The shaping factors of waste separation on the island of Porquerolles

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900117-684-050

4 January 2016

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Abstract

Waste is the most immediate and tangible product of our consumer society. Through the appreciation of waste as a resource, materials can be recycled and reintroduced in the production cycle. A prerequisite for successful recycling is waste separation. Waste separation depends on the solid waste management system in place and the psychological predisposition of the individual actor. Establishing waste separation on touristic islands is not an easy endeavour. Porquerolles, a French island in the Mediterranean Sea is no exception to this challenge. Based on a conceptual framework that was developed, the research examines how waste separation on Porquerolles is shaped by psychological and situational factors. Questionnaires with three actor groups (tourists, residents and employees) and interviews with key stakeholder offered valuable insights. Despite the expectation that the psychological factors between actors who do and actors who do not separate their waste would differ, the outcome was that overall actors show a favourable psychological disposition towards waste separation. As to why not all actors then separate their waste can be explained by examining the situational factors and the lack of a fully developed waste separation system on the island. The conceptual framework of this research recognizes the complexity of how waste separation is shaped by including both psychological and situational factors.

Keywords: waste separation, situational factors, psychological factors, island, Porquerolles, France

Acknowledgements

I would like to take the opportunity to express my sincere gratitude to some people. First, I want to thank all the interviewees and questionnaire participants who offered me some of their valuable time to answer my questions. Without you this thesis would not have been possible. I want to thank Judith van Leeuwen, my supervisor. Thank you for our many meetings and e-mail conversations and your guidance. I enjoyed working with you and feel that in the past months I learned a lot and grew as a researcher. Thank you also Christine for all your feedback on my work. I want to thank my former colleagues at EAWAG from whom I learned many of the skills I applied in this thesis. I also want to express my gratitude to Martine and Laurent. Thank you for welcoming me in your home. I appreciate this opportunity and will always cherish the time I got to spend on Porquerolles. A tremendous thank you to my family. You were always willing to read through my work and share with me your ideas, which showed me how interested you were in my thesis. Finally, I want to say thank you to Erik. Not only did you read many different versions of my thesis, but you created an environment in which I was able to write this thesis. You supported my decision to go abroad for my research and especially in the past weeks you were there for me when I had to work late or in the weekend. Thank you for all your encouraging words and for believing in me.

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Acronyms

CBO – Community-based organisation

CESC – Conseil Economique Social et Culturel

EDF – Electricité de France

EPR – Extended Producer Responsibility

EPCI – Établissement public de coopération intercommunale

EU – European Union

IGESA – Institution de Gestion Sociale des Armées

ISWM – Integrated Sustainable Waste Management

MED-3R – Euro-Mediterranean Strategic Platform for suitable waste management

MS – Member States

MSW – Municipal Solid Waste

NGO – Non-governmental organisation

NOTRe – Nouvelle organisation territoriale de la République

ODK – Open Data Kit

PMS – Porquerolles Multi Services

PTP – Ports Toulon Provence

RANAS – Risk, Attitude, Norms, Ability, Self-regulation

SWM – Solid Waste Management

TPB – Theory of Planned Behaviour

TPM – Toulon Provence Méditerranée

WFD – Waste Framework Directive

1. Introduction

1.1. Setting the Scene

Today we live in a "civilization of excess, redundancy, waste and waste disposal" (Bauman, 2004, p. 97) and this consumer society seems to be ever increasing, due to rapid population growth as well as higher living-standards (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2012; Bolt & van Zanden, 2013). Taking into account the entire material flow of a product, satisfying the needs of everybody has severe environmental impacts. The flow starts with the extraction of scarce virgin materials; followed by the manufacturing process and finally disposal once the product lost value to its holder. All these steps require energetic input and cause pollution. Recycling is a process in which waste is treated and eventually becomes the basis for a new product. Through the redefinition of waste as a resource, recycling offers the possibility to reduce the negative impacts of the classical material flow. A prerequisite for successful recycling is waste separation. In order to truly move towards a recycling society it is important to understand what the factors influencing waste separation are and how these factors shape waste separation. But what exactly is waste separation? For most of us waste separation has become part of our everyday life to such an extent that we often do not think about this topic. When dismantled waste separation entails the separation of different waste streams at the moment of their disposal.

There are many places, which offer an interesting setting to study issues related to waste. Islands offer the unique characteristic of being a landmass separated from the mainland and surrounded by water. In terms of finding the proper way to manage waste, they are faced with a particular set of challenges. Some of these constraints may include the lack of suitable land for treatment or disposal, and insufficient finances to manage waste on site or to ship it elsewhere. Furthermore, for islands, which have become an attractive destination for tourists, the quantity of waste generated and to be managed accordingly fluctuates considerably over the year. As such, islands represent a confined yet extremely complex environment in which to study waste separation.

Porquerolles, a French island in the Mediterranean Sea is faced with many of the obstacles listed above and is therefore an intriguing case for the study on waste separation. Porquerolles has a surface of 12,54 km^2. While this is not negligible, there is no possibility to treat the waste on site. Fortunately, the mainland is only 15 kilometres away and the waste can easily be shipped to the continent, although this does incur considerable costs. Even more manageable is the size of the permanent population, which amounts to 350 inhabitants throughout the year (Porquerolles, 2015a). The burden for Porquerolles is in the summer period when up to one million tourists visit the island (Enezgreen, 2014). Being a major tourist attraction, Porquerolles has numerous hotels and restaurants. In view of recycling, the waste produced by all the residents, tourists as well as the hotels and restaurants on the island taken together, offers a huge potential if properly separated. In the next section the researcher will introduce the research that has been done up till now on solid waste management on islands in general and more specifically on waste separation.

1.2. Establishing the Research Niche

As argued above, islands are interesting localities to study the management of solid waste. But what exactly is solid waste and solid waste management? Solid waste refers to the physical state of the waste and includes a number of waste streams, the most common being glass, paper, plastic, metal, and organic material. These waste streams are also often referred to as recyclables. Solid waste management (SWM) is then no more than the management of these waste streams. According to Filho and Will (2013) "waste management is understood as the procedure of monitoring and handling waste from collection, transport, treatment (processing), recovery, and recycling to final disposal" (p. 2692).

In their paper Eckelman et al. (2014) cluster the studies that have been conducted in the past years on the topic of solid waste management on islands. Some of these studies have discussed the solid waste management system of a particular island, while others have been done on the siting of landfills, the impact of greenhouse gas emissions and the potential for energy recovery from waste. Another set of studies has focussed on the potential of industrial symbiosis between industries on islands or done a material flow

analysis. Besides these rather technical studies, others have investigated the issue of solid waste management on islands from a social perspective. One study focused on the waste management behaviour of households and how the shift from importing goods towards relying more on the natural resources locally available can strengthen relationships between islanders. Finally, another study analysed the relation between socio-demographic parameters such as income and the amount of waste generated.

All of the studies introduced above are about some aspect of solid waste management and were conducted on islands; none however discusses the topic of waste separation. For this reason, this part will present literature on waste separation regardless of the place the research was conducted. In the study of Boonrod et al. (2015) four motivation mechanisms were implemented to see which approach would yield the highest percentage of organic waste separation. The mechanisms ranged from providing containers, offering information to different forms of economic incentives. According to the study, the highest percentage of organic waste separation was reached through the community business mechanism, which promoted a recycling market. Another similar study was done in which an incentive was created to bring recyclables to a collection point by exchanging the waste for eggs. The findings of the research showed that this project succeeded in garbage reduction and community empowerment. However, while at the beginning the quantities exchanged were quite high, this reduced over the period of one year. Two explanations provided are that at a certain point the waste discarded in the public area had already been collected and that more material buyers emerged in the market (Mongkolnchaiarunya, 2005). Ekere et al. (2009) explored the determinants of waste separation and utilization in urban and peri-urban households. Their results showed that gender, peer influence, land size, location of house as well as membership in environmental organisations influenced behaviour. Finally, a research done in three districts with diverging recycling rates showed that they greatly differed in the amounts and the composition of the waste produced. The district with the best recycling percentage generated less waste but interestingly still had the most recyclables in their discarded waste. Furthermore, the study found that up to one third of the waste was comprised of recyclable materials. The authors therefore argued that post-collection sorting might be of value (Aphale et al., 2015). The above literature on waste separation focuses on creating

incentives to motivate people to separate their waste and on personal factors to explain a person's behaviour. These studies therefore have a tendency to concentrate on the individual actor in the study of waste separation.

While many studies in the area of SWM remain technical and lack the human angle, the reverse can be argued for the studies on waste separation. Waste separation should however not only be researched through the psychological factors of the individual. Instead, the situational factors, which form the context in which waste separation takes place, are just as influential. By bringing together literature in the field of behavioural psychology (Barr & Gilg, 2007; Mosler, 2012) and SWM (van de Klundert & Anschütz, 2001) waste separation can be studied from both angles. The work of these authors built the basis for the conceptual framework, which will be discussed in detail in the next chapter, used in this research. In short, the framework brings together a set of situational and psychological factors deemed influential in the shaping process of waste separation. By taking a socio-technical perspective, this research will contribute to the current body of knowledge on waste separation on an island setting.

1.3. Research Objective

The empirical objective of this research is to understand how waste separation is shaped on the island of Porquerolles. While for different actors waste separation might already be part of their everyday life, it is not practiced everywhere and by everyone to the same extent. This research will therefore focus on how tourists, residents and employees of hotels and restaurants on the island behave in the public area or their accommodation, their home or their place of work respectively. Providing a better insight into how waste separation is shaped has the potential to improve waste separation from the status quo and as a consequence to advance recycling. Theoretically, an additional objective is to assess whether the conceptual framework developed, is valuable for studying how waste separation is shaped.

1.4. Research Questions

The empirical objective of understanding how waste separation is shaped, lies at the heart of this research. Based on this objective the following main research question and sub-

research questions have been devised. As the reader will notice, the fourth sub-research question makes reference to the theoretical objective.

1.4.1. Main Research Question

"How is waste separation on Porquerolles shaped by situational and psychological factors?"

1.4.2. Sub Research Questions

- "How is waste separation on Porquerolles shaped by situational factors?"
- "How is waste separation on Porquerolles shaped by psychological factors?"
- "How do situational and psychological factors mutually influence each other in the shaping process of waste separation on Porquerolles?"
- "Is the conceptual framework valuable to study the shaping process of waste separation?"

1.5. Structure of Thesis

The thesis is structured around six chapters. The next chapter offers an introduction to the work of Barr and Gilg (2007), Mosler (2012) and van de Klundert and Anschütz (2001). Based on their work a conceptual framework was built which will be presented at the end of the second chapter. Chapter 3 is the Methodology chapter of the thesis. Here the reader will be provided with the details on the research design, the research methods, data collection and analysis as well as research ethics. Chapter 4 and 5 are the empirical core of the thesis. While chapter 4 focuses on the situational factors shaping waste separation, chapter 5 will discuss the psychological factors. Finally, the thesis will close with Chapter 6 the Conclusion and Recommendations. In this part the researcher will summarize the answers to the sub-research questions and provide some recommendations for the future.

2. Theory and Conceptual Framework

2.1. Introduction

Waste separation lies at the centre of this research and becomes the unit of analysis. To understand how waste separation is shaped, the researcher looked at psychological factors and situational factors. To establish the psychological factors the researcher turned to behavioural psychology. The Framework of Environmental Behaviour by Barr and Gilg (2007) and the RANAS model of Behaviour Change by Mosler (2012) were consulted to establish the psychological factors. Both theories are grounded in the Theory of Planned Behaviour (TPB) by Fishbein and Ajzen (1975). As for the situational factors, the researcher drew on the Integrated Sustainable Waste Management (ISWM) model by van de Klundert and Anschütz (2001).

The next two sections will start by introducing the work of Barr and Gilg (2007) and Mosler (2012). The work of these authors offers three advantages: they offer many comprehensible definitions, their work is contemporary and it has been empirically tested. Afterwards the ISWM model will be discussed in detail. The work of van de Klundert and Anschütz (2001) has the advantage that besides being very practical and comprehensible, this model focuses on solid waste management and therefore is suitable for the current study. Towards the end of the chapter the conceptual framework will be presented.

2.2. Framework of Environmental Behaviour

The Framework of Environmental Behaviour (Barr and Gilg, 2007) is based on two pillars. First of all, the authors do not agree that the key agents of change is the individual and that in order to achieve more environmental friendly behaviour, awareness on the topic needs to be raised and then information disseminated. Secondly, their framework is based on the Theory of Reasoned Action the predecessor to the Theory of Planned Behaviour. A crucial difference to the Theory of Reasoned Action is that in the framework it is not attitudes towards behaviour and the subjective norms that influence the intention and finally the behaviour. Instead, social and environmental variables influence the intention and finally the behaviour. Moreover, the framework adds situational and psychological variables,

which both have an impact on the intention and the behaviour. Going beyond the attitudes and norms Barr et al. (2001) created a far more comprehensive model (Figure 1).

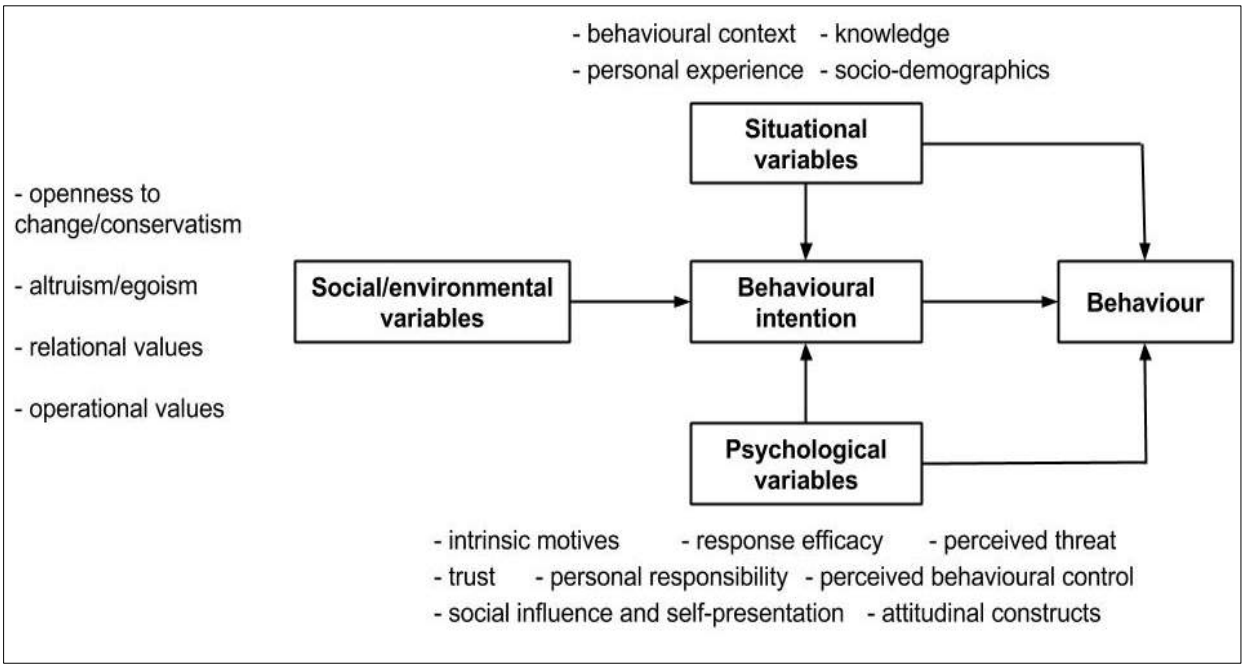


Figure 1: Framework of Environmental Behaviour adapted from Barr & Gilg (2007)

The social variables identified are greatly informed by the work of Schwartz (1992 as referenced in Barr & Gilg, 2007), who tried to establish globally common social values. Based on his research Schwartz found that there are two value pairs, which seem to be universal: openness to change versus conservatism and altruism versus egoism (Barr & Gilg, 2007). As for the environmental variables they can be divided into relational values and operational values. Relational values refer to where one positions the human in respect to the natural environment. Either they can be on equal footing (biospheric) or the human can be regarded as having dominance over the environment (anthropocentric) (Dunlap and van Liere, 1978 as referenced in Barr & Gilg, 2007; Dunlap et al., 2000 as referenced in Barr & Gilg, 2007). Operational values can be ecocentric, valuing low-tech solutions or technocentric, favouring high-tech, human-centred solutions (O'Riordan, 1985 as referenced in Barr & Gilg, 2007).

Situational variables are defined as "the behavioural context specific to each individual" (Barr & Gilg, 2007, p. 364). In total Barr and Gilg identify four sets of situational variables. First, the behavioural context in itself can be regarded as the structure within

which the behaviour takes place. This includes external structures but also internal structures such as structural changes made in the private sphere of the house. While the framework of Barr and Gilg is introduced under the psychological, this situational variable would better fit under the situational factors. Nevertheless, the fact that the authors introduce the behavioural context in their framework shows that they consider situational factors to play an important role in shaping the behaviour. The framework can therefore be said to appreciate both psychological factors of the individual and the broader situational factors. Secondly, knowledge is an important situational factor. Based on the work of Schahn and Holzer (1990 as referenced in Barr & Gilg, 2007) the authors distinguish between two types of knowledge: abstract knowledge, the "awareness of general environmental issues" and concrete knowledge or practical understandings (Barr & Gilg, 2007, p. 364). Furthermore, according to Barr and Gilg (2007) a person's past experiences as well as his or her socio-demographics have an impact on behaviour. According to Schultz et al. (1995 as referenced in Barr & Gilg, 2007) young, female, well-educated and high earning individuals would be more likely to show pro-environmental behaviour.

Psychological variables are comprised of the intrinsic motives of an actor to behave a certain way. In other words it is the "satisfaction from helping the environment" felt by the actor (Barr & Gilg, 2007, p. 364). Furthermore, psychological variables incorporate response efficacy, "the belief that one's behaviour will have some form of tangible impact on 'the environment'" (p. 364); the perceived threat caused by the environment and the trust that actors have in the validity of information received from certified sources. Additionally, four more factors can influence the psychological variables: personal responsibility, perceived behavioural control, social influence and self-presentation, and attitudinal constructs. Personal responsibility can be seen as the duty the actor feels to address problems. Perceived behavioural control is whether an individual has the confidence that they can perform a certain way, especially when considering constraints such as time and convenience. Social influence and self-perception are rather self-explanatory. They refer to the influence people that are important to the individual can have through their encouragement and discouragement. Finally, attitudinal constructs are the "range of attitudes relating to practices" (p. 365).

The Framework of Environmental Behaviour goes beyond only psychological or situational variables. Instead it offers interesting new variables, which have not yet been so clearly discussed in other literature. The framework is greatly informed by previous research and has also been tested around the topic of household waste management in the UK, which increases its validity (Barr et al., 2001; Barr et al., 2013).

2.3. The RANAS Model of Behavior Change

The Behavior Change Model developed by Mosler is based on his own work as well as the work of other behavioural psychologist whose contribution to the field has been tested over time (2012). His model can be divided into four components: factor blocks, behavioural factors, target behaviours and behaviour change techniques. These techniques are targeted at the behavioural factors identified requiring change. The model is therefore not only theoretical, but also offers a practical side. In order to assess the critical behavioural factors, Mosler also offers an analytical tool.

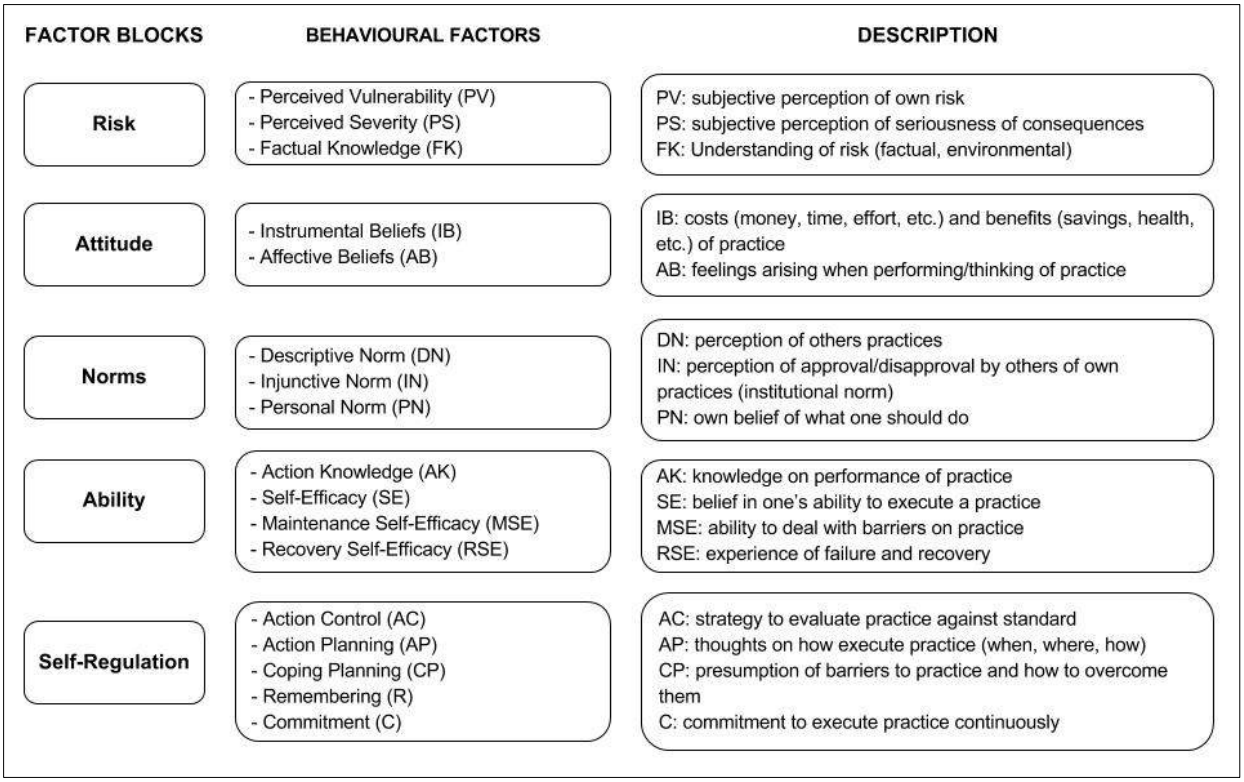


Figure 2: RANAS model adapted from Mosler (2012)

The five factor blocks give the RANAS model its name: Risk factors, Attitudinal factors, Normative factors, Ability factors and Self-regulation factors. Each factor block has a set of behavioural factors corresponding to it (Figure 2). The risk factors include perceived vulnerability, perceived severity and factual knowledge. Attitudinal factors are the combination of instrumental beliefs and affective beliefs. Norms groups descriptive norms, injunctive norms and personal norms. Under ability four behavioural factors come together: action-knowledge, self-efficacy, maintenance self-efficacy and recovery self-efficacy. Finally self-regulation includes action control, action planning, coping, planning, remembering and commitment. A description of each behavioural factor is provided in figure 3.

In order to determine which behaviour change technique will be most successful it is important to divide the sample population between those who do certain behaviour and those who do not. In case such a clear-cut division is not possible, the population can also be divided into those who intend and those who do not intend to behave a certain way. This makes sense, considering that intention is a good predictor for behaviour. The behavioural factors that show the biggest discrepancy between those two groups is then to be regarded as the factor that needs to be altered to achieve the desired behaviour. Data to reach this conclusion is mostly gathered through questionnaires.

The model of Mosler is built on many well-known behavioural psychologists. The work of Rosenstock (1974 as referenced in Mosler, 2012), Floyd et al. (2000 as referenced in Mosler, 2012) and Schwarzer (2008 as referenced in Mosler, 2012) informed the risk factors. The Theory of Planned Behavior (Fishbein and Ajzen, 2010 as referenced in Mosler, 2012), as introduced previously, adds the attitudinal, normative and ability factors. And finally research by Albarracín et al. (2005 as referenced in Mosler, 2012) and Prochaska and DiClemente (1983 as referenced in Mosler, 2012) stressed the importance of self-regulation in order for a behaviour to be continued and maintained. By combining the work of all these scholars together with his own, Mosler built a new model. Mosler has already proven that the model does not only hold ground theoretically, but has also validated it in the field. Most of the work by Mosler has been done in the water and sanitation sector (Heri & Mosler, 2008 as referenced in Mosler, 2012; Mosler et al., 2010 as referenced in Mosler, 2012; Kraemer & Mosler, 2010 as referenced in Mosler 2012). Interestingly, some studies

have however also been conducted around waste (Mosler et al., 2006; Binder & Mosler, 2007, Mosler et al., 2008). This shows that Mosler has gathered experience with his model over the years and has had the possibility to perfection it. Just as the Theory of Planned Behavior, the RANAS model has however one pitfall. Stemming from behavioural psychology it tends to focus more on the actor and does not give enough appreciation to the structure surrounding the behaviour.

2.4. Integrated Sustainable Waste Management Model

The Integrated Sustainable Waste Management (ISWM) model by van de Klundert and Anschütz (2001) offers the possibility to better operationalize the situational factors (Figure 3). Despite the fact that Wilson et al. introduced a more recent ISWM framework in 2013, the researcher prefers the ISWM model for the analysis of solid waste management systems. The ISWM model is based on three dimensions: the stakeholders, the waste system elements and ISWM aspects. Together these dimensions will be referred to as situational factors.

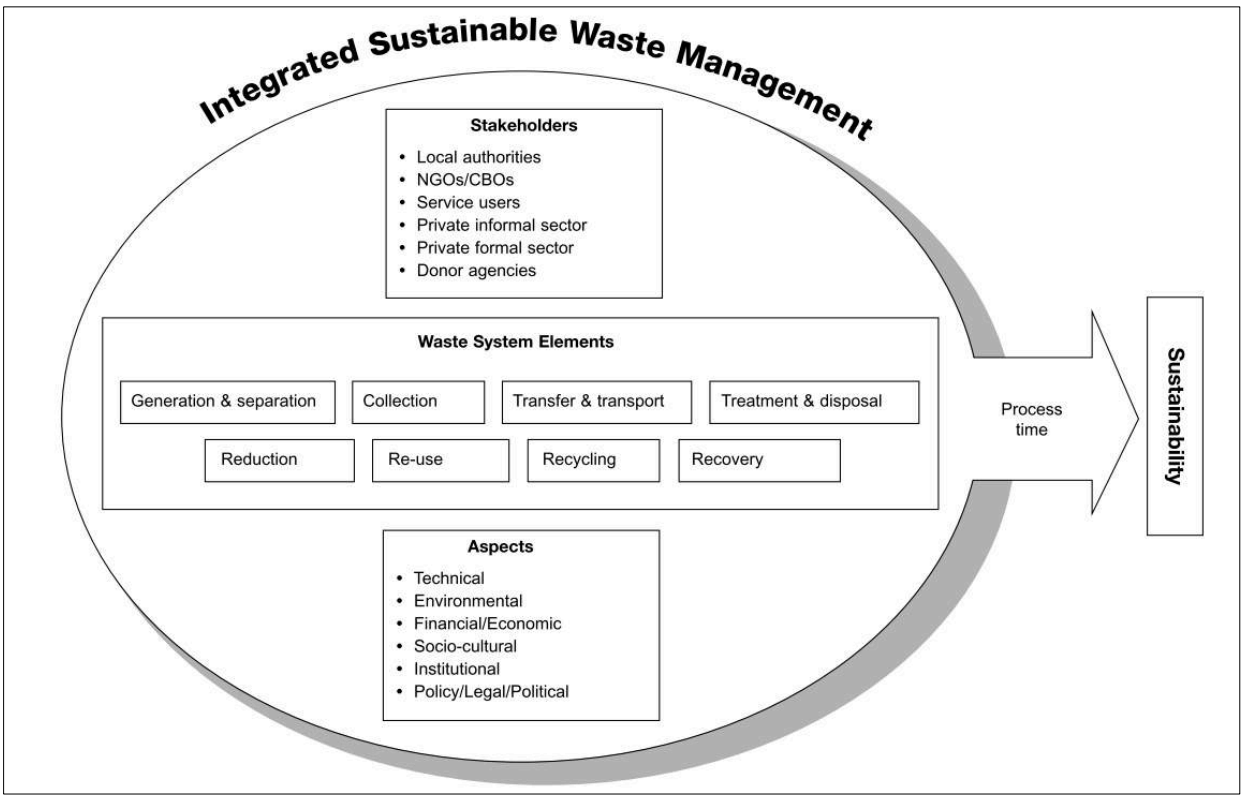


Figure 3: The Integrated Sustainable Waste Management (ISWM) model (van de Klundert & Anschütz, 2001, p. 14)

The first dimension is the stakeholders involved in waste management. As van de Klundert and Anschütz defined it, "a stakeholder is a person or an organisation that has a stake, an interest in - in this case - waste management" (2001, p. 12). Stakeholders include local authorities, non-governmental or community-based organisations (NGOs or CBOs), service users, private informal sector, private formal sector and donor agencies. The second dimension is the waste system elements. The waste system elements can best be understood as waste flow, which essentially starts with waste generation. Subsequent elements can include separation, collection, transfer and transport, treatment and finally disposal. Under waste system elements more recent concepts of reduction, re-use, recycling and recovery are included. Finally, the third dimension is the ISWM aspects, which include environmental aspects, political/legal aspects, institutional aspects, socio-cultural aspects, financial/economic aspects and technical/performance aspects. While most of those aspects seem to be self-explanatory a short explanation on each aspect will be given. The environmental aspects relate to the effects solid waste management can have on the natural environment. Political/legal aspects consider the formal legal framework in which the system is set. Institutional aspects are the organizational structures and the distribution of functions and responsibilities. The socio-cultural aspect focuses on "the influence of culture on waste generation and management" (p. 14). Financial/economic aspects refer in a narrow sense to how the system is financed. Finally, technical/performance aspects consider the "observable and practical implementation and maintenance of all the waste elements"' they focus thus more on the infrastructural side (p. 14). Together these aspects offer "lenses, through which the existing waste system can be assessed" (p. 13).

2.5. Conceptual Framework

The conceptual framework guiding this research is based on the Framework of Environmental Behavior, the RANAS model and the Integrated Sustainable Waste Management model (Figure 4). While these approaches make the study of waste separation more comprehensible, each study has also some drawbacks in other respects. For this reason combining the theories to create a new conceptual framework does seem appropriate. Although some might argue against eclecticism the researcher provides

arguments as to why this approach was chosen for this research. Firstly, most scholars built their theory on previous work. Instead of reinventing the wheel every time it makes sense to see what other scholars have already studied and then rationally argument why one perceives certain approaches to be useful or not. Secondly, by basing this conceptual framework on the work of other scholars in the field that has been tested and reviewed over the years increases the framework's validity. The value of the conceptual framework to study waste separation will have to be tested through this research.

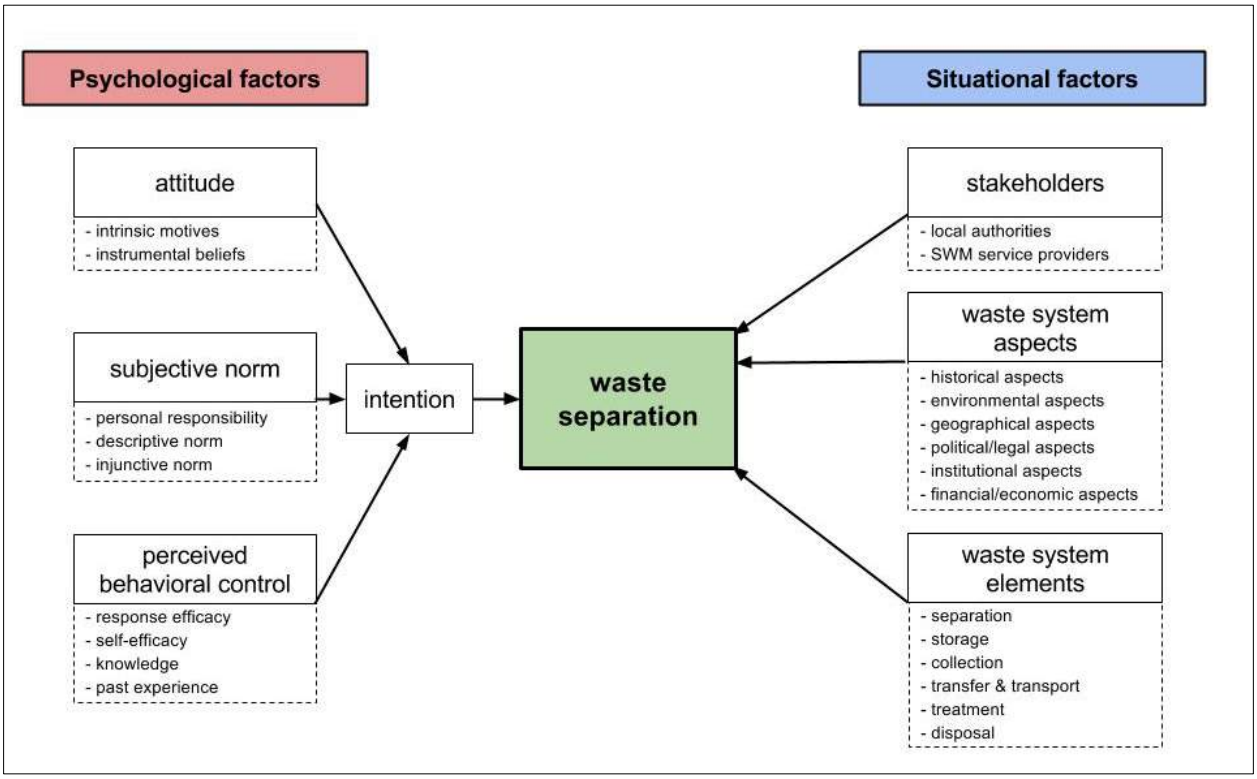


Figure 4: Conceptual Framework

At the heart of the model lies waste separation, which is studied through a socio-technical perspective, giving predominance neither to the psychological nor the situational factors. Instead, both get equal merit in explaining how waste separation is shaped.

The psychological factors have been formulated through the work of Barr and Gilg (2007) and Mosler (2012). Both studies are grounded in the field of behavioural psychology. Summarizing, a person is influenced by a number of psychological factors. The attitude towards waste separation is a combination of two factors: intrinsic motives and the instrumental beliefs. What Gilg and Barr (2007) refer to as intrinsic motives is the same

as what Mosler (2012) calls affective beliefs. They are the feeling a person gets from performing a certain way. The instrumental beliefs are the costs such as time, money and benefits a person receives from acting a certain way. Second, the subjective norm is comprised of personal responsibility, descriptive norm and injunctive norm. Personal responsibility (Barr and Gilg, 2007) can be set equal to personal norm (Mosler, 2012). Personal responsibility is the duty the actor feels on how he or she should act. Descriptive norm is how the actor perceives others behaviour. The injunctive norm describes whether the actor thinks people important to him or her would approve or disapprove of what the actor is doing. Third, perceived behavioural control is the response efficacy, self-efficacy, knowledge and the past experience of the actor. Response efficacy is the belief an actor has that his or her actions will have a tangible impact on the environment. Self-efficacy describes the belief in one's ability to execute a certain action. Knowledge is what actors know about the practice itself. Past experience refers to how they have or have not been committed to waste separation in the past. Finally, intention is the last psychological factor, which captures the other behavioural factors. According to the theory, intention is a good predictor for the actual act of waste separation and therefore offers an "indication of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen, 1991, p. 181). Finally, socio-demographics such as age, gender, income, education and possibly the country of residence should be controlled for as influencing waste separation.

