-

prepared that person was when pitching a new business opportunity. As a result, the differences between engagement and trust-building dynamics between individuals and organisations in the case of the plastic packaging waste management system in Medellín, as noted by Armstrong et al. (2022) and shown in **Figure 16**.

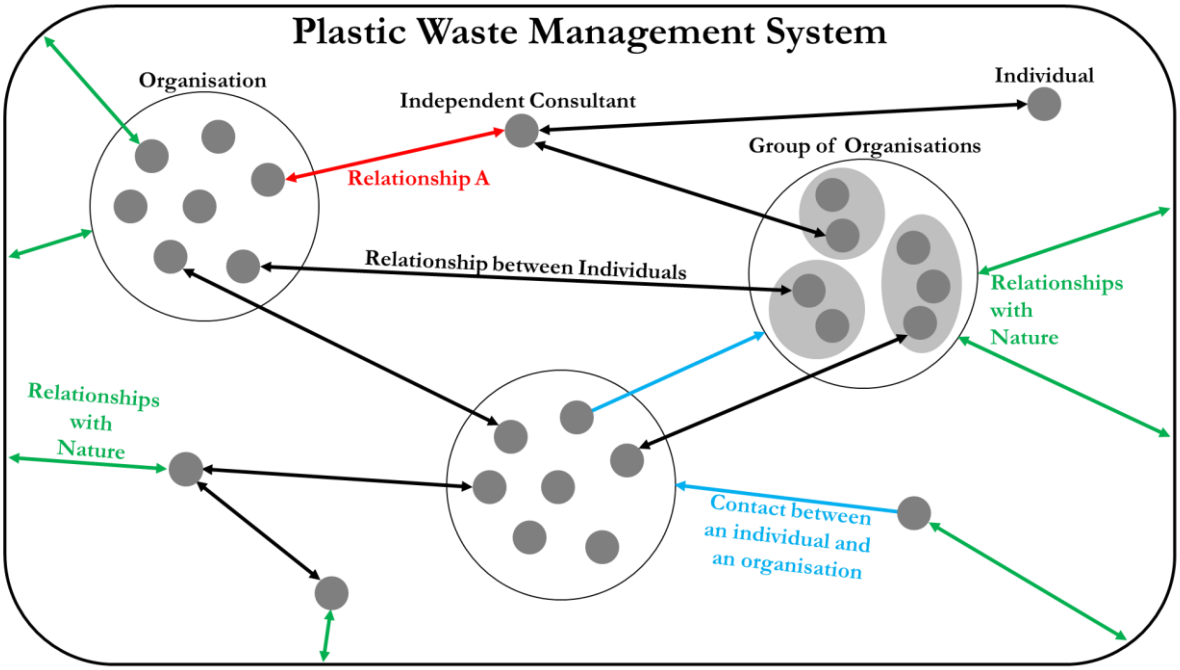


Figure 17. Interactions between individuals, organisations and nature

To exemplify **Relationship A** and based on the experiences shared by the interviewees, an *individual* working in an *organisation* could interact with another individual acting as an *independent consultant* on sustainability matters as shown by the black arrows. Simultaneously, the independent consultant might interact with other people in other organisations. The same might happen at a social event where an individual meets several other industry stakeholders, as it happened during the workshops described in Chapter Three. In a sustainability project, other interactions might occur without human contact, such as when a university lecturer told how she learned about some politicians by watching the news about them, as shown by the blue arrows, or collecting data directly from nature, as shown by the green arrows.

How the interviewees described participation in sustainability initiatives expands the understanding of the intrinsic relationship between the performance of individuals and organisations. The case shows how organisational strategies in sustainability projects need

to consider the intersection between the project and the emotional lives and values of individuals. For example, a couple of interviewees described how their spirituality influenced how they managed their organisation concerning the relevance of pursuing sustainability in their projects. The research findings make apparent the need for a holistic approach to aligning the social and technical dimensions of a system with the emotional, rational and spiritual dimensions of stakeholders to effectively tackle sustainability challenges, the various dimensions of the human explaining why the stakeholders might choose to engage even in situations that are not ideal because the motivation to trust others is low. Although the case study represents the specific circumstances of a middle-income developing country with weak governance, the case findings nonetheless contest existing approaches to understanding engagement and trust-building dynamics in sustainability projects.

Instead of confirming what could be perceived as the obdurate barriers to building trust in Colombia, the interview findings show that it was possible to build trust and engage. All the interviewees described experiences where they collaborated with others in sustainability initiatives. Instead of asking who is trustworthy or not or if it is possible to trust other stakeholders in the plastic packaging waste management system in Medellín, focusing on the matter of stakeholder purpose in building trust and the conditions required to build it could provide better and broader opportunities to trust and collaborate in sustainability projects. The deep examination of trust-building dynamics presented in the thesis shows that there are differentiated levels of trust, whether it is between family members, friends, work colleagues or acquaintances. The different levels of trust also vary over time, especially in terms of whether the relationship is expected to last for the duration of a single project or endure beyond this. One of the interviewees explicitly referred to the different levels of trust when describing his trust in his family and the trust in society. Here, the interview findings support the understanding that it is in the primary stage of sustainability projects that governments and intermediaries should undertake the most effort to build a sense of familiarity and, if possible, a community between the project stakeholders

Even with the challenges in building trust in Colombia, the interviewees, in this case, reported building immediate or ongoing relationships with other stakeholders. In this, the interview findings reveal three integrated patterns of stakeholder behaviours linked to

engagement and trust-building in sustainability projects, these dynamics being forged from a combination of individual and collective and transcendental and pragmatic drivers. The interviewees' comments and experiences showed how stakeholders adapt to progressive events by dynamically assessing the outcome of their relationship with other stakeholders, using this evaluation to inform their project decisions going forward. In summary, four factors drove stakeholders to engage when the motivation to trust is low and the distribution of agency and resources in sociotechnical systems is unequal, as shown in **Table 33**.

Table 33. Underlying drivers of engagement in sustainability projects

1	The satisfaction of material needs, such as having food and shelter.
2	The satisfaction of non-material needs, such as having a purposive and transcendental life.
3	Spontaneous opportunities in the system and interactions with other stakeholders.
4	Progressive and dynamic outcomes of the stakeholders' relationships.

In examining engagement and trust-building dynamics in the case study, the thesis expands existing knowledge in three additional ways. First, it shows how stakeholders might engage in the absence of generalised trust in being forced to do so by pressing needs in their daily lives and businesses. For example, an interviewee suggested how she could afford to satisfy her needs because she had a job and illustrated that she needed to keep her job. The sacrifices some interviewees made to keep engaging in projects show how some stakeholders make decisions without complete freedom of choice, incurring extra imposts for maintaining their involvement, increasing the asymmetry of resources and power between stakeholders in sustainability projects. Second, relationships are built between people, the case findings revealing the relevance of human emotional and spiritual domains in understanding stakeholders' behaviour and relationships in projects. One representative of a large organisation confirmed this by describing how she considered the 'chemistry' she felt with someone as input to assess their trustworthiness. The case also reveals the diffuse relationship between individual and organisational needs and capabilities. Third, the thesis expands the understanding of the complexity of human needs in the performance of complex socio-technical systems. All the interviewees illustrated it when interweaving their material and non-material needs when describing their life satisfaction levels.

The Dance of Trust is Spontaneous, Progressive and Dynamic

In engaging in sustainability initiatives, the interviewees navigated a continuum of complex scenarios in meeting new or already-known stakeholders across industry, government, and academia through civil-society events, work meetings and casual interactions. **Figure 18** provides the example of **Relationship A**, as represented by the blue and yellow three-dimensional spirals in which the blue line represents Stakeholder 1 and the yellow line represents Stakeholder 2. **Figure 18** suggests the navigation of stakeholder needs, capabilities and goals occurs when stakeholders interact, such as in an interview, a workshop or a business meeting, receiving new information and assessing their commitment to a sustainability initiative. The diagram indicates how the two stakeholders build their relationship while simultaneously interacting with others, through a sequence of planned or unplanned events, in their inner circle of trust — trusted colleagues, family or friends — and outer circles of trust — acquaintances or business partners who are new to them who have given them reasons to doubt their genuineness or reliability.

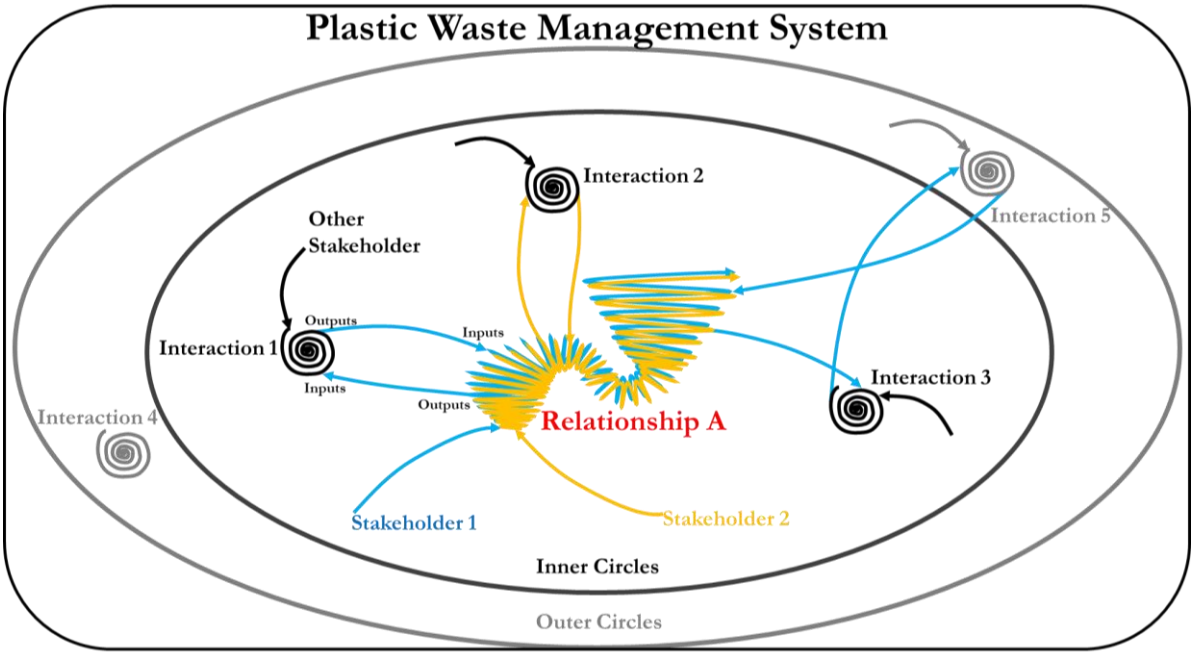


Figure 18. A Dance of Trust

Following the example of Stakeholder 1 building a relationship with Stakeholder 2, the first stakeholder will simultaneously interact with others. Each interaction might progressively provide new inputs that inform decisions in **Relationship A** and other interactions. Eventually, Stakeholder 1 could meet new people in the outer circle, bringing new inputs to

the existing relationships. It was evident during the interviews when the interviewees shared their lessons learned in previous recent or long-lasting relationships with stakeholders in other projects. In this process, the reinforcement or reassessment of stakeholder behaviours and decisions is dynamic. **Figure 18** represents the interdependent touchpoints of interaction, contingent on the many personal and contextual factors explored in the thesis, which offer opportunities to connect, exchange, reframe or pivot according to the level of engagement. It was evident when the interviewees described their different challenges to engage and build trust in sustainability initiatives, as illustrated in Chapter Four, and how they diversely overcame the challenges based on their needs, capabilities and their pursuit of reliable information, as shown in Chapter Five.

Exploring stakeholders' experiences and perceptions in the plastic packaging waste business ecosystem in Medellín provides a better understanding of the challenge of building trust, especially regarding the importance of the influence of stakeholders' cultural frameworks. For example, it is illustrated in Chapter Four in the section *Cultural barriers and the complexity of the plastic packaging waste management system make trusting others more complicated*. The interview findings also support Borgatti's (2018) position on the time it takes to build a trust-based relationship between stakeholders, the importance of shared characteristics in this as well as friendships. The findings also align with Fukuyama's (1995) position that cultural change takes time, as illustrated in Chapter Five in the section *Strengthening bonds in stakeholder communities facilitates trust-building*. What is original in the interview findings is that generalised trust building is not essential in engagement in sustainability projects. That engagement can proceed despite diverse tensions between stakeholders and the presence of a raft of short- and long-term challenges.

The thesis identifies the nuances and tacit behaviour patterns in trust-building, adding to Jucevicius and Juceviciene's (2015) examination of the complex dynamics and tensions stakeholders face when building trust, as illustrated in Chapter Four. Jucevicius and Juceviciene do not deeply examine the influence of complex stakeholder needs or how uncertainty in the management of information affects the character of trust. The thesis expands the knowledge of trust-building dynamics in complex networks of stakeholders in alignment with Bachmann and Inkpen (2011) examination of trust-building decisions based on 'other organising principles, for example, power.' The research findings reflect the opportunity identified by Armstrong et al. (2022) to use examples from the real world to

understand the flow of trust-building activities through which trust is 'signalled, created, destroyed and repaired', as illustrated in this case of the plastic packaging waste management system in Medellín.

The attributes of trust building are widely discussed in the literature, spanning the relevance of feeling familiar with others (Luhmann, 2000), having conversations to better know each other (Maríñez Sánchez, 2018) and considering human dimensions beyond rationality to understand stakeholder behaviour and decisions (Tang et al., 2019). It is illustrated across Chapter Five, as in the section *Strengthening bonds in stakeholder communities facilitates trust-building*. The thesis accepts the debate on the value of trust in stakeholder relations but further argues that trust is a primary but more complex quotient in the success of sustainability projects than previously considered, especially in situations with weak governance and where stakeholders have starkly asymmetrical needs, capabilities and objectives and little or no access to reliable information as in the case. In examining the interviewees' lived experiences when engaging and building trust, the thesis expands on what is known and thought about the possibility of building trust as a requisite for better engagement in sustainability projects (see **Table 34**).

Table 34. Knowledge shift in engaging and building trust in sustainability projects

The Literature	The thesis
Mostly in **developed** countries.	Focused on **middle-income developing** countries with weak governance
Basic examination of **asymmetrical human needs and capabilities** as a driver in engagement and trust-building in sustainability projects.	**Deep dive examination of material and non-material human needs and capabilities** driving trust-building and engaging in sustainability projects.
Basic examination of the **complexity of trust-building** dynamics where collaboration is expected.	**A human-first and integrated approach** informs the **complexity of trust-building** dynamics where collaboration is expected.

Pursing the satisfaction of needs motivates stakeholder engagement, but at a cost to people and organisations

This case had particular characteristics related to a middle-income developing country with weak governance. Different interviewees recognised that the government lacked the capabilities to foster changes in stakeholder behaviours. It is illustrated in Chapter Four in the section *Poor government intervention and communication between stakeholders block better*

collaboration to engage in legislative compliance, consistent with different reports in Colombia (Departamento Nacional de Planeación and Instituto Global de Crecimiento Verde, 2016; Ministerio de Ambiente y Desarrollo Sostenible, 2018a). Rodríguez Becerra (2009) also emphasises the need to question whether more legislation is required if a government cannot properly enforce existing legislative norms. This situation was also evident in the legislation review and the number of norms the stakeholders had to be familiar with to be able to comply with sustainability requirements from the government. It is recognised that some governments fail to support all stakeholders in a system because they enact norms without considering the differentiated stakeholder needs and capabilities (Pedwell, 2017). It is also illustrated in the legislation review in Chapter Four, in the section *Colombia's solid waste management legislation tends to make generalised compliance more difficult*. Fukuyama (1995) also observes that governments sometimes need to force compliance but fails to explain how norms are ultimately enforced with a diverse network of stakeholders in a context where different people and organisations are challenged to comply due to the obstacles of asymmetrical needs and capabilities.

Fukuyama (1995) acknowledges that forcing legislation compliance could be helpful as a substitute for trust where trust is low. However, he does not profoundly address what happens in contexts where there is inconsistent government policy (Sleman Chams and Velásquez Muñoz, 2016) and ineffective compliance strategies as Rodríguez Becerra (2009) discusses, which is the case in this thesis with the compulsory requirement of collaboration between the stakeholders to comply with Resolution 1407/2018. Fukuyama and other authors who examine trust-building dynamics neglect that in contexts with high uncertainty about the information being exchanged and poor legislative governance and enforcement as in this case, the interviewees revealed that they continued betting that it was possible to collaborate with others, which is a complex if a weak, form of trust.

