

Perceptions of stakeholders

Regarding plastic in the marine environment



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Bibi Brongers

Miriam Vorenhout



Perceptions of stakeholders

“Bachelor thesis report on the perceptions of stakeholders in the Netherlands which are involved with plastic in the marine environment”

Bachelor thesis

Authors

Bibi Brongers
Miriam Vorenhout

Supervisors

Patrick Bron (VHL)
Peter Smit (VHL)
Joana Mira Veiga (EUCC)

Van Hall Larenstein

Agora 1, 8934 CJ, Leeuwarden

Coastal & Marine Union (EUCC)

P.O. Box 11232, 2301 EE, Leiden

Date

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Contact

bibi.brongers@wur.nl
miriam.vorenhout@wur.nl

Reference cover page

Plastic Ocean, 2010



Preface

After six months of work, our thesis report of the bachelor 'Integrated Coastal Zone Management', given at Van Hall Larenstein University of Applied Sciences in Leeuwarden, is ready to be read. The subject of marine plastics is really interesting for us as we think it is a really concerning issue. Plastic does have a huge impact on the marine environment and the situation can definitely be improved. This is why we have chosen to do research on the plastic problem in the marine environment, related to the involved stakeholders. Hopefully, the report will contribute to further developments within this subject.

Even though this has been the last project of the bachelor, we still learnt a lot during the graduation process. The cooperation between the two of us went very well and it has been pleasant working together during our bachelor thesis. We complemented each other really well which made us a great team.

The thesis has been written in order of the EUCC in Leiden, which we experienced as pleasant. We would like to thank the people from the EUCC for giving us the opportunity to fulfil our bachelor thesis within this organisation. Our thanks especially go out to Joana M. Veiga, our supervisor from the EUCC. She supported us during the whole project and showed us her curiosity about the subject, the results, the process and also about our personal wellbeing. She has been a great help to us with all her enthusiasm, it was great cooperating with her.

Our thanks also go out to our internal supervisors of the Van Hall Larenstein University, Patrick Bron and Peter Smit. We were looking forward to the meetings and enjoyed all of them. The given feedback and the critical questions asked by our supervisors during the meetings made us think and led to improvements of our report. We learned a lot from them and are very thankful for sharing their knowledge with us.

Last but not least, we would like to thank all the respondents of the research. We are very grateful that those people wanted to participate in our research. Without them, we could not have fulfilled our aim.

We hope you will enjoy reading our report. If there are any questions do not hesitate to contact us by the contact details which can be found at the beginning of the report.

Bibi Brongers and Miriam Vorenhout

20th of August 2013, Leeuwarden

Summary

Marine litter is cited by UNEP as *“Any persistent, manufactured or processed solid material discarded, disposed of, or abandoned in the marine and coastal environment”*, and includes metal, glass, paper, cardboard, processed wood, cloth and plastic. This report focuses mainly on the plastic fraction of marine litter. It seems that plastic is a large threat to marine life and causes many problems since it is not fully biodegradable. Many different stakeholder sectors in the Netherlands are involved in the plastic issue but it is unclear what the perceptions of these stakeholders are regarding plastic in the marine environment. The aim of this study was an overview of the perceptions of stakeholders in the Netherlands regarding the issue of plastic in the marine environment, related to individual opinions, level of awareness, behaviour and the responsibility of the stakeholders; visions of companies within the plastic life cycle; and the behaviour, opinions and responsibility within companies of the plastic life cycle from a company perspective. The different stakeholders are divided in nine stakeholder sectors: design and manufacturing; retail; coastal and marine industry; waste management; government and policy making; environmental organisations; media; education; and general public. The first four stakeholder sectors are included within the plastic life cycle. Quantitative data was collected by a stakeholder survey and the results were analysed using the statistical programme IBM SPSS Statistics 20. Frequencies were measured and the used tests were bivariate correlations, with the outcome of Spearman's Rho. Qualitative data was gathered by a literature study on the visions of companies within the plastic life cycle and interviews were conducted with companies within the plastics life cycle. This information was analysed by the method tagging.

Regarding the results, opinions of stakeholders regarding marine litter as individual within all stakeholder sectors show that the majority is aware of the problem and that they are concerned with the issue. Also interviewed companies which are part of the plastic life cycle are aware of marine plastics. Most stakeholders within the sectors indicate marine litter more as a future threat rather than an already present one. Factors that are most contributing to marine litter are the inadequate behaviour of public, single use-/throw away products, plastic in packaging and coastal industries. According to the results on the level of awareness, the degradation time of plastic and the percentage of plastic within marine litter seem underestimated among the majority of all stakeholder sectors. Environmental organisations seem most aware of these aspects. The aspect all stakeholder sectors are aware of is the threat of marine litter to the marine environment. Carrying out behavioural activities to reduce marine litter is easy and likely for the majority within all stakeholder sectors. Asking people to pick up their litter and buying reusable products rather than single use products are considered to be least easy. It is least likely stakeholders will carry out these two actions, as well as supporting government on marine litter. The environment and sustainability seems to be high rated aspects within the policy of companies within the plastic life cycle and these companies seem to work according their sustainable visions. The stakeholder sector that is seen as the most responsible for reducing marine litter by the majority of all stakeholder sectors is the design and manufacturing sector. According to the majority of the interviewed companies, the sectors of the companies have no or low responsibility for causing marine plastics but are willing to take responsibility regarding reducing the problem. Stakeholders from the sectors within the plastic life cycle and the general public indicate each other as most responsible. The government and policy makers are considered to be most competent and environmental groups are considered to be most motivated according to the majority of the stakeholder sectors.

Recommended is to increase the awareness by a better informing and education process among all stakeholder sectors. Further research to the contribution of several factors to marine litter is recommended so cooperation with the involved stakeholders can take place to find ways to improve the situation. Business cases of companies should more focus on the subject of marine litter so a win-win situation can be reached. Also stakeholder meetings about the responsibility of stakeholders should be organised to create collaboration between stakeholders, so the problem of marine plastics can be reduced. Also the motivation of stakeholders from the government and policy makers and the design and manufacturing sector should be increased.

Samenvatting

Marien zwerfvuil is geciteerd door UNEP als *“Elk persistent, geproduceerd of bewerkt vast materiaal, wat is weggegooid, vernietigd of achtergelaten in het kust en mariene ecosysteem”*. Zwerfvuil bestaat uit metaal, glas, papier, karton, bewerkt hout, doek en plastic. In dit rapport ligt de focus op plastic. Plastic blijkt een grote bedreiging voor het leven in zee en veroorzaakt verschillende problemen omdat plastic niet volledig biologisch afbreekbaar is. Veel verschillende partijen in Nederland zijn betrokken bij het probleem, maar het is onduidelijk wat de opvattingen van deze stakeholders zijn met betrekking tot plastic in zee. Het doel van dit onderzoek was een overzicht van de opvattingen van stakeholders in Nederland met betrekking tot mariene plastics, gerelateerd aan de individuele meningen, bewustzijnsniveau, gedrag en verantwoordelijkheid van de stakeholders; visies van bedrijven binnen de levenscyclus van plastic; en de meningen, gedrag en verantwoordelijkheid van bedrijven binnen de levenscyclus van plastic. De stakeholders zijn ingedeeld binnen negen sectoren: ontwerp en productie; detailhandel; kust- en maritieme industrie; afval management; overheid en beleidsmakers; milieu organisaties; media; educatie; en het algemene publiek. De eerste vier sectoren behoren tot de levenscyclus van plastic. Kwantitatieve data is verzameld met behulp van een stakeholder enquête. De resultaten zijn vervolgens geanalyseerd met het statistische programma IBM SPSS Statistics 20. Frequenties zijn berekend en de gebruikte test was de biviaat correlaties met de uitkomst van Spearman's Rho. Kwalitatieve informatie is verzameld door middel van literatuur studie over de visies van bedrijven binnen de levenscyclus van plastic en door middel van interviews met een aantal van deze bedrijven. De resultaten zijn vervolgens geanalyseerd met de methode labelen.

Betreffende de resultaten, meningen van stakeholders met betrekking tot marien zwerfvuil als individueel binnen alle sectoren laten zien dat de meerderheid bewust is van het probleem en dat ze bezorgd zijn om de kwestie. Ook geïnterviewde bedrijven die onderdeel zijn van de plastic levenscyclus zijn zich bewust van mariene plastics. De meeste stakeholders binnen de sectoren zien marien zwerfvuil meer als toekomstige bedreiging dan als een al huidig probleem. Factoren die het meest bijdragen aan marien zwerfvuil zijn het ontoereikende gedrag van het publiek, wegwerp producten, plastic in verpakkingen en kust industrieën. Volgens de resultaten van het bewustzijnsniveau, lijken de afbraaktijd van plastic en het percentage van marien plastic binnen marien zwerfvuil onderschat te worden onder de meerderheid van alle stakeholdersectoren. Milieuorganisaties lijken het meest bewust van alle aspecten. Het aspect waar stakeholders zich wel bewust van lijken te zijn is de bedreiging die marien zwerfvuil is voor het mariene milieu. Het uitvoeren van gedragsactiviteiten om mariene plastics te reduceren is gemakkelijk en aannemelijk voor de meerderheid binnen alle stakeholdersectoren. Mensen vragen om hun vuil op te rapen en het kopen van herbruikbare producten in plaats van wegwerp producten zijn overwogen als minst gemakkelijk. Het is ook het minst aannemelijk dat de stakeholders deze activiteiten zullen uitvoeren, samen met de aanmoediging van de overheid op het gebied van marien zwerfvuil. Het milieu en duurzaamheid blijken hoog gewaardeerde aspecten binnen het beleid van bedrijven die onderdeel zijn van de plastic levenscyclus en de bedrijven lijken te werken naar aanleiding van hun duurzame visies. De stakeholdersector die als meest verantwoordelijk wordt gezien door de meerderheid van de stakeholdersectoren voor het reduceren van marien zwerfvuil is de ontwerp- en productie sector. Volgens de meerderheid van de geïnterviewde bedrijven, heeft hun eigen sector geen of een lage verantwoordelijkheid voor het veroorzaken van mariene plastics. Maar de bedrijven willen wel verantwoordelijkheid nemen waar mogelijk om het probleem te reduceren. Stakeholders van de sectoren binnen de plastic levenscyclus en het algemene publiek achten elkaar als verantwoordelijk. De overheid en beleidsmakers zijn aangewezen als meest competent en milieuorganisaties zijn aangewezen als meest gemotiveerd van alle stakeholdersectoren.

Aangeraden is om het bewustzijn te verhogen onder alle stakeholdersectoren door educatie en een betere informatie verspreiding. Verder onderzoek naar bijdragende factoren aan marien zwerfvuil is aangeraden zodat samenwerking met bijhorende stakeholders plaats kan vinden om manieren te vinden die bijdragen aan het verbeteren van de situatie. Business cases van bedrijven zullen meer moeten focussen op het onderwerp van marien zwerfvuil zodat een win-win situatie gecreëerd kan worden. Ook stakeholderbijeenkomsten zouden georganiseerd moeten worden over de verantwoordelijkheid van betrokken partijen, om zo samenwerking te bereiken tussen stakeholdersectoren om mariene plastics te reduceren. Ook de motivatie van de regering, beleidsmakers en de ontwerp- en productie sector moet worden aangesterkt.

Glossary

| | |
|--|--|
| Behaviour | The behaviour includes the actions and the future activities of stakeholders regarding their handling with plastic in the marine environment. Also the easiness and the likeliness of carrying out the behavioural activity are included. |
| CSR | Corporate Social Responsibility |
| DPI | Dutch Polymer Institute |
| EU | European Union |
| EUCC | Coastal and Marine Union |
| FP7 | Seventh Framework Programme |
| FWS | Nederlands organisatie frisdranken, waters en sappen (Dutch organisation soft drinks, water and juices) |
| IMO | International Maritime Organization |
| Level of awareness | The level of awareness is related to the perceptions of the stakeholders and includes how well the involved stakeholders are informed about the source, the cause and the impacts of the plastic problem in the marine environment. The perceptions of the stakeholders on these subjects are related to literature and therefore translated to the level of awareness. |
| MAIN | Maritieme Afvalstoffen Inzameling Nederland (Maritime Waste Collection Netherlands) |
| MARLISCO | Marine litter in Europe seas: social awareness and co-responsibility |
| MMLAP | Mobilisation and Mutual Learning Action Plan |
| MSC | Marine Stewardship Council |
| Opinions | The opinions are related to the perceptions of the stakeholders regarding the level of concerns, the attitude of the community and opinions on sources. |
| Perceptions of the stakeholders | The stakeholder profile is an overview of the behaviour, knowledge, perceptions and responsibility connected to all stakeholder sectors. Also the visions of the companies and the behaviour, perceptions and responsibility of the management of the different sectors within the plastic life cycle are included in the profile. |
| PPP | People, Planet, Profit |
| QHSE | Quality, Health, Safety and Environmental |
| Responsibility | The individual perceptions of stakeholders regarding who is responsible for reducing plastic in the marine environment; who has to or is competent to fulfil the task to drive change and who is motivated to reduce plastic according to the individual stakeholders. Also the perceptions from the company's perspective regarding their own responsibility for causing and reducing the problem are included. |
| Stakeholder sector | A stakeholder is a person, group or organisation which is involved in a certain issue. The stakeholder is involved when it can affect or is affected, and when it is interested in or concerned about the issue (WebFinance Inc, 2013). Within this research, stakeholders are clustered in sectors, meaning several stakeholder groups with a comparable aim are clustered in a sector. |
| VHL | Van Hall Larenstein |
| Visions | The visions of the companies include the message the companies spread out on behalf of sustainability/waste. When sustainability is not present in the policy of the company, there will be described what the most important propagated message is of the company. |
| WP | Work Package |

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1. Introduction

In this chapter, the study is introduced. The problem description can be found in subchapter 1.1. In subchapter 1.2, the aim of this study is given, followed by the research questions in subchapter 0 and the reading guide for the report can be found in 1.4 .

1.1 Problem description

Nowadays, ocean waters are threatened by humans. Sea water temperature rising, overfishing, ocean acidification, marine habitat destruction and marine invasive species are all threats to which humans make a major contribution (National Geographic, 2013). Furthermore, the increasing spatial pressure on coastal areas by the growing world population creates an increasing demand for food, housing, holiday places and recreational activities.

Another threat is pollution: *'Pollution is the introduction of harmful contaminants that are outside the norm for a given ecosystem.'* (National Geographic, 2013). There are several forms of harmful pollution for the marine environment and its living organisms, including noise pollution, light pollution, soil pollution, air pollution and water pollution (Mayntz, n.d.). The water pollution is threatening ocean waters and its marine life and is mostly caused due to human activities and behaviour. Water pollution can be caused by oil spills, the introduction of pesticides, herbicides, chemical fertilizers and detergents into the environment and by marine litter (National Geographic, 2013). Marine litter is cited by UNEP as *"Any persistent, manufactured or processed solid material discarded, disposed of, or abandoned in the marine and coastal environment"* (UNEP, 2009). According to estimates at a global level, approximately 80 % of marine litter originates from land-based sources (UNEP, 2009). Marine litter includes metal, glass, paper, cardboard, processed wood, cloth and plastic. This report focuses mainly on the plastic fraction of marine litter.

Plastic is a widely used material in humans' daily life. Plastic exists in many different types of resins and all types will end up in different products. A throw away mentality is present nowadays since a lot of products and their packaging are single use "disposable" products. Much plastic waste generated by consumers on land will end up in nature, finding its destination in sea due to e.g. wind and rivers. At sea, plastics will often be picked up by one of the five gyres. (Thompson, *et al.*, 2009) A gyre is *"a spiral oceanic surface current driven primarily by the global wind system and constrained by the continents surrounding the three ocean basins"* (The American Heritage Science Dictionary, 2010). The problem at these gyres due to plastic is large as the concentrations of marine plastics are very high (see Figure 1). (Thompson, *et al.*, 2009)

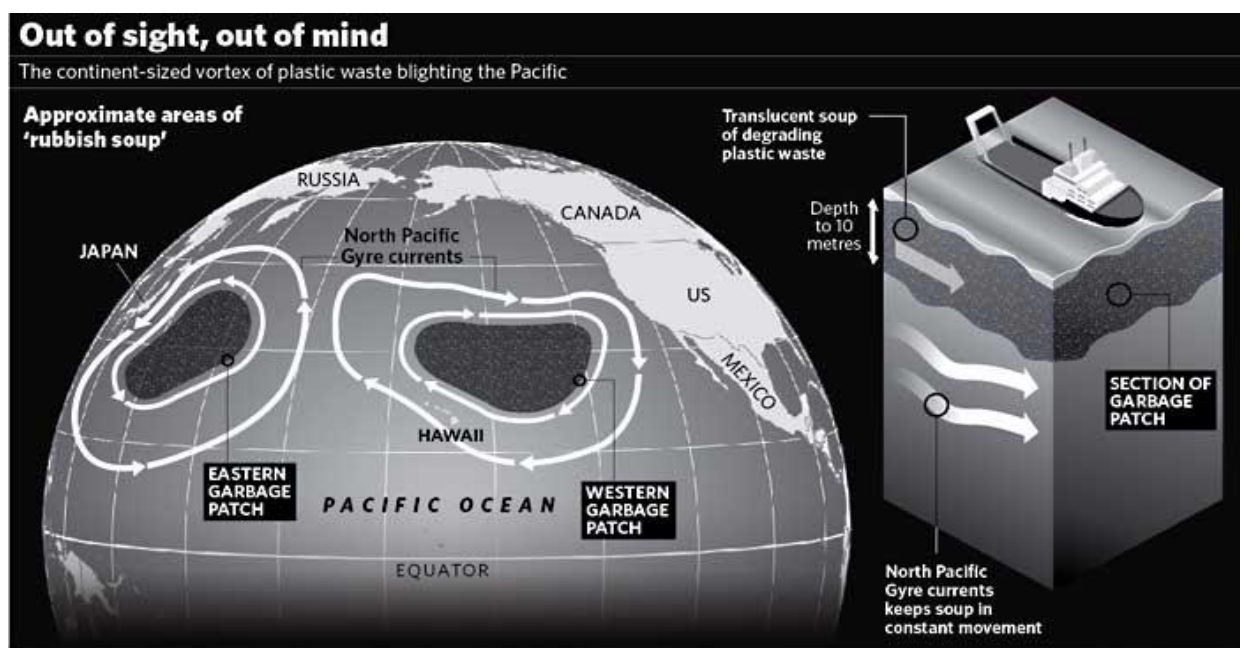


Figure 1 Plastic Soup Pacific Ocean (Innovatech International, 2012)



Figure 2 Dead bird filled with plastic parts
(Follow the Piper blog, 2011)



Figure 3 Entanglement (Santa Aguilas Foundation, 2012)

The exact degradation time of a plastic bottle depends on several factors but it is estimated to take a few centuries. (University of Florida, n.d.) In the marine environment, plastic is not fully biodegradable and is only broken down to microscopically parts (Cho, 2011). The fact that plastic cannot fully biodegrade is a major threat to marine life, which mistake plastic for food. The plastic parts can block the stomach of an organism and besides, the plastic parts are not broken down by their body. Plastic parts will remain in the stomach, causing that no signal of an empty stomach will be sent to the brain. Missing the signal of food shortage results in a lack of nutrients what finally results in starvation (Thompson, *et al.*, 2009). Sections on dead fish and birds (see Figure 2) for example have shown many plastic parts in the stomachs of these organisms.

Plastic also accumulates at the ocean's depths. Small marine organisms consume these (polluting) particles, where after the particles are introduced at the bottom of the global food chain (National Geographic, 2013). In most food chains, humans are the top predator, meaning plastics can end up in human bodies. But whether humans are exposed to plastic indirectly via a marine litter route has thus far not been established. (Wurpel, *et al.*, 2011) Another threat of plastic to marine life is entanglement (see Figure 3). An organism might not be able to forage anymore or get breath at the surface and it can choke by entanglement of plastic. Other problems caused by marine plastics are related to socio-economic factors, for example the aesthetics of beaches, high costs to coastal municipalities to clean-up the coast and damage for shipping and fishing activities (Mouat, *et al.*, 2010).

Focussing on the Netherlands, plastic seems to be present in considerably amounts in the North Sea as well. Per 100 meter beach on the North Sea, 400 items of marine litter were found, including a percentage of 75 % plastics (Rijkswaterstaat, 2012). Ten years of research on Fulmarus (a bird that feeds on the sea-surface) by IMARES (Institute for Marine Resources & Ecosystem Studies) showed no decline of the amount of plastic parts in the stomachs of the birds. A stomach of a Fulmarus which spends most of its time at the North Sea contains on average 30 pieces of plastic. Micro plastics are present in the North Sea as well. (Stichting de Noordzee, 2011) On and around the German Wadden islands, a research has been carried out on the presence of micro plastics, showing that micro plastics are abundant (Liebezeit & Dubaish, 2012). A similar research on and around the Dutch Wadden islands has not taken place yet (Plastic Soup Foundation, 2012).

In 2012, MARLISCO - a project funded by the European Commission (see Appendix I MARLISCO), has started¹. The aim of MARLISCO is to increase social awareness and co-responsibility regarding marine litter in European seas. Fifteen countries bordered by European seas participate in the project. The EUCC (Coastal and Marine Union) (see Appendix II Coastal and Marine Union) is the Dutch participant in the project. This bachelor thesis includes a sub research within the MARLISCO project, focussing on all involved stakeholders in the Netherlands. Ms J.M. Veiga, project coordinator of the EUCC and contact person of the EUCC in the MARLISCO project is the external supervisor for this study.

Marine plastics is a complex issue, as it is rooted in the way we produce products, use, dispose and deal with waste. Therefore it is an issue that involves the responsibility across several sectors, from industry, to designers, manufacturers, retailers, consumers, waste collection and management entities, national, regional and local actors. Though virtually everyone agree that marine plastics is a problem of concern, it is not yet clear how the different stakeholders within society perceive the extension of the problem, the factors that lead to marine plastics and where the responsibility lies. This is crucial to understand the perceptions of the stakeholders and deal with this problem.

¹ MARLISCO is co-funded by the European Commission. The views and opinions expressed in this publication are the sole responsibility of the authors and do not necessarily reflect the views of the European Commission.

Therefore an overview of perceptions will be set up, related to opinions, level of awareness, behaviour and responsibility of the stakeholders. A distinction will be made for each factor between different stakeholder sectors. Also a focus on the visions and the behaviour, opinions and responsibility from the companies' perspective of the stakeholder sectors of the plastic life cycle in the Netherlands will be included in the perceptions overview. With the overview of the stakeholders perceptions, strategies, campaigns and meetings can be aligned on the information so better results may be achieved. One of the activities of MARLISCO is, for example, a stakeholder meeting for which the stakeholder profile can be very useful as a source of information for the organisation of the meeting.

The different stakeholder groups can roughly be divided in four parts and nine stakeholder sectors, which are based on their function in relation to plastic. These four parts and a more detailed division of the involved stakeholders groups, set up by the management of MARLISCO, is showed in Table 1 (Hartley, *et al.*, 2012). In the profile of the stakeholders, a focus is laid on the stakeholders which are part of the life cycle of plastic (see the first part in Table 1).

Table 1 Division involved stakeholders (Hartley, *et al.*, 2012)

| Part: | Stakeholder sectors: | Groups included: |
|---|-----------------------------------|---|
| The first part exists of the manufacturers, industrial users and waste managers, which take in general advantage of plastic and are part of the plastic life cycle. | Design or manufacturing companies | Material production, material conversion, product/package design |
| | Retail | Supermarkets, other shops |
| | Coastal and/ or marine industry | Commercial fishing, shipping, off- shore industries, coastal tourism, aquaculture |
| | Waste management | Collection, transportation, separation, disposal to landfill or incineration, recycling, sewage treatment |
| The second part exists of the policy makers and the environmental organisations, which have an influence on the other involved stakeholders by implementing laws or campaigns. | Government and/ or policy making | Local, national, international |
| | Environmental organisations | NGO/charity |
| The third part exists of the media and education, which can inspire and inform the different stakeholder sectors. | Media | Newspaper, radio, television, online |
| | Education | School, college, university |
| The fourth part exists of the general public, which utilize plastic. | General public | |

In conclusion, it seems that plastic is a large threat to marine life and causes many problems since it is not biodegradable. Many different stakeholder sectors in the Netherlands are involved in the plastic problem but it is unclear what the perceptions of these stakeholders are regarding plastic in the marine environment. It is useful to know these perceptions so strategies, campaigns and meetings can be aligned on the information so better results may be achieved.

1.2 Research aim

The aim of this study is an overview of the perceptions of stakeholders in the Netherlands regarding the issue of plastic in the marine environment. The overview includes perceptions regarding the individual opinions, level of awareness, behaviour and the responsibility of the stakeholders; the visions of companies within the plastic life cycle; and the opinions, behaviour and responsibility of companies within the plastic life cycle.

1.3 Research questions

To reach the aim of the research, the main questions and research questions were formed.

Main question:

What are the perceptions of stakeholders in the Netherlands which are involved with plastic in the marine environment?

Research questions:

1. What are the opinions, the level of awareness, behaviour and the responsibility of the stakeholders in the Netherlands regarding plastic in the marine environment and what are the correlations between the variables and between ages?
2. What are the visions of the different stakeholder sectors within the plastic life cycle of the Netherlands?
3. What are the opinions, behaviour and the responsibility of the companies regarding plastic in the marine environment of the different stakeholder sectors involved in the plastic life cycle of the Netherlands?

1.4 Reading guide

In this subchapter, the structure of the report is presented. In chapter 2, the methods of the study are described, including the type of research (2.1), preconditions (2.2), data collection (2.3) and data analysis (2.4). In chapter 3, the results on the perceptions of the stakeholders are presented, including the response on the survey (3.1), the results for the entire stakeholder group (3.2), results per stakeholder sector (3.3), overview of the stakeholder sectors (3.4) and a statistical analysis (3.5). The results are followed by the discussion (chapter 4), conclusion (chapter 5) and recommendations (chapter 6).

2. Methods

The research methods of the research are described in this chapter. The type of research is explained in chapter 2.1, the preconditions of the research can be found in 2.2, and the data collection and analysis method is described in chapter 2.3 and 2.4.

2.1 Type of research

There has been made use of exploratory research, because there are no explicit existing theories on the opinions, level of awareness, behaviour and responsibility of stakeholders regarding marine plastics. This research has been carried out to describe those four variables among nine stakeholder sectors (see Introduction) and to explore eventual correlations between variables and ages. (Baarda & Goede, de., 2006)

The research is both quantitative and qualitative. Information is gained by literature study on the stakeholder sectors of the plastics lifecycle, by interviews with management members of companies within four stakeholder sectors of the plastic lifecycle, and by a survey among all nine stakeholder sectors.

2.2 Preconditions

The research had to meet a few preconditions. At first, the research needed to be executed in a timeframe of five months. A survey developed by the University of Plymouth within the MARLISCO project needed to be applied and the results of the Netherlands needed to be analysed within this study. The results must be clear and understandable for the contractor, the EUCC.

2.3 Data collection

In this subchapter the data collection methods are described. In order to answer the research questions a survey, interviews and a literature study have been carried out. Hereafter the data collection is described in more detail.

2.3.1 Survey

A stakeholder survey (see Appendix III Stakeholder survey) was conducted to collect quantitative data on opinions, level of awareness, behaviour and responsibility of the stakeholders regarding marine litter and marine plastics. This data has been used to answer the research question *‘What are the opinions, the level of awareness, behaviour and the responsibility of the stakeholders in the Netherlands regarding plastic in the marine environment and what are the correlations between the variables and between ages?’*. The stakeholder survey was already set up by the University of Plymouth, with the subject marine litter. The survey results are therefore based on marine litter. However, the focus still lies on marine plastics within the report.

The survey was web-based; a web link to the online survey was sent to the stakeholders. The use of a web-based survey made it easy to transfer the responses automatically to a spread sheet form in SPSS. A paper version of the survey has been provided as well in case no internet was available for certain stakeholders. Those surveys were scanned and sent by email to Bonny Hartley, manager of the MARLISCO project in Plymouth, who entered those surveys into SPSS.

A data-base of contacts of stakeholders was developed, mainly based on available information on the internet. The number of people contacted was 1651 (for the division within stakeholder sectors and responses see Appendix IV Overview responses, and see chapter 3.1 for responses to the survey). In the email which was sent to the stakeholders, including the link of the survey, the addressee was asked to distribute the email amongst colleagues to increase the number of respondents. The link has been promoted on Facebook and in several LinkedIn groups like waste management and scientific groups (e.g. Centre for Marine Policy) as well to reach more general public and more stakeholders within the other stakeholder sectors. During the survey responding time (approximately two months), the amount of responses has been checked several times, so when gaps occurred within several sectors, more contacts were searched online and invitations for the survey were sent to those new contacts. Also a reminder has been sent to all contacts.

The survey was set up by the University of Plymouth and has been conducted in fifteen countries who are participating in the MARLISCO project. To collect data for this thesis research focussing on the Netherlands, several survey questions were used from the existing survey. Table 8 (see Appendix V Data collection methods) shows which survey questions have been used to collect data.

2.3.2 Literature study

A literature study was carried out to provide more background information about the different stakeholder sectors of the plastic life cycle in the Netherlands. The literature study answered the research question *‘What are the visions of the different stakeholder sectors within the plastic life cycle of the Netherlands?’*

The literature study has provided information about the visions of the four stakeholder sectors of the plastic life cycle; the same companies approached for participation in the survey were studied in this phase, resulting in 315 companies (see Appendix VIII Vision labels of companies). The used information sources were internet and annual reports. At first, the websites of the stakeholders were consulted to find their visions regarding sustainability of these stakeholders. When a sustainable vision was not found on the website of the company, information has been searched at the internet by entering the name of the company and including the words mission and/or vision, and optionally sustainability or (plastic) waste. When no information was found regarding sustainability, there has been described where the company does stand for other than any kind of sustainability.

2.3.3 Interviews

During the survey time, representatives of the stakeholders of the plastic life cycle were interviewed in order to answer research question *‘What are the opinions, behaviour and the responsibility of the companies regarding plastic in the marine environment of the different stakeholder sectors involved in the plastic life cycle of the Netherlands?’*.

The interviews with stakeholders within the plastic life cycle in the Netherlands provided insight in companies of the following sectors: design or manufacturing, retail, coastal and/or marine industry, and waste management. In

support of the survey, 8 interviews were conducted within these four stakeholder sectors; see Table 2 for the division within the sectors.

Table 2 Overview interviewed stakeholder groups

| Sector | Amount of interviews | Interview within groups |
|------------------------------------|----------------------|--|
| Design and manufacturing | 4 | Production Conversion Product/ packaging design Other |
| Retail | 1 | Supermarket |
| Coastal and marine industry | 2 | Commercial fishing Shipping |
| Waste management | 1 | Waste collection and treatment |

The companies were chosen from those contacts gathered for the survey. Within the stakeholder sector ‘design and manufacturing’, companies within all three groups were approached for an interview because the plastic life cycle starts with the production and conversion of the material and the design of the product. Also the representative of the soft drinks industry has been interviewed because this company has insight in the policy of many companies within the packaging sector and furthermore, plastic drink bottles are among one of the most common items found as marine litter. Within the stakeholder sector ‘retail’, one supermarket has been approached for an interview because it is the intermediate-company of products between the production and the consumer. Within the stakeholder sector ‘coastal and marine industry’, companies of the groups commercial fishing and shipping were approached for an interview because these sectors are direct users of the coastal and marine environment. Within the stakeholder sector ‘waste management’, one company which takes care of waste collection, waste separation and waste recycling has been approached for an interview.

The companies for the interviews which were chosen had to meet some of the following requirements: The companies needed to have more than 10 employees, because when large companies make a change, it might have a more extensive impact than small companies; existing connections were used, like personal connections or connections obtained through the survey to get easier in contact with the companies; the companies had to be accessible on preference within two and a half hours by public transport from Leeuwarden but when there were no companies within this range available, companies outside this range were approached as well.

A voice recorder has been used to record the interview. Permission from the interviewee was asked before the interview started. The interview questions were prepared in advanced and was semi-structured (Baarda, de Goede & Teunissen, 2005). Appendix VI Interview questions and Table 9 (see Appendix V Data collection methods), shows the interview questions which were used to collect data.

2.4 Data analysis

In this subchapter, the data analysing methods are described per method.

2.4.1 Survey

The statistical programme IBM SPSS Statistics 20 is used to analyse the gathered data by the survey. At first the data set was checked and for question seven, sub question b,f,h,j and l were reverse recoded so all sub questions were formulated the same way and had the same scale. Because all questions were negative asked, the scale has been relabelled so the questions were asked positive (strongly disagree became strongly agree and vice versa; disagree became agree and vice versa and neutral stayed neutral). Also question four has been re-coded as the question was asked in two parts: a number, followed by day/week/month/year. To work with the data, the data has been transformed into years so all data had the same timeframe. After the recoding and relabeling process, the results for the entire stakeholder group and the results per stakeholder sector were analysed. The results for the entire stakeholder group (chapter 3.2) and the results per stakeholder sector (chapter 3.3) are descriptive and frequencies were mainly used. For survey question three (part of the level of awareness variable), a benchmark of 65-85 % has been implemented. This benchmark has been chosen due to literature, which points out that marine litter within the

North Sea exists about 75 % of marine plastic (Rijkswaterstaat, 2012). Both margins are chosen by 10 % because the percentage might differ at some places. For question four, a benchmark was implemented of ≥ 100 years, as literature points out that a plastic bottle needs at least 100 years to degrade (C-MORE, 1993). But other literature shows that plastic takes centuries to degrade (University of Florida, n.d.) while some literature even indicates that plastic is not fully bio degradable (Cho, 2011) which caused no boundary above hundred years.

The labels used for the five points scale are for each question described in Table 3. The used scale labels are described under the heading 'scale', column two. The five points scale has been reduced to a three points scale (see heading 'new scale', column three) to reduce the data and because small differentiations are not of importance for this report as it is an exploring research. However, the results of the survey on the five points scale can be found in Appendix VII Support survey results.

Table 3 Labels of the five points scale for each survey question on order of occurrence in the report

| Survey question | Scale | New scale |
|--|---------------------------|---------------------|
| 7. Some people think marine litter is a hugely important issue, others think it's not so bad overall. Please tell us your personal opinion on the following statements. (recoded) | 1: Strongly agree | Agree |
| | 2: Agree | |
| | 3: Neutral | Neutral |
| | 4: Disagree | Disagree |
| | 5: Strongly disagree | |
| 5a. In your opinion, how much does each of the following contribute to how litter ends up on the coast and in the sea? | 1: None | None |
| | 2: A Little | Average |
| | 3: Average | |
| | 4: Much | Much |
| | 5: A lot | |
| 5b. Some things can make it more likely that litter will enter the sea. In your opinion, how important are the following factors in adding to litter on the coast and in the sea? | 1: Not important at all | Not important |
| | 2: Little important | Fairly important |
| | 3: Fairly important | |
| | 4: Very important | Very important |
| | 5: Extremely important | |
| 6. Below are some possible consequences of litter in the sea. In your opinion, how much of a threat, if any, does marine litter pose to each of the following? | 1: No threat | No threat |
| | 2: Little threat | Average threat |
| | 3: Average threat | |
| | 4: Major threat | Major threat |
| | 5: Serious threat | |
| 9. Actions to reduce marine litter-How likely are you to.../ How easy would it be for you to... | 1: Not easy/likely at all | Not easy/Not likely |
| | 2: Not easy/likely | |
| | 3: Moderate | |
| | 4: Easy/likely | Easy/Likely |
| | 5: Very easy/likely | |
| 8. Who is/are responsible/ competent/ motivated for reducing quantities of marine litter? | 1: Strongly disagree | Disagree |
| | 2: Disagree | |
| | 3: Neutral | Neutral |
| | 4: Agree | Agree |
| | 5: Strongly agree | |

For question eight about the responsibility, competence and motivation of stakeholders, only 'agree' is made visible in the figures so the results are kept clear. This has been done due to the large amount of parties in combination with three variables.

For the analysing chapter, IBM SPSS Statistics 20 has been used to test data on significance and correlations. Used tests were bivariate correlations, with the outcome of Spearman's Rho. All data has been presented in figures made with the programme Excel 2010.

2.4.2 Literature research

The method used for analysing the data gained by a literature research was tagging. *Tagging* includes providing a name, description or another code to text fragments (Baarde, de Goede & Teunissen, 2005). The visions of all

companies have been tagged with labels which appeared to be on their websites or annual reports. The labels are withdrawn from the information found, resulting in down coded data. Examples of labels are 'People, planet profit' and 'recycling', and for non-sustainable visions 'innovation' and 'quality'. Thereafter similarities and differences within the labels were searched and similar visions were grouped together. This tagging system led to a structure where the information could be extracted to answer the research question of the visions. Appendix VIII Vision labels of companies shows the labels of the companies and Appendix IX Certification of companies gives an overview of the certifications of the companies.

2.4.3 Interviews

The qualitative data gathered by interviews have been analysed by applying the method tagging. The core themes are opinions, behaviour and responsibility, because these are the variables of the third research question. Each core theme contains some themes, which are shown in Appendix IV Overview responses. The core theme 'opinions' contains the themes attitude, awareness, experience and influences. Attitude directly relates to opinions, while awareness indicates if the stakeholders are aware of the problem. Experience with marine plastic is related to opinions, since if stakeholders actually see the problem and experience it, opinions might change. The core theme 'behaviour' contains the themes current activities, future activities, obstacles and conveying. Current activities relate to what their behaviour is now and future activities relate to what their future ideas are regarding their behaviour with plastic. Conveying the stakeholders' perceptions to for example their employees is part of the activities of the company. Obstacles are asked because it might occur that stakeholders are willing to reduce marine plastics for example but are not able to due to some obstacles. The core theme 'responsibility' contains the themes causing, solving and propagating responsibility. Responsibility is divided in these themes to indicate if the stakeholders consider themselves to be responsible for causing and solving the problem. Propagating the responsibility is asked to see if stakeholders which indicate to be responsible also take this responsibility and propagate it. To be sure information of each theme was obtained each theme included some interview questions. The template approach has been used (Baarde, Goede & Teunissen, 2005); the text fragments of the interview have been placed in the template and were linked to the indicators which are shown in Table 9 (see Appendix V Data collection methods). The labels were depending on the specific answers on the interview question and therefore the labels are different for each interview. Examples of labels are certification and laws. Appendix X Interviews gives all information collected with the interviews.

3. Stakeholder perceptions

In this chapter the perceptions of stakeholders involved in the plastic problem are presented. The focus is laid on the stakeholders of the plastic life cycle, namely design or manufacturing companies (3.3.1), companies of the retail sector (3.3.2), companies of the coastal and marine industry (3.3.3) and waste management companies (3.3.4). In chapter 3.1, the response to the survey and interviews is given. The results for the entire stakeholder group are described in chapter 3.2, followed by the results per stakeholder sector in chapter 3.3. Finally, an overview of all stakeholder sectors is given in chapter 3.4 and comparisons between the different stakeholder sectors, variables and age are described in chapter 3.5.

3.1 Response to survey and interview requests

The total number of survey respondents was 251. The total number of approached people within the 622 approached companies was 1651, resulting in a response percentage of 15,2 %. The distribution of the responses for all stakeholder sectors can be found in Appendix IV Overview responses. Within some stakeholder sectors, the response rate is very low. For example within the media sector it should be kept in mind that one response already counts for 20 %.

Of the 23 companies approached for an interview, eight companies were able and willing to participate. The other fifteen companies were too busy for an interview or did not respond again after first communication. One of the companies indicated to have no opinion about the plastic issue. It also occurred that some companies were not suitable after the phone call anymore, due to the products it produces like for example large boats or chemicals for

plastic products. However, these rejections did not influence the results as still eight persons in four stakeholder sectors of the plastics life cycle could be interviewed.

3.2 Results of the entire stakeholder group per variable

In this sub chapter, the results of the survey are presented for the entire stakeholder group on the subjects of opinions, level of awareness, behaviour and responsibility. The number of survey respondents within this group is 251 (N=251).

3.2.1 Opinions

The opinions of stakeholders are divided in three parts; the way stakeholders see marine litter; the way the people around the stakeholders see marine litter according to the stakeholders; and the opinions of stakeholders regarding factors contributing to marine litter. The results of each part are described below.

The stakeholders were asked to rate several statements regarding the level of importance of the problem of marine litter. On almost all statements (see Figure 4, part A), more than 70 % of the stakeholders agreed, whereof most agreement was about the fact that marine litter will cause lasting damage (89,6 %) and that marine litter is also a problem for inland communities (89,7 %). The other statement is that marine litter is already a present threat, where 50 % of the stakeholders disagree with.

The stakeholders were asked as well to give impressions on the importance marine litter has for their family, friends and the people in their local communities (see Figure 4, part B). A large part suggests that their family members and friends (named close ones in Figure 4) think it is important to reduce marine litter (68,1 %) and that those people will support measures to reduce marine litter (62,1 %). The opinions about the stakeholders' local communities are varying. At the statement 'most people in my local community do care about marine litter', 49,4 % agree, 32,3 % is neutral and 18,3 % disagree.

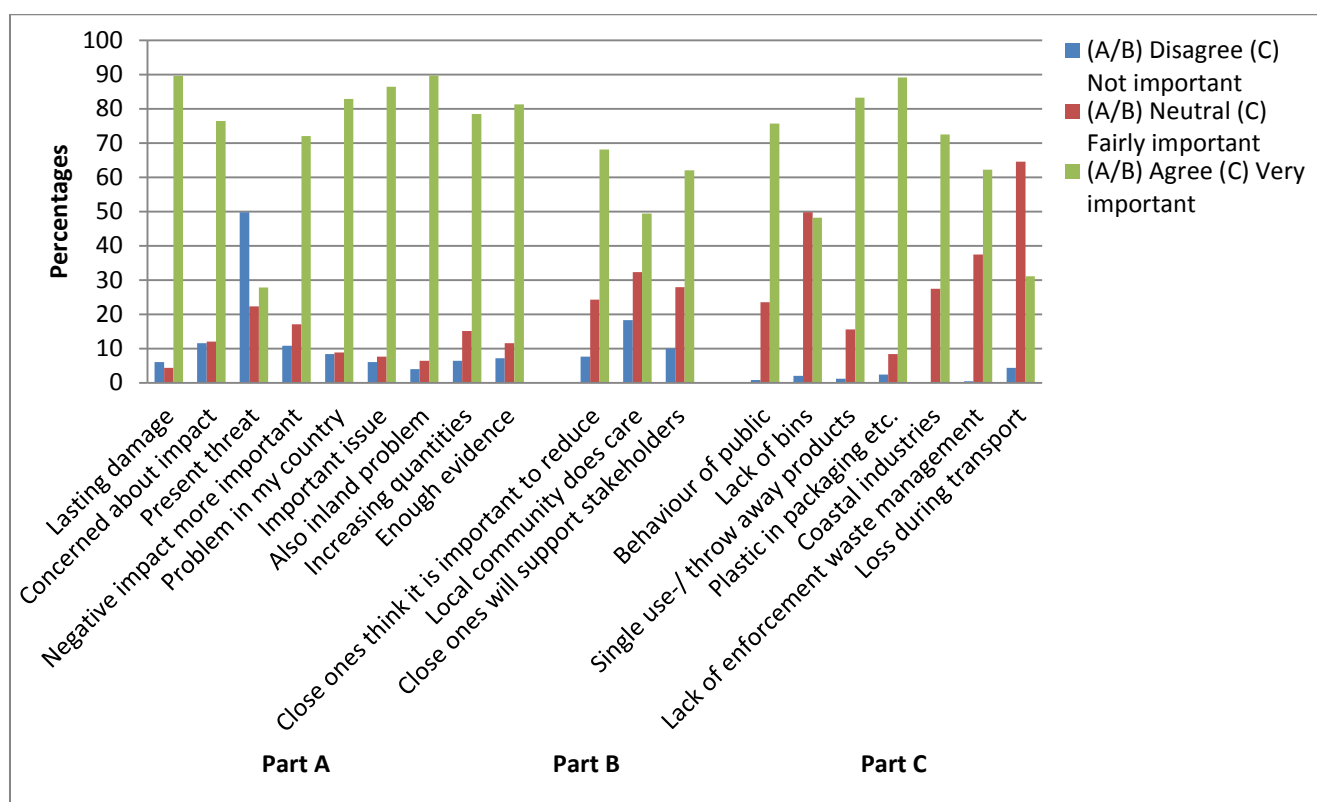


Figure 4 Total results from the entire stakeholder group (N=251) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

Another aspect stakeholders were asked about is the factors that contribute to marine litter (see Figure 4, part C). According to the opinions of the stakeholders, the most important factors are the extensive use of plastic in packaging (89,2 %), the use of single use-/ throw away products (83,3 %) and the inadequate behaviour of public (75,7 %). A lack of bins (2 % say not important, 49,8 % say fairly important) and loss during transport (4,4 % say not important; 64,4 % say fairly important) are the least indicated contributing factors.

3.2.2 Level of awareness

The level of awareness of stakeholders is divided in four parts; the quantities of plastic within marine litter; the degradation time of a plastic bottle; pathways of marine litter; impacts of marine litter. The results of each part are described below. The level of awareness is referred to literature named in the introduction.

By benchmarking the level of awareness between 65 % and 85 %, a small part of the stakeholders (19,5 %) answer within the benchmark. The majority of the stakeholders (79,9 %) indicate the percentage of plastic in the marine environment below the benchmark and 0,8 % of the stakeholders indicate the percentage to be higher. By benchmarking the level of awareness of people for a degradation time of ≥ 100 years, 31,6 % do answer within this criteria.

According to 74,1 % of the stakeholders, the major contributor to the way plastic enters seas and oceans is due to direct release in sea (see Figure 5, part A). The second important pathway seem to be rivers and estuaries, which lead much plastics to sea according to 63,4 % of the stakeholders. Least important pathways are blown from landfill or landfill collapses (3,2 % none, 65,4 % average) and 3,6 % of the stakeholders indicate sewage overflows as no contributor but still 69,8 % indicate it as an average contributor.

The stakeholders were asked how much of a threat marine plastic is to the marine environment, tourism, human health, shipping and fishing and the aesthetics (see Figure 5, part B). Almost all stakeholders (96,8 %) indicate marine plastics as most threatening the marine environment. Aesthetics seem to be major threatened according to 61,4 % of the stakeholders. The impact on tourism is seen as the least threatened factor (27,9 % suggest major threatened, 1,2 % suggest no threat), as well as shipping and fishing (34,7 % suggest major threatened, 3,2 % suggest no threat).

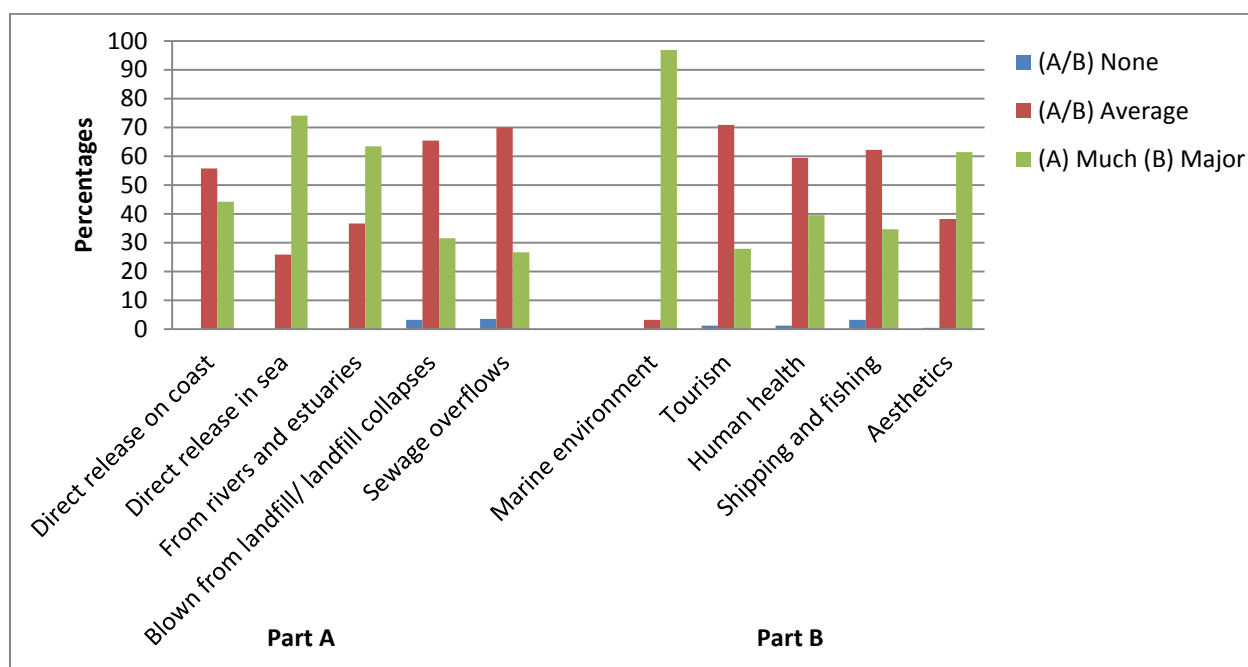


Figure 5 Total results from the entire stakeholder group (N=251) Part A: Pathways of marine plastics; Part B: Level of threat of marine plastics regarding several factors.

3.2.3 Behaviour

The behaviour of stakeholders is divided in two parts; how easy it will be for stakeholders to take action regarding reducing quantities of marine litter; how likely it will be for stakeholders to effectively put them in practice. The results of each part are described below.