On the right hand side of the framework, the situational factors can be found. The ISWM model by van de Klundert and Anschütz (2001) offered a valuable starting point to define the situational factors. As the ISWM model is mostly used in low- and middle-income settings some of the situational factors mentioned however do not apply to the current research. This means that some of the situational factors discussed under ISWM will be left out of the conceptual framework and some factors not yet considered will be included. In this research the situational factors can be set equal to the solid waste management system in place on Porquerolles. The situational factors can be divided along three dimensions: the stakeholders, the waste system aspects and the waste system elements. A priori two stakeholder groups can be identified: local authorities and SWM service providers in the form of the companies providing the collection and the treatment services. Service users as

introduced by the ISWM model have been taken out of the conceptual framework, as they are already included through the tourists, residents and employees. Moreover, the private informal sector, donor agencies and NGOs/CBOs have been omitted, as they are not present in this research setting. In the course of the research, additional stakeholders may however be identified. The waste system aspects are different lenses from which to analyze the solid waste management system. Such an analysis can focus on either historical, environmental, geographical, political/legal, institutional or financial/economic aspects of the system. Including the technical aspects as in ISWM under waste system aspects seems superfluous as based on their definition they should be incorporated in the analysis of the waste system elements. Moreover, socio-cultural aspects have been left out as they are covered by the psychological factors. Two aspects were however be added. The first is the historical aspect. While to some extent the historical aspect might be reflected in the political aspect, the case of Porquerolles and its history are particular and should be considered. The different proprietors and uses of the island in the past explain the actual state of Porquerolles and why currently a number of different authorities are present on a rather small piece of land and how this influences waste separation. Finally, the geographical aspect should not be excluded as the island setting of Porquerolles implies some exceptional context for solid waste management and more importantly waste separation. Finally, six situational factors fall under the waste system elements block: separation, storage, collection, transfer and transport, treatment and disposal. While waste separation is under study and therefore lies at the centre of the conceptual framework, the decision was made to also include it in the waste system elements. Separation will focus here on general facts such as what types of waste are separated on the island and since when this is in place. Compared to the ISWM, storage is a new addition in the conceptual framework, as it is surprisingly not mentioned in the model. In this research storage in the form of waste bins and containers will however be added to the waste system elements.

3. Research Methodology

3.1. Introduction

Decisions about the research methodology are ultimately derived from the research objective and research questions. The empirical objective of this research is to understand how waste separation is shaped. Based on the theory a conceptual framework was built, which argues that situational and psychological factors shape waste separation. The questions the theory raised were how situational and psychological factors respectively shape waste separation as well as how they mutually influence each other in the shaping process. To answer these questions, the researcher stayed eight weeks (end of May to mid July 2015) on the island of Porquerolles. Theoretically, a fourth research question was added, namely whether the conceptual framework developed is of value in the research of waste separation. Through testing the theory in the research, theory can eventually be refined. The question on the value of the conceptual framework will therefore be answered towards the end of the thesis by evaluating the overall research. The next section will introduce the research design. Afterwards the choice of methods as well as the process of data collection and analysis will be elaborated per research method. While reliability and validity are examined per method, towards the end these will be discussed for the research overall, followed by a section on research ethics and the role of the researcher.

3.2. Research Design

For the purpose of answering the research questions, a case study was selected. Due to the fact that each case differs, choosing a case study for conducting research is often criticized for its low reliability and validity (Bryman, 2008; Kohn, 1997). Despite of this, a case study offers the advantage to research a question in a clearly delimited environment. The case study of this research is Porquerolles. Choosing an island as a case study has the benefit that it is geographically isolated. Moreover, as discussed in the introduction studying the factors shaping waste separation on an island such as Porquerolles is also intriguing. The limitation of reliability and validity can be overcome in a case study. Presuming that the conceptual framework proofs to be valuable as a theoretical basis from which to study

waste separation, the framework can be applied to other settings and as such boost the reliability. Furthermore, through a carefully designed research with appropriate methods, data collection and data analysis the validity can be increased.

Returning to the research questions and the situational and psychological factors, three primary research methods were chosen. As such for the situational factors, besides desk research, observations were done and interviews were conducted with key stakeholders. The psychological factors were investigated by talking to individual actors through questionnaires. While the interviews and the questionnaires focused mainly on collecting data on the situational and psychological factors respectively, in both methods questions about the other factor were posed. Through this triangulation the internal validity can be further increased. In this research both qualitative and quantitative methods were thus applied.

3.3. Interviews

3.3.1. Choice of Method

For the situational factors secondary data in the form of policy documents, databases and other sources was consulted. Primary data on the situational factors was collected through interviews, as interviews "fundamentally concerned with environment around the phenomenon rather than the phenomenon itself" (Silverman, 1998 as referenced in Green & Thorogood, 2014, p. 104). The interviews offered the advantage to talk with experts and key stakeholders in the field, verify information gathered through secondary data and hear their personal account. For this research a semi-structured interview style was chosen. The advantage of the semi-structured interview is that next to having a clear overview of the questions that are to be raised, it gives room for induction through the insights raised by the interviewee. As such semi-structured interviews are less rigid and instead new, unthought-of topics may be raised and probed for essentially adding value to the interview and the research overall. As most qualitative research methods, interviews are often criticised for their subjectivity due to the interpretations they entail from both the interviewee and interviewer. In a way the subjectivity of the interviewee is however not really a limitation but can instead be regarded as an advantage. As Morgan (2014) states,

the method of interviewing is often chosen because it offers insights into the interviewees "beliefs and interpretations" (p. 54). As long as the researcher is reflexive and aware of the fact that whatever the interviewee says during an interview may only reflect a personal point of view, subjectivity is not an issue. Furthermore, the interviewees selected for interviews are often chosen because they are experts in a certain area and their personal experience is of value. Finally, through its inductive-style and the subjective-level, interviews offer in-depth knowledge on the research topic (Morgan, 2014).

3.3.2. Data Collection

Semi-structured interviews are guided by a topic list. Based on the secondary data and the situational factors of the conceptual framework, a topic list was prepared covering the areas to be discussed during the interview. As a variety of interviews with a range of different stakeholders were conducted, the topic list had to be adapted to the different interviewees.

The interviewees were mainly selected from the stakeholders identified in the conceptual framework. These included representatives of the local authorities (municipality of Hyères-les-Palmiers, Port-Cros National Park (*Parc national de Port-Cros)* – hereafter national park, harbour of Porquerolles – hereafter harbour, and IGESA (*Institution de gestion sociale des armées*)) and the solid waste management service providers (Veolia Propreté, Sittomat). Despite attempts to contact IGESA for an interview, the request was denied. Additional interviews were conducted with other important stakeholders such as: Ecol'eau (local NGO), TLV TPM (main ferry service provider), Bateaux Verts (ferry service provider), CESC (*Conseil Economique, Social et Culturel*: involved in drafting the charter of the national park), PMS (*Porquerolles Multi Service*: works for the national park to pick up waste) and the tourist information centre. Finally, also managers of restaurants and hotels on the island were approached for short interviews. Initially, these interviews were not planned. However, due to difficulties in doing questionnaires with employees of these establishments, these interviews were deemed appropriate in order to gather information (more on this below). Interviews were conducted until a point of saturation was reached, but of course the time available for the field research also presented a limit. In the end, a total of 33 interviews were conducted.

Interviewees were approached through mail, phone and also personally once the researcher was on site. After having obtained the consent of the interviewee, most of the interviews were recorded and also transcribed. Recording and transcribing the interviews was especially useful as all the interviews were conducted in French and this way the researcher could easily listen or read the interview again. For interviews were recording was not possible, notes were taken. Through transcribing and taking notes, reliability of the data could be increased (Green & Thorogood, 2014).

3.3.3. Data Analysis

With the help of the software Atlas.ti the transcribed interviews were analyzed through a content analysis using codes. The conceptual framework and the factors mainly informed the codes. Although within the interviews primarily situational factors were discussed, also topics falling under the psychological factors were sometimes raised. The codebook therefore includes codes from the situational and psychological factors. Moreover, some in-vivo codes were at times created for topics raised that could not be grouped in any of the existing codes (the codebook for interviews can be found in Annex III). The advantage of using Atlas.ti was that afterwards all the quotes making reference to a certain code could easily be grouped and the different point of views of the interviewees compared.

3.4. Observations

3.4.1. Choice of Method

Next to interviews, observations were chosen as an additional method to gather information on the situational factors. Observations are "a systematic method of data collection that relies on a researcher's ability to gather data through his or her sense" (O'Leary, 2004, p. 170). Since observations were not the main source of information for the situational factors, this section will remain concise.

3.4.2. Data Collection

The observation can be divided into three activities. First, the researcher wrote a research diary in the first weeks in which observations were noted. These included observations on how the researcher perceived the solid waste management system on the island. As the

researcher had not previously been on the island, these observations offered an insight on how tourists who come to Porquerolles for the first time might perceive certain aspects. Secondly, in a more structured way the researched observed the hardware in terms of containers available on the island. For this the researcher took pictures to capture the differences throughout the island. Moreover, pictures of the transfer zone on the island were taken as well as during a visit to the sorting centre on the mainland. Finally, the third type of observation included following the waste collectors by bike one morning during their tour. While the researcher first wanted to take pictures, the waste collectors were not comfortable with this and the researcher had to resolve to observing with her own eyes and later making notes.

Observations are susceptible to bias. Firstly, the researcher's "own history, biases, interests, experiences and expectations can colour what you observe" (O'Leary, 2004, p. 171). This limitation applies to all of the observations listed above. However, as for the research diary this is not necessarily a drawback, as the goal was to capture the thoughts of a newcomer to the island. Clearly, the researcher might have paid more attention than other persons. For this reason questionnaires remain the primary source of information when it comes to finding out how the individual actors perceive the situational factors. The researchers own observation however helped in setting up the questionnaire and refine the item list for the interviews to cover previously unthought-of topics. A second limitation that needs to be considered when doing observations is whether "people ever act the same when they know they are being observed" (O'Leary, 2004, p. 171). For following the waste collectors this is clearly a disadvantage. The researcher can therefore not be sure that what was observed also reflects reality.

3.5. Questionnaires

3.5.1. Choice of Method

To investigate the psychological factors of the individual actors, questionnaires were chosen. The questionnaire offered the advantage of a standardized form of asking questions, which facilitated the analysis at a later stage. Compared to interviews, questionnaires were more objective. Furthermore, through questionnaires a broader range

of people can be reached. The goal for using questionnaire is "if a representative sample is used, to be able to generalize […] to a larger population" (O'Leary, 2004, p. 153). However, questionnaires face many limitations. Some of these include a bad questionnaire design, misunderstandings of the questions, errors in statistical analysis and faulty interpretations of results (Oppenheim, 1992 as referenced in Harris & Brown, 2010). To avoid many of these limitations the questionnaire has been reviewed by different parties and tested two times on site before the final version. As the researcher asked the question it also had to be insured that questions were always asked in the same manner. This was challenging, as participants sometimes required additional information and the researcher was careful not to provide explanations. Whenever the researcher however felt that the participants did not fully understand the question, a note was made. This way the quality could be maintained during data analysis.

Having made the argument for questionnaires, the next choice is to select the population to which the questionnaire will be targeted. For this research the decision was made to focus on three actor groups: tourists, residents and employees of restaurants and/or hotels. These three actor groups were selected as they are regarded to best capture the population on Porquerolles. Due to the fact that they are encompassing they present also the majority of people who produce waste on the island and who could potentially separate their waste. Additionally, by differentiating between these three actor groups, three places in which waste separation does or does not take place are covered. For the tourists this is in the public space or at their accommodation. For residents it is in the private sphere of their house. For employees it is at their place of work. Based on the data that was collected on the individuals of these three groups they were further categorized into those that do separate their waste (practitioners) and those who do not separate their waste (non-practitioners). This categorization enabled establishing which factors shape waste separation positively or negatively.

3.5.2. Data Collection

To cater to the different actor groups, questionnaires were developed for tourists, residents and employees. Each questionnaire was divided into five parts. Instead of directly starting with the core part, participants had to be slowly eased into the topic. For this

reason each questionnaire started with some background information. For tourists this included questions whether they had been on the island before, how many days they are currently staying and what type of accommodation they have. Residents were mostly asked whether they live on the island throughout the year (primary residents) or whether they have their secondary residency on Porquerolles. Finally, employees were asked whether they worked in a hotel or restaurant and how many seasons they are now working on the island. Although this information does not represent the focus of the research, the results on the background information should not be disregarded and can therefore be found in Annex I. The second part asked questions around the structure - primarily the storage facilities - participants have available to dispose of their waste. For tourists this concentrated on the bins and containers in the public area, for residents within their home and for employees at work. The third part was about waste separation itself. Here the goal was to establish who of the participants separate their waste and who do not. The fourth part, the core of the questionnaire, addressed the psychological factors. Participants were mostly provided with a statement and asked to say to what extent they agreed or disagreed with this statement. Only for two psychological factors questions were asked. Most statements and questions asked are based on the RANAS model introduced by Mosler. Mosler has already used the questions during a number of behavior change interventions and has therefore validated them (Contzen & Mosler, 2015; Lilje, Kessely & Mosler 2015; Huber, Bhend & Mosler, 2012). Important to note is for the residents and employees all the psychological factors were solicited in a way that made reference to their role. So for example for residents the statement would always be “As a resident on Porquerolles…”. For tourists this approach was only done for the intention factor. Retrospectively, the researcher thinks it would have been beneficial to pose the questions for the tourists the same way as for residents and employees. A clear limitation of the part on the psychological factors was that per factor only one question was asked and therefore the reliability of the answers was not adequately measured. Finally, the last part focused on gathering socio-demographic data (gender, age, income, education, country of residence) of the participants. The results on the socio-demographics can be consulted in Annex I.

The questionnaires with tourists and residents were exclusively conducted electronically. With the help of the Open Data Kit (ODK) software and Excel the

questionnaire was created and later done using a tablet. The electronic questionnaire offered the advantage to immediately have the answers available digitally and further facilitated the analysis. Instead of being self-administered by the participants, the electronic questionnaire was conducted face-to-face. This meant that the researcher asked the questions and registered the answers. Participants only personally entered the answers on the socio-demographic questions. This gave the participants some privacy and also resulted in more participants than initially expected to provide this information. While most questions were close-ended, the researcher did not read the answers to the participants. Instead the participants were free to answer on their own account. If the answer matched the answer categories, the researcher selected these. However, if the answer did not match the answer categories, there was room for the researcher to write down the answer provided on the digital questionnaire. The possibility of going beyond the options in the questionnaire and also to note additional comments offered two advantages. Firstly, answers for which the researcher had not accounted for could be included. Secondly, participants often added interesting comments, which were of value to the researcher and offered supplementary insights. The advantage of face-to-face questionnaires is that they allow to "establish rapport, build trust, motivate respondents, clarify questions, read non-verbal cues, and probe appropriately" (O'Leary, 2004, p. 154). The disadvantages included that questionnaires are "lengthy", do "not assure anonymity or even confidentiality" and may be "affected by interviewer bias" (p. 154). Some of the pitfalls pointed out by O'Leary could be overcome. The duration of the questionnaire was limited to around five minutes. Clearly, some people were not willing to spare this time, but in the end the turn out was satisfactory. As for the anonymity and confidentiality, the researcher does know more about the participants. However, in the research analysis participants cannot be identified. Finally, the research is prone to the bias of the researcher. This however applies to the entire research. As will be discussed later, being reflexive can reduce the bias.

Questionnaires with employees were partially conducted face-to-face electronically using the approach described above. Due to a low turn out of questionnaires with employees in the first weeks a different approach was considered in order to retrieve the necessary data. The obstacle with doing questionnaires with employees was that they were

often very busy. Moreover, as they were working it was the decision of their superior if they could be spared for five minutes to answer questions. In order to overcome this, two approaches were devised. First, as already mentioned earlier, hotel and restaurant managers were also approached for interviews. This way at least some information could be gathered. These interviews also offered the chance to ask the managers if the researcher could conduct the questionnaire with their employees. This approach did result into some supplementary digital questionnaires. As the turn out was still not fully satisfactory, the researcher decided to conceive a paper version of the digital questionnaire. This paper questionnaire was a shorter version of the digital form, focusing only on the most important parts. The paper questionnaires were given to hotel and restaurant managers, who then distributed them to their employees. As the questionnaire was self-administered by the employees they could complete it at their convenience. This had the disadvantage that those additional comments provided in a conversation-style questionnaire could not be captured. Nevertheless, the paper version did generate additional questionnaires with employees. In total 46 questionnaires were done with employees: 19 collected digitally and 27 through the paper version. All the questionnaires were done in French.

Residents were approached through personal connections. Moreover, as many of the residents work in local stores such as the supermarket, bakery, bike rental shops, etc. they were approached here as well. At the end of each questionnaire snowball sampling was applied, asking the participant if they could introduce the researcher to another resident (O'Leary, 2004). In total, 52 questionnaires were done with residents. All were conducted in French.

The questionnaire for tourists was available in five languages: French, German, Spanish, Dutch and English. The choice of languages was based on the languages the researcher can speak. Having a variety of languages available offered the advantage that tourists from different places could be questioned. The Dutch, French and Spanish translations were each checked by native speakers to guarantee the quality of the questionnaire. Tourists were always approached after 3 pm for questionnaires. The reason for this was to make sure that they had already spent a few hours on the island and therefore had a chance to familiarize themselves with the island. Moreover, in the afternoon many tourists were easily approachable as they were then taking a break

somewhere in the village or waiting for the ferry at the harbour. In total 54 tourists participated in the questionnaire.

As was mentioned the researcher regards the turnout of the questionnaires to be satisfactory. The difficulty with questionnaires is that enough need to be sampled in order to be representative of the population. In this research the three actor groups represent three population groups of varying sizes. There are up to one million tourists, permanent residents are 350 – not yet accounting for the secondary residents – and the population of employees is undefined. Defining the appropriate sample size is therefore difficult. Instead, the researcher decided to gather around 50 questionnaires per actor group. This way the outcome between the actor groups would be comparable and the size big enough to analyse the questionnaires.

The sampling of participants is difficult to define. While the three actor groups were selected, there was some handpicked sampling in the sense that the researcher had a particular purpose in mind, namely finding participants from the three actor groups (O'Leary, 2004). For this, potential participants were approached in areas where they would most likely be found. However, afterwards simple random sampling was used, meaning, "within a designated population all elements have an equal chance of inclusion" (O'Leary, 2004, p. 107). As mentioned, for residents also snowball sampling was used. Due to this mix of sampling methods, the question can be asked whether or not the questionnaire is representative. The researcher would argue that yes it is. The handpicked sampling was done to reach the population that was selected for this research. By including three different actor groups for the questionnaire, the research also covers the majority of the population on Porquerolles. Moreover, as afterwards simple random sampling was done the participants can be said to be representative of their actor group. The biggest limitation to generalizability is the sample of 152 questionnaires, as will be discussed in chapter 5 this number reduces further to 107 when focusing only on practitioners and non-practitioners. The results therefore have to be read bearing in mind that they might not be representative.

3.5.3. Data Analysis

As the questionnaires included quantitative as well as qualitative data, they had to be analysed separately. The quantitative data was analysed with frequency tables in SPSS, which are then presented in a cross-tabs form in the analysis part. The qualitative data was analysed through content analysis. Both analyses distinguished between actor groups and practitioners and non-practitioners whenever possible.

3.6. Validity, reliability and the role of the researcher

While validity and reliability have been discussed separately per research method, this section will discuss the validity and reliability of the research overall. There are different types of validity. "Internal validity is the extent to which the structure of a research design enables us to draw unambiguous conclusions from our results" (de Vaus, 2001, p. 28). Through data triangulation by using different methods as the source for information, the internal validity of the research can be said to be rather high. While data triangulation was done for both situational and psychological factors, the internal validity for the situational factors might be higher as desk research, observations, interviews and questionnaires were used for these factors. For the psychological factors the results rely on the data from the questionnaires and the interviews.

"External validity refers to the extent to which results from a study can be generalized beyond the particular study" (de Vaus, 2001, p. 28). While the results can be generalized to Porquerolles, one should be careful to make generalizations beyond the island, as Porquerolles represents a particular case study with unique characteristics. The conceptual framework however provides the research with a higher external validity as it has the potential to be applied beyond the current case.

Finally, reliability is the extent to which a measurement instrument will provide the same result on another occasion (de Vaus, 2001). Clearly at a different time of year, such as the low season in the winter, the results would certainly be different. Right now the research was conducted during the busiest months in the year. Moreover, while the researcher strongly believes that if the research had been conducted by another researcher, the results would not have differed greatly, the role of the researcher does play an important role and can therefore reduce the reliability of the results.

Every research requires the researcher to assess their role reflexively. For this research three reflections have been made. Firstly, by conducting this research and discussing the topic of waste separation on Porquerolles, the researcher might have influenced interviewees and questionnaire participants' future behaviour. Secondly, as the research setting was on a small island, the researcher was at a certain point known to the local population. This means that some inhabitants already knew why the researcher was approaching them for an interview or questionnaire. This might have possibly influenced their answers and need to be considered in the data analysis. Finally, another point to take into account is the researchers role in collecting and analyzing the data. While the researcher was careful to stay objective, as Green and Thorogood (2014) state "It is impossible to have a field for study that is untainted by values, and impossible for the researcher to stand outside those values and subjectivities. Both research and researchers are part of the world." (p.23).

3.7. Research Ethics

3.7.1. Interviews

One of the first ethical considerations the researcher had to make is to decide whether to conduct overt or covert research. While covert research can possibly yield more information it raises an ethical dilemma, which needs to be outweighed. Due to the nature of this research there did not seem to be a significant advantage for doing covert research. Doing overt research implied that interviewees were told about the research topic, the university the researcher was coming from and how the data will be used. Being an independent researcher seemed to be advantageous for conducting the interviews. The first advantage was that the interviewees were often surprised in the researchers interest in this case study and readily shared information. Secondly, being able to assure them that the researcher was not working for any organizations involved around this topic on the island also guaranteed better access to information. Prior to each interview, the interviewees were asked whether the interview could be recorded. While most agreed to being recorded, some were not comfortable with this. In those cases only notes were taken. At the end of each interview, interviewees were asked whether or not their names could be

used in the thesis. While most gave their consent, the decision was finally made to keep their names confidential and only make reference to the organisation they work for. In the end, their names only play a minor role and the researcher wanted to guarantee their privacy. By providing the name of the organisation they represent the answers they gave is set in sufficient context.

3.7.2. Questionnaires

Questionnaire participants were not directly told that the topic was on waste separation or that the research was for the purpose of a Master thesis. Instead participants were told that the questionnaire was part of a study on Porquerolles, sometimes specifying that the topic was on the solid waste management system on the island. Clearly this presents an ethical dilemma, as the researcher did not disclose all the information to the participants. Not telling participants everything was motivated by the fact that this would diminish the chance of preconceived or socially acceptable answers. At the end of the questionnaire participants could ask questions and here the researcher provided all the answers.

4. Situational factors shaping waste separation

This section of the analysis chapter will focus on the situational factors shaping waste separation. Each of the twelve situational factors will be discussed separately. The table below provides an overview as well as a short description of each situational factors (Table 1).

	Situational factors	Description
Waste system aspects	Historical aspects	Historical aspects of Porquerolles which influence waste separation
	Environmental aspects	Environmental aspects on Porquerolles influencing waste separation
	Geographical aspects	Geographical aspects of Porquerolles having an influence on waste separation
	Political and Legal aspects	The legal framework within which waste separation is set
	Institutional aspects	Cooperation between different stakeholders (distribution of functions and responsibilities)
	Financial and Economic aspects	Financial and economic aspects around waste separation (costs, taxes, etc.)
Waste system elements	Separation	General information on waste separation
	Storage	Information on storage facilities for recyclables
	Collection	Information on collection of recyclables
	Transfer and Transport	Transfer and transport of recyclables from Porquerolles to the mainland
	Treatment	Treatment of recyclables
	Disposal	Disposal of waste that is not being treated

Table 1: Situational factors and their description

As the reader will notice the stakeholders are not listed as a separate situational factor in the table above, although are represented in the conceptual framework. The stakeholders will however figure prominently in this chapter as the information on the situational factors stem from the interviews done with them. In the next part the situational factors of the waste system aspects and the waste system elements will be discussed separately.

4.1. The context – Waste system aspects

4.1.1. Historical aspects

By taking a look at the history of Porquerolles a better understanding can be created of the current state of the island. In the 17th century the island became a defence point for the harbour of Toulon, a military base of the French navy. Under Richelieu and later Napoleon a number of forts were build on the island, which can still be seen today. For many centuries Porquerolles had a mere military function. To accommodate the families of the military, the village was built in the 19th century. In 1912, the island was sold to François Joseph Fournier. For almost 60 years the island was the private property of the Fournier family. In 1971, the family however sold 80% of the island to the French state. Until today the majority of the island belongs to the French state (Porquerolles, 2015b).

4.1.2. Environmental aspects

The French government confided the management of the 80% it had bought to the national park of Port-Cros. Port-Cros is a neighbouring island and is entirely a national park, thus the name national park of Port-Cros. In 1988, Porquerolles became a classified site due to its historical and natural value. This means urbanisation projects on the island are under very stringent rules (Porquerolles, 2015b).

In 2006, a law proposal concerning national parks, natural marine parks and regional parks, submitted by Jean-Pierre Giran, the current mayor of Hyères-les-Palmiers, was adopted (L'Assemblée nationale & le Sénat, 2006). According to this law national parks need to elaborate a charter. This charter defines the project for natural protection for the park and the surrounding area. In the charter, the park itself, also referred to as the heart of the park, will establish a set of protection objectives. As for the surrounding area, the adhesion area, a number of protection orientations are given. The 80% of the island falling under the management of the national park of Port-Cros are part of the heart of the park (dark green), while the rest fall under the potential adhesion area (light green) (Figure 5).

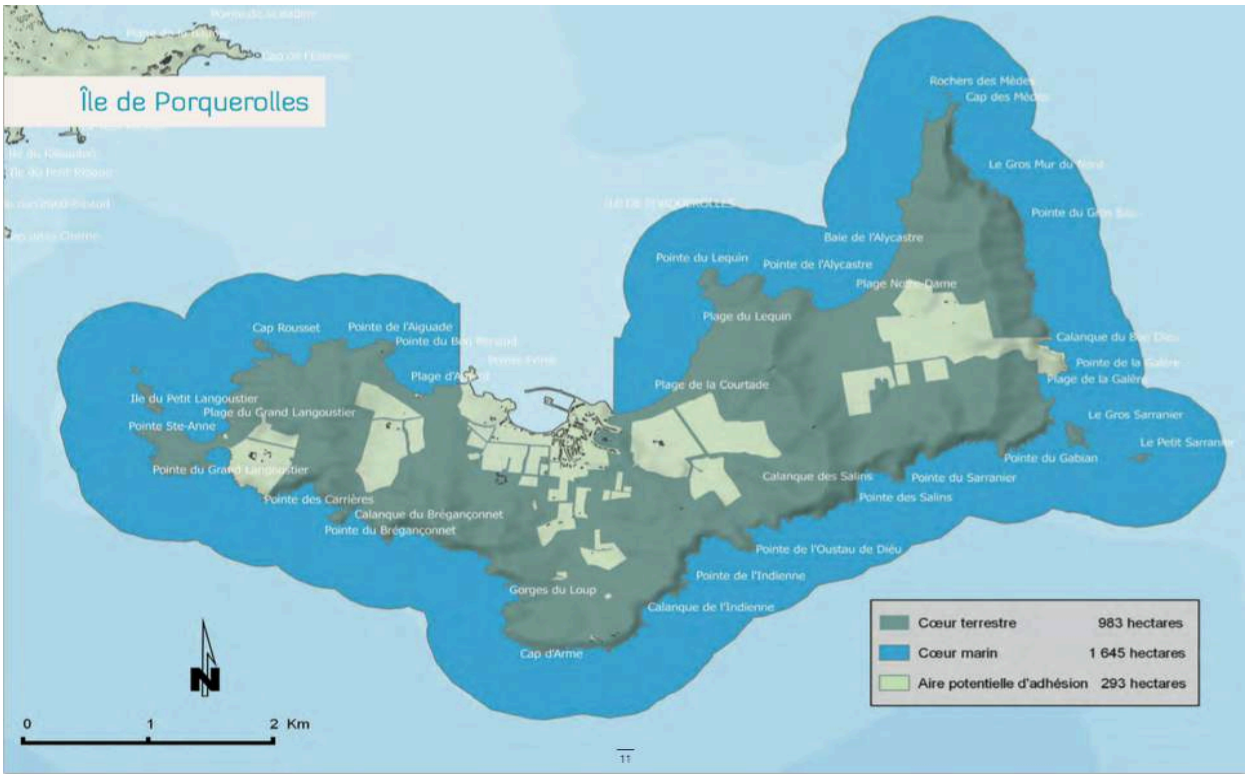


Figure 5: Heart (*coeur*) and potential adhesion area (*aire potentielle d'adhésion*) of the national park on Porquerolles

The Economic, Social and Cultural Council (*Conseil Economique Social et Culturel (CESC)*) is comprised of 64 members from three geographical areas: the coastal area, Porquerolles, and Port-Cros and Le Levant, the two neighbouring islands. Together the members do not only represent the geographical area the charter covers, but also different economic, cultural and social sectors and it serves as a link between the population to the national park and the municipality (CESC representative, personal interview, July 8, 2015). The CESC was elected in 2013 and has since then been strongly involved in the drafting process of the charter. "Our role is to promote the charter". "For us it is important that the people feel included in the process, because otherwise the charter will not work" (CESC representative, personal interview, July 8, 2015). In January 2016, the charter, which sets out the future plan for the park for the coming 15 years, will come into effect. "Once the charter will be effective, the municipalities can choose if they want to adhere to it or not. Clearly, the more municipalities adhere to the charter the more value it will have" (national park representative 1, personal interview, June 5, 2015). According to the CESC representative, of the eleven municipalities, five – among which Hyères-les-Palmiers – have

said that they will adhere to the charter, five have decided not to and one is still undecided (personal interview, July 8, 2015). This means that the village of Porquerolles will become an adhesion area. Some uncertainty concerning the harbour exists. If the municipality adheres does this also include the harbour or can the harbour decide this alone? The charter is valid for 15 years and is divided into five periods of three years; the municipalities that do not adhere right from the start can decide to do so every three years (CESC representative, personal interview, July 8, 2015).

In terms of solid waste management the charter mentions a few objectives and orientations. One of the objectives is to make the heart of the park a place of excellence in eco-responsibility. This includes sensitizing visitors to the uniqueness of the island and the need for ecologically responsible behaviour to preserve the place. Within this objective falls the goal to improve solid waste management through waste reduction as well as better waste separation by the tourists. Some more orientations address solid waste management. The first one on supporting community initiatives for the conservation of local biodiversity sets out that in order to push for better waste separation and treatment of different waste types, the adhesion area will become a site of excellence in terms of collection and treatment by improving the existing equipment. Furthermore, the adhesion areas agree that they will support the concept of a circular economy by reducing, reusing, recycling and recovering waste produced by the economic activities in the area. Just as in the heart, the adhesion areas should try to improve their waste management (Parc national de Port-Cros, 2014). While waste management, including waste separation, is discussed in the charter the objectives and orientations remain vague and miss a concrete implementation plan.

4.1.3. Geographical aspects

Porquerolles is located in the Mediterranean Sea, has a surface of 12,54 km^2 and is only 15 km away of the mainland. The most frequently used ferry to reach the island departs from the Tour Fondue on the peninsula of Giens (Porquerolles, 2015a). Porquerolles is part of the municipality of Hyères-les-Palmiers, which lies in the Var department part of the region Provence Alpes Cotes d'Azur (PACA). Var holds a population of 1,026,164 inhabitants, representing 20% of the population of the region. After Ile de France, Var is the most

touristic department in France. This translates in a tremendous peak in the population during vacation periods. In Provence Mediterranée, one of the eight territories of the Var, the permanent population rises by 71.6% through the tourists (Agence de Development Touristique, 2010 as cited in Conseil Général du Var, 2014, p. 28). Also on Porquerolles, the number of people on the island rapidly increases due to tourism. Throughout the year 350 inhabitants live on the island, while up to 1 million tourists come to visit every year (Porquerolles, 2015a). In 2015, the Plage de Notre Dame, one of the beaches on the island was selected as the most beautiful beach of Europe (European Best Destinations, 2015). In the future more and more tourists can therefore be expected on the island. According to the representative of the national park, "The people that come visit Porquerolles are not always conscience of the fact that they are visiting a national park. They come to Porquerolles to visit the most beautiful beach in Europe" (personal interview, June 5, 2015).

In terms of solid waste management the flux of tourists offers a great potential but represents of course also a huge challenge. "In the summer especially in the big surfaces [restaurants and hotels] waste separation is difficult" (municipality representative 1, personal interview, June 16, 2015). Also according to the representative of the harbour "the principal problem […] is the fact that we are on an island" (personal interview, June 2, 2015). When he says, "In the south we are the ugly duckling. We are having difficulties", the representative of Sittomat points out that the geographical location also has an effect on waste separation. He adds "When we implemented waste separation it was already in place since 10 years in the North. We really lag behind because it is not our first priority. So today we are really behind [in terms of waste separation] in comparison to other regions" (personal interview, June 22, 2015). The representative of Veolia agrees. He said, "We are a decade behind here in terms of waste separation. Even on the mainland. But on the mainland they have the means and everything is less complicated. For us especially the maritime transfer is what makes it complicated" (personal interview, June 30, 2015).

Finally, the terrain on Porquerolles is not easy. While in the village and the harbour the roads are sealed, on the rest of the island there are only dirt roads. Furthermore, the

space – especially in the village – is very constrained. With respect to waste management this poses challenges for storage of containers and the circulation during collection.

4.1.4. Political and Legal aspects

The political background provides the policy context in which this research takes place. Policies on solid waste management and particularly on waste separation and recycling frame contemporary debates in this sector. The section will start with the political discussions at the EU level and then moving to the status quo in France and finally to the local level.

4.1.4.1. Policies at the European Union level

In the European Union (EU), directives are a common legal act. They are often used, as they are less stringent than for example regulations. The nature of the directive is that it sets out a common goal for all EU Member States (MS), how this goal is achieved is up to each MS to decide (European Union, 2015).

In the field of solid waste management, the latest directive is Directive 2008/98/EC, often referred to as the Waste Framework Directive (WFD) (European Commission, 2008). Against the background of this research it is worth highlighting a few articles in the WFD. Article 4 sets out the waste hierarchy (Figure 6), which serves as a "priority order in waste prevention and management legislation and policy" (European Commission, 2008, article 4, paragraph 1). The hierarchy is illustrated as a funnel, visualising the precedence that different categories of the waste hierarchy take over each other. Prevention is the preferred approach; as if no waste is produced then there is also no need to manage it. Subsequently, there are different options once waste has been produced: reuse, recycle and recover. If none of those options is feasible, waste should be disposed of. The hierarchy can be regarded as a management guideline for waste. In a study on waste separation it is essential to also focus on recycling, as it represents the

Figure 6: Waste Hierarchy

management approach after separated waste is collected. The directive defines recycling as a "recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes" (article 3, paragraph 17). Article 11 on re-use and recycling invites MS to take measures to promote high quality recycling by setting up "separate collection of waste where technically, environmentally and economically practicable and appropriate" (article 11, paragraph 1). Moreover, article 11 sets out two important targets to be reached by MS. First, by 2015 separate collection of the following waste types should be in place: paper, metal, glass and plastic. Second, "by 2020, preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households [...] shall be increased to a minimum of overall 50% by weight" (article 11, paragraph 2a). Figure 3 illustrates how far each MS is away from reaching the 2020 target. In 2012, material recycling across all 28 MS was below 30%, while in France it was even lower. While there are some years left until the target needs to be reached, it does demonstrate that France needs to take measures to further advance recycling. Finally, the directive introduces the concept of extended producer responsibility (EPR). EPR is a way to hold manufacturers accountable for the products they produce. As set out, measures under EPR may include "subsequent management of the waste and financial responsibility of such activities" (article 8, paragraph 1).