Nussbaum (2011) defends the need for a supportive government but does not further examine how stakeholders move forward with initiatives when lacking such government support. Hearn (2015) argues that in middle-income developing countries, principally Mexico, careful government intervention could help stakeholders improve their competitiveness. Still, in such countries, the challenges of strengthening government support for stakeholder engagement in sustainability projects were often diminished by the many obstacles to enforcing legislation. This situation was illustrated in this case by

interviewees discussing how government legislation could discourage stakeholders from complying. This understanding is consistent with some interviewees' suggestion that Colombia has many norms to protect the environment and regulate waste management but poor enforcement. Here, the contribution of the thesis to knowledge is in setting out in detail how the interviewees found the motivation to engage in their material needs — as in being in a survival mode — and their non-material needs — as in being in a transcendental mode — with the spontaneous, progressive and dynamic opportunities and outcomes of their relationships driving them to continue to the *dance* which is stakeholder engagement.

However, it is clear from the case that doubts about the effectiveness of legislative enforcement affected the interviewees' investment in the compulsory requirement established by Resolution 1407/2018 to collaborate. Discussing whether compulsory or incentive-based strategies are better for fostering stakeholder engagement in complying with sustainability legislation is not definite because, as Harrington and Morgenstern (2007) note, this analysis is context-dependent. Here, Ball et al. (2018) argue for the 'development of mutual trust' (p. 250) to foster voluntary engagement in sustainability initiatives but base their opinion on a case from a developed country with strong and active government institutions. The interviewees had varied positions on which strategy was better. However, their comments revealed that a balanced scheme between command and control and incentive-based strategies would best improve the plastic packaging waste management system in Medellín. It is consistent with the mixed and flexible schemes to foster better engagement in sustainability projects proposed by Parker et al. (2009) and Pedwell (2017) while indicating the need to contextualise the analysis of each case and project.

The way the government issued Resolution 1407/2018: Extended Producer Responsibility in Packaging without considering the diverse stakeholder needs and capabilities revealed its lack of coherence in contrast with Wang and Geng's (2011) position on treating stakeholders fairly when enforcing legislation. As reported by the interviewees and in Chapter Four in the section *The case context*, Resolution 1407/2018 did not allow stakeholders to self-regulate because it ignored differences between their attributes, thus neglecting what Guerrero et al. (2013) describe as the multi-dimensional factors that come into play in developing solutions to solid waste management problems. The position on legislative framing of the Colombian government equally goes against Scott and Bryson's (2012) recommendation that giving people a measure of control regarding their approaches

to goals in engaging in sustainability initiatives is preferable. The design and enforcement of Resolution 1407/2018 also ignore what is written about the low effectiveness of norms in changing behaviours where trust is low (Bstieler, 2006) and there is weak governance and motivation to engage in sustainability initiatives where collaboration is expected (Schill and Shaw, 2016). As Gifford (2014) notes, in mandating collaboration between stakeholders in a context with weak governance, Resolution 1407/2018 increases the risk of fostering anti-norm behaviours.

Despite the presence of weak governance and enforcement of legislative compliance in Colombia, many interviewees saw the government as a third party in the process of improving engagement and trust-building activities concerning the plastic packaging waste management system in Medellín, as illustrated in Chapter Five in the section *Local awareness and attributes foster stakeholder collaboration*. It is consistent with Guerrero et al. (2013), who acknowledged governments as vital to improving solid waste management and Jia et al. (2019), who note the interdependence of the stakeholders, including the government, in developing sustainability initiatives. The need for government intervention and the risks associated with its intervention was consistent with the apparent paradox in the interviewees' positions about the role of the government being troubled and necessary. In the face of weak enforcement of legislation, the interviewees reported the need to take concrete action to move forward with projects as an essential part of their strategic planning as illustrated in Chapter Five, this finding being consistent with Amaya (2005), who notes that organisations cannot surrender to obstacles in developing their business strategies if they expect to survive and prosper.

Although some interviewees acknowledged that the government provided opportunities for consultation before issuing a new norm, as Martínez Sepúlveda et al. (2018) suggest, most interviewees felt excluded from this with Resolution 1407/2018. Schill and Shaw (2016) note the role of short-term priorities as drivers to engage in sustainable behaviours. It is consistent with the research findings where many interviewees reported that they had to make decisions around engagement in sustainability initiatives without having a clear long-term vision as discussed in Chapter Four in the section *Diverse individual and collective, pragmatic and transcendental drivers to participate in sustainability initiatives add complexity to projects*. It contrasts with Draper's (2006) examination of the need for a developed strategic vision when undertaking projects because of the disruptive influence of emergent situations. The

interview findings show that the interviewees developed strategies to fulfil both short-term needs, disruptive events and their long-term strategy, as discussed in Chapter Five in the section *Stakeholders' needs motivate them to build trust and collaborate on projects*, sharing their experience of these emerging as an opportunity to find common ground in projects to facilitate collaboration and begin to forge a sense of trust in each other.

The case context reveals diverse opportunities for engaging and building trust in projects in contrast to the perceptions about the challenging conditions in Colombia reported in many different technical reports and news items. For example, the interviewees expressed a strong sense of belonging to Medellín and saw sustainability initiatives as providing hope for building a better society as reported in different local sources (Alcaldía de Medellín, 2018a, 2018b; Instituto de Empresa de Madrid, 2016), as illustrated in Chapter Five in the section *Local awareness and attributes foster stakeholder collaboration*. These perceptions are consistent with Gifford (2014) and Vaske and Kobrin (2001) who argue that place attachment helps improve the motivation to increase sustainability in the context of a project. Sánchez-Muñoz et al. (2019) also note that the absence of a sense of belonging to a specific place can go against fostering sustainable behaviours. The contribution to the knowledge of the thesis is significant there for being framed in the more complicated context of Medellín with its many obstacles to building trust and engagement.

Although the interviewees demonstrated it was possible to build trust and engage in sustainability projects, the difficulties they experienced required time, effort and resources from them to resolve, as illustrated in Chapter Four, much more so than what is required of stakeholders in contexts with more robust institutions and higher generalised trust. As Holland (2008) writes, in such situations, 'transaction costs' increase, with the case setting out the sacrifices the interviewees had to make. Studies on engagement and trust-building in waste management initiatives in middle-income developing countries do not dive deeply into how stakeholders deal with asymmetrical conditions, higher transaction costs and trust-lacking scenarios, thus needing to invest more resources and effort in building trust and engagement. Here, the thesis contributes to knowledge by showing that in such circumstances stakeholders will collaborate.

The interviewees had to overcome historical problems that affected the self-confidence of Colombians, such as corruption, drug trafficking and social inequality, as shown in Chapter

Four, in line with Ospina (2009), who argues that Colombians lost self-confidence and spontaneous sociability due to a conflicting history. Understanding the historical context to better comprehend trust-building is consistent with the need to assess temporality as examined by Armstrong et al. (2022) in the United Kingdom, which he describes as an ongoing process of 'negotiation and re-negotiation' (p. 3) of trust-based relationships. Colombia's historical context poses specific challenges, increasing the problems in building trust. Nevertheless, as has been discussed in the thesis and illustrated by different local reports and news, the interviewees kept building collaborative relationships. In the face of this apparent paradox, the significant original contribution to the knowledge of the thesis is in identifying that building differentiated levels of trust is possible, being motivated by the satisfaction of needs, the emergence of opportunities and the progressive outcomes of the relationships. However, it was also established that certain stakeholders need to invest more in dealing with challenges of asymmetrical needs and objectives, as shown in Chapter Five in the section *Stakeholders build differentiated trust gradually by adapting to unexpected events*. How the interviewees pursued goals and responded to contextual pressures is consistent with Gong et al.'s (2018) examination of how asymmetrical access to information feeds stakeholders' uncertainty about others' motivations to engage.

The case finding that the diversity of stakeholders' needs and capabilities introduces complexity into stakeholder engagement and trust-building processes in sustainability projects add depth of information to understanding stakeholder motives and behaviour in middle-income developing countries with weak governance. A few writers address how systemic challenges in achieving sustainable development have an emotional dimension that requires education to tackle (E.g., Cottafava et al., 2019; Holmberg and Samuelsson, 2006). Regarding the interviewees' non-material needs, identifying what they considered meaningful for their lives supports Frankl's (1959) discussion of the influence of people's spiritual dimension on their motivation to keep doing their daily activities. The importance of the human spiritual dimension to understanding the stakeholder motivations as illustrated by different interviewees is consistent with Rezapouraghdam et al. (2018). They argue that employees' spiritual dimension helps organisations improve their project engagement. Similarly, Saks (2011) notes that looking for transcendence driven by spiritual values in an organisation can help employees better engage in projects. As part of the significant original contribution to knowledge, the thesis shows the human spiritual

dimension to be a motivator among to network of diverse stakeholders linked to the plastic packaging business ecosystem in Medellín.

Within the non-material motivations to engage with a sustainability challenge, stakeholders' emotional responses were also vital drivers of the interviewees' decisions to collaborate on sustainability projects, as illustrated in Chapter Five in the section *Stakeholders' needs motivate them to build trust and collaborate on projects*. Escobar (2014) emphasises the importance of comprehending human learning behaviour by balancing the influence of reason and feelings, Escobar coming to this contention through the concept 'Thinking-feeling' or '*Sentipensar*', initially developed by Saturnino de la Torre in 1997 (de la Torre and Moraes, 2005) and further advanced in his book *Sentipensar: fundamentos y estrategias para reencantar la educación*. Holmberg and Samuelsson (2006) equally argue for the relevance of putting more effort into investing in people's emotional dimension in projects and improving the management of emotions in education for sustainable development strategies. Despite the relevance of emotions and other non-material drivers for engaging and building trust in sustainability projects, there is little attention in the literature on the complex relationships between stakeholders' material and non-material needs in their motivation to build trust and engage in sustainability initiatives in middle-income developing countries.

Managing their emotional and spiritual dimensions was difficult for the interviewees, with apprehension over the likelihood of corrupting their values and objectives increasing their uncertainty when building relationships. Some interviewees revealed their doubts about putting effort into collaborative strategies to comply with Resolution 1407/2018 until there was clarity from the government about how to do this. Gunarathne and Lee (2019) discuss similar caution among stakeholders in their examination of top-down pressures driving reactive engagement among stakeholders in sustainability initiatives, while Patnaik et al. (2018) discuss the difficulties in fostering proactive engagement with sustainability requirements in developing countries. In addition to this discussion, the thesis addresses the issue of agency in stakeholders' decisions to engage due to the pressure to comply introduced by Resolution 1407/2018, the motivation to engage being forced and frequently happening in the absence of generalised trust.

In the face of the pressures stakeholders faced in this case, some interviewees adopted more individualistic behaviour when engaging with others due to their need to keep finding

business opportunities to satisfy their financial and material needs. It was discussed in Chapter Four in the section *Diverse individual and collective, pragmatic and transcendental drivers to participate in sustainability initiatives add complexity to projects*. In being more individualistic, the interviewees illustrated the paradox of the human needing to belong and establish bonds with others to improve their well-being as discussed by Baumeister and Leary (1995) and Bijlsma (2014) and improve trust-building dynamics (Martínez and Cardona, 2019), this demonstrating the human need to survive at all costs by satisfying immediate needs (Harris, 1977). Yet, in looking to meet their immediate needs individually, the interviewees also risked losing connection with others, potentially reducing opportunities to build trust and collaborate (Anastasi, 2018; Muff, 2017) while affecting their self-confidence (Agreli et al., 2019). In failing to genuinely collaborate, stakeholders are exposed to the risk of incurring extra costs in dealing with sustainability challenges, including by failing to learn about solutions that other stakeholders might have already developed and tested.

Nussbaum (2011) argues that 'each individual has different needs' (p. 70) driving their daily activities. These differences are vital when bringing stakeholders together around a common interest in sustainability (Mair and Laing, 2013), Serrano et al. (2019) arguing for the need to design specific strategies to engage specific stakeholders in sustainability initiatives. However, the literature examining stakeholder engagement in sustainability initiatives is yet to recognise the importance of a differentiated approach to understanding how sustainability projects unfold in complex networks of diverse stakeholders as in the plastic packaging business ecosystem in Medellín. Some of the tensions faced by the interviewees stemmed from contextually specific factors, as illustrated in Chapter Four in the section *Cultural barriers and the complexity of the plastic packaging waste management system make trusting others more complicated*. Other tensions were natural to the innovation processes, such as where the interviewees needed to simultaneously meet immediate needs and longer-term goals. Here, Andriopoulos and Lewis (2009) examine the complex scenarios stakeholders face in project decisions due to their diverse priorities. The asymmetrical conditions the interviewees reported experiencing exacerbated the process of making project decisions underscoring the paradoxical nature of engaging and building trust in the case.

The tensions within the interviewees' different priorities were amplified by the differences between the needs and capabilities of small and large organisations, as noted in Chapter Four in the section *Stakeholders' asymmetrical and subjective needs and priorities add tensions and*

obstruct stakeholder engagement in sustainability projects. It was consistent with Russo and Perrini's (2009) study into the differences in approaching sustainability projects between large and small businesses. Tilley (2002) also reports differences in how small and large organisations engage in sustainability initiatives while arguing that all stakeholders should play by the system's rules. Fogg (2009) reports financial stability as a barrier to the promotion of sustainable behaviours, a factor also affecting the interviewees' power and proactive behaviours in the case, the financial position of the interviewees affecting their decisions to engage in new initiatives. The difference in the interviewees' needs and capabilities led to asymmetries of power, which was evident in how some were better connected to the government and prominent stakeholders.

Given the role of the government in promoting legislation compliance as it was discussed in Chapter Four in the section *The case contex*t, the need for it to be proactive in empowering stakeholders was evident, aligning with Amran et al.'s (2013) emphasis on the need for governments to assume a leading role in fostering engagement. Aparcana (2017) argues that the effectiveness of government intervention depends on how it designs sustainability legislation, with Gunsilius et al. (2011) contending that this should include consideration of the differentiated roles of the stakeholders, whether they are formal or informal stakeholders, empowered or disempowered. However, studies on understanding the role of the government in fostering stakeholder engagement in sustainability projects in middle-income developing countries with weak governance do not deeply examine the interrelations of different and diverse stakeholders, hence the significant original contribution to the knowledge of the thesis.

The interviewees and different authors agree on the relevance of education in promoting better engagement in sustainability projects, as evident in Chapter Five in the section *Local awareness and attributes foster stakeholder collaboration*. Sánchez-Muñoz et al. (2019) argued for this in the context of a case study on solid waste management in Bogotá and Bortoleto and Hanaki (2007) in Porto Alegre, with Marková et al. (2017) examining a broader implementation of sustainability in businesses where education was vital. However, this case indicated that educational strategies were insufficient to foster collaboration due to the interviewees' asymmetrical circumstances, making the extra costs linked to designing and developing educational initiatives prohibitive for some. By contrast, the thesis argues for the impact of informal learning strategies among stakeholders according to which they

capture and process information through every experience and interaction with others, using it to inform their project decisions. Due to the scope for learning through experience, some interviewees recognised the need to collaborate to increase the likeliness of business success, as illustrated in Chapter Five in the section *Strengthening bonds in stakeholder communities facilitates trust-building*. This observation was consistent with Anastasi's (2018) argument that stakeholders need to act together as a group to improve their opportunities as in the example of the scope to be heard. A range of writers note that when some stakeholders perceive they have little or no agency, their propensity to collaborate (Rich et al., 1995) can evaporate as can trust building (Maríñez Sánchez, 2018) and the process of proposing solutions to ensure project success (Ezeah et al., 2013).

Multifactorial social and behavioural dynamics are seen as integral to building trust in a shared mission, as discussed throughout Chapter Five, Lewicki et al. (1998) examining the complex ambivalent behaviours when stakeholders navigate trust and distrust in their relationships. Sol et al. (2013) note the complexity of social learning if trust appears to arise as an emergent property of the interactions between people and organisations in innovation projects. Here, the thesis contributes to understanding stakeholder engagement and trust building by representing it as the spontaneous, progressive and dynamic outcome of stakeholder relationships in sustainability projects. It extends Le Coze's (2019) and Walker et al.'s (2008) argument for the need to consider the complexity in each phase and development of a sustainability project to design better engagement strategies. The research findings make it clear that this extends to the need for a holistic understanding of people's rational, emotional and spiritual domains when trusting and engaging in sustainability projects or not as discussed in Chapter Five.