The majority of the stakeholders are willing to take action to reduce the quantities of litter on the coast and in the sea. Therefore several behavioural activities could be carried out by the stakeholders in the future (see Figure 6). Picking up litter that stakeholders see at risk of entering the sea seems to be the most easy behavioural activity (71,8 %) and it is likely for the stakeholders (65 %) to do so. Asking people to pick up their litter if stakeholders see them littering is considered to be the most difficult action (54,2 %) and it is least likely stakeholders will express themselves to people about littering (50,6 %). Buying re-usable, rather than single use “disposable”, non-biodegradable products is the most likely behavioural activity for stakeholders (66,6 %) but does not seem to be easy for 56,2 % of the stakeholders. Most stakeholders (63,8 %) indicate the support of government policy and legislation on marine litter (like for example fines and bans for certain items on the market) as an easy behavioural activity. It is likely for 60,6 % of the stakeholders to carry out this activity.

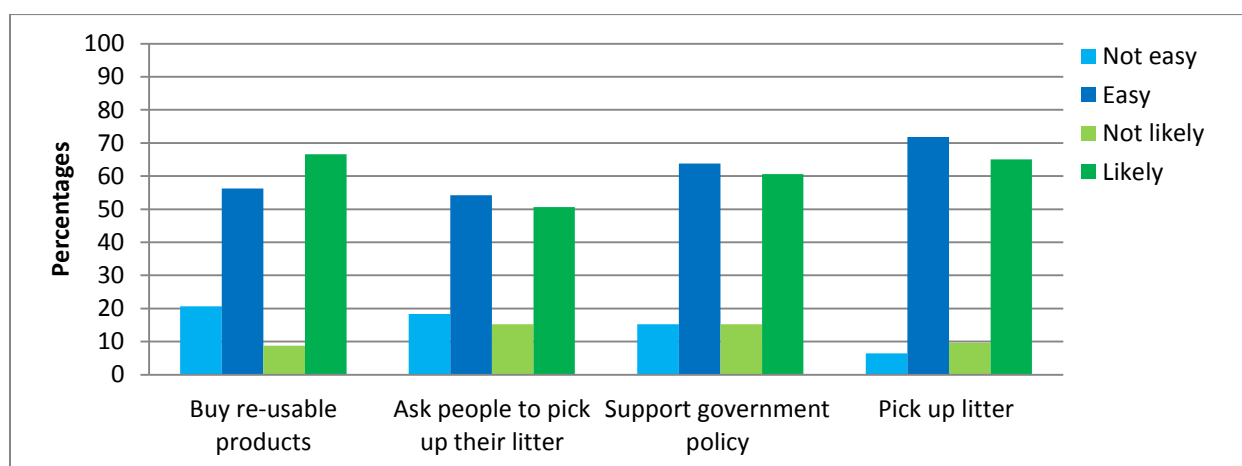


Figure 6 Opinion of the entire stakeholder group about behavioural activities (N=251). Note: the average is not included in the figure.

3.2.4 Responsibility

The responsibility of stakeholders is divided in three parts; the responsibility of stakeholders for reducing marine litter; the competences of stakeholders for reducing marine litter; the motivation of stakeholders for reducing marine litter. The results of each part are described below.

The stakeholders were asked to classify different stakeholder groups in terms of their responsibility in reducing marine litter and how competent and motivated they are to do so (see Figure 7). As individual citizens, 65,7 % of the stakeholders consider themselves to be responsible for reducing the problem of marine litter. The stakeholders see themselves as one of the most motivated (80,1 %) but not very competent (44,2 %) to reduce marine litter.

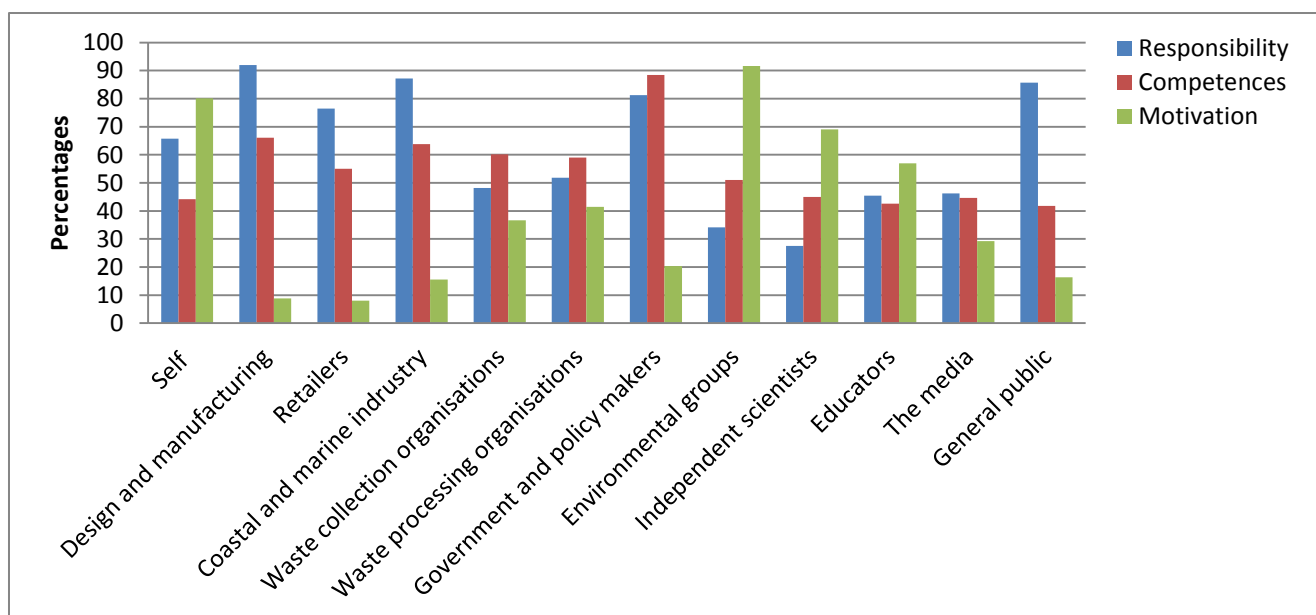


Figure 7 Agreeing individuals of the entire stakeholder group on responsibility (N=251).

Independent scientists (by 27,5 %) and environmental groups (by 34,2 %) are seen as least responsible following the stakeholders. The design and manufacturing sector is seen as the most responsible sector (by 92 %) to reduce the problem of marine litter. Also the coastal and marine industry (by 87,2 %), general public (by 85,7 %) and government and policy makers (by 81,3 %) are seen as most responsible according to the stakeholders. The design and manufacturing sector (by 66,1 %) and the coastal and marine industry (by 63,8 %) are seen as competent but the government and policy makers (by 88,4 %) are seen as most competent to reduce the quantities of marine litter. Environmental groups are considered to be most motivated (by 91,6 %) to reduce the problem. Even though the design and manufacturing sector and retailers are seen as responsible and competent to reduce the problem, these sectors are considered to be least motivated (design and manufacturing sector by 8,8 %; retailers by 8 %) to do so.

3.2.5 Sub conclusion

Regarding the opinions of stakeholders, the individuals that took part in the survey seem very involved and aware of the problem. However, the stakeholders do not totally correspond with each other about the time frame marine plastic will become a threat. The most important factors contributing to marine litter are considered the extensive use of plastic in packaging and products, the use of single use-/ throw away products and the inadequate behaviour of the public.

Regarding the results on the level of awareness, the awareness of stakeholders about marine plastic seems low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated. The most important pathway according the stakeholders is due to release in sea. The aspect the stakeholders are well aware of is the threat of marine plastic to the marine environment which corresponds with reality due to entangled marine life and ingested plastic particles by marine life.

Regarding the behaviour of stakeholders, it seems likely and easy for the majority of the stakeholders to take action to reduce the quantities of marine litter as between 50 % and 70 % of the stakeholders think the asked behavioural activities are easy and likely to carry out. Almost 70 % say it would be likely to buy re-usable items rather than single-use ones but only 55 % say it is easy to do so.

Regarding the responsibility, the stakeholders see the design and manufacturing sector as the most responsible sector for reducing marine litter but as one of the least motivated. The government and policy makers are considered to be the most competent and environmental groups are the most motivated following the stakeholders.

3.3 Results per stakeholder sector

In this sub chapter are the results of the survey, visions and interviews presented for each stakeholder sector on the subjects of the opinions, level of awareness, behaviour and responsibility. The use of percentages by N <100 is not recommended. With N <50, it is not allowed to use percentages (Fischer, T. & Julsing, M., 2007). However, percentages are used since percentages are easier to compare but the percentages should be considered as indicative.

3.3.1 Design and manufacturing

In this paragraph the results for the stakeholder sector design and manufacturing are presented. The number of survey respondents within this sector is 19 (N=19). The number of interviewees within this sector is 4 (N=4), namely material production company Sabic Europe, with as representative Mr S. Kaasenbrood (director of PlasticsEurope Netherlands and employed at Sabic Europe); an anonymous plastic conversion company; an anonymous packaging company; and umbrella organisation FWS of the packaging industry, with as representative Mr T. Juriaanse (Manager sustainability and supply chain management).

3.3.1.1 Opinions

The opinions of the design and manufacturing sector show that the majority (>70 %) of stakeholders within the sector agree on almost all statements regarding marine plastic (see Figure 8, part A). Most agreed (both 94,7 %) statements are that marine plastic will cause lasting damage and that marine plastic is an inland problem as well. Least agreed statements are that the use received out of modern materials does not outweigh any negative effects marine litter might have on the environment (63,2 % agree; 10,5 % disagree) and that marine plastic is already a present threat, which is agreed by only 15,8 % and disagreed by 63,1 % of the stakeholders.

The opinions of the majority of the individuals about their local communities are varying (see Figure 8, part B). 63,1 % agree that their local community do care about marine litter but 26,3 % disagree with this statement. Talking about the family and other close ones of the stakeholders, 73,7 % agree with the statements that their close ones think it is important to reduce marine litter and that support will be given by these close ones to the stakeholders in taking steps to reduce marine litter.

The most important factors contributing to marine litter, according the individuals within the design and manufacturing sector, are coastal industries (84,2 %) and the inadequate behaviour of the public (79 %) (see Figure 8, part C). Extensive use of plastic in packaging and products seems indicated by 15,8 % of the stakeholders as not important at all while 73,7 % indicate this factor as very important which is very interesting as plastic in packaging is part of the design and manufacturing sector. Least important factor is loss during transport of products and waste, which is indicated by 5,3 % as not important at all and only seen as very important by 21 % of the stakeholders.

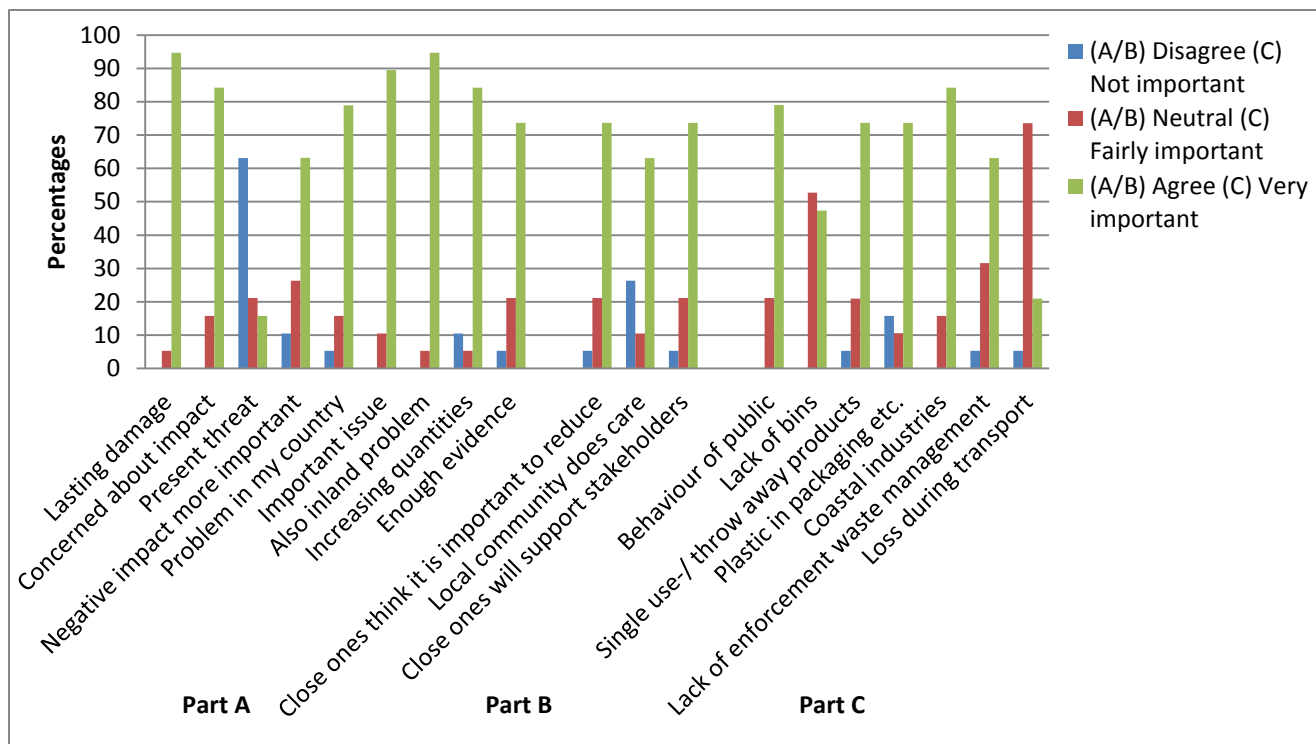


Figure 8 Total results from the design and manufacturing sector (N=19) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

Four companies within the design and manufacturing sector were asked during an interview what the awareness and attitude of the management are regarding marine plastic. All interviewees are aware of the problem with marine plastic but the anonymous interviewee of the packaging company suggests that probably 80 % of the employees are not aware of the problem and that the problem is not of high priority within the company. It is of its own interest that the interviewee knows about the problem. (Anonymous, personal communication, 13-05-2013) Sabic Europe started a campaign 'Let's really talk plastics', which is meant to convey information about plastics to their employees with the aim to increase awareness in an accessible way. Within Plastics Europe, the idea to do something similar is present as well, because many people are not aware of the value of plastics, according to Mr S. Kaasenbrood. Like Mr S. Kaasenbrood said: "Plastic does not belong in sea". (S. Kaasenbrood, personal communication, 16-05-2013) Mr T. Juriaanse of FWS indicates that marine plastic becomes more often a subject where companies need to deal with or need to give their opinion about but that the organisation has not focussed on in recent years. Due to the frequently returning subject 'the plastic soup', the company is aware that there should be paid more attention to in the years to come. (T. Juriaanse, personal communication, 06-05-2013) The interviewee of the anonymous conversion company is really concerned about the problem and fears for the future of next generations (Anonymous, personal communication, 14-05-2013).

The companies were also asked what the experiences are with marine plastic and if there are any external influences undertaken by the companies. The anonymous packaging and conversion companies indicate not to experience any problems regarding marine plastic (Anonymous, personal communication, 13-05-2013; Anonymous, personal communication, 14-05-2013). Sabic Europe is sometimes associated with marine plastics and accused of the problem, while Mr S. Kaasenbrood suggests the problem lies in the waste handling of humans (S. Kaasenbrood, personal communication, 16-05-2013). Also the members of FWS experience accusation and therefore try to avoid that their products will be thrown away and therefore try to avoid a bad image regarding their products. (T. Juriaanse, personal communication, 06-05-2013) External influences experienced by all companies are the influences originating from governmental organisations due to laws and regulations. Laws and regulations are often a driving force for companies to change future behavioural activities. (S. Kaasenbrood, personal communication, 16-05-2013; T. Juriaanse, personal communication, 06-05-2013; Anonymous, personal communication, 14-05-2013; Anonymous,

personal communication, 13-05-2013) Also environmental organisations influence the producing and packaging companies. Environmental organisations raise awareness within companies and show the problem of marine plastics. (S. Kaasenbrood, personal communication, 16-05-2013; T. Juriaanse, personal communication, 06-05-2013) The media also play an important role in raising awareness and informing producing and conversion companies. (S. Kaasenbrood, personal communication, 16-05-2013) The interviewee of the anonymous conversion company indicates that due to several articles in journals, papers and on television, awareness about marine plastics will increase. (Anonymous, personal communication, 14-05-2013) Umbrella organisations of the companies within the design and manufacturing sector raise awareness as well and come up with ideas and advice for the companies. The FWS and conversion companies indicate to be influenced by their customers. (T. Juriaanse, personal communication, 06-05-2013) The interviewee of the anonymous conversion company says, "If companies do not carry out green, the chance they can deliver to large parties is reduced to a minimum." (Anonymous, personal communication, 14-05-2013)

3.3.1.2 Level of awareness

Following the benchmark of 65 % and 85 %, it seems that 5,3 % of stakeholders from the design and manufacturing sector suggest that the amount of marine litter regarding all marine litter lies within the benchmark. The largest part (89,5 %) suggest the percentage to be lower than 65 % and 5,3 % suggest higher than 85 %. Regarding the degradation time of plastic, 21,1 % suggest the degradation time of plastics to be within the benchmark of 100 years or higher.

According the majority of the stakeholders (79 %) a lot of plastics enter seas and oceans due to direct release in sea and due to rivers and estuaries (see Figure 9, part A). The least important pathway indicated by 21,1 % of the stakeholders is sewage overflows. However, none of the pathways is indicated as no contributor to marine plastic which means that according the stakeholders of the design and manufacturing sector all pathways have a contribution to marine litter.

Marine litter is a major threat to the marine environment according the design or manufacturing sector (94,7 %), followed by aesthetics which is named as major threatened by 78,9 % (see Figure 9, part B). Least threatened seems to be tourism, where only 21,1 % indicate this factor as major threatened and 5,3 % indicate this factor as not threatened at all. Also shipping seems least threatened with 10,5 % indicating as not threatened and only 26,3 % indicate this factor as major threatened.

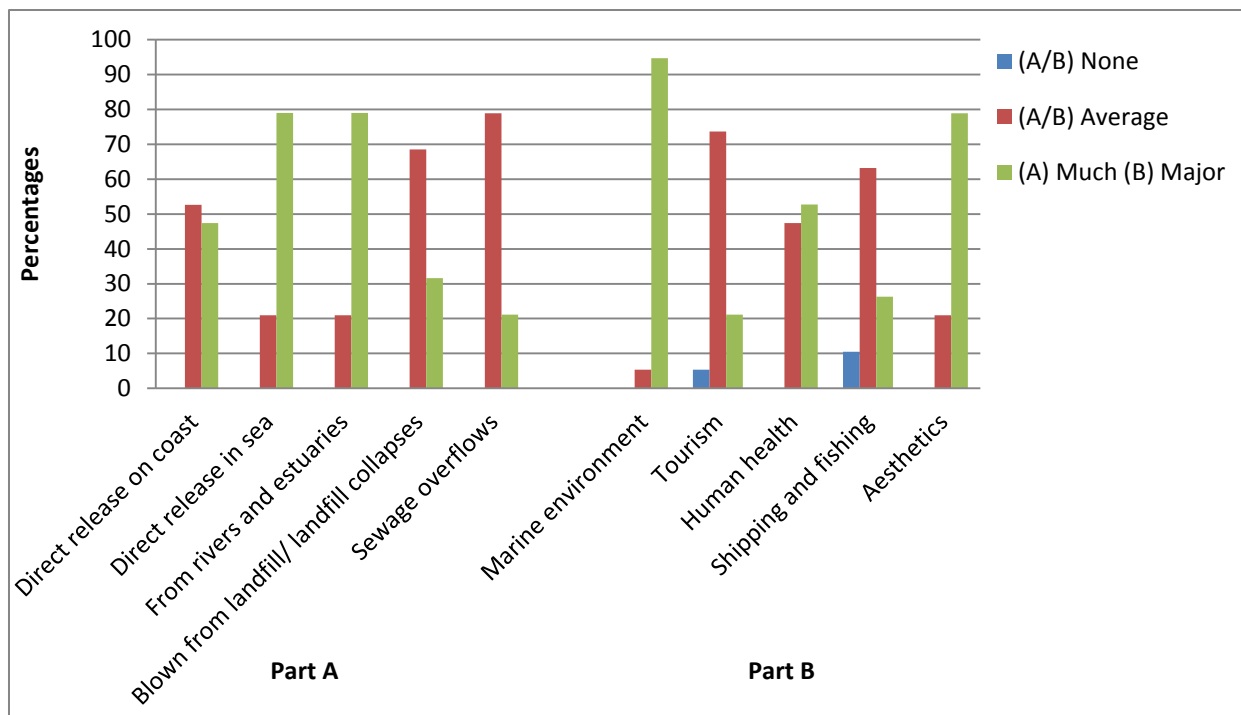


Figure 9 Part A: Pathways of marine plastics according the design and manufacturing sector; Part B: Level of threat of marine plastics regarding several factors according the design and manufacturing sector (N=19)

3.3.1.3 Behaviour

Picking up litter to reduce the quantities of marine litter is considered to be the easiest (79 %) behavioural activity by the stakeholders from the design or manufacturing sector (see Figure 10) and it is likely (63,2 %) the stakeholders will actually carry out this behavioural activity. It is least likely (52,7 %) the stakeholders will ask people to pick up their litter when the stakeholders see them littering. The most likely (73,7 %) activity to carry out is buying re-usable products, even though this activity is considered to be most difficult (not easy for 42,1 %).

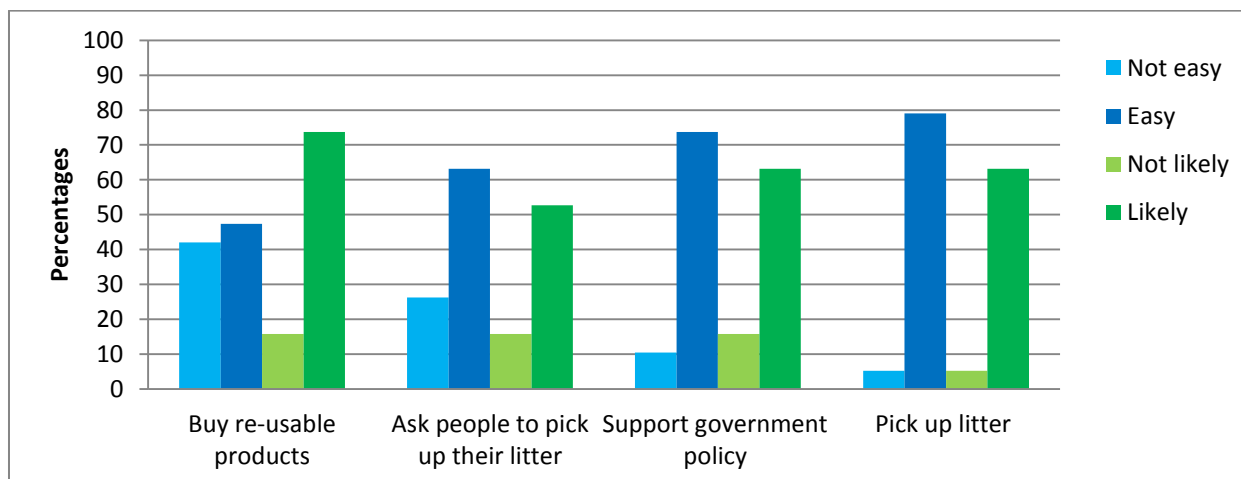


Figure 10 Opinion of the design and manufacturing sector about behavioural activities (N=19). Note: the average is not included in the figure.

Within the visions of the stakeholder sector design and manufacturing, environment seems a high rated aspect within the policy of the companies (see Appendix VIII Vision labels of companies). Some are directly related to plastic, some are related to other environmental aspects. Most named subjects regarding behaviour directly related to plastic are reducing packaging weight/material, use of recyclable materials, sustainable/degradable/compostable resources, recycling and waste reduction. Also nine companies are attending the project Bio Based Polymers (Bol,

van der & Abeelen, 2012). Some companies cooperate with other stakeholders, have an influence on the customer and create awareness among their employees. One company indicates that due to strong safety requirements, recycling of waste is kept down to 10 %. Other values related to the environment are sustainability, corporate social responsibility and future generations. Certificates are present in a lower frequency but most named is the ISO 14001 certificate (see Appendix IX Certification of companies). Some companies do not mention the environment or sustainability at all within the visions. For these companies the focus is on innovation, quality and client specific production.

PlasticsEurope is a European trade association and thereby the voice of European plastics manufacturers (PlasticsEurope, 2013). The association performs activities on three main items: environment and climate; consumer protection, including for example the use of plastics; resource efficiency, including waste and marine litter. The plastic production industry is working on the subject of marine plastics since 2010 and aims to reduce the problem by the following methods: prevention, research and awareness. (S. Kaasenbrood, personal communication, 16-05-2013). Waste management is well regulated within Sabic Europe. Different waste streams are separated as much as possible in the factory and all plastic waste from the production is collected and recycled by Ravago. This company is specialised in industrial plastic waste and produces new raw materials out of waste. Sabic Europe and PlasticsEurope participate in a project of the Dutch Polymer Institute (DPI) together with companies like Stichting the Noordzee and Van Gansewinkel. (S. Kaasenbrood, personal communication, 16-05-2013) The aim of the project is to find the source of the problem of marine plastics followed by closing the plastic lifecycle (Bolt, A., personal communication, 02-05-2013). The role of Sabic Europe and PlasticsEurope is to participate in the thinking process and Sabic Europe contributes by its expertise on materials as well. (S. Kaasenbrood, personal communication, 16-05-2013)

A Decree of activities is applied at the anonymous material conversion company. (Anonymous, personal communication, 14-05-2013) This decree includes regulations to prevent environmental pollution (Rijksoverheid, 2012) and to create awareness on the impact of a company on the environment. Therefore the company has carried out an intern research on the impact on the environment for each department within the company. Instead of the use of plastic cup the office switched to cups of glass. To save the amount of used materials, reduce costs and to improve quality a foaming agent is added to the product. They also try to reduce the amount of packaging material to an absolute minimum. Most of the packaging material exists already of carton boards instead of plastic boards and the used wrapping foil is as thin as possible. Waste streams are all mapped in detail and are also being monitored. By a returning system, due to deposits, the company strives to get back all its materials. No waste created by the company is lost; the created waste will be collected, separated, recycled at a recycling company and returns to the company to be reused within its products. Other products which are used for other purposes will end up with other waste and will be separated and recycled by waste management companies. The end of life value is high and there are aspects which can be brought to attention, which the company does by technical marketing. An annual environmental report is published every year to be transparent to the stakeholders of the company. (Anonymous, personal communication, 14-05-2013)

FWS is the umbrella organisation for the entire soft drinks sector and their main task is to represent the interests of different stakeholders. To meet this task FWS creates for example agreements with municipalities and the Ministry of Infrastructure and Environment to find the balance between different interests. An important aspect is the Framework Packaging agreement. The European Directive of Packaging sets guidelines for all countries and each country has to implement these in its own laws. The organisation of that process lies with each country. In the Netherlands these regulations are formed in the Framework Packaging agreement, which are concluded by all stakeholders of the packaging stream. Recently the agreement is signed for the next ten years by the packaging sector, municipalities and the Ministry of Infrastructure and Environment for collaboration to close the chain of plastic materials. Therefore the whole industry needs to meet agreements, like a certain amount of plastic collection, a minimum use of 25 % recycled plastic in new plastic bottles, no free plastic bags in supermarkets, etc.

All companies within the Netherlands are required to deliver an annual statement of all used packaging materials. The code of conduct of the FWS is another example for its role in society which includes all aspects for both environmental and social sustainability. Large steps are taken within the packaging sector in the last few years, like a

high weight reduction of plastic bottles, higher percentages of recycled plastic materials and no use of PVC. (T. Juriaanse, personal communication, 06-05-2013) The anonymous packaging company tries to reduce packaging material as much as possible and uses recyclable material where possible. (Anonymous, personal communication, 13-05-2013) Packaging development is centrally regulated in the innovation centrum where packaging specialists test new developed alternative materials, including materials which have an environmental perspective. (Anonymous, personal communication, 13-05-2013) A packaging institute is created to carry out research in cooperation with several universities. (T. Juriaanse, personal communication, 06-05-2013) Business cases developed by packaging specialists can be seen as CSR (Corporate Social Responsibility) cases as well. The packaging specialists need to convey the CSR case towards the marketer, to make sure the marketer is aware of the design and the used materials. (Anonymous, personal communication, 13-05-2013)

Restrictions to initiate activities on better plastic handlings are not directly present within the manufacturing sector and there will be no change if there is too little benefit for the companies. A business case is needed but it does not always have to be economic profitable when it is environmentally profitable. Investments within the company are also made while not recouping. However, sometimes restrictions do occur. It can happen that recycling streams with the right quality are not (frequently enough) available or that the price is too high and it is not possible for a single company to pioneer without the other companies to go along as it might lead to bankruptcy of the company. (Anonymous, personal communication, 14-05-2013) Also cost considerations are the main driving force to economize within the packaging sector. Continuity of businesses and the need of business models which include a payback time of the investment costs are important. Environmental benefits are often abstract for businesses in case of money. (T. Juriaanse, personal communication, 06-05-2013) Another main restriction within the packaging sector to become more sustainable are nowadays food safety and quality. It is important for companies to keep the quality of products to the quality standard. Sustainable packaging might be good for the environment but might lead to bad quality of products and thereby violate the reputation of the company. It is important to be aware of all consequences when decisions regarding packaging are made. (Anonymous, personal communication, 13-05-2013) Safety is an important restriction for the manufacturing sector as well since the recycling stream does not seem to be reliable enough for the production of pipelines (valves) according to international regulations on safety requirements. Also the use of bio plastics made from sustainable organic material is not ready for these kinds of products so far. (Anonymous, personal communication, 14-05-2013)

The future of the anonymous conversion company will exist of continuous environmentally improvement of products which is also restricted by the ISO 14001 certificate (see Appendix IX Certification of companies). The ISO 14001 certificate is a standard which is internationally accepted. The standard outlines how to put an effective environmental management system in place, so during growth the environmental impact will be reduced (British Standard Institution, 2013). This has to do with the weight, the material of the products and where the material origins. Also increasing closed recycling streams and increasing use of recycled material will be considered for the future. (Anonymous, personal communication, 14-05-2013) The interviewee of the packaging company indicated that the focus of economic aspects might transfer more towards social aspects in the future, due to the social commitment of people. (Anonymous, personal communication, 13-05-2013)

3.3.1.4 Responsibility

Most of the responding stakeholders from the design or manufacturing sector (see Figure 11) consider the sector they are working in to be responsible (68,5 %) and one of the most competent (78,9 %) but not very motivated (10,6 %). But from an individual perspective within the sector, stakeholders consider themselves to be responsible (68,5 %) and competent (63,2 %) and the highest motivated (73,7 %) of all stakeholders to reduce the problem of marine litter.

Environmental groups (73,7 %) are considered to be most motivated as well but environmental groups (21 %) are, together with independent scientists (26,3 %), considered to be least responsible. These two sectors are also seen as least competent (environmental groups: 42,2 %; independent scientists: 36,9 %). The coastal and marine industry is considered to be least motivated (5,3 %) to reduce the problem but the sector (84,3 %) is together with the general public (84,2 %) seen as most responsible for reducing marine litter. The government and policy makers (89,4 %) are

most competent to reduce the problem, also the design and manufacturing sector (78,9 %) is competent according to the stakeholders.

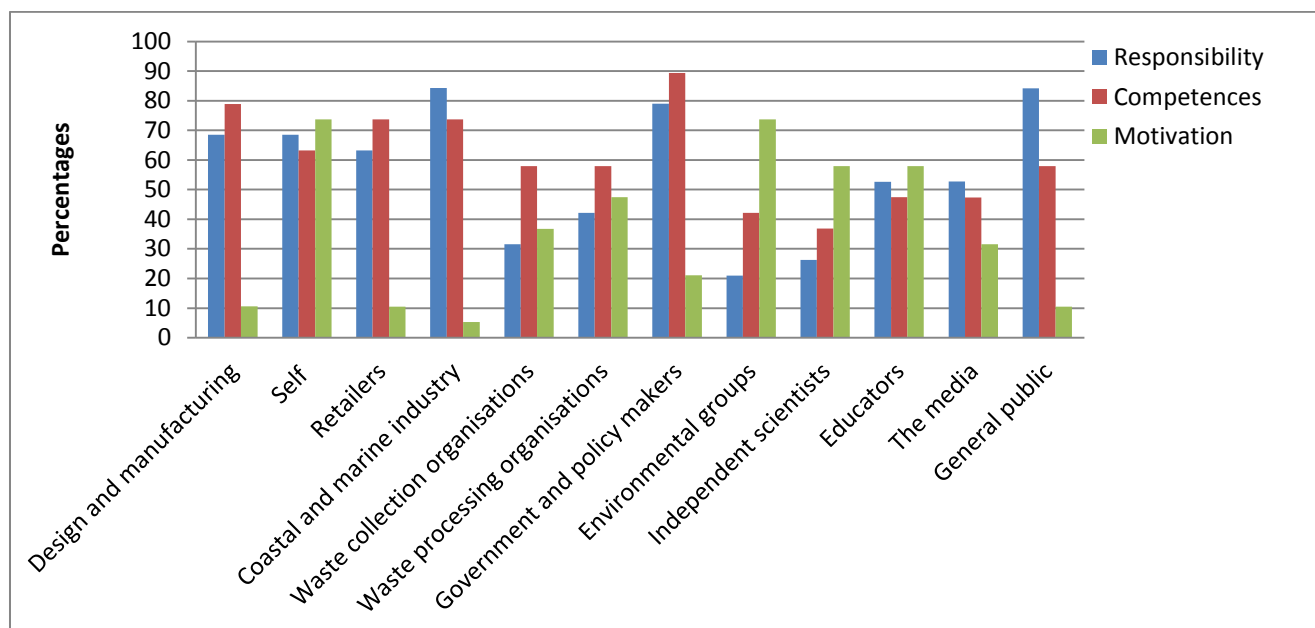


Figure 11 Agreeing stakeholders from the design and manufacturing sector on responsibility (N=19)

According to the anonymous interviewee from the material conversion company, all stakeholders have their responsibility whether in contributing to the problem or in preventive and/or reactive actions to reduce the problem. (Anonymous, personal communication, 14-05-2013) Also according Mr T. Juriaanse shared responsibility for the problem of marine plastics lies with the entire plastic product chain, including the packaging sector. (T. Juriaanse, personal communication, 06-05-2013) But the main responsibility for causing marine plastics lies with the behaviour of consumers, according to the anonymous material conversion company, Sabic Europe and FWS (Anonymous, personal communication, 14-05-2013; S. Kaasenbrood, personal communication, 16-05-2013; T. Juriaanse, personal communication, 06-05-2013). The plastic production sector does not have a responsibility for causing the problem of marine plastics, according Mr S. Kaasenbrood. The sector produces plastics but does not have an influence on the throw away behaviour of citizens. The only physical intervention which could be taken by the plastic production sector is acting responsible and minimising pollution as much as possible. Sabic Europe takes this responsibility of prevention. The sector is willing to collaborate and improve its behaviour to decrease the problem of marine plastics. (S. Kaasenbrood, personal communication, 16-05-2013) The material conversion company indicates not to be directly responsible for contributing to plastic in sea, and especially not due to their returning system and 'green' production process. Large players in the production chain should take the lead in making sustainable changes. Smaller players need to be aware of the problem and the possibilities to change and should follow the large players within the sector. (Anonymous, personal communication, 14-05-2013) The packaging sector takes its responsibility for the problem of marine plastics by collaboration and acting according the Framework Packaging agreement. (T. Juriaanse, personal communication, 06-05-2013) The packaging company think it is important to collect and reuse plastic materials and considers itself responsible for taking care of that aspect. "Prevention is better than solving", says the anonymous interviewee, "and make sure the used materials are recyclable". All stakeholders contribute to the aspect of prevention but improvements are always possible. (Anonymous, personal communication, 13-05-2013)

Also waste management is very important for closing the plastic lifecycle. The waste management system in the Netherlands is relatively well organised but there are large global differences which are a major part of the problem. It is important to find the cause of the problem of marine plastics, what the contribution of all actors in the plastic product chain is to the problem, including the packaging sector and other sectors. (T. Juriaanse, personal communication, 06-05-2013) Also according to the anonymous interviewee from the material conversion company, the main problem is not caused by the Netherlands. The Netherlands are already very aware of recycling and are actively involved in the problem. The main problem areas are countries like China, India, America and maybe Brazil,

where no recycling streams are present in a valuable way. These countries should take their responsibility. The interviewee says “It would be great when there will be global awareness”. But before pointing out to other countries, the most optimal results should be achieved in the Netherlands as well. (Anonymous, personal communication, 14-05-2013)

3.3.1.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be involved and aware of the problem but suggest that marine litter is more of a future threat. The two most contributing factors to marine litter are coastal industries and the inadequate behaviour of public in the stakeholders’ opinions. Sabic Europe, Plastics Europe, FWS and two anonymous companies are aware of the problem with marine plastic but the anonymous packaging company and FWS suggest that the problem is not of high priority within the company. The interviewee of the anonymous conversion company is really concerned about the problem and fears for the future of next generations. The only experience companies have with marine plastic is that the companies are sometimes associated with marine plastics and sometimes accused of the problem. External influences experienced by the companies are laws and regulations, environmental organisations, media, umbrella organisations and customers.

Regarding the results of the level of awareness, the awareness of stakeholders about marine plastic seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according the stakeholders is due to release in the sea. The aspect the stakeholders are well aware of is the threat marine plastic is to the marine environment.

Regarding the behaviour of the design and manufacturing sector, it is easy and likely for the majority of the stakeholders to take action to reduce marine litter. The asked behavioural activities are seen as easy (63,2 – 79 % of the stakeholders) and likely (52,7 – 73,7 % of the stakeholders) to carry out, except for the easiness to buy reusable products. Also according to the visions of design and manufacturing companies, the environment seems to be a high rated aspect within the policy of the companies. Within the packaging sector large steps are made. Also the manufacturing sector is working on reducing the problem for example by prevention but business cases and costs are the main restrictions to improve on sustainable aspects.

Regarding the responsibility of the design and manufacturing sector, the sector is seen as responsible and one of the most competent to reduce marine litter but not very motivated. As individual within the sector, stakeholders are responsible, competent and the most motivated of all. Environmental groups are considered to be most motivated as well. The coastal and marine industry and the general public are seen as most responsible, while the government and policy makers are seen as most competent. Also from the companies’ perspective, the general public is the most responsible. Countries which are not aware of the problem and without a valuable recycling system should take its responsibility. The sector propagates responsibility by prevention and working as sustainable as possible.

3.3.2 Retail

In this paragraph the results for the stakeholder sector retail are presented. The number of survey respondents within this sector is 13 (N=13) and the number of interviewees within this sector is 1 (N=1), namely supermarket Jumbo, with as representative Mr B. Degenhart (entrepreneur of Jumbo Leens).

3.3.2.1 Opinions

The results on the opinions of the stakeholders within the retail sector show that the majority of the stakeholders agree with most of the statements (see Figure 12, part A). Most agreement is on the statement that marine litter is also a problem in the stakeholders’ country. Least agreed statements are that the use, received out of the modern material, does not outweigh any negative effects on the environment (61,6 % agree) and that marine plastic is already a present threat (38,5 % agree; 46,2 % disagree). Mr B. Degenhart is aware of the problem of marine plastics because he fears for the future of next generations. There is currently no exchange of the awareness of the management to the employees since the supermarket has just been owned by Mr B. Degenhart but when all other aspects are set, he wants to make his employees aware on the problems of plastics as well.

The stakeholders (69,3 %) suggest that their family and friends think that it is important to reduce marine litter (see Figure 12, part B). However, the stakeholders are not sure about the support they might receive from close ones

(46,2 % agree). There is also less agreement how much the local communities of the stakeholders care about marine plastic; 46,2 % agree that the people in their community care about marine plastic but 30,8 % also disagree.

The most important factors contributing to marine litter according the stakeholders from the retail sector are the inadequate behaviour of public (92,4 %), followed by coastal industries (84,6 %) (see Figure 12, part C). Loss during transport of products and waste is a less important factor according the retail sector, where only 15,4 % indicate this factor as very important but still 84,7 % indicate this factor as fairly important. 7,7 % of the stakeholders indicate single use-/ throw away products and the extensive use of plastic in packaging and products as not important at all, while the majority of the stakeholders indicate these factors as very important.

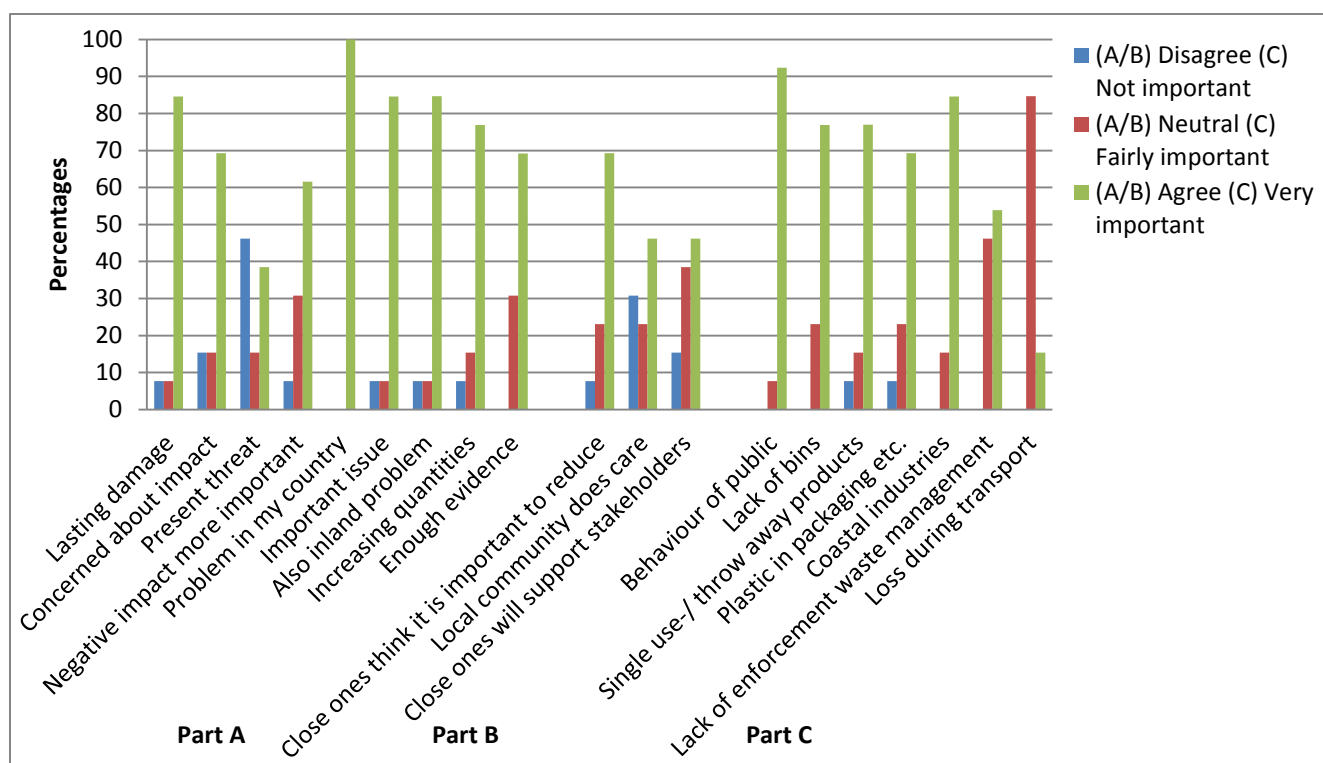


Figure 12 Total results from the retail sector (N=13) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

3.3.2.2 Level of awareness

By benchmarking the level of awareness about the percentage of plastic within marine litter between 65 % and 85 %, it seems that only a very small percentage (7,7 %) of the stakeholders answer within the benchmark and 92,3 % indicate the percentage to be less than 65 %. Regarding the degradation time of plastic, only 7,7 % think the degradation time is 100 years or higher.

The largest pathway for marine plastic is direct release into the sea according all stakeholders of the retail sector (see Figure 13, part A). The least important indicated pathway is due to blown from landfill or landfill collapses, where only 15,4 % of the stakeholders indicate a lot of plastic come from this pathway. 7,7 % of the stakeholders indicate sewage overflows as no contributing pathway, while still 38,5 % indicate it as a very important pathway.

Marine litter is a major threat to the marine environment according all stakeholders of the retail sector (see Figure 13, part B). Tourism is seen as least threatened by 23,1 %, which indicates this factor to be major threatened but still 77 % indicate tourism to be average threatened.

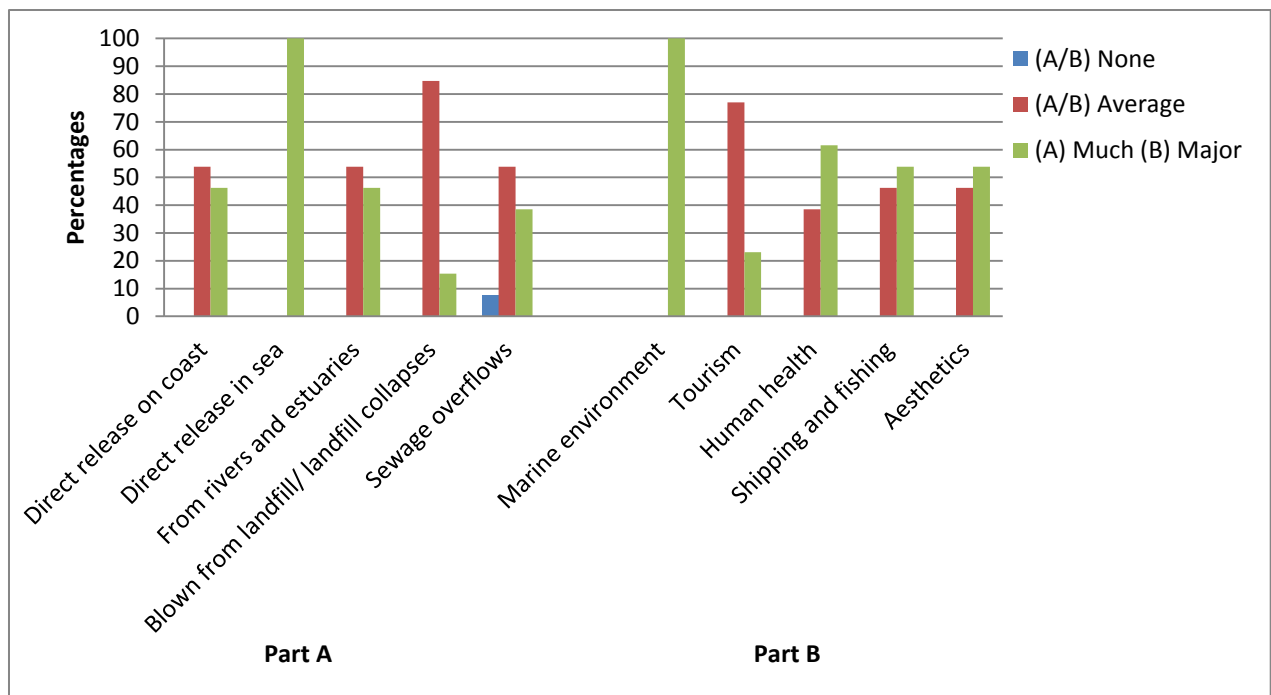


Figure 13 Part A: Pathways of marine plastics according the retail sector; Part B: Level of threat of marine plastics regarding several factors according the retail sector (N=13)

3.3.2.3 Behaviour

Regarding the behaviour of stakeholders from the retail sector (see Figure 14), picking up litter that the stakeholders see at risk of entering the sea is considered to be the easiest (84,7 %) action to reduce the quantities of marine litter. It is most likely (69,2 %) that stakeholders will ask people to pick up their litter, although expressing themselves to people about littering is seen as most difficult (easy for 46,2 %; not easy for 30,8 %). Buying re-usable products and supporting government on marine litter is also not very easy (easy for 53,9 %; not easy for 30,8 %) but buying re-usable products is the least likely (53,9 %) behavioural activity for the stakeholders to carry out.

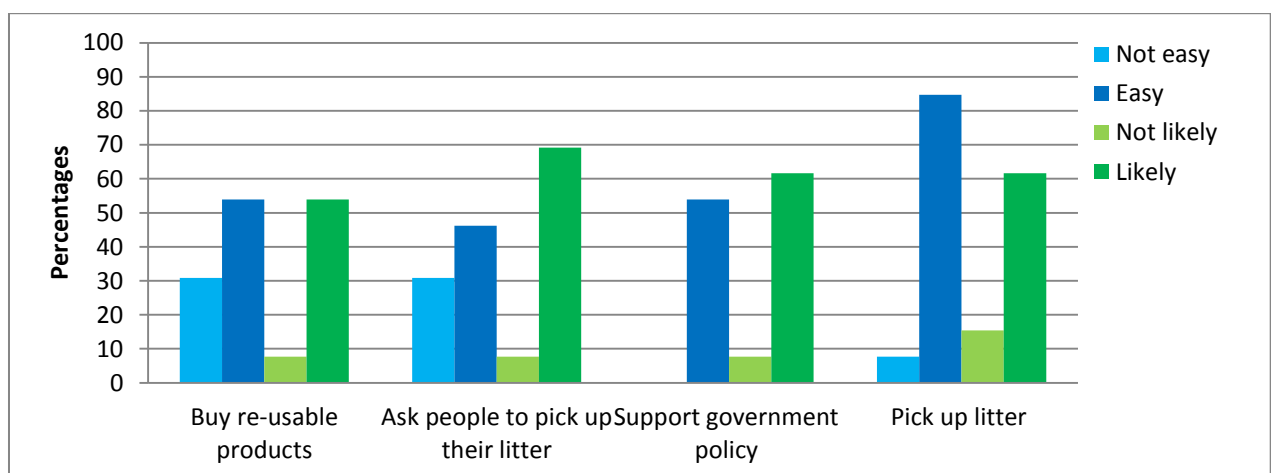


Figure 14 Opinion of the retail sector about behavioural activities (N=13). Note: the average is not included in the figure.