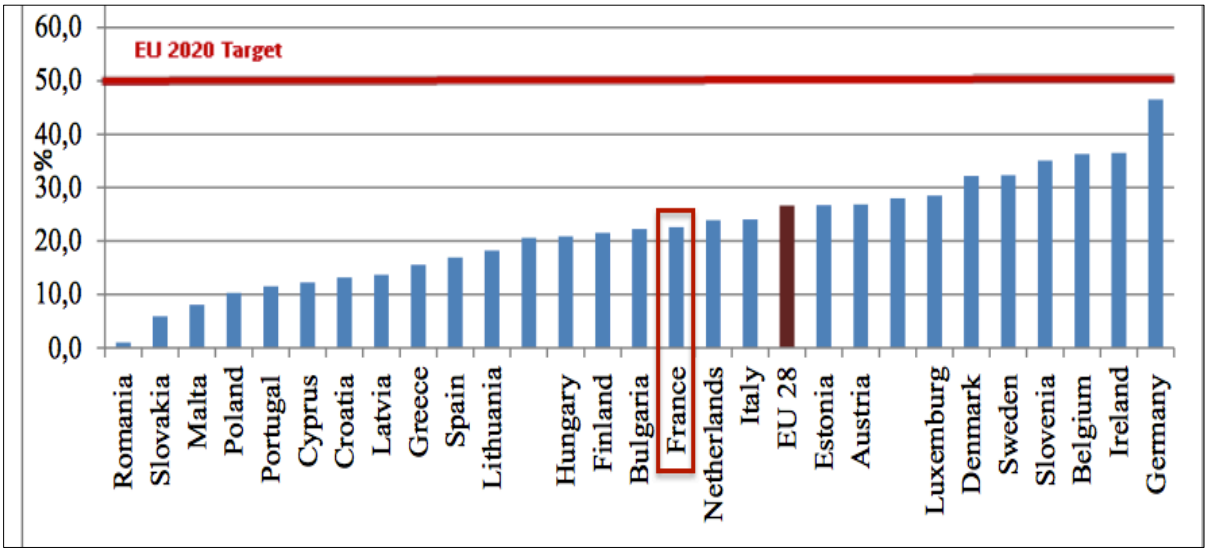


Figure 7: Material recycling as percentage of municipal solid waste (MSW) in EU28 in 2008 (European Commission, 2014, p. 8)

Based on their legal duty, the Commission has to monitor and possibly revise the targets by the end of 2014. If appropriate and by taking into account "the relevant environmental, economic and social impacts" the Commission can propose a set of new targets to the European Parliament and Council (article 11, paragraph 4). This has been done through a legislative proposal in July 2014. Here the Commission reviewed the recycling and other waste-related targets of various directives, including the WFD. As such, the Commission recommends that recycling and preparing for re-use of municipal waste should be increased to 70% by 2030. Furthermore some material specific recycling targets are proposed: by 2025 90% of paper, by the end of 2030 60% of plastics and 90% of glass. Moreover, landfilling of recyclables is to be phased out by 2025 (European Commission, 2015a). In December 2015, the European Commission adopted a new Circular Economy Package, which "will contribute to 'closing the loop' of product lifecycles through greate recycling and re-use, and bring benefits for both the environment and the economy" (European Commission, 2015b)

4.1.4.2. Policies in France

In France the Environmental Code (*Code de l'environnement*) contains all the legal texts with regards to environmental law. This code is continuously updated to include all the recent amendments. One of the sections of the Environmental Code is dedicated to waste and transposes many articles of the Waste Framework Directive (Code de l'environnement, 2015, Livre V, Titre IV, Chapitre I). The definitions given in the WFD are outlined in article L 541-1-1 of the Environmental Code. Furthermore, the waste hierarchy is taken up in article L-541-1 and L-541-2-1. Finally, article L 541-21-2 introduces the targets set in article 11 of the WFD (Ministère de l'Écologie, du Développement Durable et de l'Energie, 2011). Extended Producer Responsibility is in France organized through eco-organisations (*éco-organismes*). For each waste product group there is one eco-organisation who is responsible for the end-of-life management of this product. Manufactures of the products pay a contribution to the appropriate eco-organisation to fulfil their extended producer responsibility. With this money recycling of the products can be supported. In France, EPR for packaging waste is ensured by Eco-emballages (Sittomat, 2014).

On a national level, it is the responsibility of the Ministry of Environment (*Ministère de l'Écologie, du Développement Durable et de l'Energie*) to prepare and implement environmental policies of the French government (Ministère de l'écologie, du développement durable et de l'énergie, 2014). Within the ministry, the Department of Risk Prevention (*Direction Générale de la Prévention des Risques*) is in charge of waste management. In 2001, the French Prime Minister together with the Minister of Environment created an additional institutional body focused on waste management called the National Council on Waste (*Conseil National des Déchets*) (Premier Ministre, 2001). The Council functions as a voluntary advisory body and monitors the implementation of policies relating to waste.

France is administratively divided into regions, departments, territories and municipalities. As defined in the Code of Territorial Collectives municipalities have to guarantee, possibly in cooperation with departments and regions, the collection, transport and the treatment of household waste (Code général des collectivités territoriales, 2015, article L 2224-13). Municipalities can however decide to transfer part or the entirety of this competence to a public organisation of inter-communal cooperation (*établissement public de coopération intercommunale*) (EPCI).

4.1.4.3. Local solid waste management plans

According to the WFD, MS have to establish waste management plans. These plans shall "alone or in combination, cover the entire geographical territory of the Member State concerned" (European Commission, 2008, article 28, paragraph 1). In France, the departments are responsible for writing these plans. In 2014, Var published a project plan on Prevention and Management of Non-Dangerous Waste (*Plan de Prévention et de Gestion des Déchets Non Dangereux*) (Conseil Général du Var). This plan covers the whole department and therefore also includes the municipality of Hyères-les-Palmiers. In this plan the General Council of the Var department (*Conseil Général du Var*) offers among others a detailed plan on the current state of affairs, a description of the solid waste management system as well as the objectives for the future. From a legal perspective it is important to note that "waste separation is not an obligation, but it is recommended" (municipality representative 1, personal interview, June 16, 2015). While the municipality

does not have a solid waste management plan that is publicly available, they did publish an annual report in 2013 (*Rapport annuel sur le prix et la qualité du service public d'élimination des déchets – Année 2013*). This report provides details, among others, on collection and treatment of the waste in the municipality (Ville d'Hyères-les-Palmiers, 2013).

Coming back to the charter of the national park and its objectives and orientations it is also important to distinguish between their legal statuses. Objectives, which apply to the heart of the park are subject to regulatory obligation, while orientations for the adhesion areas do not fall under such obligation. The regulatory power the national park holds in the heart of the park can be regarded as a "policing power" which allows the national park "to verbalize offenses" (national park representative 1, personal interview, June 5, 2015). "Rather than repression, the goal of the charter is to pass on knowledge, a general education, a mindset" (CESC representative, personal interview, July 8, 2015). In the heart of the park, it is the park, which has "the possibility to put certain things in place" (national park representative 1, personal interview, June 5, 2015). As the representative of the national park however points out "This does not mean that we do not do this in collaboration with other parties. But we hold a lot of responsibility" (personal interview, June 5, 2015). In the adhesion area, the national park cannot impose anything without the permission of the municipalities (CESC representative, personal interview, July 8, 2015).

In compliance with EU directive 2000/59/EC on Port facilities for ship-generated waste and cargo residues, the harbour of Porquerolles just recently, and for the first time, drafted a Waste Reception and Handling Plan (*Plan de Réception et de Traitement des Déchets d'Exploitation des Navires et des Résidus de Cargaison*) (Port de Porquerolles, 2015). While the plan is for internal purposes only, the representative of the harbour adds, "it will be up to us to communicate the content of this document to the users of the harbour" (personal interview, June 2, 2015). This plan offers some details on the facilities on the harbour for solid and liquid waste as well as how they are collected and treated.

4.1.5. Institutional aspects

Today there are four authorities present on the island: the national park of Port-Cros, the municipality of Hyères-les-Palmiers, the harbour of Porquerolles and IGESA. The national park is responsible for the area belonging to the heart of the park. The municipality of

Hyères-les-Palmiers is in charge of the village. The harbour is under the authority of Ports Toulon Provence (PTP), a public organisation of inter-communal co-operation encompassing 18 harbours including the harbour of Porquerolles. IGESA is a French army institute. They organise, among others, holidays for military personnel and their family. IGESA also has a vacation site on Porquerolles. In terms of how waste is managed throughout the island it is interesting to notice that each site has a different approach, although nothing can be said over the IGESA grounds as they are not open to the public and an interview was refused.

As discussed, in France it is the responsibility of the municipalities to guarantee the collection and the treatment of waste. They can however choose to delegate part or all of these responsibilities. Waste collection in the municipality of Hyères-les-Palmiers is assured by Veolia Propreté Onyx Mediterranée (hereafter referred to as Veolia). The responsibility of waste treatment is transferred to Toulon Provence Mediterranean (*Toulon Provence Mediterranée*) (TPM), a community agglomeration (*communauté d'agglomeration*). TPM is a public organisation grouping together 12 municipalities among which Hyères-les-Palmiers. Together with two other inter-communal co-operations, TPM delegated most of the solid waste management responsibility to Sittomat (Figure 8). Sittomat is a syndicate created by these three organizations of inter-communal co-operations in 1979. In other words, Sittomat is owned by these three organizations grouping together 26 municipalities with a total population of 522.455 citizens. In summer, due to the touristic attraction of the region, waste production increases by another 100.000 people (Sittomat, 2015b). Treatment of cardboard/paper and plastic waste takes place in a sorting centre in Seyne-sur-mer. Sittomat has entrusted this centre to the management of Veolia (Sittomat, 2014). According to the Sittomat representative one major institutional challenge is that "In France all the regions we have a different collection system. There are regions they collect the recyclables separately and others where they put everything in the same bag. And it does not even have to be regions that are very far apart. At a distance of 500 metres the system can be totally different. So even here in our region it is already a bit difficult because we do not all have the same way to separate our waste (personal interview, June 22, 2015).

Figure 8: Area of responsibility Sittomat (Sittomat, 2014, p. 4)

Currently, France is undergoing a major administrative reorganisation (*nouvelle organisation territoriale de la République*) (NOTRe). Today, France counts 22 regions. As of 1 January 2016 this will however dramatically reduce to 13 regions. Although the PACA region remains unaffected by these territorial changes, the new law brings along many structural adjustments. With regards to solid waste management, the core change is the redistribution of responsibilities. As has been discussed, until now the municipalities were in charge of solid waste management. Article 66 of the law depicts that the community agglomerations (*communauté d'agglomeration*), in this case this would be TPM, are now responsible for the collection and treatment of household and assimilated waste (*déchets ménagers et assimilés*) (L'Assemblée nationale & le Sénat, 2015). Assimilated waste is waste that is of provenance from for example businesses and due to the type of waste being produced it is similar or assimilated to household waste. As TPM is already in charge of treatment, the biggest change to come is that the responsibility for collection is now transferred from the municipality to TPM. How and whether this will have an effect on the role of Veolia is not yet clear. For Hyères-les-Palmiers the transfer of responsibilities to TPM is expected to take place on 1 January 2017 (municipality representative 2, personal communication, October 1, 2015). Sittomat anticipates that this will eventually lead to the

total transfer of the collection from TPM to them (Sittomat representative, personal communication, October 6, 2015). The new law will however also impact the charter of the national park. As municipalities will loose in their importance, in the future, the TPM will be the contact partner (CESC representative, personal interview, July 8, 2015).

On Porquerolles it is the responsibility of the municipality to ensure waste collection. This does not only include the village but also the area of the park. Despite the fact that the responsibility for waste in the heart of the park falls to the state and as such to the national park, the national park is too dependent of the municipality in terms of solid waste management (CESC representative, personal interview, July 8, 2015). Important to note is that the national park holds the responsibility over their containers. This includes also their maintenance. As a representative of the national park confesses "It would be good if the municipality would be responsible for all the containers on the island. Afterwards everything from the beaches to the containers, that this is our responsibility that is logical" (personal interview, June 5, 2015). The responsibility in terms of waste management for the national park is everything that is not disposed of in the containers. For this they have hired a local organisation Porquerolles Multi Services (PMS). From April to September they work five days per week and in the peak season every day. Every morning they go around the island for two hours to collect all the "wild waste" lying in the park and on the beaches (national park representative 1, personal interview, June 5, 2015; PMS, personal interview, June 6, 2015). As PMS is a private company once they pick up the waste, it becomes their property and therefore they are also responsible for the further processing of the waste (PMS, personal interview, June 6, 2015). The harbour being a private domain has to provide the containers, while the municipality ensures the collection of the waste (Port de Porquerolles, 2015, p. 6). Whether the harbour or the municipality would eventually be responsible for putting in place waste separation on the harbour remains unclear. According to the harbour representative "there is no use of us to put it in place if there is nothing else in the chain. We are three stakeholders on the island and all three have to do it. If there is only one of us who is doing it I do not see the interest of it" (harbour representative, personal interview, June 2, 2015). In contrast to this statement by the harbour, a representative of the municipality affirmed, "It would be our responsibility to develop waste separation on the entire island" (municipality representative 2, personal

interview, 23 June, 2015). All these comments show that the division of responsibilities between the different stakeholders on the island concerning waste separation is complex and badly defined.

4.1.6. Financial and Economic aspects

In France citizens pay a waste removal tax (*taxe d'enlèvement des ordures ménagères*) to the municipality to cover the costs involved in waste management. As the representative of Sittomat points out "This tax is one of the most unfair taxes that exist" (personal interview, June 22, 2015). The reason he says this is because this tax does not differentiate between how much waste one produces. For this reason a law was passed which tries to rectify this injustice (L'Assemblée nationale & le Sénat, 2013). Next to a reduced basic waste removal tax an incentive tax is applied which is calculated on the volume or the frequency of collection for non-recyclables. Unfortunately, in the Sittomat area "the incentive tax has not yet been implemented" (Sittomat representative, personal interview, June 22, 2015). One of the reasons given is that putting this system into place is still rather complex, especially in vertical housing (Sittomat representative, personal interview, June 22, 2015). Despite this challenge, "the incentive tax really has the potential to advance waste separation" (Sittomat representative, personal interview, June 22, 2015) and "eventually it will also have to be implemented as it is obligatory" (Sittomat representative, personal interview, June 22, 2015). In sum, while the Sittomat sees the challenge of putting the tax in operation, they see a double benefit in it. First, "the tax would become fairer" (Sittomat representative, personal interview, June 22, 2015). Second, people would be motivated to reduce the non-recyclables they produce and separate more of the recyclable waste as they do not have to pay any tax on these (Sittomat representative, personal interview, June 22, 2015). Considering that municipalities currently receive the waste removal tax, due to their responsibility to collect waste, implementing the incentive tax also falls under their responsibility. Once the territorial organisation is in place the TPM would receive the tax and as such also be responsible for implementing the incentive tax. Besides environmental benefits that increased waste separation can bring along, representatives from the municipality were very straightforward by saying "The municipality will put finances first.

If tomorrow they see that it costs more to separate than it does not to, they will stop doing it" (municipality reprsentative 2, personal interview, June 23, 2015).

Treatment of recyclables is partially financed by the eco-organisations on packaging waste. These organisations receive a financial contribution by manufacturers. Part of this contribution is then given to Sittomat to cover part of their treatment cost. This system falls under the extended producer responsibility principle discussed in the political and legal aspects section. Sittomat also covers their costs with the recyclables they sell as well as the electricity produced through the incineration plant and sold to EDF (Sittomat representative, personal interview, June 22, 2015). Furthermore, while this is only for incineration, Sittomat charges a fee for every ton brought to the plant. Municipalities that are part of Sittomat pay a reduced fee, while external municipalities who wish to burn their waste pay an elevated fee (Sittomat representative, personal interview, June 22, 2015). Whether or not the profit made from the incinerator is then also used to cover costs for recycling is not clear. All in all, treatment, whether of recyclables or non-recyclables is the responsibility of Sittomat. Since they are however a public organisation of inter-communal cooperation they are not allowed to make profit. This means any profit they do make is divided among the member municipalities. In turn, if the Sittomat does not have enough revenue to balance with their costs, the municipalities have to pay the difference (Sittomat representative, personal interview, June 22, 2015).

On Porquerolles, due to its geographical isolation "waste management costs a lot of money" (municipality representative 1, personal interview, June 16, 2015). The main costs accrue from the transportation to the mainland. How exactly the transportation costs are set has not become clear. The only information on the distribution of costs that was retrieved came from Waste Reception and Handling Plan of the harbour of Porquerolles. Here it was stated, that while the collection of the containers on the harbour is done by the municipality through Veolia "the harbour has to pay the transport for each container" (Port de Porquerolles, 2015, p. 6). Despite the little information on the financial aspects, it has been mentioned, that by reducing the volume through compacting, costs can be reduced (municipality representative 2, personal interview, June 23, 2015). Next to compacting, another possibility to reduce costs is by preventing waste production. As the representative from the national park points out "Our priority is not that people separate

their waste, but that they leave the island with their waste, as this would also drastically reduce the costs" (personal interview, June 5, 2015). He adds that for the waste that is nevertheless discarded on the island, waste separation would be of course the preferred option. The main difficulty then lies in communicating, especially to visitors, that by separating their waste they have not chosen for the best option (national park representative 1, personal interview, June 5, 2015). While this does not fall under the financial and economic aspects, a comment by a representative of the tourist information centre should be added here. She pointed out that in the past years there have been campaigns to tell people to bring back their waste to the mainland. However, she lamented that this was also not well thought through as once the ferry arrives at the Tour Fondue on the mainland nothing was there to reception the waste (tourist information representative, personal interview, June 24, 2015). The difficulty with ensuring that tourists leave the island with their waste is that the harbour at the Tour Fondue is also private property. Just as with the harbour of Porquerolles, at the Tour Fondue, the harbour is responsible for providing the containers and the municipality for the collection. Who would eventually be responsible for setting up the possibility to separate different waste streams is however unclear. If the municipality and the national park as well as the harbour of Porquerolles therefore want to reduce their transportation costs by preventing waste being discarded on the island, storage facilities must be provided upon the arrival of the ferry on the mainland. As long as such a structure is not guaranteed, prevention will not be likely to succeed.

4.2. The solid waste management system – Waste system elements

4.2.1. Waste separation

The first waste system element is waste separation, the act of disposing of the recyclables separately in order to facilitate recycling. In the Sittomat territory, waste separation for glass, cardboard/paper and plastic was introduced in 1996 through central collection points. In 2000 six municipalities were equipped with a door-to-door pick up system for plastic and cardboard/paper waste. Back then this was a multi-material system, which entailed that both waste types were disposed of in the same bin. As the costs for the

treatment were very high – mainly due to the fact that the sorting centre was the only one in the area and dictated the prices – Sittomat investigated whether it would be cheaper if the recyclables were already separated beforehand. As the treatment costs could be reduced like this, waste separation for cardboard/paper and plastic is done in two waste streams since 2005. Glass waste is still only collected through collection points (Sittomat representative, personal interview, June 22, 2015). Interestingly, the switch in the system has enabled the collection of a lot more plastic waste. This is most likely due to the fact that having only one bin - and because plastic waste often takes up a lot of volume - whenever people did not have any space left in their bin they discarded the plastic with the non-recyclables (Sittomat representative, personal interview, June 22, 2015). In 2002, organic valorisation was introduced to citizens through the distribution of individual composts (Sittomat, 2015a). Finally, in 2012 the municipality of Hyères-les-Palmiers extended waste separation from central collection points to also include a door-to-door collection system (Hyères-les-Palmiers, 2012).

According to the municipality (representative 1, personal interview, June 16, 2015) and Veolia (representative, personal interview, June 30, 2015) on Porquerolles waste separation has been set up two to three years ago. Both agree that it is however complicated. According to the representative of the municipality, putting waste separation truly in place requires a big time and monetary investment. Compared to the mainland, waste separation on an island is even more complex (personal interview, June 16, 2015). While both representatives say that, at least in the village, there is the possibility for waste separation the representative of the harbour laments that there is no real waste separation available on Porquerolles. He therefore also does not see the point if the harbour installs it in their perimeter. Especially if in the end everything is collected with the same truck (personal interview, June 2, 2015). He adds that he does not want fictive waste separation where people separate but in the end it is not processed correctly. In his words: “It does not make sense to lie to them [the people], with the hope that one day we will be able to process the waste correctly” (personal interview, June 2, 2015). Also the CESC representative states that on Porquerolles waste separation is only starting. As he points out “if there is one who does not do it well, then all is in vain.” For him “It [waste

separation] has not yet become a lifestyle habit" (CESC representative, personal interview, July 8, 2015).

Based on the observation, the researcher found that waste separation is not deployed very systematically across the island or even in the village (more on this aspect in the next section on storage). Another representative of the municipality gives a possible explanation for this. As he says, the municipality internally decides where to put collection points, but depending on the waste type this can sometimes be difficult. For plastic and cardboard/paper waste the nuisance is rather low, but glass waste causes a lot of noise. For this reason most collection points are at the outskirts. So for the municipality it becomes difficult to say that they are totally committed to waste separation (municipality representative 2, personal interview, June 23, 2015). The Sittomat however also reminds municipalities that they cannot afford to take a waste stream out of the separation system, because they receive financial restitution for it (Sittomat representative, personal interview, June 22, 2015). In the end, this sounds like a political dilemma where politicians are faced with the challenge to cater to those who do want waste separation, those who do not want to be bothered by it and at the same time keep on receiving the financial benefits.

One of the representatives of the municipality says that the only way waste separation will work on Porquerolles is if it takes place in front of the door, as people will not move to separate their waste. A true door-to-door pick up system on Porquerolles is however something the municipality is having difficulties putting in place (municipality representative 1, personal interview, June 16, 2015). In the words of the representative of Veolia: "It is good to put in place waste separation, but afterwards it also requires the respect and the civil responsibility of the people and that is what is the most complicated" (personal interview, June 30, 2015). For the municipality of Hyères-les-Palmiers the key is to communicate on the relevance and the credibility of waste separation, as people start to doubt what the direct benefit is for them to commit (municipality representative 2, personal interview, June 23, 2015).

Despite of all this, residents and businesses on Porquerolles are demanding waste separation (municipality representative 1, personal interview, June 16, 2015). Also the representative of Veolia says that the ones who really make use of waste separation in the

village are the businesses and the residents because they know the island (personal interview, June 30, 2015). “And who are the ones who pollute the containers? It is not the residents who separate their waste who pollute. All the restaurants when they throw away their glass waste it is not in their interest to pollute the bins. So who are the ones who pollute? To 90% it is the tourists who pollute, because they just do not care. They just open the lid and throw away their trash” (municipality representative 1, personal interview, June 16, 2015). The representative of the national park opposes this. He thinks that tourists do have the mentality to separate their waste (personal interview, June 5, 2015). For the municipality representative, putting in place waste separation also in public spaces, or at least making it more accessible to the tourists, would not be feasible. “There are 950.000 tourists who come visit Porquerolles every year. Many of them come from abroad. So we would have to put it in place in different languages. This would be difficult” (municipality representative 1, personal interview, June 16, 2015). According to the representative of the national park, the true difficulty is tourists who only come for one day. He would be surprised if they separate their waste. Instead he thinks they will just put everything in the same bag. The tourists who stay for multiple days should however be included in the waste separation efforts (personal interview, June 5, 2015).

4.2.2. Storage

While this section will focus on the containers available throughout the island, it is important to consider the waste bins actors make use of and have available within the premises of their hotel, their private homes or at work as they play an important role in the shaping process of waste. As each actor makes use of different waste bins, it is impossible to generalize on the different hardware available. Throughout the interviews some challenges however surfaced, which might be applicable to a variety of actors. As one hotel owner said, the obstacle they are facing in relation to hardware is in order to incentivize waste separation in the rooms “Multiple waste bins would be necessary. This implies a lot of organisation to put in place.” According to him this “would then also depend on the municipality, the national government and the hotel business” (hotel 1, personal interview, May 29, 2015). Whether or not these authorities would really be responsible for putting this in motion is uncertain. As for the working environment, but also in the private sphere,

space plays a crucial role. As was mentioned by a restaurant employee (restaurant 1, personal interview, June 17, 2015) and a resident (municipality representative 1, personal interview, June 16, 2015) who lives on a boat, waste separation is not installed due to space constraints.

Turning to the containers available throughout the island, we differentiate between the area in the national park, the village and the harbour. In the national park green containers of 500 litres are stationed at often frequented points such as cross roads or beach entrances (Picture 1). In summer the total number of containers reaches 38, while in the winter only 15 are left (Porquerolles Multi Services, personal interview, June 6, 2015). Those containers do not discriminate against waste types. Instead they are meant for any waste the visitor may produce and needs to discard of to avoid littering. According to the CESC representative, while the waste on the land is important their priority is marine waste (personal interview, July 8, 2015). No disposal possibility is available on the beaches themselves. Although on the beaches signs are positioned, directing the visitors to the closest containers (Picture 2). The national park has plans to improve the appearance of the containers by building sheds around them with driftwood collected on the beaches (national park representative 1, personal interview, June 5, 2015). While this is certainly a good idea, the containers should however still be recognisable and easily accessible.

Picture 1: Containers available in the national park

Picture 2: Sign directing visitors to the closest containers

In the village, most residents, restaurants and hotels share containers. The containers from the municipality can be easily distinguished as they have a sticker with the logo of the municipality on them. Moreover, they are the only ones offering the possibility for waste separation. Containers of 500 litres for recyclables also have coloured lids. Grey lids are for plastic waste, yellow for cardboard/paper and green for glass. Some of the containers also have a picture or some text indicating which waste type they are meant for. The lids for these recyclables have the possibility to be locked. Waste can however still be disposed of through holes in the lid (Picture 3). The option to lock the containers and only providing a small hole decreases disposal error and increases the likelihood that the quality of the recyclables is good. As was mentioned by the waste collectors, restaurant and hotel owners on the island can receive a key for the containers (waste collector 1, personal interview, July 10, 2015; waste collector 2, personal interview, July 12, 2015). This way they can discard their waste at once and save time. The problem is however that not the

same person throws away the waste every time. The quality of the recyclable is therefore not always very good. Nevertheless, the waste collectors concluded that the quality of recyclables is generally better for closed containers (waste collector 1, personal interview, July 10, 2015; waste collector 2, personal interview, July 12, 2015). As was stated by the representative of Veolia, metal carts were put in place for cardboard by Veolia, because the containers were not sufficient and because businesses on the island where not folding the cardboard boxes and therefore reducing their volume (personal interview, June 30, 2015). A representative from the municipality suggests containers reserved for residents and businesses, because tourists make it difficult to keep recyclables clean (municipality representative 3, personal interview, June 29, 2015). However, as one of the representatives' stresses implementing such a system would be complicated and cost a lot of money (municipality representative 1, personal interview, June 16, 2015). Interestingly, not all the containers for recyclables are available everywhere. Sometimes only containers for one or two additional recyclables are available. As a representative from the municipality pointed out the municipality works together with Veolia to decide where to put the containers (municipality representative 3, personal interview, June 29, 2015). One of the waste collectors however mentions, "there are place where there are containers which have no purpose at all" (waste collector 2, personal interview, July 12, 2015). While there are numerous places were recyclables can be discarded, the two most frequented places are next to the church and after the little bridge on the road leaving the village towards the west of the island. These places are not collection points but waste grouping points. It is important to make this distinction, because if they were collection points it would be the responsibility of Sittomat to collect. Due to a lack of space and the difficulty to install door-to-door pick up effectively on the island the municipality opted for these grouping points, which remain under their responsibility. Sittomat supplies the containers, while it is the responsibility of the municipality to take care of maintenance and replacements (Sittomat representative, personal interview, June 22, 2015). In the public area, especially on the central square, small waste bins are available to the visitors. These bins do not offer the possibility to separate waste streams, which is deplored by one of the waste collectors (waste collector 2, personal interview, July 12, 2015).

Picture 3: Example of a container for recyclables (cardboard/paper waste)

At the harbour, along the pier there are 35 containers for non-recyclables with a capacity of 660 litres. They mainly serve the pleasure boaters but are also used by the tourists who pass them at least twice during their stay: once they arrive on the island and once they leave the island. The containers of the harbour are visually rather pleasant due to the sticker of a marine environment with which they are decorated (Picture 4). According to the Waste Reception and Handling Plan of the harbour they also have two 660 litres containers for glass waste (Port de Porquerolles, 2015). Behind the tourist information, which is on the perimeters of the harbour there is a third waste grouping point. Here containers of the municipality for recyclables can be found. The businesses on the harbour have containers for non-recyclables and mostly for recyclables such as cardboard/paper and glass. Moreover, on the harbour there is the possibility for businesses to store oil waste.

Picture 4: Containers available on the harbour

While a great deal of questionnaire participants was satisfied with the containers available throughout the island, some offered ideas on how to improve them. Reoccurring suggestions were to put waste bins on the beaches or at least more containers at beach entrances. Furthermore, many complained that they were not always very visible. They therefore suggest more signs to direct people to the containers as well as making them more apparent by using more colours. One tourist also said that the containers were not very accessible as they were closed. Two additional improvements mentioned were not to put up prohibition signs but instead use positive encouragement. Finally, the containers should be better maintained as some found them to be very dirty.

Looking at the containers available throughout the island it can be summarized that each area of the island has its own storage facilities. As the representative of Veolia puts it so nicely: "So in one part of the island they demand you to separate your waste and in another part of the island they do not. So what should people think" (personal interview, June 30, 2015). Indeed this inconsistency on a rather small island is rather confusing. Another layer of complexity is added due to the fact that different container types (from the national park, the municipality and harbour) can be located next to each other at some places (Picture 5). As in the picture below these are sometimes ways to extend waste separation into areas, such as the national park, where it is not normally set up. This mixed

system however creates confusion and also statements from interviewees have not succeeded in decreasing this ambiguity. According to the representative from the harbour, the containers for recyclables behind the tourist information belong to the harbour (personal interview, June 2, 2015), while the representative from Veolia said that they belong to the municipality (personal interview, June 30, 2015).

Picture 5: Container of national park next to container of municipality located in the national park

4.2.3. Collection

Waste collection of recyclables can be done either through a door-to-door pick up system (*porte-à-porte*) or at central collection points (*point d'apport volontaire*). The collection type chosen often depends on the particularities of the collection site and the material to be collected. In the Sittomat region this means that cardboard/paper and plastic waste are collected through a door-to-door pick-up-system as well as central collection points. Glass waste is only collected at central collection points (Sittomat, 2014). The responsibility for collection in the three inter-communal co-operations is diffused depending on the collection type. This means that door-to-door pick up of non-recyclables and recyclables remains the responsibility of the municipalities. Collection of recyclables at the central collection points is however assured by Sittomat. Both municipalities and the Sittomat have

delegated their responsibility of collection to an external service provider: Veolia (Sittomat, 2014).

Today, in terms of waste separation, the representative of Sittomat points out that there are not many municipalities in the Toulon region performing well. In 2014, the municipality of Hyères-les-Palmiers produced 2.214 tons of cardboard/paper, 1.200 tons of glass and 276 tons of plastic waste (personal interview, June 22, 2015). With this Hyères-les-Palmiers had a ratio of 66.2 kg/inhabitant for these three waste types. The average across the Sittomat area for cardboard/paper, plastic and glass is at 51.4 kg/inhabitant, which means that Hyères-les-Palmiers is still above average (Sittomat, 2014, p. 18). All the same there are other municipalities that have a considerably higher ratio (Sanaire: 97 kg/recyclables/inhabitant; Vendoles: 113 kg/recyclables/inhabitant) and these are also very touristic places (Sittomat representative, personal interview, June 22, 2015). Taking a broader perspective, the average across France of recyclables collected per inhabitant was 75.9 kg in 2013 (Sinoe, 2013). In sum, Hyères-les-Palmiers is therefore above the Sittomat average, but scores below the national average. As the representative from Sittomat points out, Hyères-les-Palmiers has however also not yet put in place waste separation throughout the entire municipality (personal interview, June 22, 2015). Why people do not want to separate their waste is unclear to the Sittomat. Nevertheless, they try to do all in their power to promote waste separation. This includes distributing bins, communication, and distribution of pre-collection bags. Despite of all these efforts waste separation is still not very popular (Sittomat representative, personal interview, June 22, 2015). The table below summarizes how many recyclables were collected in Hyères, across the Sittomat and France, differentiating between waste streams and offering the kg/inhabitant ratio (Table 2).

	Hyères (2014)	Sittomat (2014)	France (2013)
cardboard/paper (t)	2.214	14.141	309.928.6
plastic (t)	276	2.478	
glass (t)	1.200	10.246	189.508.8
Total (t)	3.690	26.865	499.437.4
Population	55.774	522.445	65.801.000
kg/inhabitant	66.2	51.4	75.9

Table 2: Recyclables collected in the municipality of Hyères-les-Palmiers, Sittomat and France

On Porquerolles each morning employees from Veolia collect the waste. They start around 5 am and finish at 10 am. The tour starts with two employees who collect the non-recyclable waste in the village, then the Langoustier and Plage d'Argent on the west side of the island and then back to the village. During the tour for non-recyclables the collectors also check the containers of recyclables. Back in the village one of the collectors takes the truck for cardboard/paper waste and does the tour in the village. The other colleague drives the truck for non-recyclables to the transfer zone, where he switches to the truck for glass waste and returns back to the village to continue the collection. The containers in the national park are picked up twice a week (waste collector 1, personal interview, July 10, 2015). The containers for non-recyclables in the harbour are collected every day, while the two containers for glass waste are collected every three days (Port de Porquerolles, 2015).

There are multiple trucks available for the waste collection including one truck per recyclable collected (Picture 6). This is also necessary as collection of recyclables with the truck for non-recyclables would be counter-productive as it is dirty and would then soil the recyclables (Veolia representative, personal interview, June 30, 2015). All the trucks run on biodegradable fuel (Veolia representative, personal interview, June 30, 2015). One waste collector complained that the equipment is rather old. Moreover, the organisation in the summer is not adapted to either more tours, more containers or more trucks which has as consequence that the container overflow in the summer (waste collector 1, personal

interview, July 10, 2015). An employee of a restaurant also confirmed that especially in the summer the containers are not sufficient (restaurant 2, personal interview, June 27, 2015).

Picture 6: Trucks for waste collection stationed on transfer zone

As already pointed out during the collection tour for non-recyclables, the collectors also check the quality of the containers for recyclables. In case they are too polluted they immediately dispose them with the non-recyclables. The reason why they do this is that if the skip for recyclables arrives on the mainland and the quality is too low, it will be refused and incinerated (Veolia representative, personal interview, June 30, 2015). They also do not have a choice to act differently because firstly they do not have the time to rectify the errors (Veolia representative, personal interview, June 30, 2015) and secondly for safety reasons they are not allowed to put their hands in the waste (waste collector 2, personal interview, July 12, 2015). Throughout the village there are recurrent rumours among residents, restaurant owners (restaurant 4, personal interview, July 4, 2015; restaurant 8, personal interview, July 2, 2015; restaurant 10, personal interview, June 15, 2015) but also from the harbour representative that waste collectors mix the waste (personal interview, June 2, 2015). After confronting the representative of Veolia with this, he replied, "We have had complaints from people, who said 'we see how you collect the waste'. But they when they saw a green container that was collected with a yellow container, for them this meant that the recyclables are mixed with the non-recyclables. But what they do not know is that

even if they separate their waste, when we open the containers, in the cardboard we will find glass, aluminium cans even household waste. We cannot afford to put this with the recyclables. We have to put it with the non-recyclables. So they see us mix the waste, I do not deny it, but it is because the container is polluted. I cannot afford to put this container with the recyclables just because there are people watching. And after the collection I can also not afford to sort everything. That is not what waste separation is. Waste separation should be done beforehand, at the source". He adds that they very often find polluted containers (personal interview, June 30, 2015).