Dance-like patterns of negotiation: An underestimated aspect of stakeholder agency

In examining the interactions between the interviewees when engaging and building trust in the plastic packaging business ecosystem in Medellín, the metaphor of a *dance* clarified the complex trust-building dynamics when the interviewees adapted to system change and contextual factors to pursue their goals. As a significant, original contribution to the knowledge of the thesis, I propose the use of the concept of *Dance of Trust* in understanding the complex multifactorial considerations that motivate stakeholders to engage in sustainability projects. The *dance* metaphor offers insights into the three integrated patterns

of stakeholder behaviours — Spontaneity, Progressiveness and Dynamism— relative to the individual and collective motivation significant to the general research question — What drives stakeholders to engage when the motivation to trust is low and the distribution of power and resources unequal?

Trusting Spontaneously: Adapting to change and leveraging emergent events

Facilitation of collaboration opportunities, frequently meeting and dialogue seemed to improve the likelihood of engaging as suggested by Armstrong et al.'s (2022) examination of the need to avoid taking trust for granted in projects and to keep putting effort into maintaining trust to circumvent damage in trust relations due to system disruptions. Spontaneity is the first pattern of behaviour in trust-building identified by the case, describing the emergence of events in complex systems. For example, two individuals could meet at an industry event to fortuitously find that they share a business partner, work in the same industry or enjoyed attending this event. **Figure 19** illustrates how the two people could interact in this way, their background, present status and motivations for attending the event influence their meeting and subsequent feeling of connection despite it seeming accidental or spontaneous to them.

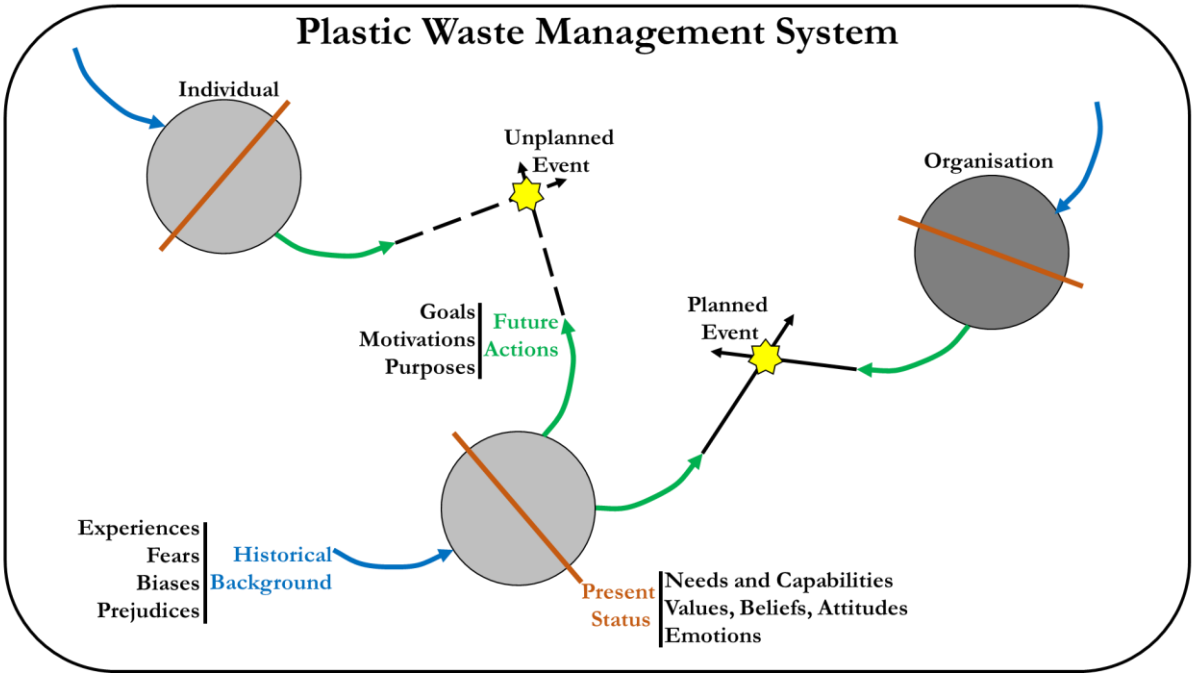


Figure 19. Unplanned and planned events

Following the example of **Figure 19**, the two individuals share their different experiences, fears, biases and prejudices in conversation, influencing their initial attitudes and behaviours. For example, the representatives of the two industry associations described their experiences with government officials and a representative of an NGO, where they shared their opinions which affected their relationships. Spontaneity is examined in the literature on trust-building by varied authors. Heuser (2005) discusses how emergent events can trigger social cohesion, such as when stakeholders form associations to deal with a shared problem. He analyses a case characterised by perceived generalised trust, which was not the situation of the plastic packaging waste business ecosystem in Medellín. Ospina (2009) observes that Colombia has generally lost spontaneous sociability due to entrenched problems of corruption and inequality (see also Le Coze, 2019; Walker et al., 2008). The thesis demonstrates that the opposite can be the case, with stakeholders engaging and building trust following spontaneous events, such as industry workshops. Lewicki et al. (1998) discuss the complex, emergent properties of trust in human relationships but argue for the need for more research to better understand the dynamics of trust-building processes, especially concerning context-specific factors. Sol et al. (2013) also see trust as an emergent property of stakeholder relationships, one that helps stakeholders navigate the uncertainties in sustainability projects, but they examine a case where there was well-established mutual trust due to the comparative homogeneity of stakeholders.

Following the instance of **Relationship A**, as shown in **Figure 20**, there are explicit and tacit conditions on which stakeholders start, continue or stop building trust. For example, the relationships with the interviewees evolved since I first met some stakeholders and over a year, where the conditions on which trust was built continued to change. **Figure 20** sets out six possible scenarios of interactions, named AA, BB, CC, DD, EE and FF

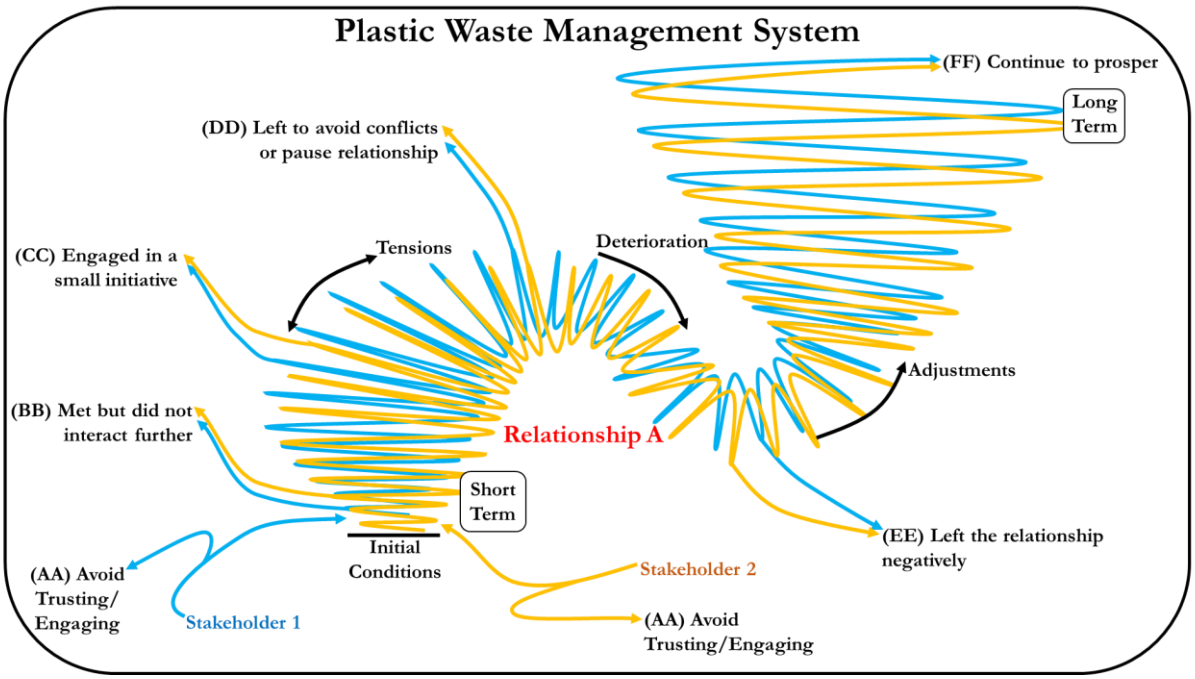


Figure 20. Scenarios of relationship building

Informed by Fukuyama (1995), Munns (1995) and Tuckman and Jensen (1977)

Scenario AA: Avoid Trusting/Engaging. Stakeholders do not have any interaction because they never met at an event or one or both decided not to talk for having other priorities. This scenario is not examined in the thesis.

Scenario BB: Met but did not interact further. Stakeholders start to converse, but the discussion ceases after a short time. Perhaps they talked about project ideas or exchanged details about each other's lives but did not feel motivated to continue with the relationship, did not find any shared interest or felt any chemistry between them. It happened with most of the research participants invited to the interviewees who decided not to participate on them.

Scenario CC: Engaged in a small initiative. Stakeholders have a conversation and agree to meet again to develop future initiatives, as happened with the 27 interviewees. Suppose the relationship continues to build positively. In that case, they might decide to collaborate on a small endeavour, such as doing some tests to process new plastic waste, following spontaneous ideas that emerged during the initial dialogue. Some interviewees reported they could continue to build positive relationships with people they met during a workshop, as a food company representative commented on a waste processor with whom they did some tests of potential waste processing.

Scenario DD: Left the conversation to avoid conflict or paused the relationship. After deciding to collaborate, a spontaneous event can emerge that goes against the expectations of one or both stakeholders, such as someone not complying with their commitment to helping run tests on recovered materials in a specialised laboratory. I did not perceive this scenario took place during my research. This situation adds tension to the relationship, potentially leading it to cease before further conflicts emerge. The stakeholders might also choose to end the relationship because their expectations have been met in a project finishing and there are no motivations to instigate a new initiative. This scenario occurred with most interviewees with whom I have not continued to interact in research or project-related activities.

Scenario EE: Left the relationship negatively. Spontaneous conflicting situations can emerge, making the stakeholders leave the relationship with negative feelings and opinions of each other. I did not perceive this scenario took place during my research.

Scenario FF: Continue to prosper. Conversely, stakeholders could see their expectations met, boosting their motivation to work on other projects. In this scenario, the stakeholders might even decide to undertake more significant initiatives. As described in the different scenarios, a gradual sequence of spontaneous events suggests that relationships can progressively build where stakeholders base their business decisions on ongoing and updated information about others' behaviours and the changing contextual factors. I did not perceive this scenario took place during my research. The following section examines the second stakeholder behaviour pattern, Progressiveness, in more depth.

Trusting Progressively: Weighing stakeholder goals, needs and capabilities

Stakeholders build trust and engage progressively as Botsman (2017) examines when describing that people first need to trust an idea, then an organisation and others. Progressiveness is identified as the second behaviour pattern, encapsulating how building trust takes time and persistent effort in building relationships depending on the stakeholders' goals. However, as part of the thesis's contribution to knowledge, the amount of time and effort required to build trust vary depending on the scope and purpose of each relationship. Hence, not all project interactions necessarily need too much investment of time and effort to invest in engagement and even a measure of trust. According to Guavita Moreno and Peñafort Camacho (2001), stakeholder interactions typically combine

conversations and shared activities through which people dynamically interweave ideas in a constant flow of interactions (Armstrong et al., 2022). Through this process, stakeholders can ascend a 'spiral of trust' as some authors claim of trust dynamics (Covey, 2006; Munns, 1995; Tang et al., 2019) and as it happened with the interviewees for more than a year before conducting the interviews. **Figure 21** illustrates a pattern through which stakeholders can build trust, characterised by many small steps or promises that continue strengthening the relationship if all stakeholders keep delivering as expected.

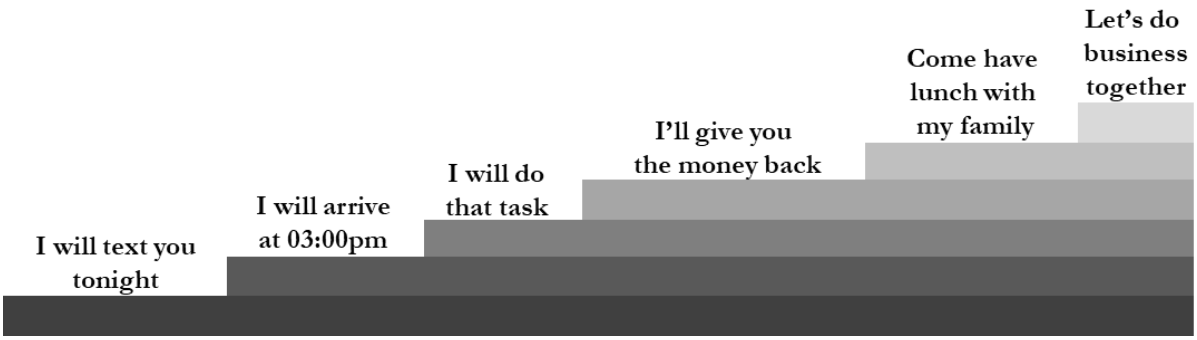


Figure 21. Building trust progressively

Informed by Fukuyama (1995) and Munns (1995). Modified from
https://www.researchgate.net/publication/348936548_Confiando_Paso_a_Paso

Progressiveness is examined in the literature on trust-building by different authors. For example, Armstrong et al. (2022) argue that trust-building activities take place in 'an incremental, participatory and continually tested interactive process' (p. 13). Still, he does not illustrate how this gradual process occurs in challenging contexts characterised by weak governance, corruption and inequality, as in Colombia. Cowan and Todorovic (2000) use the concept of a spiral to explain how stakeholders building relationships become increasingly aware of each other's values to improve their engagement in projects. Still, they limit their examination to the domain of a single organisation and do not assess the potential effect of the diverse needs of employees. In its original contribution to knowledge, the thesis argues that trust-building dynamics operate like an interconnected set of bent, three-dimensional spirals rather than the simple spirals proposed by other authors examining trust. **Figure 20** illustrates that stakeholders can go back and forth in their relationships, gradually moving forward in the dance that is the search for new opportunities and business partners. It was evident in what interviewees said when referring to the conflicts they managed, how they continually learned and how they overcame the barriers to keep engaging in sustainability projects.

A range of authors, however, argue that the process of forging stakeholder relationships along the path to capitalising on business opportunities is most effective if externally supported. Notably, Panyathanakun et al. (2013) see the need to develop community-based projects to bring stakeholders together in a project and foster trust-building, although they provide little insight into how this process might occur at a system level in a complex socio-technical system with interconnected networks of stakeholders facing diverse contextual challenges. Shams (2019) also highlights the evolution of trust-building processes contingent on 'expected courses of actions and interactions' (p. 126) but does not profoundly address how this process happens in sustainability projects where stakeholders are required to navigate asymmetrical circumstances and challenging contextual forces.

As illustrated by the interview findings, trust can be built progressively through emergent events such as by responding to a request by email or being on time for a business meeting as agreed upon to encourage stakeholders to consider whether they might collaborate on a joint business opportunity. It is further illustrated in Chapter Five in the section *Stakeholders build differentiated trust gradually by adapting to unexpected events*. The relevance of showing results with concrete indicators for people to perceive the progress of an initiative is critical, Bush et al. (2018) analysing the dissemination of research outputs to relevant parties. In developing relationships, stakeholders move from one goal or expectation to another through small steps, commencing with their inner circles of trustworthy people and expanding to new stakeholders in their outer circles. It was illustrated by some interviewees when they referred to how third parties or already-known people could help them connect with new stakeholders. Meanwhile, stakeholders keep learning from each other about the range of stakeholder responses, using this developing experience to keep informing their business decisions. In the case of the plastic packaging waste management system in Medellín, the interviewees seemed to prefer to first work with people and organisations they already knew, those who had an established reputation or were introduced by someone trustworthy.