Behaviour taken from the company perspective, supermarkets deal with plastics in terms of packaging and plastic bottles every day. Plastic bottles are the largest part of plastics at supermarket Jumbo since large amounts of plastic bottles are returned to supermarkets. The supermarket concern Jumbo takes in all returnable deposit bottles, including the bottles originating from any other supermarket. The return of deposit bottles to supermarkets takes time and money because of the work it entails. But it relieves the environment as the bottles will be recycled. For this reason, Mr B. Degenhart thinks the abolition of returnable deposit bottles is not the best initiative. The head office of

Jumbo, located in Veghel, imposes requirements for products and packaging methods within the supply chain. Jumbo Veghel is currently working on Jumbo's own brand to make products and packaging more sustainable and can influence producers of major brands as well. Next to the influence Jumbo can have on stakeholders, stakeholders can have an influence on Jumbo as well. Jumbo operates based on seven certainties where the desire of the consumer comes first, meaning consumers have a big influence on the sustainability of the company. Sustainable products are often more expensive and this price difference needs to be paid but most consumers are not motivated to do so. The entire process is a combination of manufacturers, suppliers and consumers. (B. Degenhart, personal communication, 13-05-2013)

There are several activities related to plastic within Jumbo, where employees are already aware of. All plastic used in the Jumbo at Leens, like plastic bags, are biodegradable. Each Jumbo supermarket contains a ball where consumers can leave their plastic bags so other consumers can re-use these. If consumers want to buy a new plastic bag they have to pay 10 euro cents. This stimulates them to take their own bag or to use the used-plastic bags. Jumbo communicates its sustainability policy to consumers but it is hard to influence their behaviour especially outside the supermarket.

All retail companies propagate a sustainable vision (Appendix VIII Vision labels of companies), except one which stands for present-day and fast fashion. The other companies seem to be aware of the problems with plastics, as many values are related to plastics. Most named aspects within the visions directly related to plastic are recycling, use of recyclable materials, waste reduction and waste separation. The companies also seem to stimulate other stakeholders for sustainability and waste reduction. Values related to the environment are corporate social responsibility, sustainability, reducing the impact on the environment and local products. Future generations seem to be respected as well, for example by not fishing on endangered species and only purchase MSC certified fish.

3.3.2.4 Responsibility

The responsibility (see Figure 15) of the retail sector is low estimated among the stakeholders (30,8 %) from the retail sector. The stakeholders think the sector they are working in is not very competent (30,8 %) and one of the least motivated (7,7 %). From an individual perspective within the sector, the stakeholders see themselves as responsible (61,6 %) and one of the most motivated (77 %) to reduce the problem of marine litter but the stakeholders think their competences (30,8 %) to do so are low.

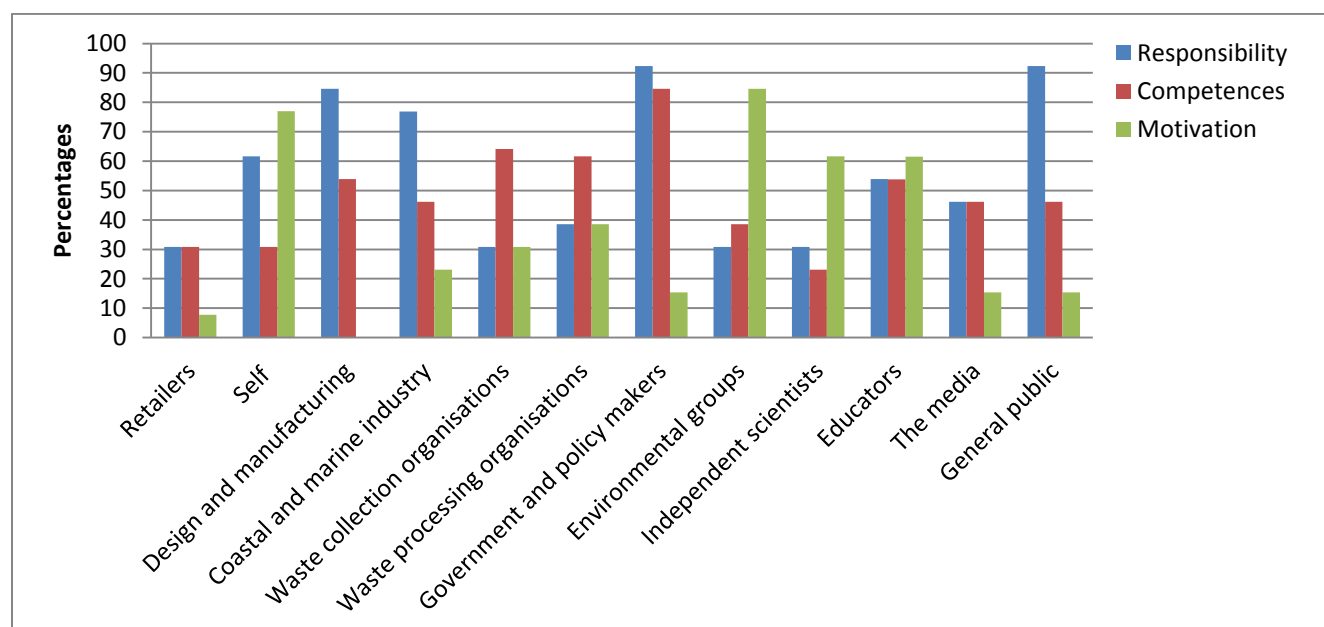


Figure 15 Agreeing stakeholders from the retail sector on responsibility (N=13)

The entire population is responsible for the environment they live in and for reducing and causing the problem of marine plastics. In the opinion of Mr. B. Degenhart, the responsibility for causing the problem of marine plastics lies

mainly with the consumers who need to deal with plastic in a responsible way. Jumbo and the whole sector take their responsibility. Supermarkets have to deal with thousands of consumers weekly so they need to know how to deal with the environment. The influence of one single supermarket is not to a large extent but when the whole Jumbo concern cooperates, a large contribution on awareness and a reduction of the problem can be made. (B. Degenhart, personal communication, 13-05-2013)

3.3.2.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be involved and aware of the problem but almost half of the stakeholders disagree that marine litter is already a present threat and only 38,5 % agree with this statement. The two most contributing factors to marine litter are the inadequate behaviour of public and coastal industries in the stakeholders' opinions. Mr B. Degenhart is aware of the problem of marine plastics and fears for the future of next generations. There is currently no exchange of the awareness of the management to the employees but he is willing to involve his employees with awareness as well.

Regarding the results of the level of awareness, the awareness of stakeholders about marine plastic seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according the stakeholders is due to release in sea. The aspect the stakeholders are well aware of is the threat of marine plastic to the marine environment.

Regarding the behaviour of stakeholders from the retail sector, the easiness and likeliness for the stakeholders to take action to reduce marine litter is moderate. Except for the easiness of picking up litter and the likeliness to ask people to pick up their litter, both the easiness (46,2 – 53,9 % of the stakeholders) and likeliness (53,9 – 61,6 % of the stakeholders) of the asked behavioural activities are not highly estimated. However all retail companies do propagate a sustainable vision. For example supermarket Jumbo is working on sustainable packaging and has several activities related to plastic.

Regarding the responsibility to reduce marine plastics, the consumers are most responsible according to the companies' perspective. The responsibility of the retail sector is estimated low. The sector is also considered to be not very competent and least motivated. As individual within the sector, the stakeholders are more responsible and one of the most motivated but the competences are estimated low. The government and policy makers are most responsible according the stakeholders. This sector is also seen as the most competent and environmental groups are considered to be most motivated.

3.3.3 Coastal and marine industry

In this paragraph the results for the stakeholder sector coastal and marine industry are presented. The number of survey respondents within this sector is 35 (N=35) and the number of interviewees within this sector is 2 (N=2), namely fishing company Ekofish Group, with as representative Mr J. de Boer (Captain PD147 Enterprise), and shipping company Amasus Shipping B.V., with as representative Mr H. Melles (fleet manager).

3.3.3.1 Opinions

The results on the opinions of the stakeholders of coastal and marine industry sector show that more than 70 % agree with most statements, whereof most agreement (85,7 %) exists about the statement that marine plastics will cause lasting damage (see Figure 16, part A). Least agreement is about the statement that quantities are increasing (62,9 %) and about the statement that marine plastic is already a present threat, where 42,9 % disagree with.

The opinions of the individuals about their local community and close ones are varying (see Figure 16, part B). 71,5 % suggest that most of their family and friends think it is important to reduce marine plastics. 57,1 % agree that most of those close to the stakeholders will support them in taking steps to marine litter and 57,2 % suggest that most people in their local communities do care about marine plastics.

Regarding factors of marine litter, most of the stakeholders from the coastal and marine industry sector believe that marine litter can be sourced back to the extensive use of plastic in packaging and products (88,6 %), followed by single use- / throw away products (77,1 %) (see Figure 16, part C). Least agreement is present about a lack of bins

(2,9 % say not important, 51,4 % say fairly important) and the loss of products and waste during transport (5,7 % say not important, 57,2 % say fairly important).

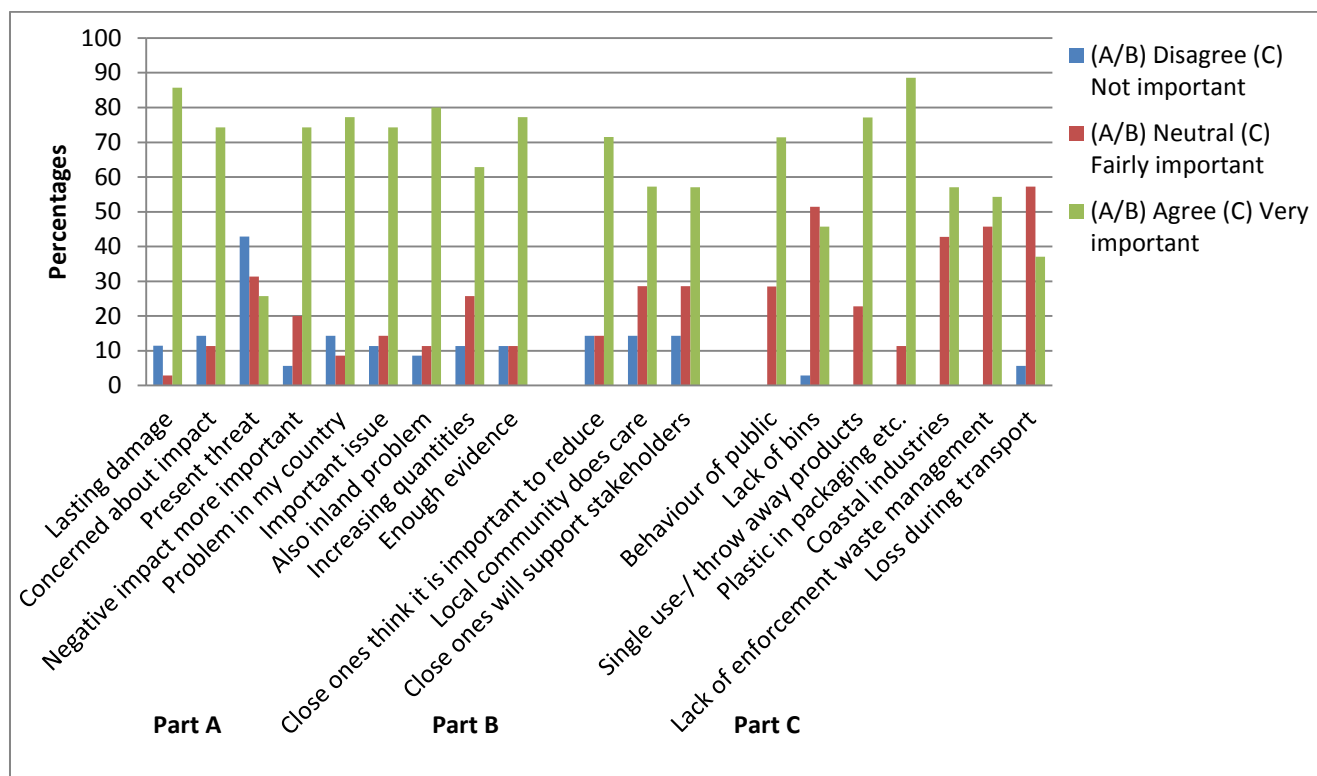


Figure 16 Total results from the coastal and marine industry sector (N=35) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

Amasus Shipping B.V. and Ekofish Group were asked during an interview what the awareness and attitude of the management are regarding marine plastic. Amasus Shipping B.V. is aware of the environment and the problem with marine plastic but does not have a specific view regarding marine plastics. However, a balance between nature and economy is important to the company according to Mr H. Melles. (H. Melles, personal communication, 17-04-2013) Also Ekofish Group is aware of the problem of marine plastics and it collaborates with environmental organisations and research institutes like Wageningen University to find solutions to environmental cases. But conveying their awareness to other colleagues seems to be an obstacle as colleagues will often not accept advice and comments on the subject of marine litter by a colleague fisherman according to Mr J. de Boer. Mr J. de Boer also indicates the problems regarding marine litter in other parts of the world; “What is normal in some parts of the world, might be all but normal in other parts of the world”. It will take time to create awareness all around the globe. (J. de Boer, personal communication, 22-04-2013)

The companies were also asked about their experiences with marine plastic and if there are any external influences undertaken by the companies. Both companies do not experience negative problems from marine plastics. However, sometimes fishing net gets stuck in the propellers of the companies’ ships but both companies indicate this is most often not a large problem. While sailing on some shipping routes a lot of floating plastic bottles is seen by the crew of Ekofish Group and each catch contains several plastic bottles as well. (J. de Boer, personal communication, 22-04-2013; H. Melles, personal communication, 17-04-2013) An external influence undertaken by both companies is the influence of the customer. When customers ask for sustainability, the fishing sector is willing to comply; when customers do not want sustainable products, changes and improvements will be less likely. (J. de Boer, personal communication, 22-04-2013) Some of the customers of shipping companies do have requirements on sustainability and are looking for a responsible company with quality. The shipping sector is also influenced by the government since the government makes the industry aware of the environment by laws and regulations. (H. Melles, personal communication, 17-04-2013) But government parties are not influencing the fishing sector on a way that will lead to

changes within companies. More regulations and laws are not a solution for the problem according to Mr J. de Boer (J. de Boer, personal communication, 22-04-2013).

3.3.3.2 Level of awareness

Following the benchmark of 65 % and 85 %, it seems that 14,3 % of the stakeholders from the coastal and marine industry suggest that the amount of marine litter regarding all marine litter lies within the benchmark. 85,7 % suggest the percentage to be lower than 65 %. Regarding the degradation time of plastic, 31,4 % suggest the degradation time of plastics to be within the benchmark of 100 years or higher.

According 68,6 % of the stakeholders, a lot of plastics enter the sea due to direct release in sea. 60 % indicate the second most important pathway to be rivers and estuaries (see Figure 17, part A). Least important pathways are blown from landfill or landfill collapses (5,7 % say no contribution) and sewage overflows (8,6 % say no contribution).

The marine environment is major threatened by marine litter, according 94,2 % of the stakeholders of the coastal and marine industry (see Figure 17, part B). Also aesthetics are seen as major threatened according the stakeholders (62,8 %). Least threatened are humans (80 % say average threatened) and shipping and fishing (2,9 % say not threatened, 74,3 % say average threatened).

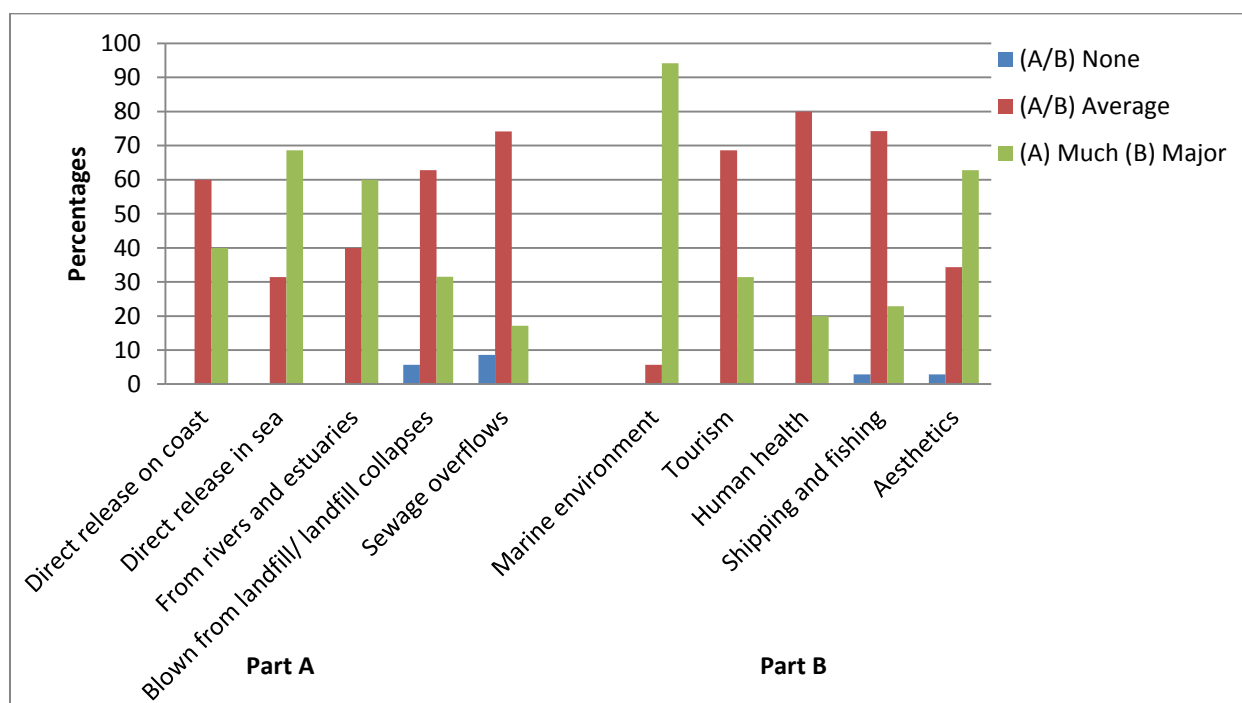


Figure 17 Part A: Pathways of marine plastics according the coastal and marine industry sector; Part B: Level of threat of marine plastics regarding several factors according the coastal and marine industry sector (N=35)

3.3.3.1 Behaviour

Picking up litter that the stakeholders see at risk of entering the sea is seen as the easiest (68,6 %) and the most likely (57,2 %) behavioural activity to reduce the quantities of marine litter, according to the responding stakeholders from the coastal and marine industry (see Figure 18). Asking people to pick up their litter if the stakeholders see them littering is the least likely (48,5 %) activity to carry out. Expressing themselves to people about littering is seen as one of the most difficult (not easy for 5,8 %; easy for 54,3 %) action to reduce the problem of marine litter. The most difficult behavioural activity (not easy for 20 %; easy for 54,3 %) according to the stakeholders is to buy re-usable products. Also it is not very likely to carry out this action (not likely for 22,9 %).

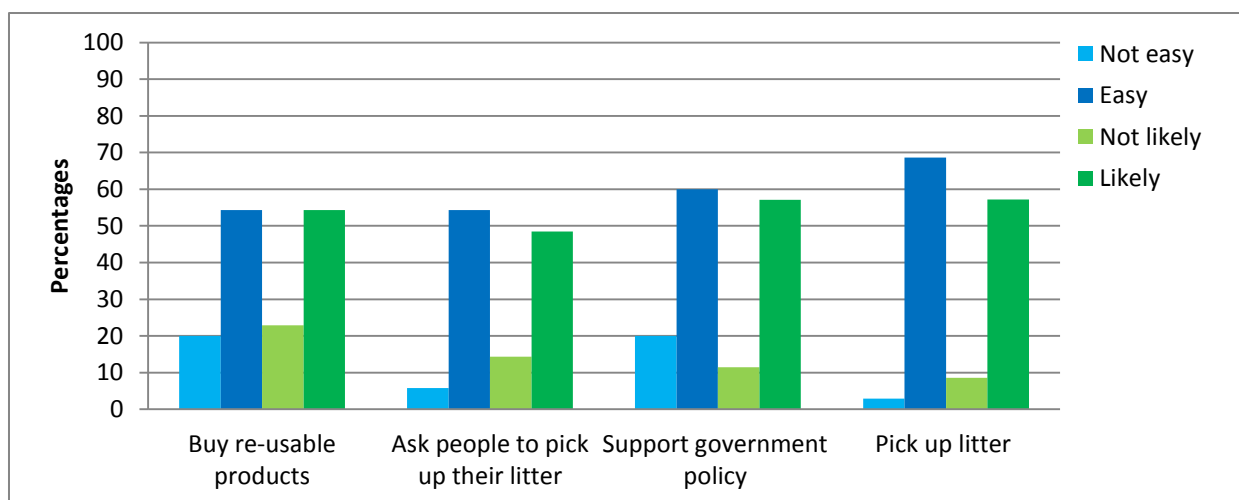


Figure 18 Opinion of the coastal and marine industry about behavioural activities (N=35). Note: the average is not included in the figure.

Of the companies within the coastal and marine industry sector, about half of them do not propagate a sustainable vision or no vision at all (see Appendix VIII Vision labels of companies). Quality seems the most important driving force within these companies. Of the companies with sustainable visions, most named values directly related to plastic are recycling and waste reduction. Also named by some companies are reducing packaging weight/ material, cooperation with stakeholders and sustainable/degradable/compostable resources. Furthermore the stakeholders seem involved with sustainability and 11 companies from the coastal tourism possess a Green Key certificate (see Appendix IX Certification of companies). Corporate social responsibility and future generations as well as the MSC certificate are in the attention of the stakeholders as well.

Linked to the framework of existing international legislation, the national law of the Netherlands obligates Dutch vessels to have a Garbage Management Plan in which a shipping company has to describe their waste handling (IMO, 2013). All shipping companies sailing under the Dutch nation flag possess the International Safety Management Certificate as well (IMO, 2013^A). To obtain and retain this certificate Amasus Shipping B.V. has implemented a Quality, Health, Safety and Environmental (QHSE) policy. The QHSE manual, in which the behavioural activities and the procedures are described, is used on board by the crew. Posters with information about waste management are on board to make the crew continuously aware. The behavioural activities of the crew are supervised by the office, so improvements on the waste management can be implemented when needed. Amasus Shipping B.V. strives to separate waste in appropriate containers. The crew on board is responsible for the waste separation but there is little insight in the effective compliance of the crew members. The crew members also keep track on the storage capacity for waste. Waste compactors are available on some vessels to increase the storage capacity. The waste is retained on board and released upon arrival in the port. No waste is dumped overboard but it is hard to prevent small accidents like the loss of small pieces of waste. There are currently no plans for further improvements for waste management on board of the vessels due to the limited possibilities on a vessel. The waste disposal in ports is well regulated nowadays. The costs of waste management facilities are included in the port charges. A record should be maintained to keep track of what waste is retained on board and what is released upon arrival in the port but there is not much compliance on this regulation. (H. Melles, personal communication, 17-04-2013)

Just like the shipping sector, fishing companies have to describe their waste handling in a Garbage Management Plan. Ekofish Group is acting regarding the regulations but indicates it is hard to separate waste on board due to the limited space. Only chemical waste is separated from residual waste and returnable deposit bottles are always returned to the supermarket. The company also indicates that very little plastic waste is produced on board. According Mr J. de Boer, waste disposal is not well regulated at most ports in the Netherlands. In most ports the costs of waste management facilities are not included in the port charges and fishing vessels have to pay extra for releasing their waste. MAIN (Maritime Waste Collection Netherlands) collects maritime waste like unused fuel but does not collect residual and separated plastic waste. Waste caught is retained on board and released upon arrival in

the port. When fishing companies have to pay to release the caught waste, they are not willing to retain it on board anymore. By the Fishing For Litter project, deposit of waste caught including old fishing gear is free of charge. The caught fish is stored in trays on board, when the fish has been landed the fish will be packaged in packaging prescribed by supermarkets. Collaboration with supermarkets will be useful to influence the method of packaging and to stimulate more sustainable packaging. (J. de Boer, personal communication, 22-04-2013)

3.3.3.2 Responsibility

Most of the responding stakeholders from coastal and marine industry (see Figure 19) consider the sector they are working in to be very responsible (74,3 %) and one of the most competent (60 %) to reduce the problem. However, they think the sector they are working in is not very motivated (34,3 %) to do so. From an individual perspective within the sector, the stakeholders are less responsible (62,8 %) and competent (34,3 %) to reduce the problem. But individually, they have more motivation (57,1 %) to do so.

According to Mr H. Melles, the whole shipping sector has responsibility regarding the plastic problem since the sector makes use of the environment. This is why the sector needs to act responsible and to minimise pollution as much as possible. Amasus Shipping B.V. takes its responsibility by the compliance of the Garbage Management Plan and the QHSE manual. The whole shipping sector contributes by trying not to increase the plastic problem. (H. Melles, personal communication, 17-04-2013)

The fishing sector is not responsible for creating and reducing the problem of marine plastics, according to Mr J. de Boer. They consider themselves only responsible for the loss of fishing gear at sea. The responsibility the fishing sector is willing to take regarding the contribution to reduce marine litter lies with catching waste and bringing it ashore. An opportunity could be to deploy the fishing sector to carry this out, according to Mr J. de Boer. The sector is currently working to be more sustainable on several subjects. Restrictions for other colleagues in the fishing sector and other stakeholder sectors are needed at a certain stage, for example for the manufacturing sector. Ekofish Group takes its responsibility for the problem and the whole fishing sector is gradually working towards sustainability but improvements can always be made. (J. de Boer, personal communication, 22-04-2013)

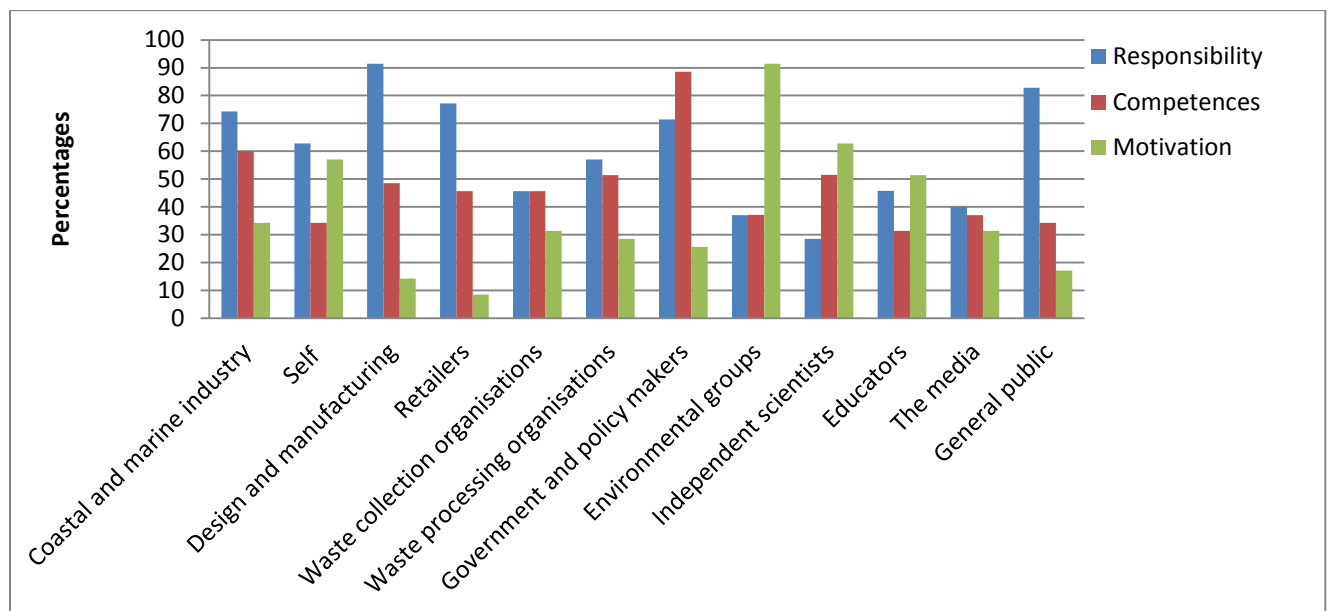


Figure 19 Agreeing stakeholders from the coastal and marine industry on responsibility (N=35)

Most of the stakeholders think the design and manufacturing sector (91,4 %) is responsible for reducing marine litter (Figure 19). Also general public is considered to be responsible (82,8 %). Independent scientists (28,6 %) are seen as least responsible to reduce the problem. The government and policy makers are the most competent (88,6 %) according the stakeholders, while educators are the least competent (31,4 %). Following the stakeholders are environmental groups (91,4 %) the most motivated and retailers (8,6 %) least motivated.

3.3.3.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be involved and are aware of the problem. However, the stakeholders (62,9 %) are least sure about the statements that quantities are increasing and about the statement that marine plastic is already a present threat. The two most contributing factors to marine litter are the extensive use of plastic in packaging and products and single use- / throw away products in the stakeholders' opinions. Amasus Shipping B.V. and Ekofish Group are both aware of marine plastics and are involved with sustainability. But Amasus Shipping B.V. does not have a specific point of view regarding marine plastics. Conveying their awareness to other colleagues seems to be an obstacle as colleagues will often not accept advice and comments on the subject of marine litter by a colleague fisherman according to Mr J. de Boer. Both companies do not experience negative problems from marine plastics. External influences undertaken by the companies are the influence of the customer and the government within the shipping industry.

Regarding the results of the level of awareness, the awareness of stakeholders about marine plastic seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according to the stakeholders is due to release in sea. The aspect the stakeholders are well aware of is the threat marine plastic is to the marine environment.

Regarding the behaviour of stakeholders from the coastal and marine industry, the easiness and likeliness for the stakeholders to take action to reduce marine litter is moderate. Except for the easiness of picking up litter, both the easiness (54,3 – 60 % of the stakeholders) and likeliness (48,5 – 57,2 % of the stakeholders) of the asked behavioural activities are not highly estimated. About half of the companies within the coastal and marine industry do not have a vision on sustainability but within the shipping and fishing sector the waste handling is organised well and no waste is dumped overboard, according to Mr H. Melles and Mr J. de Boer.

Regarding the responsibility to reduce marine plastics, the shipping sector has responsibility but the fishing sector has not, according to the perspective of companies. Both stakeholder groups are willing to take responsibility to reduce marine plastics. The stakeholders from the coastal and marine industry consider the sector to be very responsible and competent but not very motivated. As individual within the sector, the stakeholders are less responsible and competent but have more motivation. The design and manufacturing sector is seen as the most responsible sector, while the government and policy makers are the most competent. Environmental groups are considered to be the most motivated.

3.3.4 Waste management

In this paragraph the results for the stakeholder sector waste management are presented. The number of survey respondents within this sector is 10 (N=10), the number of interviewees within this sector is 1 (N=1), namely waste management company Van Gansewinkel, with as representative Mr A. Bolt (project manager at Van Gansewinkel Group B.V.).

3.3.4.1 Opinions

The results on the opinions of the waste management sector regarding marine litter (see Figure 20, part A) show that 100 % of the stakeholders think marine litter will cause lasting damage, 90 % see it as an important issue and also 90 % indicate that it is a problem for inland. Notable is that only 50 % of the stakeholders agree and 40 % even disagree that they are concerned with the impact of marine litter, even though the stakeholders all think it will cause lasting damage. The timeframe marine litter will become a threat is varying as well among the stakeholders, where 50 % disagree marine litter is already a present threat.

The opinions about the close ones and the local community of the individual stakeholders are quite positive (see Figure 20, part B). 60 % of the stakeholders indicate that most of their family and friends think it is important to reduce marine litter and that most of those close to them will support the stakeholders in taking steps to reduce marine litter. 50 % suggest that most people in their local communities do care about marine litter.

According to the stakeholders from the waste management sector, the two most contributing factors to marine litter are the inadequate behaviour of public (very important by 100 %) and single use- and throw away products (90 %) (see Figure 20, part C). The least important factors indicated by the stakeholders are a lack of bins, coastal industries

and loss during transport. According to Mr A. Bolt, marine plastic is a social problem due to the throw away behaviour (A. Bolt, personal communication, 02-05-2013).

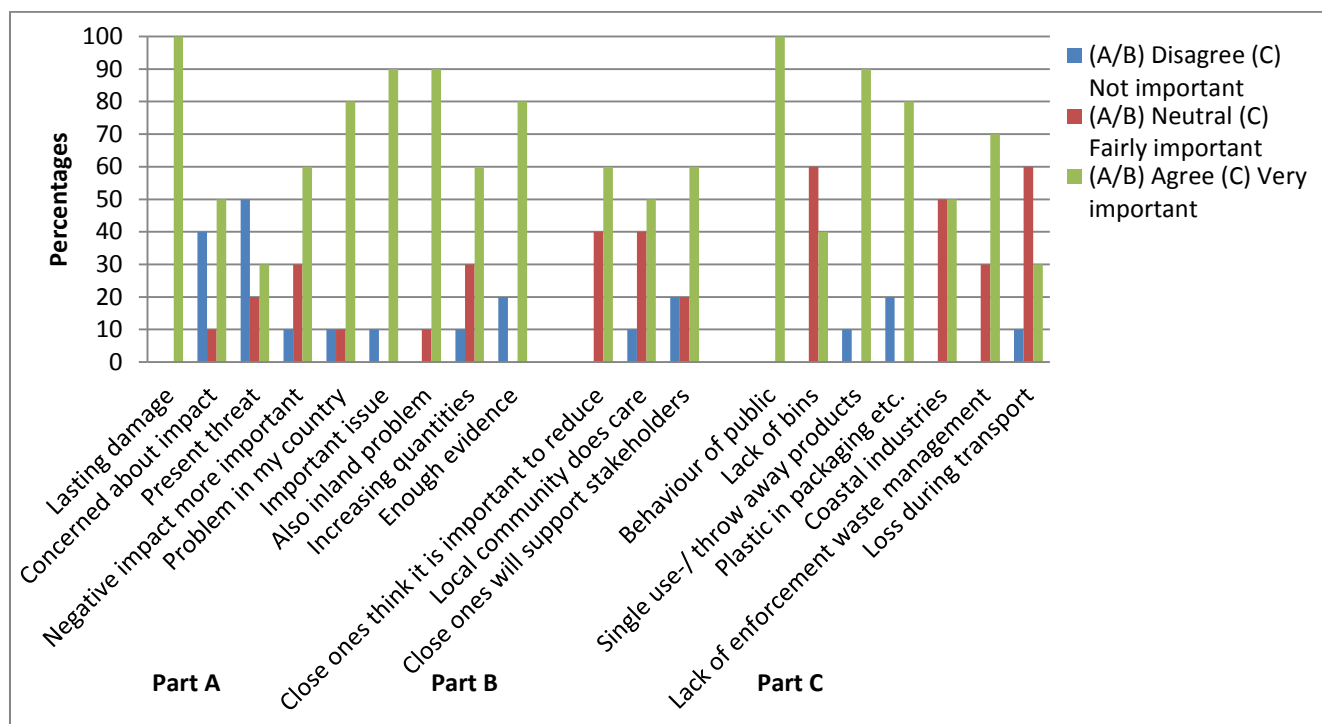


Figure 20 Total results from the waste management sector (N=10) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

Waste management company Van Gansewinkel is aware of the problem of marine plastics, including the employees, who are working on environmental services and environmental subjects. Van Gansewinkel strives to convey the importance of environmental subjects to society. Van Gansewinkel is mainly influenced by the media. (A. Bolt, personal communication, 02-05-2013)

3.3.4.2 Level of awareness

By benchmarking the percentage of plastic within marine litter between 65 % and 85 %, 40 % of the stakeholders' answers were within the benchmark and 60 % of the stakeholders indicate the percentage to be below the benchmark. Regarding the degradation time of plastic, 30 % of the stakeholders' answers were within the benchmark of 100 years or higher.

The most important pathways contributing to marine plastic are due to direct release in sea according 70 % of the stakeholders and due to rivers and estuaries according 60 % (see Figure 21, part A). Blown from landfill or landfill collapses seem the least indicated pathway by the stakeholders, where 30 % say much, 50 % say average and 20 % say none plastics come from this pathway. Sewage overflows is also a less indicated pathway but still 70 % of the stakeholders say an average amount of plastics comes from this pathway.

According all stakeholders from the waste management sector, marine litter is a major threat to the marine environment. Aesthetics of the coast are also influenced by marine plastic according the stakeholders, whereof 50 % indicate this factor as major threaten. Human health is threatened according to 40 % of the stakeholders and tourism, shipping and fishing are least threatened according 30 % of the stakeholders.

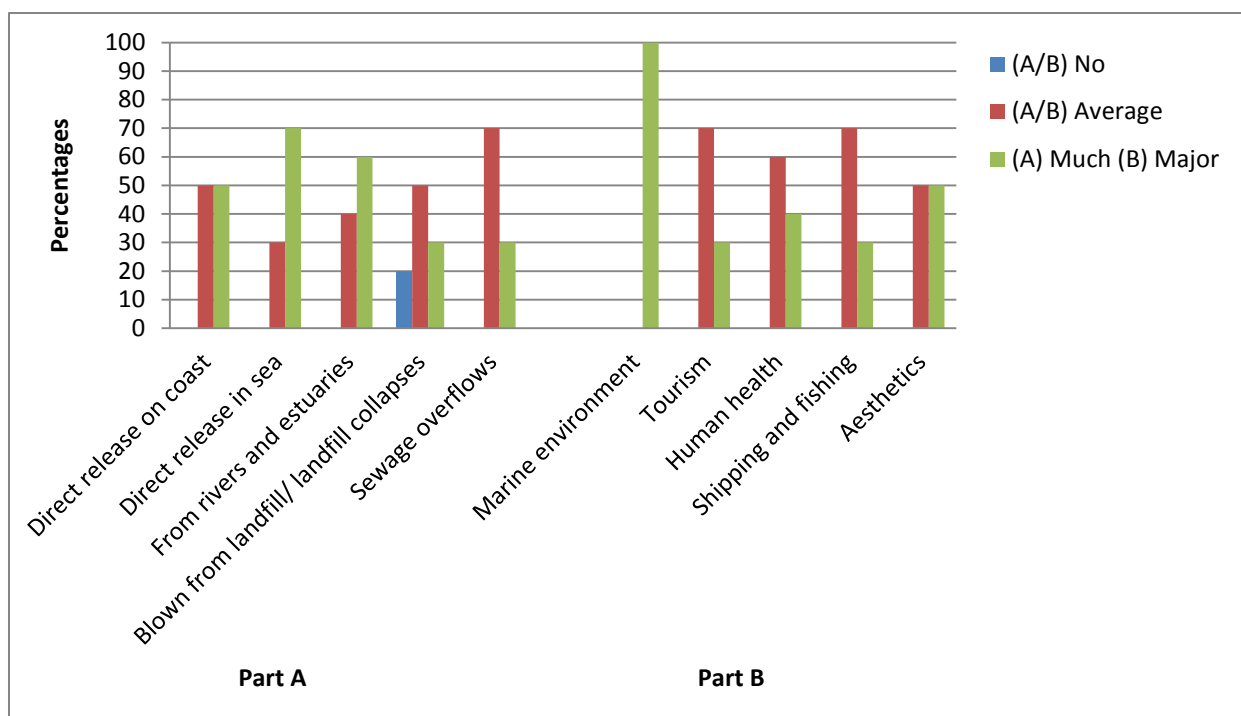


Figure 21 Part A: Pathways of marine plastics according the waste management sector; Part B: Level of threat of marine plastics regarding several factors according the waste management sector (N=10)

3.3.4.3 Behaviour

Regarding the behaviour of the stakeholders from the waste management sector, picking up litter is considered to be the easiest activity to reduce the quantities of marine litter by 60 % of the stakeholders (see Figure 22) since none of the stakeholders think the behavioural activity is not easy. This activity is likely for 70 % of the stakeholders. It is even more likely (by 70 %) to ask people to pick up their litter since none of the stakeholders think it is not likely. Buying re-usable products is considered to be the most difficult where 40 % indicate the activity as not easy and where 60 % of the stakeholders indicate it as a likely activity.

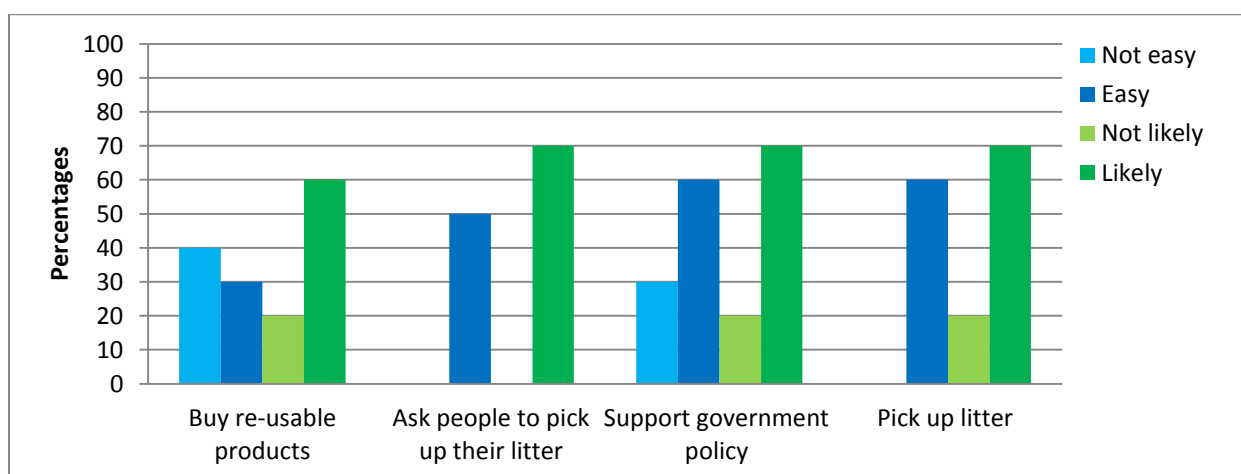


Figure 22 Opinion of the waste management sector about behavioural activities (N=10). Note: the average is not included in the figure.

According to Van Gansewinkel, "Waste does not exist" (Van Gansewinkel, 2013). Van Gansewinkel uses the "Cradle to Cradle" principle to close the life cycle of waste by re-using waste as material to produce new products. The company recycles plastic materials of technical products within the subsidiary company COREC. Waste is collected from municipalities and transferred to sorting stations of Nedvang. At the office the different waste streams are

collected separately in the appropriated bin which is a product of EcoSmart, part of Van Gansewinkel Group B.V. Currently waste from households (undifferentiated waste) is not recycled and goes to incineration plants, including the not separated plastics. Van Gansewinkel works on a project to receive and recycle more plastics out of household waste by the process of a profitable post-separation plant. The project takes several years to complete. Van Gansewinkel motivates companies to separate their waste by placing special containers for each kind of waste which reduces the amount of residual waste. The plastic industry is stimulated to reuse plastics and other raw materials. By stimulating the industry Van Gansewinkel helps the industry to close the life cycle of plastic. In the field of (marine) litter Van Gansewinkel is involved in several litter campaigns. Like Sabic Europe and PlasticsEurope, Van Gansewinkel is participating in the project of the Dutch Polymer Institute (DPI). (A. Bolt, personal communication, 02-05-2013)

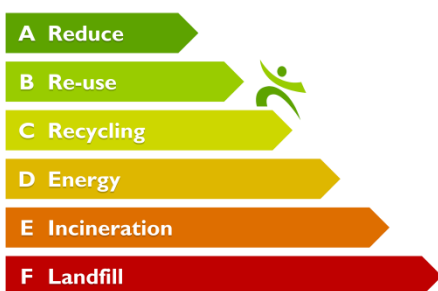


Figure 23 Lansink's Ladder (Recycling.nl, n.d.)

The "Ladder" Lansink" distinguishes standards on how to deal with waste (see Figure 23). Higher priority lies with the prevention of waste, following by re-use and recycling. When prevention and re-use is not possible, waste should be used for the generation of energy. Incineration and landfilling are the least wanted solutions (Recycling.nl, n.d.). Environmental laws and regulations are maintained within many companies. Certifications on environmental aspects are present as well but in a low level (see Appendix IX Certification of companies). Ten types of certificates regarding the environment are present within the 74 researched waste management companies. The ISO 14001 certificate is the most present. The VIHB certificate is also named within the companies and is directly related to waste since the certification is for transportation of plastic and paper waste (lpt, n.d.). Four companies do not mention the environment or sustainability at all within the visions. For these companies the focus is on economic aspects, clients and quality.

According the visions of companies from the waste management sector (see Appendix VIII Vision labels of companies) sustainability and the environment are high rated aspects in the policy of the companies. The most important sustainable and environmental aspects named are corporate social responsibility and the balance between people, planet and profit. Innovation and efficiency are important within the visions of the waste management companies to operate in an environmental friendly way. Like Van Gansewinkel, many waste management companies see waste as a source for new products to protect resources. Therefore re-use and recycling is of high importance, according to the "Lansink's Ladder" which is used by some of the waste management

3.3.4.4 Responsibility

The results on the responsibility of the waste management sector (see Figure 24) are estimated low. 30 % of the stakeholders agree that waste collection organisations have a responsibility. Within the waste processing organisations, the responsibility is agreed by 40 % of the stakeholders. Waste collection organisations seem more competent (60 %) to reduce the quantities of marine litter than waste processing organisations (50 %). 50 % of the stakeholders agree that the waste management sector is motivated to reduce marine litter. From an individual perspective within the waste management sector, 70 % see themselves as responsible, as one of the most motivated (90 %) and 50 % agree on their competency to reduce the problem of marine litter.

According Van Gansewinkel, the waste management sector is not responsible for causing the problem but is willing to take responsibility as far as possible for reducing the problem by sharing their knowledge and as long as it is a business case. Laws and policies stimulate the separate collection of certain waste streams. The main obstacle is the economic feasibility. (A. Bolt, personal communication, 02-05-2013)

The design and manufacturing sector and the coastal and marine industry are seen as the most responsible (both 90 %) for reducing marine litter, while environmental groups (20 %) and independent scientists (10 %) are considered to be the least responsible sectors. The design and manufacturing sector is, together with the government and policy makers, seen as the most competent sector as well since 90 % of the stakeholders agree on their competences. General public is least competent to reduce the problem, according 30 % of the stakeholders of the waste management sector. All stakeholders agree on the motivation of environmental groups, therefore they are seen as most motivated. Also independent scientists are one of the most motivated since 90 % of the stakeholders agree.

Although the government and policy makers are very responsible and competent to reduce the problem, the sector is considered by 10 % to be the least motivated.

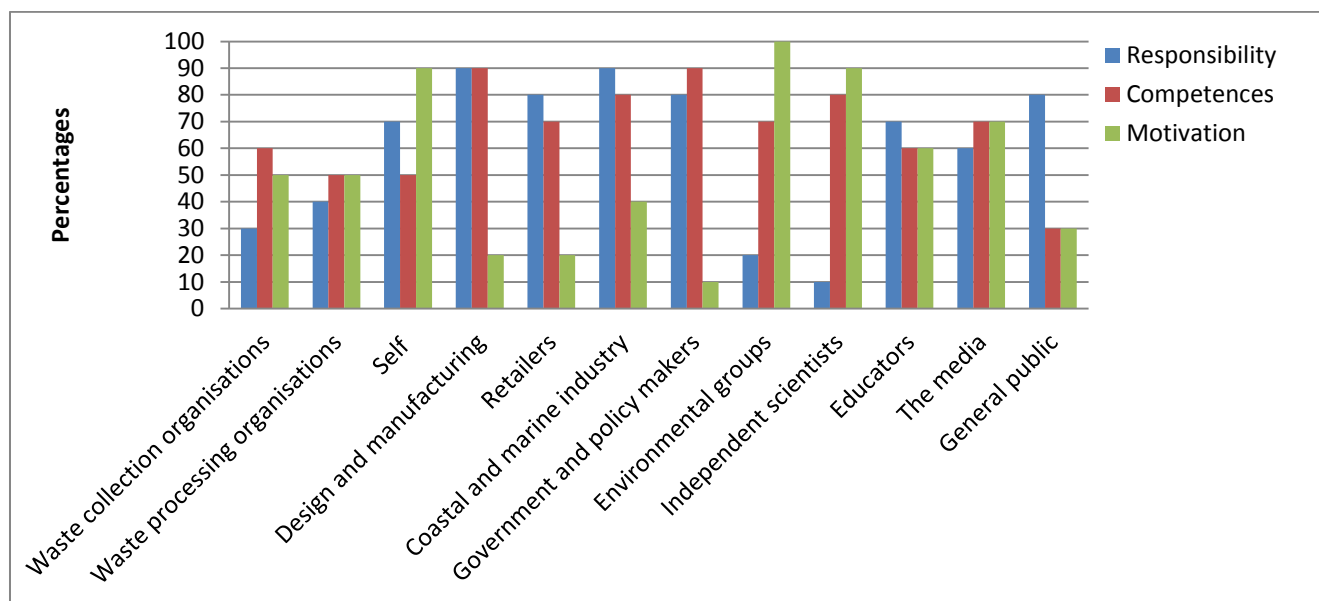


Figure 24 Agreeing individuals of the entire stakeholder group on responsibility (N=10)

3.3.4.5 Sub conclusion

Regarding the opinions within the waste management sector, the stakeholders seem to be involved and are aware of the problem. However, the stakeholders do not correspond with each other about the time frame marine plastic will become a threat and only 50 % are concerned about the impact of marine plastic. According to this group, the two most contributing factors to marine litter are the inadequate behaviour of public and single use- and throw away products. Waste management company Van Gansewinkel is aware of the problem, mainly influenced by the media and self-able to influence their customers.