While a formal collection system for glass, cardboard/paper and plastic waste exists in the village of Porquerolles nothing is developed for organic waste. Due to the many restaurants on the island as well as the agricultural activities and maintenance operations of the national park a lot of organic waste is however produced. For this reason two projects were launched. The first project was initiated by the national park in cooperation with the municipality of Hyères-les-Palmiers and an external partner, ComposTerre. Based on the latest information, a report by ComposTerre on the practicability of composting on Porquerolles is still awaited (municipality representative 2, personal interview, June 23, 2015). Depending on the outcome of this report, composting could then be implemented. The second project on composting organic waste was initiated in 2012. Under the European Neighbourhood Policy Instrument (ENPI) the EU co-financed a new project under the topic of waste treatment and recycling. The result of which is a 3-year project entitled "Euro-Mediterranean Strategic Platform for suitable waste management" (MED-3R). The aim of the strategic platform is to serve as a network for experts on waste in the Mediterranean region to exchange best practices but also to "reinforce cross-border cooperation based on the involvement of public authorities, social and economic actors and local populations" (ENPI CBC MED & European Union, n.d.). During the project, which will run until the end of 2015, 13 pilot projects have been initiated. One of the themes is "Recycling and processing waste from islands". Porquerolles was chosen as one of the sites for a pilot project. Under the MED-3R project, Porquerolles focused on the aerobic digestion of food waste from the restaurants on the island. In 2014 a number of restaurants were asked to separate their organic waste. This waste was then collected and dried. The goal was to reduce the volume of organic waste, which through the drying process reduced

by 80% in a day. Unfortunately, due to French regulations this dried compost cannot be used in France. Nevertheless, there might be a market for it in Switzerland (municipality representative 2, personal interview, June 23, 2015). Some of the restaurant owners who participated said that until now they were not informed about the outcome of this project (restaurant 7, personal interview, June 17, 2015; restaurant 8, personal interview, July 2, 2015; hotel 4, personal interview, July 3, 2015).

Expanding waste separation throughout the entire island would have the most direct influence on waste collection. According to the representative of the national park "if one day waste separation will be available in the national park, the municipality would remain responsible for collection (personal interview, June 5, 2015). "The question is then whether or not the municipality is willing to do multiple tours" (national park representative 1, personal interview, June 5, 2015). For the representative of Veolia the constraint lies in a lack of human resources and means. "Even if they [the collectors] start earlier in the morning it gets difficult because then the problem is that people will complain about the noise and if they take too long in the morning then the tourists arrive and it gets problematic to circulate. So it is difficult, because Porquerolles is very small and it is an island. So it is a very delicate equilibrium." (personal interview, June 30, 2015).

4.2.4. Transfer and Transport

After collection comes the transfer and transport of waste. While non-recyclables are shipped every day to the incinerator on the mainland, recyclables are first stored in the skips on the transfer zone on the island until they are full. Then they are transported with the ferry to the mainland. Cardboard/paper and plastic waste are sent to the sorting centre in Seyne-sur-mer, while glass waste is brought to La Garde.

The transfer zone is located in the east of the island, close to Courtade (Picture 7). The municipality stresses that currently "the problem is that the transfer zone is not accessible" This accessibility includes the fact that it is somewhat difficult to get to it as it is located outside of the village and roads towards it are not always in good shape. In principle, the transfer zone should also not be open to the public. Currently there is however no gate to close it off, which means that people just enter the transfer zone without supervision. Ideally, an employee from Veolia should be present to instruct people

where to dispose of their waste. According to the municipality representative "this would advance waste management on the island" (municipality representative 2, personal interview, June 23, 2015). He however stresses that the transfer zone is not a reception centre, but was set up to give Veolia a place on the island to store the collected waste before it is shipped to the mainland (municipality representative 2, personal interview, June 23, 2015). Right now they are working on putting the transfer zone up to standards and make it part of an elaborated waste management plan (municipality representative 2, personal interview, June 23, 2015). Rather a big challenge for this transfer zone is also that it is located on the premises of the national park, which implies that "it needs to remain clean" (Veolia representative, personal interview, June 30, 2015). According to the Veolia representative, a compacting machine for cardboard waste already exists on the transfer zone, which allows reducing the volume and the frequency of transport to the mainland (personal interview, June 30, 2015).

Picture 7: Pictures from the transfer zone

4.2.5. Treatment

One can distinguish between different treatment types. The preferred treatment options are material valorisation and energetic valorisation. Material valorisation is a synonym for recycling and it distinguishes between material valorisation through recycling of materials such as glass, plastic and cardboard/paper and organic valorisation through composting of organic waste. While energetic valorisation through incineration can be argued to a treatment, it will be discussed in the section on disposal. In 2014, of all the waste collected in the municipalities served by Sittomat, 30% was recycled and 8% composted.

After collection, glass waste is brought to La Garde, while cardboard/paper and plastic waste are transported to one of the two sorting centres (Picture 8). The sorting centre for Hyères-les-Palmiers is at Seyne-sur-mer and managed by Veolia (municipality representative 2, personal interview, June 23, 2015). At the sorting centre, cardboard/paper and plastic waste go through an optical and manual sorting process. This is necessary to guarantee the homogeneity of the waste streams as the separated waste collected is not always of high quality. In fact, in 2012 in the department of Var of the 43,264 tonnes that were transported to the sorting centre, 4,327 tonnes (10%) was refused (Conseil Général du Var, 2014). This rejected waste is then either incinerated or landfilled.

Picture 8: Pictures from sorting centre

Every two months the sorting centre does a characterization per municipality for plastic and cardboard/paper waste. Taking plastic waste as an example, the characterisation permits to establish how much percent of the recyclables collected are coloured, opaque or PHD plastic or even neither of them and therefore refused and sent to

the incinerator. The process entails that the content of a truck coming from a certain municipality is discharged on the empty conveyor belt of the sorting centre and then the percentage per waste type and the percentage of refusal is calculated. Currently, the percentage of refusal for cardboard/paper waste is between 8% and 10%, while for plastics it is at 35%. Per waste stream and per municipality, an average percentage of the current characterisation and the characterisation done two months ago is then calculated and applied to all the trucks that come with this waste stream from the municipality in question to the sorting centre (Sittomat representative, personal interview, June 22, 2015). As was pointed out by the municipality of Hyères-les-Palmiers, since the recyclables are directly send to the sorting centre they do not have any control mechanism. They would prefer to have the possibility to check the quality of the recyclables themselves instead to hear from Sittomat what percentage of their recyclables is refused (municipality representative 2, personal interview, June 23, 2015). Whether this is really feasible is doubtful, as it would cost supplementary time, space, human and financial resources. Furthermore, seen that Hyères-les-Palmiers is part of the Sittomat the necessity for them to double-check the quality of the recyclables seems superfluous unless they do not trust Sittomat and Veolia.

After the second sorting process, materials are compacted and shipped to the corresponding recycling centres for further treatment (Picture 9). Cardboard/paper goes to the paper mills in Rouen and Avignon, tetra pack to Spain; plastics are sold to Valorplast and shipped to Italy (Sittomat representative, personal interview, June 22, 2015). Glass waste is brought from La Garde to a glass manufacturer in Languedoc (municipality representative 2, personal interview, June 23, 2015). The companies buying the recyclables need to provide Sittomat with a valorisation certificate from which they can clearly see where to the recyclables are brought. This is necessary because the eco-organisations want to have the traceability and know where the recyclables “end their life”. The eco-organisations also conduct controls to ensure that the information provided is accurate (Sittomat representative, personal interview, June 22, 2015). Organic waste that is either collected or directly brought to the reception centre is treated at one of the two composting platforms. For the organic waste of Hyères-les-Palmiers this is the platform at Cuers (Sittomat, 2014).

Picture 9: Compacted recyclables

4.2.6. Disposal

Energetic valorisation is no more than a synonym for incineration. As the term however indicates, waste is not only incinerated but the energy that is produced in the process is captured and electricity and heat produced. A last treatment option is landfilling, although in the past years, partially due to the EU Waste Framework Directive, landfilling has become less prominent and is often the approach taken if neither material valorisation nor energetic valorisation are feasible. In the Departmental Plan of the Var, is stipulated that the three landfilling sites for non-dangerous waste will close by the end of 2020 (Conseil Général du Var, 2014)

In 2014, of all the waste that was collected in the municipalities served by Sittomat, 30% was recycled and 8% composted, 42% incinerated and 20% landfilled. The landfilling percentage was rather high last year, as currently the incineration plant is under construction to give the plant a newer look but also to modernise it in order to further minimise emissions and noise but also to improve effectiveness. As such, the housing complex in Berthe will be provided with heat and the turbines producing electricity will be optimised (Var-matin, 2015). The incinerator in Toulon is the only incinerator in the entire department and was financed by all three inter-communal cooperations together. This means that the 26 municipalities, which are part of the Sittomat, can incinerate their waste at a reduced price per ton (Sittomat representative, personal interview, June 22, 2015). By

2016, Sittomat has the objective that 60% of the waste burned will come from two external municipal communities (Conseil Général du Var, 2014). This has two implications: firstly, Sittomat will be able to generate more revenue, as the price will be higher for the external communes; secondly, to achieve this the 26 municipalities need to reduce the amount of waste they incinerate to guarantee this extra capacity to external municipalities. This can be achieved by either producing less waste or by further improving waste separation for recycling.

5. Psychological factors shaping waste separation

5.1. Introduction

This chapter focuses on the psychological factors shaping waste separation. The data stems primarily from the quantitative and qualitative answers to the questionnaires provided by the participants, the individual actors. While the research aims at answering how psychological factors shape those separating their waste. It is just as relevant to understand how these factors influence participants who do not separate their waste. For this reason the analysis on the psychological factors will be split between the participants, who were categorised as practitioners, and those, who were non-practitioners. Besides looking at the overall outcome between those two groups, a differentiation in the data will also be done between tourists, residents and employees. Before moving to the psychological factors the next section will first establish who of the participants are practitioner and who are non-practitioners, followed by some background and socio-demographic information on these two groups.

5.2. Establishing the practitioners and the non-practitioners

A total of 152 questionnaires were collected throughout the three actor groups. A core part of the questionnaire was used to find out whether the tourists, residents and employees that took part could be defined as practitioners or non-practitioners. Having defined this, the results between the practitioners and non-practitioners could then be compared in order to see how they differ in the various factors. A practitioner is regarded as somebody who separates his or her waste. The three actor groups greatly differ due to their role and the space within which they can separate their waste. For the tourists this space is the public environment, for residents it is the private sphere of their homes on Porquerolles and for the employees it is at their working place in either hotels and/or restaurants.

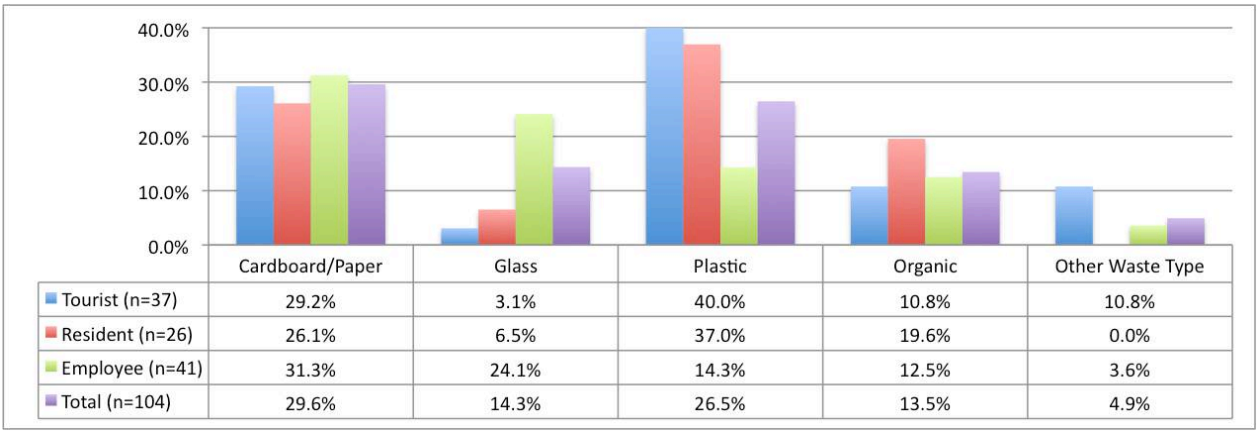
In order to establish, who of the participants qualify as practitioners and who as non-practitioners a set of questions were asked. These questions were solicited in a way that reminded the participants of their role as tourist, resident or employees. Moreover, the questions referred to a recent moment in the past such as the day itself or the previous day.

This way the probability that participants remembered what they did was increased and at the same time the amount of socially desirable answers decreased. For each actor group the first question was broad, asking them whether today or yesterday they had produced waste during their visit on Porquerolles, at home or at work. Of the 54 tourists, 37 said that they had indeed produced waste (68.5%, n=54). For the residents only 29 confirmed this (55.8%, n=52) while among the employees this amounted to 41 people (89.1%, n=46). Despite the expectation that all participants would say that they had recently produced waste, the consequence of this question was that the total amount of participants for the further analysis directly decreased. The total of participants therefore dropped from 152 to 107 (37+29+41=107).

Before continuing to focus on these 107 questionnaires a valid question to ask is why the 45 remaining participants did not produce any waste. Unfortunately, the tourists were the only actor group to provide such an explanation. Most tourists said that they did not produce any waste because they ate at a restaurant or in the hotel. One tourist stated that she pays attention not to produce any waste, while two others said that they had not produced waste because they are only on Porquerolles for a couple of hours. Other explanations by tourists included that they took their picnic with them or that it was still too early in the day for having produced any waste.

For participants who affirmed that they had produced waste the follow-up question was which waste types they had produced. The goal of the question was to find out the most frequently produced recyclable waste types and also if they differed between the actor groups (Table 3). Among the tourists plastic and cardboard/paper were the most frequently produced waste types. The third most recurrent answer was organic waste. On the same place came the category of other waste types such as aluminium cans, cigarette stubs and the wrapping of a chips bag. On the last place was glass waste. Also for residents plastic and cardboard/paper were the most repeatedly produced waste types. More than half of the residents said to have produced plastic waste and 26.1% confirmed having produced cardboard/paper waste. Organic waste and glass waste followed. Among the employees who produced waste the order of the most frequent waste types differed from those given by the other two actor groups. This being said, the two waste types mostly produced were cardboard/paper and glass waste. Plastic waste was mentioned by 14.3%

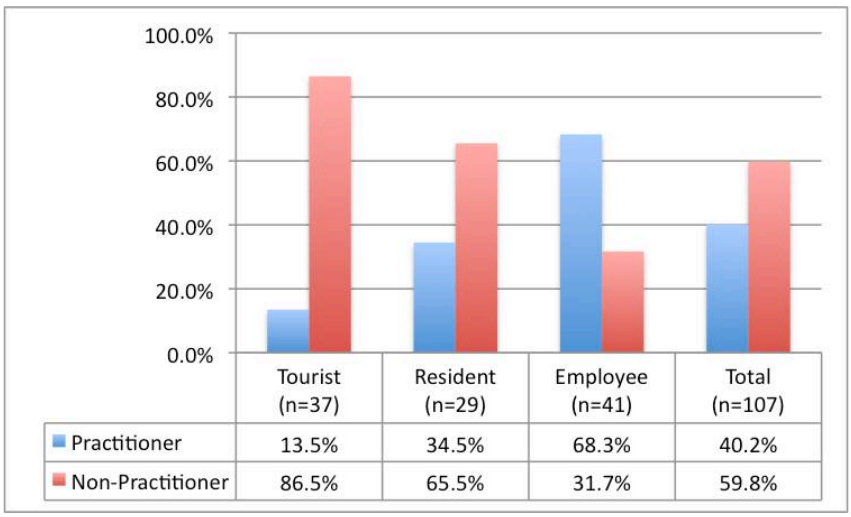
of employees. Less common seems to be organic waste (12.5%). Other waste types mentioned by employees included aluminium cans, coffee grounds and glass that is refundable. This result indicates that throughout the actor groups cardboard/paper and plastic waste are the most commonly produced waste types and at least for the employees group also glass is recurrent. Taking all the responses together, organic waste appears to be less frequent while employees again mostly mentioned them. From a solid waste management (SWM) point of view, this means that a great potential lies in offering both tourists and residents the opportunity to separate their cardboard/paper and plastic waste. Next to this, in restaurants and hotels glass and organic waste should be captured.



	Cardboard/Paper	Glass	Plastic	Organic	Other Waste Type
Tourist (n=37)	29.2%	3.1%	40.0%	10.8%	10.8%
Resident (n=26)	26.1%	6.5%	37.0%	19.6%	0.0%
Employee (n=41)	31.3%	24.1%	14.3%	12.5%	3.6%
Total (n=104)	29.6%	14.3%	26.5%	13.5%	4.9%

Table 3: Waste Types Produced

Subsequently, two questions were asked to establish how the waste was disposed and whether it was separated or not. First, participants were asked to state how they disposed of their waste. Here attention was paid to whether or not they mentioned by themselves, that they had separated the waste. The follow-up question then directly asked them to state whether or not they had separated their waste. Doing so enabled determining the practitioners and the non-practitioners (Table 4). Of the remaining 107 participants most (59.8%) were non-practitioners. Splitting the practitioners and non-practitioners up according to the actor groups the results show that most practitioners can be found among the employees followed by the residents and finally the tourists. As for the non-practitioners the outcome is subsequently reversed.



	Tourist (n=37)	Resident (n=29)	Employee (n=41)	Total (n=107)
Practitioner	13.5%	34.5%	68.3%	40.2%
Non-Practitioner	86.5%	65.5%	31.7%	59.8%

Table 4: Practitioners and Non-Practitioners

When the participants were asked to explain why they did or did not separate their waste, the reasons were very diverse. Answers of tourist practitioners included that it has become a habit and that because it is already done at home, they continue doing so also at other places, that in the doubt they preferred separating their waste or that they separated their waste because they saw the two different waste bins. One tourist added that if the bins are not available then it is for certain that people will not separate their waste. Also resident practitioners mentioned that it was a question of waste separation having become a habit. Another common answer was that the types of waste produced, corresponds to what they separate. In other words, they had the structural possibility to separate. One resident said that she was separating her waste to avoid filling her trash up and having to bring out the waste all the time. For the employees group some of the reasons given by the other two actor groups were repeated. As such the fact that it has become a habit and that the structural possibilities are in place are popular answers. Two new answers given by employees were that they were doing it for environmental reasons or that they were obliged to do so by the hotel or restaurant they worked for. Only one employee gave a different answer than his colleagues, saying that he separated "because it takes less space in our waste bins".

Explanations of non-practitioners for not having separated their waste were also very divers. Two tourists stated that overall there was no possibility to separate their waste, also not in their hotel room. Additional comments included that on the boat there is

not a lot of space or that they either will take their waste with them or that they did not produce a lot of waste. Finally, one tourist admitted that the proximity of the waste bin he had in front of him was the reason why he did not separate his waste. Among the residents the most common justification was that they do not have the waste bins, either within or outside of the home, to separate. Another explanation provided by two residents is that on Porquerolles there is no existing or functioning system for waste separation and this is why they do not separate their waste. Finally, one resident stated that he just did not know where else to put his waste. Among the employees, a common rationale was that at work they do not have the possibility to separate due to the lack of multiple waste bins. Lack of time and the fact that the restaurant one employee works for, does not demand waste separation were also added. Ultimately, one employee stated that she does not separate her waste "because it is of no use, seen that it is later put in the same container".

The finding demonstrates that throughout the actor groups, the presence or absence of the storage facilities, so the adequate bins, to separate waste work as enabling or constraining factor respectively. Furthermore, having made of waste separation a habit, reoccurring in the everyday life of all practitioners lead them to separate their waste, even if for tourists this did not take place in their usual environment. Interestingly, the argument of a lack of space was utilized both by practitioners and non-practitioners. For practitioners the argument was that through waste separation the volume of non-recyclables could be reduced. In contrast, non-practitioners stated that in their environment they do not have the place to put multiple waste bins. Both are of course valid arguments, while in the end the overall volume of waste produced will most likely remain constant regardless of whether waste is separated or not. While more participants might share the conviction that they separate because it is good for the environment, employees were the only to mention it. Unsurprisingly, both residents and employees stated that they do not separate because of the inefficiency of the SWM system on Porquerolles, seen that compared to tourists they know the island a lot better. Also the stressful working environment of the personnel leads to the fact that they do not have the time to separate. Finally, it becomes apparent that the non-binding/binding nature of waste separation can be an influencing factor. The lack of this obligation to separate waste or the monitoring from a higher level for the tourists and

apparently also for the residents should be considered as an interesting addition to further increase the number of practitioners.

5.3. Psychological Factors

Before analyzing the psychological factors shaping practitioners and non-practitioners, these factors should be recapitulated. In total, based on the theory, ten psychological factors were identified and selected to structure the research. The table below lists the ten psychological factors and offers an explanation (Table 5).

	Psychological factors	Description
Attitude	Intrinsic motives	Feeling the actor gets from separating his/her waste
	Instrumental beliefs	Costs (time, money, space) and benefits (environment) an actor identifies from separating his/her waste
Subjective norm	Personal responsibility	The duty an actor feels to separate his/her waste
	Descriptive norm	Whether the actor thinks people important to him/her separate their waste
	Injunctive norm	How the actor thinks that people important to him/her would value them separating their waste
Perceived behavioural control	Response efficacy	The belief the actor has that him/her separating his/her waste will have some tangible impact on the environment
	Self-efficacy	The belief the actor has in his/her ability to separate waste
	Knowledge	The actors knowledge about waste separation
	Past experience	Whether the actor has separated his/her waste in the past
	Intention	How hard the actor is willing to try or how much of an effort they are planning to exert to separate their waste

Table 5: Psychological factors and their description

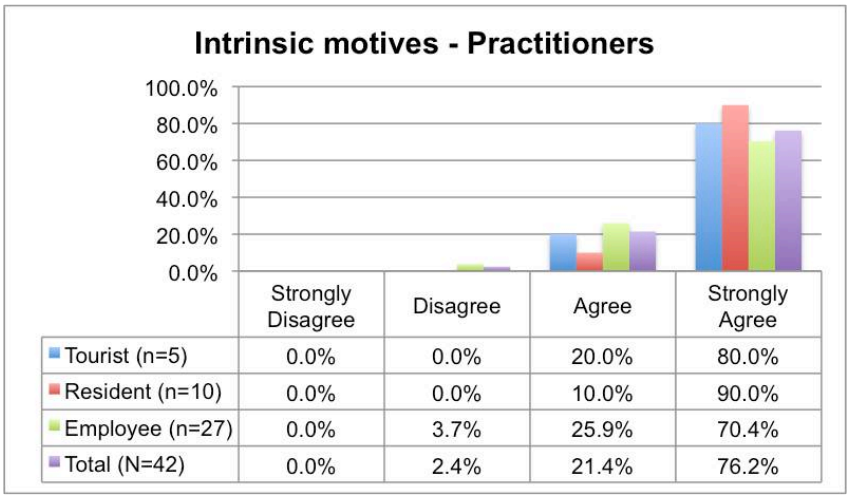
Each factor will be examined separately by first presenting the expected outcome, then the results and finally by providing an analysis and discussing its implication for the research.

5.3.1. Attitude

Two factors were chosen to cover the concept of attitude: intrinsic motives and instrumental beliefs. According to Cronbach's Alpha (.339) the two factors unfortunately do not cover the concept fully.

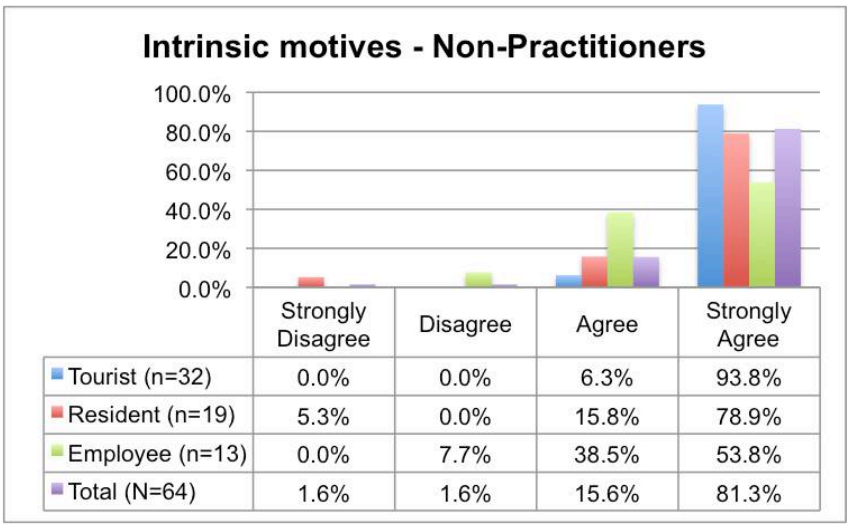
5.3.1.1. Intrinsic motives

Starting with the intrinsic motives, participants were asked if they feel that separating their waste is good. With this question the sentiments actors attach to waste separation were explored. The assumption was that practitioners would have stronger positive feelings than non-practitioners.



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	0.0%	0.0%	20.0%	80.0%
Resident (n=10)	0.0%	0.0%	10.0%	90.0%
Employee (n=27)	0.0%	3.7%	25.9%	70.4%
Total (N=42)	0.0%	2.4%	21.4%	76.2%

Table 6: Intrinsic motives - Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	0.0%	0.0%	6.3%	93.8%
Resident (n=19)	5.3%	0.0%	15.8%	78.9%
Employee (n=13)	0.0%	7.7%	38.5%	53.8%
Total (N=64)	1.6%	1.6%	15.6%	81.3%

Table 7: Intrinsic motives - Non-Practitioners

Overall, the results showed that regardless of being a practitioner or non-practitioner participants stated to have strong or very strong positive feelings about waste separation (Table 6, Table 7). So why do (1) practitioners and (2) non-practitioners with strong emotional attachment to waste separation differ in what they say about it? And do (3) practitioners and (4) non-practitioners offer explanations for their low emotional attachment?

(1) Of the practising tourists who tended to agree with the statement only one tourist provided an answer, saying that she still always has doubts. If these doubts are whether the waste is really recycled or whether she doubts herself, is not clear. From the residents one said that especially the national park is the place to set-up waste separation, while another admitted, that despite of him separating his waste, it was not always perfect. Furthermore, it was pointed out that waste separation offers the chance to raise ones consciousness on how much waste one produces. Finally, according to another resident "for the planet of course we need to do something". One of the employees confessed while he attaches a strong positive feeling to it, a real follow-up after separation is important. He adds that there were plans to put fines for those who do not separate their waste, but because at collection all is mixed he thinks it is the waste collectors who should pay a fee. (2) A few non-practitioners who tended to agree offered valuable comments. One tourist stated that for her it is important to separate her waste, to be able to give it a second life. Among the residents explanations included that they felt a personal responsibility to separate their waste. One resident added that the building in which they lived should be better equipped as currently there is no space allocated to make waste separation possible. (3) (4) Unfortunately, none of the practising or not practising participants who disagreed to a certain extent with the statement provided any supplementary insights.

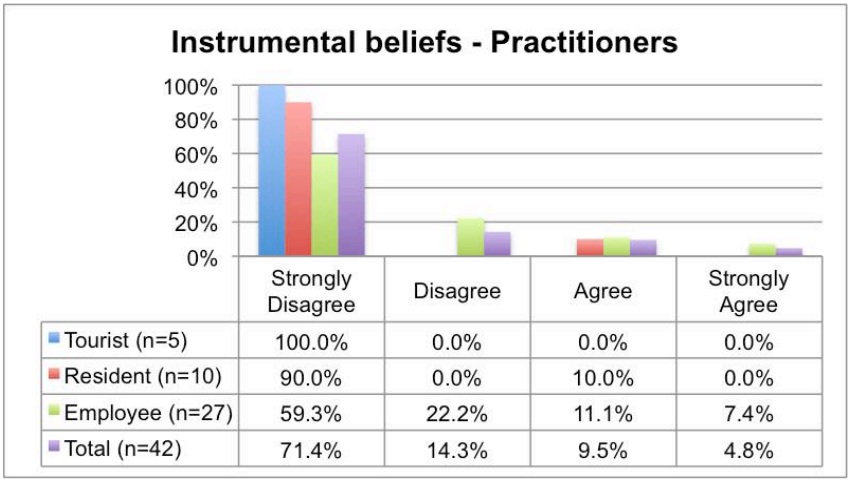
According to the representative from Veolia "there are only a few that feel concerned with waste separation and who respect the natural environment" (personal interview, June 30, 2015). Based on the interviews that were conducted with hotel and restaurant owners the answers however show that they do feel positively about waste separation. One said that they would really like to separate their waste, while two others attached their sentiments to their attachment to Porquerolles in the fact of being located on an island (restaurant 3, personal interview, June 16, 2015; restaurant 11, personal

interview, June 18, 2015). For these reasons they sometimes make the effort to work with refundable glass or try their best to reduce the packaging waste from their suppliers. While these comments do show positive feelings a representative from the national park said overall "it requires raising consciousness and changing the mentality of the people" (national park representative 2, personal interview, July 9, 2015)

The results of the questionnaires did not match the expectations. Nevertheless, they did show that overall participants feel positively about waste separation. Non-practitioners who feel positively present a lot of potential of becoming future practitioners. While there was some disagreement between interviewees on the importance people attach to waste separation it can definitely not do any harm to further raise consciousness among all the actors present on the island on the importance of waste separation. Convincing people who do not feel favourable towards waste separation on its importance is however not easy. Having said this, the other factors, which are impeding those non-practitioners who tended to agree, need to be uncovered and dealt with to further increase the number of practitioners.

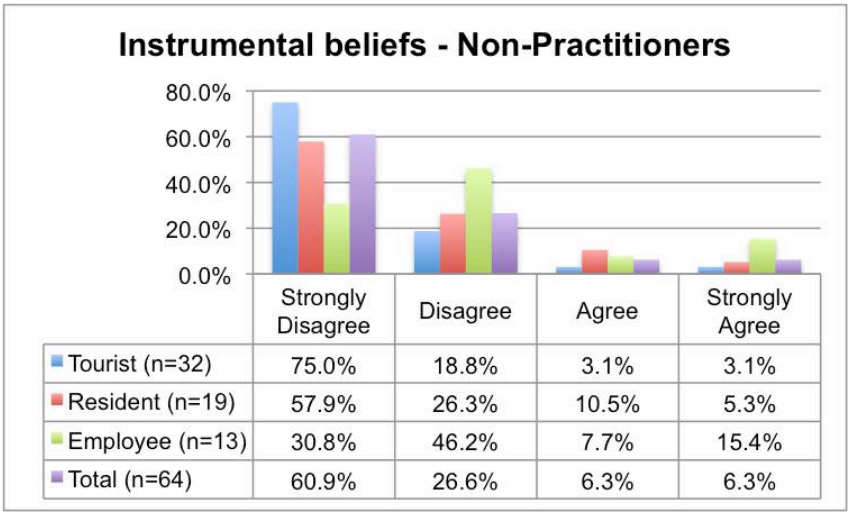
5.3.1.2. Instrumental beliefs

The second attitudinal factor is the instrumental belief, the costs and benefits participants attach to waste separation. There is a whole range of instrumental beliefs, which could be included here. Each actor however is influenced by different instrument beliefs differently. Effort was chosen as the measure for the instrumental belief factor for all participants as it is rather broad and therefore can appeal to a wider audience. The question here was whether it takes the participants a lot of effort to separate their waste. The expectation was that practitioners would respond negatively (strongly disagree, disagree), saying that it does not cost them effort, while non-practitioners would admit that it does cost them effort by providing positive answers (agree, strongly agree).



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	100.0%	0.0%	0.0%	0.0%
Resident (n=10)	90.0%	0.0%	10.0%	0.0%
Employee (n=27)	59.3%	22.2%	11.1%	7.4%
Total (n=42)	71.4%	14.3%	9.5%	4.8%

Table 8: Instrumental belief – Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	75.0%	18.8%	3.1%	3.1%
Resident (n=19)	57.9%	26.3%	10.5%	5.3%
Employee (n=13)	30.8%	46.2%	7.7%	15.4%
Total (n=64)	60.9%	26.6%	6.3%	6.3%

Table 9: Instrumental beliefs - Non-Practitioners

The results show that the majority of participants lean towards negative answers, suggesting that it does not cost them effort to separate waste (Table 8, Table 9). Tourist practitioners are the only group who unanimously state that they strongly disagree with the statement that it costs them effort to separate waste. While the majority of resident practitioners do lean towards strongly disagreeing (90%), some said that they agreed that it did take them effort (10%). Despite the effort it costs them they however still separate their waste. Just fewer than 60% of employees strongly disagreed. Nevertheless, employees did offer answers ranging from strongly disagree to strongly agreeing, while the percentage did diminish towards the agreement side. This means that also employees, who say that it does cost them an effort, still separate their waste. The qualitative data of the questionnaire

can shed some light on the following questions: (1) why do practitioners tend to disagree that waste separation costs them effort; (2) are there other reasons why non-practitioners who tend to disagree do not separate their waste; (3) do the residents and employees who agree that waste separation requires effort offer valuable explanations why they still separate their waste; (4) do participants who tend to agree and who do not separate their waste offer more insights?

(1) Among the practitioners who disagreed or strongly disagreed, one resident said instead of effort it did require space, another instrumental belief. According to one employee it was just a rhythm to take. (2) Despite the prediction, also the majority of non-practitioners disagreed that waste separation cost them a lot of effort. Throughout those participants comments from residents included that in case the structure was in place it did not require an effort. Another set of answers was that either they did not have the appropriate bins at home or that they merely do not think about waste separation. Others stressed, "it is not difficult to separate your waste", as there were only three types of waste to separate it is manageable. The tourists said in the end "it costs as much effort to separate waste than it costs not to separate waste" and it eventually becomes a habit. (3) For those practitioners who did agree that it required an effort only one resident provided an explanation as to why he feels this way when he said "compared to in the past were everything was mixed it was easier back then and it did not require any effort". (4) Looking at the explanations provided by non-practitioners who agreed waste separation required an effort, justifications from residents included lack of structure and space were impeding them. For one of the employees time was also an obstacle.