Stakeholders take small steps for different reasons, such as to reduce their imminent risks, because they do not have other options due to their limited resources or as part of their long-term strategy, this being consistent Armstrong et al. (2022) noting the gradual process of negotiating and renegotiating the conditions of trust. In this case, sharing fears or interests, such as those related to the risks and strategy to comply with Resolution

1407/2018: Extended Producer Responsibility in Packaging often proved sufficient for facilitating conversations between stakeholders. For example, many interviewees described their motivation to increase profit in the business opportunities framed under Resolution 1407/2018. It is consistent with Anastasi's (2018) argument that sharing a knowledge base and objectives can foster engagement and Muff's (2017) examination of the relevance of sharing a vision for the future to motivate stakeholders to collaborate. Nooteboom and Six (2003) also argue that sharing values, practices and identity fosters a sense of connectedness and contributes to trust-building.

However, as the interviewees revealed, deeper motivations for engaging and trusting linked to their individual or organisation's purposes were needed to move relationships beyond initial conversations and translate them into lasting collaboration. For example, some interviewees mentioned the need to share values and goals to build more profound relationships to tackle more significant challenges and opportunities. With interactions starting or continuing, agreements about project expectations can be reached in the short term by focusing on small activities that stakeholders can undertake with others. **Figure 22** suggests how short-term activities can build relationships and opportunities for the long term by focusing on more significant activities they have an interest in undertaking with new people or organisations.

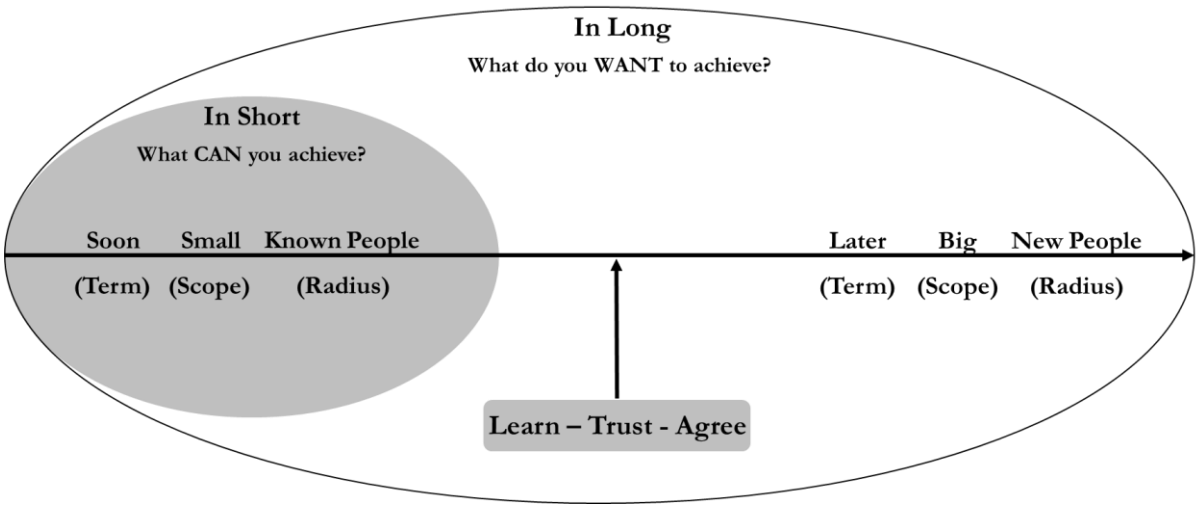


Figure 22. Short-term and long-term possibilities

Informed by Parker et al. (2009). Modified from

https://www.researchgate.net/publication/345952935_Confiar_en_Corto_y_en_Largo_Aterrice_y_Suene

Knowing others and learning from them does not necessarily prevent spontaneous situations from happening in sustainability projects due to their complex nature. It was illustrated by interviewees who described adverse events happening to them with people they thought they knew. Nevertheless, more profound knowledge helps others to predict their range of behaviours. Learning from each other seemed to help the interviewees be prepared to avoid significant risks or seize new opportunities. To best adapt to emergent situations during a relationship, the interviewees revealed they had to continuously and dynamically monitor their connections with others and the system, uncovering the third and last behaviour pattern, Dynamism.

Trusting Dynamically: Monitoring stakeholder behaviours and reassessing decisions

Literature argues that in sustainability projects, stakeholders can find themselves in a spiral of trust or distrust, with the potential for this to dynamically switch from one spiral to the other (Munns, 1995; Tang et al., 2019). As previously described, the case of the plastic packaging waste management system in Medellín illustrates a pattern of dynamic three-dimensional bent spirals typifying the development of stakeholder relations. Dynamism is the third and last pattern of behaviour describing stakeholders' constant adaptation to change. **Figure 23** illustrates possible cycles of trust and distrust, showing where there is space for decisions to be made that could change the course of a relationship for the better or worse.

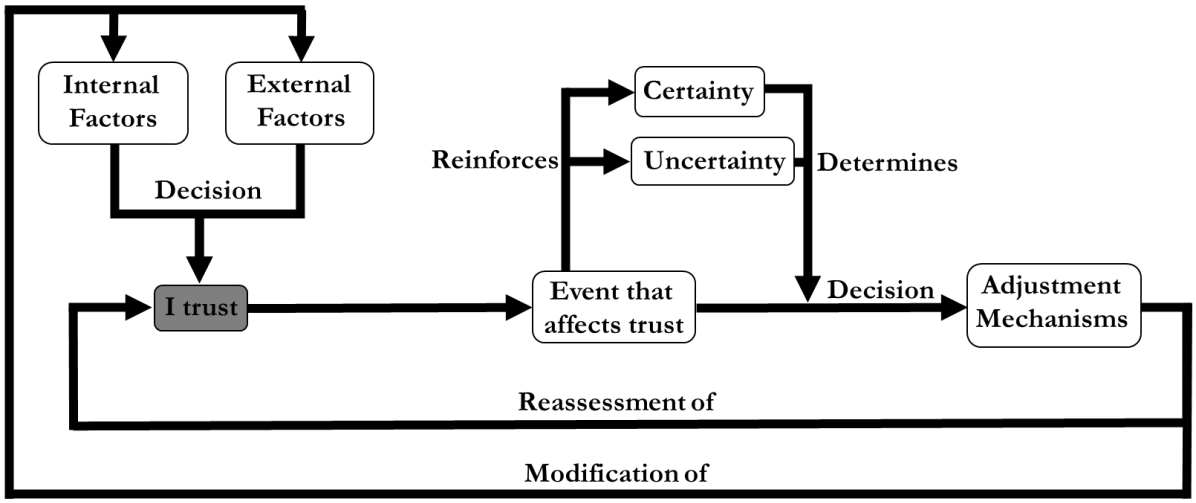


Figure 23. Possible cycles of trust/distrust.

Informed by Munns (1995)

These cycles depend on internal factors, such as the stakeholder needs and capabilities, events that affect the stakeholders' trust, such as changes in market requirements and external factors, such as a legal framework for developing sustainable business opportunities. For example, one waste processor described the risks associated with the volatility of prices of recovered materials and its impact on the stability of the whole value chain of waste recovery. These cycles also depend on stakeholders' adjustment mechanisms, which are instituted to protect their circumstances and the relationship, such as deciding to write a contract to cover all project partners. Some interviewees described their mechanisms to protect themselves, such as installing monitoring equipment or signing a contract with a business partner. These mechanisms are required because individuals and organisations are prone to disappointing others when they make mistakes, change their priorities, or, in Colombia, surrender to problematic values, such as undertaking unethical or illegal activities. Stakeholders can also change their values, goals, needs and capabilities, decisions and behaviours for the better, for example, by repairing a damaged relationship, redefining their image or building a new reputation.

Following the example of **Relationship A**, one or both stakeholders might decide to leave the *Dance of Trust*, such as in *Scenario DD: Left to avoid conflicts or pause the relationship* but being willing to openly collaborate if a new opportunity emerges. Stakeholders who temporarily or permanently exit a relationship typically do it based on updated information, which changes their perception of others' trustworthiness. If appropriately managed, stakeholders can change their perceptions with few precautions, although interview findings demonstrated they still keep monitoring their relationships based on ongoing experience and learning, as illustrated in Chapter Five in the section *Stakeholders build differentiated trust gradually by adapting to unexpected events*. Equally, a relationship perceived as trustworthy could evolve into an untrustworthy interaction. Tuckman and Jensen (1977) argue that the stages of building workgroups require stakeholders to take proactive actions and make adjustments to stop destructive events from disrupting a relationship and in order to return to a more stable scenario as shown in **Figure 20** and **Figure 23**. **Figure 24** suggests that avoiding idealising or demonising an individual or an organisation is critical because emergent events could change their behaviours and the level of trust in a relationship.

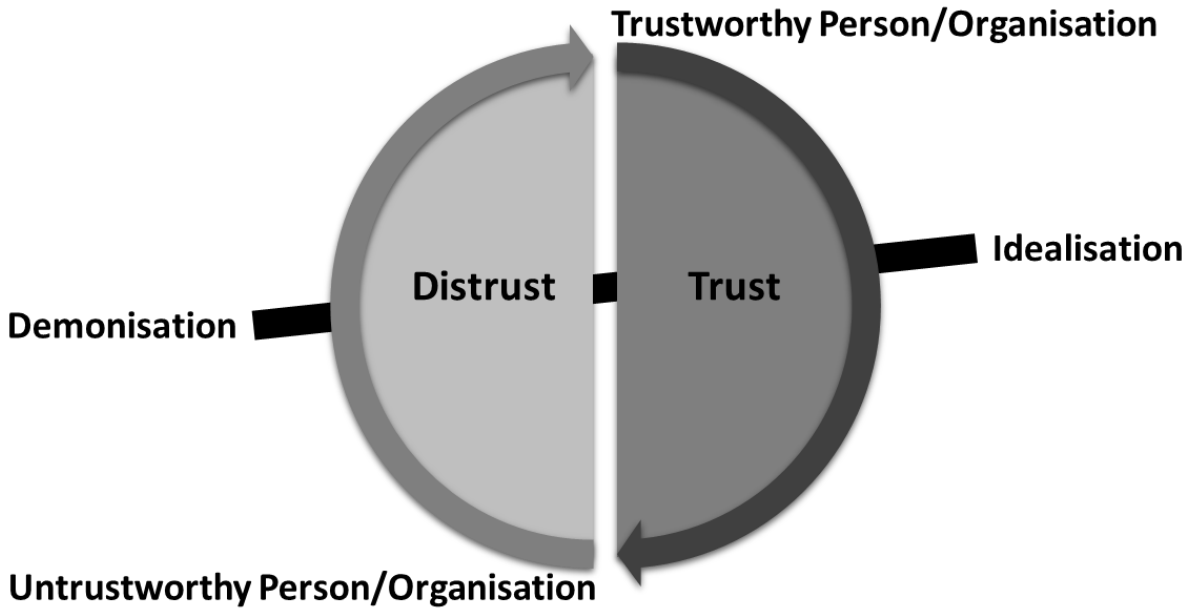


Figure 24. Balancing idealisation and demonisation.

Informed by Lepsius (2017) and Maríñez Sánchez (2018). Modified from https://www.researchgate.net/publication/340980117_Confiar_y_Desconfiar_Loops_de_Aprendizaje_y_Retroalimentacion

Dynamism is also examined in the literature about trust-building by different authors. For example, Armstrong et al. (2022) discuss the dynamic influence of disruptions in stakeholder relationships that modify stakeholder interactions, putting trust on trial. However, their study was based on projects in a developed country with less complexity concerning the types of stakeholders and challenges involved. Bstieler (2006) analyses a product development case to show how trust formed despite conflicts. He sees conflicts as detrimental to building trust if they are persistent and poorly managed, requiring project stakeholders to resolve them to protect relationships. However, they do not deeply address the dynamics at a system level in a complex network of stakeholders simultaneously dealing with different conflicts, tensions, priorities and initiatives. Maríñez Sánchez (2018) also sees the need for people to be aware of the dynamic challenges to collaboration by undertaking ongoing monitoring of their relationships to constantly assess their decision to trust others.

Literature about engagement and trust-building in sustainability projects addresses the attributes of trust and trust-building processes in different scenarios, including examining its importance in maximising engagement for sustainability projects. However, the literature lacks sufficient deep examination at a system level of the complexity of the interactions in a diverse network of stakeholders where collaboration is expected and compulsory to

comply with sustainability legislation in a middle-income developing country with weak governance and asymmetrical stakeholder conditions. Here lies the significant original contribution to the knowledge of the thesis, adding to the theory of stakeholder management in socio-technical systems by examining the influence of stakeholder's material and non-material needs and their access to reliable information during their relationships as drivers to keep building trust and engagement in contexts where trust is low and the distribution of power and resources unequal.

Chapter summary

There is a vast literature about engagement and trust-building in sustainability projects, examining individual and organisational levels. However, there is an insufficient examination of the complexity of trust-building dynamics between stakeholders affecting their motivation to engage in sustainability projects in middle-income developing countries with weak governance. In this case study, the interviewees found motivations to engage, with or without trust, by pursuing the satisfaction of their material and non-material needs, seizing emergent opportunities and learning from the progressive and dynamic outcomes of their relationships. While engaging, the interviewees revealed three behaviour patterns, which intertwined spontaneously, progressively and dynamically. To better understand these dynamics, I drew on the *dance* metaphor. The *Dance of Trust* maps out complex dynamic patterns of behaviours showing that the interviewees could build trust and engage in sustainability projects following shared purposes and setting mechanisms for protecting their relationships. These patterns are types of social and situated variables that, if made explicit, can help stakeholders focus on finding new opportunities to participate in sustainability projects while defining strategies to succeed in their initiatives, despite the asymmetrical, trust-lacking conditions of the case.

The significant original contribution to the knowledge of the thesis lies in deductively expanding stakeholder engagement theory by merging it with knowledge of sustainable behaviours and holistically examining individual and organisational material and non-material needs and capabilities in sustainability project engagement. The thesis further develops the socio-technical systems theory by analysing attributes of individuals and organisations commonly found in middle-income developing countries with weak governance, such as the asymmetry in the stakeholder needs, capabilities and access to reliable information, this affecting the freedom with which they make decisions in

sustainability projects. Lastly, the thesis deepens the analysis of the complexity of trust-building dynamics as a significant factor influencing stakeholder engagement in facing challenges for individuals and organisations in sustainability projects.

CONCLUSION AND RECOMMENDATIONS

This thesis has provided novel insight into how stakeholders engage in sustainability projects by building differentiated levels of trust in the circumstance of a middle-income developing country with weak governance. Resolution 1407/2018: Extended Producer Responsibility in Packaging established different obligations for stakeholders to improve the packaging waste management system, including forcing stakeholders to collaborate with each other. For example, the Resolution obliged the producers of packed products to support packaging manufacturers to develop more sustainable packaging and to promote alliances with organisations managing the sorting and processing of waste, neglecting the nuances of how stakeholders build trust and collaborate in projects as illustrated in the thesis.

In examining Resolution 1407/2018 compliance strategies, the case study explored a range of barriers to stakeholder engagement and trust in the form of asymmetrical stakeholder values, needs, capabilities and access to reliable information as impacting their motivation to engage in sustainability initiatives. The thesis identifies a set of meta and micro challenges born out of the complexities of the plastic packaging business ecosystem — as an example of a socio-technical system — to argue that stakeholders' purposes and experiences of unfolding events can lead them to adapt to less-than-ideal circumstances. The case findings show that even in situations where trust is low and stakeholder circumstances are asymmetrical, sustainability initiatives meet with a greater measure of success than might be expected.

In reflecting the movements in a dance, engaging with other stakeholders when working on sustainability projects requires understanding the relationship between stakeholders and contextual factors influencing stakeholder interactions. Understanding a sustainability project's multiple elements and factors requires examining social and technical challenges and solutions while comprehending the human factors that affect system-stakeholder interactions. People working on sustainability projects will find it essential to understand the complexity of interactions between individuals, groups and organisations particular to a specific system if they adjust their behaviour and decisions to emergent situations, the thesis revealing that despite the interviewees being aware and interested in resolving technical challenges, they were generally more concerned about social obstacles such as

dealing with corruption or managing the uncertainty in the information reliability to enable collaboration.

In this case, the interviewees had faced a wide range of technical and social challenges with complying with Resolution 1407/2018, demonstrating that sustainability projects are not homogenous undertakings, with the insights emerging from them being hard to generalise. Worse, stakeholder interactions need to be contextualised to be fully understood, suggesting that the influence of the human quotient is a significant but easily overlooked factor in determining a successful engagement in sustainability projects, this dimension being hard to capture when designing new legislation. This difficulty challenges the objective of Resolution 1407/2018 in taking a uniform approach to stakeholder collaboration in the context of Colombian solid waste management. The case findings show that stakeholders developing sustainability projects need to consider specific stakeholder characteristics such as capabilities, needs, objectives and values to better capture the human quotient in managing project uncertainties and emergences.