Regarding the results on the level of awareness, it seems that the stakeholders have a limited awareness. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according the stakeholders is due to direct release in the sea, while estimates at global scale points out 80 % of marine plastic originate from land based sources. The aspect the stakeholders are well aware of is the threat marine plastic is to the marine environment.

Regarding the behaviour of stakeholders from the waste management sector, it is easy and likely for the majority of the stakeholders to take action to reduce marine litter. Except for buying re-usable products, the asked behavioural activities are seen as easy (50 – 60 % of stakeholders) and likely (70 % of the stakeholders) to carry out. Also according to the visions of waste management companies, most companies try to operate in an environmental friendly way. Sustainability and the environment are high rated aspects. Waste management company Van Gansewinkel acts according its vision; “Waste does not exist”, i.e. waste has value.

Regarding the responsibility to reduce marine plastics from the companies’ perspective the waste management sector is not responsible for causing the problem but is willing to take responsibility. As individual within the waste management sector, the stakeholders see themselves more responsible and motivated than the whole sector they are working in. Their individual competences are of the same level as the whole sector but waste collection organisations are considered to be more competent than waste processing organisations. The stakeholders see the design and manufacturing sector and the coastal and marine industry as most responsible sector to reduce marine litter. The design and manufacturing sector is, together with the government and policy makers, seen as most competent sector as well. Environmental groups are considered to be most motivated.

3.3.5 Government and policy making

In this paragraph the results for the stakeholder sector government and policy making are presented. The number of respondents within this sector is 34 (N=34).

3.3.5.1 Opinions

The results on the perceptions of the stakeholders from the government and policy making sector show that on most statements (see Figure 25, part A), the majority of the stakeholders agree. Most agreement (94,1 %) is on the statement that stakeholders think marine plastics will cause lasting damage, followed by the statement that marine plastic is an important issue (88,3 %). Least agreement is about the statement that marine plastic is already a present threat. Only 23,5 % indicate the problem to be already a present problem, while 53 % indicate it to be a future problem.

The results about close ones and the local community of the stakeholders from the government and policy making show that 71,4 % of the stakeholders have the perception that most of their family and friends think it is important to reduce marine plastics (see Figure 25, part B). 62,9 % suggest that most of those close to the stakeholders will support them in taking steps to reduce marine plastics and 48,6 % suggest that most people in their local communities do care about marine plastics.

The most important factor contributing to marine litter is the extensive use of plastic in packaging and products according to 94,2 % of the stakeholders (see Figure 25, part C). With 82,4 % of the stakeholders, single use- and throw away products are seen as the second important factor contributing to marine plastics. Least important factors are a lack of bins, where 5,9 % suggest it as not important, loss during transport of products and waste is seen by 2,9 % as a not an important factor and the behaviour of public, where 2,9 % indicate it as not an important factor but still 61,8 % see the behaviour of public as very important.

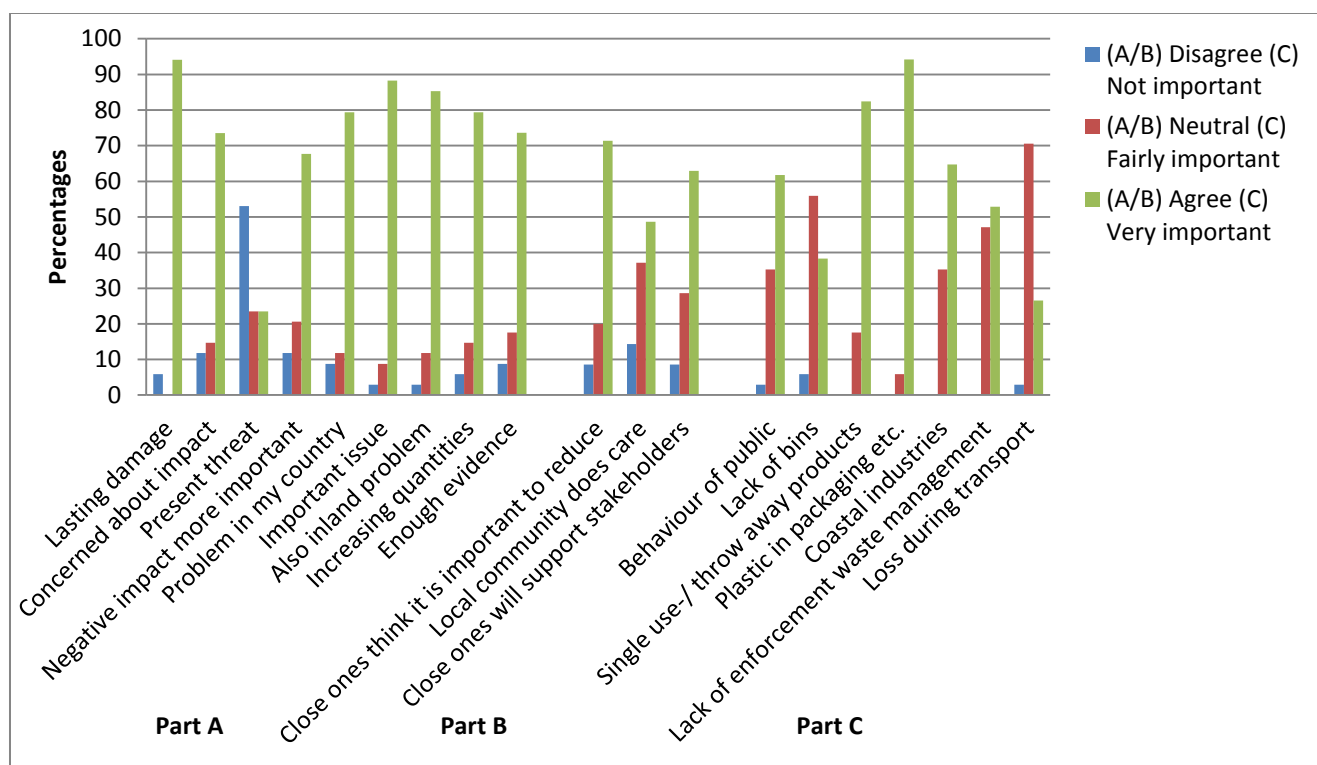


Figure 25 Total results from the government and policy making sector (N=34) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

3.3.5.2 Level of awareness

By benchmarking the percentage of plastic within marine litter between 65 % and 85 %, only 8,8 % of the stakeholders answer within this benchmark. The rest of the stakeholders suggest the percentage to be less than 65 %. Regarding the degradation time of plastic, 32,4 % of the stakeholders indicate the degradation time above the benchmark of 100 years or higher.

The most important pathway of marine plastics according 67,7 % of the stakeholders from the government and policymaking sector is direct release in sea (see Figure 26, part A), followed by rivers and estuaries according 64,7 % of the stakeholders. Blown from landfill or landfill collapses and sewage overflows are seen as least contributing, where 2,9 % of the stakeholders suggest none plastics come from this pathway but still >70 % indicate those pathways as average important.

According 97,1 % of the stakeholders, marine plastics are a major threat to the marine environment (see Figure 26, part B). Tourism seems least threatened by marine plastics, as 2,9 % of the stakeholders indicate it as a not threatened but still 85,3 % indicate is as average threatened. Also human health is not threatened according 5,9 % of the stakeholders and shipping and fishing is not threatened according 2,9 % of the stakeholders.

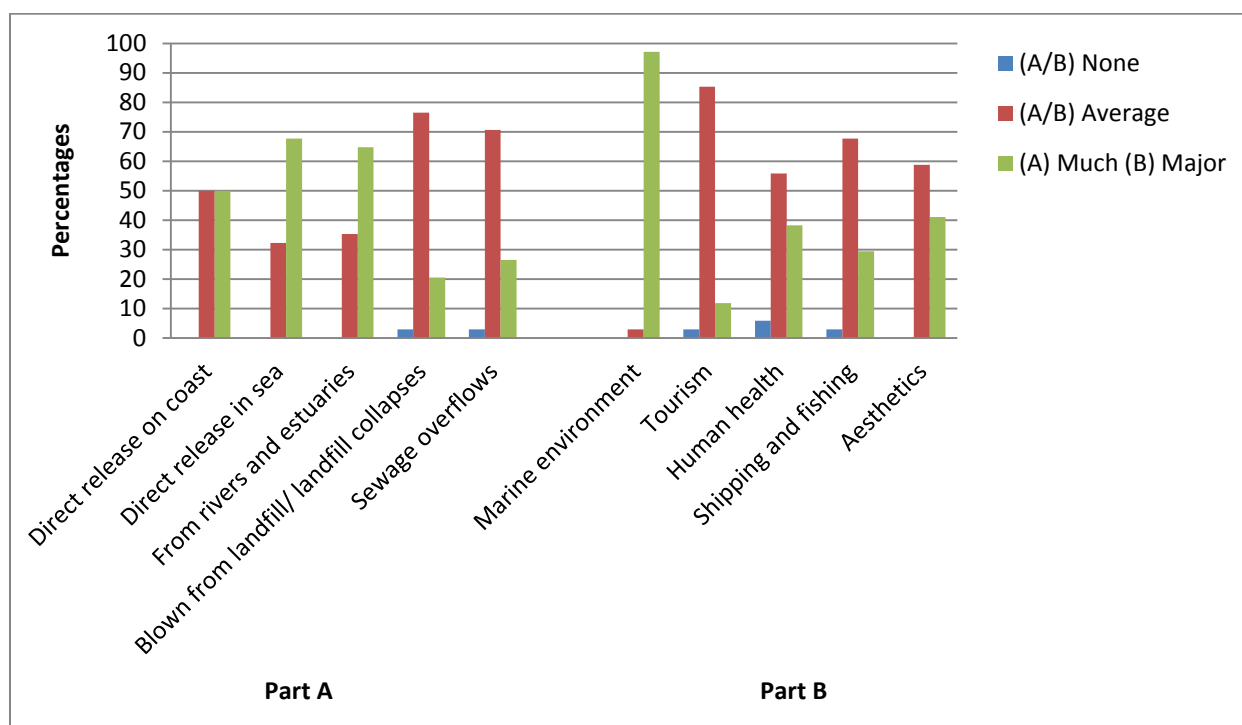


Figure 26 Part A: Pathways of marine plastics according the government and policy making sector; Part B: Level of threat of marine plastics regarding several factors according the government and policy making sector (N=34)

3.3.5.3 Behaviour

Regarding the behaviour of the stakeholders from the government and policy makers (see Figure 27), asking people to pick up their litter if the stakeholders see them littering is seen as the least likely action to reduce the problem of marine litter since the activity is not likely for 26,5 % of the stakeholders. This could be caused by the easiness of the action since it is considered to be most difficult (not easy for 23,4 %; easy for 55,8 %). But picking up litter themselves is the easiest (79,4 %) behavioural activity and most likely (73,6 %) to carry out according to the stakeholders. Also it is very likely (70,6 %) that the stakeholders will actual buy re-usable products. Noticed is that just 67,7 % of the stakeholders from the government and policy makers consider supporting government policy on marine litter as easy and for just 67,6 % of the stakeholder it is likely to do so.

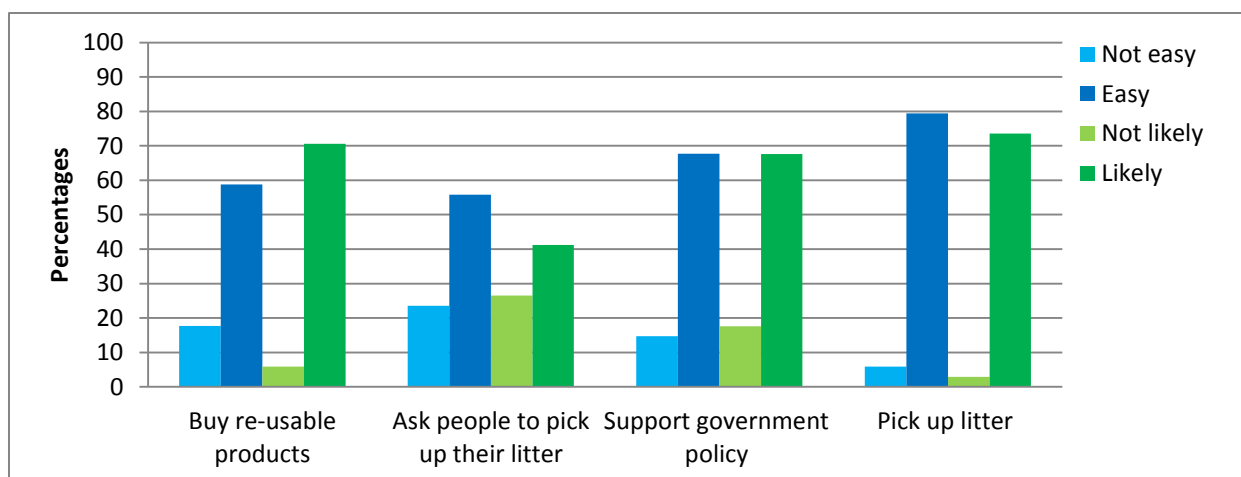


Figure 27 Opinion of the government and policy makers about behavioural activities (N=34). Note: the average is not included in the figure.

3.3.5.4 Responsibility

Most of the responding stakeholders from the government and policy making sector (see Figure 28) consider the sector they are working in to be very responsible (85,2 %) to reduce marine litter. The stakeholders think the sector they are working in is by far the most competent (94,1 %) to reduce the problem of marine litter but the motivation of the sector is estimated low (32,3 %) by the stakeholders. From an individual perspective within the sector, the stakeholders are less responsible (61,8 %) and competent (41,1 %) but one of the most motivated (82,3 %) to reduce marine litter.

The design and manufacturing sector is seen as most responsible sector since all stakeholders agree. Also the coastal and marine industry (91,2 %) and the retail sector (88,3 %) have a very high responsibility to reduce marine litter, while independent scientists are least responsible (14,7 %) according the stakeholders. As mentioned before, the government and policy makers are by far most competent to reduce the problem. The other stakeholder sectors are competent following about or less than 60 % of the stakeholders. Independent scientists (32,3 %) are least competent but are seen as one of the most motivated (79,4 %) while environmental organisations are seen as the most motivated (97,1 %) to reduce marine litter according to the stakeholders.

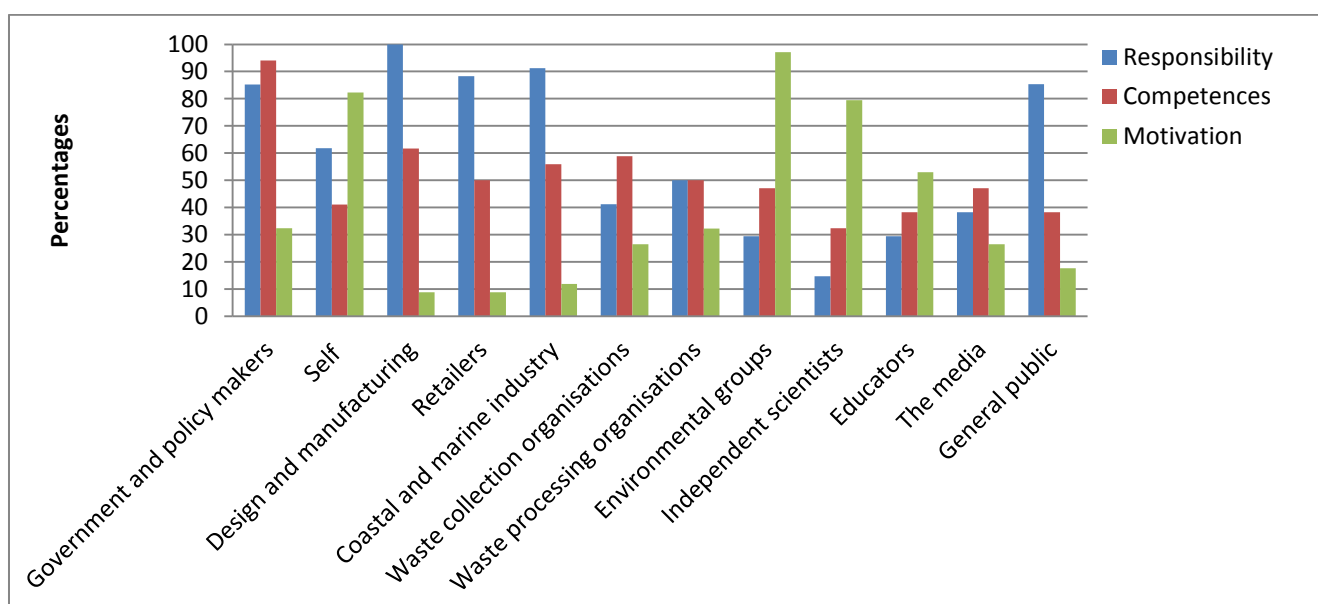


Figure 28 Agreeing stakeholders from the government and policy makers on responsibility (N=34)

3.3.5.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be involved and are aware of the problem with marine plastic. However, the stakeholders are least sure about the statement that marine plastic is already a present threat, where only 23,5 % agree with. The two most contributing factors to marine litter are the extensive use of plastic in packaging and products and single use- and throw away products in the stakeholders' opinions.

Regarding the results of the level of awareness, the awareness of stakeholders about marine plastic seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according to the stakeholders is due to release in sea. The aspect the stakeholders are well aware of is the threat marine plastic is to the marine environment.

Regarding the behaviour of stakeholders from the government and policy makers, it is easy and likely for the majority of the stakeholders to take action to reduce marine litter. Except the likeliness of asking people to pick up their litter, the asked behavioural activities are seen as easy (55,8 – 79,4 % of stakeholders) and likely (67,6 – 73,6 %) to carry out.

Regarding the responsibility of the government and policy makers to reduce marine litter, the responsibility of the sector is considered to be very high. The sector is seen by far as the most competent sector, although the motivation is estimated low. As individual within the sector, the stakeholders are less responsible and competent but a lot more motivated. The design and manufacturing sector is seen as the most responsible sector, while environmental organisations are considered to be most motivated.

3.3.6 Environmental organisations

In this paragraph the results for the stakeholder sector environmental organisations are presented. The number of responses within this stakeholder sector is 15 (N=15).

3.3.6.1 Opinions

The results on the opinions of the environmental organisations sector show that all stakeholders agree that the use received out of the modern material does not outweigh any negative effects on the environment and that marine plastic is a problem for inland communities as well (see Figure 29, part A). On all other statements, 80 % of the stakeholders or more agree, except the timeframe marine litter will become a threat. Less than half of the stakeholders (46,7 %) agree that marine litter is already a present threat but 40 % disagree with this statement.

The opinions about the close ones of the stakeholders are quite corresponding (see Figure 29, part B). 73,3 % of the stakeholders suggest that most of their family and friends think it is important to reduce marine litter and 80 % suggest that their close ones are willing to support the stakeholders in taking steps to reduce marine litter. The opinions about the local communities of the stakeholders are varying, 46,7 % agree that their community does care but 20 % disagree with this statement.

Regarding factors contributing to marine litter, the extensive use of plastic in packaging and products seems the most important factor by all stakeholders within the environmental organisations sector, together with the single use- and throw away products which is seen by 86,7 % of the stakeholders as very important factor (see Figure 29, part C). The loss during transport of products and waste is seen as the least important factor by only 66,6 % of the stakeholders suggesting it is a fairly important factor and 6,7 % indicating it as not important.

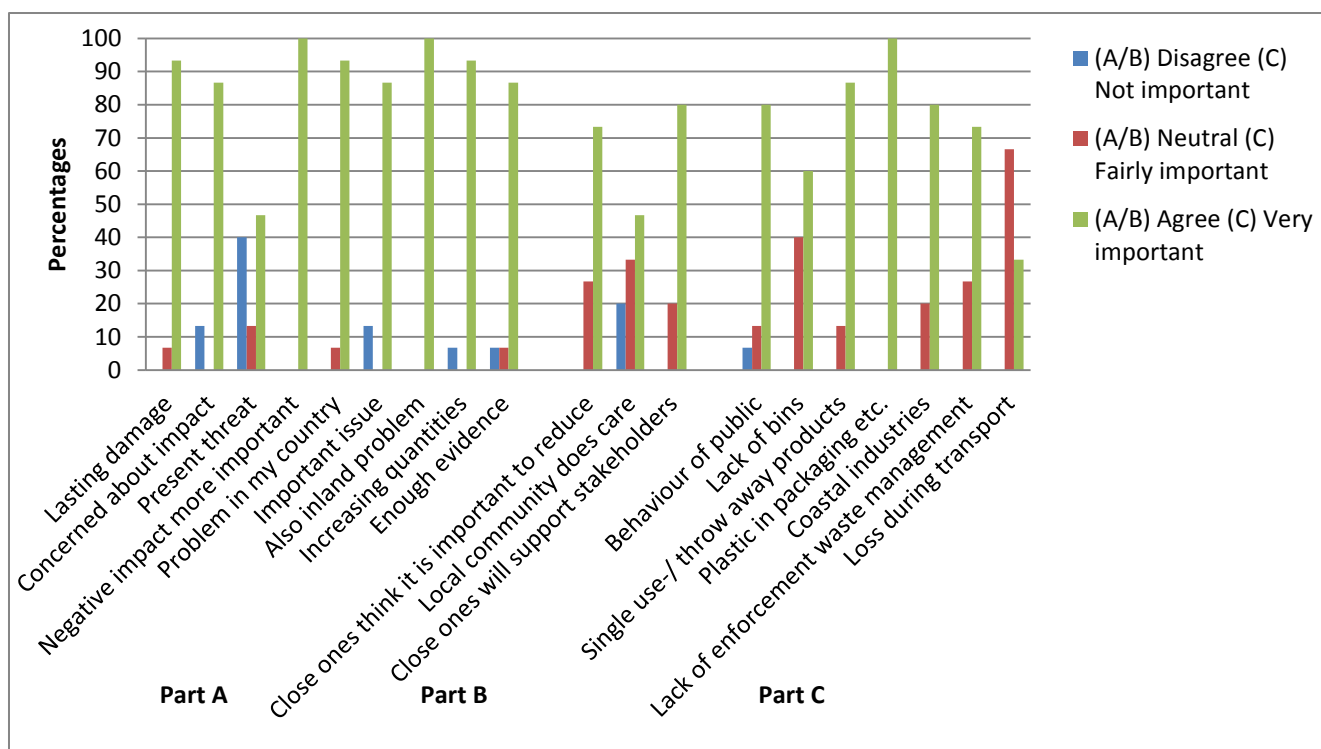


Figure 29 Total results from the environmental organisations sector (N=15) **Part A:** Opinions about personal importance of marine litter; **Part B:** Opinions about attitudes of close ones and the local community regarding marine litter; **Part C:** Importance of several factors contributing to marine litter.

3.3.6.2 Level of awareness

Within the environmental organisations sector, 53,3 % of the stakeholders indicate the percentage of plastics within the marine environment to be within the benchmark of 65 % and 85 %. The other part indicates the percentage to be less than 65 %. Regarding the degradation time of plastic, 73,3 % of the stakeholders indicate the degradation time to be 100 years or higher.

The most important pathways leading to marine litter are due to rivers and estuaries according 80 % of the environmental organisations sector and due to direct release in sea according 66,7 % (see Figure 30, part A). The least indicated pathways where a lot of plastics come from are direct release on coast and sewage overflows according 73,4 % of the stakeholders indicating both pathways as average important.

According all stakeholders of the environmental organisations sector, the marine environment is major threatened by marine litter (see Figure 30, part B). Least threatened is shipping and fishing according the stakeholders, where 66,7 % point out this factor to be average threatened.

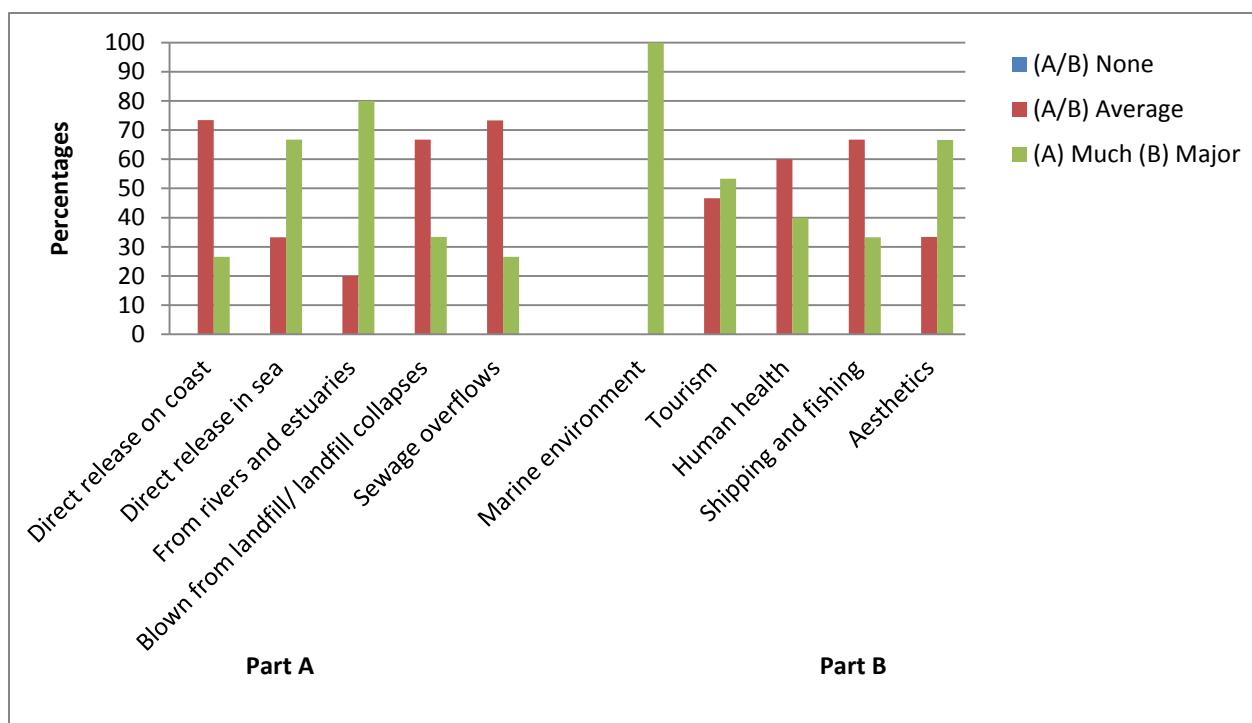


Figure 30 Part A: Pathways of marine plastics according the environmental organisations sector; Part B: Level of threat of marine plastics regarding several factors according the environmental organisations sector (N=15)

3.3.6.3 Behaviour

Regarding the behaviour of the stakeholders from environmental groups (see Figure 31), picking up litter and asking people to pick up their litter is considered to be easy (80 %). But supporting government policy on marine litter is considered to be the easiest action to reduce marine litter since none of the stakeholders think the behavioural activity is not easy. This could be caused by the easiness of the action (supporting government policy) since none of the stakeholders see supporting government policy as a difficult action. Asking people to pick up their litter is the least likely (66,7 %) action following the stakeholders.

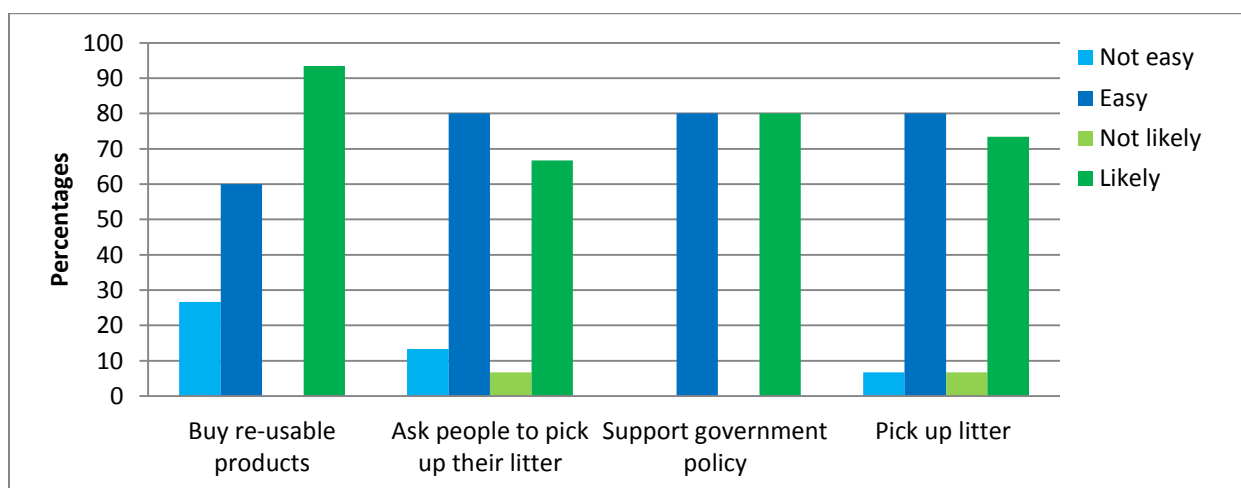


Figure 31 Opinion of environmental groups about behavioural activities (N=15). Note: the average is not included in the figure.

3.3.6.4 Responsibility

The responding stakeholders from environmental organisations (see Figure 32) think the sector they are working in is the least responsible (26,6 %) for reducing the problem. But the stakeholders consider their own sector to be very competent (66,7 %) and most motivated (93,4 %) to reduce the problem of marine litter. From an individual

perspective within the sector, the stakeholders have the same motivation as the whole sector but their responsibility is higher (66,6 %) and as individual they are less competent (46,6 %) to reduce the problem.

The design and manufacturing sector and the coastal and marine industry are considered to be most responsible for reducing the problem of marine litter since all stakeholders agree on the responsibility of both sectors. But the government and policy makers (93,3 %) are by far most competent according the stakeholders. The media (20 %) is considered to be the least competent to reduce the problem. As mentioned before, the stakeholders from environmental organisations see themselves and the sector they are working in as the most motivated sector. The retail sector is least motivated since none of the stakeholders think retailers are motivated. Also the design and manufacturing sector (6,7 %) has very little motivation to reduce the problem.

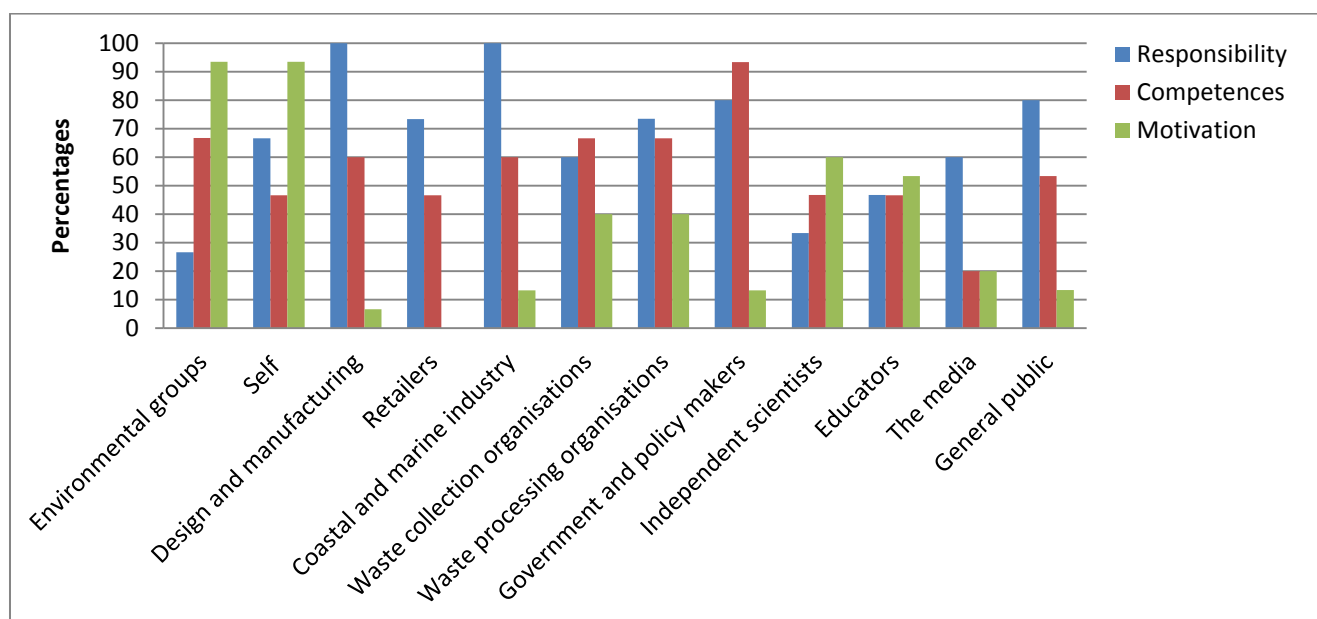


Figure 32 Agreeing stakeholders from environmental organisations on responsibility (N=15)

3.3.6.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be very involved and are aware of the problem as more than 80 % of the stakeholders agree with all statements. However, the opinions are varying about the time frame marine litter will become a threat. The two most contributing factors to marine litter are the extensive use of plastic in packaging and products and single use- and throw away products in the stakeholders' opinions.

Regarding the results of the level of awareness, the awareness of stakeholders about marine litter seems to be reasonable among the majority of the stakeholders. The percentage of plastic within marine litter (53,3 %) and the degradation time of plastic (73,3 %) are well estimated by the majority of the stakeholders and the most important pathway according the stakeholders is due to rivers and estuaries. The aspect the stakeholders are aware of as well is the threat of marine litter to the marine environment.

Regarding the behaviour of stakeholders from environmental organisations, it is very likely (66,7 – 93,4 % of the stakeholders) the stakeholders will take action to reduce marine litter since all of the asked behavioural activities are considered to be easy among the majority of the stakeholders (60 – 80 % of the stakeholders).

Regarding the responsibility of environmental organisations to reduce marine litter, the environmental organisations are least responsible but the most motivated and competent as well. As individual within the sector, the stakeholders have the same motivation, their responsibility is higher but as individual they are less competent to reduce the problem. The design and manufacturing sector and the coastal and marine industry are seen as most responsible, while the government and policy makers are by far most competent.

3.3.7 Media

In this paragraph the results for the stakeholder sector media are presented. The number of respondents within this sector is 5 (N=5). Due to the very low response rate, it should be kept in mind that one response counts for 20 %.

3.3.7.1 Opinions

The results of the opinions of the media show that with almost all statements, 80 % of the stakeholders agree (see Figure 33, part A). The two exceptional statements are that the use received out of the modern material does not outweigh any negative effects on the environment (40 % agree, 60 % neutral) and that marine litter is already a present threat (20 % agree, 80 % disagree).

According 60 % of the stakeholders, most of their family and friends think it is important to reduce marine litter (20 % disagree) and most close ones are willing to support the stakeholders in taking steps to reduce marine litter (see Figure 33, part B). Also 60 % of the stakeholders indicate that most people in their local community do care about marine litter but 20 % disagree.

The most important factors contributing to marine litter are the inadequate behaviour of public, a lack of bins and coastal industries according all stakeholders within the media sector (see Figure 33, part C). With 80 % of the stakeholders indicating loss during transport of products and waste as fairly important, this factor is seen as the least important. But as none of the stakeholders indicates any factor to be not important, all factors contribute to a certain extent according the stakeholders of the media sector.

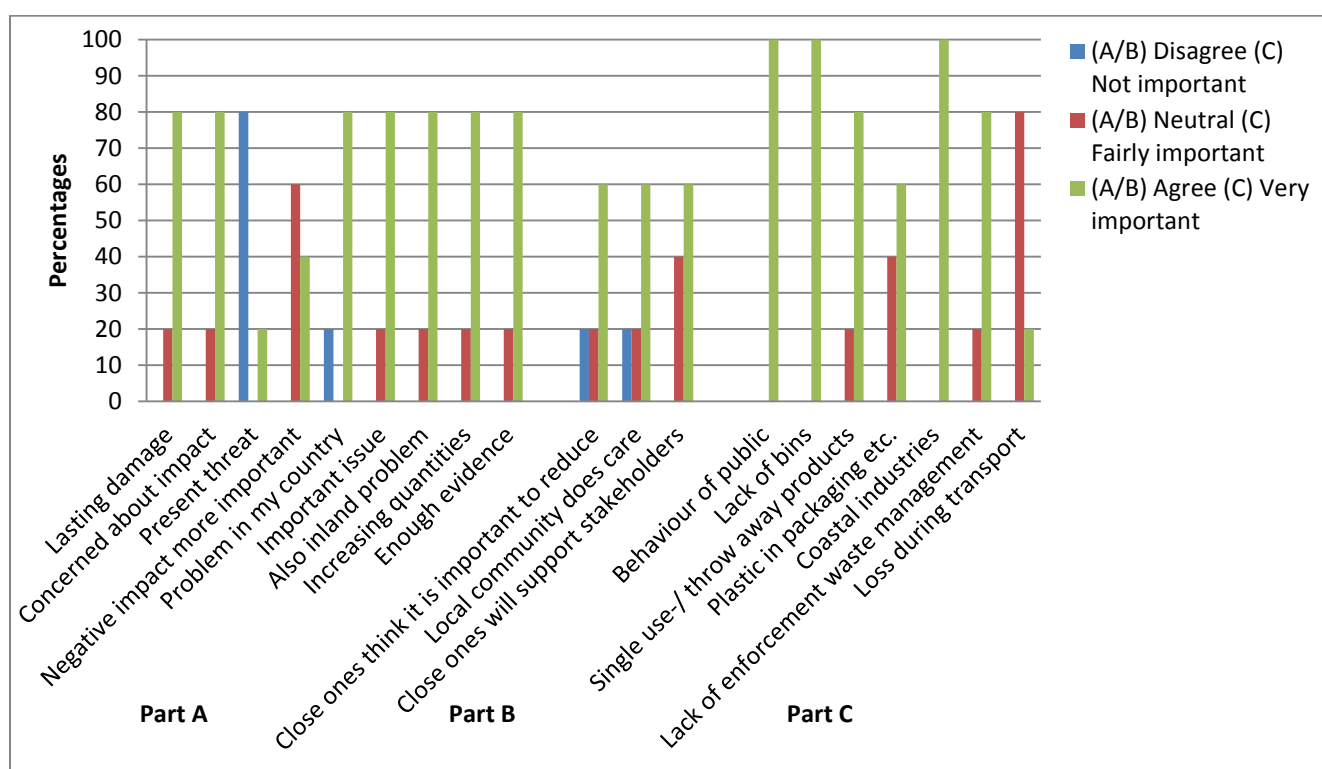


Figure 33 Total results from the media sector (N=5) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

3.3.7.2 Level of awareness

Within the media sector, 20 % of the stakeholders indicate the percentage of plastics within all marine litter to be between 65 % and 85 %. All other stakeholders indicate the percentage to be less than 65 %. Regarding the degradation time of plastic, 40 % answer within the benchmark of 100 years or higher.

According 80 % of the stakeholders within the media sector, the largest pathway to marine litter is due to direct release in sea, followed by rivers and estuaries (60 %) and direct release on the coast (60 %) (see Figure 34, part A).

With 20 % of the stakeholders saying much, blown from landfill or landfill collapse and sewage overflows are seen as less contributors. However, sewage overflows seems the least contributor as 20 % indicate this pathway to be none.

The factors most threatened by marine litter according all stakeholders within the media sector are the marine environment and aesthetics (see Figure 34, part B). Shipping and fishing seems the least affected factor, seen by 80 % of the stakeholders as average threatened.

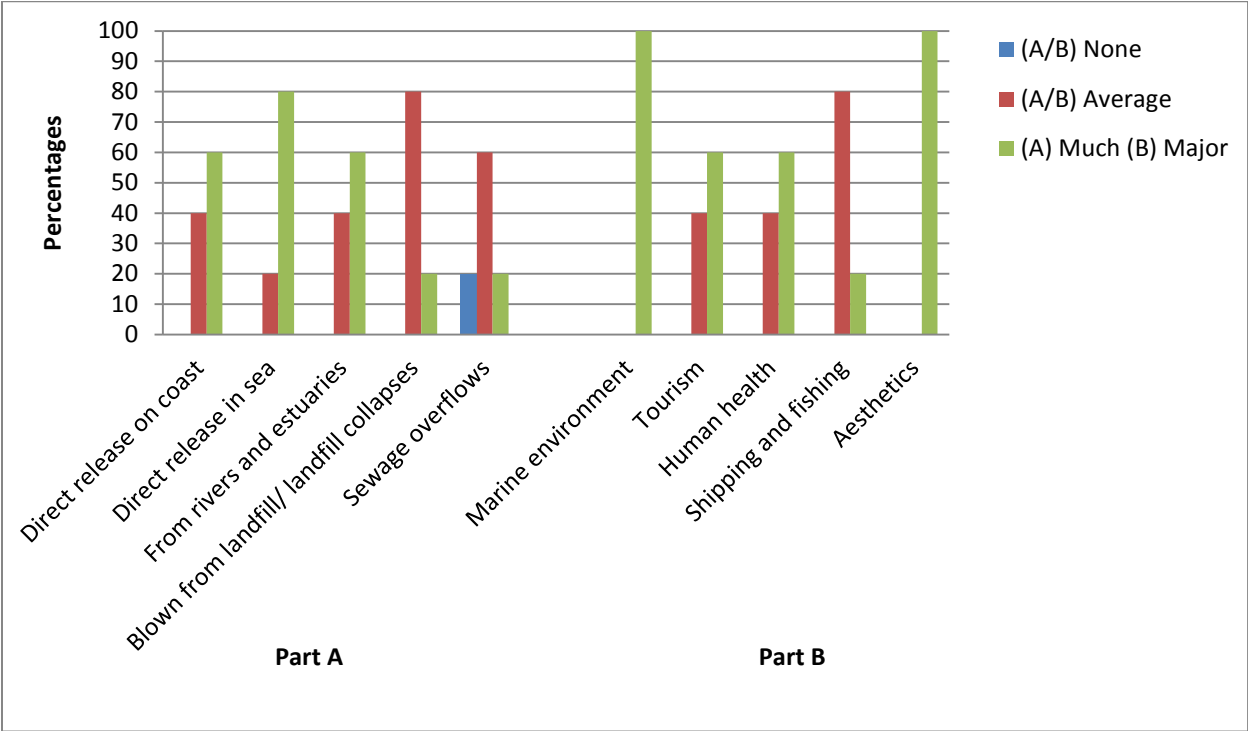


Figure 34 Part A: Pathways of marine plastics according the media sector; Part B: Level of threat of marine plastics regarding several factors according the media sector (N=5)

3.3.7.3 Behaviour

Regarding the behaviour of the stakeholders from the media sector (see Figure 35), picking up litter and supporting government policy on marine litter are considered to be the easiest actions since all stakeholders do agree. Asking people to pick up their litter when stakeholders see someone littering (not easy for 20 %; easy for 60 %), is seen as most difficult action to reduce the quantities of marine litter. But it is most likely the stakeholders will buy re-usable products to reduce the problem since all responding stakeholder do agree.

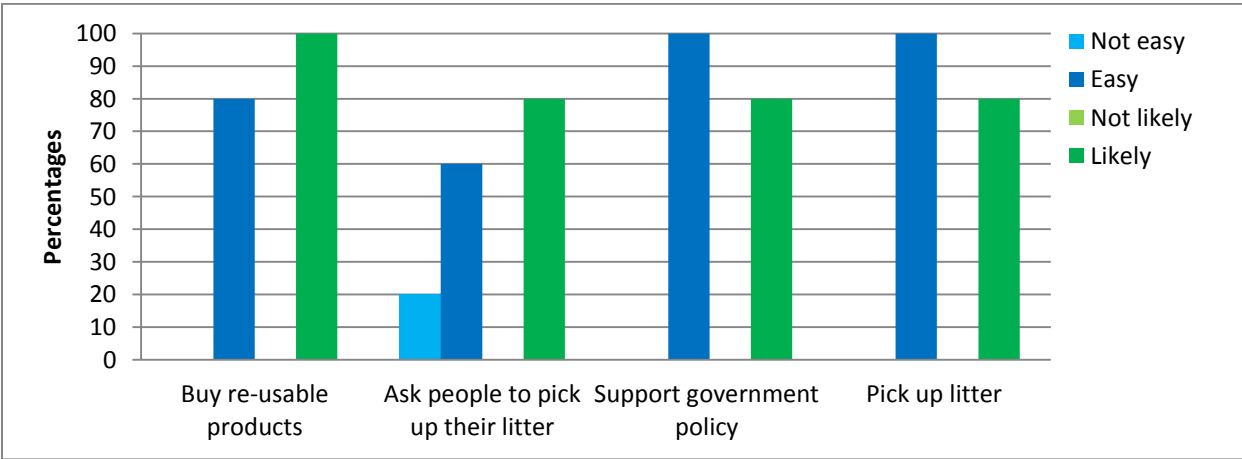


Figure 35 Opinion of the media about behavioural activities (N=5). Note: the average is not included in the figure.

3.3.7.4 Responsibility

80 % of the responding stakeholders from the media sector (see Figure 36) consider the sector they are working in to be responsible for reducing marine litter. But this responsibility is not trusted by the stakeholders since none of the stakeholders think the media is motivated and 20 % consider the sector to be competent. From an individual perspective within the sector, the stakeholders say they have the same responsibility as the media sector. But both competences and motivation is higher since 60 % of the responding individuals consider themselves to be competent and 80 % is motivated.

All stakeholders within the media sector agree on the responsibility of the design and manufacturing sector, retailers, the coastal and marine industry, the government and policy makers and the general public. Independent scientists (20 %) and environmental organisations (40 %) do have the lowest responsibility to reduce the problem of marine litter according the media sector. The design and manufacturing sector and waste collection organisations are the most competent since all stakeholders agree on the competences of both sectors. None of the stakeholders think environmental groups are competent to reduce marine litter, which makes environmental groups least competent but environmental groups are considered to be the most motivated as well since all stakeholders agree on its motivation. The stakeholders within the media sector consider the design and manufacturing sector, retailers and the coastal and marine industry to be the least motivated since none of the stakeholders considers these sectors to be motivated.

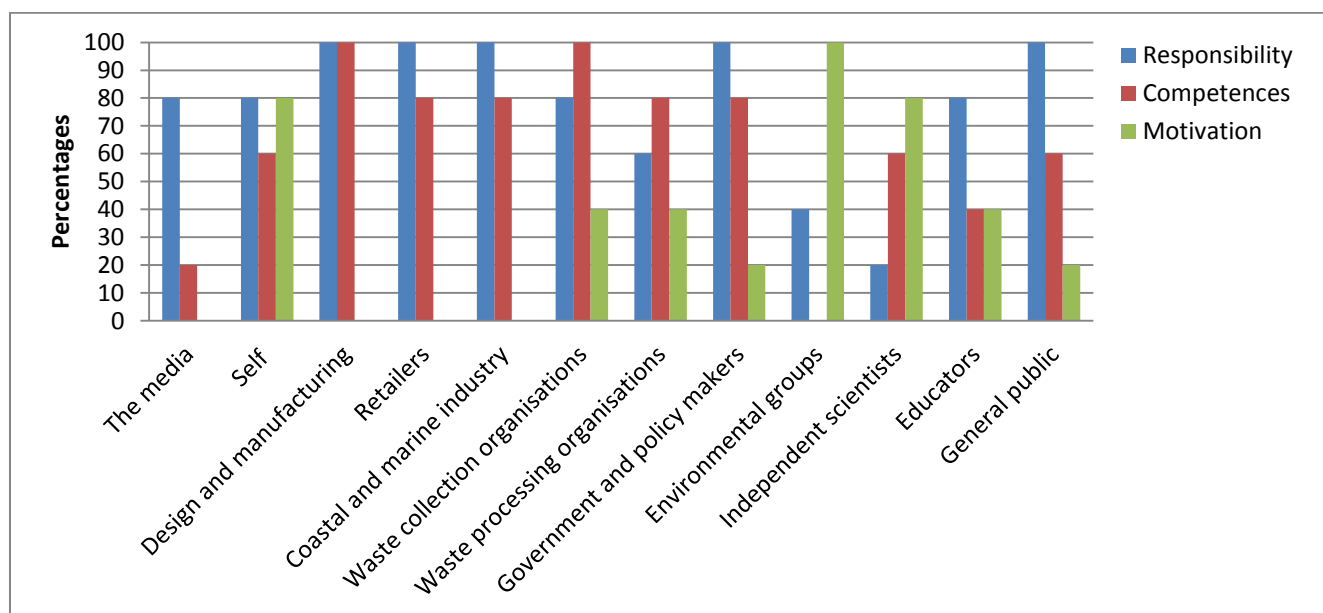


Figure 36 Agreeing stakeholders from the media on responsibility (N=5)

3.3.7.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be involved and are aware of the problem with marine plastic. The stakeholders are least sure about the statement that marine plastic is already a present threat, that only 20 % agree with and about the statement that the use received out of modern material does not outweigh any negative effects on the environment, which 40 % agree with. The three most contributing factors to marine litter are the inadequate behaviour of public, a lack of bins and coastal industries in the opinions of all stakeholders.