Also interviewees provided explanations, especially, as to which instrumental beliefs were hampering waste separation. Reoccurring was the financial costs. According the Veolia representative the only way to ensure better waste separation from restaurants would be by saying that everything they throw away with the non-recyclables they have to pay, while the recyclables, which are separated are for free (personal interview, June 30, 2015). The Sittomat representative comes to the same conclusion although he thinks this might be a good approach for everyone (personal interview, June 22, 2015). Also the waste collectors regard financial penalties as an effective instrument (waste collector 2, personal interview, July 12, 2015). Another possibility would be to have so called green police

patrolling who check the contents of the bins and then fine those who pollute the recyclables (Veolia representative, personal interview, June 30, 2015). Also referring to the financial aspects, the representative from the municipality puts it rather bluntly when he says, "the real question is whether or not there is a financial gain to separate waste" (municipality representative 2, personal interview, June 23, 2015). He elaborates by saying that people do not see the purpose to separate their waste if it is just for the profit of the system and for them the only profit they see is environmental (municipality representative 2, personal interview, June 23, 2015). According to him "If we want businesses to separate their waste it would be better if they get paid to do it" (municipality representative 2, personal interview, June 23, 2015). While financial instrumental beliefs seem to be prominent, there are still diverging ways on how to use them: as a penalty or an incentive. Distance was also mentioned as a factor shaping waste separation. Up until now glass waste is only collected at collection points. The Sittomat representative therefore wonders whether the distance is related to the low quantity of glass that is currently being collected (personal interview, June 22, 2015). Along the same line, the representative from the municipality and Veolia think that for waste separation to work, everything should be in the vicinity of the people, as they are generally lazy when it comes to waste separation (municipality representative 2, personal interview, June 23, 2015; Veolia representative, personal interview, June 30, 2015). This also offers an explanation as to why tourists do not separate their waste "Because when they [the tourists] arrive, the first containers that they will see are those at the harbour. That is why when they leave they also throw away there waste at the harbour" (Veolia representative, personal interview, June 30, 2015). For the Sittomat the incentive tax will have a big impact on waste separation. Currently, many of the obstacles mentioned are lack of space and time. "once the incentive tax will be introduced suddenly people will find the space and the time that is necessary to separate waste" (Sittomat representative, personal interview, June 22, 2015). He adds that currently those who do separate are those who do want to do it and do not mind to invest time. "Unfortunately, this is not yet the majority" (Sittomat representative, personal interview, June 22, 2015). The hotel and restaurant owners reiterate all the reasons provided by representatives of the local authorities as well as the solid waste management service

providers. They confirm “it is complicated to bring the waste to the containers, especially for small establishments” (hotel 2, personal interview, July 2, 2015). Also they say that specifically when it comes to glass waste and taking the extra step of using solely refundable glass, they do not do it because it costs them more money, time and finally it would also take up space, which they do not have, to store the bottles (restaurant 1, personal interview, June 17, 2015). They also agree with the conclusion from the municipality, that if they would get paid, they would separate their waste a lot better (restaurant 1, personal interview, June 17, 2015). Despite the space issue, one restaurant manager said that separating more waste types also would hamper the aesthetics outside of their restaurants, as it would require more containers. Furthermore, if they would additionally separate the waste types for which they do not have the containers in the back of the restaurant, they would have to pass the restaurant with the trash to go to the collection point and this would not be good for business, as there are then still clients around (restaurant 3, personal interview, June 16, 2015). Space and most importantly the time constraint it would require due to the adaptation process is also a hindering factor, a cost, for another restaurant (restaurant 4, personal interview, July 4, 2015). Referring to the visitors, one hotel manager said that in reality most just opt for the fastest option, which is to throw all in the same bag (hotel 3, personal interview, July 6, 2015).

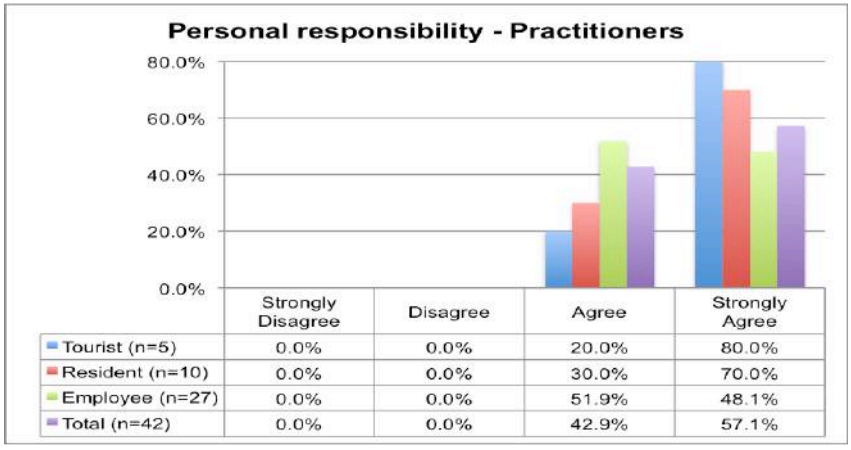
If waste separation becomes a nuisance for people they will not commit to it. For this reason the costs associated with waste separation need to be reduced as much as possible, especially for those who do consider it to be an effort. The most recurrent obstacles mentioned were a lack of space, structural facilities and time. Interestingly, those who did not regard waste separation to be an effort most often replied that it has become a habit. For waste separation to become a habit is has to become routinized and repeated continuously. This can be facilitated if the obstacles associated with waste separation are reduced to a minimum.

5.3.2. Subjective Norms

With a Cronbach’s Alpha of .636, personal responsibility, descriptive norm and injunctive norm can be said to cover the concept of subjective norms very well.

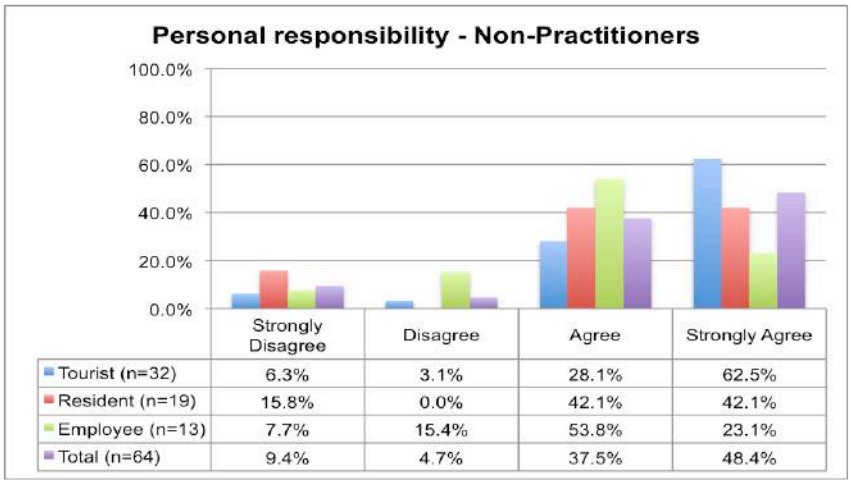
5.3.2.1. Personal responsibility

Moving towards the subjective norms, the first factor investigated was personal responsibility. For this factor, all participants were asked to what extent they agreed or disagreed with the statement, that they felt a personal responsibility to separate their waste. The expectation was that among practitioners most would agree or strongly agree, while non-practitioners probably would have the tendency to feel less of a personal responsibility.



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	0.0%	0.0%	20.0%	80.0%
Resident (n=10)	0.0%	0.0%	30.0%	70.0%
Employee (n=27)	0.0%	0.0%	51.9%	48.1%
Total (n=42)	0.0%	0.0%	42.9%	57.1%

Table 10: Personal responsibility – Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	6.3%	3.1%	28.1%	62.5%
Resident (n=19)	15.8%	0.0%	42.1%	42.1%
Employee (n=13)	7.7%	15.4%	53.8%	23.1%
Total (n=64)	9.4%	4.7%	37.5%	48.4%

Table 11: Personal responsibility - Non-Practitioners

As the tables show, indeed all the practitioners – without expectations – either agreed or strongly agreed that they felt a personal responsibility to separate their waste (Table 10). Among the non-practitioners the picture is however not so clear-cut (Table 11). Interestingly, also non-practitioners tend to feel a personal responsibility to separate their

waste. Especially some resident non-practitioners strongly disagreed (15.8%), while about a fourth of all the employee non-practitioners also said that they either disagreed or strongly disagreed (23.1%). What are then the explanations given by those participants who do match the expectation ((1) practitioners who tend to agree and (2) non-practitioners who tend not to agree) and those who do not ((3) non-practitioners who tend to agree).

(1) Although one tourist agreed she felt a personal responsibility to separate her waste, she confessed it has more become a habit, which she does not question anymore. In a sense for her it has become another way of how to dispose of her waste. Among the residents one practitioner said that it depended on whether the process is followed-up until the end of the chain. Another one even takes her personal responsibility as far as correcting the errors of others by putting the waste that others threw in the wrong container in the correct one. One resident said that he especially felt a personal responsibility towards Porquerolles to separate his waste. Also others, residents and employees, connected their sense of responsibility to the island. (2) Among the non-practitioners who disagreed to a certain extent with the statement one comment by a tourist was that he was doubtful whether the follow-up such as collection and treatment was working effectively. One tourist added that he thinks he should be reimbursed for what he throws away for free, because others are making profit out of it. One resident was very honest when he added he just does not feel personally concerned about it. (3) For the non-practitioners who leaned towards agreement, arguments from tourists included they were educated to do it or it was more for the common rather than for the personal benefit. While one of the residents does feel a personal responsibility she is lacking the containers to separate her waste. For one employee a personal responsibility would manifest if he had the possibility to separate his waste at work. Similarly, another employee feels a strong personal responsibility even if at work they do not separate their waste.

One strong manifestation of personal responsibility was the example provided by the representative of the harbour. He said because there was nothing provided for oil waste on the island, the harbour installed a collection tank (personal interview, June 2, 2015). Speaking about the tourists, he however feels that they do not feel any sort of responsibility. This shows itself, among others, by the fact that whenever they see that a

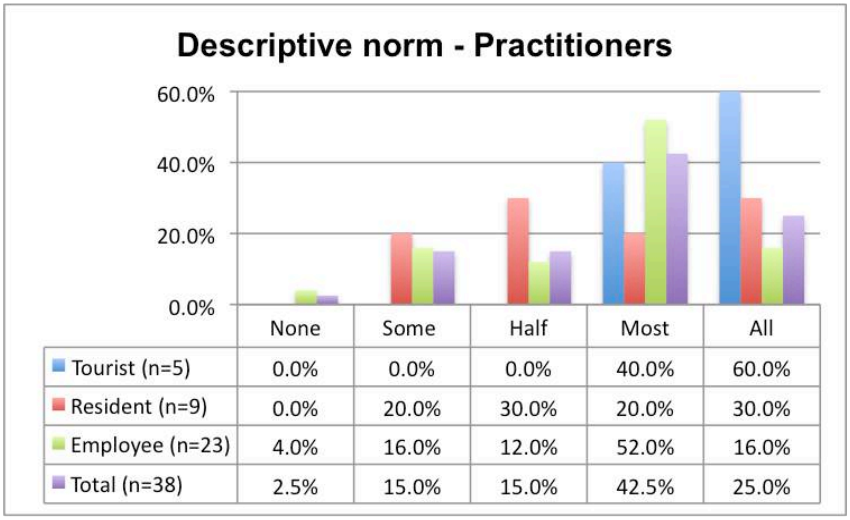
container is full instead of walking to the next empty container, they just put their trash on the ground, which is of course a nuisance because then the sea gulls come and create a mess (harbour representative, personal interview, June 2, 2015). A municipality representative even went as far as saying that, "the tourists do not at all feel concerned. They have the tendency to pollute the wastes bins for the recyclables" (municipality representative 1, personal interview, June 16, 2015). According to him, whenever a container is polluted, to 90% this is due to the tourists because they just do not care. The tourists just open the lid and throw away their waste without paying attention (municipality representative 1, personal interview, June 16, 2015). Moving towards the hotel and restaurant owners, most said that they did feel a personal responsibility. One even said that they felt a "moral responsibility" (restaurant 4, personal interview, July 4, 2015). One interviewee said that despite the fact that she heard that the waste was mixed when collected; she still separates her waste (restaurant 5, personal interview, July 4, 2015). For one restaurant owner waste separation is also a question of citizenship and respect for the environment (restaurant 6, personal interview, July 15, 2015). Referring to her employees, one restaurant owner honestly said that they do not care at all about waste separation (restaurant 7, personal interview, June 17, 2015). In contrast, the employees of one of the hotels do seem to have this sense of responsibility to separate their waste. However, the owner adds that they cannot do more than explain to their employees how to behave. In the end, it remains a personal choice whether they want to do it or not (hotel 3, personal interview, July 6, 2015). Making reference to tourists, he however says that due to the vast amount of tourists visiting over the year, making them feel personally responsible by telling them how to separate their waste seems to be complicated (hotel 3, personal interview, July 6, 2015). Also the representative from Veolia agrees that, while tourists might separate their waste at home, when they come to Porquerolles, they do not care at all (personal interview, June 30, 2015). He is however also critical about the residents and the businesses on the island. According to him, many think regardless of whether they separate or not, the waste will arrive at the same point. Due to this, he thinks that the quality of the recyclables will never really be good. For him, the only way this will change, is if people start taking their responsibility (Veolia representative, personal interview, June 30, 2015). Overall, one of the waste collectors deplores a lack of general education and civil behaviour.

He even goes as far as saying that the people do not respect the work the waste collectors do (waste collector 1, personal interview, July 12, 2015).

So how does personal responsibility finally shape waste separation? Overall, the majority of practitioners as well as non-practitioners tend to agree that they feel a personal responsibility to separate their waste. This offers again a good basis from which to further nurture waste separation. The comments left by participants lead to the conclusion that this responsibility can be increased by offering the structural possibilities to separate waste, improving the understanding of how the waste is processed once it is discarded and by making use and possibly raising the feeling of attachment with the island.

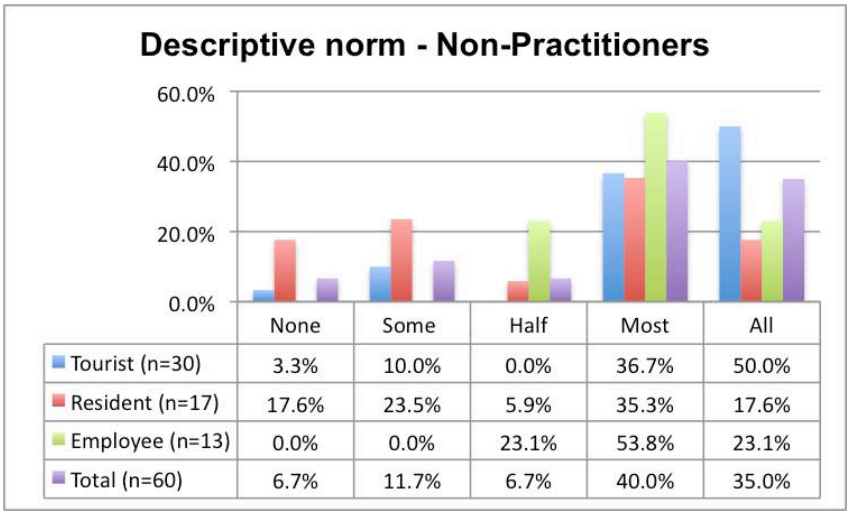
5.3.2.2. Descriptive norm

The descriptive norm looks at how actors think people important to him or her act. So in this case the question is how many people of their entourage separate their waste. The expectation was that practitioners would reply that more than half of their entourage separates their waste, while non-practitioners would say that less than half separate their waste. This expectation is based on the expectation that practitioners as well as non-practitioners might be influenced by the behaviour of the people around them.



	None	Some	Half	Most	All
Tourist (n=5)	0.0%	0.0%	0.0%	40.0%	60.0%
Resident (n=9)	0.0%	20.0%	30.0%	20.0%	30.0%
Employee (n=23)	4.0%	16.0%	12.0%	52.0%	16.0%
Total (n=38)	2.5%	15.0%	15.0%	42.5%	25.0%

Table 12: Descriptive norm - Practitioners



	None	Some	Half	Most	All
Tourist (n=30)	3.3%	10.0%	0.0%	36.7%	50.0%
Resident (n=17)	17.6%	23.5%	5.9%	35.3%	17.6%
Employee (n=13)	0.0%	0.0%	23.1%	53.8%	23.1%
Total (n=60)	6.7%	11.7%	6.7%	40.0%	35.0%

Table 13: Descriptive norm - Non-Practitioners

The results show that overall the majority of both practitioners (67.5%) and non-practitioners (75%) said that more than half of their entourage separates their waste (Table 12, Table 13). Differentiating between the actor groups the outcome does not differ a lot. For the tourists and the employees the majority of practitioners (tourists: 100%, employees: 68%) stated that the people important to them separated their waste, the same applied for non-practitioners (tourists: 86.7%, employees: 76.9%). For residents the percentage was rather equally divided: 50% of practitioners said that more than half of their entourage separated their waste, while 52.9% of the non-practitioners said the same. Consulting the questionnaires, it would be interesting to find out, if participants such as (1) practitioners who said that more than half and (2) non-practitioners who said that less than half of their entourage is separating their waste, are influenced by them. Moreover, how can it be explained that (3) practitioners who said that less than half and (4) non-practitioners who said that more than half of the people important to them separate their waste, are not influenced by them?

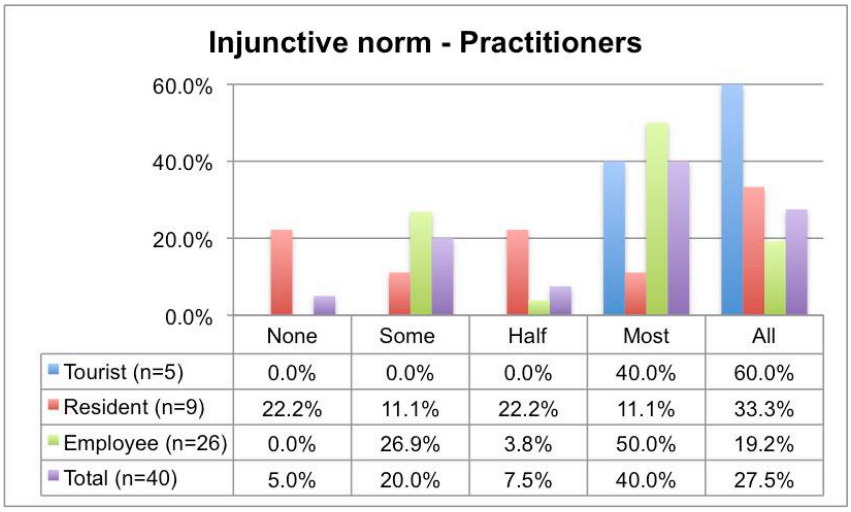
Unfortunately, only little additional information was provided to adequately answer these questions. (1) Comments provided by one resident practitioner who stated that more than half of his entourage also separated their waste, was that “it corresponds to our lifestyle”. Another resident said that the people around them were separating their waste as far as is it is possible. This implies that waste separation depends on the structural possibilities. (2) Lack of structural facilities was also provided as an explanation by another

non-practising resident as to why people important to them were not separating their waste. They added however, that sometimes their friends and family also do not want to make the effort to separate their waste. (3) Practitioners who had said that less than half of their entourage separated their waste left no comments. (4) A non-practising tourist who stated that more than half of his or her friends and family were separating their waste said, "If the structure is in place, yes they will separate their waste. We are more sensitized to that nowadays". Two residents admitted that everyone was doing it a bit but that they thought that it was not always done properly.

Overall, the presence or absence of structural facilities seems to influence whether people in the entourage of participants separate their waste or not. Moreover, having integrated waste separation into their lifestyle was also another reason given by those participants who said that more than half separated their waste.

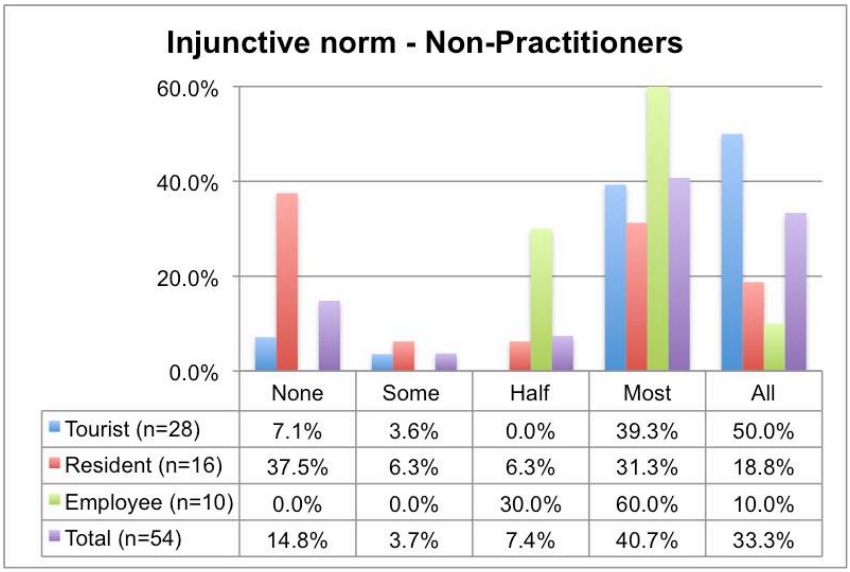
5.3.2.3. Injunctive norm

The last subjective norm surveyed for was the injunctive norm. The injunctive norm looks at how a person thinks people important to him or her value their behaviour. As such the participants were asked how many of the people that are important to him or her, so family and friends, would find it important if they separated their waste. The expectation here was that participants who said that more than half of their entourage find it important would also be more likely to be practitioners, while the reverse would apply to non-practitioners.



	None	Some	Half	Most	All
Tourist (n=5)	0.0%	0.0%	0.0%	40.0%	60.0%
Resident (n=9)	22.2%	11.1%	22.2%	11.1%	33.3%
Employee (n=26)	0.0%	26.9%	3.8%	50.0%	19.2%
Total (n=40)	5.0%	20.0%	7.5%	40.0%	27.5%

Table 14: Injunctive norm - Practitioners



	None	Some	Half	Most	All
Tourist (n=28)	7.1%	3.6%	0.0%	39.3%	50.0%
Resident (n=16)	37.5%	6.3%	6.3%	31.3%	18.8%
Employee (n=10)	0.0%	0.0%	30.0%	60.0%	10.0%
Total (n=54)	14.8%	3.7%	7.4%	40.7%	33.3%

Table 15: Injunctive norm - Non-Practitioners

The results do not fully support the expectation (Table 14, Table 15). As the tables show, about three-quarter of participants, for both the practitioners (67.5%) and non-practitioners (74%), estimate, that either most or all of the people important to them would find it important if they separate their waste. While all tourist practitioners said that more than half of the people around them think that, among residents this percentage was at 44.4%. Of the practicing employees almost 70% said that more than half of their friends would find it important. As for the non-practising tourists the vast majority (89.3%) said that more than half of their entourage would find it important. Nevertheless, this social pressure was not enough for them to also separate their waste during their visit. Of the non-practising residents about half (50.1%) actually said that more than half of their friends and family would find it important if they would separate their waste. For the employees the majority (70%) said that more than half would find it important. Regardless of this they still do not separate their waste at work. So are (1) practitioners positively influenced by their peers and (2) non-practitioners negatively? And are (3) practitioners who still separate their waste just not easily influenced by the opinions of those in their entourage, while (4) non-practitioners just do not care? Or are there any supplementary explanations provided by the participants?

(1) Of the practitioners who said that either most or all of their entourage would find it important, one employee said that he talks about this with the people that are

important to her, possibly even colleagues, and that they would like to do more and better. (2) For the non-practitioners who said that the interest of their friends or family was low, one tourist even stated that the topic is never discussed in his social environment. Another tourist thinks that when it comes to waste separation it is every man/woman for himself/herself. (3) Among the practitioners who said either none or some would be interested only residents provided supplementary information. As such one quite bluntly said, „They do not care". Also another resident confirmed that it was not a discussion she was having with her friends and family. She even says that in general people do not want to be annoyed by separating their waste, also because in the end they feel they already pay enough taxes to employ others [waste collectors] to do it. She however, as a practitioner realizes that it is important to participate in the effort of recycling through separating waste. This shows that these residents are not easily influenced by the opinion of others. (4) Finally, of the participants who do not separate their waste but who said it would be of importance to the people close to them, one tourist said his children would find it very important if he'd separate his waste, also during his holidays on Porquerolles. An employee added, „on Porquerolles the people want to separate their waste, but the structure to do so is just not in place".

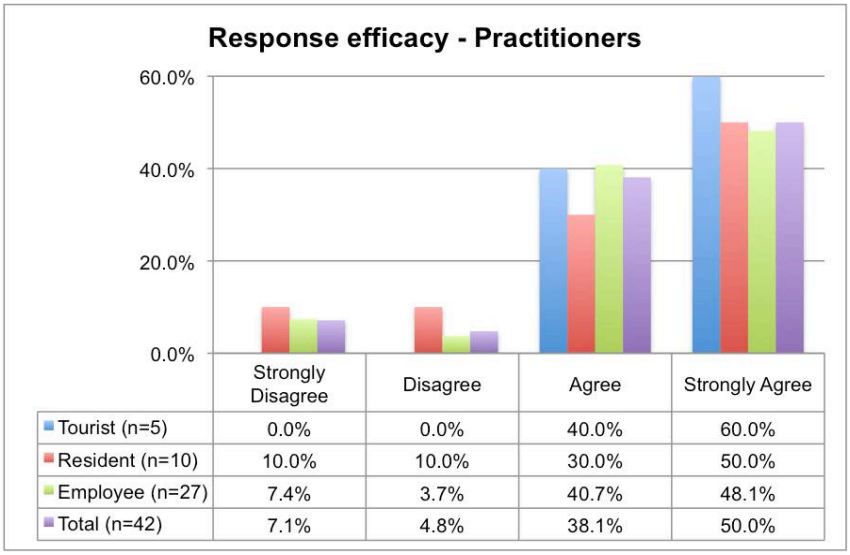
The conclusion we can draw from the injunctive norm is very diverse. Overall, waste separation has to become a topic that is discussed with friends and family. As of now there are only some practitioners who for sure know how their environment thinks about waste separation and can therefore also judge how they would regard their own actions. Besides this, there are a number of practitioners and non-practitioners who point out that it is not a conversational topic. Their assessment is therefore not based on anything substantiated. By furthering a feeling that while waste separation is indeed an individual act, its success depends on the commitment of everyone and for this reason the immediate environment of each person also counts, waste separation can be further rooted.

5.3.3. Perceived Behavioural Control

The Cronbach's Alpha for the four factors covering perceived behavioural control (response efficacy, self-efficacy, knowledge, past experience) is rather low (.198), suggesting that the factors do not cover the concept sufficiently.

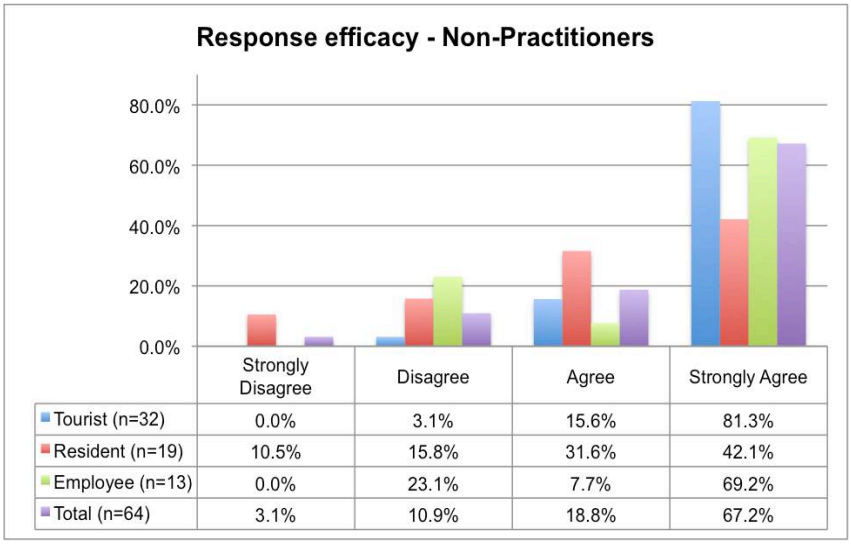
5.3.3.1. Response efficacy

The first psychological factor of the perceived behavioural control group is response efficacy. Response efficacy is the belief a person holds that his or her actions will have an impact on the environment. The assumption made is that participants, who agree or strongly agree separating their waste will have a positive impact on the environment, will be likely to be practitioners. In contrast, most non-practitioners are expected to strongly disagree or disagree with this statement.



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	0.0%	0.0%	40.0%	60.0%
Resident (n=10)	10.0%	10.0%	30.0%	50.0%
Employee (n=27)	7.4%	3.7%	40.7%	48.1%
Total (n=42)	7.1%	4.8%	38.1%	50.0%

Table 16: Response efficacy - Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	0.0%	3.1%	15.6%	81.3%
Resident (n=19)	10.5%	15.8%	31.6%	42.1%
Employee (n=13)	0.0%	23.1%	7.7%	69.2%
Total (n=64)	3.1%	10.9%	18.8%	67.2%

Table 17: Response efficacy - Non-Practitioners

Considering all the participants the figures do not show such a clear picture (Table 16, Table 17). In fact, the majority of both practitioners and non-practitioners tend to either agree or strongly agree that separating their waste has a positive impact on the environment. (1) What then motivates the practitioners, who tend to agree? (2) Do non-practitioners who do believe that separating waste has a positive environmental impact give reasons why they then do not separate their waste? (3) And do non-practitioners who tend to disagree provide reasons as to why they feel this way? (4) Finally, why do practitioners who do not think separating waste is good for the environment still do it?

(1) One of the tourists who strongly agreed that waste separation has a positive impact, rather soberly said, "even if the impact is not extraordinary". Other tourists also added more sceptical comments such as "it only has an impact if everyone separates his waste" or that "there is only an impact if it is treated and recycled correctly". While one resident agreed separating her waste does have a positive impact she added a critical comment: "I feel there is no reflection done about waste reduction. The moment we consume, we produce waste. […]. We are made responsible, we are made feel guilty and they impose on us citizens to separate our waste. But it looks like producers and politicians do not have the same objectives. They [producers] just want to either sell their products or save money." One employee said that he hoped it would be a good example for others. However, many of the other employees were still doubtful of the impact especially due to a lack of knowledge of the process. Although no motivations for why practitioners feel that their actions have a positive impact were given, these comments show that overall practitioners are still doubtful of the environmental benefit of waste separation. (2) The group with the most potential to become genuine practitioners is the non-practitioners who tend to agree to some extent with the statement. Possible hindering factors can be retrieved from the comments left by these participants. As such, many tourists said they at least hoped that it had a positive impact. Also residents provided similar comments. One resident said she strongly agrees, but only if the waste is treated correctly. Along the same lines, another resident agrees that waste separation does have a positive impact, especially if she puts her organic waste in the garden. For the other waste types, she hopes that by separating them it has a positive impact on the environment. However, she does not know

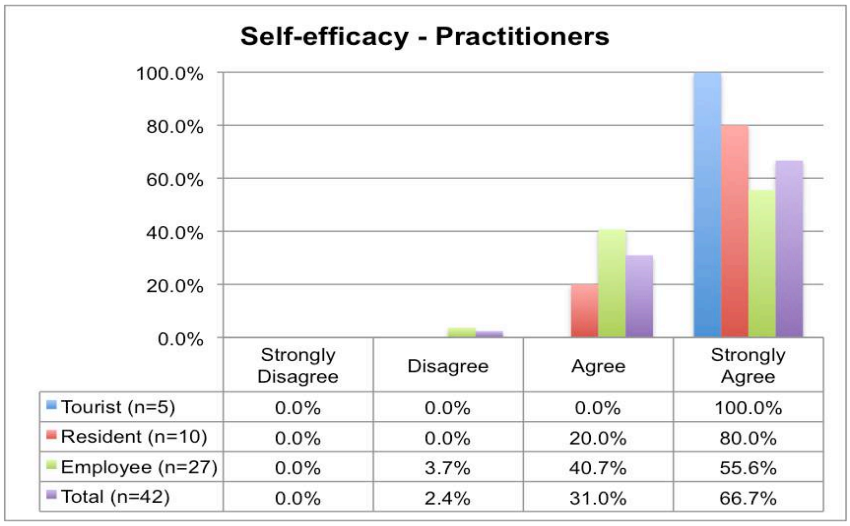
enough about how the rest of the process chain works to make an accurate judgment. Another resident said, “of course it [waste separation] is good. If everyone does a little bit, it is good for everyone and good for the planet”. Yet another resident agreed about the positive impact, but was sceptical if it was enough. He said “I feel that it is better to do it [separate waste]. But it does not make me feel like a super hero. It is not my actions alone that will keep Porquerolles clean. Everyone needs to think the same way.” Moreover he adds that the individual action has little impact and instead the big corporations are those who can make the biggest change. (3) The only explanation provided by a non-practitioner as to why he thinks it does not have an environmental impact if he separates his waste is by a resident. According to him “there is no waste separation system in place on Porquerolles. And it is very good like this, because the distinction between different waste types is very complicated”. In other words, it would not be of any use for him to separate his waste. First, there is no structure in place on the island to accommodate for the separated waste. Second, he thinks even if he does separate his waste he is probably bound to make mistakes. (4) Unfortunately, none of the practitioners who leaned towards disagreement provided supplementary explanations.

Looking at all the remarks two hindering factors for becoming practitioners can be identified. First, the lack of knowledge of the further treatment process; second, the realization that only if everyone commits to waste separation will it be useful. Considering the second point, one would think that those people who provide this argument would then also separate their waste. Apparently they however have a rather fatalistic perspective, as they see that not everyone is separating their waste and therefore they do not see the use for them to even start. As a consequence, two measures should be taken. First, more information needs to be disseminated on how the further treatment process goes and what the environmental benefits are. People have to know that what they do is useful. Second, while this might be difficult to achieve, a general realization must be created that the actions of each person matters. The moment where both those hindering factors come together is during the collection. Due to the general belief that the recyclables are mixed when collected, people do not see why they should even bother to separate their waste, while others start to have doubts on the treatment process. By making clear to everyone on

the island that generally recyclables are collected separately and then further prepared for recycling. However sometimes because of the low quality of recyclables in the container, collectors are forced to dispose of them with non-recyclables. A clear communication on this has the potential to motivate more people to commit to waste separation.

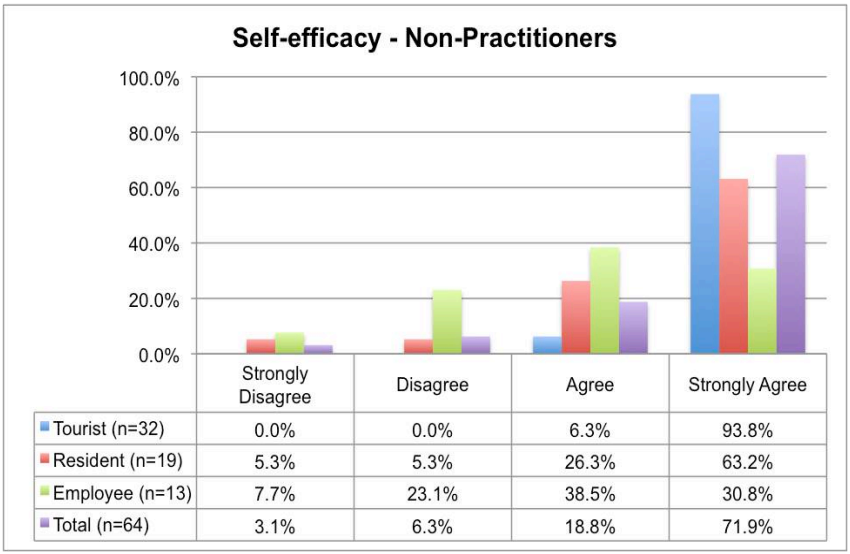
5.3.3.2. Self-efficacy

The self-efficacy factor is the belief the actor has in his or her ability to separate waste. All participants were asked if they believe that they are capable of separating their waste. Participants could either disagree (strongly disagree, disagree) or agree (agree, strongly agree) with this statement. The expectation was that most who had faith in their abilities would also be practitioners, while those who were doubtful would tend to be non-practitioners.



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	0.0%	0.0%	0.0%	100.0%
Resident (n=10)	0.0%	0.0%	20.0%	80.0%
Employee (n=27)	0.0%	3.7%	40.7%	55.6%
Total (n=42)	0.0%	2.4%	31.0%	66.7%

Table 18: Self-efficacy - Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	0.0%	0.0%	6.3%	93.8%
Resident (n=19)	5.3%	5.3%	26.3%	63.2%
Employee (n=13)	7.7%	23.1%	38.5%	30.8%
Total (n=64)	3.1%	6.3%	18.8%	71.9%

Table 19: Self-efficacy - Non-Practitioners

While practitioners almost exclusively (97.7%) tend to agree, only 9.4% of the non-practitioners leaned towards disagreement (Table 18, Table 19). All tourist and resident practitioners tended towards agreement, while for employees this percentage was just a bit lower (96.3%). Interestingly, none of the tourist non-practitioners leaned towards disagreement, while residents (10.6%) and employees (30.8%) said that they either disagreed or strongly disagreed. Among the comments left by participants explanations can be retrieved as to (1) why practitioners are confident about their ability; (2) why non-practitioners do not have this self-assurance; (3) what makes the employees who do not believe in their ability to separate still commit to waste separation; and (4) why non-practitioners who are sure of their abilities still do not separate their waste?