When working on shared projects, the asymmetrical needs, capabilities and access to reliable information influence the differential agency of stakeholders, these differences in power affecting engagement and trust-building dynamics. Project leaders need to develop practices to assess the level of trust between project stakeholders, to decide whether they need to develop, strengthen or repair across project teams of wider networks of project stakeholders. Likewise, a need to continuously assess the information stakeholders are using to make their project decisions to ensure their continued participation in a project. Observing and connecting with stakeholders form the solid ground on which trust as both a universal and personal driver can be built in sustainability projects, contributing to better stakeholder engagement even though the case findings show that stakeholders will engage even when their motivations to do so and level of trust are extremely strained.

There is a vast literature on engagement and trust-building processes in sustainability projects. Some authors emphasise the importance of addressing the phenomenon of trust simultaneous to engagement because this shows how stakeholders navigate and behave in complex sustainability initiatives. Much of the reviewed literature describes these processes as scenarios without recourse to the differential nature of real-world contextual circumstances, particularly in middle-income developing countries with weak governance.

Consequently, the literature on stakeholder engagement in sustainability projects highlights the importance of trust-building dynamics without providing enough insight into why stakeholders would collaborate where there is low trust and many risks involved as illustrated in the case of the plastic packaging waste management system in Medellín. In especially challenging contexts such as this, project stakeholders deal with different barriers and drivers when making decisions. Their combination pushes them to persist in everyday life while adapting to and learning from every new experience. Here, the case study explored stakeholders' strategies to overcome the bent to disengage. The thesis describes the stakeholders' satisfaction with their material and non-material needs in the context of emergent situations and progressive outcomes as a dynamic *Dance of Trust*. The interview findings show that stakeholders seized spontaneous opportunities and progressively and dynamically assessed the trustworthiness of others in projects, this dance of enticements and impediments informing and updating their project decisions. The thesis shows that stakeholders in middle-income developing countries with weak governance and asymmetrical stakeholder circumstances, where the motivation to trust is low and the distribution of power and resources unequal, can still build trust in a differentiated way. The research findings show that they do so by defining the scope for new trust-based relationships depending on their goals and values.

Interviewing stakeholders from different system levels allowed me to compare the behaviour of different categories of stakeholders, providing insights into the organisational level of this case. Having the opportunity to build trust for more than a year before conducting the interviews was critical to holding rich conversations with the interviewees, as I previously commented in Chapter Three, in the section *Ethical approval*. Future research could be enriched by including group activities, such as focus groups, to contrast individual and collective responses and deepen the analysis inside each participant organisation. The rapid review of legislation provided insights into how government addresses stakeholder engagement and trust to increase collaboration in projects to improve solid waste management, this informing and framing my interviews. Future research projects could include a deeper analysis of legislation to better understand each norm's legalities and historical background and its specific impact on the state of the environment and environmental management in Colombia. Thematic analysis was vital to identifying the critical themes emerging from the interviews about what drives the stakeholders to trust and engage in collaborative projects. A systematic literature review and content analysis

could strengthen future research projects by taking a quantitative approach to examining what is known and thought about trust-building and stakeholder engagement.

The socio-technical systems approach contributed to framing the collection and allocation of research data to understand the structure and dynamics of the plastic packaging business ecosystem in Medellín and the significance of and relationships between social and technical challenges and solutions to improve plastic packaging waste management. This framework helped examine the interactions between the interviewees, with a particular focus on how they kept learning with each new interaction despite the local challenges. This approach contributed to acknowledging how individual and organisational goals motivate stakeholders to build trust and engage in sustainability initiatives while adapting to the system's emergent situations and context factors. It also enabled deductive conceptual-isation of the case data, thus providing the possibility of knowing the case and learning about the stakeholder drivers and barriers to better engagement and trust-building in sustainability projects. A socio-technical systems approach is also suited for qualitative research, allowing a broader analysis of stakeholder motivations in project decisions. Nonetheless, this theoretical framework has limitations because the information collected from the interviewees and literature is always partial and incomplete due to resource constraints, such as limited time constraints for conducting more interviews or a deeper literature review.

The thesis reveals how the *dance* between project stakeholders when building trust is influenced by a differentiated interaction of stakeholder attributes, such as their needs and capabilities, and a system's structure and dynamics, as when negotiating sustainability projects. The stakeholder attributes made it more challenging for some stakeholders to engage in projects due to a lack of resources and the levels of sacrifices they had to make to maintain their engagement. For example, some stakeholders appeared to be more vulnerable during system change, such as the introduction of Resolution 1407/2018, and could not easily find other stakeholders to collaborate with in sustainability projects. Some interviewees illustrated that some stakeholders did not fully cover their material needs, such as having their living place or paying for studying. That made it more difficult for them to be in a levelled playfield when negotiating projects. The stakeholders' asymmetrical needs impacted their power to work out the specifics of a project, which affected their leverage

and led them to subordinate to the expectations and requirements of other, more powerful stakeholders.

Nevertheless, the stakeholders' needs provided them with the momentum to be motivated to keep findings ways to build trust and engage in shared sustainability projects where collaboration was expected to comply with government legislation. All interviewees were aware of the relevance of satisfying their material and non-material needs. In some cases, the interviewees appeared to find the motivation to engage and build trust in a project to satisfy their most immediate basic needs, as if they were in 'survival mode.' In other words, they seemed to feel motivated to engage and trust because not doing so could lead them to bankruptcy or lack the means to keep satisfying their fundamental needs. Yet, all of them had some measure of a purposive life motivating them to persist in their organisational and sustainability activities. The research revealed that their non-material needs, such as pursuing a purposive life, gave them enough strength to keep finding project opportunities. They did so by having self-confidence in their capabilities and finding support from their existing connections and third parties to get complementary capabilities. This process was sometimes affected by the interviewees' diverse priorities and goals. While some interviewees adapted in a survival mode to solve short-term material needs, others could develop a long-term engagement strategy. In better understanding how the stakeholders' needs and capabilities affected their engagement and trust-building in sustainability projects to comply with government legislation and how they overcame their challenges, the findings respond to my first research question *How do needs driving the pursuit of stakeholders' goals affect their motivation to engage and trust where collaboration is required?*.

In overcoming the challenges the interviewees found with their diverse needs, capabilities, power, priorities and goals, they learnt from every new experience, positive or negative. For example, they could learn from a robbery they suffered and from a new successful business opportunity. The interviewees illustrated that they learned in different ways. For instance, whether through formal or informal activities, such as a business event or a gathering to clean up a city or through social or technical-related activities, such as a program to invite people to know the waste pickers of their neighbourhood or a training program about how to interpret new legislation. These learning dynamics progressively informed the interviewees' decisions to collaborate and build trust in shared initiatives while constantly assessing their level of trust and engagement.

However, the diverse attributes of the stakeholders made it harder for them to find common ground in projects and increased the difficulty of informing their decisions. The lack of clarity, consistency and transparency of the information from the government and other stakeholders increased the uncertainty for the interviewees about the reliability of the information they acquired. The cultural barriers, such as the prejudices against some of the stakeholders, added an extra layer of problems to facilitate sharing of information and conversations among stakeholders. Yet, all the interviewees showed they kept their awareness about the importance of critical issues in the trust-building and engagement dynamics in projects, such as the need to keep having interactions with other stakeholders to improve their likeliness of success in getting new business opportunities. To do so, the interviewees illustrated how they relied on their existing communities of stakeholders to keep satisfying their needs and complement their capabilities. In this process, many interviewees illustrated the importance of fostering deeper emotional connections to better know each other. They also grew their communities through their existing connections and with the help of third parties.

In better comprehending how the interviewees kept learning to better inform their decisions, build trust and engage in sustainability initiatives where collaboration was compulsory to comply with government legislation, I found the three patterns of stakeholder behaviour helpful in understanding the nuanced characteristics of the *dance* of engagement and trust-building, challenging entrenched perceptions about the general level of ethical dysfunction in Colombia beyond family and close friends. Despite the problems in accessing reliable information, the stakeholders found ways to keep doing it, this responding to my second research question *How does the reliability of communication and information affect stakeholders' willingness to engage and trust in sustainability initiatives?*

In revealing these behaviour patterns, the interviewees showed how stakeholders could *spontaneously* build trust when interacting in a planned or unplanned activity to discover they share values, motivations to engage, needs and capabilities. They built trust *progressively* depending on their personal background, present status and motivations for meeting their goals, and the outcomes of their relationships with other stakeholders to date. In doing so, the research participants built trust *dynamically*, continuously monitoring conditions and interactions in the system to inform future decisions. In repurposing the *Dance of Trust*

metaphor, the thesis has expanded knowledge about engagement and trust-building in sustainability projects in middle-income developing countries with weak governance.

Stakeholders found the motivation to build trust and engage in collaborating in sustainability projects in challenging contexts, as the one in this research's case study, in four drivers. The satisfaction of material needs, such as having food and shelter, and the satisfaction of non-material needs, such as having a purposive and transcendental life. They also found motivation in the system's spontaneous opportunities, interactions with other stakeholders, and the progressive and dynamic outcomes of the stakeholders' relationships. These motivations heightened the understanding of what drives stakeholders to engage in the face of signals telling them not to trust and to disengage responds to my general research question *What drives stakeholders to engage when the motivation to trust is low and the distribution of power and resources unequal?*

Implications for maximising stakeholder engagement in sustainability initiatives

Complying with Resolution 1407/2018 posed challenges to this case's network of diverse stakeholders, these questioning the use of command and control or incentive-based compliance strategies if these did not consider the differentiated approach to the situations and needs of the stakeholder network. The diversity of the stakeholder attributes in sustainability projects requires governments to adopt a whole-system perspective when designing new legislation to facilitate compliance. This perspective helps understand the drivers of and barriers to engagement and trust-building processes at different levels in a waste management system. Decision-makers and project leaders in a project could seize the benefits of explicit awareness of the behaviour patterns illustrated in the thesis when they manage stakeholders in sustainability projects. Understanding the terms under which stakeholders seek to meet their expectations and the scope of what they can achieve is critical to strengthening trust-building, engagement dynamics and stakeholder learning. The research findings show that stakeholders can progressively and dynamically form perceptions of others without idealising or demonising people and organisations, opening them to new possibilities and ongoing partnerships while developing the skills and mechanisms to protect them and their relationships.

Generally speaking, the thesis provides five significant lessons to help stakeholders improve their project performance and relationships when fostering engagement and collaboration in sustainability projects. These lessons could help individuals and organisations reduce project risks, improving learning dynamics and decision-making efficiency. First, stakeholders planning and executing sustainability projects should include activities to build a sense of community and foster engagement and trust-building as a primary project task before embarking on the following project activities. Governments, particularly in contexts with low trust and weak governance, need to gain trust by responding to stakeholders' different needs and capabilities to facilitate collaboration instead of forcing it as Resolution 1407/2018 did. Individual stakeholders and stakeholder organisations can better learn about the deeper motivations to engage and their purposes linked to project goals, which serve to inform the planning and development of new initiatives. Convivial events for stakeholders that foster familiarity and promote spontaneous conversations offer the possibility that collaboration will flourish in later project phases.

Second, people and organisations engaging in sustainability projects need to reach a consensus about concrete steps to move forward with new activities in the short, middle and long term. However, it could be easier for project stakeholders to find common ground around short-term rather than long-term goals, especially in middle-income developing countries where people and organisations deal with asymmetrical conditions. No matter how small or large the stakeholders' objectives are, they can typically find shared goals in the short term to facilitate a measure of trust-building and engagement. To avoid losing a holistic view on a project by focusing on the short term, strategies exist for designing future activities such as project and program management models and the design of futures.

Third, if project stakeholders want better success in sustainability projects, they must assess stakeholder asymmetries in the project context. Asymmetries bring tensions to a system's structure and dynamics, making engaging and building trust in sustainability collaborative initiatives more challenging. Not investing in assessing stakeholder needs and capabilities can be compared to not investing time in technical learning, accruing what experts call a *social debt* that brings additional barriers, risks and inefficiencies to the project. To avoid these inefficiencies, stakeholders must plan for and devote resources to assessing, developing, strengthening and repairing trust between project stakeholders.

Fourth, project stakeholders need to become increasingly aware that, no matter how many monitoring and adjustment mechanisms in trust-building they establish, they depend on genuine transparency in information exchange. Authentic information exchange makes it more likely that stakeholders will invest in a project based on objectives and values beyond the monetary, such investment leading to the potential for trust to develop. For example, under the assumption that people cannot be trusted, the procedures and resources invested in triangulating information, getting written approvals from a wide range of stakeholders and tracking all the activities and outcomes could end up increasing the costs of transactions, thus increasing project inefficiency.

Fifth, people's non-material needs, such as those linked to their spiritual and emotional dimensions, are as critical as material human and project needs when engaging. In satisfying non-material needs such as having a purposive life, seeking transcendence and receiving recognition for good actions, stakeholders find deep motivations to engage in a sustainability project and continue to do so despite the asymmetrical circumstances and challenges they might face. When project stakeholders plan project activities, they should include tasks that strengthen stakeholder capabilities to manage their emotional domain and cultivate their spirituality and transcendence to strengthen the motivation to engage in a sustainability project.

In summary, stakeholders looking to improve engagement in sustainability projects should include a project stage for building, repairing or strengthening trust and building a sense of community to facilitate the following steps. Failing to do so could increase the social costs that could grow the system's inefficiencies. One concrete measure of these inefficiencies is the financial cost and sacrifices people and organisations directly or indirectly incur due to distrust and assumptions in decision-making. Building stronger trust-based communities in projects could help stakeholders increase their empowerment and freedom to engage.

Limitations and future research

I faced different limitations in the research process. Some interviewees were more expressive when answering the questions or expressing their ideas and provided more profound answers and data than others. Due to the COVID-19 Pandemic, I did the interviews virtually, which could be a barrier to genuine and informal conversation. However, as explained in Chapter Three in the section *Data quality assurance*, I followed a

clear and well-defined process to collect and analyse data. During the study, new research questions emerged. Below, I identify six potential paths for future research.

First, future research could address other lesser-understood subjective aspects influencing stakeholder engagement, considering the range of motivations to engage in a project and deepening the analysis using different behavioural studies approaches. For example, examining the diversity of values of individual and organisational stakeholders or other limiting factors that could affect stakeholders' freedom to make proactive decisions to collaborate in different initiatives.

Second, based on the discussion of stakeholders' freedom when making project decisions, future research could examine how stakeholders forcibly build trust depending on their power in a system. The thesis showed that some interviewees were in a position where they could not freely decide to keep engaging and building trust due to the pressure of their material and non-material needs. Researchers could gain more insights into individuals' values, beliefs, attitudes, needs and capabilities and include more variables related to engaging and building trust in a sustainability project, such as examining other drivers affecting their engagement in projects, such as fears and cognitive and emotional biases. This approach provides a more robust perspective on stakeholder interactions. Here, additional research could define a new case study or a comparative study.

Third, the human spiritual dimension was identified as a critical motivation for stakeholders to engage. A new research path could address spirituality by deepening the analysis of people's emotions and spiritual beliefs affecting their attitudes and behaviours, expanding the understanding of people's transcendental view of life. Addressing this non-material need could provide new insights into the inputs stakeholders consider when interacting with each other, such as the role of intuition in making decisions about others' trustworthiness.

Fourth, future research could examine stakeholder experiences when they have gains or losses due to system change. Researchers could examine what happens to an organisation and its employees when it goes bankrupt after a change in legislation that it could not comply with. This research path could provide insights into the invisible but actual social costs of some system changes. For example, researchers might find it interesting to

investigate the increments of detriments in people's quality of life after a disruption occurs in a system, examining what aspects of people's lives improve or worsen.

Fifth, future research could study trust dynamics at a system level based on the homeostasis of complex systems with a mix of quantitative and qualitative research approaches. A complex system needs some attributes to sustain over time without deteriorating to secure its identity and prosperity. For example, the plastic packaging waste management system in Medellín required at least some stakeholders to comply with Resolution 1407/2018 to show the government that this Resolution had a positive impact, even though not all eligible stakeholders could comply. If just a few or no stakeholders complied with the Resolution, it would probably show the government that issuing this norm was a mistake and should have been revoked. The level of trust between stakeholders could be examined as one system attribute, examining if there is an optimal level of generalised trust or an optimal level for just some stakeholders trusting each other to assess the possibility for a system to endure despite its disturbances.