Regarding the results of the level of awareness, the awareness of stakeholders about marine plastic seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according the stakeholders is due to release in the sea. The aspect the stakeholders are well aware of is the threat marine plastic is to the marine environment.

Regarding the behaviour of stakeholder from the media sector, it is very likely (80 – 100 % of the stakeholders) stakeholders within the media sector will take action to reduce marine litter since all asked behavioural activities are considered to be easy (60 – 100 % of the stakeholders).

Regarding the responsibility of the media sector, the sector is seen as responsible to reduce marine litter but not very motivated and competent to do so. As individual within the sector, the responsibility is of the same level but both the motivation and competences are considered to be higher. The design and manufacturing sector, retailers, the coastal and marine industry, the government and policy makers and the general public are seen as the most responsible, while the design and manufacturing sector and waste collection organisations are the most competent and environmental groups the most motivated.

3.3.8 Education

In this paragraph the results for the stakeholder sector education are presented. The number of respondents within this sector is 72 (N=72).

3.3.8.1 Opinions

The results of the education sector show that with all statements (see Figure 37, part A), except the time frame, more than 70 % of the stakeholders agree on. Most agreement (91,7 %) is about marine litter which is also a problem for inland communities. Least agreement is about the timeframe which states that marine litter is already a present threat, 44,5 % disagree with this statement.

The opinions about the close ones and the local community of the individual stakeholders are varying (see Figure 37, part B). 41,6 % agree that their local communities do care about marine litter and 59,7 % agree with the statements that their close ones think it is important to reduce marine litter. More than half the stakeholders (55,6 %) indicate that close ones are willing to support the stakeholders in taking steps to reduce marine litter.

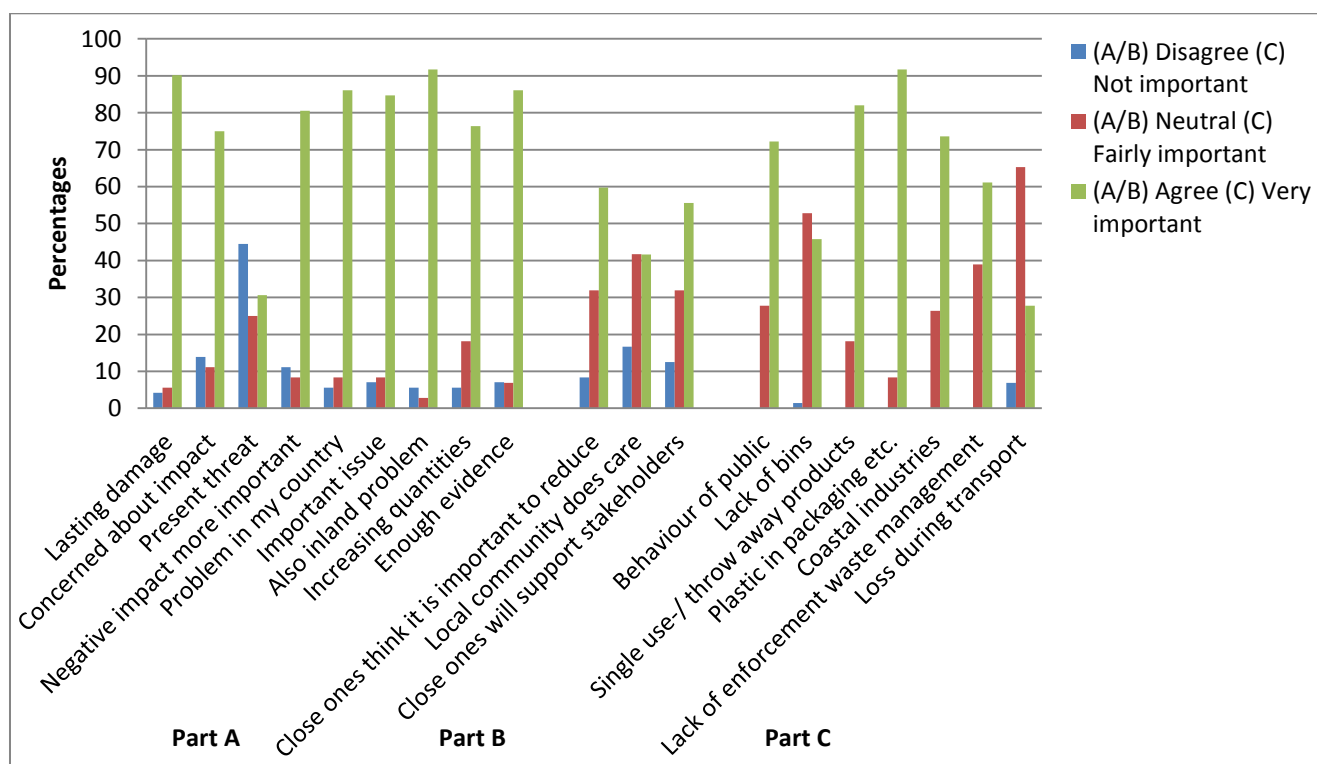


Figure 37 Total results from the education sector (N=72) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

The most important factor contributing to marine litter lies with the extensive use of plastic in packaging and products according 91,7 % of the stakeholders and the problem also lies in the use of single use-/throw away products by 82 % (see Figure 37, part C). The two least important factors are a lack of bins, seen as not important (1,4 %) and as fairly important (52,8 %), and the loss during transport of products and waste which is indicated as not important (6,9 %) and as fairly important (65,3 %).

3.3.8.2 Level of awareness

Within the education sector, a small part of the stakeholders (16,7 %) indicate that the percentage of plastics lies within the benchmark of 65 % and 85 %, where 1,4 % indicate the percentage to be higher than 85 % and the largest part of the stakeholders indicate the percentage to be less than 65 %. Regarding the degradation time of plastic, 31,9 % answer within the benchmark of 100 years or higher.

The most important pathway according 69,5 % of the stakeholders is direct release in sea (see Figure 38, part A), followed by rivers and estuaries (58,4 %). Less important seem to be blown from landfill or landfill collapses, indicated as not important (4,2 %) and as fairly important (63,9 %) and sewage overflows, indicated as not important (1,4 %) and as fairly important (75 %).

The far most threatened factor according the stakeholders of the education sector is the marine environment (95,9 %) (see Figure 38, part B). Aesthetics seem threatened as well but in a lower percentage according 59,7 % of the stakeholders. Least threatened seems to be tourism by the stakeholders (73,6 % say average threat). Shipping and fishing is indicated by 2,8 % as not threatened, while still 59,7 % see it as average threatened.

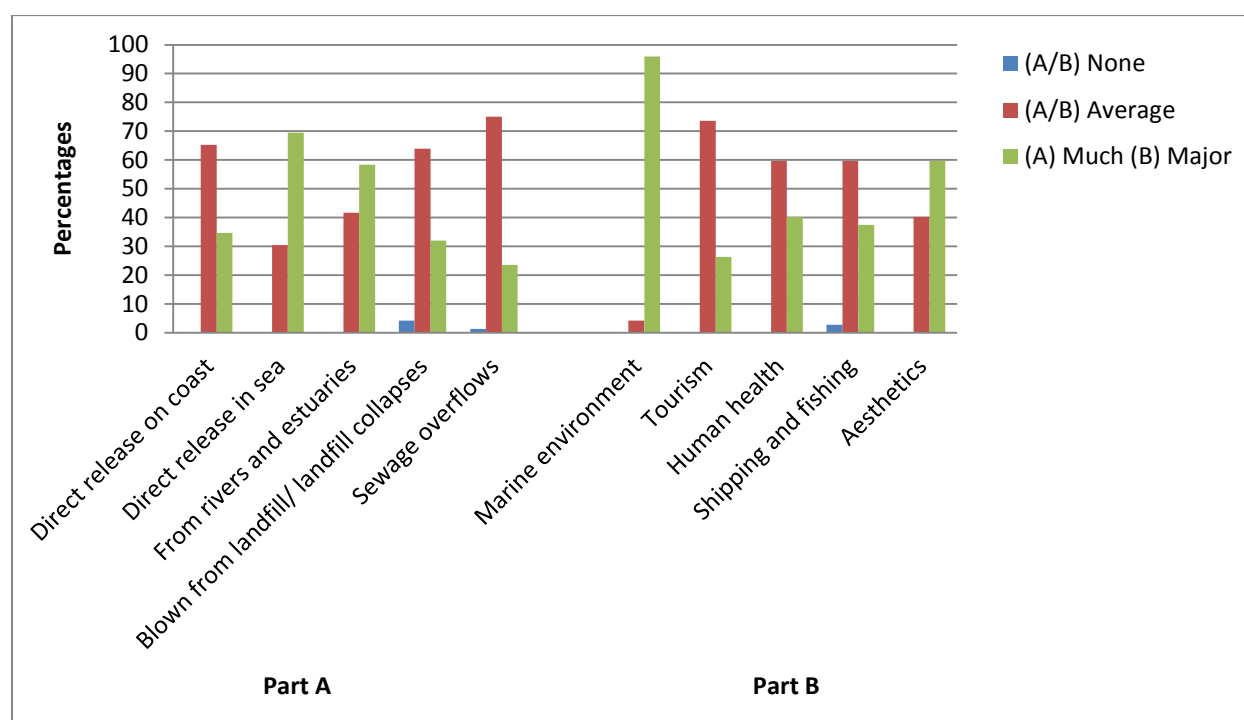


Figure 38 Part A: Pathways of marine plastics according the education sector; Part B: Level of threat of marine plastics regarding several factors according the education sector (N=72)

3.3.8.3 Behaviour

Regarding the behaviour of the stakeholders from the education sector (see Figure 39), picking up litter is considered to be the easiest (68,1 %) action to reduce the quantities of marine litter. Therefore it is, together with buying re-usable products, the most likely (65,3 %) behavioural activity to carry out. Asking people to pick up their litter if the stakeholders see them littering is considered to be the most difficult (56,9 %) but the least likely action to carry out is supporting government policy on marine litter (not likely for 19,4 %; likely for 51,3 %), according to the stakeholders.

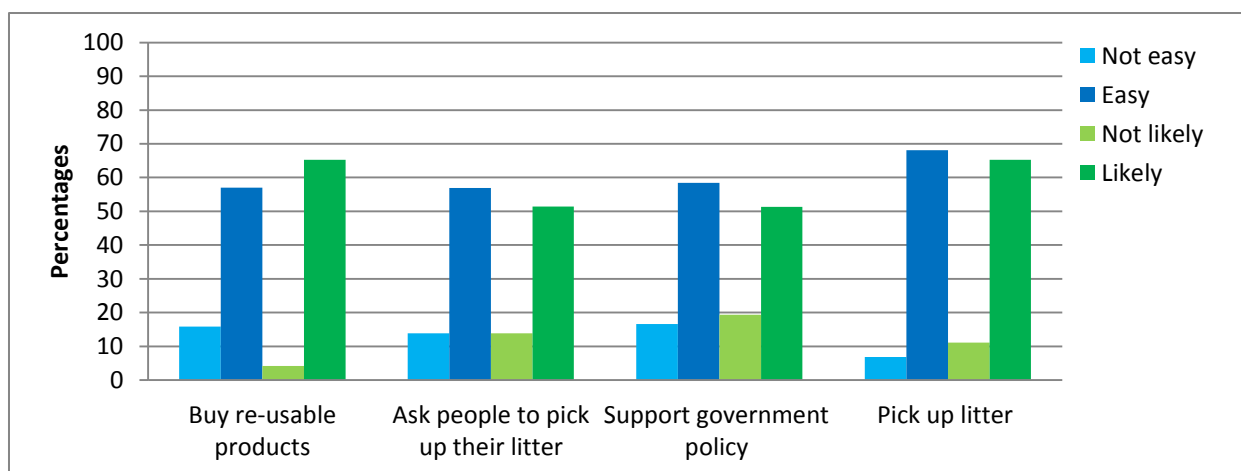


Figure 39 Opinion of the education sector about behavioural activities (N=72). Note: the average is not included in the figure.

3.3.8.4 Responsibility

About half (51,4 %) of the responding stakeholders from the education sector (see Figure 40) see the sector they are working in to be responsible for reducing the problem. The stakeholders think their sector is motivated (63,9 %) but not very competent (41,7 %). From an individual perspective within the sector, the stakeholders see themselves more responsible (69,4 %) and motivated (84,7 %) than the whole sector they are working in. Individually they have the same level of competences as the whole education sector.

The design and manufacturing sector (93 %) and the coastal and marine industry (91,7 %) are seen as the most responsible sectors to reduce the problem of marine litter. Also general public (83,4 %) has high responsibility, according the stakeholders. Independent scientists (36,1 %) and environmental groups (40,3 %) are considered to be the least responsible, although these two sectors are considered to be very motivated to reduce the problem. Environmental groups are considered as most motivated of all (94,4 %). The design and manufacturing sector (7 %) and retailers (5,6 %) are considered to be least motivated. The government and policy makers (88,9 %) have the most competences to reduce marine litter, while general public (36,1 %) are the least competent to do so.

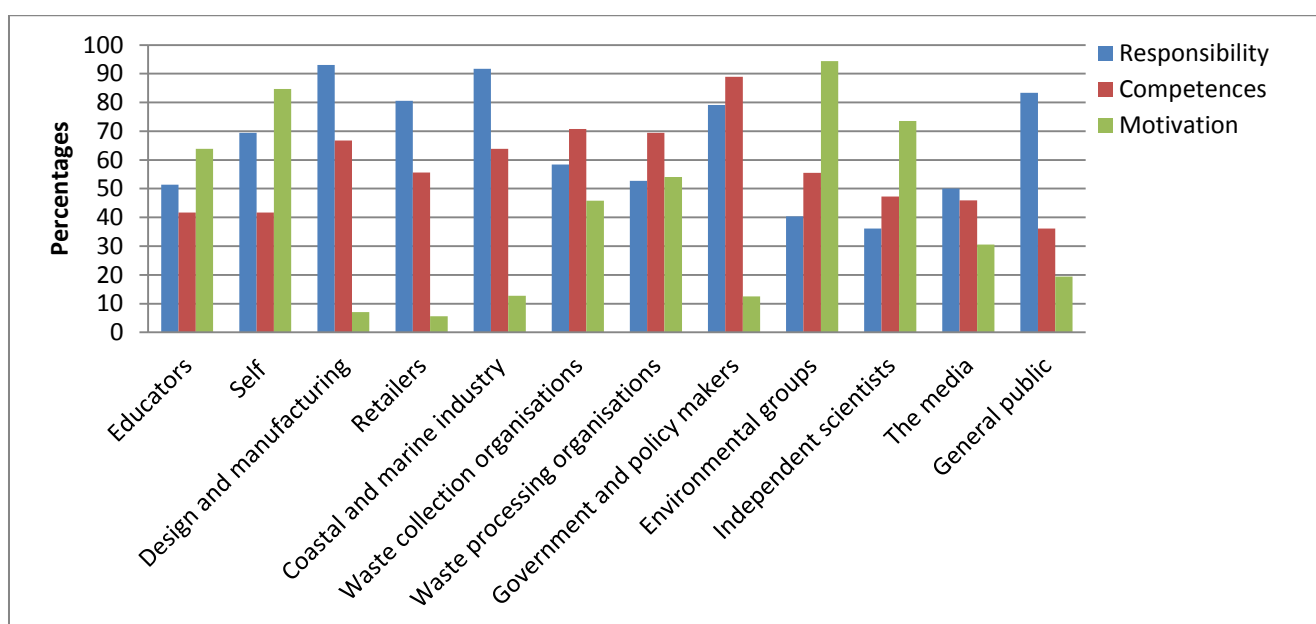


Figure 40 Agreeing stakeholders from the education sector on responsibility (N=72)

3.3.8.5 Sub conclusion

Regarding the opinions of stakeholders within the education sector, the stakeholders seem to be involved and are aware of the problem with marine plastic. The stakeholders are least sure about the statements about the statement that marine plastic is already a present threat, where only 30,6 % agree. The two most contributing factors to marine litter are the extensive use of plastic in packaging and products and the use of single use-/throw away products.

Regarding the results of the level of awareness, the awareness of stakeholders about marine plastic seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according to the stakeholders is due to release in sea. The aspect the stakeholders are well aware of is the threat of marine plastic to the marine environment.

Regarding the behaviour of stakeholders from the education sector, the easiness and likeliness for the stakeholders to take action to reduce marine litter is moderate. Both the easiness (56,9 – 69,1 % of the stakeholders) and likeliness (51,3 – 65,3 % of the stakeholders) of all asked behavioural activities are not highly estimated.

Regarding the responsibility of the education sector, the sector is seen as moderate responsible to reduce marine litter. The sector is seen as motivated but not very competent. As individual within the sector, the stakeholders have the same competences but are more responsible and motivated. The design and manufacturing sector and the coastal and marine industry are seen as the most responsible sectors, while the government and policy makers are most competent. Environmental groups are seen as most motivated.

3.3.9 General public

In this paragraph the results for the stakeholder sector general public are presented, i.e. all those individuals that are not associated with any of the sectors specified above. The number of respondents within this sector is 48 (N=48).

3.4.1.1 Opinions

The results of the general public show that with most statements (see Figure 41, part A), more than 70 % of the stakeholders agree, whereof most agreement (95,9 %) is about the statement that marine plastic is an important issue. Less agreement is about the statement that marine plastic is already a present threat, 56,2 % of the stakeholders disagree.

The opinions about the close ones and the local community of the individual stakeholders are varying (see Figure 41, part B). 50,1 % agree that their local communities do care about marine litter, while 75,1 % agree that close ones think it is important to reduce marine litter and 68,8 % indicate that close ones are willing to support the stakeholders in taking steps to reduce marine litter.

The most important contributors to marine litter are the extensive use of plastic in packaging and products according to 95,8 % of the stakeholders and the problem also lies in the use of single use-/throw away products by 93,8 % (see Figure 41, part C). The two least important factors are a lack of bins, seen as not important (2,1 %) and fairly important (52,1 %), and the loss during transport of products and waste which is seen as not important (2,1 %) and fairly important (54,2%).

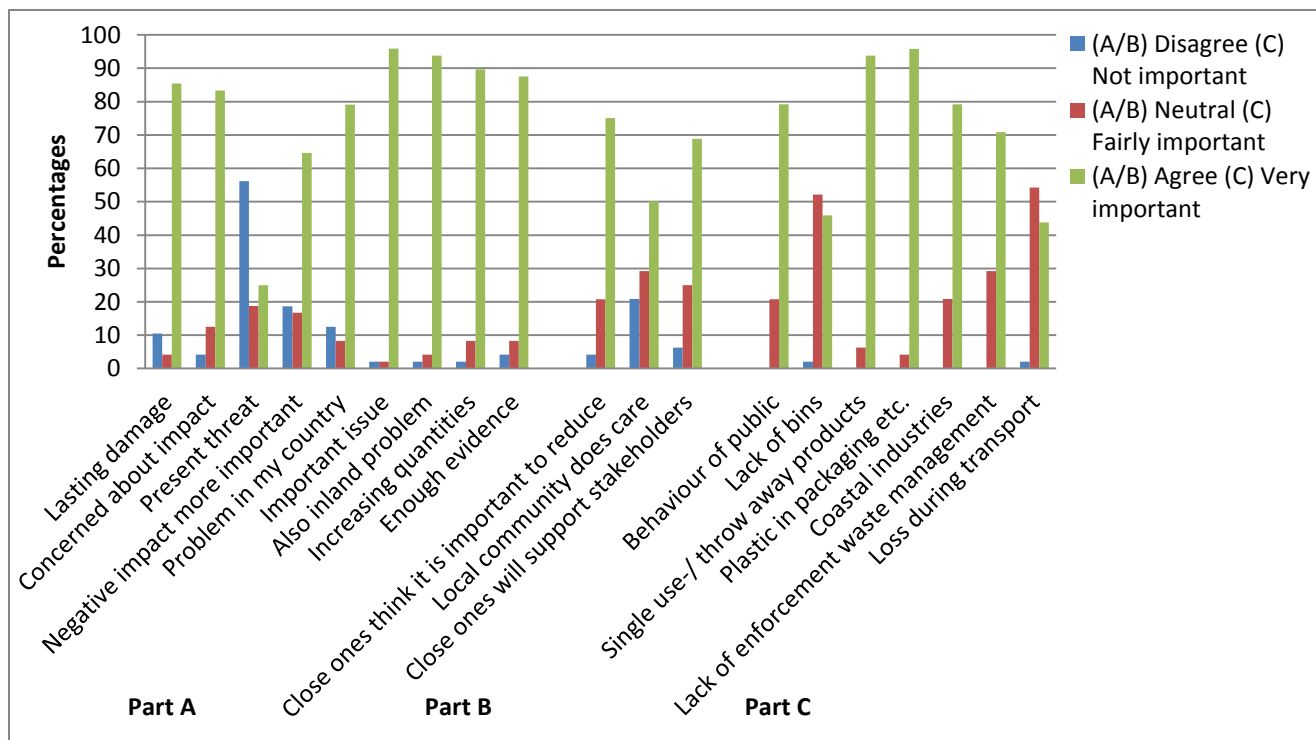


Figure 41 Total results from the general public (N=48) Part A: Opinions about personal importance of marine litter; Part B: Opinions about attitudes of close ones and the local community regarding marine litter; Part C: Importance of several factors contributing to marine litter.

3.4.1.2 Level of awareness

By benchmarking the percentage of plastic between 65 % and 85 %, a small part (29,2 %) of the general public answer within this category and 70,8 % answer below 65 %. Regarding the degradation time, 27,7 % indicate the degradation time to be 100 years or higher.

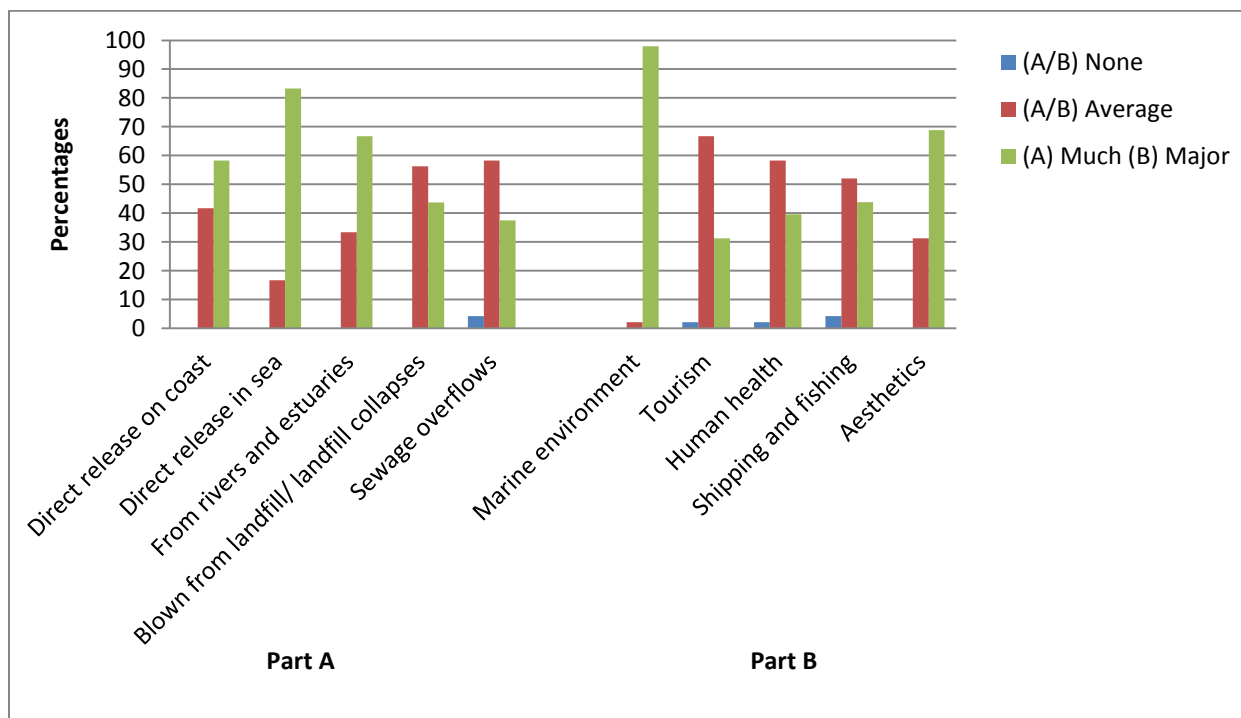


Figure 42 Part A: Pathways of marine plastics according the general public; Part B: Level of threat of marine plastics regarding several factors according the general public (N=48)

The most important pathway leading to marine plastic according the general public (83,3 %) is due to direct release in sea (see Figure 42, part A). Least important pathways indicated as much by the general public are blown from landfill or landfill collapses (56,3 % indicate average contribution) and sewage overflows (58,3 % indicate average contribution, 4,2 % indicate even no contribution).

The most threatened factor by marine litter is the marine environment according 97,9 % of the general public (see Figure 42, part B). Also the aesthetics of beaches is seen by 68,8 % of the general public as major threatened. Least threatened is tourism which is indicated by 66,7 % of the stakeholders as average threatened and by 2,1 % as not threatened. Also shipping and fishing seem less threatened, with 4,2 % of the stakeholders indicating it as not threatened and 52,1 % as average threatened. Human health is seen by 2,1 % as not threatened and by 58,3 % as average threatened.

3.4.1.3 Behaviour

Regarding the behaviour of the general public (see Figure 43), picking up litter is considered to be the easiest (64,6 %) action to reduce the problem of marine litter. It is least likely (not likely for 18,8 %; likely for 39,6 %) general public will ask people to pick up their litter if the general public sees someone littering. This may be because the easiness of the activity which is the lowest (not easy for 18,8 %; easy for 39,6 %) according to the general public. According the stakeholders, the most likely action to reduce the problem of marine litter is buying re-usable products (64,6 %).

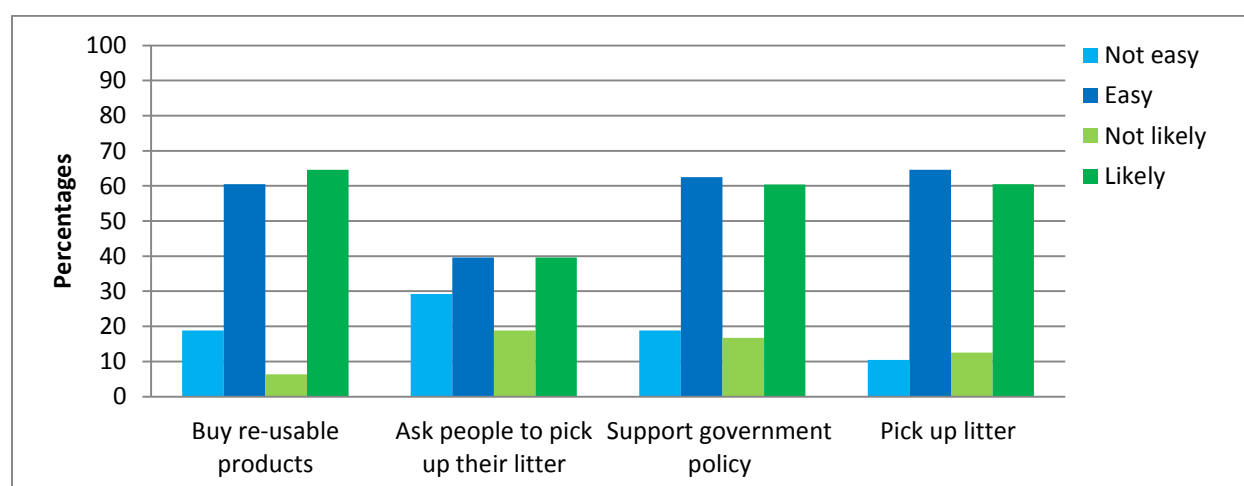


Figure 43 Opinion of the general public about behavioural activities (N=48). Note: the average is not included in the figure.

3.4.1.4 Responsibility

Most of the responding stakeholders from the general public (see Figure 44) says the general public has responsibility (91,7 %) for reducing the problem of marine litter. This responsibility is not fully trusted since about half of the stakeholders (47,9 %) from the general public think general public is competent but the stakeholders think the general public is not motivated (10,4 %). From an individual perspective, the stakeholders think they are less responsible (62,5 %) but individually they are one of the most motivated (85,5 %) to reduce the problem. Half of the stakeholders think they are competent to reduce the problem individually.

The design and manufacturing sector (93,8 %) is seen as the most responsible to reduce the problem of marine litter, also the responsibility of the coastal and marine industry and the government and policy makers is highly estimated (85,4 %). Independent scientists (25,1 %) are least responsible according the stakeholders. Regarding the stakeholders, the government and policy makers (87,5 %) are most competent to reduce the problem but environmental groups (89,6 %) are most motivated. The design and manufacturing sector and the coastal and marine industry are considered to be least motivated to reduce marine litter (8,4 %).

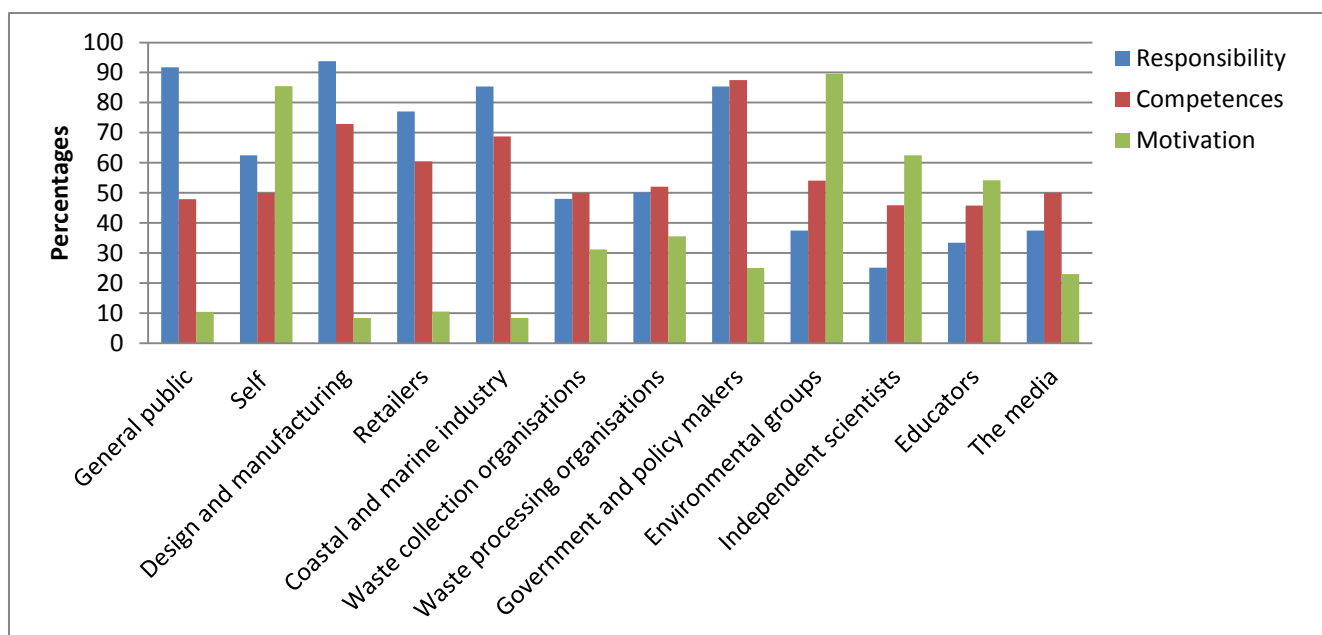


Figure 44 Agreeing stakeholders from the general public on responsibility (N=48)

3.4.1.5 Sub conclusion

Regarding the opinions of stakeholders, the stakeholders seem to be involved and are aware of the problem with marine litter. The stakeholders are least sure about the statement that marine litter already is a present threat, where only 25 % agree. The two most contributing factors to marine litter are the extensive use of plastic in packaging and products and the use of single use-/throw away products.

Regarding the results of the level of awareness, the awareness of stakeholders about marine litter seems to be low among the majority of the stakeholders. The percentage of plastic within marine litter and the degradation time of plastic are underestimated and the most important pathway according the stakeholders is due to release in sea. The aspect the stakeholders are well aware of is the threat of marine litter to the marine environment.

Regarding the behaviour of stakeholders from the general public, it is easy and likely for the stakeholders to take action to reduce marine litter. Except for asking people to pick up their litter, the asked behavioural activities are seen as easy (60,5 – 64,6 % of the stakeholders) and likely (60,4 – 64,6 % of the stakeholders) to carry out.

Regarding the responsibility of the general public to reduce marine litter, the general public is one of the most responsible but seen as not very motivated and moderate competent. As individual within the sector, the stakeholders are also moderate competent but less responsible and more motivated. The design and manufacturing sector is seen as most responsible, while the government and policy makers are seen as most competent. Environmental groups are considered to be most motivated.

3.4 Overview of all stakeholder sectors

In this sub chapter, an overview of the results of all stakeholder sectors is presented on the subjects of opinions, level of awareness, behaviour and responsibility.

3.4.1 Opinions

The opinions of the stakeholder sectors regarding the statement *'The use we get out of modern materials does not outweigh any negative effects they might have on the marine environment'* are varying (see Figure 45). In general, stakeholder sectors agree for more than 60 % with this statement, environmental groups even agree with the statement for 100 %. Within the media sector, 60 % of the stakeholders are neutral about this statement but none disagree. The general public seem to disagree most with 18,7 %.

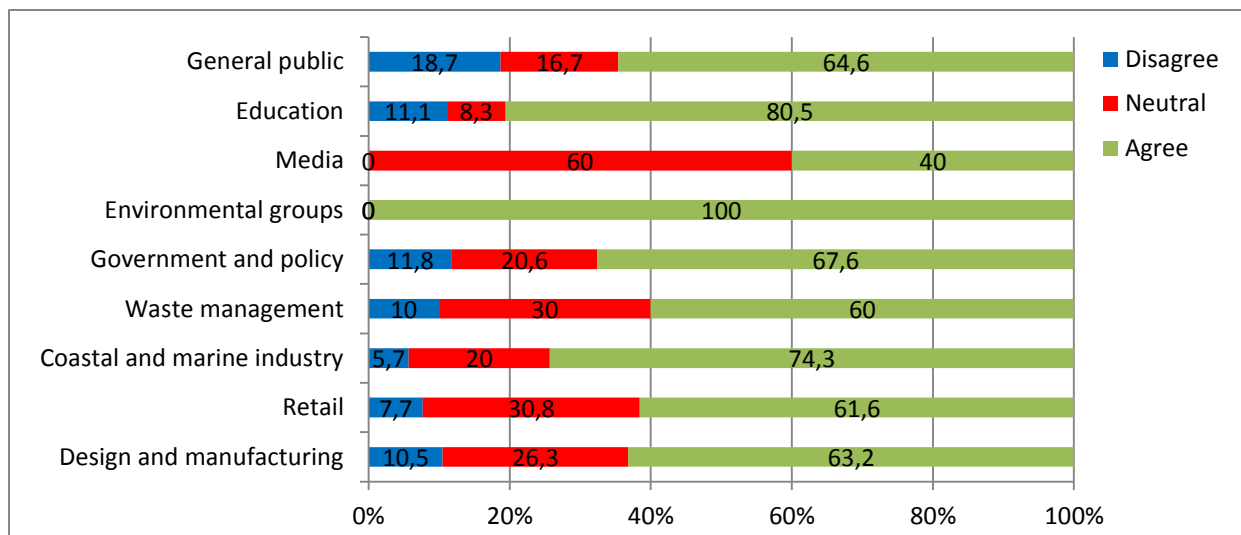


Figure 45 Answers of stakeholder sectors on the statement *'The use we get out of modern materials does not outweigh any negative effects they might have on the marine environment'*

The opinions of the stakeholder sectors regarding the statement *'Marine litter is a present environmental threat rather than a future one'* are varying as well (see Figure 46) but tend more to disagreement among the stakeholder sectors. Media disagrees with the highest percentage of 80 %, followed by design and manufacturing with 63,1 % disagreeing stakeholders. Least disagreement seems present with environmental groups (40 %) and coastal and marine industry (42,9 %). Most agreement seems present among environmental groups as well with 46,7 %, followed by the retail sector with 38,5 %.

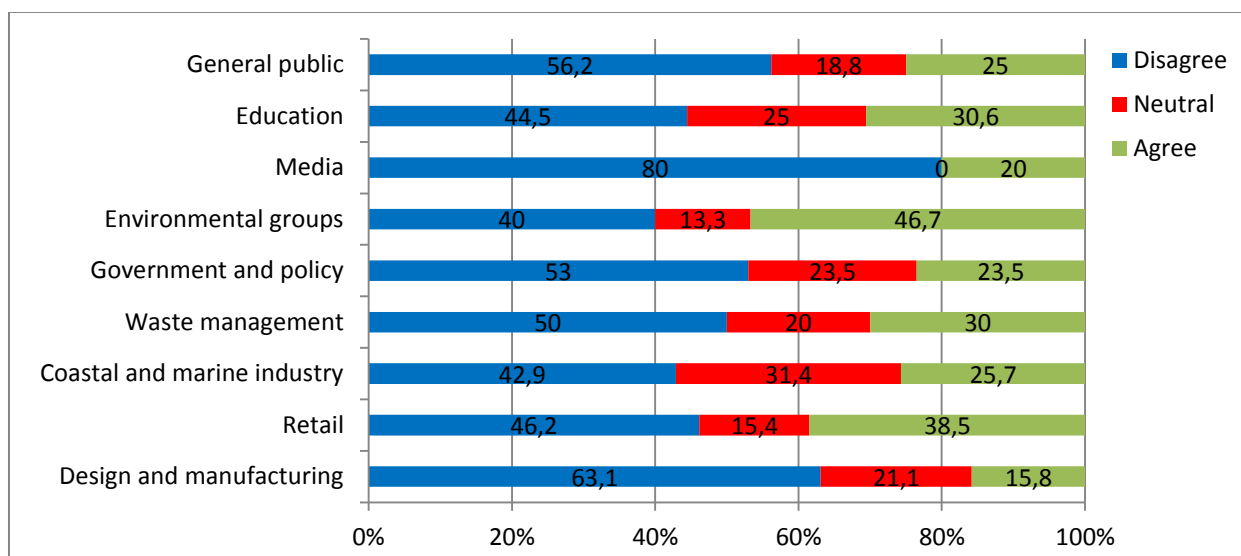


Figure 46 Answers of stakeholder sectors on the statement *'Marine litter is a present environmental threat rather than a future one'*

Regarding factors contributing to marine litter (see Figure 47), behaviour of public, single use-/throw away products, plastic in packaging and coastal industries are seen among all stakeholder sectors as most contributing to marine litter (>2,6; mean 2,8). Lack of enforcement of waste disposal management is seen among all stakeholder sectors as a contributor as well (>2,5; mean 2,6). A less important factor is a lack of bins (>2,3; mean 2,5) but the media sector seems to find this factor as very important (3 points) and also the retail sector sees this factor as important (2,8 points). Least important factor is loss during transport of products and waste (mean 2,2). Even though loss during transport of products and waste is seen as least important factor, it is still indicated as fairly important.

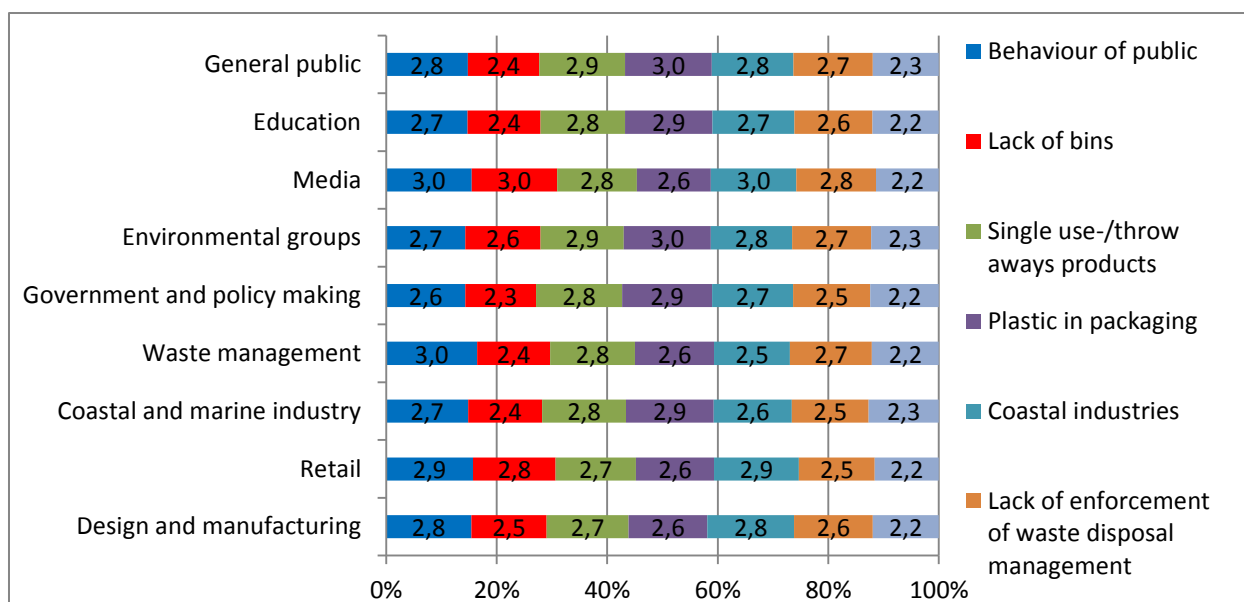


Figure 47 Importance of factors contributing to marine litter according to the stakeholder sectors (max. per source is 3)

A correlation between the stakeholders opinions about the two statements ‘Most of my family and/or friends think it is important to reduce marine litter’ and ‘Most of those close to me will support me in taking steps to reduce marine litter’, is present with a moderately strong positive correlation (Spearman’s rho; $R=,481$; $P \geq ,000$; $N=251$) (Vocht, de, 2011). A moderately positive correlation (Spearman’s rho; $R=,374$; $P \geq ,000$; $N=251$) is present as well between how concerned the stakeholders are themselves regarding marine plastic, related to how they see the support of close ones regarding reducing marine plastic.

3.4.2 Level of awareness

The amount of plastic within marine litter is underestimated among all stakeholder sectors (see Figure 48). Environmental organisations seem most aware of the quantities but still 46,7 % of the stakeholders within this sector do underestimate the quantities. Least aware seem governmental organisations and policy makers with only 8,8 % answering within the benchmark. A small percentage (5,3 %) of the stakeholders of the design and manufacturing sector overestimate the percentage with more than 85 % and within the education sector the amount is overestimated by 1,4 % of the stakeholders.

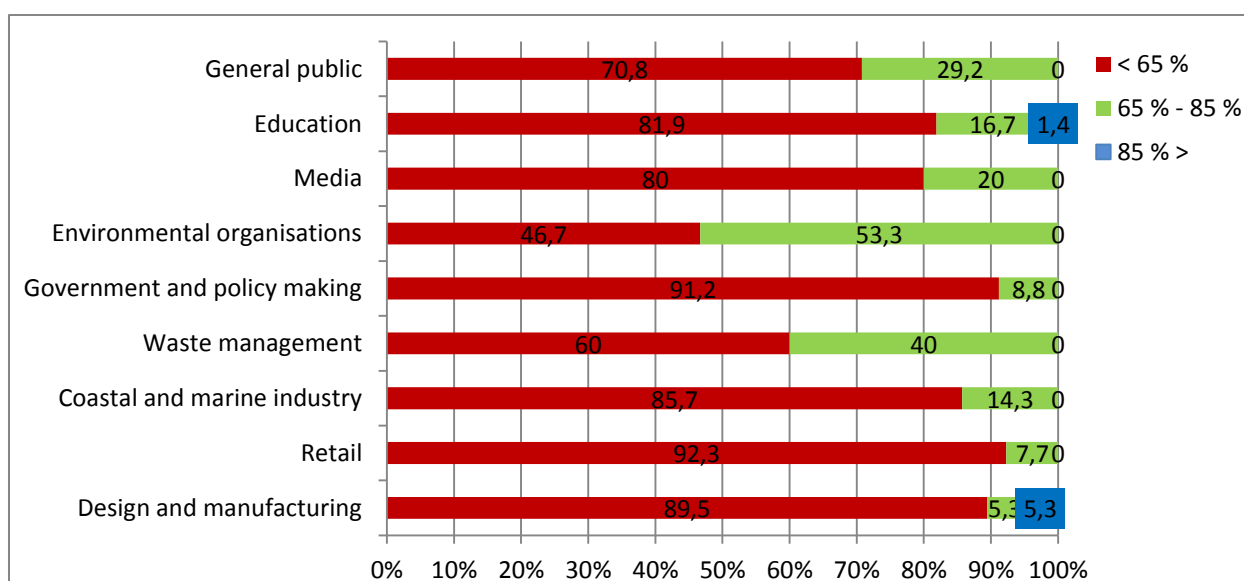


Figure 48 The distribution of quantities of plastic within marine litter regarding stakeholder sectors

The degradation time of a plastic bottle is underestimated among all stakeholder sectors, except for environmental organisations (see Figure 49). Within environmental organisations, 73,3 % of the stakeholders seem aware that a plastic bottle needs more than 100 years to degrade. The stakeholders within the retail sector seem least aware of the degradation time with only 7,7 % of the stakeholders. Remarkably is that also the stakeholders within the design and manufacturing are not aware of the degradation time of plastic, while this sector also includes the production of plastic.

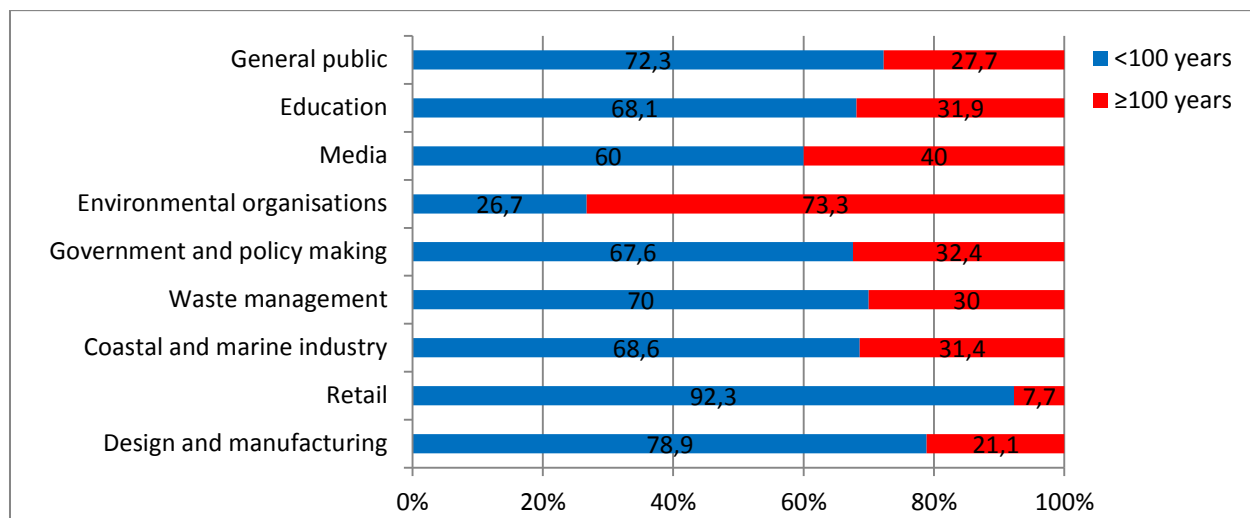


Figure 49 The distribution of the degradation time of plastic regarding stakeholder sectors

The most important pathway according all stakeholder sectors (see Figure 50) is direct release in sea, except for environmental organisations who indicate the most important pathway contributing to marine litter as rivers and estuaries. Also design and manufacturing indicate rivers and estuaries as an important pathway contributing to marine litter. All other stakeholder sectors indicate rivers and estuaries as second important pathway, followed by direct release on the coast. Least important pathways indicated by all stakeholder sectors are blown from landfill or landfill collapses and sewage overflows. No large distributions are present among the stakeholder sectors which show that the stakeholders agree on the pathways of marine litter, with the only exception for environmental groups and the design and manufacturing sector indicating rivers and estuaries to be the most important pathway.