(1) Among the practitioners who have confidence, one resident said that overall there is still a lack of means on Porquerolles to separate waste properly. While not offering real reasons as to why they think they are capable of separating their waste at work, employees however still offer other valuable insights. For example, they added that at work they are obliged to separate their waste. One employee gives a more detailed account: "If one takes the trouble to separate the waste, it is possible. Especially when considering the amount of waste that is produced in the restaurant, we need to make an effort. However, there are not enough facilities on the island for waste separation". (2) (3) Unfortunately, none of the non-practitioners and practitioners with low self-confidence provided

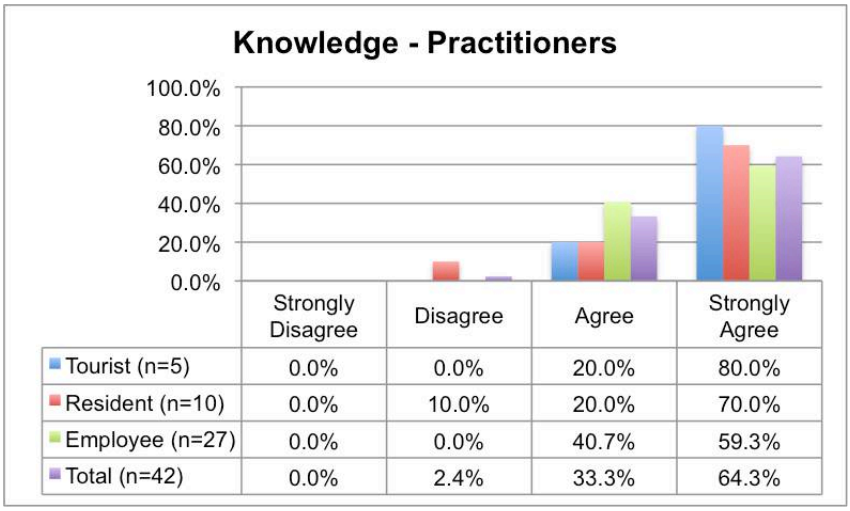
explanations. (4) Non-practitioners with a high-level of confidence about their capabilities said, “Waste separation is simple and not complicated. It is a rhythm, a ritual.” If the tourist felt this way, the question can be asked as to why she herself does not separate her waste. Two residents provided a possible explanation when they pointed out that the structure for and organization of waste separation was missing. Another comment provided by a resident is “if I want to, I can separate my waste”. This suggests that what is keeping him from separating his waste is that he is merely not interested in doing so. While not really offering an explanation on her actions and the way she assessed the statement, another resident added, “The biggest worry are the tourists. They produce a lot of waste.”

Also the interviewees offered some insights on the self-efficacy of actors. According to one municipality representative “in general people do not have the discipline to separate their waste. Here it is a mess. We do not have the Anglo-Saxon discipline here in the south” (municipality representative 1, personal interview, June 16, 2015). Restaurant and hotel owners were overall rather positive about their and their employees’ ability to separate their waste. Often self-efficacy was linked to making of waste separation a habit (restaurant 1, personal interview, June 17, 2015; restaurant 3, personal interview, June 16, 2015; hotel 1, personal interview May 29, 2015). A precondition for waste separation to become a habit is to know about waste separation. Knowledge, through informing and training employees, was therefore also mentioned (restaurant 8, personal interview, July 2, 2015; restaurant 3, personal interview, June 16, 2015). Finally, one of the interviewees pointed out that the ability to separate waste heavily depended on the structural means available. In his words “If it was in place, we would do it automatically. But since it is not in place…” (hotel 4, personal interview, July 3, 2015).

In terms of self-efficacy the majority of participants believe in their ability to separate their waste, some repeating that it is easy and has become a habit. This represents a good basis and also a lot of potential to promote waste separation. The most common impeding factor mentioned is however the lack of structural means available on Porquerolles to separate waste.

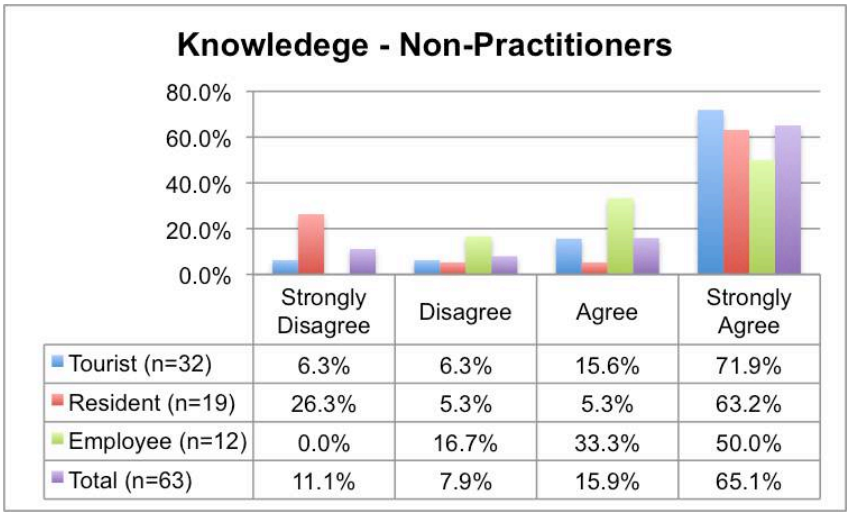
5.3.3.3. Knowledge

Knowledge about waste separation is another important psychological factor to consider. All participants were therefore asked to what extent they agree or disagree that they knew how to separate their waste. The expectation was that practitioners would lean towards agreement, while non-practitioners would rather disagree.



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	0.0%	0.0%	20.0%	80.0%
Resident (n=10)	0.0%	10.0%	20.0%	70.0%
Employee (n=27)	0.0%	0.0%	40.7%	59.3%
Total (n=42)	0.0%	2.4%	33.3%	64.3%

Table 20: Knowledge – Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	6.3%	6.3%	15.6%	71.9%
Resident (n=19)	26.3%	5.3%	5.3%	63.2%
Employee (n=12)	0.0%	16.7%	33.3%	50.0%
Total (n=63)	11.1%	7.9%	15.9%	65.1%

Table 21: Knowledge - Non-Practitioners

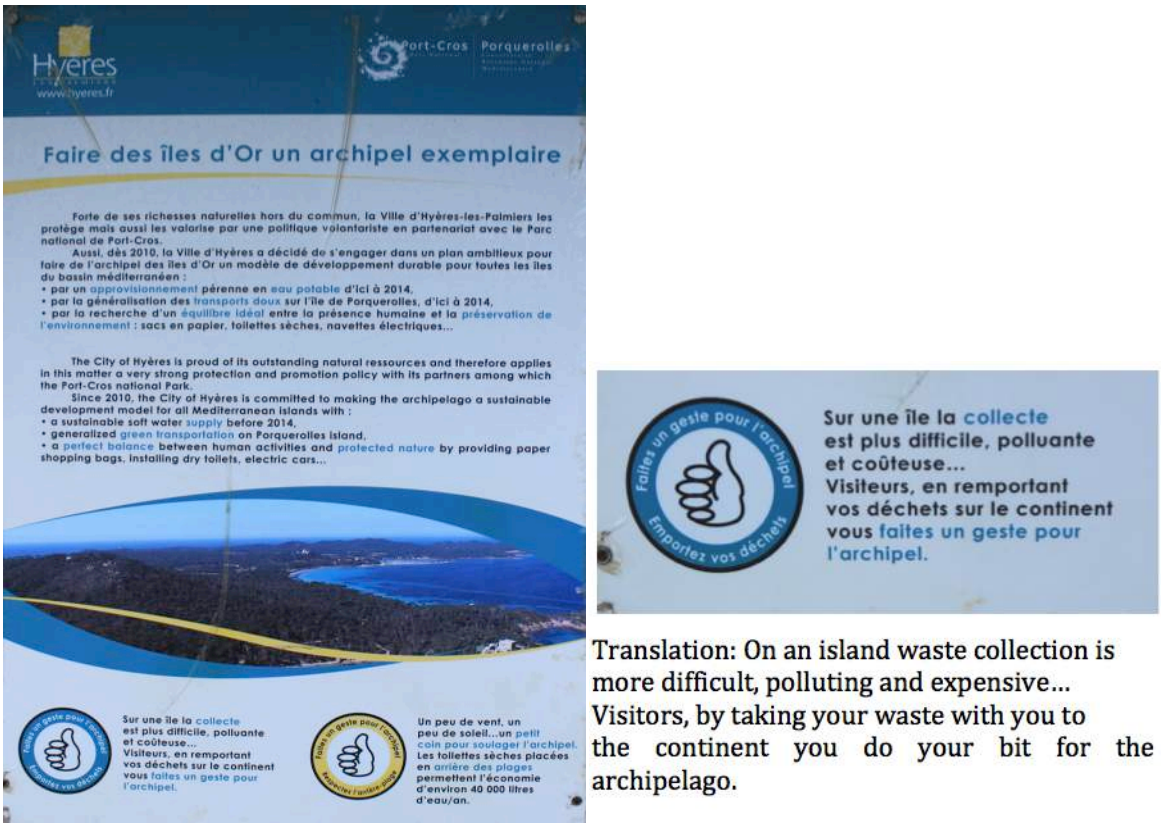
As the results show, the majority of practitioners tend to agree (97.6%). Only 2.4% of all participants - exclusively residents - said that they disagreed (Table 20). The percentage of participants, who agreed to a certain extent, decreases to 81% when only considering the non-practitioners (Table 21). While this shows that a great part of non-

practitioners are knowledgeable when it comes to waste separation, there are still a few non-practitioners who do not feel that they know how to separate their waste. This leads to the following questions: (1) from where do knowledgeable practitioners get their knowledge, (2) why do some practitioners consider themselves as unknowledgeable, (3) why are non-practitioners, who are knowledgeable, still not separating their waste, (4) is it the lack of knowledge or another factor that is hindering non-practitioners who tend to disagree to separate their waste? Turning again to the qualitative data of the questionnaires some answers to these questions can be provided.

(1) The only participants who provided an answer as to where they got their knowledge from and why they feel so confident were residents. One resident said he separates his waste the way he thinks is correct or how he was told to do it. While other residents based their knowledge on what is indicated on the containers, or they consult a special dictionary on this matter given by the municipality where they live. (2) One practising resident confessed that he does not know how the waste is separated on Porquerolles. (3) Most comments from knowledgeable non-practitioners came from tourists. One of them admitted that he is especially facing difficulties with plastic waste. Here he is sometimes unsure. Two other tourists also state that more or less they know how to separate their waste. One tourist even added that if she does not separate properly back home the waste is not collected. Another one also considered that she knows how to separate, pointing out that it is also indicated on the containers for which waste types it is meant. Another interesting answer was that they did not know how waste separation was working in France. One knowledgeable non-practicing resident said, “As with everything else, it depends on the means put at disposition”. (4) Non-practitioners – tourists and employees – with a low level of knowledge said that they do “not always” know how to separate their waste. One resident lamented that especially when it comes to packaging waste she does not always know how to dispose of it correctly. Similarly, another resident said “other than glass bottles, I do not know”.

In order to promote waste separation, Sittomat sends out 18 “separation ambassadors” (*ambassadeurs du tri*). They do mostly communication work on markets, at schools or within organisations. In 2014, the ambassadors had 300 different communication events where they sensitized up to 37.000 citizens to the topic of waste

separation (Sittomat, 2014). One of the waste collectors states that it is especially important to educate the children about this at school, as they are the new generation and can learn better (waste collector 2, personal interview, July 12, 2015). According to him older generations need to understand that if they separate their waste there are also some direct financial gains for them in terms of reduced taxes (waste collector 2, personal interview, July 12, 2015). While not directed to waste separation but more to the goal to prevent waste being produced on the island and to incentivize the tourists to take their waste back with them, a video message is shown on the ferry from the Tour Fondue to Porquerolles. After four repetitions of the security video – subtitled into four languages, a video with animations is shown. Here the rules of the national park are communicated, among them also the message to return with the waste. This video is unfortunately only shown once with French subtitles. Whether the tourists who take the ferry really pay attention remains doubtful, as the video is only shown inside and most visitors tend to sit outside to enjoy the view. Upon arrival on the island there is also a poster on the "Exemplary Archipelago" (*l'archipel exemplaire*). At the bottom of this poster it is again mentioned that tourists would do a good deed by bringing their waste back to the mainland. Again this information is only provided in French (Picture 10). Talking about the tourists, one hotel owner said that they informed their guests about waste separation on the reservation or when tourists asked the hotel. Overall, most of their guests however knew where they could find containers for recyclables as they come frequently to Porquerolles (hotel 3, personal interview, July 6, 2015). As for the employees working in the restaurants and hotels across the island, most interviewees said it was a question of telling and training them (restaurant 8, personal interview, July 2, 2015; hotel 1, personal interview, May 29, 2015; hotel 4, personal interview, July 3, 2015). While they were rather confident this would be sufficient to make sure that they separate their waste, one restaurant owner said that her employees do not care and telling them is not sufficient. The only way to ensure that they separate their waste would be to watch over them (restaurant 7, personal interview, June 17, 2015). Two restaurant owners added that they felt they were lacking information from the municipality concerning waste separation (restaurant 8, personal interview, July 2, 2015; restaurant 9, personal interview, July 15, 2015).

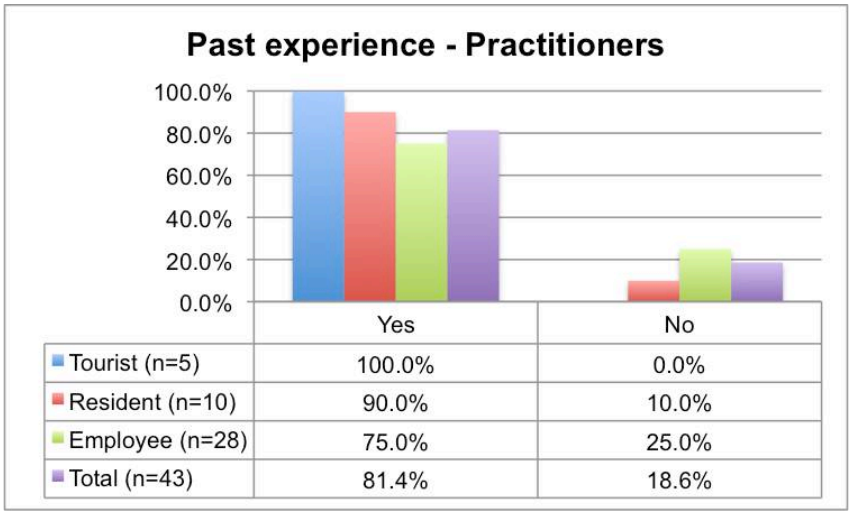


Picture 10: Poster Exemplary Archipelago

Knowledge does seem to be important when it comes to waste separation. Clearly, only if the people who do separate their waste also know how to do it properly will the final result be positive. Interestingly, there are still some practitioners and - less surprisingly -some non-practitioners who are somewhat unsure. Most doubts are around packaging waste such as plastics. Spreading knowledge is a question of clear communication. This becomes even more important considering how waste is separated can greatly differ from one place to the next (Sittomat representative, personal interview, June 22, 2015). The most immediate form of communication and possibly also the one, which reaches most people, is providing clear pictures on the containers on what is permitted and what is not. The majority of containers for recyclables on Porquerolles also include these pictures, while there are a few older containers who lack such clear instructions.

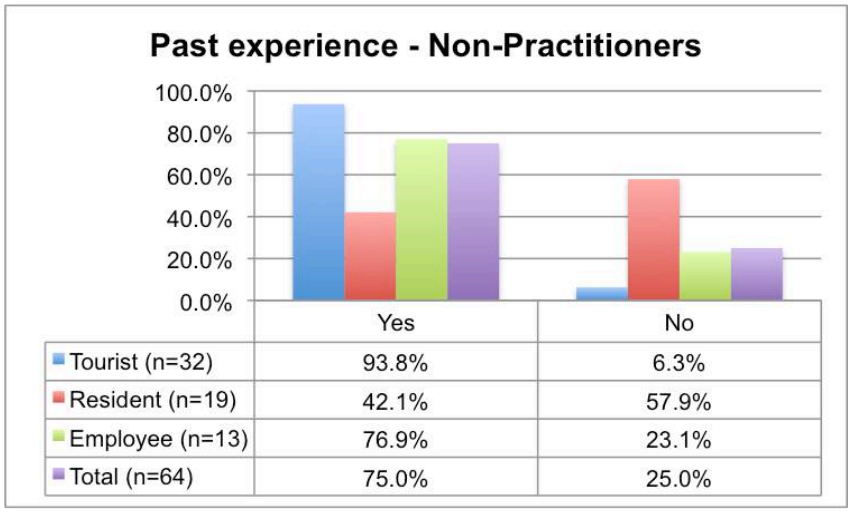
5.3.3.4. Past experience

The past experience looks at whether participants separate waste in their home at their primary residency. In order to check this all participants were asked whether or not at home they commit to waste separation. The prognosis was that those who do would also be more likely to follow the practice as tourist, resident or employee on Porquerolles, while those who do not might also not separate their waste elsewhere.



	Yes	No
Tourist (n=5)	100.0%	0.0%
Resident (n=10)	90.0%	10.0%
Employee (n=28)	75.0%	25.0%
Total (n=43)	81.4%	18.6%

Table 22: Past experience - Practitioners



	Yes	No
Tourist (n=32)	93.8%	6.3%
Resident (n=19)	42.1%	57.9%
Employee (n=13)	76.9%	23.1%
Total (n=64)	75.0%	25.0%

Table 23: Past experience - Non-Practitioners

The results do show that the majority of practitioners, ranging from 75% to 100% throughout the actor groups, do separate their waste at home (Table 22). When comparing practitioners and non-practitioners based on the total percentage of those participants who

do not separate their waste, the percentage for non-practitioners is slightly higher than the one of practitioners (Table 23). The questions that then come naturally are whether (1) practitioners and (2) non-practitioners differ in the arguments they provide as of why they do or why (3) practitioners and (4) non-practitioners do not separate their waste at home?

(1) Motives for waste separation at home among practicing tourists can roughly be divided into three categories: the availability of the facilities to separate, environmental considerations and because it is regarded as normal, a habit, a civil duty. Among residents one of the enabling factors mentioned was "because it is simple". One resident agrees that it is a "simple gesture". He confesses that he also does it so that his conscience is soothed and if it also contributes to something then it is good. However, he is not totally convinced it does. Also employees offered a set of similar reasons to the tourists and residents. These included structural possibilities, the environment as well as civil responsibility. (2) Motives for waste separation at home among non-practicing tourists can roughly be divided into five categories: financial reasons, the availability of the facilities to separate, environmental considerations, the legal obligation to separate and because it is regarded as normal, a habit, a civil duty. A non-practicing resident gave an interesting motivational factor. She said, "In Paris we know that waste separation is respected and that our effort leads to something. The big polluted cities motivate to separate waste." Another resident just said that where he lives they are asked to do it. Yet another resident said similarly that waste separation is a civil act. One resident provides a more detailed explanation: "It [waste separation] has become part of the lifestyle habits. We [people in general] have realized that it is better for the environment, which seems to be logical. Now we [people in general] wonder why we have not separated our waste before." Also employees separate their waste at home for environmental reasons or because where they live waste separation is obligatory. (3) Only employees who are practitioners but do not separate their waste at home offered additional comments. These were that they did not separate because by themselves they did not produce a lot of waste, a lack of structure, financial considerations, living on a boat, having other priorities, not seeing the environmental impact and time constraints. (4) A common explanation for not separating waste at home given by non-practitioners (tourists, residents and employees) is the lack of the necessary hardware for

or organization of waste separation. One resident said that with the exception of glass, there is no waste separation in the municipality they live in. She also feels a lack of knowledge on how to separate other waste types. Furthermore, one employee admits she does not separate her waste at home because it is not an obligation in the municipality she lives in.

According to the representative of Veolia, people who come to visit Porquerolles are usually very used to waste separation (personal interview, June 30, 2015). One of the hotel owner consents to this. He says, "Here we receive a lot of people from Paris. And in Paris waste separation already exists. It exists everywhere in France and the people are already used to it" (hotel 1, personal interview, May 29, 2015). Talking about his employees he also says that most of them are already used to separate their waste at home. He however points out that at work it is necessary to train them again on this matter as it is important to avoid mistakes (hotel 1, personal interview, May 29, 2015). Two other hotel and restaurant owners state that they are already used to waste separation as they also do it at their primary residency (hotel 2, personal interview, July 2, 2015; restaurant 3, personal interview, June 16, 2015).

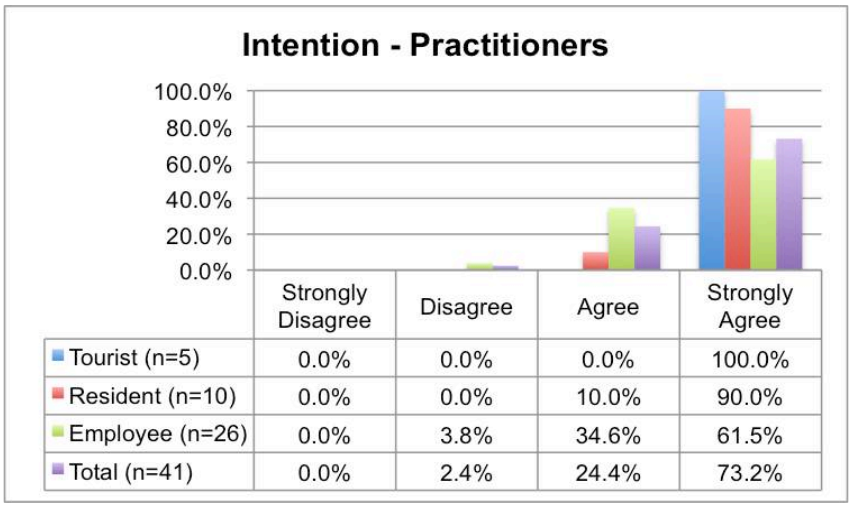
The past experience of participants and the reasons they provide as to why or why not they separate their waste at home can offer valuable ideas for Porquerolles as to what influences people to act one way or another. Throughout, the most repeatedly mentioned points for waste separation included structural facilities, environmental considerations, civil responsibility, habit, financial benefits and obligation. For those who do not separate their waste the reasons included a lack of structure, not seeing the environmental benefit, financial constraints, lack of space, time, knowledge and the obligation to separate. All of these reasons together provide a range of explanations as to why waste separation might not yet be as established on Porquerolles, and also offer a set of possibilities on how to improve it.

5.3.4. Intention

Finally, the last psychological factor investigated was to what extent the participants in their role as tourists, residents and employees intend to separate their waste. As in the theory, intention is regarded as a good predictor for waste separation; the expectation is

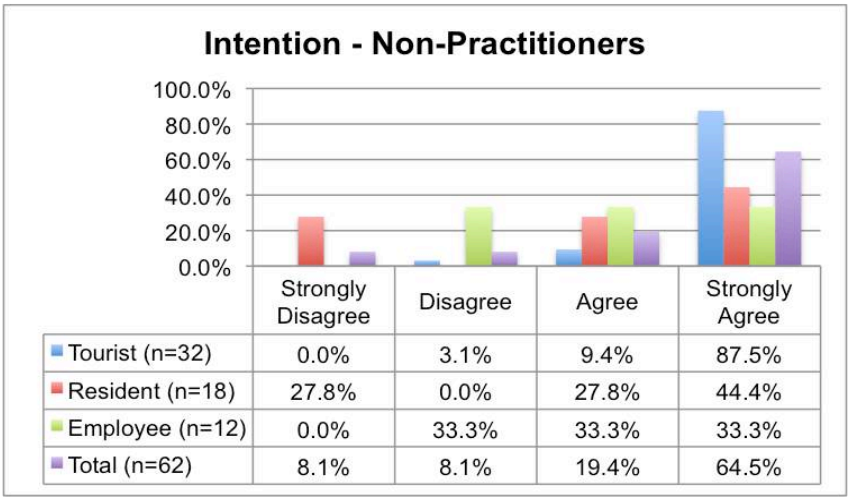
that the majority of practitioners lean to agree to intend separating their waste. At the same time, non-practitioners will have a low level of intention.

The data reveals that almost all practitioners (97,6%) lean towards agreement (Table 24). Furthermore, the percentage of non-practitioners who tend to disagree is at 16.2% (Table 25), compared to 2.4% for the practitioners. If the theory is correct, the 83.9% of non-practitioners who say that they intend to separate their waste offers a lot of potential to become future practitioners. Interestingly, the majority of non-practitioners who say that they either strongly disagree or disagree are to be found among residents (27.8%) and employees (33.3%). Looking at the qualitative data provided by the participants the comments are divided along (1) practitioners who tend to agree; (2) practitioners who tend to disagree; (3) non-practitioners who tend to agree; (4) non-practitioners who tend to disagree.



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=5)	0.0%	0.0%	0.0%	100.0%
Resident (n=10)	0.0%	0.0%	10.0%	90.0%
Employee (n=26)	0.0%	3.8%	34.6%	61.5%
Total (n=41)	0.0%	2.4%	24.4%	73.2%

Table 24: Intention – Practitioners



	Strongly Disagree	Disagree	Agree	Strongly Agree
Tourist (n=32)	0.0%	3.1%	9.4%	87.5%
Resident (n=18)	27.8%	0.0%	27.8%	44.4%
Employee (n=12)	0.0%	33.3%	33.3%	33.3%
Total (n=62)	8.1%	8.1%	19.4%	64.5%

Table 25: Intention - Non-Practitioners

(1) A logical answer among residents but also employees was that they were already separating their waste, so the question on their intention seemed superfluous to them. Furthermore, one resident said he intends to separate his waste, if he is sure that it is properly processed. If this is not the case his intention to separate will fade. Another resident elaborates that she has the space and the waste bins for this purpose. If she were living in an apartment she would not do it. Despite already separating his waste, one employee "would like to do it better". (2) Practitioners who tend to agree did not leave any supplementary data. (3) Non-practitioners who leaned towards agreement provided diverse answers. One tourist said "yes and no", adding if the possibility existed then he would agree. Other residents said in the future they would try to separate their waste. Interestingly, one resident who was categorized as non-practitioner said that he was already separating his waste. Among the employees, one said, "If the means are in place, yes. I will however not separate if everything lands in the same truck. Waste separation also demands time." For another employee separating his waste would depend on whether he is helped along the way. The kind of help he would require is however not specified. (4) Finally, one non-practising tourist who tended to disagree said, "waste separation is not possible". Other explanations by residents included that they do not intend to separate their waste if the truck mixes everything. Two residents were quite honest when they said that at the moment they did not intend to separate their waste, or at least their intention was not any higher than before. Finally, one employee said, "I would like to. It is not

because I lack the willingness. It is just that they [the place they work at] do not do it [separate waste]".

Only a few interviewees addressed the intention, talking merely about tourists. According to one hotel owner and the representative of the tourist office they regularly see the tourists who have separated their waste (hotel 3, personal interview, July 6, 2015; tourist information representative, personal interview, June 24, 2015). The representative of the tourist information centre describes the situation the following way: "There are many people who come here, also many pleasure boaters. Seen that we are located on the harbour we see them arriving. They separated their waste on their boat and afterwards they come here and ask 'Where can we throw away the glass, where the cardboard and where the plastics?'" (personal interview, June 24, 2015).

For some of the practitioners intention was almost equated with waste separation, which means that intention is indeed a good predictive factor. Intention was however also linked to whether or not the waste is properly processed, if the structural means and the space are available and if support is provided to guide them. While some participants were quite honest that they do not intend to separate their waste anymore than before, others vowed to improve in the future.

6. Conclusion and Recommendations

6.1. The research objective and research questions

The researcher would like to start this chapter by recapitulating the research objective and research questions. The empirical objective of this research was to understand how waste separation is shaped. Based on the work of Barr and Gilg (2007) , Mosler (2012) and van de Klundert and Anschütz (2001) a conceptual framework was developed, which argues that situational and psychological factors shape waste separation. The questions the framework raised were how situational and psychological factors respectively shape waste separation as well as how they mutually influence each other in the shaping process. Theoretically, a fourth research question was added, namely whether the conceptual framework developed is of value in the research of waste separation. While most questions have been discussed throughout the thesis, this chapter will provide the concluding answer per research question. Moreover, recommendations on how to advance waste separation on Porquerolles will be provided.

6.2. The relation between situational factors and waste separation

How do situational factors shape waste separation? While chapter 4 offered a detailed description on all the situational factors, the author will here critically synthesize the most important points.

The history of Porquerolles offers an explanation as to why today on such a small piece of land so many different authorities are present. In terms of waste separation this is not very favourable, as the harbour, the national park and the municipality can each autonomously decide which waste types they will collect and whether or not they will deploy a system for waste separation. Today, waste separation is the most advanced in the village, although it has to be pointed out that this is also not systematically the same throughout the village. The fragmentation stands in the way of creating a shared feeling of responsibility among all authorities to promote waste separation. Instead responsibility is now easily shifted between authorities. Although the municipality is responsible for collection - also in the harbour and in the national park - the municipality also depends on

the collaboration of the harbour and national park to implement waste separation on the rest of the island. In the charter of the national park, waste separation in the heart of the park is discussed, demonstrating a readiness for this. However, as discussed before, concrete implementation steps are missing. The only way waste separation is currently apparent in the national park is at the few places where containers from the national park and the municipality are deployed next to each other.

For actors this fragmentation is confusing. For an action to turn into behaviour it needs to be repeated recursively in order to establish a routinisation. When the solid waste management does not offer stability, routinisation is difficult to achieve. Residents and employees are mostly in contact with the same SWM system at their home and at their work, so routinisation might be easier for them. For tourists routinisation is however more difficult due to two reasons. First, they are subject to different systems, which look different and demand different actions in different parts of the island. Secondly, due to the fact that they are on Porquerolles for a limited amount of time, a routinisation is not easily established.

Right now France, just like every other EU Member State, is under pressure to reach the recycling targets. One essential step to reach these is by introducing waste separation. Although there is a politically favourable climate for waste separation it is not yet implemented everywhere. Citizens are also not obliged to separate their waste and no political measures are in place to promote it. At any rate, in the South of France, including Porquerolles, waste separation is rather novel and here the political climate might not yet be mature enough. Instead, as was pointed out, politicians are driven by political considerations, not wanting to create any dissatisfied citizens. The territorial reorganisation that will come into effect in 2016 in France has the potential to positively influence waste separation both from an institutional and a political point of view. Institutionally, all the responsibilities for SWM will be shifted to TPM. While currently Sittomat is already responsible for treatment, they expect that the TPM might also transfer the responsibility of collection to them. The first advantage this would have is that at least in all the TPM area one unified collection system could be deployed. How exactly this will affect Porquerolles is however uncertain, as the harbour and the national park will most likely retain the authority in their respective territories. The second, political advantage is

that Sittomat, being a private institute and therefore not elected by citizens, does not to have to make political deliberations. Beyond Porquerolles, a harmonised system on which waste types are separated and how in France or possibly throughout the EU would also be worth considering.

Whether or not waste separation throughout the entire island is "technically, environmentally and economically practicable and appropriate" also needs to be considered (European Commission, 2008, article 11, paragraph 1). Concentrating waste separation to the village and possibly extending it to the harbour may be a lot more sensible for three reasons. Firstly, the majority of waste is produced in these places. Secondly, the village and the harbour have a better infrastructure and are easily accessible. Thirdly, as they fall outside of the heart of the park, they are bound to less stringent environmental rules. From an economic view point, an analysis would be needed to calculate the costs involved such as more human resources, equipment and transport and monetary benefits that would incur if waste separation would be set up systematically in the village and the harbour. Right now the economic incentives are not yet in place to promote waste separation and people who currently separate their waste might not see any direct benefit. Instead, those people separate their waste mostly out of environmental considerations. The incentive tax has the potential to further advance waste separation by providing a financial benefit.

Storage in the form of waste bins and containers can be said to represent the physical nexus between the actor and the structure. At the container the waste leaves the actor and becomes the responsibility of the SWM system. On Porquerolles, the type of containers available varies a lot. This has again to do with the fragmentation discussed earlier. Focusing on containers for recyclables some effort has already been made to make them recognisable. Colour coding and pictures are a good way to tell people, which waste types goes into which container. However, a more harmonised system throughout the EU on the colour coding could also be useful, as this varies also between and within MS. The possibility of closing the lid and only providing a small slot to dispose of the recyclables is a good addition. This can increase the quality of recyclables as people might consider first what to dispose of. Providing businesses on the island with keys to the containers is then a good compromise so that waste separation does not cost them too much time. Overall, on

Porquerolles the grouping points for waste separation are not very well signposted and containers for recyclables are not very pleasing as they often overflow and are dirty. Both of which does not positively influence waste separation. On the mainland there are plans to implement underground storage containers. These offer many advantages. Firstly, they are aesthetically nicer and cleaner. Furthermore, they often offer the possibility to store a bigger volume. For Porquerolles, such underground containers would also be interesting, although it has been pointed out during interviews that they will most likely not be available on Porquerolles. The reason for this is that these containers also require special collection equipment, which would then have to be adapted to the terrain on Porquerolles. The one disadvantage closed containers bring is that waste collectors would have no possibility to control the quality of recyclables during the collection. Instead all recyclables would be collected separately. If the quality were low this would only become apparent at a later stage. Whether or not this makes a difference in the treatment process is unclear. However, if collectors collect the recyclables separately this might influence waste separation positively, as tourists, residents and employees could then no longer accuse the collectors of mixing the waste.

Collection for waste separation is already in place for plastic, cardboard/paper and glass waste and seems to be working. However, the rumour that during collection recyclables are mixed with non-recyclables discourages many people to separate their waste. It has been discussed that at times recyclables are indeed collected together with non-recyclables. The reason collectors do this is however not because of malice, but because the quality of recyclables is often very low. This then has to do with the fact that people do not separate their waste correctly. It is therefore important that all the actors on Porquerolles understand that their individual action will have an impact on the success of waste separation and information has to be shared that collectors do collect recyclables separately if the quality is satisfactory. In the past some research has been conducted on the feasibility to also collect organic waste separately. Especially in hotels and restaurants it would be good idea to capture this waste stream.

Little can be said about the influence of transfer and transport on waste separation. Clearly the transfer zone is bound to some environmental constraints due to its location in the national park. The possibility to store the recyclables on the island for a while offers the

possibility to reduce the transportation frequencies to the mainland, which are a big financial burden. Improving waste separation and compacting the recyclables as much as possible can further reduce transfer costs.

Concerning the treatment of recyclables, there seems to be an elaborated system in place. This impacts waste separation positively, as if no treatment would be available, waste separation would automatically become redundant. Nevertheless, it has to be pointed out that many actors still know little on how their waste is being treated. This implies that more awareness has to be raised on the process and the benefits of waste separation and recycling.

Finally, disposal has little direct impact on waste separation. Currently, incineration is reserved for non-recyclables or recyclables of low quality. Landfilling of non-dangerous waste is still possible at three sites in the department; all of them will have to close by 2020. The prospect that landfilling will no longer be a possibility in the future together with the plan of the incineration plant in Toulon to burn more of the waste from surrounding municipalities has the possibility to positively influence waste separation.