Sixth, researchers could find opportunities to study how trust is built, controlling and measuring more variables. For example, incorporating the financial costs of distrust in the organisations' profit and loss balances or running social network analyses, measuring critical variables of the dynamics of trust and looking for correlations in the nature and strength of ties between stakeholders working in shared projects.

Public presentations

1. Ivorra-Peñafort, L., Seemann, K., Parnell, M. (2021) *Bridging Minds and Hearts Through Design: Promoting Connections Between Stakeholders to Foster Collaboration Concerning Sustainability Projects in Complex Systems.* 15th International Conference on Design Principles and Practices. Monterrey, Mexico (Virtual). https://cgscholar.com/cg_event/events/G21/proposal/55057

2. Ivorra-Peñafort, L. (2020) *Mapping emotional connections to foster engagement in sustainability projects. A case in the plastic packaging industry in Medellín (Colombia).* 7th International Forum of Design as Process. Design And Territory. Emergencies and Conflicts. Cali, Colombia. National University of Colombia - Palmira campus (The conference cancelled all the presentations except for the keynote speakers due to COVID-19)

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Appendix 1 - Evidence of Ethics Approval

Initial approval

From: Sally Fried <sfried@swin.edu.au>

Date: Monday, 18 March 2019 at 10:16 am

To: Matthew Parnell <mparnell@swin.edu.au>

Cc: RES Ethics <resethics@swin.edu.au>, Kurt Seemann <kseemann@swin.edu.au>, Maria Camacho <mcamacho@swin.edu.au>, Lucas Rafael Ivorra Peñafort <livorrapenafort@swin.edu.au>, RES Grants <resgrants@swin.edu.au>

Subject: SHR Project 2019/027 - Ethics Clearance

To: Dr Matthew Parnell, CDI

SHR Project 2019/027 - Improving stakeholder engagement in Medellin, Colombia, a component of the Waste to Opportunity program in Colombia.

Dr Matthew Parnell, Lucas Rafael Ivorra Penafort (Student) – CDI/Prof Kurt Seemann, María Camacho, Dr Carlos Serrano Lobos– FHAD/José Hermilson González Moreno – Plastines S.A.S.

Approved duration: 18-03-2019 to 17-01-2020 [Adjusted]

I refer to the ethical review of the above project by a Subcommittee (SHESC3) of Swinburne's Human Research Ethics Committee (SUHREC). Your response to the review as e-mailed on 17 March 2019 was put to the Subcommittee delegate for consideration.

I am pleased to advise that, as submitted to date, ethics clearance has been given for the above project to proceed in line with standard on-going ethics clearance conditions outlined below.

- The approved duration is 18-03-2019 to 17-01-2020 unless an extension request is subsequently approved.
- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the *National Statement on Ethical Conduct in Human Research (2018)* and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor, and addition or removal of other personnel/students from the project, requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.
- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project. Information on project monitoring and variations/additions, self-audits and progress reports can be found on the Research Internet pages.
- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the Swinburne project number. A copy of this e-mail should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely,

Sally Fried

Secretary, SHESC3

Final report approval

Lucas Rafael Ivorra Penafort

From: Astrid Nordmann
Sent: Tuesday, 2 November 2021 4:39 PM
To: Lucas Rafael Ivorra Penafort
Subject: FW: Acknowledgement of Report for 20211041-8733

Dear Lucas

Your Final Report has been approved.

Kind regards
Astrid

Dr Astrid Nordmann | Research Ethics Coordinator Research Services | Swinburne University of Technology
Ph +61 3 9214 3845 | anordmann@swin.edu.au
Level 1, Swinburne Place South
24 Wakefield St, Hawthorn VIC 3122, Australia www.swinburne.edu.au

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From: donotreply@infonetica.net <donotreply@infonetica.net> **Sent:** Wednesday, 3 November 2021 8:38 AM
To: Matthew Parnell <mparnell@swin.edu.au> **Cc:** RES Ethics <resethics@swin.edu.au>
Subject: Acknowledgement of Report for 20211041-8733

Dear Matthew,
The Annual or Final Report for project 20211041-8733: Improving stakeholder engagement in Medellin,
Colombia, a component of the Waste to Opportunity program in Colombia. has been processed and satisfies the reporting requirements set under the terms of ethics clearance.
Regards,

Dr Astrid Nordmann

Research Ethics Office

Swinburne University of Technology

P: +61 3 9214 3845 | E: resethics@swin.edu.au

Appendix 2 – Specific literature review

#	Year	Author	Capabilities	Needs	Trust	Freedom	Uncertainty	Motivation	Learning Feedback Cycles	Structure and Dynamics
1	2016	Aday, J. B., & Phelan, K. V. (2016)	0	0	0	0	0	1	0	0
2	2019	Agreli, H., Barry, F., Burton, A., Creedon, S., Drennan, J., Gould, D., . . . Hegarty, J. (2019)	0	1	0	1	0	2	2	1
3	2013	Akadiri, P. (2013)	1	1	0	1	1	0	0	1
4	2019	Aksoy, L., Alkire, L., Choi, S., Kim, P. B., & Zhang, L. (2019)	1	1	1	0	1	1	1	2
5	2015	Alvarez, S., & Rubio, A. (2015)	0	0	0	0	0	0	0	0
6	2019	Amore, M. D., Bennedsen, M., Larsen, B., & Rosenbaum, P. (2019)	1	0	1	0	0	0	1	1
7	2013	Amran, A., Zain, M., Sulaiman, M., Sarker, T., & Ooi, S. (2013)	1	1	0	1	0	0	1	2
8	2016	Antunes, A., & Franco, M. (2016).	1	1	1	1	0	1	1	1
9	2014	Aparcana, S. (2017).	2	1	2	1	1	2	0	2
10	2013	Aparcana, S., & Salhofer, S. (2013)	0	0	0	1	0	0	0	1
11	2007	APSC - Australian Public Service Commission. (2007)	1	1	1	1	1	1	1	1
12	2014	Arend, R. J. (2014).	1	2	1	0	0	2	1	1
13	2016	Arminen, H., Tuppura, A., Toppinen, A., & Kozak, R. (2016)	1	1	1	1	1	1	1	1
14	2019	Arora, N., Bakshi, S., & Bhattacharjya, S. (2019)	1	1	0	0	0	0	1	2
15	2019	Arturo Téllez-Bedoya, C., & Andrés Bernal-Rodríguez, E. (2019).	1	1	1	0	0	1	0	0
16	2015	Atkins, J., Atkins, B. C., Thomson, I., & Maroun, W. (2015).	0	0	0	0	1	1	1	1
17	2017	Azevedo, S., & Barros, M. (2017)	0	0	0	0	1	0	0	0
18	2011	Bachmann, R., & Inkpen, A. C. (2011)	1	1	2	1	1	1	1	1
19	2016	Baden, D., & Prasad, S. (2016)	0	2	1	1	0	2	2	0
20	2014	Baden, D., & Wilkinson, S. (2014)	0	2	1	1	1	1	0	2
21	2013	Bal, M., Bryde, D., Fearon, D., & Ochieng, E. (2013)	1	1	1	0	1	1	1	1
22	2015	Basso, C., García da Rosa, E., Romero, S., González, C., Lairihoy, R., Roche, I., . . . Sommerfeld, J. (2015)	0	0	0	0	0	0	0	2
23	2016	Battershill, C., Ross, P., & Schiel, D. (2016)	1	1	0	0	1	0	1	2
24	2001	Baud, I., Grafakos, S., Hordijk, M., & Post, J. (2001)	1	1	0	0	0	0	0	1
25	2016	Baza Álvarez, C., & Alvarado Verdín, V. M. (2016)	0	1	1	0	0	0	0	0
26	2018	Bell, J., Paula, L., Dodd, T., Németh, S., Nanou, C., Mega, V., & Campos, P. (2018)	1	0	0	0	1	1	0	1
27	2019	Bialous, S. (2019).	0	0	0	0	0	1	0	1
28	2014	Bilodeau, L., Podger, J., & Abd-El-Aziz, A. (2014)	1	1	0	0	2	0	0	2
29	2015	Blok, V., Wesselink, R., Studynka, O., & Kemp, R. (2015)	1	1	0	2	0	1	0	1
30	2015	Borella, M. R. d. C., & Barcellos, P. F. P. (2015)	0	1	0	0	0	1	1	1
31	2007	Bortoleto, A. P., & Hanaki, K. (2007).	0	1	0	0	1	0	1	0
32	2018	Bowd, R., Quinn, N. W., Kotze, D. C., & Guilfoyle, M. J. (2018).	0	1	0	0	1	0	1	2
33	2015	Bowles, T. M., Hollander, A. D., Steenwerth, K., & Jackson, L. E. (2015).	0	0	0	0	1	0	1	0
34	2004	Boyle, M.-E. (2004)	1	2	1	1	1	2	1	1
35	2019	Brennan, M., Connelly, A., & Lawrence, G. (2019)	2	1	0	1	0	2	0	1
36	2019	Brown, H. S., & Cohen, M. J. (2019)	0	1	1	1	1	1	2	2
37	2015	Burcea, S. G. (2015).	0	1	0	0	0	1	1	1
38	2018	Bush, J. M., Jung, H., Connell, J. P., & Freeberg, T. M. (2018)	0	1	2	1	1	0	2	1
39	2015	Cai, L., Cui, J., & Jo, H. (2015).	0	1	1	1	0	1	0	2
40	2016	Castro Camargo, L. A., Bracho, S. B. G., Riatiga Fandiño, H., Vera Mercado, E. J., & del Pilar Castro Molano, L. (2016)	1	1	1	0	0	0	1	1
41	2004	Caswell, T. (2004)	0	1	1	0	1	1	1	1
42	2019	Cevallos-Muñoz, O., Alcocer-Quinteros, P., & Abreu-Ledón, R. (2019)	2	1	0	1	0	1	0	1
43	2016	Chan, E. S. W., & Hsu, C. H. C. (2016)	1	1	0	0	0	1	1	1
44	2018	Chandra, Y. (2018)	1	1	1	0	0	1	0	1
45	2014	Chaplin, G., & Wyton, P. (2014)	0	1	1	0	0	2	2	1
46	2017	Chappin, E. J. L., Bijvoet, X., & Oei, A. (2017)	0	1	1	0	0	1	2	2
47	2014	Chaturvedi, A., Saluja, M. S., Banerjee, A., & Arora, R. (2014)	1	1	0	0	0	0	1	1
48	2016	Chávez Porras, Á., & Rodríguez González, A. (2016)	1	1	0	0	0	0	0	1
49	2015	Chen, A., Abramson, A., Becker, N., & Megdal, S. B. (2015)	0	1	0	0	1	0	1	2
50	2015	Chiappelli, F., Bakhordarian, A., Thames, A. D., Du, A. M., Jan, A. L., Nahcivan, M., . . . Maida, C. A. (2015)	1	1	0	0	0	1	1	1
51	2017	Chidiac El Hajj, M., Abou Moussa, R., & Chidiac, M. (2017)	1	1	1	1	0	2	2	2
52	2014	Christensen, D., Drysdale, D., Hansen, K., Vanhille, J., & Wolf, A. (2014)	1	1	0	0	1	0	1	2
53	2019	Chung, L. H., & Parker, L. D. (2019)	0	1	0	0	0	1	0	1
54	2016	Clark, C. R. (2016)	1	1	0	1	1	1	2	0
55	2017	Clarke, S. F., Nawaz, W., Skelhorn, C., & Amato, A. (2017).	1	1	0	0	1	1	1	1
56	2015	Clarke, T., & Boersma, M. (2015)	0	1	0	1	0	1	2	2
57	2018	Cochrane, L., & Cundill, G. (2018)	0	1	1	0	0	1	2	1
58	2003	Corral Verdugo, V., Frias Armenta, M., & Gonzalez Lomeli, D. (2003)	0	1	0	0	0	1	0	2
59	2010	Crittenden, V. L., Crittenden, W. F., Ferrell, L. K., Ferrell, O. C., & Pinney, C. C. (2010)	2	1	0	0	0	2	2	2
60	2019	Cuello Echeverry, M. A., & Arrauth Ochoa, K. D. (2019)	1	2	0	0	0	0	0	1
61	2019	da Silva, I. B., & Godinho Filho, M. (2019).	1	1	0	0	0	1	1	0
62	2016	Dai, Y. C., Lin, Z. Y., Li, C. J., Xu, D. Y., Huang, W. F., & Harder, M. K. (2016)	0	1	1	0	0	2	1	2