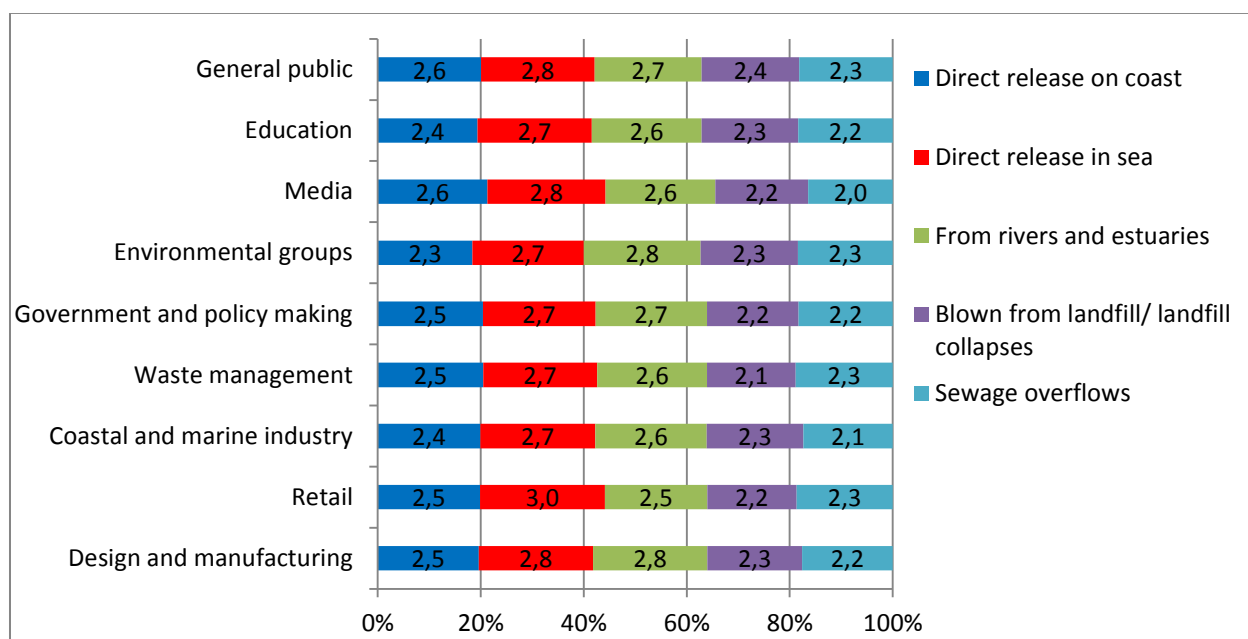


Figure 50 Importance of pathways contributing to marine litter according the stakeholder sectors (max. per pathway is 3)

3.4.3 Behaviour

According to the average percentages of responding stakeholders about the easiness and likeliness of the asked behavioural activities (see Figure 51), it is likely (>54,3 %) and easy (>50 %) for the majority within all stakeholder sectors to carry out behavioural activities to reduce marine litter. It is the most likely and most easy for stakeholders from the media sector (both 85 %) to carry out behavioural activities to reduce marine litter. It is also likely (78,4 %) and easy (75 %) for stakeholders from environmental groups to carry out the activities. The asked behavioural activities are least easy for stakeholders from the waste management sector (50 %) and least likely to carry out for stakeholders from the coastal and marine industry (54,3 %) and general public (56,3 %).

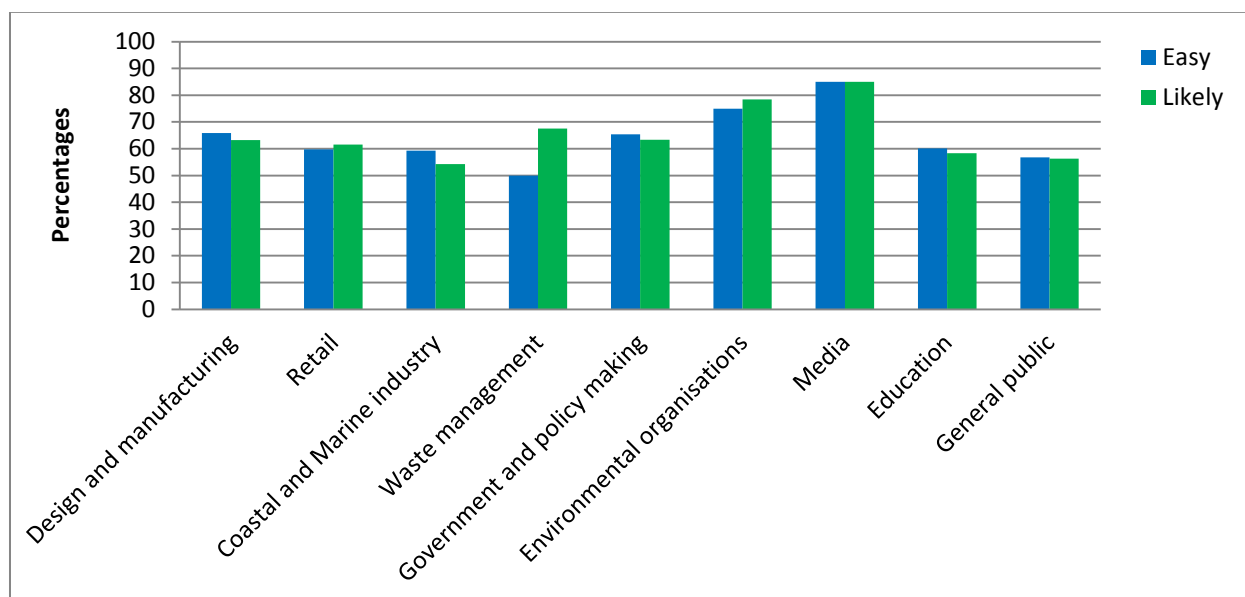


Figure 51 Opinion of all stakeholder sectors about behavioural activities (N=251)

A correlation exists between the easiness and likeliness for all behavioural activities (Spearman's rho; $P \geq 0,000$; $N=251$). The correlation between the easiness and likeliness of buying re-usable products is moderately strong positive (Spearman's rho; $R=0,492$; $P \geq 0,000$; $N=251$). Strong positive correlations exist between the easiness and likeliness of asking people to pick up their litter (Spearman's rho; $R=0,528$; $P \geq 0,000$; $N=251$), supporting government policy on marine litter (Spearman's rho; $R=0,656$; $P \geq 0,000$; $N=251$) and picking up litter (Spearman's rho; $R=0,633$; $P \geq 0,000$; $N=251$).

3.4.4 Responsibility

The design and manufacturing sector is seen by the majority of all stakeholder sectors as the most responsible sector to reduce marine litter (see Table 4). The stakeholders from the design and manufacturing sector and the coastal and marine industry indicate each other as most responsible. Three other sectors indicate the coastal and marine industry as most responsible as well. Independent scientists are seen by the majority of all stakeholder sectors as the least responsible sector. Noticed is that the stakeholders from environmental organisations and from the retail sector consider their own sector to be least responsible.

The government and policy makers are seen by the majority of all stakeholder sectors as the most competent sector. The stakeholders from the government and policy makers agree on their responsibility as well. Only stakeholders from the media sector consider the design and manufacturing sector and waste collection organisations to be most competent. The stakeholders from the waste management sector consider the design and manufacturing sector as most competent as well. But the opinion of the stakeholder sectors about the least competent sector varies. Independent scientists, the education sector, environmental groups, the media and general public are seen as least competent. The opinion of the stakeholder sectors about the least motivated sector varies. The most mentioned sectors are the design and manufacturing sector, the retail sector and the coastal and marine industry. All stakeholder sectors do agree on the most motivated sector which is environmental groups.

Table 4 Overview responsibility according to all stakeholder sectors

| | Least responsible | Most responsible | Least competent | Most competent | Least motivated | Most motivated |
|-------------------------------------|---|--|------------------------|--|---|-----------------------|
| Design and manufacturing | Environmental groups | Coastal and marine industry | Independent scientists | Government | Coastal and marine industry | Environmental groups |
| Retail | Independent scientists Environmental groups Waste collection Retailers | General public Government | Independent scientists | Government | Design and manufacturing | Environmental groups |
| Coastal and marine industry | Independent scientists | Design and manufacturing | Education | Government | Retailers | Environmental groups |
| Waste management | Independent scientists | Coastal and marine industry Design and manufacturing | General public | Government Design and manufacturing | Government | Environmental groups |
| Government and policy makers | Independent scientists | Design and manufacturing | Independent scientists | Government | Design and manufacturing Retailers | Environmental groups |
| Environmental groups | Environmental groups | Design and manufacturing Coastal and marine industry | Media | Government | Retailers | Environmental groups |
| Media | Independent scientists | Design and manufacturing Coastal and marine industry Government Retailers General public | Environmental groups | Design and manufacturing Waste collection organisations | Design and manufacturing Coastal and marine industry Retailers Media | Environmental groups |
| Education | Independent scientists | Design and manufacturing | General public | Government | Retailers | Environmental groups |
| General public | Independent scientists | Design and manufacturing | Education | Government | Design and manufacturing Coastal and marine industry | Environmental groups |

Correlations between the three aspects (responsibility, competences, motivation) of responsibility to reduce marine litter do exist. Between the responsibility of the stakeholders and their competences (Spearman's rho; $R=,316$; $P\geq,000$; $N=251$) there is a moderately strong positive correlation. Between responsibility and the motivation of the stakeholders (Spearman's rho; $R=,210$; $P=,001$; $N=251$) and between the competences and the motivation (Spearman's rho; $R=,126$; $P=,046$; $N=251$) the correlation is slightly positive.

3.5 Statistical analysis of variables and ages

In this chapter, a statistical analysis for the data gained by the survey is given.

3.5.1 Variables

In this sub chapter, a statistical analysis of the variables is presented.

3.5.1.1 Behaviour and responsibility

Correlations are present between the motivation of the entire stakeholder group to reduce marine litter and the likeliness to carry out behavioural activities to do so. The correlation of asking people to pick up their litter if the stakeholders see them littering (Spearman's rho; $R=,183$; $P=,004$; $N=251$), supporting government policy on marine litter (Spearman's rho; $R=,265$; $P\geq,000$; $N=251$) and picking up litter (Spearman's rho; $R=,214$; $P=,001$; $N=251$) with the motivation of stakeholders is slightly positive (Vocht, de, 2011). A moderately strong positive correlation exists between buying re-usable products and the motivation (Spearman's rho; $R=,314$; $P\geq,000$; $N=251$). When the motivation of stakeholders increases, the higher is the likeliness of the stakeholders to carry out behavioural activities to reduce marine litter.

Between the easiness of behavioural activities and the competences of the stakeholders to reduce marine litter, only a correlation exists between competences and the easiness of picking up litter, which is slightly positive (Spearman's rho; $R=,153$; $P=,015$; $N=251$).

3.5.1.2 Opinions and behaviour

No correlation (Spearman's rho; $P=,393$; $N=251$) exist between how concerned the stakeholders are and the likeliness to ask people to pick up their litter. But slightly positive correlations are present between how concerned the stakeholders are and the likeliness stakeholders will buy re-usable products (Spearman's rho; $R=,172$; $P=,006$; $N=251$), the likeliness stakeholders will support government policy on marine litter (Spearman's rho; $R=,270$; $P\geq,000$; $N=251$) and the likeliness stakeholders will pick up litter (Spearman's rho; $R=,165$; $P=,009$; $N=251$). When the concerns of stakeholders regarding marine litter increase, the higher is the likeliness of the stakeholders to carry out behavioural activities to reduce marine litter.

3.5.1.3 Opinions and responsibility

A moderately strong positive correlation exists between motivation and the concerns of the stakeholders about the impacts of marine plastic (Spearman's rho; $R=,393$; $P\geq,000$; $N=251$) and a slightly positive correlation exists between responsibility and the concerns of the stakeholders about the impacts of marine plastic (Spearman's rho; $R=,179$; $P=,004$; $N=251$). When the concerns of stakeholders regarding marine litter increase, motivation and responsibility of the stakeholders themselves will increase.

A moderately strong positive correlation (Spearman's rho; $R=,393$; $P\geq,000$; $N=251$) exists between the motivation to reduce marine litter and whether the stakeholders are concerned about the impacts of marine litter. When the concerns of stakeholders regarding marine litter increase, the more motivated they are to reduce marine litter.

3.5.1.4 Level of awareness and responsibility

No correlation is existing between motivation of stakeholders and the level of awareness regarding degradation time in years (Spearman's rho; $P=,132$; $N=250$) and between responsibility and the level of awareness regarding degradation time in years (Spearman's rho; $P=,240$; $N=250$).

3.5.1.5 Level of awareness and opinions

A slightly positive correlation is present between the concerns of the stakeholders about the impacts of marine plastic and the degradation time of plastic (Spearman's rho; $R=,208$; $P=,001$; $N=250$). When stakeholders indicate a

higher degradation time, it is more likely they agree to the concerns about the impact of marine litter than when a lower degradation time is estimated.

3.5.1.6 Level of awareness and behaviour

A slightly positive correlation between the quantities of plastic within marine litter and how likely the stakeholders are to support government policy/legislation on marine litter does exist (Spearman's rho; $R=,181$; $P=,004$; $N=251$). Between the quantities and the likeliness of other activities, no correlations exist ($P\geq,05$).

A slightly positive correlation between the level of awareness regarding degradation time of plastic and how likely the stakeholders are to support government policy/legislation on marine litter does exist (Spearman's rho; $R=,234$; $P\geq,000$; $N=250$). A slightly positive correlation is present as well between the level of awareness regarding degradation time of plastic and the likeliness to buy re-usable, rather than single use "disposable", non-biodegradable products (Spearman's rho; $R=,189$; $P=,003$; $N=250$). So when stakeholders estimate a higher degradation time, the likeliness to carry out activities increases.

3.5.2 Ages

In this sub chapter, a statistical analysis of the ages is presented.

The correlation with ages and several variables have been tested (see Table 5). The outcome of age across all variables did not point out to be significant (Spearman's Rho; $P\geq,0,05$; $N=251$), except the age with self- responsibility and with self- motivation to reduce marine litter. A slightly positive correlation is present between ages and self- responsibility (Spearman's rho; $R=,165$; $P=,009$; $N=251$) and between ages and self-motivation (Spearman's rho; $R=,188$; $P=,003$; $N=251$). The correlations between ages and self- responsibility are not influenced by the distribution of the stakeholders within the different stakeholder sectors (Oneway Anova; $P=,534$; $df= 47$; $N=251$). The correlations between ages and self- motivation are neither influenced by the distribution of the stakeholders within the different stakeholder sectors (Oneway Anova; $P=,100$; $df= 47$; $N=251$). However the correlation between ages and self-motivation does not seem statistical significant (Chi-square $P=,245$; $df=188$; $N=251$). The correlations between ages and self- responsibility do seem statistical significant (Chi-square $P=,048$; $df=188$; $N=251$).

Table 5 Significance and correlations between ages and several other variables

| Tested variables | Belongs to variable | Used test | Significance (P) | Spearman Correlation (R) | Other |
|---|---------------------|----------------|-------------------------------|--------------------------|---|
| Ages vs factors | Level of awareness | Spearman's rho | At all variables $P\geq,0,05$ | - | - |
| Ages vs degradation time | Level of awareness | Spearman's rho | $P=,112$ | - | - |
| Ages vs percentage of plastic within marine litter | Level of awareness | Spearman's rho | $P=,781$ | - | - |
| Ages vs opinions regarding marine plastics | Opinions | Spearman's rho | At all variables $P\geq,0,05$ | - | - |
| Ages vs self-competence | Responsibility | Spearman's rho | $P=,764$ | - | - |
| Ages vs self-responsibility | Responsibility | Spearman's rho | $P=,009$ | $R=,165$ | Chi- square $P=,048$ Oneway Anova $P=,534$ |
| Ages vs self-motivation | Responsibility | Spearman's rho | $P=,003$ | $R=,188$ | Chi-square $P= ,245$ Oneway Anova $P=,100$ |
| Ages vs behaviour easiness | Behaviour | Spearman's rho | At all variables $P\geq,0,05$ | - | |
| Ages vs behaviour likeliness | Behaviour | Spearman's rho | At all variables $P\geq,0,05$ | - | |

3.5.3 Sub conclusion

When stakeholders indicate a higher degradation time, it is more likely they agree to the concerns about the impact of marine litter and it is more likely they will carry out behavioural activities to reduce marine plastics. The more concerned the stakeholders are, the higher the self-responsibility of the stakeholders. Also the more concerned the stakeholders are, the more motivated they are to reduce marine litter and the higher the likelihood stakeholders will actually carry out behavioural activities to do so. Also, when behavioural activities are easy and stakeholders are motivated, the higher the likelihood is that stakeholders will actually carry out the activities to reduce marine plastics.

Between ages and variables, no large correlations are present. The only correlations existing are ages with responsibility of the stakeholders as individual and between ages and motivation of stakeholders as individual, however last named is not statistically significant.

4. Discussion

Within this chapter, some results and other aspects found in this report will be discussed.

It is estimated marine litter originates for 80 % of land based resources at the global level but within the Netherlands this percentage differs. One of the largest pathways in the Netherlands is due to direct release in sea, whereof 40-45 % of marine litter originates from coastal and marine industries such as fishing and shipping (Rijkswaterstaat, 2012). According to the results, almost all stakeholder sectors (except for the environmental organisations sector) indicate direct release in sea as most important pathway. So either the stakeholders are really aware of this aspect within the Netherlands, or there may be for example a misconception that marine litter is produced at sea. No conclusions can be taken, as the survey was not specific to the issue in the Netherlands.

Already expected was that environmental organisations would probably have a higher level of awareness regarding marine plastic/litter than other stakeholder sectors due to the fact that environmental organisations often work with environmental issues like marine litter. What is unexpected is that the design and manufacturing sector is not aware of the degradation time of plastic in the marine environment, while this sector includes companies which produce plastics and should be aware of the properties of their materials.

The underestimated degradation time and quantities of marine plastics by the stakeholders might explain why some stakeholders do not see marine litter as a present threat. It is interesting to see that the majority of the stakeholders indicate marine litter as a future threat, as it was expected stakeholders would already be more concerned with the present situation. It is likely that the situation will get worse in the future as plastics remain in the sea for centuries and therefore will tend to accumulate but it seems people are not well aware of the extension of impacts that marine litter possesses. Most people underestimate the socio-economic impacts as they indicate marine litter as more of an ecologic issue than affecting the human dimension too. Also very interesting is the fact that people do not really see aesthetics as an impact on tourism. This might be because in most touristic coastal areas and beaches, the local authorities invest a lot in cleaning the beaches regularly and therefore the problem is not visible.

The perceptions regarding the responsibility of the stakeholders seems to be a complicated issue since the perceptions are varying and stakeholder sectors indicate each other as most responsible. Large differences in perceptions regarding responsibility are present between the general public and stakeholders from the sectors within the plastic life cycle since they indicate each other as most responsible. According to the stakeholders of the design and manufacturing sector, the plastic products are not causing the problem but the inadequate behaviour (throw away behaviour) of citizens. This is in fact common in such complex issues, where stakeholders tend to attribute responsibility to others rather than recognising they also have a role to play (J.M. Veiga, personal communication, 2-7-2013).

After a week experience on a professional fishing vessel, it appeared that the management of caught waste is more complicated than the interview with J. de Boer (Ekofish Group) pointed out. The caught waste is not always retained on board due to a lack of time of fishermen to store the waste and also due to the storage capacity on the fishing vessel. Waste management facilities at ports do not motivate fishing companies enough to retain caught waste on

board. In some ports, fishing companies have to pay to release the caught waste or the logistics of waste management facilities is not properly regulated.

The government and policy makers are considered to be most competent to reduce the problem and the design and manufacturing to be most responsible but the motivation of these two sectors to reduce the problem is estimated low. The low motivation of these two sectors could be related to other interests, for example business cases and costs, that they could see as more important and therefore these interests have higher priority.

Buying re-usable products rather than single use products is often considered as the least easy behavioural activity to reduce marine plastics although the willingness of respondents to choose for such products tends to be high. This could reflect the opinion that society offers limited options/alternatives to consumers. The easiness and likeliness of asking people to pick up their litter comes out low as well. This could be caused by an uncomfortable feeling of citizens in the Netherlands as people might be afraid for the response of people when expressing themselves.

Due to the fact there has been made use of a survey, a bias could have occurred as respondents might only fill in a survey as they feel themselves involved with the subject. That might explain why a very high percentage of the stakeholders is concerned and aware of the issue with marine litter.

Within some stakeholder sectors the response rate on the survey is very low, for example within the media sector with only five responses. The stakeholders from the media sector have a low level of awareness, which is a pity given the fact that they represent one of the most influential channels in society. An unexpected result within this sector is the easiness and likeliness of carrying out behavioural activities which is the highest for the stakeholders within the media sector. These two results could be reflected to the low response rate on the survey.

To continue on the survey, due to the fact that the survey has been set up by the University of Plymouth as part of the European project MARLISCO and not for this study, the survey is based on marine litter and not on marine plastics. Some questions could be phrased back to marine plastic, like the degradation time and the quantities of plastic within marine litter. Within the results, all other questions had to be phrased back to marine litter. Also some questions are not used during this study and some questions are missing in the survey which would have been useful. Some examples of questions are described below.

For example, in the end of the survey has been questioned which stakeholder sector and stakeholder group they represented. It can be said that the individual perception of the person is measured as representative of the stakeholder group. But if the stakeholders filled in the survey from the perspective of their function within the company, the results might differ. Since a person might not stand for the position of the company and has individually very different perceptions on the problem of plastic in sea. Therefore the survey has been used within this study to investigate the individual perception of stakeholders and interviews were taken to investigate the company's perception.

Also, the respondents were asked about the origin and the amounts of waste. It might have been hard for the respondents to fill this in without numbers as well. What is understood for a large amount? This remained unclear for the respondent, what might have led to guessing the answer. It would also have been good to attach a note box in the end so people could have placed their comments.

The survey focused on the easiness and likeliness of stakeholders to carry out some behavioural activities (see survey question 9). It might not have been clear that the questions are about the current behaviour, so it is hard to conclude whether the stakeholders filled it in as current or future behaviour.

So due to this survey, some issues are underexposed which would have been very useful for the overview of perceptions. When the option would have been present for a survey special for this study, the survey would have lain on marine plastic and a focus would have been laid more on current behaviour and struggle points for stakeholders to improve their policy on plastics. But since it would have been hard to equalize a survey for all companies with different kinds of targets, the choice might have been made to do only interviews with companies and only a survey for consumers.

5. Conclusion

In conclusion, the opinions of stakeholders as individual within all stakeholder sectors regarding marine litter show that the stakeholders are aware of the problem and that the majority is concerned with the issue. The opinions regarding the timeframe that marine litter will become a threat are varying among and within stakeholder sectors. Most stakeholders indicate marine litter as a future threat rather than a present one. Also interviewed companies which are part of the plastic life cycle are aware of marine plastics and are influenced by external parties as governmental organisations (laws and regulations), environmental organisations, media, umbrella organisations and customers. In the opinion of the stakeholders within all stakeholder sectors, factors that contribute most to marine litter are the inadequate behaviour of public, single use-/throw away products and plastic in packaging and coastal industries. Least contributing factors are a lack of bins, loss during transport of products and waste.

The environmental organisations seem most aware of the degradation time of plastic and the percentage of plastic within marine litter. Awareness among the majority of the other stakeholder sectors regarding the percentage of plastic within marine litter and the degradation time of plastic seem underestimated. Direct release in sea is indicated as most important pathway all stakeholder sectors, except by the environmental organisations sector which indicates rivers and estuaries as most important pathway. Literature research indicates at a global scale that 80 % of marine litter comes from land based resources, so according to that aspect, all stakeholder sectors are not quite aware of pathways of marine litter. The aspect all stakeholder sectors are aware of is the threat of marine litter to the marine environment.

Carrying out behavioural activities to reduce marine litter is easy and likely for the majority within all stakeholder sectors. The easiness and likeliness are the highest for the stakeholders from the media sector and from environmental organisations. It is least easy for stakeholders of the waste management sector and it is least likely general public and the stakeholders of the coastal and marine industry will carry out behavioural activities. The behavioural activities to reduce marine plastics which are most considered as least easy are asking people to pick up their litter and buying re-usable products rather than single use products. Asking people to pick up their litter is the least likely activity, also buying reusable products and supporting government on marine litter are mentioned as least likely to be executed. According to the majority of the companies within the plastic life cycle, the environment and sustainability seems to be a high rated aspect within the policy. The waste management companies are working on recycling to give waste a higher value. Within the packaging sector large steps are made, also the manufacturing sector is working on reducing the problem. Supermarkets have several activities related to plastic. Also within the shipping and fishing sector the waste handling is well organised. Business cases and costs are the main restrictions to improve on sustainable aspects.

The design and manufacturing sector is seen by the majority of all stakeholder sectors as the most responsible sector to reduce marine litter. Also the general public is seen as very responsible. The stakeholders from the design and manufacturing sector and the coastal and marine industry indicate each other as most responsible. Independent scientists are seen by the majority of all stakeholder sectors as least responsible. According to the majority of the interviewed companies, the sectors of the companies have no or low responsibility for contributing to marine plastics but are willing to take responsibility regarding the reduction of marine litter. The stakeholder sectors that are considered to be most competent by the majority of all stakeholder sectors are the government and policy makers, which is agreed by the government and policy makers. Independent scientists, the education sector, environmental groups, the media and general public are mentioned as least competent. Environmental groups are the most motivated stakeholder sector. The design and manufacturing sector, the retail sector and the coastal and marine industry are mentioned as least motivated.

When stakeholders indicate a higher degradation time, it is more likely they agree on the concerns about the impact of marine litter and it is more likely they will carry out behavioural activities to reduce marine plastics. The more concerned the stakeholders are, the higher the self-responsibility of the stakeholders will be. Also the more concerned the stakeholders are, the more motivated they are to reduce marine litter and the likeliness stakeholders will actually carry out behavioural activities to do so will increase. Also the easier behavioural activities are and the more motivated the stakeholders are, the higher the likeliness will be that stakeholders will actually carry out the activities to reduce marine plastics.

6. Recommendations

After the findings within this study, some recommendations could be created as focus points regarding further activities related to marine plastics/litter.

Stakeholders seem concerned about the marine litter issue but most of the stakeholders do not consider the problem as a present threat, which might be caused by the low level of awareness of all stakeholder sectors. Only environmental organisations seem aware while even within this sector some improvements regarding the level of awareness can be reached. So all stakeholder sectors should be better informed about marine plastics/litter. Regarding individuals, the use of media and education will be useful. As companies are mainly influenced by governmental organisations (laws and regulations), environmental organisations, media, umbrella organisations and customers, those parties can be used to inform and encourage companies. Informing due to articles about marine litter in journals of their professional fields can be helpful. When stakeholders are more aware of for example the degradation time of plastic, the concerns about the impact of the marine plastics might grow, as well as the likeliness of stakeholders to carry out behavioural activities to reduce marine litter. At the same time, when the concerns of stakeholders increase, the stakeholders feel more responsible and will be more motivated to reduce marine litter, followed by a higher likeliness the stakeholders will actual carry out behavioural activities.

Educational programmes should be established about behavioural activities to reduce the problem of marine plastics. As mentioned before, how easier behavioural activities are, how more likely it is stakeholders will actually carry out the activities to reduce marine litter. Educational programmes could make the stakeholders more aware about behavioural activities causing a higher likeliness stakeholders will actually carry out the actions to reduce marine plastics. The programme could for example educate about the options in terms of re-usable products.

According the opinions of stakeholders, factors most contributing to marine litter are the inadequate behaviour of public, single use-/throw away products, plastic in packaging and coastal industries. Further research to the contribution of these factors is recommended and once these contributions are clear, it should be considered to cooperate with the stakeholders involved by those factors to find ways to improve the situation.

Business cases and costs are the main restrictions for companies to improve on sustainable aspects, therefore business cases should be created within this subject.

To continue on companies, fishing companies should get motivated to deliver the caught waste in the port. Motivation can be held by improving the waste management facilities at ports by for example including the costs of these facilities within the port charges, providing compensation for each kilo of caught waste a fishing company brings on shore and improving the logistics of waste containers to dispose the caught waste.

Stakeholder meetings about the responsibility of stakeholders should be organised to create collaboration between stakeholders to reduce the problem of marine plastics. The different stakeholders within the plastic life cycle have to discuss with each other that are able to take responsibility for reducing marine plastics, so next steps for improvements could be taken. It is important to involve the government and policy makers into the meetings as well, since this sector is seen as most competent to make changes.

The motivation of stakeholders from the government and policy makers and the design and manufacturing sector should be increased. The government and policy makers are considered to be the most competent to reduce the problem and the design and manufacturing to be the most responsible but the motivation to do so seems to be low. When these two sectors are motivated to reduce marine plastics as well, large steps to a better situation could be created.

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Appendix I MARLISCO

MARLISCO (Marine litter in Europe seas: social awareness and co-responsibility) is a FP7 project funded by the European Commission. FP7 (Seventh Framework Programme) contains all initiatives of the EU related to research and technology development. It promotes research and innovation. The four main categories in which the objectives of FP7 are divided are cooperation, ideas, people and capacities (Cordis, 2011). MARLISCO is part of the initiative called “Science in Society” (J.M. Veiga, personal communication, 21-01-2013). Fifteen European countries located on European seas will participate in order to achieve the main objective of MARLISCO: *“Increase the awareness of the consequences of societal behavior in relation to waste production and management on marine socio-ecological systems, to promote co-responsibility among the different actors, to define a more sustainable collective vision, and facilitate grounds for concerted actions through the successful implementation of the Mobilisation and Mutual Learning Action Plan (MMLAP).”* (DOW MARLISCO, 2012). The duration of MARLISCO is 36 months; the project started in June 2012 and ends May 2015. Seven work packages in which MARLISCO is divided will be carried out during the project period. Figure 52 shows the structure of the seven work packages.

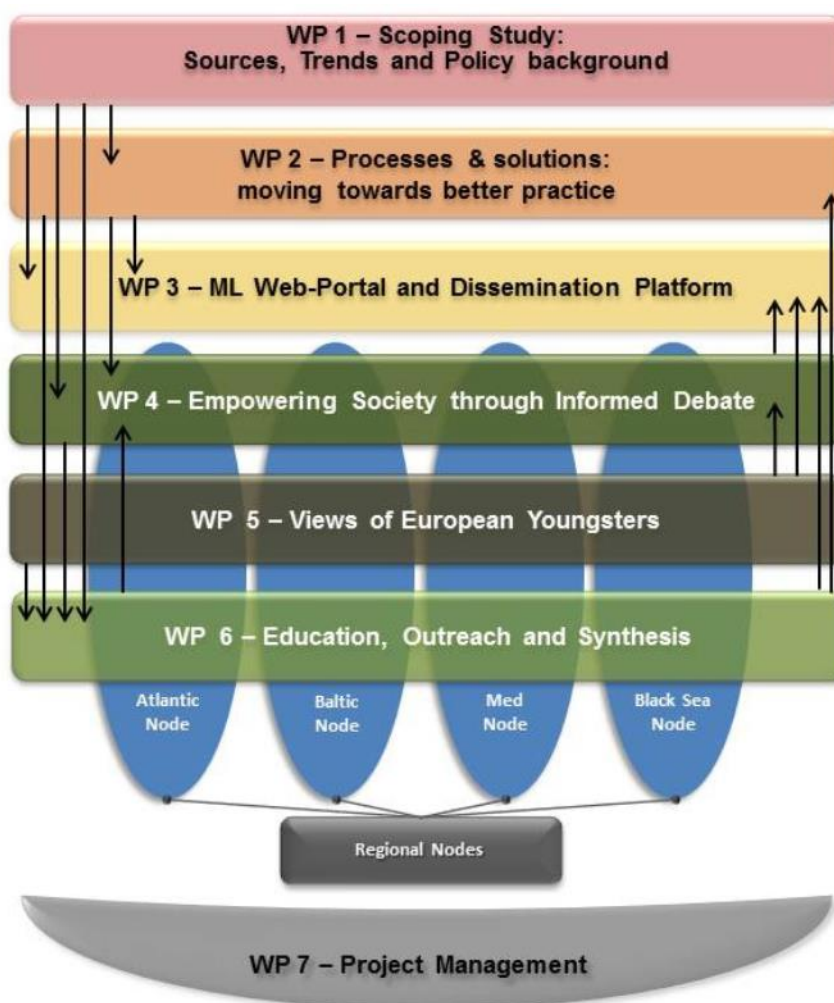


Figure 52 Structure of MARLISCO's work packages (DOW MARLISCO, 2012)

The sub-objectives of MARLISCO are divided in the seven work packages, as described in Table 6.

Table 6 Work packages and sub-objectives MARLISCO (DOW MARLISCO, 2012)

| Work package: | Sub-objective MARLISCO: |
|--|--|
| WP 1: Scoping study: Sources, trends and policy background. | Providing a review of current understanding of the sources, type, distribution and fate of marine litter in European Seas. To provide an evidence base to support appropriate actions and to provide a baseline against which change can be measured. |
| WP 2: Processes and solutions: moving towards better practices. | Providing an evaluation of the perception of key stakeholders regarding marine litter. Assessing current practices and possible solutions. Measuring the effectiveness of the MMLAP at changing attitudes and perceptions. |
| WP 3: ML Web-Portal and dissemination platform. | Developing a web based portal to promote the MMLAP and to provide an information source on marine litter which will stimulate discussion. |
| WP 4: Empowering society through informed debate. | To identify and resolve barriers that slow down the implementation of good practices a platform for structured dialogue will be provided among the key stakeholders in 12 European countries. |
| WP 5: View of European Youngsters. | Developing a video contest in schools in 14 countries around the European Seas in which children will develop short videos about marine litter to get in touch with the problem and the possible solutions. |
| WP 6: Education, Outreach and Synthesis. | Identifying good practice and facilitating its adoption at specific sectors. |
| WP 7: Project Management. | Increasing awareness and empower general public and children through national educational activities and communication tools. Their views will be integrated in the platforms of dialogue (WP4). |

This project plan focuses on WP 2: Processes and solutions, moving towards better practices. To provide an overview on the perception of key stakeholders regarding marine litter, a survey will be done. This survey is set up by the University of Plymouth. In each of the 15 participating European countries, a participant will carry out the survey among the key stakeholders of each country. The data of the survey will be collected between February and March 2013 and this process will be repeated in 2014 to evaluate possible changes in the perceptions of stakeholders regarding marine litter within a year (Hartley, Pahl & Thompson, 2012). To provide a correct overview on the perception of stakeholders regarding marine litter, the survey contains ten sorts of questions:

1. Awareness of marine litter and the scale of problem.
2. Awareness of the sources of marine litter.
3. Awareness of the negative consequences of marine litter.
4. Risk perception: concern vs. denial.
5. Perceived responsibility and trust in particular groups/organization to reduce marine litter.
6. Behavioural intentions and self-efficacy/perceived control in taking action to reduce marine litter.
7. Social norms.
8. Personal importance/value of the ocean.
9. Overall attitude/perception that marine litter is an important issue.
10. Demographics and stakeholder grouping. (Hartley, Pahl & Thompson, 2012)

Appendix II Coastal and Marine Union

The Coastal & Marine Union (EUCC) is the largest coastal zone network in Europe. The network consists of 2700 members and member organizations including coastal practitioners, planners and experts. The EUCC possesses 15 national branches and offices in seven countries. The operational fields of the EUCC are Europe, the Mediterranean Sea, the Black Sea and other neighbouring regions (see Figure 53). (EUCC, n.d.) A further overview about the responsibilities of the international part of the EUCC can be found in Table 7.

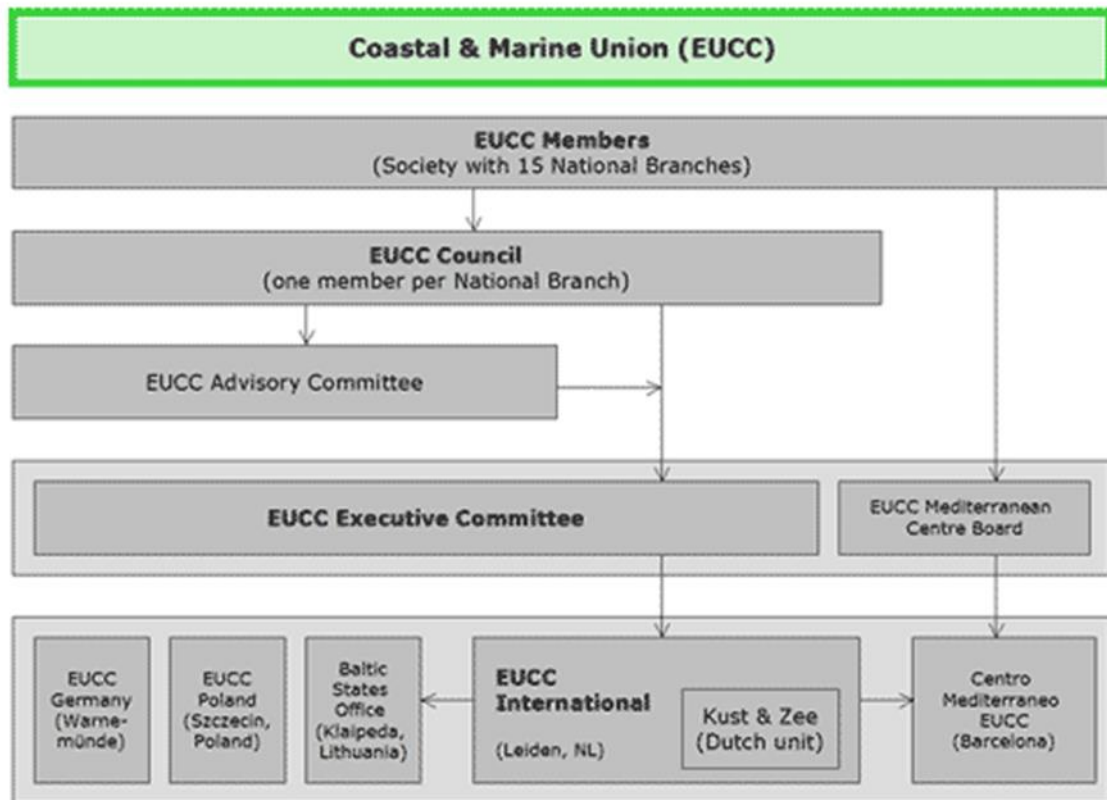


Figure 53 Organogram EUCC (EUCC, n.d.)

The vision of the EUCC is to realize a rich, healthy and attractive coastal and marine environment for both human and nature, in which conservation, usage, management and development cooperate with each other. In order to achieve this vision, the EUCC is working on the basis of six objectives: sustainable development; energy and climate; biodiversity and ecological networks; development in coastal and marine areas; raising awareness; and promoting cooperation. The four main subjects the EUCC is working on are marine litter, fisheries, tourism and biodiversity. (Kust en Zee, 2009)

Table 7 Responsibilities EUCC International (EUCC, n.d.a)

| EUCC International | Employee: | Responsibility: |
|--|--|---|
| Management team | Mike Mannaart, Albert Salman, Maria Ferreira, Robert Steenbergen | <ul style="list-style-type: none"> - Management of the organization. - Coordination of all units, staff and projects. |
| Executive Director | X | <ul style="list-style-type: none"> - Executive management - Overall strategy - Relations with EUCC president, board, national branches, council, ECNC, IUCN. |
| Managing Director | Head: Mike Mannaart Assistant: Mariëtte Ruigrok | <ul style="list-style-type: none"> - Acting CEO (overall strategy, relations with EUCC president, board, national branches, council, ECNC, IUCN) - ICT |
| Unit General Affairs | Head: Robert Steenbergen Staff: Jakkus van der Salm, Iris Pasman, Astrid Dol, Ben Overdevest, Cecile Zoetemelk, Piet Lansbergen, René Beckerschmidt | <ul style="list-style-type: none"> - Personnel, - Office, - Finances, - Administration Operational management X-Pierience, - ICT, - Administration. |
| Unit International Programme | Head: Maria Ferreira Staff: Alan Pickaver, Patrycja Czerniak, Joana Mira Veiga, Erik Devilee, Nico den Hollander, Ben Spaans | <ul style="list-style-type: none"> - International coastal & marine policy related projects and activities. |
| Unit Sustainable Development | Head: Albert Salman Staff: Daniela van Elburg, Marija Pejčić, Athena Stoura, Nico den Hollander, Irma Schutten | <ul style="list-style-type: none"> - International projects and activities, especially the QualityCoast and QualityTourism programme. |
| Unit Kust & Zee (Dutch national branch of EUCC International) | Head: Mike Mannaart Staff: Erik van Dijk, Freddy van der Brugge, Joos Versfelt, Marije Siemensma, Marijke Kooijman, Lotte Kauffman | <ul style="list-style-type: none"> - Overall general management. |

Appendix III Stakeholder survey

Perceptions about marine litter

We would like to invite you to take part in a survey about marine litter (litter which is found on the coast and in the sea).

Who is organising this survey?

This survey is part of a European project called MARLISCO – Marine Litter in Europe Seas: Social Awareness and Co-Responsibility. The survey is being led by Plymouth University, UK.

What are the aims of the survey?

We want to understand what people's opinions are about marine litter. In this survey there are some questions about what type of litter is found in the sea, where it comes from, what the consequences are, and who is responsible.

On the next few pages we will ask you some questions about this and it should only take about 15 minutes. **There are no right or wrong answers to the questions in this survey. We are interested in your opinions.**

What happens to the information I provide?

Participation in this research guarantees confidentiality of the information you provide. No one apart from the research team will have any access to the information you provide. We will not ask you to write your name on the survey. Surveys will be stored securely for as long as is required by the UK Data Protection Act. Once the data are analysed a report of the findings may be submitted for publication. Only broad trends will be reported and it will not be possible to identify any individuals. A summary of the results will be available from the researcher on request.

Contact for further information

If you require any further information or have any queries about this survey, please contact your national contact Joana M. Veiga at J.Veiga@eucc.net, or the principal researcher in the UK, Bonny Hartley (bonny.hartley@plymouth.ac.uk)

VOLUNTEER CONSENT

Please read the statements below and tick the box at the bottom of the page to indicate you consent to take part

I have received adequate information about the survey and about my ethical rights as a participant.

I fully understand that my participation is voluntary, the information I provide is confidential, and that I can withdraw from the survey at any time.

☐ Please tick to confirm you agree to take part in this survey

This survey is about **marine litter**.

Marine litter is any persistent, manufactured or processed solid material that is discarded, disposed of, or abandoned on the coast and in the sea.

We want to understand what people's opinions are about marine litter.

There are no right or wrong answers to the questions in this survey. We are interested in your opinions.

1. First, please tell us a bit about your personal experiences of visiting the coast.

a) How often do you visit the coast?

never yearly monthly weekly daily

b) When you visit the coast, how often do you notice litter?

never rarely on some visits on most visits on every visit

c) We would like to know how close you live to the coast. Please enter the approximate distance you live from the coast (please specify whether this is in miles or km) _____

2. Regardless of where you personally visit, we're interested in your thoughts on the distribution of marine litter in the world in general. How much marine litter do you think there is in each of the following locations?

Please use the scale from 1 (none) to 5 (a large amount).

| | none | | | | | a large amount |
|---|------|---|---|---|---|----------------------|
| On beaches | 1 | 2 | 3 | 4 | 5 | |
| On the surface of coastal waters (what you can see from land) | 1 | 2 | 3 | 4 | 5 | |
| On the surface of open oceans (away from the coast, out of sight of land) | 1 | 2 | 3 | 4 | 5 | |
| Below the water's surface | 1 | 2 | 3 | 4 | 5 | |
| In polar seas | 1 | 2 | 3 | 4 | 5 | |
| Near urban coastal areas | 1 | 2 | 3 | 4 | 5 | |

3. Below we've listed different materials that might contribute to marine litter. We'd like to know what you think this marine litter consists of.

In your opinion, what percentage of marine litter do you think each of these materials represent?
(in terms of the number of items found).

Please mark a response anywhere on the scale so that the total is 100.

| | | | | | | | | | | | |
|---------------------|---|----|----|----|----|----|----|----|----|----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| Metal | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |
| Plastic/polystyrene | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |
| Glass | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |
| Paper/cardboard | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |
| Processed wood | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |
| Cloth | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |
| Other/miscellaneous | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | | | | | | | | | | |

4. Litter changes as it's exposed to the outdoors. How long do you think it takes each of these materials to decompose/break down on the coast and in the sea?

Please estimate by entering a number in the box and select from days/weeks/months/years

| | | | |
|-------------------------------|----------------------|-------------------------|------------|
| An aluminium drinks can takes | <input type="text"/> | days/weeks/months/years | to degrade |
| A plastic bottle takes | <input type="text"/> | days/weeks/months/years | to degrade |
| A glass bottle takes | <input type="text"/> | days/weeks/months/years | to degrade |
| A cardboard box takes | <input type="text"/> | days/weeks/months/years | to degrade |
| A wooden pallet takes | <input type="text"/> | days/weeks/months/years | to degrade |
| A cotton t-shirt takes | <input type="text"/> | days/weeks/months/years | to degrade |

5. Another important question is where this litter comes from that can be found on the coast and in the sea. Below are some questions about how litter may end up there.

- a) In your opinion, how much does each of the following contribute to how litter ends up on the coast and in the sea?

| | none | | | a large amount | |
|--|------|---|---|-------------------|---|
| | 1 | 2 | 3 | 4 | 5 |
| Direct release on the coast (e.g., beach-user, coastal tourism) | 1 | 2 | 3 | 4 | 5 |
| Direct release in the sea (commercial and recreational fishing, ships abandoning waste at sea, off-shore industries) | 1 | 2 | 3 | 4 | 5 |
| Litter reaching the sea from rivers and estuaries | 1 | 2 | 3 | 4 | 5 |
| Litter blown into the sea from landfills, or due to landfill collapses | 1 | 2 | 3 | 4 | 5 |
| Sewage overflows | 1 | 2 | 3 | 4 | 5 |

- b) Some things can make it more likely that litter will enter the sea. In your opinion, how important are the following factors in adding to litter on the coast and in the sea?

| | not at all important | | | very important | |
|---|-------------------------|---|---|-------------------|---|
| | 1 | 2 | 3 | 4 | 5 |
| Behaviour of public when disposing of litter (e.g., leaving litter on the beach, discarding litter in the toilet) | 1 | 2 | 3 | 4 | 5 |
| Lack of bins in public areas | 1 | 2 | 3 | 4 | 5 |
| Single-use/throw-away nature of many products used today | 1 | 2 | 3 | 4 | 5 |
| Extensive use of plastic as material in everyday products and packaging | 1 | 2 | 3 | 4 | 5 |
| Behaviour of coastal industries (e.g., fishermen, restaurateurs, tourist centres) | 1 | 2 | 3 | 4 | 5 |
| Lack of enforcement of waste disposal management | 1 | 2 | 3 | 4 | 5 |
| Losses during transportation of products or waste | 1 | 2 | 3 | 4 | 5 |

6. Below are some possible consequences of litter in the sea.

In your opinion, how much of a threat, if any, does marine litter pose to each of the following?

Please use the scale from 1 (*no threat*) to 5 (*severe threat*).

| | no threat | | | severe threat | |
|--|--------------|---|---|------------------|---|
| The marine environment (e.g., wildlife, habitats) | 1 | 2 | 3 | 4 | 5 |
| Tourism at the coast | 1 | 2 | 3 | 4 | 5 |
| Human health (e.g., injury/infection by sharp, or sewage-related litter) | 1 | 2 | 3 | 4 | 5 |
| Shipping and fishing (e.g., damage to propellers, fishing nets etc.) | 1 | 2 | 3 | 4 | 5 |
| The appearance of the coast (aesthetics) | 1 | 2 | 3 | 4 | 5 |

7. Some people think marine litter is a hugely important issue, others think it's not so bad overall. Please tell us your personal opinion on the following statements ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

| | strongly disagree | | | strongly agree | |
|---|----------------------|---|---|-------------------|---|
| The oceans are so large, it is unlikely that marine litter will cause lasting damage | 1 | 2 | 3 | 4 | 5 |
| I am very concerned about the impacts of marine litter | 1 | 2 | 3 | 4 | 5 |
| Marine litter is a future environmental threat rather than a present one | 1 | 2 | 3 | 4 | 5 |
| The use we get out of modern materials outweighs any negative effects they might have on the marine environment | 1 | 2 | 3 | 4 | 5 |
| Marine litter is a problem elsewhere but not in my country | 1 | 2 | 3 | 4 | 5 |
| Marine litter is an important issue | 1 | 2 | 3 | 4 | 5 |
| Marine litter is only a problem for coastal communities | 1 | 2 | 3 | 4 | 5 |
| The quantity of litter on the coast and in the sea is increasing | 1 | 2 | 3 | 4 | 5 |
| There is not enough evidence to properly conclude that marine litter is a problem | 1 | 2 | 3 | 4 | 5 |
| Most of my family and/or friends think it is important to reduce marine litter | 1 | 2 | 3 | 4 | 5 |
| Most people in my local community don't care about marine litter | 1 | 2 | 3 | 4 | 5 |
| Most of those close to me will support me in taking steps to reduce marine litter. | 1 | 2 | 3 | 4 | 5 |

8. Who do you think is responsible for reducing marine litter?

In the table below are a list of people and groups.

For each one please select a number from 1 to 5 in each box to indicate whether you agree or disagree that the person or group...

- Is/are responsible for reducing quantities of marine litter*
- is/are competent to reduce quantities of marine litter*
- is/are motivated to reduce quantities of marine litter*

| 1 strongly disagree | 2 | 3 | 4 | 5 strongly agree | |
|--|---|---|--|--|--|
| | | | <i>a) I think they are responsible</i> | <i>b) I think they are competent</i> | <i>c) I think they are motivated</i> |
| General public | 1 | 2 | 3 | 4 | 5 |
| Environmental groups (NGOs and charities) | 1 | 2 | 3 | 4 | 5 |
| Independent scientists | 1 | 2 | 3 | 4 | 5 |
| Government and policy makers | 1 | 2 | 3 | 4 | 5 |
| Self | 1 | 2 | 3 | 4 | 5 |
| Industry that design and produce items which could potentially be littered | 1 | 2 | 3 | 4 | 5 |
| Retailers that sell items which could potentially be littered (e.g., supermarkets) | 1 | 2 | 3 | 4 | 5 |
| Commercial users of the coast and sea (e.g., fishermen, shipping, off-shore industries, coastal tourism) | 1 | 2 | 3 | 4 | 5 |
| Organisations that collect waste from businesses and homes | 1 | 2 | 3 | 4 | 5 |
| Organisations that deal with the collected waste (e.g., at recycling units, landfill sites) | 1 | 2 | 3 | 4 | 5 |
| Educators (e.g., at schools, colleges, universities) | 1 | 2 | 3 | 4 | 5 |
| The media (e.g., newspapers, television, radio, online) | 1 | 2 | 3 | 4 | 5 |

9. Actions to reduce marine litter

Below is a list of actions that individuals could take to reduce the quantity of litter on the coast and in the sea.