6.3. The relation between psychological factors and waste separation

How do psychological factors shape waste separation? This was the second sub-research question of this thesis. The expectation was that the researcher would find substantial differences between practitioners and non-practitioner concerning the psychological factors. In the end, the outcome was that practitioners and non-practitioners only differ slightly in the psychological factors. While the expectation did not hold, the result can still be regarded as being rather positive, as in the end the majority of actors showed to have a positive predisposition to waste separation. This means that there is a fertile ground to establish and advance waste separation.

The majority of participants agreed that them separating their waste would be good, while – with the exception of tourists who scored the same – less non-practitioners than practitioners thought this. Comparing the actor groups, residents and employees also scored lower than tourists. Clearly, asking about a person's intrinsic motives might provoke some socially acceptable answers and the feelings they attach to waste separation might not have been adequately measured through this factor. A possible explanation why

residents and employees score a little lower might be that they are more on the island and are therefore more confronted of how waste separation works or does not work on the island. In contrast, the reverse could be argued namely that because they are on the island for a longer time than the tourists, their emotional attachment to the island and therefore for waste separation should be bigger.

Throughout the participants, most disagreed that waste separation represented an effort to them. Interestingly, non-practitioners disagreed less with this statement, suggesting that for non-practitioners waste separation is an effort. Effort is a rather broad term. Through the conversation with participants the biggest obstacles identified for waste separation where space, time and structural facilities. While the structural facilities such as waste bins should, as argued, be the responsibility of the individual, the containers fall under the responsibility of the different authorities. Adequate containers for waste separation should therefore be deployed at numerous places offering each time the full spectrum of waste streams that are also treated: plastic, cardboard/paper and glass. Space and time are difficult obstacles to overcome. However, if the right incentives are in place and there are more benefits associated with waste separation than costs, space and time might not be so predominant anymore. Between the actor groups, employees disagreed least and tourists disagreed most that waste separation is an effort. Reasons for the tourists can be found in the fact that as of now waste separation is not targeted to them. Instead, waste separation is currently mostly meant for residents and businesses on the island. An explanation as to why for employees waste separation represents an effort might be that it is an additional task during their busy working hours. As was pointed out, once waste separation becomes a habit, a routinised action, the effort associated with waste separation could decrease.

Practitioners feel a higher sense of responsibility towards waste separation, than non-practitioners. While this might seem evident, surprisingly among the non-practitioners, tourists feel most personal responsibility and employees the least. This was rather unexpected as throughout the interviews, the comment was made more than once that tourists do not care about waste separation. The outcome for the tourists however shows that tourists do indeed feel responsible. Moreover, due to the fact that employees are acting in their working environment the expectation was that they would feel a greater

sense of responsibility because they might be obliged to behave a certain way by their superior. Why this expectation did not hold might be due to the fact that in the end they do not hold the responsibility but their managers do. Moreover, if waste separation is not implemented at their work, they will also not feel responsible for it.

The results for the descriptive norm – how many people in the entourage of the participants separate their waste – does not show any clear pattern. While for the tourists the percentage of those who said more than half did separate their waste was highest, the non-practitioners scored lower than practitioners. This goes along the expectation that for non-practitioners, less people in their entourage separate their waste. Turning to the other two actor groups, the percentage of employees who stated that more than half separated their waste was lower, while for the residents it was the lowest. Interestingly, for employees and residents more non-practitioners than practitioners said that more than half of their friends and family committed to waste separation. This outcome implies that whether or not the entourage does or does not separate their waste might not be a reliable factor in predicting whether a person will or will not separate their waste.

The injunctive norm, how many people in the entourage of the participants would find it important if they separate their waste, shows a similar outcome than the descriptive norm. Again most tourists said more than half of their entourage would find it important, showing a higher percentage among practitioners than non-practitioners. Fewer employees said this, while the pattern between practitioners and non-practitioners is the same as for tourists. Finally, even fewer residents said that more than half of their entourage would find it important. Interestingly, against the expectation that non-practitioners would show lower percentages than practitioners the outcome for the residents was reversed. The conclusion that is drawn from this is that the injunctive norm might also not be an adequate factor. An explanation as to why descriptive norm and injunctive norm do not shape waste separation could be that waste separation is not a conversational topic for many people.

Considering the positive impact of waste separation on the environment, the percentage of practitioners who do agree with this statement is higher than for non-practitioners for all three actor groups. Between the actor groups, most tourists agreed with this, followed by employees and finally residents. From the conversation with

participants it became apparent that there are still frequent doubts and uncertainties on the impact. A better knowledge of the whole process once the waste is collected until the treatment and the recycling is therefore needed to show what the environmental benefits of waste separation are. Interestingly, many participants said that the response efficacy also depended on whether or not everyone was separating their waste or not. This is certainly true, considering that even if one person separates their waste, if the quality of the recyclable in the container is low, all of it will be collected with the non-recyclables and eventually incinerated. Better knowledge of the process might already alleviate the problem and increase waste separation. However, with reference to the descriptive and injunctive norm, by making waste separation a conversational topic and nurturing the feeling of personal but most importantly common responsibility, waste separation can be advanced.

In general, participants agreed that they are confident that they can separate their waste. The difference was that more practitioners than non-practitioners tended to agree with this statement. Between the actor groups, all tourists agreed, followed by the majority of residents. In comparison, fewer employees agreed with the statement. Throughout the conversation many of the comments by participants was that their ability however strongly depended on the structural facilities as well as better knowledge on how to separate. The lack of these two could be an explanation as to why non-practitioners agreed less than practitioners with this statement.

The majority of participants agreed that they knew how to separate their waste, while again fewer non-practitioners than practitioners said so. Between the actor groups, tourists scored the highest followed by the employees and finally the residents. The most frequent source of knowledge came from the information provided on the containers or what participants were told to do. For some participants it was however unclear how waste is separated on Porquerolles and most uncertainty was felt for plastic waste. This implies that better information on how waste is separated on Porquerolles through for example clear indications on the lids would positively influence waste separation.

Whether or not participants separate their waste at home does also not show a consistent pattern. For tourists and residents more practitioners than non-practitioners said yes, at home they do separate their waste. For employees, slightly more non-

practitioners than practitioners said yes. From the comments left by participants some conclusions can be drawn as to why in the past participants have or have not separated their waste. This can provide ideas on how to promote waste separation on Porquerolles. Those who have separated their waste in the past, frequently mentioned structural facilities, civil responsibility, legal obligation, environmental and financial considerations as well as having made waste separation a habit as possible explanations for their actions. Those who said that in the past they have not separated their waste gave lack of space, knowledge, structural facilities as well as having other priorities or the fact that it is not an obligation as explanations.

Finally, more practitioners than non-practitioners agreed that they intended to separate their waste. Comparing between the actor groups the intention was highest among tourists, followed by residents and finally employees. Based on the theory, intention is a good predictor for waste separation. However, as the participants made clear, intention is not enough. Instead it depended on so many other, exclusively situational factors. These included how the process worked, space and structural facilities.

6.4. Recommendations

Based on the results from the situational and psychological factors, some recommendations can be provided as to how advance waste separation on Porquerolles.

- Clearer division of responsibilities between local authorities, possibly transferring all the responsibility to the municipality and eventually through TPM to Sittomat;
- Focus waste separation on the village and the harbour;
- Highly frequented places in the park should offer the possibility to separate waste or at least that in the village and harbour waste separation is possible;
- Make the places for waste separation more apparent and aesthetically pleasant. Consider whether underground containers would not be a good option for Porquerolles also with reference to the “Exemplary Archipelago”;
- Introduce separated collection of organic waste, at least in hotels and restaurants;
- Harmonization in France and possible at EU level of colour coding as well as which waste streams are separated and how;

- Implement the incentive tax as soon as possible as this has the possibility to drastically advance waste separation;
- Make use of positive psychological predisposition of actors on waste separation;
- Include tourists in waste separation;
- Promote bringing back waste to the mainland through a video/announcement on the ferry in multiple languages, printing it on the ferry ticket and other communication streams;
- Put in place adequate containers with the possibility to separate waste on the mainland upon arrival of the ferry;
- Increase knowledge on how waste is separated on Porquerolles and how recyclables are further collected and treated;
- Promote waste separation as a conversational topic;
- Create awareness that the success of recycling depends on the collective effort to separate waste.

6.5. The duality of situational and psychological factors in shaping waste separation

While focus of this research has been on how situational and psychological factors shape waste separation, the researcher was also interested to see how the factors mutually influence each other in the shaping process of waste separation. Although there was not a clear methodology developed to research this question, the interviews and questionnaires showed that situational and psychological factors are closely linked.

In this research, the influence of psychological factors on the situational factors became evident through the interviewees who regularly mentioned psychological factors such as instrumental beliefs, responsibility, knowledge and past experience. Situational factors however also influence psychological factors. This became most apparent through the questionnaires. Whenever questions were asked on psychological factors, participants often made reference to situational factors.

Whether or not these interviews and questionnaires are proof enough that situational and psychological factors mutually influence each other in the shaping process can be contested. What can however be deduced from the above is that in a research on

waste separation, psychological and situational factors cannot be researched in isolation from each other.

The findings showed that irrespective of separating waste or not, most participants depicted a positive psychological predisposition towards waste separation. Nevertheless, some still do not separate their waste. This automatically leads to the question what influences these participants. Based on the conceptual framework, we then turn to the situational factors. In the case of Porquerolles, situational factors might therefore be more influential in shaping waste separation. This does however not mean that the psychological factors are not important and can be neglected. Instead, based on the positive psychological predisposition across the participants this should be used as a fertile ground on which to advance waste separation. The favourable conditions should however not be missed, as in the future the psychological factors of the actors might be less advantageous. While this research focused on one very particular case, the researcher is hesitant to generalize the results and the overall positive psychological predisposition. While today's society is probably more conscious about the importance of waste separation and recycling, this conclusion is tentative and would require further research.

In the end, for waste separation to be further established on Porquerolles both routinisation and de-routinisation are needed. Seen that waste separation is still rather new on Porquerolles, it may not yet be fully routinised by all actors. Furthermore, for those actors who do not yet commit to waste separation, their current behaviour of no waste separation has to be de-routinised. Routinisation and de-routinisation require the appropriation of new meanings (psychological factors) and technologies (situational factors).

6.6. The conceptual framework

The conceptual framework developed for this research was based on the work of behavioural psychologists (Barr and Gilg, 2007; Mosler, 2012) and the ISWM model (van de Klundert & Anschütz, 2001). The framework appreciates the role of the individual actor with his or her psychological predisposition and situational factors in shaping waste separation. The framework therefore accounts for the complexity of the behaviour and allows studying and analyzing waste separation from various angles.

Whether or not all factors in the conceptual framework are equally relevant can be debated. For the situational factors the researcher would argue that all factors were important. The waste system aspects offered the possibility to analyze the context in which waste separation takes place, while the waste system elements covered the whole process after waste separation until the treatment. As this study is on waste separation, disposal did not necessarily have to be included. As for the stakeholders, the framework accounted only for two groups: the local authorities and the SWM service providers. For this research, these stakeholders were good starting points. However, through the course of the research a variety of other stakeholders were included, who in the end provided interesting insights. Turning to the psychological factors, the Cronbach's Alpha suggests that the factors of the subjective norm cover the concept rather well, while the ones for attitude and perceived behavioural control are not sufficient. This implies that the factors need to be further developed, tested and possibly new factors added. In any case, per factor multiple questions need to be included in the questionnaire to test the reliability of the answers and reduce the chance of socially desirable answers.

The situational and psychological factors of the conceptual frameowrk could be further operationalised by improving the methodological approach on how to measure them. The researcher chose to investigate three actor groups. While this has made the research more comprehensive and interesting, it has also increased the complexity in terms of data collection and analysis. While it is impossible to have the same questionnaire for all the actor groups, future research should ensure that especially the questions on the psychological factors are asked in a standardized way each time making reference to the actor's particular role.

In conclusion, while the framework is tailored to waste related topics and the factors need to be further refined, the research has contributed to studying behaviour and in the future other behaviours could possibly be researched with this framwork. Moreover, the research adds to the existing body of literature on waste separation, by providing insights into how it is shaped by situational and psychological factors. For Porquerolles, the research has succeeded in presenting a set of recommendations on how waste separation can be advanced on the island.

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Hotel 1 – Personal interview on May 29, 2015

Hotel 2 – Personal interview on July 2, 2015

Hotel 3 – Personal interview on July 6, 2015

Hotel 4 – Personal interview on July 3, 2015

Municipality representative 1 – Personal interview on June 16, 2015

Municipality representative 2 – Personal interview on June 23, 2015

Municipality representative 2 – Personal communication on October 1, 2015

Municipality representative 3 – Personal interview on June 29, 2015

National park representative 1 – Personal interview on June 5, 2015

National park representative 2 – Personal interview on July 9, 2015

Porquerolles Multi Services representative – Personal interview on June 6, 2015

Restaurant 1 – Personal interview on June 17, 2015

Restaurant 2 – Personal interview on June 27, 2015

Restaurant 3 – Personal interview on June 16, 2015

Restaurant 4 – Personal interview on July 4, 2015

Restaurant 5 – Personal interview on July 4, 2015

Restaurant 6 – Personal interview on July 15, 2015

Restaurant 7 – Personal interview on June 17, 2015

Restaurant 8 – Personal interview on July 2, 2015

Restaurant 9 – Personal interview on July 15, 2015

Restaurant 10 – Personal interview on June 15, 2015

Restaurant 11 – Personal interview on June 18, 2015

Sittomat representative – Personal interview on June 22, 2015

Sittomat representative – Personal communication on October 6, 2015

Tourist information representative – Personal interview on June 24, 2015

Veolia representative – Personal interview on June 30, 2015

Waste collector 1 – Personal interview on July 10, 2015

Waste collector 2 – Personal interview on July 12, 2015

Annex I – Background and socio-demographic information of participants

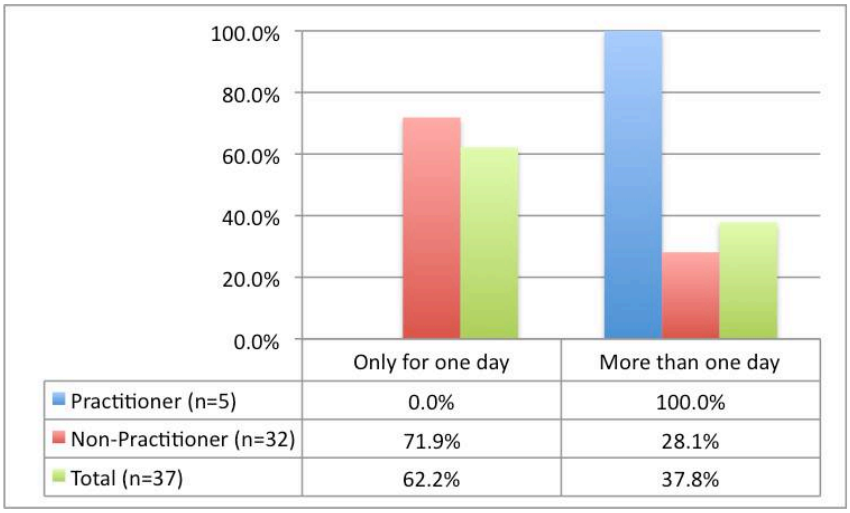
Background and socio-demographic information

The questionnaire started with a section that asked each actor group specific background questions and ended with personal information regarding socio-demographic aspects. The results of the background information will be presented separately per actor group as the type of questions asked differed. At the end of this section, the socio-demographics of all the participants will be presented, distinguishing between practitioners and non-practitioners as well as actor groups.

Background Information

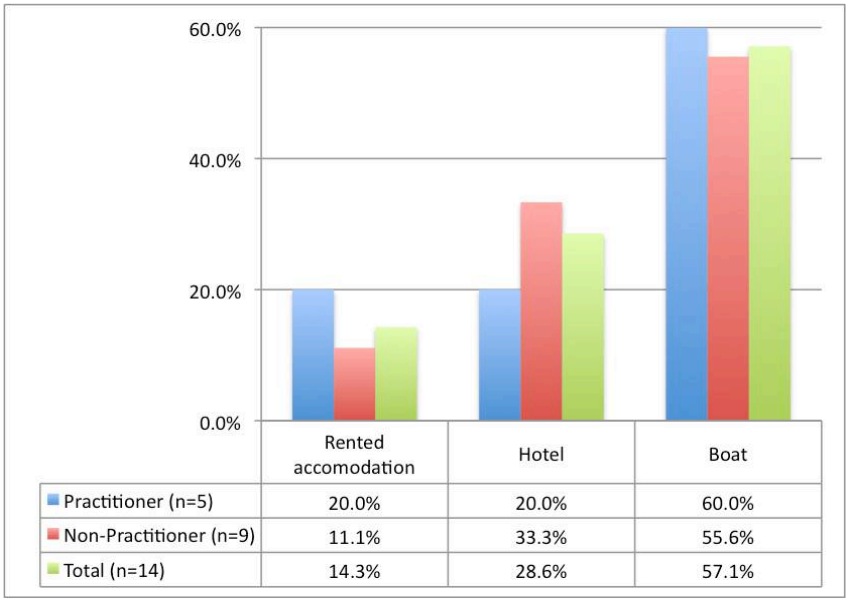
Tourists

Of the five tourist practitioners, all of them stayed on Porquerolles for more than one day. In comparison, most of the tourist non-practitioners reported to be staying only for the day (Table 26). For all the tourists who stayed more than one day the boat was the most common accommodation type irrespective whether they were practitioners or non-practitioners. Staying at a hotel or having rented an accommodation does not seem to vary a lot between practitioners and non-practitioners (Table 27). All the practitioners also stated that they had been on the island before. For the non-practitioners, the number of tourists who had not previously been on the island is slightly higher than for those who had (Table 28).



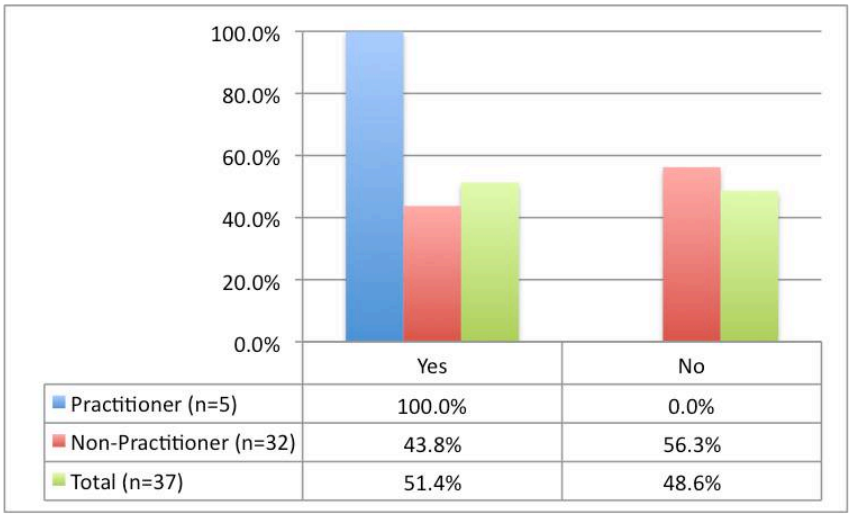
	Only for one day	More than one day
Practitioner (n=5)	0.0%	100.0%
Non-Practitioner (n=32)	71.9%	28.1%
Total (n=37)	62.2%	37.8%

Table 26: Tourists - Duration of stay



	Rented accomodation	Hotel	Boat
Practitioner (n=5)	20.0%	20.0%	60.0%
Non-Practitioner (n=9)	11.1%	33.3%	55.6%
Total (n=14)	14.3%	28.6%	57.1%

Table 27: Tourists - Type of accommodation



	Yes	No
Practitioner (n=5)	100.0%	0.0%
Non-Practitioner (n=32)	43.8%	56.3%
Total (n=37)	51.4%	48.6%

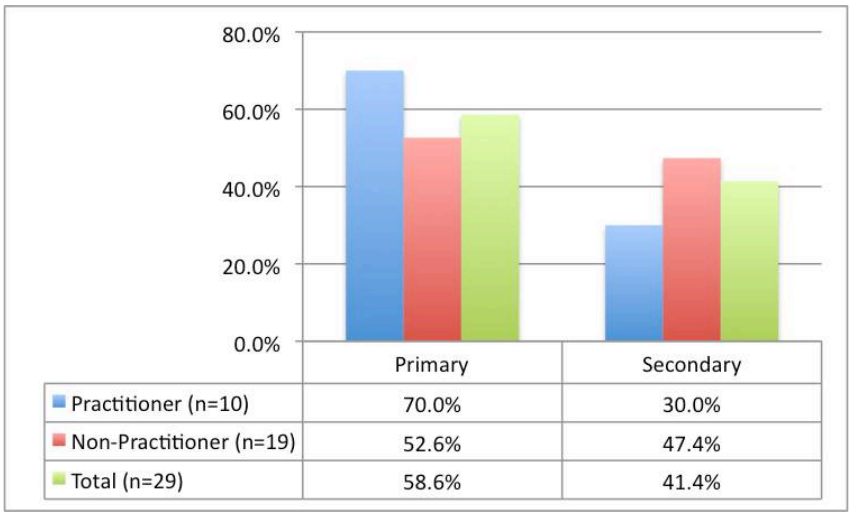
Table 28: Tourists - On Porquerolles before

While the accommodation type does not seem to show a clear influence on whether or not a tourist is a practitioner or a non-practitioner, it seems that staying more than one day or staying only for one day on Porquerolles, respectively correlate positively and negatively with waste separation. The results also suggest that all the tourists who had previously been on Porquerolles were also separating their waste. This might be due to the fact that because they are already acquainted with the island they know where they can separate their waste. As for the non-practitioners, the tourists who had and those who had not separated their waste was almost equally divided. If better knowledge of the island and its solid waste management structure explains why all the practitioners had also already been on the island before, the reason why the other tourists had not separated their waste was possibly due to a lack of knowledge. To increase the number of practitioners among tourists, a possibility would be to improve the visibility of the places where waste separation is possible.

Residents

Among the resident practitioners, most (70%) are primary residents (Table 29). Interestingly, among the non-practitioners the amount of primary and secondary residents is almost equally distributed. The expectation was that most primary residents would be practitioners due to their better knowledge of the SWM system and their greater connection to the island and most secondary would be non-practitioners due to the

opposite arguments. The results show that among secondary residents, the amount of practitioners is indeed low (30%). The assumption that most practitioners are among primary residents therefore holds (70%). Why are there however still so many non-practitioners among primary residents (52.6%)? A possible explanation for this is that although the primary residents live year-round on the island and therefore are also better acquainted with the workings of the solid waste management system, they might also be more disillusioned about by it.

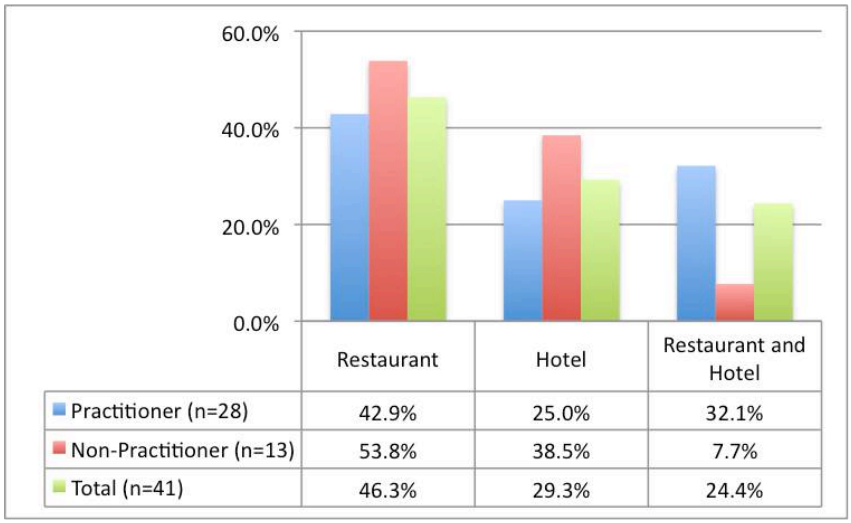


	Primary	Secondary
Practitioner (n=10)	70.0%	30.0%
Non-Practitioner (n=19)	52.6%	47.4%
Total (n=29)	58.6%	41.4%

Table 29: Residents - Primary/Secondary residency

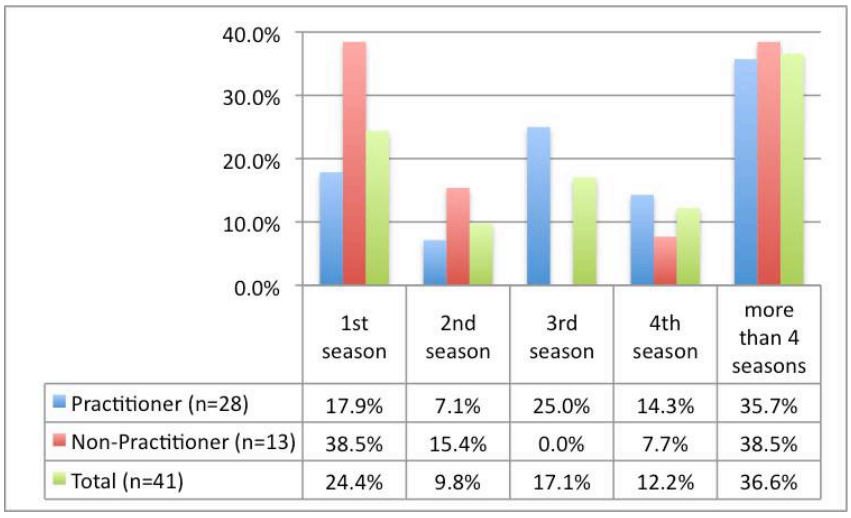
Employees

The background information gathered from the employees was about in which type of business they worked in and how many seasons they had already been working on Porquerolles. While the business type was not assumed to have an influence on waste separation the expectation was that most practitioners are the employees who worked already multiple seasons on the island, while non-practitioners should be more common among newer employees. Indeed the outcome reveals that there is no clear trend in the business type among practitioners and non-practitioners (Table 30). Nevertheless, the questionnaire did show that practitioners are mostly found among employees that have been working on Porquerolles for three or more seasons. However, the distribution among non-practitioners is not conclusive and does not match the previous expectation that most should be among the less experienced employees (Table 31).



	Restaurant	Hotel	Restaurant and Hotel
Practitioner (n=28)	42.9%	25.0%	32.1%
Non-Practitioner (n=13)	53.8%	38.5%	7.7%
Total (n=41)	46.3%	29.3%	24.4%

Table 30: Employees – Business type



	1st season	2nd season	3rd season	4th season	more than 4 seasons
Practitioner (n=28)	17.9%	7.1%	25.0%	14.3%	35.7%
Non-Practitioner (n=13)	38.5%	15.4%	0.0%	7.7%	38.5%
Total (n=41)	24.4%	9.8%	17.1%	12.2%	36.6%

Table 31: Employees - Number of seasons already working on Porquerolles

Socio-demographic Information

The socio-demographic information gathered from the participants included their country of origin, gender, year of birth, level of education and income. While there was not a real expectation on whether socio-demographics shape waste separation, past research suggests that people that are more involved in environmental behaviour, such as waste separation are "younger, female, well educated and high earning" (Barr & Gilg, 2007, p. 364). Furthermore, as the setting of the case is in France, the prediction was that the majority of practitioners would live in France. Whether or not the socio-demographic data gathered confirms this or shows a different trend will be discussed below.

Country of residence

The figures show, without exception, that all the 40 practitioners (100%) live in France (Table 32). However, looking at the figure of the non-practitioners the conclusion that is drawn that the majority (91.9%) also live in France (Table 33). The fact that almost all of the residents and employees, who participated in the questionnaire, live in France clearly influences this outcome. Nevertheless, this is again not surprising due the setting of the case study. A more diverse picture would be expected from the tourists. The four additional countries of residence that were mentioned by tourists – other than France – were Belgium, Italy, Australia and Canada. When considering only the tourists, the conclusion can be drawn that those who have their country residence outside of France are likely to be non-practitioners, while French tourists are either practitioners or non-practitioners. That foreign tourists will most likely be non-practitioners can be explained by the fact, that every country has their own solid waste management system requiring citizens to act differently. For this reason tourists do not know how to correctly dispose of their waste when they come to France or even Porquerolles. The difference between France with far away countries such as Australia and Canada might be rather big. However, also within the EU between the Member States there is not one harmonized system. But even for French tourists the way waste is separated on Porquerolles might not be clear, as also regions differ in the way they collect their waste (Sittomat representative, personal interview, June 22, 2015).

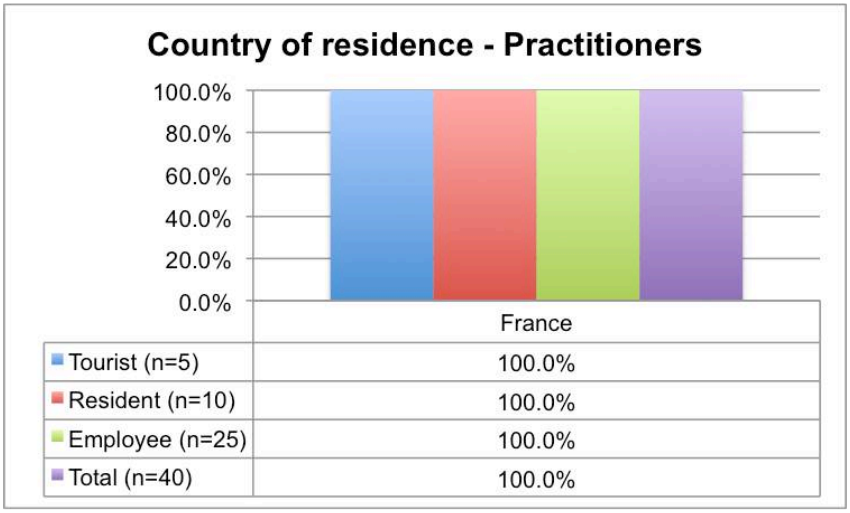
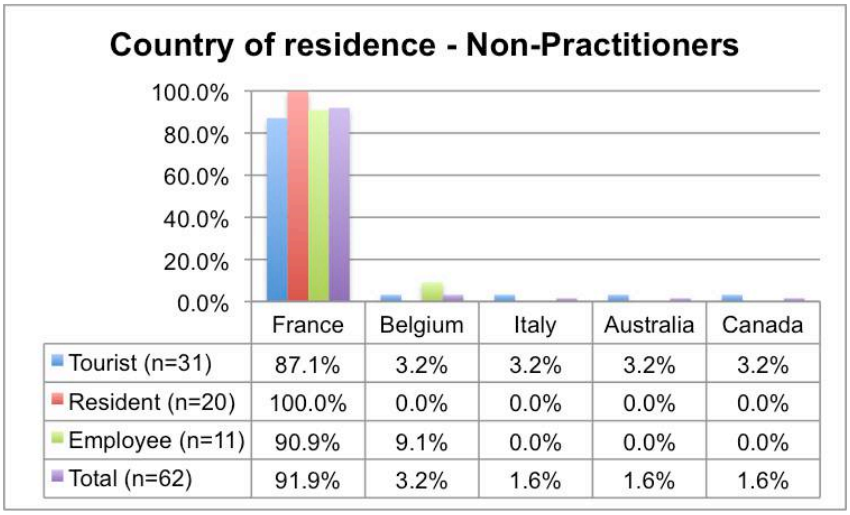


Table 32: Country of residence - Practitioners

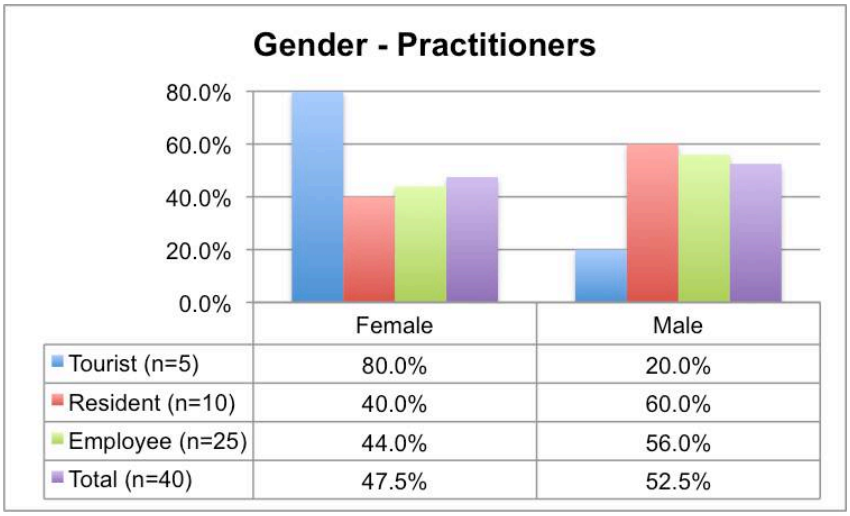


	France	Belgium	Italy	Australia	Canada
Tourist (n=31)	87.1%	3.2%	3.2%	3.2%	3.2%
Resident (n=20)	100.0%	0.0%	0.0%	0.0%	0.0%
Employee (n=11)	90.9%	9.1%	0.0%	0.0%	0.0%
Total (n=62)	91.9%	3.2%	1.6%	1.6%	1.6%

Table 33: Country of residence - Non-Practitioners

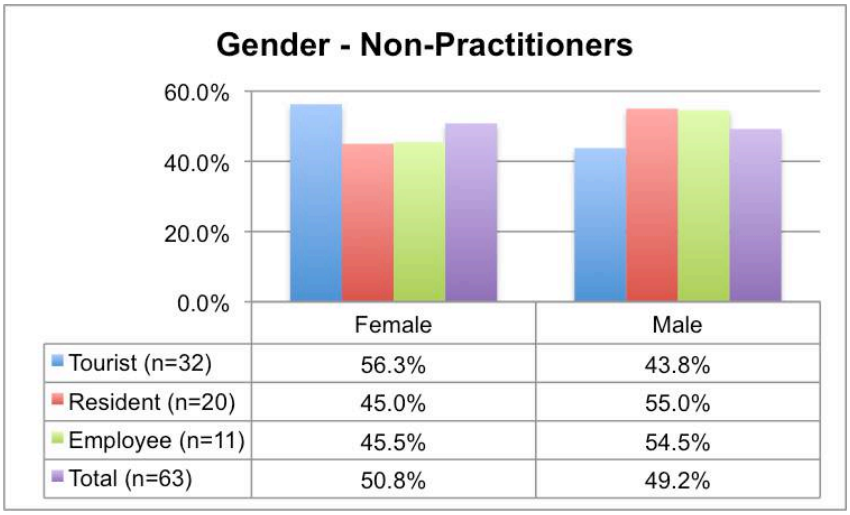
Gender

Do women really tend to separate their waste more than men? According to the data, the percentage of females and males are almost equally divided among practitioners and non-practitioners (Table 34, Table 35). This means that for this case study the conclusion that women show a more environmental friendly behaviour in terms of waste separation cannot be made. On the contrary, there are even somewhat more male practitioners (52.5%) and female non-practitioners (50.8%). Only tourists show to have a greater amount (80%) of female practitioners and somewhat less male non-practitioners (43.8%).