#	Year	Author	Capabilities	Needs	Trust	Freedom	Uncertainty	Motivation	Learning Feedback Cycles	Structure and Dynamics
63	2009	Davis, G., & Wolski, M. (2009)	1	1	0	0	0	1	2	2
64	2004	Dawe, G. F. M., Vetter, A., & Martin, S. (2004)	2	1	0	0	0	1	1	1
65	2015	De Giorgi, C., Palù, D. D., & Allione, C. (2015)	1	2	0	0	0	1	1	2
66	2016	de Koning, J. I. J. C., Ta, T. H., Crul, M. R. M., Wever, R., & Brezet, J. C. (2016)	1	1	2	0	0	2	2	1
67	2019	del Pilar Sánchez-Muñoz, M., Cruz Cerón, J. G., & Giraldo Uribe, J. J. (2019)	1	1	0	0	0	2	2	2
68	2016	Dev, N. K., & Shankar, R. (2016).	1	1	1	0	0	0	2	1
69	2018	Dhiman, R., VishnuRadhan, R., Eldho, T. I., & Inamdar, A. (2018)	1	1	0	0	1	0	0	1
70	2019	Di Vaio, A., Varriale, L., & Trujillo, L. (2019)	1	1	1	0	0	0	1	1
71	2012	Dobson, H. E., Svanström, M., & Bland Tomkinson, C. (2012)	0	2	0	2	2	0	2	1
72	2010	Dolles, H., & Söderman, S. (2010).	1	1	0	0	0	1	2	2
73	2006	Draper, S., & Lenssen, G. (2006)	1	1	1	1	0	0	2	1
74	2018	Dugan, A. J., Birdsey, R., Mascorro, V. S., Magnan, M., Smyth, C. E., Olguin, M., & Kurz, W. A. (2018)	0	0	0	0	1	1	0	2
75	2007	Duran, M., Alzate, M., Lopez, W., & Sabucedo, J. M. (2007)	1	1	1	0	0	2	0	0
76	2018	Durusut, E., Tahir, F., Foster, S., Dineen, D., & Clancy, M. (2018)	1	0	0	0	0	0	0	1
78	2018	Easman, E. S., Abernethy, K. E., & Godley, B. J. (2018)	0	1	0	0	1	2	0	1
79	2017	Echavarri-Bravo, V., Thygesen, H. H., & Aspray, T. J. (2017)	0	0	0	0	1	0	0	0
80	2018	Egea, F. J., Torrente, R. G., & Aguilar, A. (2018)	0	1	0	0	1	0	0	1
81	2012	Ezeah, C., & Roberts, C. L. (2012)	1	1	0	1	0	1	0	1
82	2013	Ezeah, C., Fazakerley, J. A., & Roberts, C. L. (2013)	2	2	1	1	0	2	1	1
83	2013	Fonzar, A. M. (2013)	1	2	1	0	0	2	2	2
84	2019	Fox, A. E. M., Iriste, S., & Bezeljak, P. (2019)	0	1	0	0	0	0	2	0
85	2018	Fritz, M. M. C., & Silva, M. E. (2018)	1	1	1	0	0	1	2	1
86	2019	Fuldauer, L. I., Ives, M. C., Adshead, D., Thacker, S., & Hall, J. W. (2019).	2	2	1	0	1	2	1	1
87	2013	Fülöp, G. (2013)	1	1	1	0	0	1	2	0
88	2018	Gabriel, C.-A., Bortsie-Aryee, N. A., Apparicio-Farrell, N., & Farrell, E. (2018)	0	1	0	0	2	1	2	1
89	2013	Galada, H. C., Gurian, P. L., Montalto, F., Sheller, M., Piasecki, M., Ayalew, T. B., & O'Connor, S. (2013)	1	1	0	0	0	1	1	1
90	2005	Gallego, I. (2005).	1	1	1	1	0	0	1	1
91	2014	Geiger, S. M., Otto, S., & Diaz-Marin, J. S. (2014)	1	1	0	0	0	0	2	2
92	2014	Ghobadian, A., & O'Regan, N. (2014)	0	1	0	0	1	1	1	1
93	2014	Gifford, R. (2014)	1	1	1	1	0	2	2	2
94	2016	Glackin, S., & Dionisio, M. R. (2016)	1	1	2	0	1	1	1	1
95	2018	Glackin, S., & Gudes, O. (2018)	1	1	0	0	0	1	1	1
96	2013	Glew, D., Stringer, L. C., & McQueen-Mason, S. (2013).	1	0	0	0	1	0	1	2
97	2017	Goh, E., Muskat, B., & Tan, A. H. T. (2017)	1	1	0	0	0	1	2	0
98	2019	Gómez-Soto, J. A., Sánchez-Toro, Ó. J., & Matallana-Pérez, L. G. (2019)	1	1	1	0	0	0	0	2
99	2018	González Ordóñez, A. I. (2018)	2	2	0	0	0	1	2	1
100	2012	Goworek, H., Wigley, S. M., Fisher, T., Cooper, T., Woodward, S., & Hiller, A. (2012).	1	1	1	0	0	1	0	2
101	2018	Griffin, P. W., Hammond, G. P., & Norman, J. B. (2018)	0	1	0	0	1	1	1	1
102	2016	Groening, C., & Kanuri, V. K. (2016).	1	1	0	1	1	2	2	2
103	2012	Guang Shi, V., Assistant, Lenny Koh, S. C., Baldwin, J., & Cucchiella, F. (2012)	1	1	1	0	0	2	1	1
104	2013	Guerrero, L. A., Maas, G., & Hogland, W. (2013)	1	1	0	0	0	2	2	2
105	2019	Gunarathne, N., & Lee, K.-H. (2019).	1	1	0	0	2	2	0	2
106	2011	Gunsilius, E., Spies, S., García-Cortés, S., Medina, M., Dias, S., Scheinberg, A., . . . Ruiz, S. (2011)	1	1	2	1	0	1	1	2
107	2012	Gutberlet, J. (2012)	1	1	0	0	0	0	1	2
108	2019	Haas, B., Fleming, A., Haward, M., & McGee, J. (2019)	1	1	0	0	1	0	0	1
109	2013	Hadfield-Hill, S. A. (2013)	1	1	0	0	0	1	2	2
110	2013	Hanson, M. A. (2013)	0	2	0	0	0	2	2	1
111	2013	Henderson, S. (2013)	1	1	0	0	0	1	1	2
112	2016	Henwood, W., Moewaka Barnes, H., Brockbank, T., Gregory, W., Hooper, K., & McCreanor, T. (2016)	0	1	0	0	0	1	0	2
113	2018	Herrera-Mendoz, K., Ramirez-Ordoñez, M., De La Hoz Álvarez, M., & Acuña Rodríguez, M. (2018)	1	1	1	0	0	2	0	1
114	2011	Hess, J., Bednarz, D., Bae, J., & Pierce, J. (2011)	1	1	0	0	2	0	1	2
115	2014	Hidalgo Barrio, M. D., Martin Marroquin, J. M., Gomez Rincon, M., Aguado Pesquera, A., & Antolin Giraldo, G. (2014)	1	1	0	0	0	0	1	0
116	2010	Hirsch, D. D. (2010).	1	1	2	2	0	2	2	2
117	2019	Hodgkins, S., Rundle-Thiele, S., Knox, K., & Kim, J. (2019)	0	1	0	0	0	2	2	2
118	2010	Hopkinson, P., Fadeeva, Z., & James, P. (2010)	1	1	1	0	0	1	2	1
119	2012	Hutchinson, D., Singh, J., & Walker, K. (2012)	0	1	0	0	0	1	1	1
120	2014	IGES - Institute for Global Environmental Strategies. (2014)	2	2	2	2	2	2	2	2
121	2018	Ikhlayel, M. (2018)	1	1	0	0	0	0	1	1
122	2015	Illia, L., Romenti, S., Rodríguez-Cánovas, B., Murtarelli, G., & Carroll, C. E. (2015)	0	1	2	2	0	0	2	1
123	2017	Imbert, E., Ladu, L., Morone, P., & Quitzow, R. (2017)	1	1	1	0	0	1	1	1
124	2004	Innes, J. E., & Booher, D. E. (2004)	1	1	1	0	0	0	2	2
125	2019	Islam, M. T., & Huda, N. (2019)	1	1	0	0	1	0	1	1
126	2017	Janmaimool, P. (2017)	2	1	0	0	0	2	0	2
127	2019	Jia, L., Evans, S., & Linden, S. V. (2019)	0	1	0	0	0	2	0	1

#	Year	Author	Capabilities	Needs	Trust	Freedom	Uncertainty	Motivation	Learning Feedback Cycles	Structure and Dynamics
128	2015	Johar, F., & Razak, M. R. (2015)	1	1	0	0	0	1	0	2
129	2017	Jollands, S., & Quinn, M. (2017)	0	1	0	0	0	1	0	0
130	2015	Jones, P., Comfort, D., & Hillier, D. (2015).	1	1	1	0	0	0	0	0
131	2018	Jürisoo, M., Lambe, F., & Osborne, M. (2018)	1	2	2	0	0	2	2	1
132	2006	Kaatz, E., Root, D. S., Bowen, P. A., & Hill, R. C. (2006)	1	1	1	0	1	1	1	1
133	2005	Kaatz, E., Root, D., & Bowen, P. (2005).	1	1	1	0	0	0	1	1
134	2019	Kaffashi, S., & Shamsudin, M. N. (2019)	1	1	0	0	0	1	1	1
135	2017	Kajzer Mitchell, I., & Walinga, J. (2017).	2	1	0	0	1	2	2	2
136	2016	Kalantzis, A., Thatcher, A., & Sheridan, C. (2016)	1	1	0	0	0	0	0	1
137	2012	Katamba, D., Tushabomwe Kazooba, C., Babiiha Mpisi, S., Marvin Nkiko, C., Nabatanzi-Muyimba, A. K., & Hensley Kekaramu, J. (2012)	0	1	0	1	0	1	1	1
138	2013	Katusiimeh, M. W., Burger, K., & Mol, A. P. J. (2013)	1	1	1	1	0	0	0	1
139	2019	Kaur, A., & Lodhia, S. K. (2019)	0	1	0	0	0	0	0	1
140	2015	Khan, E. A., & Quaddus, M. (2015)	1	1	0	1	0	1	0	1
141	2017	Kiron, D., Unruh, G., Reeves, M., Kruschwitz, N., Rubel, H., & Zumfelde, A. (2017)	1	2	1	0	1	2	2	2
142	2012	Krizek, K. J., Newport, D., White, J., & Townsend, A. R. (2012)	1	2	0	1	0	2	2	1
143	2013	Kruijsen, J. H. J., Owen, A., & Boyd, D. M. G. (2013)	1	2	0	0	0	1	2	2
144	2018	Krütli, P., Pohl, C., & Stauffacher, M. (2018)	1	1	0	0	1	2	2	1
145	2018	Kusi-Sarpong, S., Gupta, H., & Sarkis, J. (2018).	1	2	0	0	0	0	1	1
146	2017	Lalot, F., Falomir-Pichastor, J. M., & Quiamzade, A. (2017)	0	2	0	0	1	2	1	2
147	2019	Lasrado, F., & Zakaria, N. (2019).	2	2	0	1	0	2	2	2
148	2012	Latif, S. A., Omar, M. S., Bidin, Y. H., & Awang, Z. (2012)	0	1	0	0	0	0	1	2
149	2012	London, M. (2012)	1	1	0	0	1	2	2	1
150	2017	Lopes de Sousa Jabbour, A. B., Vazquez-Brust, D., Jose Chiappetta Jabbour, C., & Latan, H. (2017)	1	1	0	0	1	1	1	1
151	2002	Ma Eugenia, C. B., Nepomuceno, G., & Covar, R. (2002)	1	1	0	0	0	1	1	1
152	2013	Mair, J., & Laing, J. H. (2013)	0	1	0	0	0	1	2	1
153	2012	Mallery, C., Ganachari, D., Fernandez, J., Smeeding, L., Robinson, S., Moon, M., . . . Siegel, J. (2012)	0	1	1	0	0	1	2	1
154	2016	Manda, B. M. K., Bosch, H., Karanam, S., Beers, H., Bosman, H., Rietveld, E., . . . Patel, M. K. (2016)	2	1	0	0	1	1	2	2
155	2014	Mandel, G., & Marchant, G. (2014).							2	1
156	2016	Marchand, L., Sabaris, C. Q., Desjardins, D., Oustriere, N., Pesme, E., Butin, D., . . . Mench, M. (2016).	0	0	0	0	0	0	0	0
157	2018	Marcucci, E., Gatta, V., & Le Pira, M. (2018)	1	1	0	2	0	2	2	0
158	2015	Marín-Idárraga, D. A., & Losada Campos, L. Á. (2015)	1	2	1	1	1	2	2	2
159	2017	Marková, V., Lesníková, P., Kaščáková, A., & Vinczeová, M. (2017)	1	1	0	0	0	1	0	1
160	2013	Martin, S. A., & Assenov, I. (2013)	0	1	0	0	0	0	0	1
161	2014	Martinez, F., Lenssen, G., Nijhof, A., Roger, L., & Kievit, H. (2014)	1	1	0	0	1	2	2	2
162	2017	Martínez-López, Y., García-Gonzalez, M., Ricardo Fernández-Concepción, R., Álvarez-Lazo, D., & Martínez-Rodríguez, E. (2017)	0	1	0	0	0	1	0	1
163	2019	Maximenko, N., Corradi, P., Law, K. L., Van Sebille, E., Garaba, S. P., Lampitt, R. S., . . . Wilcox, C. (2019)	1	1	0	0	1	2	1	1
164	2018	Maxton-Lee, B. (2018)	1	1	0	1	0	0	1	2
165	2018	McKay, V. (2018)	2	1	0	1	0	1	2	2
166	2000	Medina, M. (2000)	1	1	0	0	0	0	1	2
167	2016	Melisa Viegas, G., Walsh, C., & Barros, M. V. (2016)	1	1	0	0	0	0	1	2
168	2015	Mentis, M. (2015)	1	1	0	0	2	0	2	1
169	2016	Meynell, F. (2016)	1	0	0	0	0	0	2	2
170	2018	Meza Rios, M. M., Herremans, I. M., Wallace, J. E., Althouse, N., Lansdale, D., & Preusser, M. (2018)	2	1	0	0	1	2	2	2
171	2016	Miemczyk, J., Howard, M., & Johnsen, T. E. (2016)	2	1	0	0	2	1	2	2
172	2011	Minoli, D. M., & Smith, M. T. (2011)	1	1	1	0	1	2	0	2
173	2017	Mititelu, C., Fiorani, G., & Litardi, I. (2017)	1	2	0	0	0	1	2	2
174	2019	Mkutu, K., Mkutu, T., Marani, M., & Ekitela, A. L. (2019)	1	1	2	0	1	1	0	2
175	2017	Mohd Fuzi, N., Habidin, N. F., Hibadullah, S. N., & Ong, S. Y. Y. (2017)	0	1	0	1	0	1	1	1
176	2018	Molina-Besch, K., Wikström, F., & Williams, H. (2018)	0	1	0	0	2	1	0	2
177	2014	Morgan, E. A., & Grant-Smith, D. C. C. (2014)	1	1	2	2	2	2	2	2
178	2017	Muff, K. e., & ProQuest. (2017).	1	1	2	1	1	2	2	2
179	2015	Munjal, P. G., & Sandeep Munjal, D. V. J. P. (2015)	1	2	0	0	0	2	1	1
180	2018	Murdock, A., & Dolezal, N. (2018)	1	1	1	1	0	1	2	1
181	2011	Muster, V., & Schrader, U. (2011)	1	2	0	2	0	1	2	2
182	2015	Neary, T. (2015)	1	2	0	0	0	1	0	2
183	2019	Nelson, K. M., Partelow, S., & Schluter, A. (2019)	1	1	0	0	1	2	0	1
185	2008	Nisbet, E. K. L., & Gick, M. L. (2008)	0	2	0	0	0	2	2	2
186	2015	Ohlmeier, B. (2015)	1	2	0	1	0	0	2	2
187	2017	Paillé, P., Raineri, N., & Boiral, O. (2017)	1	1	0	0	0	2	1	2
188	2019	Pandebesie, E. S., Indrihastuti, I., Wilujeng, S. A., & Warmadewanthi, I. (2019)	1	2	1	0	0	0	0	1
189	2018	Pawsey, N., Nayeem, T., & Huang, X. (2018)	0	1	2	1	0	2	1	1
190	1994	Post, J. E., & Altma, B. W. (1994)	1	1	0	0	1	1	2	2
191	2013	Poulton, M. M., Jagers, S. C., Linde, S., Van Zyl, D., Danielson, L. J., & Matti, S. (2013)	1	1	2	0	2	1	0	2
192	2016	Provasnek, A. K., Schmid, E., & Steiner, G. (2016)	1	1	2	0	2	1	2	2

#	Year	Author	Capabilities	Needs	Trust	Freedom	Uncertainty	Motivation	Learning Feedback Cycles	Structure and Dynamics
193	2014	Raha, D., Mahanta, P., & Clarke, M. L. (2014).	1	2	0	0	0	1	1	1
194	2013	Rahim, M. M., & Alam, S. (2013).	0	1	1	2	0	2	0	2
195	2012	Rajak, D. (2012).	2	2	0	1	0	1	1	1
196	2012	Ramsay, L. F., & Naidoo, R. (2012)	0	1	1	0	0	1	0	1
197	2017	Rapp, A., Marino, A., Simeoni, R., & Cena, F. (2017)	1	2	1	0	1	0	2	1
198	2012	Rashid, N. R. N. A., & Mohammad, N. (2012)	0	1	1	0	0	2	2	2
199	2018	Rezapouraghdam, H., Alipour, H., & Arasli, H. (2018)	0	2	1	0	0	2	0	2
200	2008	Rowlinson, S., & Cheung, Y. K. F. (2008)	0	1	1	0	0	1	0	1
201	2014	Ryan, B., Kuhl, I., & Ware, R. (2014)	1	0	0	0	0	0	1	1
202	2014	S. Fogel, D., & Elizabeth Palmer, J. (2014).	1	1	1	0	0	0	1	2
203	2015	Salehin, M., & Sikder, A. H. M. K. (2015)	2	1	0	0	0	0	0	2
204	2016	Scheinberg, A., Nesic, J., Savain, R., Luppi, P., Sinnott, P., Petean, F., & Pop, F. (2016)	2	2	1	0	0	2	2	2
205	2016	Schill, M., & Shaw, D. (2016)	0	1	0	0	2	2	0	2
206	2018	Schuelke-Leech, B.-A. (2018)	1	2	0	0	1	0	2	1
207	2012	Scott, C., & Bryson, A. (2012)	1	1	1	0	0	2	2	2
208	2019	Serrano, A. M., Tiuzo, S. C., & Martínez, M. S. (2019)	1	1	2	0	0	0	2	2
209	2016	Sheau-Ting, L., Sin-Yee, T., & Weng-Wai, C. (2016)	0	1	0	0	0	2	0	1
210	2017	Simões, C., & Sebastiani, R. (2017)	0	1	1	0	0	1	2	1
211	2016	Singh, N., Ma, J., & Yang, J. (2016)	1	1	0	0	0	0	0	1
212	2014	Smith, S. D., Gillies, C. L., & Shortland-Jones, H. (2014)	0	1	0	0	0	0	0	2
213	2012	Solis Salazar, M. (2012)	0	1	1	0	0	1	0	1
214	2013	Sovacool, B. K. (2013)	2	2	1	0	0	1	2	2
215	2016	Steg, L. (2016)	0	2	0	0	0	2	2	2
216	2008	Sugiyama, N., & Takeuchi, T. (2008)	1	1	0	0	0	0	0	2
217	2017	Sulkowski, A. J., Edwards, M., & Freeman, R. E. (2017)	1	1	2	0	1	2	2	2
218	2017	Taha, Y., Benzaazoua, M., Hakkou, R., & Mansori, M. (2017)	1	1	0	0	0	0	0	0
219	2014	Tandon, A. (2014)	1	2	1	1	1	1	2	2
220	2016	Tencati, A., Pogutz, S., Moda, B., Brambilla, M., & Cacia, C. (2016)	1	1	0	0	0	0	0	1
221	2010	Terraza, H., & Sturzenegger, G. (2010).	1	1	2	0	0	2	0	2
222	2011	Tokos, H., Pintarič, Z. N., & Krajnc, D. (2011)	0	1	0	0	1	0	1	2
223	2015	Townsend, J., & Barrett, J. (2015)	1	1	0	0	1	1	2	1
224	2007	Tudor, T. L., Barr, S. W., & Gilg, A. W. (2007)	0	1	0	0	0	2	1	1
225	2007	Tudor, T., Barr, S., & Gilg, A. (2007)	0	1	0	0	0	1	1	2
226	2014	Tuli, P., & Shankar, R. (2014)	2	1	1	0	1	1	1	1
227	2017	van der Ven, H. (2017)	1	1	2	0	1	1	2	2
228	2007	van Timmeren, A., Yang, J., & Sidler, D. (2007)	1	1	0	0	2	0	0	2
229	2012	Velis, C. A., Wilson, D. C., Rocca, O., Smith, S. R., Mavropoulos, A., & Cheeseman, C. R. (2012)	2	2	1	0	0	1	0	2
230	2016	Verkuijl, C. (2016)	1	1	0	0	1	0	0	1
231	2015	Vidal, N. G., Berman, S., & Van Buren, H. (2015)	1	1	0	0	0	0	1	1
232	2018	Vildåsen, S. S., & Havenvid, M. I. (2018)	2	2	1	0	0	0	2	2
233	2018	Wadsworth, R., Hallett, S., & Sakrabani, R. (2018).	1	1	0	0	1	0	0	1
234	2018	Wang, X. V., & Wang, L. (2018)	1	1	0	0	1	0	1	2
235	2011	Wang, X., & Geng, Y. (2011).	2	1	1	0	0	0	2	2
236	2016	Welfens, M. J., Nordmann, J., & Seibt, A. (2016)	0	2	2	1	0	2	2	2
237	2006	Wilson, D. C., Velis, C., & Cheeseman, C. (2006)	1	1	0	0	0	1	0	1
238	2018	Winkler, A.-L. P., Brown, J. A., & Finegold, D. L. (2018)	0	2	1	0	1	2	0	1
239	2019	Withisuphakorn, P., Batra, I., Parameswar, N., & Dhir, S. (2019)	1	1	0	0	0	1	2	1
240	2018	Yukalang, N., Clarke, B., & Ross, K. (2018)	2	1	0	0	0	0	2	2
241	2012	Zain, S. M., Basri, N. E. A., Basri, H., Zakaria, N., Elfithri, R., Ahmad, M., . . . Khan, I. A. I. (2012)	0	1	0	0	1	0	1	2
242	2018	Zanchi, L., Delogu, M., Zamagni, A., & Pierini, M. (2016).	1	2	0	1	0	0	0	2
243	2014	Zifkos, G. (2014).	1	1	0	1	0	1	2	1
244	2009	Zoller, H. M., & Tener, M. (2009)	0	1	1	0	1	1	2	1
245	2014	Zucchella, A., & Urban, S. (2014)	1	1	0	0	0	2	1	1
246	2012	Zurbrugg, C., Gfrerer, M., Ashadi, H., Brenner, W., & Kuper, D. (2012)	1	2	0	0	1	1	2	1