For each one, please select a number from 1 to 5 to indicate *how easy it would be for you* and *how likely you are* to do each one, using the following scales:

| | | | | |
|----------------------------|---|---|---|--------------------------|
| 1 not easy at all | 2 | 3 | 4 | 5 very easy |
| 1 extremely unlikely | 2 | 3 | 4 | 5 extremely likely |

| | <i>How easy would it be for you to...</i> | <i>How likely are you to...</i> |
|---|---|-------------------------------------|
| Buy re-usable, rather than single use “disposable”, non-biodegradable products | 1 2 3 4 5 | 1 2 3 4 5 |
| Ask people to pick up their litter if you see them littering | 1 2 3 4 5 | 1 2 3 4 5 |
| Support Government policy/legislation on marine litter (e.g., fines, bans for certain items on the market, making manufacturers responsible for the disposal of their products) | 1 2 3 4 5 | 1 2 3 4 5 |
| Pick up litter that you see at risk of entering the sea | 1 2 3 4 5 | 1 2 3 4 5 |

10. How valuable do you think coasts and seas are to our society?

Please indicate how valuable the coasts and seas are to society, in each of the following ways.

| | not at all valuable | | | | very valuable |
|---|------------------------|---|---|---|------------------|
| For recreation and tourism | 1 | 2 | 3 | 4 | 5 |
| As a source of food | 1 | 2 | 3 | 4 | 5 |
| For trade and shipping | 1 | 2 | 3 | 4 | 5 |
| For employment | 1 | 2 | 3 | 4 | 5 |
| As a source of energy | 1 | 2 | 3 | 4 | 5 |
| As a part of your culture and identity | 1 | 2 | 3 | 4 | 5 |
| For education and science | 1 | 2 | 3 | 4 | 5 |
| For its scenery, aesthetics | 1 | 2 | 3 | 4 | 5 |
| For its role in supporting biodiversity in plants and animals | 1 | 2 | 3 | 4 | 5 |
| As a legacy to preserve for future generations | 1 | 2 | 3 | 4 | 5 |

11. Finally, please answer the following questions about yourself

Age: _ _ _ _ _

Gender: male/female

Country of residence (select one):

- 1 Belgium
- 2 Bulgaria
- 3 Cyprus
- 4 Denmark
- 5 France
- 6 Germany
- 7 Greece
- 8 Ireland
- 9 Italy
- 10 Netherlands
- 11 Portugal
- 12 Romania
- 13 Slovenia
- 14 Spain
- 15 Turkey
- 16 UK
- 17 Other _____

Highest educational level that you have attained (select one):

- 1 No formal education
- 2 Incomplete primary school
- 3 Complete primary school
- 4 Incomplete secondary school: technical/vocational type
- 5 Complete secondary school: technical/vocational type
- 6 Incomplete secondary: university-preparatory type
- 7 Complete secondary: university-preparatory type
- 8 Some university-level education, without degree
- 9 University-level education, with degree

Occupation _ _ _ _ _

Please list any membership of environmental organisations here

Do you work in any of the following sectors?

| | Yes/No | If yes, please specify by selecting from the options below: |
|---------------------------------|--------|---|
| Design or manufacturing | | Material production Material conversion Product/packaging design Other _____ |
| Retail | | Supermarkets Other shops Other _____ |
| Coastal and/or marine industry | | Commercial fishing Shipping Off-shore industries Coastal tourism Aquaculture Other _____ |
| Waste management | | Waste collection and transportation Waste separation Waste disposal to landfill or incineration Waste recycling Sewage treatment Other _____ |
| Government and/or policy making | | Local National International Other _____ |
| Environmental organisation | | NGO/charity Other _____ |
| Media | | Newspaper Radio Television Online Other _____ |
| Education | | School College (further education) University (higher education) Other _____ |

If you are interested in hearing about other aspects of this European project to reduce marine litter, future surveys, and other activities we might be planning then please leave your email address below (this information will not be shared with any other parties) or follow us on Facebook, LinkedIn or at www.marlisco.eu.

Email address: _____

Thank you for taking part in this survey.

DEBRIEF

Thank you very much for taking part in this survey.

We would like to provide some further information about the purpose of the survey and what we expect to find.

We are looking at the relationships between several different attitudes and beliefs people may have about the issue of marine litter. In particular, we are interested in learning about individuals'...

- awareness and acceptance of the problem
- awareness of the sources and negative impacts of marine litter
- views about who should take responsibility for reducing marine litter
- intentions to take various courses of action to reduce marine litter

We are asking many different groups of people who have some interest in or responsibility for reducing the quantity of marine litter to take this survey. This includes recreational and commercial users of the coast and sea, environmental groups, government and policy makers, waste management sectors, and designers, manufacturers and retailers of items that can potentially become marine litter.

There are many barriers to reducing marine litter and its negative impacts. Understanding these factors will help to overcome these barriers and raise awareness in order to inspire changes in people's attitudes and behaviours. Visit our project website <http://www.marlisco.eu/> for more information.

If you have any questions about this research please contact your national contact Joana. M. Veiga at j.Veiga@eucc.net, or the principal researcher in the UK, Bonny Hartley at bonny.hartley@plymouth.ac.uk

Once again, we would like to thank you for your valuable contribution to this research. Your participation is greatly appreciated.

Yours sincerely,

Bonny Hartley

If you are dissatisfied with the way the research is conducted, please contact the principal investigator in the first instance email: bonny.hartley@plymouth.ac.uk. If you feel the problem has not been resolved please contact the secretary to the Faculty of Science Human Ethics Committee: Mrs Paula Simson, email: paula.simson@plymouth.ac.uk telephone: ++44 1752 584503.

Appendix IV Overview responses

| Sector | Amount of approached companies/ organisations | Amount of approached contacts within companies/ organisations | Total response within sector | Total amount of companies |
|-----------------------------|---|---|------------------------------|-------------------------------------|
| Design and manufacturing | 122 | 215 | 19 | 1210 ² conversion |
| Retail | 22 | 92 | 13 | 99060 ³ |
| Coastal and marine industry | 97 | 149 | 35 | 2761 ⁴ (ex. restaurants) |
| Waste management | 75 | 153 | 10 | 1055 ⁵ |
| Government/ Policy | 15 | 87 | 34 | Unkown |
| Environmental organisations | 34 | 136 | 15 | Unkown |
| Media | 75 | 148 | 5 | Unkown |
| Education | 182 | 671 | 72 | 7434 ⁶ |
| General public | - | - | 48 | Unkown |
| Not willing to participate | | | 13 | |
| Total | 622 | 1651 | 264 | |

² Rabobank, 2013

³ CBS, 2012

⁴ Zeebenengezocht.nl, n.d.; Booking.com, 2013; KvK, 2013; KvK, 2013^A; KvK, 2013^B; KvK, 2013^C; KvK, 2013^D

⁵ KvK, 2013^E; KvK, 2013^F; KvK, 2013^G

⁶ Stamos, 2013; Stamos, 2013^A; Stamos, 2013^B; Stamos, 2013^C

Appendix V Data collection methods

Table 8 Questions overview survey

| Main question: | Research question: | Operationalization questions: | Sub-operationalization questions: | Survey questions: |
|---|--|--|---|---|
| What are the perceptions of stakeholders in the Netherlands which are involved with plastic in the marine environment? | What are the opinions, the level of awareness, behaviour and the responsibility of the stakeholders in the Netherlands regarding plastic in the marine environment and what are the correlations between the variables and between ages? | What are the opinions of the stakeholders regarding plastic in the marine environment? | How do the stakeholders see the problem with marine plastic on several statements? | 7. Some people think marine litter is a hugely important issue, others think it's not so bad overall. Please tell us your personal opinion on the following statements. |
| | | | What are the sources of plastic in the marine environment according the stakeholders? | 5a. In your opinion, how much does each of the following contribute to how litter ends up on the coast and in the sea? |
| | | What is the level of awareness of the stakeholders regarding plastic in the marine environment? | How well informed are stakeholders about the quantities and disposal time of plastic in the marine environment? | 3. In your opinion, what percentage of marine litter do you think each of these materials represent? |
| | | | | 4. Litter changes as it's exposed to the outdoors. How long do you think it takes each of these materials to decompose/break down on the coast and in the sea? |
| | | | What are the causing factors of plastic in the marine environment according the stakeholders? | 5b. Some things can make it more likely that litter will enter the sea. In your opinion, how important are the following factors in adding to litter on the coast and in the sea? |
| | | | What are the potential impacts of plastic in the marine environment that stakeholders are aware of? | 6. Below are some possible consequences of litter in the sea. In your opinion, how much of a threat, if any, does marine litter pose to each of the following? |
| | | What is the behaviour of the stakeholders regarding plastic in the marine environment? | How likely would stakeholders be to take action on tackling the problem? | 9. Actions to reduce marine litter-How likely are you to... |
| | | | How easy would it be for stakeholders to take action on tackling the problem? | 9. Actions to reduce marine litter - How easy would it be for you to... |
| | | How much do the stakeholders trust the specific stakeholders | Who are responsible for reducing the plastic problem according to | 8a. Who is/are responsible for reducing quantities of marine litter? |

| | | | |
|--|--|--|---|
| | which are according to them responsible for reducing the plastic problem? | the stakeholders? | |
| | | Do the stakeholders trust the responsible stakeholders? | 8b. Who is/are competent to reduce quantities of marine litter? |
| | | | 8c. Who is/are motivated to reduce quantities of marine litter? |
| | What are the correlations between the variables? | What is the correlation between behaviour and responsibility? | |
| | | What is the correlation between opinions and behaviour? | |
| | | What is the correlation between opinions and responsibility? | |
| | | What is the correlation between level of awareness and responsibility? | |
| | | What is the correlation between level of awareness and opinions? | |
| | | What is the correlation between level of awareness and behaviour? | |
| | What are the correlations between the ages? | What is the correlation between age and opinions? | |
| | | What is the correlation between age and level of awareness? | |
| | | What is the correlation between age and behaviour? | |
| | | What is the correlation between age and responsibility? | |

Table 9 Questions overview interview

| Main question: | Research question: | Operationalization questions/variables: | Indicator: | Indexing method: | Interview questions: | Interview continue questions: |
|---|--|---|--------------------|-----------------------|---|--|
| What are the perceptions of stakeholders in the Netherlands which are involved with plastic in the marine environment? | What are the opinions, behaviour and the responsibility of the companies regarding plastic in the marine environment of the different stakeholder sectors involved in the plastic life cycle of the Netherlands? | What are the opinions of the management regarding plastic in the marine environment? | Attitude | Self-description | What is the attitude of the management towards plastic? | What are the motivations for your answer? |
| | | | Awareness | Self-description | Are you as management of the company aware of the plastic problem in the marine environment? | - |
| | | | Experience | Self-description | Do you often notice the problem in your professional field? Is the plastic problem a problem for your company as well? | If yes, what kind of problems do you notice? If yes, why is it a problem for your company? |
| | | | Influences | Self-description | Are there any external influences which change your perceptions? | If yes, how are you influenced and by whom? |
| | What is the behaviour of the management regarding plastic? | | Current activities | Behaviour | How are you dealing with plastic waste within the company at the moment? | Is plastic separated from other waste? |
| | | | | | Does the management of the company undertake actions to improve the current handling system of plastic at the moment? | If yes, which actions are undertaken? If no, what are the reasons? |
| | | | Obstacles | Self-description | Are there any obstacles to undertake actions to improve the current handling system of plastic? | If yes, what kind of obstacles? |
| | | | Future activities | Behavioural intention | Does the management have other plans for the future to improve the handling system of plastic? | If yes, what kind of plans? If no, why not? |
| | | | Convey | Behavioural intention | Does the management convey their perceptions of plastic in the marine environment to the employees of the company? | If yes, how do you do/try this? If yes, how are the perceptions absorbed by the employees? If no, what are the obstacles to convey |

| | | | | |
|--|----------------------------|-----------------------|--|---|
| What is the responsibility of the represented stakeholder group according the management regarding plastic? | Causing | Self-description | Does the management think the company has responsibility in causing the plastic problem? Does the management think the entire sector of your company has responsibility in causing the plastic problem? | these perceptions? If yes, what kind of responsibility? If no, why not? |
| | Solving | Behavioural intention | Does the management think the company has responsibility in solving the plastic problem? Does the management think the entire sector of your company has responsibility in solving the plastic problem? | If yes, what kind of responsibility? If no, why not? |
| | Propagating responsibility | Self-description | Does the company propagate their responsibility? Does the entire sector propagate their responsibility? | What are the motivations for your answer? |

Appendix VI Interview questions

1. Welke functie heeft u?
2. Op welk gebied heeft uw bedrijf veel met de kust en de zee te maken?
3. Op welk gebied heeft uw bedrijf veel met plastic te maken?
4. Hoe staat u als management van het bedrijf tegenover plastic in zee?
 - Wat zijn uw motivaties hiervoor?
5. Bent u zich als management van het bedrijf bewust van het probleem van plastic in zee?
6. Komt u het probleem in uw werkveld vaak tegen?
7. Is het plastic probleem ook een probleem voor uw bedrijf?
 - Zo ja, wat voor problemen ervaart u?
8. Zijn er invloeden van buitenaf die uw mening veranderen/vormen?
 - Zo ja, op welke manier wordt u beïnvloedt en door wie?
9. Hoe wordt er binnen het bedrijf op dit moment omgegaan met plastic?
10. Wat gebeurt er met het afval wat aan binnen het bedrijf geproduceerd wordt?
11. Wordt het plastic van ander afval gescheiden?
12. Onderneemt u als management acties om de omgang met plastic van uw bedrijf te verbeteren?
 - Zo ja, welke acties onderneemt u?
 - Zo nee, waarom niet?
13. Zijn er belemmeringen om acties te ondernemen?
 - Zo ja, wat voor belemmeringen?
14. Zijn er ook invloeden van buitenaf wat uw gedrag positief of negatief veranderd?
15. Heeft het management van het bedrijf (naast eerdergenoemde acties meer) plannen voor in de toekomst om de omgang met plastic te verbeteren?
 - Zo ja, welke plannen?
 - Zo nee, waarom niet?
16. Draagt u uw mening/opvattingen over plastic in zee ook uit naar uw werknemers?
 - Zo ja, hoe doet u dit /probeert u dit te doen? Zijn er ook belemmeringen om dit te doen?
 - Zo ja, hoe worden uw meningen/opvattingen over plastic in zee opgenomen door uw werknemers? (Zijn hun opvattingen over plastic in zee veranderd? Gaan uw werknemers nu anders met plastic om?)
 - Zo nee, waarom niet? Wat zijn de belemmeringen om dit te doen?
17. Vindt u dat uw bedrijf verantwoordelijkheid heeft ten opzichte van het veroorzaken van het plastic probleem in zee?
 - Zo ja, welke verantwoordelijkheid vindt u dat uw bedrijf heeft?
18. Vindt u dat de gehele sector waaronder uw bedrijf valt bijdraagt aan de oorzaak van het probleem?
 - Zo ja, op welke manier draagt deze sector bij aan het plastic probleem?
 - Wat zijn uw motivaties hiervoor?
19. Vindt u dat uw bedrijf verantwoordelijkheid heeft ten opzichte van het oplossen van het plastic probleem in zee?
 - Zo ja, welke verantwoordelijkheid vindt u dat uw bedrijf heeft?
20. Vindt u dat de gehele sector waaronder uw bedrijf valt bijdraagt aan het oplossen van het probleem?
 - Zo nee, vindt u dat de gehele sector waaronder uw bedrijf valt zou moeten bijdragen aan het oplossen van het probleem?
 - Wat zijn uw motivaties hiervoor?
21. Vindt u dat uw bedrijf deze verantwoordelijkheid ook draagt?
22. Vindt u dat de gehele sector deze verantwoordelijkheid ook draagt?
 - Wat zijn uw motivaties hiervoor?

Appendix VII Support survey results

Opinions

| Opinions entire stakeholder group (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|---|-------------------|---------------------------|-------------------|--------------------------------------|--------------------------|--------------------|------------------------|--------------------------|--------------------|--|---------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 3,6 | 5,6 | 21,9 | 4,8 | 2,8 | 2,4 | 0,8 | 1,6 | 2 | 0,8 | 2,8 | 1,6 |
| Disagree | 2,4 | 6 | 27,9 | 6 | 5,6 | 3,6 | 3,2 | 4,8 | 5,2 | 6,8 | 15,5 | 8,4 |
| Neutral | 4,4 | 12 | 22,3 | 17,1 | 8,8 | 7,6 | 6,4 | 15,1 | 11,6 | 24,3 | 32,3 | 27,9 |
| Agree | 18,3 | 29,1 | 13,1 | 29,1 | 27,1 | 29,1 | 33,1 | 29,1 | 33,9 | 42,6 | 32,3 | 40,2 |
| Strongly Agree | 71,3 | 47,4 | 14,7 | 43 | 55,8 | 57,4 | 56,6 | 49,4 | 47,4 | 25,5 | 17,1 | 21,9 |

| Opinions design and manufacturing sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|--|-------------------|-----------------------------------|-------------------|--------------------------------------|--------------------------|--------------------|-------------------------|--------------------------|--------------------|--|---------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned impact marine litter | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problems | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 0 | 0 | 36,8 | 0 | 0 | 0 | 0 | 0 | 5,3 | 0 | 0 | 5,3 |
| Disagree | 0 | 0 | 26,3 | 10,5 | 5,3 | 0 | 0 | 10,5 | 0 | 5,3 | 26,3 | 0 |
| Average | 5,3 | 15,8 | 21,1 | 26,3 | 15,8 | 10,5 | 5,3 | 5,3 | 21,1 | 21,1 | 10,5 | 21,1 |
| Agree | 15,8 | 26,3 | 15,8 | 21,1 | 26,3 | 42,1 | 36,8 | 31,6 | 21,1 | 42,1 | 36,8 | 42,1 |
| Strongly agree | 78,9 | 57,9 | 0 | 42,1 | 52,6 | 47,4 | 57,9 | 52,6 | 52,6 | 31,6 | 26,3 | 31,6 |

| Opinions retail sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|--|-------------------|-----------------------------------|-------------------|--------------------------------------|--------------------------|--------------------|-------------------------|--------------------------|--------------------|--|---------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned impact marine litter | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problems | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 7,7 | 7,7 | 7,7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Disagree | 0 | 7,7 | 38,5 | 7,7 | 0 | 7,7 | 7,7 | 7,7 | 0 | 7,7 | 30,8 | 15,4 |
| Average | 7,7 | 15,4 | 15,4 | 30,8 | 0 | 7,7 | 7,7 | 15,4 | 30,8 | 23,1 | 23,1 | 38,5 |
| Agree | 15,4 | 46,2 | 15,4 | 15,4 | 30,8 | 23,1 | 38,5 | 23,1 | 53,8 | 23,1 | 23,1 | 30,8 |
| Strongly agree | 69,2 | 23,1 | 23,1 | 46,2 | 69,2 | 61,5 | 46,2 | 53,8 | 15,4 | 46,2 | 23,1 | 15,4 |

| Opinions coastal and marine industry sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|---|-------------------|--------------------------------------|-------------------|-----------------------------------|--------------------------|--------------------|-------------------------|--------------------------|--------------------|--|---------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned impact marine litter | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problems | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 8,6 | 2,9 | 14,3 | 0 | 2,9 | 5,7 | 0 | 0 | 0 | 2,9 | 2,9 | 0 |
| Disagree | 2,9 | 11,4 | 28,6 | 5,7 | 11,4 | 5,7 | 8,6 | 11,4 | 11,4 | 11,4 | 11,4 | 14,3 |
| Average | 2,9 | 11,4 | 31,4 | 20 | 8,6 | 14,3 | 11,4 | 25,7 | 11,4 | 14,3 | 28,6 | 28,6 |
| Agree | 11,4 | 25,7 | 11,4 | 20 | 28,6 | 40 | 34,3 | 28,6 | 34,3 | 42,9 | 34,3 | 31,4 |
| Strongly agree | 74,3 | 48,6 | 14,3 | 54,3 | 48,6 | 34,3 | 45,7 | 34,3 | 42,9 | 28,6 | 22,9 | 25,7 |

| Opinions waste management sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|--|-------------------|---------------------------|-------------------|-----------------------------------|--------------------------|--------------------|------------------------|--------------------------|--------------------|--|---------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 0 | 20 | 30 | 10 | 10 | 0 | 0 | 10 | 20 | 0 | 0 | 0 |
| Disagree | 0 | 20 | 20 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 20 |
| Average | 0 | 10 | 20 | 30 | 10 | 0 | 10 | 30 | 0 | 40 | 40 | 20 |
| Agree | 40 | 20 | 20 | 60 | 40 | 30 | 20 | 20 | 40 | 40 | 20 | 40 |
| Strongly agree | 60 | 30 | 10 | 0 | 40 | 60 | 70 | 40 | 40 | 20 | 30 | 20 |

| Opinions government and policy making sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|--|-------------------|---------------------------|-------------------|--------------------------------------|--------------------------|---------------------|------------------------|--------------------------|--------------------|---|------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Importan t issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 0 | 5,9 | 32,4 | 11,8 | 0 | 0 | 2,9 | 0 | 5,9 | 0 | 2,9 | 2,9 |
| Disagree | 5,9 | 5,9 | 20,6 | 0 | 8,8 | 2,9 | 0 | 5,9 | 2,9 | 8,6 | 11,4 | 5,7 |
| Average | 0 | 14,7 | 23,5 | 20,6 | 11,8 | 8,8 | 11,8 | 14,7 | 17,6 | 20 | 37,1 | 28,6 |
| Agree | 26,5 | 20,6 | 8,8 | 26,5 | 29,4 | 26,5 | 35,3 | 23,5 | 26,5 | 51,4 | 28,6 | 40 |
| Strongly agree | 67,6 | 52,9 | 14,7 | 41,2 | 50 | 61,8 | 50 | 55,9 | 47,1 | 20 | 20 | 22,9 |

| Opinions environmental organisations sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|---|-------------------|---------------------------|-------------------|--------------------------------------|--------------------------|--------------------|------------------------|--------------------------|--------------------|---|------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 0 | 13,3 | 26,7 | 0 | 0 | 13,3 | 0 | 6,7 | 6,7 | 0 | 0 | 0 |
| Disagree | 0 | 0 | 13,3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| Average | 6,7 | 0 | 13,3 | 0 | 6,7 | 0 | 0 | 0 | 6,7 | 26,7 | 33,3 | 20 |
| Agree | 13,3 | 26,7 | 20 | 40 | 6,7 | 20 | 33,3 | 20 | 20 | 60 | 46,7 | 46,7 |
| Strongly agree | 80 | 60 | 26,7 | 60 | 86,6 | 66,7 | 66,7 | 73,3 | 66,7 | 13,3 | 0 | 33,3 |

| Opinions media sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|---|-------------------|---------------------------|-------------------|-----------------------------------|--------------------------|--------------------|------------------------|--------------------------|--------------------|---|------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Disagree | 0 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 20 | 20 | 0 |
| Average | 20 | 20 | 0 | 60 | 0 | 20 | 20 | 20 | 20 | 20 | 20 | 40 |
| Agree | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 40 | 40 | 20 | 40 | 40 |
| Strongly agree | 80 | 80 | 20 | 40 | 60 | 80 | 80 | 40 | 40 | 40 | 20 | 20 |

| Opinions education sector (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|---|-------------------|---------------------------|-------------------|-----------------------------------|--------------------------|--------------------|------------------------|--------------------------|--------------------|---|------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 4,2 | 5,6 | 16,7 | 4,2 | 1,4 | 2,8 | 1,4 | 1,4 | 1,4 | 1,4 | 2,8 | 1,4 |
| Disagree | 0 | 8,3 | 27,8 | 6,9 | 4,2 | 4,2 | 4,2 | 4,2 | 5,6 | 6,9 | 13,9 | 11,1 |
| Average | 5,6 | 11,1 | 25 | 8,3 | 8,3 | 8,3 | 2,8 | 18,1 | 6,9 | 31,9 | 41,7 | 31,9 |
| Agree | 20,8 | 30,6 | 15,3 | 36,1 | 31,9 | 26,4 | 36,1 | 29,2 | 36,1 | 40,3 | 31,9 | 41,7 |
| Strongly agree | 69,4 | 44,4 | 15,3 | 44,4 | 54,2 | 58,3 | 55,6 | 47,2 | 50 | 19,4 | 9,7 | 13,9 |

| Opinions general public (recoded and relabelled, see chapter 2.4.1) | | | | | | | | | | | | |
|---|-------------------|---------------------------|-------------------|-----------------------------------|--------------------------|--------------------|------------------------|--------------------------|--------------------|---|------------------------------|--|
| Importance/ Percentages | Lasting damage | Concerned about impact | Present threat | Negative impact more important | Problem in my country | Important issue | Also inland problem | Increasing quantities | Enough evidence | Close ones think it is important to reduce | Local community does care | Close ones will support stakeholders |
| Strongly disagree | 4,2 | 4,2 | 22,9 | 8,3 | 8,3 | 0 | 0 | 2,1 | 0 | 0 | 6,3 | 2,1 |
| Disagree | 6,3 | 0 | 33,3 | 10,4 | 4,2 | 2,1 | 2,1 | 0 | 4,2 | 4,2 | 14,6 | 4,2 |
| Average | 4,2 | 12,5 | 18,8 | 16,7 | 8,3 | 2,1 | 4,2 | 8,3 | 8,3 | 20,8 | 29,2 | 25 |
| Agree | 14,6 | 37,5 | 10,4 | 27,1 | 20,8 | 29,2 | 29,2 | 37,5 | 37,5 | 43,8 | 31,3 | 43,8 |
| Strongly agree | 70,8 | 45,8 | 14,6 | 37,5 | 58,3 | 66,7 | 64,6 | 52,1 | 50 | 31,3 | 18,8 | 25 |

| Factors according to the entire stakeholder group | | | | | | | | |
|---|------------------------|--------------|-------------------------------------|------------------------------|-----------------------|---|--|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste | |
| Not important at all | 0,8 | 2 | 1,2 | 2,4 | 0 | 0,4 | 4,4 | |
| Little important | 10 | 20,7 | 4,8 | 3,2 | 6 | 10,4 | 29,5 | |
| Fairly important | 13,5 | 29,1 | 10,8 | 5,2 | 21,5 | 27,1 | 35,1 | |
| Very important | 33,5 | 28,3 | 31,5 | 26,7 | 44,6 | 33,9 | 19,1 | |
| Extremely important | 42,2 | 19,9 | 51,8 | 62,5 | 27,9 | 28,3 | 12 | |

| Factors according to the design and manufacturing sector | | | | | | | |
|--|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 0 | 5,3 | 15,8 | 0 | 5,3 | 5,3 |
| Little important | 15,8 | 21,1 | 10,5 | 5,3 | 5,3 | 5,3 | 36,8 |
| Fairly important | 5,3 | 31,6 | 10,5 | 5,3 | 10,5 | 26,3 | 36,8 |
| Very important | 31,6 | 15,8 | 26,3 | 26,3 | 47,4 | 36,8 | 10,5 |
| Extremely important | 47,4 | 31,6 | 47,4 | 47,4 | 36,8 | 26,3 | 10,5 |

| Factors according to the retail sector | | | | | | | |
|--|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 0 | 7,7 | 7,7 | 0 | 0 | 0 |
| Little important | 0 | 7,7 | 15,4 | 7,7 | 0 | 7,7 | 38,5 |
| Fairly important | 7,7 | 15,4 | 0 | 15,4 | 15,4 | 38,5 | 46,2 |
| Very important | 46,2 | 61,5 | 46,2 | 23,1 | 61,5 | 23,1 | 15,4 |
| Extremely important | 46,2 | 15,4 | 30,8 | 46,2 | 23,1 | 30,8 | 0 |

| Factors according to the coastal and marine industry sector | | | | | | | |
|---|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 2,9 | 0 | 0 | 0 | 0 | 5,7 |
| Little important | 17,1 | 17,1 | 11,4 | 5,7 | 11,4 | 8,6 | 34,3 |
| Fairly important | 11,4 | 34,3 | 11,4 | 5,7 | 31,4 | 37,1 | 22,9 |
| Very important | 31,4 | 25,7 | 31,4 | 14,3 | 25,7 | 28,6 | 25,7 |
| Extremely important | 40 | 20 | 45,7 | 74,3 | 31,4 | 25,7 | 11,4 |

| Factors according to the waste management sector | | | | | | | |
|--|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 0 | 10 | 20 | 0 | 0 | 10 |
| Little important | 0 | 20 | 0 | 0 | 10 | 10 | 20 |
| Fairly important | 0 | 40 | 0 | 0 | 40 | 20 | 40 |
| Very important | 50 | 10 | 10 | 30 | 10 | 20 | 30 |
| Extremely important | 50 | 30 | 80 | 50 | 40 | 50 | 0 |

| Factors according to the government and policy making sector | | | | | | | |
|--|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 2,9 | 5,9 | 0 | 0 | 0 | 0 | 2,9 |
| Little important | 11,8 | 23,5 | 2,9 | 0 | 11,8 | 14,7 | 29,4 |
| Fairly important | 23,5 | 32,4 | 14,7 | 5,9 | 23,5 | 32,4 | 41,2 |
| Very important | 32,4 | 26,5 | 32,4 | 32,4 | 47,1 | 29,4 | 5,9 |
| Extremely important | 29,4 | 11,8 | 50 | 61,8 | 17,6 | 23,5 | 20,6 |

| Factors according to the environmental organisations sector | | | | | | | |
|---|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 6,7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Little important | 0 | 6,7 | 0 | 0 | 6,7 | 6,7 | 33,3 |
| Fairly important | 13,3 | 33,3 | 13,3 | 0 | 13,3 | 20 | 33,3 |
| Very important | 40 | 46,7 | 40 | 40 | 53,3 | 40 | 13,3 |
| Extremely important | 40 | 13,3 | 46,7 | 60 | 26,7 | 33,3 | 20 |

| Factors according to the media sector | | | | | | | |
|---------------------------------------|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Little important | 0 | 0 | 20 | 20 | 0 | 0 | 20 |
| Fairly important | 0 | 0 | 0 | 20 | 0 | 20 | 60 |
| Very important | 20 | 20 | 40 | 0 | 60 | 20 | 0 |
| Extremely important | 80 | 80 | 40 | 60 | 40 | 60 | 20 |

| Factors according to the education sector | | | | | | | |
|---|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 1,4 | 0 | 0 | 0 | 0 | 6,9 |
| Little important | 11,1 | 25 | 2,8 | 1,4 | 2,8 | 11,1 | 29,2 |
| Fairly important | 16,7 | 27,8 | 15,3 | 6,9 | 23,6 | 27,8 | 36,1 |
| Very important | 31,9 | 26,4 | 30,6 | 29,2 | 54,2 | 31,9 | 18,1 |
| Extremely important | 40,3 | 19,4 | 51,4 | 62,5 | 19,4 | 29,2 | 9,7 |

| Factors according to the general public | | | | | | | |
|---|------------------------|-----------------|-------------------------------------|------------------------------|-----------------------|---|--|
| Importance/ Percentages | Behaviour of public | Lack of bins | Single use-/ throw away products | Plastic in packaging etc. | Coastal industries | Lack of enforcement of waste disposal management | Loss during transport of product/ waste |
| Not important at all | 0 | 2,1 | 0 | 0 | 0 | 0 | 2,1 |
| Little important | 8,3 | 25 | 0 | 4,2 | 4,2 | 12,5 | 22,9 |
| Fairly important | 12,5 | 27,1 | 6,3 | 0 | 16,7 | 16,7 | 31,3 |
| Very important | 31,3 | 29,2 | 31,3 | 27 | 39,6 | 47,9 | 31,3 |
| Extremely important | 47,9 | 16,7 | 62,5 | 68,8 | 39,6 | 22,9 | 12,5 |

Level of awareness

| Awareness entire stakeholder group | | | | | | | | | | | |
|------------------------------------|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 3,2 | 3,6 | No threat | 0 | 1,2 | 1,2 | 3,2 | 0,4 |
| A Little | 23,5 | 6,4 | 8,8 | 31,5 | 35,5 | Little threat | 1,2 | 25,1 | 23,5 | 26,3 | 12,7 |
| Average | 32,3 | 19,5 | 27,9 | 33,9 | 34,3 | Average threat | 2 | 45,8 | 35,9 | 35,9 | 25,5 |
| Much | 27,1 | 45 | 35,9 | 24,7 | 19,9 | Major threat | 25,5 | 21,9 | 27,5 | 25,1 | 34,7 |
| A lot | 17,1 | 29,1 | 27,5 | 6,8 | 6,8 | Serious threat | 71,3 | 6 | 12 | 9,6 | 26,7 |

| Awareness design and manufacturing sector | | | | | | | | | | | |
|---|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 0 | 0 | No threat | 0 | 5,3 | 0 | 10,5 | 0 |
| A Little | 26,3 | 10,5 | 10,5 | 47,4 | 26,3 | Little threat | 0 | 10,5 | 26,3 | 31,6 | 10,5 |
| Average | 26,3 | 10,5 | 10,5 | 21,1 | 52,6 | Average threat | 5,3 | 63,2 | 21,1 | 31,6 | 10,5 |
| Much | 31,6 | 31,6 | 57,9 | 21,1 | 21,1 | Major threat | 15,8 | 15,8 | 31,6 | 15,8 | 42,1 |
| A lot | 15,8 | 47,4 | 21,1 | 10,5 | 0 | Serious threat | 78,9 | 5,3 | 21,1 | 10,5 | 36,8 |

| Awareness retail sector | | | | | | | | | | | |
|-------------------------|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 0 | 7,7 | No threat | 0 | 0 | 0 | 0 | 0 |
| A Little | 15,4 | 0 | 7,7 | 46,2 | 7,7 | Little threat | 0 | 38,5 | 15,4 | 15,4 | 7,7 |
| Average | 38,5 | 0 | 46,2 | 38,5 | 46,2 | Average threat | 0 | 38,5 | 23,1 | 30,8 | 38,5 |
| Much | 23,1 | 53,8 | 30,8 | 15,4 | 23,1 | Major threat | 30,8 | 23,1 | 38,5 | 30,8 | 23,1 |
| A lot | 23,1 | 46,2 | 15,4 | 0 | 15,4 | Serious threat | 69,2 | 0 | 23,1 | 23,1 | 30,8 |

| Awareness coastal and marine industry sector | | | | | | | | | | | |
|--|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 5,7 | 8,6 | No threat | 0 | 0 | 0 | 2,9 | 2,9 |
| A Little | 34,3 | 11,4 | 5,7 | 31,4 | 37,1 | Little threat | 5,7 | 22,9 | 34,3 | 42,9 | 20 |
| Average | 25,7 | 20 | 34,3 | 31,4 | 37,1 | Average threat | 0 | 45,7 | 45,7 | 31,4 | 14,3 |
| Much | 20 | 45,7 | 28,6 | 22,9 | 11,4 | Major threat | 37,1 | 25,7 | 14,3 | 14,3 | 31,4 |
| A lot | 20 | 22,9 | 31,4 | 8,6 | 5,7 | Serious threat | 57,1 | 5,7 | 5,7 | 8,6 | 31,4 |

| Awareness waste management sector | | | | | | | | | | | |
|-----------------------------------|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| No threat | 0 | 0 | 0 | 20 | 0 | No threat | 0 | 0 | 0 | 0 | 0 |
| Little threat | 20 | 0 | 10 | 40 | 40 | Little threat | 0 | 30 | 10 | 30 | 20 |
| Average threat | 30 | 30 | 30 | 10 | 30 | Average threat | 0 | 40 | 50 | 40 | 30 |
| Major threat | 50 | 50 | 30 | 30 | 10 | Major threat | 40 | 30 | 20 | 20 | 30 |
| Serious threat | 0 | 20 | 30 | 0 | 20 | Serious threat | 60 | 0 | 20 | 10 | 20 |

| Awareness government and policy making sector | | | | | | | | | | | |
|---|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 2,9 | 2,9 | No threat | 0 | 2,9 | 5,9 | 2,9 | 0 |
| A Little | 29,4 | 8,8 | 11,8 | 32,4 | 38,2 | Little threat | 0 | 38,2 | 20,6 | 32,4 | 14,7 |
| Average | 20,6 | 23,5 | 23,5 | 44,1 | 32,4 | Average threat | 2,9 | 47,1 | 35,3 | 35,3 | 44,1 |
| Much | 35,3 | 32,4 | 29,4 | 17,6 | 26,5 | Major threat | 14,7 | 11,8 | 29,4 | 26,5 | 17,6 |
| A lot | 14,7 | 35,3 | 35,3 | 2,9 | 0 | Serious threat | 82,4 | 0 | 8,8 | 2,9 | 23,5 |

| Awareness environmental organisations sector | | | | | | | | | | | |
|--|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 0 | 0 | No threat | 0 | 0 | 0 | 0 | 0 |
| A Little | 6,7 | 0 | 6,7 | 6,7 | 33,3 | Little threat | 0 | 13,3 | 26,7 | 26,7 | 6,7 |
| Average | 66,7 | 33,3 | 13,3 | 60 | 40 | Average threat | 0 | 33,3 | 33,3 | 40 | 26,7 |
| Much | 13,3 | 26,7 | 46,7 | 26,7 | 13,3 | Major threat | 20 | 53,3 | 26,7 | 33,3 | 53,3 |
| A lot | 13,3 | 40 | 33,3 | 6,7 | 13,3 | Serious threat | 80 | 0 | 13,3 | 0 | 13,3 |

| Awareness media sector | | | | | | | | | | | |
|------------------------|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 0 | 20 | No threat | 0 | 0 | 0 | 0 | 0 |
| A Little | 0 | 0 | 20 | 80 | 40 | Little threat | 0 | 0 | 0 | 20 | 0 |
| Average | 40 | 20 | 20 | 0 | 20 | Average threat | 0 | 40 | 40 | 60 | 0 |
| Much | 40 | 60 | 20 | 0 | 20 | Major threat | 20 | 40 | 60 | 20 | 40 |
| A lot | 20 | 20 | 40 | 20 | 0 | Serious threat | 80 | 20 | 0 | 0 | 60 |

| Awareness education sector | | | | | | | | | | | |
|----------------------------|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 4,2 | 1,4 | No threat | 0 | 0 | 0 | 2,8 | 0 |
| A Little | 25 | 6,9 | 11,1 | 29,2 | 38,9 | Little threat | 1,4 | 25 | 22,2 | 26,4 | 9,7 |
| Average | 40,3 | 23,6 | 30,6 | 34,7 | 36,1 | Average threat | 2,8 | 48,6 | 37,5 | 33,3 | 30,6 |
| Much | 19,4 | 43,1 | 29,2 | 26,4 | 16,7 | Major threat | 27,8 | 23,6 | 27,8 | 27,8 | 34,7 |
| A lot | 15,3 | 26,4 | 29,2 | 5,6 | 6,9 | Serious threat | 68,1 | 2,8 | 12,5 | 9,7 | 25 |

| Awareness according to the general public | | | | | | | | | | | |
|---|----------------------------|--------------------------|------------------------------|--|---------------------|---------------------------------|-----------------------|---------|-----------------|-------------------------|------------|
| Amount/ Percentages | Direct release on coast | Direct release in sea | From rivers and estuaries | Blown from landfill/ landfill collapses | Sewage overflows | Level of threat/ Percentages | Marine environment | Tourism | Human health | Shipping and fishing | Aesthetics |
| None | 0 | 0 | 0 | 0 | 4,2 | No threat | 0 | 2,1 | 2,1 | 4,2 | 0 |
| A Little | 18,8 | 4,2 | 4,2 | 25 | 37,5 | Little threat | 0 | 25 | 25 | 10,4 | 14,6 |
| Average | 22,9 | 12,5 | 29,2 | 31,3 | 20,8 | Average threat | 2,1 | 41,7 | 33,3 | 41,7 | 16,7 |
| Much | 35,4 | 62,5 | 47,9 | 33,3 | 29,2 | Major threat | 22,9 | 18,8 | 29,2 | 29,2 | 43,8 |
| A lot | 22,9 | 20,8 | 18,8 | 10,4 | 8,3 | Serious threat | 75 | 12,5 | 10,4 | 14,6 | 25 |

Behaviour

| Behavioural activities entire stakeholder group | | | | | | | | |
|---|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 4,0 | 1,6 | 3,6 | 2,8 | 4,8 | 5,2 | 1,2 | 0,8 |
| Not | 16,7 | 7,2 | 14,7 | 12,4 | 10,4 | 10,0 | 5,2 | 8,8 |
| Moderate | 23,1 | 24,7 | 27,5 | 34,3 | 21,1 | 24,3 | 21,9 | 25,5 |
| Easy/likely | 26,3 | 36,7 | 29,9 | 29,1 | 30,7 | 29,5 | 36,3 | 35,1 |
| Very | 29,9 | 29,9 | 24,3 | 21,5 | 33,1 | 31,1 | 35,5 | 29,9 |

| Behavioural activities design and manufacturing sector | | | | | | | | |
|--|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 5,3 | 5,3 | 0 | 5,3 | 0 | 0 | 0 | 0 |
| Not | 36,8 | 10,5 | 26,3 | 10,5 | 10,5 | 15,8 | 5,3 | 5,3 |
| Moderate | 10,5 | 10,5 | 10,5 | 31,6 | 15,8 | 21,1 | 15,8 | 31,6 |
| Easy/likely | 31,6 | 57,9 | 31,6 | 21,1 | 31,6 | 21,1 | 47,4 | 42,1 |
| Very | 15,8 | 15,8 | 31,6 | 31,6 | 42,1 | 42,1 | 31,6 | 21,1 |

| Behavioural activities retail sector | | | | | | | | |
|--------------------------------------|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 0 | 0 | 7,7 | 7,7 | 0 | 0 | 0 | 0 |
| Not | 30,8 | 7,7 | 23,1 | 0 | 0 | 7,7 | 7,7 | 15,4 |
| Moderate | 15,4 | 38,5 | 23,1 | 23,1 | 46,2 | 30,8 | 7,7 | 23,1 |
| Easy/likely | 15,4 | 23,1 | 23,1 | 53,8 | 30,8 | 23,1 | 30,8 | 15,4 |
| Very | 38,5 | 30,8 | 23,1 | 15,4 | 23,1 | 38,5 | 53,8 | 46,2 |

| Behavioural activities coastal and marine industry | | | | | | | | |
|--|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 5,7 | 2,9 | 2,9 | 0 | 2,9 | 8,6 | 0 | 0 |
| Not | 14,3 | 20,0 | 2,9 | 14,3 | 17,1 | 2,9 | 2,9 | 8,6 |
| Moderate | 25,7 | 22,9 | 40,0 | 37,1 | 20,0 | 31,4 | 28,6 | 34,3 |
| Easy/likely | 20,0 | 25,7 | 28,6 | 31,4 | 37,1 | 37,1 | 34,3 | 22,9 |
| Very | 34,3 | 28,6 | 25,7 | 17,1 | 22,9 | 20,0 | 34,3 | 34,3 |

| Behavioural activities waste management sector | | | | | | | | |
|--|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 20,0 | 10,0 | 0 | 0 | 10,0 | 10,0 | 0 | 0 |
| Not | 20,0 | 10,0 | 0 | 0 | 20,0 | 10,0 | 0 | 20,0 |
| Moderate | 30,0 | 20,0 | 50,0 | 30,0 | 10,0 | 10,0 | 40,0 | 10,0 |
| Easy/likely | 10,0 | 30,0 | 10,0 | 10,0 | 20,0 | 30,0 | 20,0 | 30,0 |
| Very | 20,0 | 30,0 | 40,0 | 60,0 | 40,0 | 40,0 | 40,0 | 40,0 |

| Behavioural activities government and policy making sector | | | | | | | | |
|--|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 11,8 | 2,9 | 2,9 | 0 | 8,8 | 8,8 | 5,9 | 2,9 |
| Not | 5,9 | 2,9 | 20,6 | 26,5 | 5,9 | 8,8 | 0 | 0 |
| Moderate | 23,5 | 23,5 | 20,6 | 32,4 | 17,6 | 14,7 | 14,7 | 23,5 |
| Easy/likely | 29,4 | 35,3 | 38,2 | 20,6 | 32,4 | 29,4 | 38,2 | 32,4 |
| Very | 29,4 | 35,3 | 17,6 | 20,6 | 35,3 | 38,2 | 41,2 | 41,2 |

| Behavioural activities environmental organisations sector | | | | | | | | |
|---|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Not | 26,7 | 0 | 13,3 | 6,7 | 0 | 0 | 6,7 | 6,7 |
| Moderate | 13,3 | 6,7 | 6,7 | 26,7 | 20,0 | 20,0 | 13,3 | 20,0 |
| Easy/likely | 26,7 | 46,7 | 46,7 | 46,7 | 26,7 | 26,7 | 20,0 | 26,7 |
| Very | 33,3 | 46,7 | 33,3 | 20,0 | 53,3 | 53,3 | 60,0 | 46,7 |

| Behavioural activities media sector | | | | | | | | |
|-------------------------------------|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Not | 0 | 0 | 20,0 | 0 | 0 | 0 | 0 | 0 |
| Moderate | 20,0 | 0 | 20,0 | 20,0 | 0 | 20,0 | 0 | 20,0 |
| Easy/likely | 0 | 20,0 | 60,0 | 20,0 | 40,0 | 20,0 | 20,0 | 20,0 |
| Very | 80,0 | 80,0 | 0 | 60,0 | 60,0 | 60,0 | 80,0 | 60,0 |

| Behavioural activities education sector | | | | | | | | |
|---|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 1,4 | 0 | 4,2 | 2,8 | 8,3 | 6,9 | 0 | 1,4 |
| Not | 12,5 | 4,2 | 9,7 | 11,1 | 8,3 | 12,5 | 6,9 | 9,7 |
| Moderate | 29,2 | 30,6 | 29,2 | 34,7 | 25,0 | 29,2 | 25,0 | 23,6 |
| Easy/likely | 30,6 | 43,1 | 36,1 | 36,1 | 29,2 | 31,9 | 40,3 | 43,1 |
| Very | 26,4 | 22,2 | 20,8 | 15,3 | 29,2 | 19,4 | 27,8 | 22,2 |

| Behavioural activities general public | | | | | | | | |
|---------------------------------------|------------------------|------------|------------------------------------|------------|---------------------------|------------|----------------|------------|
| | Buy re-usable products | | Ask people to pick up their litter | | Support government policy | | Pick up litter | |
| Percentages | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness | Easiness | Likeliness |
| Not at all | 0 | 0 | 6,3 | 6,3 | 2,1 | 2,1 | 2,1 | 0 |
| Not | 18,8 | 6,3 | 22,9 | 12,5 | 16,7 | 14,6 | 8,3 | 12,5 |
| Moderate | 20,8 | 29,2 | 31,3 | 41,7 | 18,8 | 22,9 | 25,0 | 27,1 |
| Easy/likely | 29,2 | 31,3 | 18,8 | 18,8 | 29,2 | 27,1 | 37,5 | 41,7 |
| Very | 31,3 | 33,3 | 20,8 | 20,8 | 33,3 | 33,3 | 27,1 | 18,8 |