	Female	Male
Tourist (n=5)	80.0%	20.0%
Resident (n=10)	40.0%	60.0%
Employee (n=25)	44.0%	56.0%
Total (n=40)	47.5%	52.5%

Table 34: Gender - Practitioners

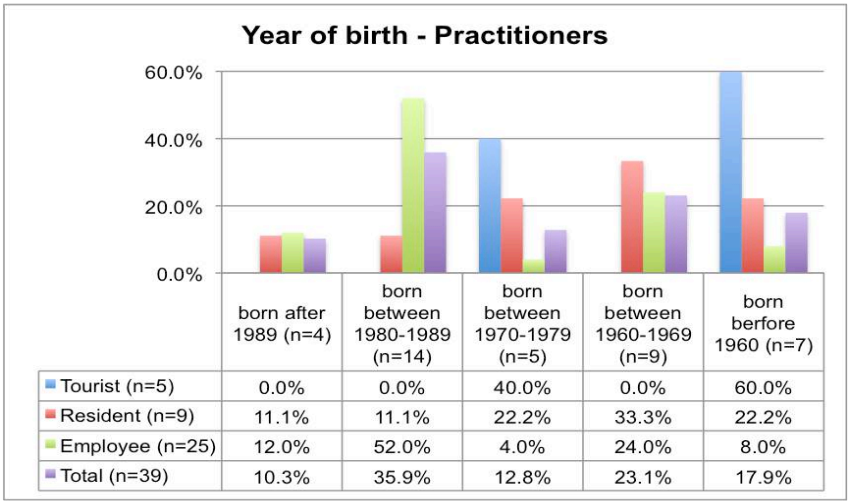


	Female	Male
Tourist (n=32)	56.3%	43.8%
Resident (n=20)	45.0%	55.0%
Employee (n=11)	45.5%	54.5%
Total (n=63)	50.8%	49.2%

Table 35: Gender - Non-Practitioners

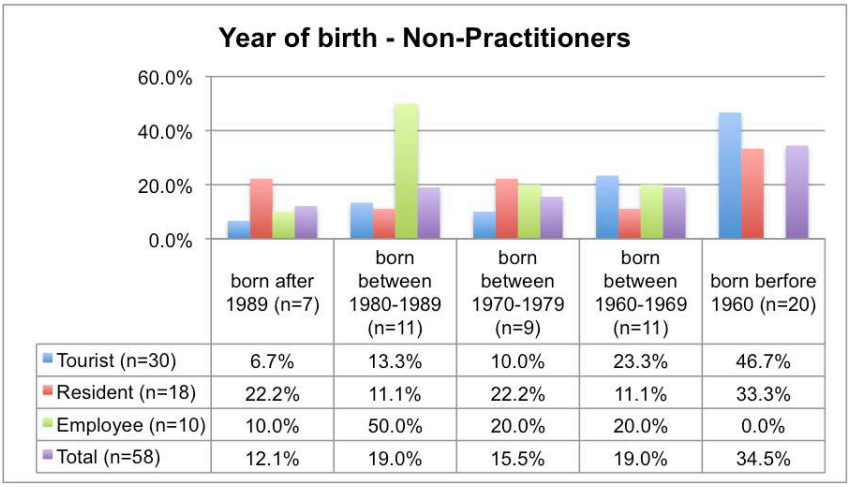
Year of Birth

Taking the two younger year of birth groups (born after 1989 and born between 1980-1989) and the two older year of birth groups (born between 1960-1969 and born before 1960) together, the data does suggest that more practitioners are younger (46.2%) instead of older (41%) and that among non-practitioners there are more older generations (53.5%) than younger ones (39%). When distinguishing between the three actor groups, only the older non-practicing tourists (70%) and residents (44.4%) as well as the younger practicing employees (64%) fit the prognosis. Overall this leads to the conclusion, that age is not an adequate predictor if a person does or does not separate his or her waste.



	born after 1989 (n=4)	born between 1980-1989 (n=14)	born between 1970-1979 (n=5)	born between 1960-1969 (n=9)	born berfore 1960 (n=7)
Tourist (n=5)	0.0%	0.0%	40.0%	0.0%	60.0%
Resident (n=9)	11.1%	11.1%	22.2%	33.3%	22.2%
Employee (n=25)	12.0%	52.0%	4.0%	24.0%	8.0%
Total (n=39)	10.3%	35.9%	12.8%	23.1%	17.9%

Table 36: Year of birth - Practitioners

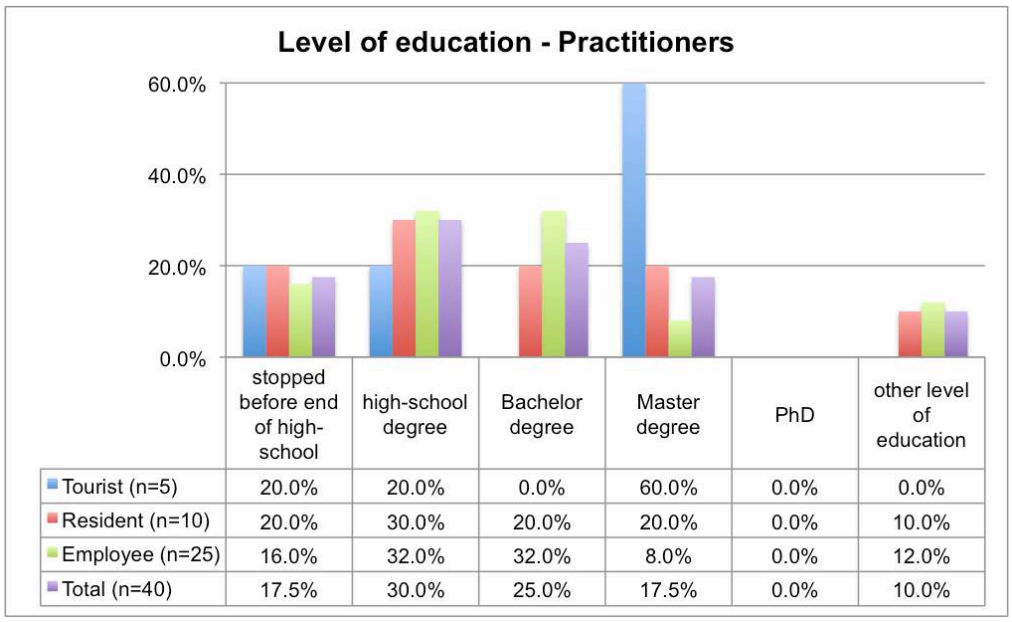


	born after 1989 (n=7)	born between 1980-1989 (n=11)	born between 1970-1979 (n=9)	born between 1960-1969 (n=11)	born berfore 1960 (n=20)
Tourist (n=30)	6.7%	13.3%	10.0%	23.3%	46.7%
Resident (n=18)	22.2%	11.1%	22.2%	11.1%	33.3%
Employee (n=10)	10.0%	50.0%	20.0%	20.0%	0.0%
Total (n=58)	12.1%	19.0%	15.5%	19.0%	34.5%

Table 37: Year of birth - Non-Practitioners

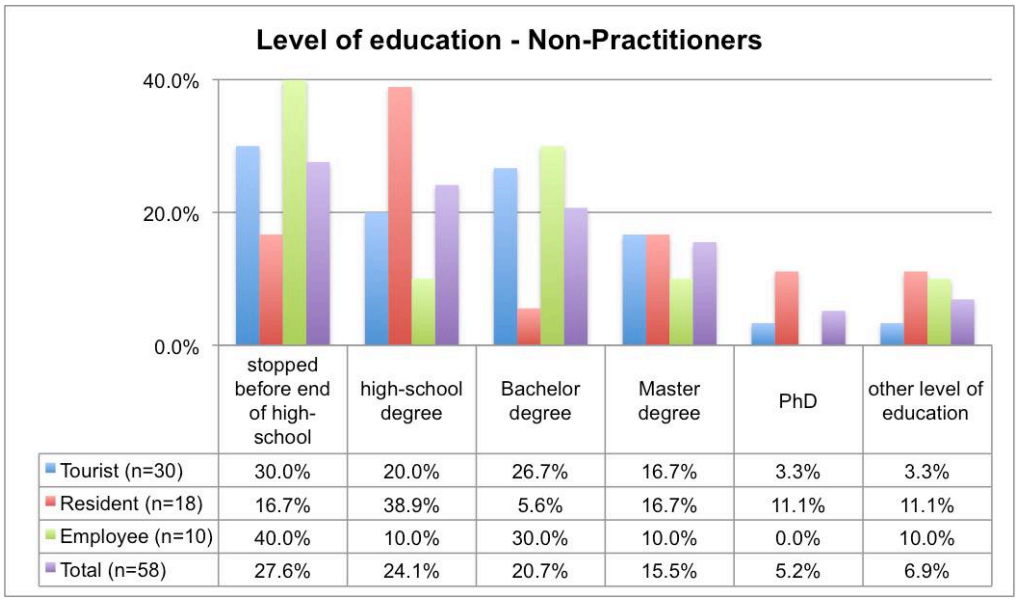
Level of education

Does the level of education a person has really influence their behaviour? The theory implies that people with a higher level of education would rather separate their waste than those with a lower level education. Here a higher level of education is regarded as having three or more years of supplementary education after high school (Bachelor degree and higher), while a lower level of education is regarded to as a high-school degree or lower. The figures show that the percentages are not conclusive (Table 38, Table 39). Considering all the actor groups, the percentage of practitioners and non-practitioners are almost equally divided among those with a lower and those with a higher level of education. Only the non-practitioners with a lower level of education (51.7%) show a slightly higher percentage than those with a higher level (41.4%). Zooming in on the three actor groups, the tourists are the only ones who fit the expectation with 60% of practitioners having a higher level of education (compared to 40% with a lower level) and 50% of non-practitioners having a lower level (compared to 46.7%). The difference in percentages is however not high enough to convince that the education level really does have an impact. Residents show the biggest difference in percentages among non-practitioners, suggestion that more (55.6%) have a lower level of education than a higher one (33.4%). Only non-practicing employees with a lower education level (50%) compared to 40% with a high level fit the prognosis. Overall, the data however does not depict a clear trend.



	stopped before end of high-school	high-school degree	Bachelor degree	Master degree	PhD	other level of education
Tourist (n=5)	20.0%	20.0%	0.0%	60.0%	0.0%	0.0%
Resident (n=10)	20.0%	30.0%	20.0%	20.0%	0.0%	10.0%
Employee (n=25)	16.0%	32.0%	32.0%	8.0%	0.0%	12.0%
Total (n=40)	17.5%	30.0%	25.0%	17.5%	0.0%	10.0%

Table 38: Level of education - Practitioners



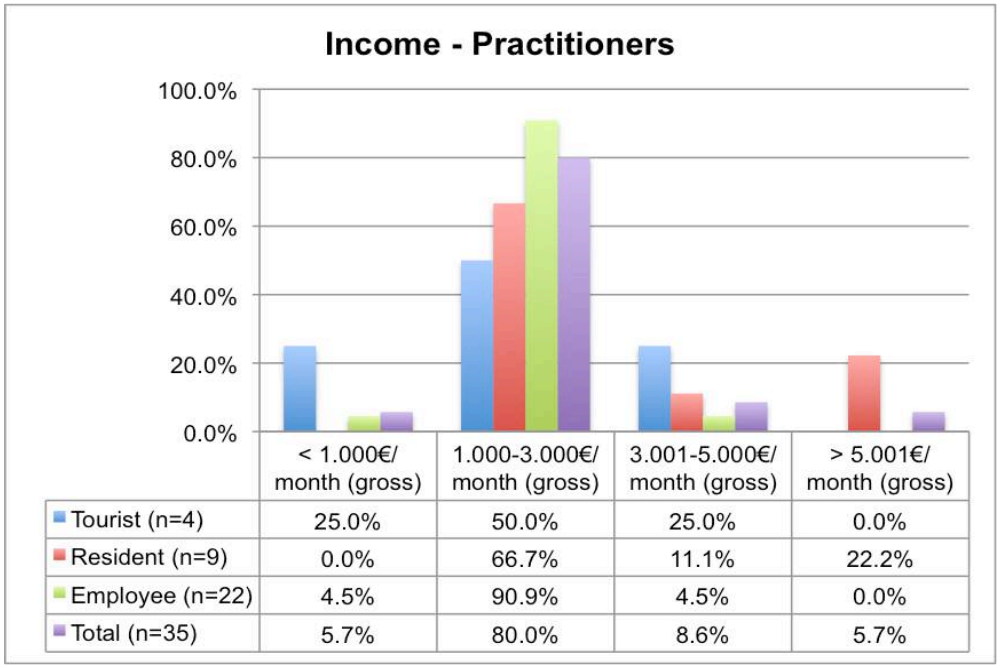
	stopped before end of high-school	high-school degree	Bachelor degree	Master degree	PhD	other level of education
Tourist (n=30)	30.0%	20.0%	26.7%	16.7%	3.3%	3.3%
Resident (n=18)	16.7%	38.9%	5.6%	16.7%	11.1%	11.1%
Employee (n=10)	40.0%	10.0%	30.0%	10.0%	0.0%	10.0%
Total (n=58)	27.6%	24.1%	20.7%	15.5%	5.2%	6.9%

Table 39: Level of education - Non-Practitioners

Income

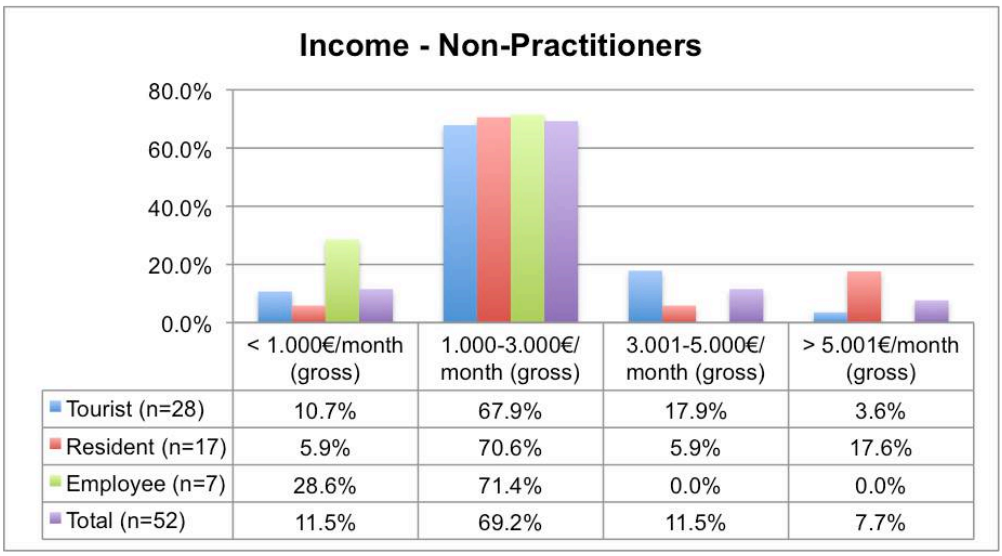
Moving to the last socio-demographic: income. Based on the theory, people with a higher income (above 3.001 €/month (gross)) are likely to be practitioners, while those with a lower income (less than 3.000 €/month (gross)) would be non-practitioners. As the tables show, most participants said that they earned between 1.000-3.000 €/month (gross) (Table 40, Table 41). As asking about income is a sensitive question, the income groups

were kept rather big. Retrospectively, they were possibly a bit too broad to investigate whether income really does shape waste separation. Taking this into considerations, the data does suggest that the majority of non-practitioners (80.7%) have a lower income. The same applies to non-practitioners in the three actor groups: tourist (78.6%), residents (76.5%) and employees (100%). As already pointed out, due to how low and high is defined in this research, saying that the majority of non-practitioners have a low income would therefore be premature. Whether or not income therefore has an impact cannot be established. Instead, a better definition of what low and high income is and more detailed data would be necessary in a future study to see whether and how they correlate. Whether or not participants will reveal this data however remains to be seen.



	< 1.000€/ month (gross)	1.000-3.000€/ month (gross)	3.001-5.000€/ month (gross)	> 5.001€/ month (gross)
Tourist (n=4)	25.0%	50.0%	25.0%	0.0%
Resident (n=9)	0.0%	66.7%	11.1%	22.2%
Employee (n=22)	4.5%	90.9%	4.5%	0.0%
Total (n=35)	5.7%	80.0%	8.6%	5.7%

Table 40: Income - Practitioners



	< 1.000€/month (gross)	1.000-3.000€/ month (gross)	3.001-5.000€/ month (gross)	> 5.001€/month (gross)
Tourist (n=28)	10.7%	67.9%	17.9%	3.6%
Resident (n=17)	5.9%	70.6%	5.9%	17.6%
Employee (n=7)	28.6%	71.4%	0.0%	0.0%
Total (n=52)	11.5%	69.2%	11.5%	7.7%

Table 41: Income - Non-Practitioners

The relation between socio-demographics and waste separation

The theory states that the participant who is young, female, has a high level of education and earns a good income is likely to demonstrate pro-environmental behaviour such as separating their waste. This suggests that most participants, who are older, male, have a lower level of education and do not earn so much would tend to not separate their waste. The question that this raises is whether, taking gender to the side, a lot of young people also have a high level of education and income. Instead, one could reason that a better education level and a higher income gradually increase, as one gets older. The socio-demographic data collected among the participants suggest that gender, year of birth, level of education and income do not show a convincing the relation to waste separation. When grouping the young (born after 1979), female participants with a high education level (Bachelor or higher) and a high income (more than 1.000€ gross/month) together the outcome does also not support the theory. Instead out of the 10 that fulfil the above criteria, more than half (60%) were non-practitioners. Important to note is that, while before high-level of income was defined to be more than 3.000 €/month gross, here also those with an income of more than 1.000€/month gross were included.

The only socio-demographic that leads to believe that there is a relation with waste separation, is the country of residence. Participants who are from abroad are exclusively non-practitioners, while all participants are French. But clearly the group of foreign

practitioners is rather small, making it difficult to draw general conclusions on this. As there are also a number of non-practitioners who reside in France, it would be interesting to see where in France they live, seen that Poulet suggests that even within France the solid waste management system and therefore also how waste is separated can change from one commune to the next.

Annex II – Item List Interviews

Local authorities and solid waste management service providers

Name of Interviewee		**Date**	
Organisation		**Location**	
Email address		**Start time**	
Phone			
Additional Information			

Interview Partners		**PN**	**VH**	**SIT**	**VEO**	
1.	**Introduction (< 5 minutes)**					
1.1.	Is it ok for you if I record this interview? *Start recording.*					
1.2.	Thank-you very much for your time.					
1.3.	I am very glad that I can talk to you today, because I am very interested in what you have to say.					
1.4.	My name is Alix Reichenecker, I am Master student of Wageningen University and I currently doing my research for my thesis on topic of waste separation on Porquerolles.					
1.5.	The interview will take about 1 hour.					
1.6.	The data of this interview will be used for my thesis.					
1.7.	Is it ok for you if I cite you in my thesis? Would you prefer to cite you personally or the organisation you present?					
1.8.	*For you: check and enter starting time.*					
1.9.						
2.	**Personal Information (< 5 minutes)**					
2.1.	Can you tell me about your own position and responsibility within _____?					
2.2.	Can you tell me about the work of _____?					
2.3.	What role does _____ play in terms of waste management on Porquerolles?					
2.4.	What are your responsibilities in terms of the waste produced in the public space on Porquerolles?					
2.5.						
3.	**Current Situation (5 minutes)**					
3.1.	How much waste is produced on Porquerolles per year? (or in Hyères if distinction not possible) - Per waste type if possible					
3.2.	How much does the amount of waste produced change over the year?					
3.3.	Is there a clear difference in amounts produced in the summer versus the winter months?					
3.4.	How much do tourists influence the production of waste?					

3.5.	Would you say that the tourists on Porquerolles influence the work of _____ in terms of solid waste management? - If yes, how so?					
3.6.						
4.	**Current Problems (5 minutes)**					
4.1.	What are the current problems for _____ in terms of waste management on Porquerolles?					
4.2.	From the standpoint of _____ what is the current problem with regards to tourists and waste on Porquerolles?					
4.3.						
5.	**Current Policies (10 minutes)**					
5.1.	By 2015, France wants to increase recycling of household waste by 45% and to reduce waste production by 7%. - How much on target are you with these goals? - How does this influence the tourists?					
5.2.	There is a departmental plan on the prevention on non-hazardous waste for the department of Var. - Were you involved in its creation? If yes, how?					
5.3.	According to the *Code de l'environnement* there should be a local programme on the prevention of household waste by 2012. I read that there have been some delays in its establishment. Does Hyères already have such a programme? - If yes what does it entail? If no, what are the plans for this in the future - Does it mention anything about Porquerolles and/or tourists?					
5.4.						
6.	**Collaboration with other stakeholders (< 5 minutes)**					
6.1.	How are the responsibilities concerning solid waste management on Porquerolles divided between the different stakeholders? o Stakeholders to probe for: municipality of Hyères, national park of Port Cros, Sittomat, Veolia Proprete, TLV, NGOs (WWF, Ecol'eau), tourist information, harbour, hotels, restaurants, tourists					
6.2.						
7.	**Littering/Separation (10 minutes)**					
7.2.	How do ensure waste separation? - Are there mechanisms in place to increase waste separation?					

	○ Incentives/information/fines - Do you have a different approach for the different actor groups? - If yes, why?	
7.3.	Have there been studies that you know of on waste separation (on Porquerolles)? - If yes, what was the outcome of the results	
7.4.	How successful would you say are the different actor groups in terms of separating their waste appropriately? - What do you think is the biggest challenge? - How would you suggest overcoming this?	
7.5.		
8.	**Technical: Collection/Transfer/Transport/Treatment/Disposal/RRR (10 minutes)**	
8.1.	What happens once the waste is thrown away?	
8.2.	How often is the waste collected? - How does this change over the year?	
8.3.	How is it brought to the continent?	
8.4.	How is the waste treated?	
8.5.	Do you have contracts on how much waste needs to be produced?	
8.6.	Is the quality of the waste collected better in summer or in winter?	
8.7.	Do you collect and treat all waste types or only specific ones?	
8.8.		
9.	**Environment (< 5 minutes)**	
9.1.	From an environmental point of view, what pressures does waste cause for Porquerolles? - Air/soil/water	
9.2.	Does waste affect the health of the people on Porquerolles?	
9.3.		
10.	**Finances (5 minutes)**	
10.1.	How is waste management on Porquerolles financed? - Who pays what: state, municipality, residents, hotels, restaurants, businesses, national park, tourists	
10.2.	Since 2014, *tarification incitative* for waste production is obligatory in France. Is it already implemented here?	
10.3.	Do you make revenue from waste management? - How?	

10.3.	Do you make revenue from waste management? - How? - How much?	
10.4.		
11.	**Suggestions (<5 minutes)**	
11.1.	How would you suggest increasing waste separation on Porquerolles?	
12.	**Additional information**	
12.1.	Ask if wants to add something	
13.	**Thank for time**	
13.1.	Provide own contact details again Ask if interested to receive thesis once finished (in English)	
13.2.	Ask if can contact them again if I need some clarifications on their answers > check if you have all the contact details (fill in above)	

PN – Parc National (national park), VN - Ville d'Hyères (city of Hyères), SIT – Sittomat, VEO - Veolia

Restaurant and Hotel Owners

1. Introduction
    - Provide information on research and how information will be used
2. Personal information
    - Can you tell me a little bit more about the restaurant/hotel?
    - Can you tell me a bit more about your role?
    - How many people do you serve?
    - How many people work here?
    - Are you open throughout the year?
3. Waste management
    - What is your role within the hotel/restaurant in terms of waste management?
4. Current situation
    - How much waste do you currently produce (how many times per day do you have to go to the containers?)
    - Do you pay an incentive tax?
5. Waste separation
    - Do you separate waste your waste in your hotel/restaurant?
    - What kind of facilities do you have within your hotel/restaurant to separate waste?
    - What kind of facilities doe you have outside of your hotel/restaurant to separate your waste?
    - Do you share these containers with others?
    - What type of waste can you separate?
    - Do you know since waste separation is possible on Porquerolles?
    - Do you have the feeling that your employees are paying attention to this?
6. Additional questions
    - Did you participate in MED 3R?
    - What kind of obstacles do you see for your hotel/restaurant in terms of waste separation?
    - How would you recommend to improve the current waste separation system on Porquerolles?
    - How do you see the future of waste separation on Porquerolles?
7. Closing
    - Would you like to add something?
    - Can I note your name and function?
    - Ask for permission to cite in thesis.

Annex III – Codebook Interviews

Code	Code Info
aluminium waste	Quotations on aluminium waste (cans)
bulky waste	Quotations on bulky waste
cardboard/paper waste	Quotations on cardboard/paper waste
collection	Quotations on the collection of waste by Veolia
Composterre	Quotations on Composterre
descriptive norm	Quotations in which others behaviour is evaluated
disposal	Quotations on waste that is not being treated for recycling
Eco-emballages	Quotations on Eco-emballages
Ecogestes	Quotations on Ecogestes
Ecol'eau	Quotations on Ecol'eau
employees	Quotations referring to employees of hotels/restaurants
environmental aspects	Quotations on environmental aspects on Porquerolles influencing waste separation
financial/economic aspects	Quotations on financial/economic aspects around waste separation on Porquerolles (costs, taxes, etc.)
future	Quotations that refer to the future
general info on restaurant/hotel	Quotations that give general information on the restaurant/hotel. This can include information on how long it is open, how many clients they serve and how many people work there
geographical aspects	Quotations on the geographical aspects of Porquerolles having an influence on waste separation
glass waste	Quotations on glass waste
harbour	Quotations referring to the harbour of Porquerolles as a site or authority
historical aspects	Quotations on the history of Porquerolles
household waste	Quotations on household waste (ordures ménagères). This also includes what can be classified as household waste coming from restaurants/hotels. This waste is not separated but includes all the residue that remains after separating other waste materials.
injunctive norm	Quotations that give an indication of how people important to the interviewee value their behaviour
institutional aspects	Quotations on the cooperation between different stakeholders (distribution of functions and responsibilities)
instrumental belief	Quotations on the costs (time, money) and benefits of performing a certain way

intention	Quotations that give an indication of how hard people are willing to try, or how much of an effort they are planning to exert, in order to separate their waste
intrinsic motives	Quotations on the feeling a person gets from separating their waste
knowledge	Quotations that indicate the knowledge available on, required for or transmitted (information) on waste separation
MED 3R	Quotations on the MED 3R project
municipality	Quotations referring to the municipality of Hyères-les-Palmiers as authority
national park	Quotations referring to the national park of Port-Cros as a site or authority
obstacles	Quotations that refer to the current obstacles existing around waste separation
oil waste	Quotations on oil waste
organic waste	Quotations on organic waste
other waste	Quotations on other waste types
past experience	Quotations that refer to waste separation that has occurred in the past
personal responsibility	Quotations that refer to the duty a person feels on how he/she should behave
plastic waste	Quotations on plastic waste
pleasure boaters	Quotations on pleasure boaters
PMS	Quotations on PMS
political/legal aspects	Quotations on the formal legal framework in which waste separation is set
prevention	Quotations on the prevention of waste production
reason for waste separation	Quotations that give reasons why waste is separated
reason no waste separation	Quotations that give reasons why waste is not separated
reception centre	Quotations on the reception centre
resident	Quotations on residents of Porquerolles
response efficacy	Quotations on the belief a person has that him/her separating his/her waste will have some tangible impact on the environment
self-efficacy	Quotations that refer to the ability to separate waste
separation	Quotations on waste separation in general
Sittomat	Quotations on Sittomat, responsible for the treatment of recyclables

socio-demographics	Quotations on socio-demographics (age, gender, income, education level, country of residence)
sorting centre	Quotations on the sorting centre on the mainland
storage	Quotations on the storage facilities for recyclables
tourists	Quotations referring to tourists on Porquerolles
transfer zone	Quotations on the transfer zone on Porquerolles
transfer/transport	Quotations on the transfer/transport of waste
treatment	Quotations on the treatment of recyclables
Veolia	Quotations referring to Veolia (responsible for waste collection and the treatment of recyclables at the sorting centre)
waste production	Quotations that refer to the volume of waste produced

Annex IV – Questionnaires

Section A - Information and Language

>>> This section was the same for all the actor groups. <<<

A1.1. Enter respondent number:

A1.2. Enter date and time:

A1.3. Ce sondage fait partie d'une étude sur Porquerolles et dura seulement 5 minutes. Afin que les résultats de ce sondage sont précis, il est très important que vous répondiez aux questions honnêtement et par vous-même.

Section B – Work

>>> This section differed per actor group. <<<

B1.1. A Porquerolles, dans quelle sorte d'entreprise travaillez vous?

1 Restaurant
2 Hôtel
3 Autre

B1.2. Please specify the other:

B1.3. Depuis combien de saisons est-ce que vous travaillez déjà sur Porquerolles?

1 première saison
2 deuxième saison
3 troisième saison
4 quatrième saison
5 plus que quatres saisons

Section C - Solid waste management system at work

>>> This section focused on the SWM system on the public area and accomodations for tourists and at home for residents. <<<

C1.1. Sur votre lieu de travail, est-ce que vous faites le tri de différents types de déchets?

1 Oui
2 Non

C1.2. Extra information given:

C2.1. Quels types de déchets est-ce que vous triez sur votre lieu de travail?

1 Carton/Papier
2 Verre
3 Plastique/Emballage

4 Organique/Déchets verts
5 Déchets mixtes/Ordures ménagers

C2.2. Extra information given:

C3.1. Est-ce que vous pouvez me dire pourquoi vous faites le tri de déchets sur votre lieu de travail?

C4.1. Est-ce que vous pouvez me dire pourquoi vous ne faites pas le tri de déchets sur votre lieu de travail?

C5.1. A votre avis, comment est-ce que le tri des déchets sur votre lieu de travail pourait elle être amélioré?

Section D – Behaviour

>>>This section differed between actor groups. For tourists it focused on waste separation in the public area or their accommodation and for residents it focused on waste separation at their residence on Porquerolles. <<<

D1.1. Avez-vous produit des déchets aujourd'hui ou hier au travail?
1 Oui
2 Non

D2.1. Quelle sorte de déchet avez vous produit?
1 Carton/Papier
2 Verre
3 Plastique/Emballage
4 Organique/Déchets verts
5 Déchets mixtes/Ordures ménagers

D2.2. Extra information given:

D3.1. Comment est-ce que vous vous êtes débarrassé de vos déchets?
1 J'ai jeté le déchet dans la poubelle (ne dit rien sur le tri)
2 J'ai jeté le déchet dans la poubelle pour ce type de déchets (mentionne le tri)
3 Autre manière

D3.2. Extra information given:

D4.1. Est-ce que vous avez trié vos déchets?
1 Oui

2 Non

D4.2. Extra information given:

D5.1. Pouvez-vous me dire pourquoi vous avez trié vos déchets?

D6.1. Pouvez-vous me décrire la poubelle dans laquelle vous avez jeté vos déchets?

D7.1. Pouvez-vous me dire pourquoi vous n'avez pas trié vos déchets?

D8.1. A la maison, est-ce que vous triez vos déchets?
>>> past experience <<<
1 Oui
2 Non

D8.2. Extra information given:

D9.1. Quels sont les types de déchets que vous triez à la maison?
1 Carton/Papier
2 Verre
3 Plastique/Emballage
4 Organique/Déchets verts
5 Déchets mixtes/Ordures ménagers

D9.2 Extra information given:

D10.1. Quelles sont les raisons pour lesquelles vous ne faites pas le tri de vos déchets à la maison?
D11.1. Quelles sont les raisons pour lesquelles vous faites le tri de vos déchets à la maison?
>>>This question was missing for the employees but was asked to tourists and residents.<<<

Section E - Behavioural factors
A quel point êtes vous en accord ou en desaccord avec les déclarations suivantes:
>>> The same questions were asked for tourists and residents. While the questions for the residents were also targeted to their role, this was only done for the intention factor for the tourists. <<<

E1.1. A quel point êtes-vous d'accord avec cette déclaration: En tant qu'employé(e)l, je sens une responsabilité personnelle de trier mes déchets sur mon lieu de travail.
>>> personal responsibility <<<
1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)

4 Fortement en accord (++)

E1.2. Extra information given:

E2.1. A quel point êtes-vous d'accord avec cette déclaration: En tant qu'employé(e), ça me coûte beaucoup d'effort de trier mes déchets sur mon lieu de travail.
>>> *instrumental belief* <<<
1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)
4 Fortement en accord (++)

E2.2. Extra information given:

E3.1. A quel point êtes-vous d'accord avec cette déclaration: En tant qu'employé(e), je pense que ça sera bien que je tri mes déchets sur mon lieu de travail.
>>> *intrinsic motives* <<<
1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)
4 Fortement en accord (++)

E3.2. Extra information given:

E4.1. A quel point êtes-vous d'accord avec cette déclaration: En tant qu'employé(e), je pense que le tri de mes déchets sur mon lieu de travail a un impact positif sur l'environment.
>>> *response efficacy* <<<
1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)
4 Fortement en accord (++)

E4.2. Extra information given:

E5.1. Dans quelle mesure êtes-vous d'accord avec cette déclaration: En tant qu'employé(e), je suis persuadé que je peux trier mes déchets sur mon lieu de travail.
>>> *self-efficacy* <<<
1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)
4 Fortement en accord (++)

E5.2. Extra information given:

E6.1. Dans quelle mesure êtes-vous d'accord avec cette déclaration: En tant qu'employé(e), je sais comment trier mes déchets sur mon lieu de travail.
>>> *knowledge* <<<

1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)
4 Fortement en accord (++)

E6.2. Extra information given:

E7.1. A quel point êtes-vous d'accord avec cette déclaration: En tant qu'employé(e), j'ai l'intention de trier mes déchets sur mon lieu de travail.
>>> *intention* <<<

1 Fortement en désaccord (--)
2 En désaccord (-)
3 D'accord (+)
4 Fortement en accord (++)

E7.2. Extra information given:

E8.1. Combien de personnes qui sont importantes pour vous (famille, amis) trient leurs déchets?
>>> *descriptive norm* <<<

1 Aucun (0 sur 10 personnes)
2 Quelqu'uns (1-4 sur 10 personnes)
3 La moitié (5 sur 10 personnes)
4 Presque tout le monde (6-9 sur 10 personnes)
5 Tout le monde (10 sur 10 personnes)

E8.2. Extra information given:

E9.1. Combien de personnes qui sont importantes pour vous (famille, amis) est-ce que vous pensez trouveraient ça important que vous triez vos déchets sur votre lieu de travail?
>>> *injunctive norm* <<<

1 Aucun (0 sur 10 personnes)
2 Quelqu'uns (1-4 sur 10 personnes)
3 La moitié (5 sur 10 personnes)
4 Presque tout le monde (6-9 sur 10 personnes)

5 Tout le monde (10 sur 10 personnes)

E9.2. Extra information given:

E10.1. Pouvez-vous me dire pourquoi vous pensez qu'il est important que vous en tant qu'employé(e) triez vos déchets sur votre lieu de travail?

Section F - Personal Information
>>> This section was the same for all the actor groups. <<<

F1.1. Dans quel pays habitez vous?

F1.2. Select gender
1 Femme
2 Homme

INSTRUCTION FOR YOU: Give the interviewee the tablet. Ask them to fill in the subsequent information.

F1.3. Année de naissance (par exemple 1976):

F1.4. Sélectionnez votre plus haut niveau de formation:
1 J'ai arrêté avant le bac
2 Baccalauréat
3 Bachelor (Brevet) (Bac +3 ans)
4 Master (Bac +5 ans)
5 Docteur
6 Autre niveau d'éducation

F1.5. Pourriez-vous indiquer votre dernier niveau de formation:

F1.6. Sélectionnez le groupe de revenu qui correspond à vous:
1 moins que 1,000 € par mois (nette)
2 1,000 - 3,000 € par mois (nette)
3 3,001 - 5,000 € par mois (nette)
4 plus que 5,001 € par mois (nette)

Section G - Thank you and save
>>> This was the same for all the actor groups. <<<

G1.1. Merci beaucoup pour votre temps et pour vos réponses. Je vous souhaite encore une bonne journée. Vous pouvez maintenant rendre la tablette.

G1.2. Est-ce que vous pourriez me présenter à quelqu'un d'autre qui travaille dans la gastronomie ou dans un établissement hôtelier sur Porquerolles?

G1.3. In case you want to add some extra information concerning this interview, you can do it here:

G1.4. Save the questionnaire under Employee_#!