Appendix 3 – Rapid legislation review

#	Type	Legislation	Year	Command and Control (C) strategies or Incentive Design strategies (I) or Both (B) or None (N) for enforcin	Specific stakeholder (S) or a network of stakeholders (N)	Differentiation in the strategies (Y) considering the different types of organisations or not (N)	Offer clear guidance (Y), offer some guidance (S) on how to comply with the regulation or not (N)
1	Ley	Ley 23 de 1973	1973	c	n	n	s
2	Decreto Ley	Decreto Ley 2811 de 1974	1974	c	s	n	n
3	Ley	Ley 9 de 1979	1979	c	n	n	n
4	Decreto	Decreto 2104 de 1983	1983	c	n	y	s
5	Decreto	Decreto 1601 de 1984	1984	c	s	n	n
6	Constitution	Constitución Nacional de Colombia 1991	1991	b	n	n	s
7	Decreto	Decreto 1842 de 1991	1991	b	s	n	s
8	Ley	Ley 99 de 1993	1993	c	n	n	n
9	Ley	Ley 60 de 1993	1993	c	s	n	n
10	CONPES	Conpes 2750 de 1994	1994	b	n	n	s
11	Decreto	Decreto 1600 de 1994	1994	c	n	n	s
12	Decreto	Decreto 966 de 1994	1994	c	n	n	s
13	Decreto	Decreto 1524 de 1994	1994	c	n	n	s
14	Decreto	Decreto 1753 de 1994	1994	c	n	y	s
15	Ley	Ley 142 de 1994	1994	c	n	y	s
16	Decreto	Decreto 548 de 1995	1995	c	s	n	s
17	Decreto	Decreto 605 de 1996	1996	c	s	n	y
18	Ley	Ley 286 de 1996	1996	c	s	n	y
19	Ley	Ley 388 de 1997	1997	c	n	n	n
20	Resolución	Resolución 940 de 1997 (Bogotá)	1997	c	n	n	n
21	Ley	Ley 491 de 1999	1999	b	n	n	s
22	Ley	Ley 511 de 1999	1999	i	s	n	s
23	Decreto	Decreto 1124 de 1999	1999	c	s	n	y
24	Ley	Ley 632 de 2000	2000	i	s	n	n
25	Resolución	Resolución 1096 de 2000	2000	c	n	n	s
26	Resolución	Resolución 133 de 2000	2000	c	s	n	s
27	Resolución	Resolución 120 de 2000	2000	c	n	y	y
28	Decreto	Decreto 2695 de 2000	2000	i	n	y	y
29	Ley	Ley 715 de 2001	2001	c	n	n	n
30	Acuerdo	Acuerdo 23 de 2001 (Medellín)	2001	c	n	n	s
31	Ley	Ley 689 de 2001	2001	c	n	y	s
32	Resolución	Resolución 151 de 2001	2001	c	n	y	y
33	Decreto	Decreto 005 de 2003 (Medellín)	2002	b	n	n	n
34	Decreto	Decreto 1713 de 2002	2002	c	n	n	s
35	Decreto	Decreto 289 de 2002 (Medellín)	2002	c	n	n	s
36	Acuerdo	Acuerdo Distrital 61 de 2002 (Bogotá)	2002	c	s	n	s
37	Política	Pol. Nal. de Educ. Ambiental	2002	b	n	y	s
38	Decreto	Decreto 1728 de 2002	2002	c	n	y	s
39	Decreto	Decreto 891 de 2002	2002	c	s	n	y
40	Decreto	Decreto 1604 de 2002	2002	c	s	n	y
41	Decreto	Decreto 514 de 2003 (Medellín)	2003	c	n	n	n
42	Acuerdo	Acuerdo 114 de 2003 (Bogotá)	2003	c	s	n	n
43	Decreto	Decreto 1180 de 2003	2003	c	n	n	s
44	Decreto	Decreto 061 de 2003 Bogotá	2003	c	n	n	s
45	Decreto	Decreto 1505 de 2003	2003	i	n	n	s
46	Decreto	Decreto 1140 de 2003	2003	i	s	n	s
47	Resolución	Resolución 1045 de 2003	2003	c	n	n	y
48	Decreto	Decreto 216 de 2003	2003	c	s	n	y
49	Resolución	Resolución CRA 271 de 2003	2003	b	s	y	y
50	Decreto	Decreto 1669 de 2003	2003	c	s	y	y
51	Resolución	Resolución 0643 de 2004	2004	c	n	n	s
52	Decreto	Decreto 4317 de 2004	2004	c	n	n	s
53	Decreto	Decreto 1200 de 2004	2004	n	n	n	s
54	Decreto	Decreto 190 de 2004	2004	c	n	y	s
55	Decreto	Decreto Distrital 400 de 2004 (Bogotá)	2004	c	s	n	y
56	Resolución	Resolución 477 de 2004	2004	c	n	y	y
57	Decreto	Decreto 1220 de 2005	2005	c	n	n	s
58	Decreto	Decreto 2078 de 2005 (Medellín)	2005	c	n	n	s
59	Decreto	Decreto 707 de 2005	2005	c	n	n	s
60	Decreto	Decreto 2762 de 2005	2005	c	n	n	s
61	Decreto	Decreto 838 de 2005	2005	c	s	n	s

#	Type	Legislation	Year	Command and Control (C) strategies or Incentive Design strategies (I) or Both (B) or None (N) for enforcin	Specific stakeholder (S) or a network of stakeholders (N)	Differentiation in the strategies (Y) considering the different types of organisations or not (N)	Offer clear guidance (Y), offer some guidance (S) on how to comply with the regulation or not (N)
62	Resolución	Resolución 1390 de 2005	2005	c	s	y	s
63	Resolución	Resolución 351 de 2005	2005	b	n	y	y
64	Resolución	Resolución 352 de 2005	2005	c	s	y	y
65	Directiva	Directiva 9 de 2006 (Bogotá)	2006	c	n	n	s
66	Acuerdo	Acuerdo Metropolitano 4 de 2006 (Itagüí)	2006	c	n	n	s
67	Acuerdo	Acuerdo Municipal 46 de 2006 (Medellín)	2006	b	n	y	s
68	Decreto	Decreto 312 de 2006 (Bogotá)	2006	b	n	y	s
69	Resolución	Resolución CRA 405 de 2006	2006	c	s	y	y
70	Resolución	Resolución Metropolitana 879 de 2007 (Itagüí)	2007	c	n	n	n
71	Acuerdo	Acuerdo Distrital 287 de 2007 (Bogotá)	2007	n	n	n	n
72	Ley	Ley 1151 de 2007	2007	b	n	n	s
73	Acuerdo	Acuerdo Metropolitano 30 de 2007	2007	c	n	n	s
74	Decreto	Decreto 409 de 2007 (Medellín)	2007	c	n	n	s
75	Decreto	Decreto 545 de 2007 (Bogotá)	2007	c	n	n	s
76	Decreto	Decreto 617 de 2007 (Bogotá)	2007	c	n	n	s
77	Ley	Ley 1176 de 2007	2007	c	s	n	s
78	Resolución	Resolución 0964 de 2007	2007	c	s	n	s
79	Decreto	Decreto 330 de 2007	2007	c	n	n	y
80	Decreto	Decreto 620 de 2007 (Bogotá)	2007	c	s	y	y
81	Resolución	Resolución 429 de 2007	2007	i	s	y	y
82	Acuerdo	Acuerdo Distrital 344 de 2008 (Bogotá)	2008	c	s	n	n
83	Ley	Ley 1259 de 2008	2008	c	n	n	s
84	Resolución	Resolución 1684 de 2008 MAVDT	2008	c	s	n	s
85	Conpes	Conpes 3530 de 2008	2008	b	n	y	s
86	Decreto	Decreto 818 de 2008 (Medellín)	2008	c	n	y	s
87	Decreto	Decreto 3200 de 2008	2008	c	n	n	y
88	Decreto	Decreto 2778 de 2008	2008	b	s	n	y
89	Ley	Ley 1263 de 2008	2008	c	s	n	y
90	Decreto	Decreto 175 de 2009	2009	c	n	n	n
91	Decreto	Decreto 440 de 2009 (Medellín)	2009	c	n	n	s
92	Decreto	Decreto 2600 de 2009	2009	c	n	n	s
93	Resolución	Resolución 1822 de 2009 MAVDT	2009	c	s	n	s
94	Decreto	Decreto 2350 de 2009	2009	c	s	n	s
95	Ley	Ley 1333 de 2009	2009	c	n	y	y
96	Resolución	Resolución 1117 de 2010 (Bogotá)	2010	c	s	n	n
97	Resolución	Resolución 726 de 2010 UAESP	2010	c	s	n	n
98	Decreto	Decreto 261 de 2010 (Bogotá)	2010	c	n	n	s
99	Decreto	Decreto 2820 de 2010	2010	c	n	n	s
100	Decreto	Decreto 1666 de 2010	2010	c	s	n	s
101	Decreto	Decreto 446 de 2010 Bogotá	2010	c	s	n	s
102	Resolución	Resolución 1529 de 2010	2010	c	s	n	s
103	Política	Pol. Nal. de Prod. y Consumo Sostenible	2010	b	n	y	s
104	Decreto	Decreto 587 de 2010	2010	c	s	n	y
105	Decreto	Decreto 456 de 2010 (Bogotá)	2010	c	s	y	y
106	Ley	Ley 1450 de 2011	2011	c	n	n	n
107	Decreto	Decreto 575 de 2011 (Bogotá)	2011	c	n	n	s
108	Decreto	Decreto 675 de 2011 (Bogotá)	2011	c	n	n	s
109	Resolución	Resolución CRA 541 de 2011	2011	c	s	n	s
110	Decreto	Decreto 3565 de 2011	2011	c	s	n	s
111	Ley	Ley 1454 de 2011	2011	b	n	y	s
112	Resolución	Resolución 6981 de 2011 SDM/SDA	2011	c	n	y	s
113	Decreto	Decreto 141 de 2011	2011	c	s	n	y
114	Ley	Ley 1549 de 2012	2012	c	n	n	n
115	Decreto	Decreto 82 de 2012 (Bogotá)	2012	C	S	N	N
116	Decreto	Decreto 178 de 2012	2012	c	n	n	s
117	Resolución	Resolución 65 de 2012 UESP	2012	c	s	n	s
118	Decreto	Decreto 082 RD 4847 de 2012 (Bogotá)	2012	n	s	n	s
119	Decreto	Decreto 2981 de 2013	2013	c	n	n	s
120	Decreto	Decreto 412 de 2013 (Bogotá)	2013	c	s	n	y
121	Decreto	Decreto 920 de 2013	2013	b	s	y	y
122	Decreto	Decreto 113 de 2013 (Bogotá)	2013	c	s	y	y
123	Ley	Ley 1715 de 2014	2014	c	n	n	n
124	Decreto	Decreto 2041 de 2014	2014	c	n	n	s
125	Resolución	Resolución 754 de 2014	2014	c	n	y	y

#	Type	Legislation	Year	Command and Control (C) strategies or Incentive Design strategies (I) or Both (B) or None (N) for enforcing	Specific stakeholder (S) or a network of stakeholders (N)	Differentiation in the strategies (Y) considering the different types of organisations or not (N)	Offer clear guidance (Y), offer some guidance (S) on how to comply with the regulation or not (N)
126	Decreto	Decreto 1074 de 2015	2015	n	s	n	n
127	Decreto	Decreto 1077 de 2015	2015	b	n	n	s
128	Ley	Ley 1753 de 2015	2015	b	n	n	s
129	Decreto	Decreto 1736 de 2015 Nivel Nacional	2015	c	s	n	s
130	Decreto	Decreto 469 de 2015 (Bogotá)	2015	c	s	n	s
131	Resolución	Resolución 720 de 2015	2015	b	s	y	y
132	Conpes	Conpes 3874 de 2016	2016	b	n	n	s
133	Decreto	Decreto 596 de 2016	2016	b	n	n	s
134	Resolución	Resolución 668 de 2016	2016	b	n	n	s
135	Resolución	Resolución 0276 de 2016	2016	b	s	n	s
136	Decreto	Decreto 1784 de 2017	2017	b	s	n	s
137	Decreto	Decreto 130 de 2018 (Bogotá)	2018	c	s	n	n
138	Conpes	Conpes 3918 de 2018	2018	b	n	n	s
139	Resolución	Resolución 1407 de 2018	2018	b	n	n	s
140	Ley	Ley 1938 de 2018	2018	c	s	n	s
141	Decreto	Decreto 2412 de 2018	2018	i	s	n	s
142	Acuerdo	Acuerdo Metropolitano 23 de 2018 (Valle de Aburrá)	2018	b	n	n	y
143	Resolución	Resolución 1397 de 2018	2018	c	n	y	y
144	Resolución	Resolución CRA 853 de 2018	2018	b	s	y	y
145	Decreto	Decreto 285 de 2019 (Bogotá)	2019	c	s	n	n
146	Acuerdo	Acuerdo Metropolitano 23 de 2019 (Valle de Aburrá)	2019	n	s	n	n
147	Resolución	Resolución 1558 de 2019	2019	c	n	n	s
148	Ley	Ley 1977 de 2019	2019	c	n	y	s
149	Resolución	Resolución 2184 de 2019	2019	c	n	y	y
150	Resolución	Resolución 938 de 2019 Ministerio de Vivienda, Ciudad y Territorio	2019	c	s	y	y
151	Resolución	Resolución 1342 de 2020	2020	n	n	y	s