Responsibility

| Responsibility entire stakeholder group (N=251) | | | | |
|--|--|--------------------------------------|--------------------------------------|-------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 1,2 3,2 10,0 31,5 54,2 | 13,9 13,9 30,3 18,7 23,1 | 9,2 42,6 31,9 9,2 7,2 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 21,5 23,1 21,1 16,7 17,5 | 10,8 13,5 24,7 25,5 25,5 | 0,8 1,6 6,0 13,5 78,1 |
| Independent scientists (N=250) | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 25,5 17,5 29,1 15,1 12,4 | 13,5 13,9 27,1 22,3 22,7 | 0,8 4,8 25,5 32,7 36,3 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,0 3,2 13,5 21,5 59,8 | 0,4 3,2 8,0 12,7 75,7 | 10,4 29,1 40,2 13,1 7,2 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 7,2 9,6 17,5 20,3 45,4 | 17,9 14,3 23,5 17,5 26,7 | 0,4 3,6 15,9 27,1 53,0 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0,4 2,4 5,2 21,1 70,9 | 6,0 7,6 20,3 24,3 41,8 | 29,5 42,6 19,1 5,2 3,6 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0,8 5,6 17,1 25,1 51,4 | 10,4 12,0 22,7 23,9 31,1 | 30,7 36,3 25,1 4,0 4,0 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,8 10,0 21,9 65,3 | 7,2 7,6 21,5 28,3 35,5 | 16,3 31,9 36,3 11,2 4,4 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,4 19,1 26,3 19,1 29,1 | 7,2 6,8 25,9 27,9 32,3 | 9,2 18,3 35,9 21,5 15,1 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,0 16,3 23,9 21,5 30,3 | 7,6 10,4 23,1 23,1 35,9 | 6,4 19,9 32,3 23,1 18,3 |
| Educators (N=250) | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 13,1 18,7 22,3 20,7 24,7 | 11,6 19,5 25,9 24,7 17,9 | 2,0 7,2 33,5 35,5 21,5 |
| The media (N=250) | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 12,7 15,9 24,7 17,9 28,3 | 15,1 15,9 23,9 22,7 21,9 | 8,4 19,5 43,4 19,5 8,8 |

| Responsibility design and manufacturing sector (N=19) | | | | |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 5,3 10,5 31,6 52,6 | 10,5 10,5 21,1 21,1 36,8 | 5,3 42,1 42,1 0 10,5 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 26,3 47,4 5,3 10,5 10,5 | 5,3 10,5 42,1 21,1 21,1 | 0 15,8 10,5 21,1 52,6 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 26,3 21,1 26,3 10,5 15,8 | 5,3 15,8 42,1 21,1 15,8 | 5,3 5,3 31,6 31,6 26,3 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 21,1 5,3 73,7 | 0 0 10,5 10,5 78,9 | 10,5 42,1 26,3 15,8 5,3 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,5 10,5 10,5 5,3 63,2 | 15,8 5,3 15,8 15,8 47,4 | 0 5,3 21,1 15,8 57,9 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 5,3 5,3 21,1 21,1 47,4 | 0 5,3 15,8 36,8 42,1 | 21,1 36,8 31,6 5,3 5,3 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 5,3 31,6 15,8 47,4 | 0 15,8 10,5 42,1 31,6 | 31,6 21,1 36,8 10,5 0 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 15,8 21,1 63,2 | 0 10,5 15,8 15,8 57,9 | 21,1 26,3 47,4 5,3 0 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 5,3 47,4 15,8 10,5 21,1 | 5,3 5,3 31,6 36,8 21,1 | 21,1 10,5 31,6 10,5 26,3 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 15,8 15,8 26,3 21,1 21,1 | 0 5,3 36,8 31,6 26,3 | 15,8 26,3 10,5 26,3 21,1 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 15,8 15,8 15,8 10,5 42,1 | 0 15,8 36,8 15,8 31,6 | 5,3 10,5 26,3 36,8 21,1 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,5 10,5 26,3 21,1 31,6 | 5,3 26,3 21,1 10,5 36,8 | 5,3 21,1 42,1 21,1 10,5 |

| Responsibility retail sector (N=13) | | | | |
|--|--|--------------------------------------|--------------------------------------|-------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 7,7 30,8 61,5 | 7,7 30,8 15,4 30,8 15,4 | 7,7 53,8 23,1 7,7 7,7 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 15,4 30,8 23,1 15,4 15,4 | 15,4 7,7 38,5 15,4 23,1 | 0 7,7 7,7 23,1 61,5 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 30,8 23,1 15,4 7,7 23,1 | 15,4 15,4 46,2 23,1 0 | 0 23,1 15,4 30,8 30,8 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 7,7 0 38,5 53,8 | 0 7,7 7,7 15,4 69,2 | 23,1 46,2 15,4 7,7 7,7 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 7,7 0 30,8 23,1 38,5 | 15,4 30,8 23,1 15,4 15,4 | 0 0 23,1 30,8 46,2 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 7,7 7,7 15,4 69,2 | 7,7 15,4 23,1 30,8 23,1 | 23,1 46,2 30,8 0 0 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 38,5 30,8 0 30,8 | 15,4 38,5 15,4 7,7 23,1 | 15,4 46,2 30,8 0 7,7 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 7,7 15,4 15,4 61,5 | 7,7 15,4 30,8 7,7 38,5 | 23,1 30,8 23,1 7,7 15,4 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 7,7 23,1 38,5 15,4 15,4 | 7,7 15,4 15,4 15,4 46,2 | 7,7 7,7 53,8 23,1 7,7 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 7,7 30,8 23,1 23,1 15,4 | 7,7 15,4 15,4 15,4 46,2 | 7,7 15,4 38,5 23,1 15,4 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 23,1 23,1 23,1 30,8 | 0 23,1 23,1 53,8 0 | 0 7,7 30,8 53,8 7,7 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 7,7 7,7 38,5 0 46,2 | 7,7 15,4 30,8 30,8 15,4 | 15,4 23,1 46,2 0 15,4 |

| Responsibility coastal and marine industry (N=35) | | | | |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 11,4 5,7 37,1 45,7 | 22,9 11,4 31,4 11,4 22,9 | 14,3 40,0 28,6 2,9 14,3 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 22,9 25,7 14,3 11,4 25,7 | 14,3 25,7 22,9 14,3 22,9 | 2,9 0 5,7 20,0 71,4 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 28,6 11,4 31,4 8,6 20,0 | 17,1 11,4 20,0 22,9 28,6 | 0 5,7 31,4 25,7 37,1 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,9 5,7 20,0 20,0 51,4 | 0 5,7 5,7 14,3 74,3 | 20,0 25,7 28,6 14,3 11,4 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 5,7 17,1 14,3 17,1 45,7 | 20,0 17,1 28,6 5,7 28,6 | 0 5,7 37,1 17,1 40,0 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,9 5,7 25,7 65,7 | 2,9 8,6 40,0 17,1 31,4 | 34,3 31,4 20,0 8,6 5,7 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,9 2,9 17,1 28,6 48,6 | 11,4 8,6 34,3 17,1 28,6 | 37,1 34,3 20,0 0 8,6 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,9 22,9 14,3 60,0 | 5,7 5,7 28,6 28,6 31,4 | 14,3 20,0 31,4 22,9 11,4 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,6 14,3 31,4 20,0 25,7 | 5,7 11,4 37,1 17,1 28,6 | 14,3 20,0 34,3 17,1 14,3 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 11,4 17,1 14,3 25,7 31,4 | 8,6 11,4 28,6 20,0 31,4 | 8,6 28,6 34,3 14,3 14,3 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,6 22,9 22,9 22,9 22,9 | 14,3 28,6 25,7 11,4 20,0 | 2,9 14,3 31,4 34,3 17,1 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,6 11,4 40,0 14,3 25,7 | 11,4 20,0 31,4 20,0 17,1 | 5,7 22,9 40,0 20,0 11,4 |

| Responsibility waste management sector (N=10) | | | | |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 20,0 30,0 50,0 | 10,0 10,0 50,0 0 30,0 | 0 30,0 40,0 10,0 20,0 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 30,0 10,0 40,0 10,0 10,0 | 10,0 10,0 10,0 40,0 30,0 | 0 0 0 10,0 90,0 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 30,0 10,0 50,0 0 10,0 | 10,0 0 10,0 40,0 40,0 | 0 0 10,0 50,0 40,0 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 10,0 10,0 20,0 60,0 | 0 0 10,0 10,0 80,0 | 10,0 30,0 50,0 0 10,0 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 10,0 20,0 30,0 40,0 | 10,0 10,0 30,0 20,0 30,0 | 0 0 10,0 40,0 50,0 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 10,0 20,0 70,0 | 0 0 10,0 40,0 50,0 | 20,0 30,0 30,0 10,0 10,0 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 20,0 30,0 50,0 | 0 0 30,0 30,0 40,0 | 30,0 10,0 40,0 10,0 10,0 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 10,0 40,0 50,0 | 0 0 20,0 30,0 50,0 | 20,0 30,0 10,0 30,0 10,0 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,0 20,0 40,0 10,0 20,0 | 0 20,0 20,0 10,0 50,0 | 10,0 10,0 30,0 40,0 10,0 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,0 20,0 30,0 20,0 20,0 | 0 20,0 30,0 10,0 40,0 | 10,0 10,0 30,0 30,0 20,0 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 20,0 0 10,0 50,0 20,0 | 10,0 0 30,0 30,0 30,0 | 0 0 40,0 20,0 40,0 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,0 0 30,0 40,0 20,0 | 20,0 0 10,0 40,0 30,0 | 0 0 30,0 50,0 20,0 |

| Responsibility government and policy making sector (N=34) | | | | |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,9 5,9 5,9 29,4 55,9 | 26,5 11,8 23,5 23,5 14,7 | 8,8 44,1 29,4 14,7 2,9 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 29,4 14,7 26,5 11,8 17,6 | 26,5 5,9 20,6 23,5 23,5 | 0 0 2,9 5,9 91,2 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 26,5 23,5 35,3 8,8 5,9 | 20,6 20,6 26,5 14,7 17,6 | 0 5,9 14,7 44,1 35,3 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,9 11,8 38,2 47,1 | 2,9 0 2,9 8,8 85,3 | 11,8 26,5 29,4 17,6 14,7 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,8 11,8 17,6 14,7 47,1 | 23,5 14,7 20,6 17,6 23,5 | 0 2,9 14,7 29,4 52,9 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 17,6 82,4 | 11,8 14,7 11,8 8,8 52,9 | 26,5 50,0 14,7 5,9 2,9 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,9 0 8,8 26,5 61,8 | 20,6 14,7 14,7 17,6 32,4 | 38,2 32,4 20,6 5,9 2,9 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,9 5,9 5,9 85,3 | 14,7 8,8 20,6 14,7 41,2 | 11,8 44,1 32,4 11,8 0 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 11,8 17,6 29,4 8,8 32,4 | 14,7 2,9 23,5 20,6 38,2 | 11,8 8,8 52,9 20,6 5,9 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,8 8,8 32,4 20,6 29,4 | 17,6 11,8 20,6 5,9 44,1 | 5,9 17,6 44,1 14,7 17,6 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 26,5 26,5 17,6 11,8 17,6 | 29,4 17,6 14,7 20,6 17,6 | 2,9 5,9 38,2 29,4 23,5 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 23,5 23,5 14,7 17,6 20,6 | 32,4 8,8 11,8 23,5 23,5 | 14,7 17,6 41,2 17,6 8,8 |

| Responsibility environmental organisations (N=15) | | | | |
|--|--|--------------------------------------|--------------------------------------|--------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,7 0 13,3 40,0 40,0 | 6,7 13,3 26,7 26,7 26,7 | 6,7 46,7 33,3 6,7 6,7 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 13,3 13,3 46,7 13,3 13,3 | 0 20,0 13,3 26,7 40,0 | 0 0 6,7 6,7 86,7 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 33,3 33,3 0 26,7 6,7 | 13,3 20,0 20,0 20,0 26,7 | 0 0 40,0 26,7 33,3 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 20,0 6,7 73,3 | 0 0 6,7 13,3 80,0 | 0 46,7 40,0 13,3 0 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,7 0 26,7 13,3 53,3 | 6,7 26,7 20,0 13,3 33,3 | 0 0 6,7 6,7 86,7 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 26,7 73,3 | 13,3 6,7 20,0 20,0 40,0 | 26,7 53,3 13,3 6,7 0 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 6,7 20,0 13,3 60,0 | 20,0 13,3 20,0 33,3 13,3 | 46,7 40,0 13,3 0 0 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 6,7 93,3 | 13,3 13,3 13,3 26,7 33,3 | 13,3 40,0 33,3 13,3 0 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 13,3 26,7 20,0 40,0 | 13,3 0 20,0 33,3 33,3 | 6,7 26,7 26,7 20,0 20,0 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,7 13,3 6,7 26,7 46,7 | 13,3 6,7 13,3 33,3 33,3 | 13,3 13,3 33,3 20,0 20,0 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,7 26,7 20,0 20,0 26,7 | 6,7 20,0 26,7 33,3 13,3 | 0 13,3 33,3 40,0 13,3 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 26,7 13,3 26,7 33,3 | 20,0 40,0 20,0 6,7 13,3 | 26,7 20,0 33,3 13,3 6,7 |

| Responsibility media sector (N=15) | | | | |
|--|--|-----------------------------------|-----------------------------------|-----------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 20,0 80,0 | 0 0 40,0 40,0 20,0 | 0 20,0 60,0 20,0 0 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 20,0 20,0 20,0 40,0 0 | 0 0 40,0 60,0 0 | 0 0 0 40,0 60,0 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 40,0 0 40,0 20,0 0 | 20,0 0 20,0 60,0 0 | 0 0 20,0 60,0 20,0 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 0 100 | 0 0 20,0 0 80,0 | 0 20,0 60,0 20,0 0 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 20,0 20,0 60,0 | 0 20,0 20,0 40,0 20,0 | 0 0 20,0 0 80,0 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 0 100 | 0 0 0 80,0 20,0 | 0 80,0 20,0 0 0 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 0 100 | 0 0 20,0 40,0 40,0 | 20,0 40,0 40,0 0 0 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 0 40,0 60,0 | 0 0 20,0 40,0 40,0 | 0 0 100 0 0 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 20,0 20,0 60,0 | 0 0 0 80,0 20,0 | 0 20,0 40,0 20,0 20,0 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 40,0 20,0 40,0 | 0 0 20,0 60,0 20,0 | 0 20,0 40,0 20,0 20,0 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 20,0 0 40,0 40,0 | 0 0 60,0 40,0 0 | 0 0 60,0 40,0 0 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 0 20,0 20,0 60,0 | 20,0 0 60,0 20,0 0 | 0 40,0 60,0 0 0 |

| Responsibility education sector (N=72) | | | | |
|--|--|--------------------------------------|--------------------------------------|-------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 1,4 0 15,3 30,6 52,8 | 12,5 18,1 33,3 15,3 20,8 | 6,9 36,1 37,5 12,5 6,9 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 22,2 23,6 13,9 23,6 16,7 | 11,1 11,1 22,2 33,3 22,2 | 0 0 5,6 12,5 81,9 |
| Independent scientists | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 23,6 9,7 30,6 20,8 15,3 | 13,9 12,5 26,4 18,1 29,2 | 0 1,4 25,0 36,1 37,5 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,8 2,8 15,3 20,8 58,3 | 0 4,2 6,9 15,3 73,6 | 6,9 27,8 52,8 11,1 1,4 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 5,6 11,1 13,9 23,6 45,8 | 23,6 9,7 25,0 16,7 25,0 | 1,4 4,2 9,7 36,1 48,6 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 1,4 5,6 19,4 73,6 | 8,3 6,9 18,1 26,4 40,3 | 40,3 37,5 15,3 2,8 4,2 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,8 16,7 26,4 54,2 | 11,1 11,1 22,2 27,8 27,8 | 31,9 34,7 27,8 2,8 2,8 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 1,4 6,9 30,6 61,1 | 11,1 5,6 19,4 34,7 29,2 | 18,1 30,6 38,9 9,7 2,8 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,9 11,1 23,6 27,8 30,6 | 9,7 4,2 15,3 38,9 31,9 | 6,9 22,2 25,0 31,9 13,9 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 8,3 12,5 26,4 20,8 31,9 | 8,3 9,7 12,5 31,9 37,5 | 4,2 20,8 20,8 34,7 19,4 |
| Educators | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 16,7 12,5 19,4 23,6 27,8 | 15,3 20,8 22,2 26,4 15,3 | 0 1,4 34,7 33,3 30,6 |
| The media | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 16,7 13,9 19,4 19,4 30,6 | 15,3 15,3 23,6 27,8 18,1 | 4,2 20,8 44,4 23,6 6,9 |

| Responsibility general public (N=48) | | | | |
|--|--|--------------------------------------|--------------------------------------|-------------------------------------|
| | Percentages | Responsible: | Competent: | Motivated: |
| General public | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 2,1 6,3 29,2 62,5 | 8,3 10,4 33,3 20,8 27,1 | 14,6 54,2 20,8 8,3 2,1 |
| Environmental groups | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 14,6 20,8 27,1 16,7 20,8 | 2,1 16,7 27,1 20,8 33,3 | 2,1 0 8,3 10,4 79,2 |
| Independent scientists (N=47) | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 18,8 25,0 29,2 18,8 6,3 | 8,3 14,6 29,2 27,1 18,8 | 2,1 6,3 29,2 20,8 41,7 |
| Government and policy makers | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 4,2 2,1 8,3 20,8 64,6 | 0 2,1 10,4 16,7 70,8 | 8,3 20,8 45,8 14,6 10,4 |
| Self | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,4 6,3 20,8 27,1 35,4 | 12,5 14,6 22,9 27,1 22,9 | 0 4,2 10,4 29,2 56,3 |
| Industry that design and produce items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 4,2 2,1 25,0 68,8 | 2,1 4,2 20,8 22,9 50,0 | 22,9 50,0 18,8 6,3 2,1 |
| Retailers that sell items which could potentially be littered | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 8,3 14,6 35,4 41,7 | 4,2 8,3 27,1 18,8 41,7 | 18,8 50,0 20,8 6,3 4,2 |
| Commercial users of the coast and sea | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 0 6,3 8,3 27,1 58,3 | 0 8,3 22,9 37,5 31,3 | 16,7 37,5 37,5 4,2 4,2 |
| Organisations that collect waste from business and homes | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,1 27,1 22,9 18,8 29,2 | 0 8,3 41,7 20,8 29,2 | 4,2 22,9 41,7 10,4 20,8 |
| Organisations that deal with the collected waste | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 2,1 25,0 22,9 18,8 31,3 | 2,1 10,4 35,4 18,8 33,3 | 2,1 16,7 45,8 16,7 18,8 |
| Educators (N=47) | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 6,3 20,8 37,5 16,7 16,7 | 2,1 18,8 31,3 25,0 20,8 | 4,2 10,4 29,2 39,6 14,6 |
| The media (N=47) | Strongly disagree: Disagree: Neutral: Agree: Strongly agree: | 10,4 22,9 27,1 14,6 22,9 | 8,3 12,5 27,1 20,8 29,2 | 8,3 16,7 50,0 16,7 6,3 |

Appendix VIII Vision labels of companies

| Legend | |
|-----------------------|--|
| Sustainable vision | |
| No sustainable vision | |

| Sector | Company | Vision labels |
|------------|------------------------------------|---|
| Production | Natureko | CSR; Sustainable, biodegradable products. (Natureko, n.d.) |
| | SABIC Europe | Respect and care for environment; Comply environmental laws, regulations and standards; Conserve resources; Prevent pollution; Reduce waste. (Sabic, 2013) |
| | Ashland | Committed to values of responsibility; Sustainability. (Ashland, 2013) |
| | Romar- Voss | Attention to safety and environmental regulations. (Romar- Voss, n.d.) |
| | DSM | Sustainability; PPP. (DSM, 2013) |
| | VOSSCHEMIE Benelux | Innovation; Quality; ISO 9001. (Vosschemie Benelux, n.d.) |
| | Synbra Technology bv. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) Awarded by NRK with prestigious gold medal for most innovative and sustainable Dutch enterprise 2009; Cradle to Cradle certificate. (Synbra Technology, n.d.) |
| | Polycel Gouda b.v. | Lowest possible environment impact; Production of EPS (Polycel Gouda, n.d.) |
| | ExPoSchuim | Production of EPS. (ExPoSchuim, n.d.) |
| | Brands Structural Products | Quality. |
| | Eurocarbon | ISO 9001; Quality. |
| | Euroresins Benelux B.V. | Eco friendly- innovations; Sustainable materials. (Euroresins Benelux, 2013) |
| | Barentz B.V. | Quality; Service; Innovation. (Barentz B.V., n.d.) |
| | BASF | CSR; PPP. (BASF, 2013) Conserving resources; Sustainability. (BASF, n.d.) Environmental protection; Future generations. (BASF, n.d. ^Δ) |
| | Telijn Aramid | Sustainable growth. Highest priority on preservation of safety and natural environment. (Telijn Aramid, n.d.) Internal recycling. Reduce amount of waste. (Telijn Aramid, n.d. ^Δ) ISO 14001. (Telijn Aramid, n.d. ^Δ) |
| Conversion | Aarts Plastics B.V. | Environmental responsible; Sustainable techniques. (Aarts Plastics, n.d.) Spreading sustainable vision through all work layers; ISO 14001; Monitor emissions of garbage streams, used raw materials, energy and other environmental aspects. (Aarts Plastics, n.d. ^Δ) |
| | NPSP Composieten | More sustainable environment by reducing impact and sharing expertise; CSR. (NPSP, n.d.) |
| | Acodeq Kunststoffen Industrie B.V. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) |
| | Alligator Plastics B.V. | Sustainable resources; Bio polymers; Compostable bio polymers. (Alligator Plastics, n.d.) Future.(Alligator Plastics, n.d. ^Δ) |
| | Appkuns B.V. | Client specific production. (Appkuns, n.d.). ISO 13485; ISO9001; Continuity; Innovation. (Appkuns, n.d. ^Δ) Quality; Reliability; Flexibility; Efficiency. (Appkuns, n.d. ^Δ) |
| | AVK Plastics B.V. | Environmental friendly. (AVK Plastics, 2010) ISO 14001 certified; Reducing cooling water; Rejected products (waste)<1%; Reducing gas consumption by 5%; Reducing raw material consumption for OD G+W surface boxex at least 15%; Saving 40 tons of material by internal recycling of spues and rejected products; Preparing and implementing energy savings plant.(AVK, 2012) |
| | AWA Molding B.V. | Only use of thermoplasts (recyclable). (AWA Molding, 2013) |
| | Bango Plastics v.o.f. | X |
| | Batelaan Kunststoffen B.V. | As little material as possible; Energy efficiency; Reducing waste; Recycling of waste. (Batelaan Kunststoffen, 2013) Sustainable partner. (Batelaan Kunststoffen, 2013 ^Δ) |
| | Bema Kunststoffen B.V. | Sustainable packaging. (Bema Kunststoffen, 2013) |
| | Blok Plastic B.V. | X |
| | Depla B.V. | Use of recycled resources. (Depla, n.d.) |
| | Desch-Epla B.V. | When the design of the product allows, we use recycled plastics. (Desch- Epla, n.d.) |
| | DNL Kunststoffen B.V. | Only resources which succeed the REACH guideline; Only resources according 2002/95/EC guidelines. (DNL Kunststoffen, 2013) |
| | ELHI Kunststoffen Industrie B.V. | ISO 9001 certified. (ELHI Kunststoffen Industrie, 2012) Innovation; Quality. (ELHI Kunststoffen Industrie, 2012 ^Δ) |
| | Espol Plastics B.V. | Quality; Certified quality norms. (Espol Plastics, 2013) |
| | Fakoplast Plastic Products B.V. | 100% recyclable resources; Use of new- and recycled materials. (Fakoplast Plastic Products, n.d.) |

| | |
|------------------------------------|--|
| Flethic B.V. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) Sustainability. (Flethic, n.d.) |
| GDK Plastics B.V. | Client specific; Innovation; Quality; Efficiency. (GDK Plastics, 2013) |
| GL Plastics B.V. | ISO 9001; ISO/TS 16949. (GL Plastics, n.d.) |
| Greijn Form Technics B.V. | Quality. (Greijn Form Technics, n.d.) |
| Habeva B.V. | Service; Flexibility; Quality; Depending the product requirements, all resources can be used. (Habeva, n.d.) |
| HEKU Kunststoffen B.V. | Cradle to cradle; Collecting and recycling of waste; Sufficient use of available resources with little waste as possible. (HEKU Kunststoffen, n.d.) |
| Injection Point | Client specific production; Quality. (Injection Point, 2011) |
| Innosell B.V. | Quality, reliability; Qualified specific packaging materials. (Innosell, n.d.) |
| JansenThermoforming | Compostable environmental friendly plastic; Sustainability. (JansenThermoforming, n.d.) |
| Bulbfust B.V. / K.P.I. | ISO14001 certified. (K.P.I., 2012) |
| Kellpla BV | Innovations; Quality. (Kellpla, 2013) |
| KHZ Kunststoffen B.V. | Quality. (KHZ Kunststoffen, n.d.) |
| KIK Kunststoffen Industrie B.V. | Innovation; Quality; Efficiency. (KIK Kunststoffen Industrie, n.d.) |
| Kornelis Caps & Closures | Eco-sensible production; Future generations; Respecting and protecting environment; Clear internal environmental policy; Sustainability. (Kornelis Caps & Closures, 2013) |
| Lipro Plastics B.V. | Care for environment; Succeed on all requirements regarding the environment. (Lipro Plastics, 2012) |
| Medica Europe BV | Efficiency. (Medica Europe, n.d.) |
| Medisize B.V. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) |
| Parker Polyflex BV | Clean and efficient energy generation; Responsible use of resources; Reduction of resources. (Parker Polyflex, 2013) |
| Pekago Covering Technology | Innovation. (Pekago Covering Technology, 2013) ISO 9001; Client specific product; ISO 13485; Flexibility; Quality; Reliability. (Pekago Covering Technology, n.d.) |
| Plasti Forma B.V. | Originated recycling company. (Plasti Forma, n.d.) Biodegradable PLA; Reusing raw materials; Reducing waste. (Plasti Forma, n.d. ^A) All responsible for a sustainable planet; Recycling 100% of residual materials from used foils; Only using biodegradable cleaning products. (Plasti Forma, n.d. ^B) |
| Plastica B.V. | Client specific production. (Plastica, n.d.) |
| Polyplastic B.V. | Quality; Reliability; Client specific production. (Polyplastic, n.d.) |
| Prince Kunststofbouw B.V. | CSR; Strong safety requirements which keep recycling of waste down to 10 %, . Sustainable processing; Reusable materials; 90% of waste recycling by use of other products. (Prince Kunststofbouw, n.d.) |
| Promolding B.V. | CSR; maximum functional use of materials; Low CO2; Recyclable. (Promolding, n.d.) |
| ROVERS Medical Devices B.V. | X |
| Run Plastics B.V. | Production on client specifications. (Run Plastics, n.d.) |
| Sell Kunststoffen B.V. | Sustainable production; Recycling of waste and rest products; Separation of rest materials during production process. (Sell Kunststoffen, n.d.) |
| Snelcore B.V. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) ISO 14001. (Snelcore, 2013) |
| Sonoco Crellin B.V. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) ISO 14001 certified. (Sonoco Crellin, 2013) |
| T & M Kunststoffen B.V. | Bio plastics (due to the CO2 advantage and compostable). (T&M Kunststoffen, 2010) |
| Teamplast B.V. | PPP; Sustainability; Recycling; Energy efficient methods. (Teamplast, 2013) Green energy; Use of renewable energy resources. (Teamplast, 2013 ^A) Reduce residual materials; Other residual materials send to a reputable recycling company. (Teamplast, 2013 ^B) Biodegradable materials; Bio based, renewable materials. (Teamplast, 2013 ^C) |
| Timmerije B.V. | Attending 'Biobased polymeren'. (Agentschap NL, 2012) |
| Tri-Ergon B.V. | X |
| VDL Wientjes Roden B.V. | Comply with environmental aspects imposed by authorities/customers. (VDL Wientjes Roden, 2013) |
| Voestalpine Plastics Solutions BV | Attending 'Biobased polymeren'. (Agentschap NL, 2012) |
| Wiezoplast A.W.Z. | Packaging BRC certified; Lloyd's register quality assurance; ISO 9001 certified; German packaging award winner 2010: De gouden noot (Wiezoplast A.W.Z., 2013) |
| Wilco Vacuümvorm Verpakkingen B.V. | Environmental friendly. (Wilco Vacuümvorm Verpakkingen, n.d.) |
| CKV plastics | Bio-degradable plastics. (CKV plastics, n.d.) |

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| | Dumocom | Use of recycled materials; Sustainability. (Dumocom, 2011) |
| | Euro Mouldings | Attending 'Biobased polymeren'. (Agentschap NL, 2012) EmvJ program; Energy saving; Reuse of waste materials; Reuse of cardboard packaging trays. (Euro Mouldings, n.d.) |
| | Ypma Plastics BV | Clients. (Ypma Plastics, n.d.) |
| | De Jong & Maaskant | Sustainable policy; Less energy use; Longer life of oil; Bio-degradable products. (De Jong & Maaskant, 2013) |
| | Dupolco | Quality; Client specific production; Product sustainability. (Dupolco, 2013) |
| | Lantor BV | QHSE policy; Close watch on environmental footprint. (Lantor BV, n.d.) ISO 14001. (Lantor BV, n.d.) ^A |
| | AKFI | Client specific production (AKFI, n.d.) |
| | Polux | Prevent environmental pollution; Reduce emissions of harmful substances. (Polux, 2012) |
| | Dimensio | Recyclable bags; CO2 neutral bags by reforestation projects; Bio-degradable/compostable bags; Sustainable energy; CSR. (Dimensio, n.d.) EN 13432 certified. (Dimensio, n.d.) ^A |
| | Synprodo BV | Cradle to cradle; Protection of environment; EPS; Recycling; Closing the chain from raw material to reuse. (Synprodo BV, 2013) |
| | Bericap | Reduce CO2 emissions. (Bericap, 2012) |
| | De Boer Industriële Groep | Client specific production; Quality; Engagement; Innovation. (De Boer Industriële Groep, n.d.) |
| | Lankhorst Recycling Products | PPP; Sustainability; CSR. (Lankhorst Recycling Products, 2013) Products from recycled material. (Lankhorst Recycling Products, 2013) ^B Low transportation-Low CO2 emissions; Upgrading of products. (Lankhorst Recycling Products, 2013) ^B |
| | ALLPLAST B.V. | Client specific; Innovation. (Allplast, n.d.) |
| Product packaging/ design | Hordijk Verpakkingen | Attending 'Biobased polymeren'. (Agentschap NL, 2012) Future generations; Keep surroundings clean and safe; Only use of recyclable raw materials; Minimum quantity of plastic; low energy use; Sustainable innovations as much as possible. (Hordijk Verpakkingen, n.d.) |
| | Unilever | Future; Reduce environmental impact; CSR; Reducing packaging material; Increasing recycling- and reclaiming percentages; Increasing recycled volume. (Unilever, 2013) Acquire agricultural resources from sustainable resources. (Unilever, 2013) ^A |
| | C.M. Packaging | Customer specified products and packaging; Innovation. (C.M. Packaging, 2013) ISO 22000; ISO 9001; HACCP certified; Quality; Safety; Health. (C.M. Packaging, 2013) ^A |
| | Vorselaars Vruchtensappen en Frisdranken B.V. | CSR; Efficient use of resources, packaging materials, water and energy; Little impact as possible on environment. (Vrumona, 2013) Waste reduction; Recycling of waste; Cooperation with suppliers about packaging material; Products used of recycled materials and new materials; Initiator 'houd Nederland schoon'; Influence on customer; ISO certified Environmental care. (Vrumona, 2013) ^A Less waste weight. (Vrumona, 2013) ^B |
| | Refresco Benelux | QHSE policy; QHSE thinking expected from employees; ISO 14001, IFS certified. (Refresco Benelux, n.d.) |
| | H.J. Heinz B.V. | Sustainable Ketchup. (H.J. Heinz, 2012) Fully recyclable ketchup bottles; Usage of recyclable material. (H.J. Heinz, 2011) CSR; Reducing Greenhouse gasses/energy consumption/solid landfill waste/packaging materials; water usage; Engage all employees about voluntary activity to enhance their own sustainability (work & home). (H.J. Heinz, 2012) ^A |
| | Burg Groep BV | CSR; PPP; Respecting the environment; Future generations; Water reduction; CO2 reduction; Waste reduction; Reduction of resources; Less energy. (Burg Groep, n.d.) |
| | Coca-Cola Enterprises Nederland B.V. | Low carbon, sustainable packaging; Using renewable and reusable materials; Ensuring recyclable packaging; Encouraging consumers to recycle more often, supporting and championing improvements to national collection and sorting schemes and investing in recycling and reprocessing infrastructure; Less use of materials; Using sustainable materials; Re-using materials; Taking care of energy, water usage; Using their brand marketing to encourage recycling; Fundamentally reshape how people behave in their own homes; Cooperation with social researchers. (Coca-Cola Enterprises Nederland, 2013) |
| | Danone Waters Beverages Benelux | Recycling. (Danone Waters Beverages Benelux, 2012) Limited environmental risks; Carbon offsetting by funding projects with high environmental and social value. (Danone Waters Beverages Benelux, 2012) ^A |
| | Hero Nederland B.V. | Changes with the World. (Hero Nederland, n.d.) |
| | Siebrand NV | Sustainability; CSR; Have a little impact as possible on the environment; Less and only PVC free foil; Separated glass collection; Recycled cartoon; EKO certified. (Siebrand, 2013) |
| | Spadel Nederland B.V. | Reduce impact on environment; Protect nature; Future generations; Cooperation/listening to stakeholders. (Spadel Nederland, n.d.) Avoid the risks |

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| | | of environmental pollution; Protect surface and groundwater; Reduction of CO2 emissions; Reduction of energy and resource use; Prevention and valorisation of waste, especially packaging waste; Chain integration, inform, make aware and teach employees, suppliers en subcontractors of these materials. (Spadel Nederland, n.d. ^Δ) |
| | United Soft Drinks B.V. | X |
| | Wild Juice B.V. | Responsible use of environmental resources; Sustainability; PPP. (Wild Juice, 2013) Reducing amount of waste; Recycling materials; Reclaiming of more than 35,000 steel and plastic drums per year. (Wild Juice, 2013 ^Δ) |
| | Friesland Campina | CSR; Sustainability; Climate-neutral growth through entire chain; Support and encourage dairy farmers for sustainability; Sustainable energy production; Energy and waste saving. (Friesland Campina, 2013) |
| | FWS | Responsible packaging policy; CSR; Energy saving. (FWS, n.d.) Reduction packaging materials; Efficient recycling; (FWS, 2013) Favour of separate collection. (FWS, 2013 ^Δ) Supporting plastic heroes; Stimulating for light weighted products; Reduction of litter in the country. (FWS, n.d. ^Δ) |
| | De Jong Disposables | Ecological line, 100% degradable, recyclable and compostable; Use of recycled resources. (De Jong Disposables, 2013) |
| Other | NRK | Better environment; Recycling; Members enterprise sustainable with eye for PPP. (NRK, 2012) CSR; Sustainable purchasing. (NRK, 2012 ^Δ) |
| | Advanced Plastics Benelux BV | Innovation; Quality; ISO 9001 (Advanced Plastics Benelux BV, n.d.) |
| | AkzoNobel Polymer Chemicals | Sustainability. 'Creating more value from fewer resources'. Increasing revenue from downstream eco-premium solutions by 20%. Improve resource efficiency across full value chain. (AkzoNobel Polymer Chemicals, 2013) |
| | Wilsor Kunsthasen | - |
| | Univar Zwijndrecht N.V. | Responsibility environment. SHE policy. (Univar Zwijndrecht N.V., 2013) |
| | Fatol Mulder BV | Quality; Innovation. (Fatol Mulder BV, n.d.) |
| | Plastics Europe Netherlands | Resource efficiency; Waste management; Future generations. (Plastics Europe Netherlands, 2013) Official Associate of the Sustainable Energy EU Campaign; Sustainable development. (Plastics Europe Netherlands, 2013 ^Δ) |
| | Platex BV | X |
| | Addcomp | Environmental protection. (Addcomp, 2012) |
| | Merrem & la Porte BV | Quality; Safety; ISO 9001; VCA 2008/5.1 certified. (Merrem & la Porte BV, n.d.) |
| | DPI | Sustainability related polymer research. (DPI, 2013) |
| | HARJON POLYESTER | X |
| Supermarkets | Acrylic Composites | Environmental friendly. (Acrylic Composites, n.d.) |
| | Lidl Nederland GmbH | MSC certified fish; Cares for environment; Future generations; Reduce energy and materials. (Lidl Nederland, 2013) |
| | ALDI Inkoop BV | No use of endangered species; Extension of sustainable catch methods; Reducing by catch; Support of a fish friendly aquaculture; Close cooperation with suppliers. (Aldi Inkoop, 2013) Fish farming based on high standards for environmental standards and animal welfare; ASC; Functional waste management. (Aldi Inkoop, 2013 ^Δ) |
| | Jumbo Supermarkten B.V. | Future generations. (Jumbo Supermarkten, 2013) CSR. (Jumbo Supermarkten, 2012) Sustainable waste treatment; Energy from waste. (Jumbo Supermarkten, 2011) |
| | Poesz Supermarkten B.V. | Clean trucks. (Poesz, 2013) |
| | Hoogvliet | CSR; Minimalizing transport distance; Maximum waste separation and treatment; Biological and fair-trade products; Recycling; Environmental friendly packaging; Green electricity. (Hoogvliet, 2013) |
| | Dirk Bas en Digros | Sustainability; CSR; Separate collection of waste; Recycling. (Dirk Bas en Digros, 2013) |
| | Spar Holding B.V. | CSR; PPP; Strategy@Sustain. (Spar Holding, 2013) |
| | Dekamarkt | CSR; Stimulation of trading partners for sustainability; Sustainability. (Dekamarkt, 2013) Waste separation; Stimulation of clients to reduce waste; Waste bins 'Houd Nederland schoon'; Bags only for payment and recyclable; Bagbowl (bag exchange); Recycling. (Dekamarkt, 2013 ^Δ) |
| | Agrimarkt | Small production chain; Less CO2 emission. (Agrimarkt, 2013) |
| | Attent | Local products. (Attent, 2013) |
| | Coop | Responsible, sustainable growth. (Coop, n.d.) CSR; Reduced impacts of products on environment. (Coop, n.d. ^Δ) Separation of waste streams; Reduction of waste at the source, by taking back and by recycling; Stimulation of environmental friendly product packaging; Reuse of plastics. (Coop, n.d. ^B) |
| | Plus | Local products; Cares for environment; Biological and fair-trade products. (Plus, 2013) CSR. (Plus, 2013 ^Δ) Reduce own impact on environment; 100% recyclable bags. (Plus, 2013 ^B) |
| | Electrolux | Sustainable development; Reducing negative impacts on environment; Improvement of waste; Proactive approach with respect to environmental legislation. Stimulates suppliers manage the environmental protection |
| Other shops | | |

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| | | principles as Electrolux. (Electrolux, 2010) |
| | Queens | Sustainable produced products; Respect environment; Guarding eventual impacts on nature; Stimulating partners to handle the same way. (Queens, 2013) |
| | Via Mio | X |
| | Street one | X |
| | Pro 071 | X |
| | Body Shop | Little impact as possible on environment; Less energy use; Reduction of waste; Changing way of thinking by people; Less packaging material; Recycled material in product and transport packaging; Reuse of products. (The Body Shop, 2013) |
| | t Oorzaakje | X |
| | Jack and Jones | Biological and sustainable mode; Fair-trade cotton. (Jack and Jones, 2013) |
| | Dixons | Future generations; Manage impact on environment; Reducing emissions; Reducing waste; Unwanted equipment recycling. (Dixons, 2012) |
| | Blokker Nederland B.V. | X |
| Commercial fishing | Urker Vishandel J Koffeman | HACCP gecertificeerde vis. (Urker Vishandel J Koffeman, n.d.) |
| | M. Parlevliet B.V./ ATL Seafood B.V. | Sustainability; Decrease energy level; Reuse heating. (M. Parlevliet B.V./ ATL Seafood B.V., n.d.) Future generations; MSC; Decrease waste; Sustainable packaging of fish. (M. Parlevliet B.V./ ATL Seafood B.V., n.d. ^Δ) |
| | Lenger Seafoods | Working with sustainable suppliers; Waste reduction and reuse; Way of packaging decided by customers; Conserving nature; CSR; Sustainable catching methods. (Lenger Seafoods, 2011) |
| | Jacson | Responsible fisheries; Cooperation with biologists. (Jacson, n.d.) |
| | Cornelis Vrolijk | Sustainable management of pelagic fisheries; Conserve healthy ecosystems; Responsible management; Cooperation with scientists; Innovation of sustainable fishing methods; Future generations. (Cornelis Vrolijk, 2013) Reducing by catch; CSR; Certified fish. (Cornelis Vrolijk, 2012) |
| | Parlevliet & Van der Plas B.V. | Sustainable fisheries; MSC; Sustainable policy with central role of transfer of knowledge and co-operation. (Parlevliet & Van der Plas B.V., n.d.) |
| | W. van der Zwan & Zn. | Sustainable fishing; Future generations; MSC. (W. van der Zwan & Zn., n.d.) |
| Shipping | Havenbedrijf Rotterdam | Sustainability. (Havenbedrijf Rotterdam n.d.) |
| | Rederij Wagenborg | QHSE policy; As little impact as possible on environment; Future generations. (Rederij Wagenborg, 2013) |
| | KVNR | Environmental responsible shipping; 2050- Emission free shipping; >2020- growing to CO2 neutral; 2050- CO2 reduction 50% compared to 2020; Unambiguous rules for stimulating shipping waste; Improving current regulations and improving issuance facilities worldwide for shipping. (KNVR, 2013) |
| | VOMS | Removal of harmful emissions of substances. (VOMS, 2013) |
| | VCR | X |
| | Holland Amerika Lijn | Responsible environmental policy; Care for resources. (Holland Amerika Lijn, 2013) |
| | Pot Scheepvaart | X |
| | Amasus shipping B.V. Delfzijl | Sustainable transport; Reducing impact on environment. (Amasus shipping B.V., n.d.) Balancing PPP; QHSE policy; CSR. (Amasus shipping B.V., n.d. ^Δ) |
| | Rederij Van Donderen | Safety; Service. (Rederij Van Donderen, (n.d.) |
| | Mercurius Shipping Group | Innovation; Entrepreneurship; Synergy. (Mercurius Shipping Group, 2013) |
| Offshore industries | Airborne Oil & Gas | Client specific production; Quality; ISO 9001 (Airborne Oil & Gas, 2013) |
| | Blue Offshore B.V. | QHSE policy; Future generations; No harm to environment, the planet as a whole. (Blue Offshore B.V., 2013) |
| | Offshore Ship Designers B.V. | Innovation; Cost- effective. Offshore Ship Designers B.V., (n.d.) |
| | Damen Dredging Equipment | Quality; Client specific production. (Damen Dredging Equipment, 2013) Innovation. (Damen Dredging Equipment, 2013 ^Δ) Service; Reliability. (Damen Dredging Equipment, 2013 ^Δ) |
| | Damen Shipyards Gorinchem | Environmental friendly. (Damen Shipyards Gorinchem, 2013) |
| | Boskalis BV | CSR; Environmental care. (Boskalis BV, 2013) |
| | Offshore Marine Contractors B.V. | Service. (Offshore Marine Contractors B.V., n.d.) |
| | Star Offshore BV | Quality; Reliability. (Star Offshore BV, n.d.) |
| | Rusch Offshore Services BV | Client specific production. (Rusch Offshore Services BV, n.d.) |
| | Offshore Independents BV | X |
| | HSM Offshore BV | QHSE Policy; Company Environmental Plan. (HSM Offshore BV, 2010) |
| | Burdock Offshore Services | Sustainable relation with contractor; Personal approach. (Burdock Offshore Services, 2012) |
| | Offshore Marine Contractors (OMC) | Safety and health of the environment. (Offshore Marine Contractors (OMC), 2010) |

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| | GSP Offshore BV | Sustainability; ISO 14001; QHSE Policy; No harm to the environment; Responsibility towards environment. (GSP Offshore BV, 2013) Improve environmental awareness of our employees for environment protection; Future generations; Balance between performance in business and performance in environmental protection; PPP. (GSP Offshore BV, 2013 ^A) |
| | Lowland Marine & Offshore B.V. | Satisfying clients. (Lowland Marine & Offshore B.V., 2013) |
| | Jumbo Offshore vof | Engineering; Safety awareness; Reliability. (Jumbo Offshore vof, 2013) |
| | Van Oord | Sustainable solutions; Future. (Van Oord, n.d.) |
| Coastal tourism | NL Bureau voor Toerisme & Congressen | Effectiveness. (NL Bureau voor Toerisme & Congressen, 2013) |
| | Hotel Zuiderduin | X |
| | NH Zandvoort Hotel | X |
| | Pension Zee en Duinzicht | X |
| | Strand hotel Scheveningen | Hospitable; Service. (Strand hotel Scheveningen, n.d.) |
| | Hotel Anna | X |
| | Hotel Grand café Heeren van Noortwyck | X |
| | Prominent Inn Hotel | X |
| | Steigenberger Kurhaus Hotel | Service; Guest satisfaction; Quality; Innovation; Meeting customer demands; Hospitality; Historical value. (Steigenberger Kurhaus Hotel, 2011) |
| | Hotel Zee en Duin | X |
| | Strandpaviljoen “Het Wantveld” | Sustainability from an ecological perspective. (Strandpaviljoen “Het Wantveld”, n.d.) |
| | Hotel Savoy | X |
| | De Baak Seaside | Quality of entrepreneurship and the long-term effects on the environment; Sustainability. (De Baak Seaside, 2013) |
| | Hotel appartementen Bloemendaal aan Zee | X |
| | Best Western Hotel de Vassy | Hospitable. (Best Western Hotel de Vassy, n.d.) |
| | Strand hotel Nassau | The coast is clean; Local bio products. (Strand hotel Nassau, 2012) |
| | Strandhotel Duinhevel | X |
| | Hotel Elzenduin | CSR; PPP; Sustainable management; Purchasing products with environmental certificate; Reduction of waste; Waste separation; Preference for suppliers with sustainable policy; Green Key certified. (Hotel Elzenduin, 2012) |
| | Brasserie de Badmeester | X |
| | Restaurant Aan Zee | Sustainable restaurant. (Restaurant Aan Zee, 2013) |
| | Grand Hotel Huis ter Duin | Supports a better world. (Grand Hotel Huis ter Duin, 2012) |
| | Pannenkoekenboerderij Langs Berg en Dal | Hospitable; Relaxed child friendly atmosphere (Pannenkoekenboerderij Langs Berg en Dal, n.d.) |
| | De Verrassing | Hospitable. (De Verrassing, n.d.) |
| | Zilte Zoen Bergen aan Zee | Eye for environment in a natural environment. (Zilte Zoen, 2013) |
| | Restaurant De Zeeuwse Kust | X |
| | WestCord Residentie Vlierijck Oost-Vlieland | Care about the environment. Green Key certified. (WestCord, 2013) |
| | Strand hotel Buren aan Zee | X |
| | Schiermonnikoog.com | X |
| | Strandhotel Noordzee | X |
| | Motel Texel | X |
| Aquaculture | Aquaculture farming technology | Protection, preservation natural environments. Waste reduction and recycling. (Aquaculture farming technology, 2013) |
| | Hesyl Aquaculture | Environmental friendly. Care about the environment. (Hesyl Aquaculture, 2013) |
| | Van Slooten Aquacultuur | Environmental friendly recirculation system. (Van Slooten Aquacultuur, 2013) |
| | Topsy Baits | Quality. (Topsy Baits, n.d.) |
| | Roem van Yerseke B.V. | MSC mussels; Heading of sustainability at website is under construction. (Roem van Yerseke B.V., n.d.) |
| | Seafarm | Cooperation with NGO's; Environmentally responsible; Taking care of natural resources; Future generations; Cradle to Cradle; Bio based material. (Seafarm, n.d.) |
| | Ace4all | Quality. (Ace4all, n.d.) |
| | The Barbé Group | Quality. (The Barbé Group, n.d.) |
| | Delta Mossel B.V. | Sustainability. (Delta Mossel B.V., n.d.) |
| | Prins & Dingermanse | Respect for nature; Responsibility. (Prins & Dingermanse, n.d.) |
| | Krijn Verwijs | Sustainable, healthy and fair products; Depending on the environment; Sustainable fisheries. (Krijn Verwijs, 2013) |
| | Fleuren & Nooijen BV | Adaptation specific needs of customer. Sustainable as in long life span. (Fleuren & Nooijen BV, n.d.) |

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| | Til-Aqua International | Innovation. (Til-Aqua International, n.d.) |
| | Silt | Environment friendly. (Silt, 2012) ASC and Global G.A.P certification in progress. (Silt, 2012 ^a) |
| | Stichting Zeeuwse Tong | X |
| | EcoDeco | Sustainability; Nature conservation. (EcoDeco, n.d.) |
| | Palingkwekerij Bardeel | Sustainability; No artificial substances; Traditional process. (Palingkwekerij Bardeel, n.d.) |
| | De Stroom | X |
| | AnnaCaviar | Sustainability. (AnnaCaviar, n.d.) |
| Other | VisNed | Sustainable fisheries. (VisNed, n.d.) |
| | BluePort Lauwersoog | Sustainable economic development; Sustainable fisheries. (BluePort Lauwersoog, 2013) |
| | Nederlandse Vissersbond | Sustainable development of affiliates. (Nederlandse Vissersbond, n.d.) |
| | Nederlandse Vis Unie | CSR; Sustainability; MSC; ASC; Global Gap. (Nederlandse Vis Unie, n.d.) |
| | Strand Nederland | CSR. (Strand Nederland, 2013) |
| | Nutreco | Sustainability. Reduce environmental impact. (Nutreco, 2013) |
| | T-Xchange | Human reasoning; Sense making for a classification of problems. (T-Xchange, n.d.) |
| | Profish | Sustainability; ASC; MSC. (Profish, n.d.) |
| | Dayseaday Fresh and Frozen BV | MSC certified. (Dayseaday Fresh and Frozen, n.d.) |
| | Seafood Connection | Sustainability; CSR. (Seafood Connection, n.d.) Use certifications ASC, MSC, Global G.A.P. (Seafood Connection, n.d. ^a) |
| | NEVEVI (Nederlandse Vereniging van Viskwekers) | CSR; Sustainability; Certified fish. (NEVEVI, 2012) |
| | The Pelagic Freezer-trawler Association | Sustainability; Future; MSC. (The PFA, n.d.) |
| Waste collection organisations | Bek en Verburg | ISO 14001; CSR (Bek & Verburg, n.d.) |
| | Roele de Vries | ISO 14001 (Roele de Vries, n.d.) |
| | Vliko BV | Continues attention for the environment; ISO 14001; Investments in new machinery; Awareness employees (VLIKO, 2013) |
| | RMN Reinigingsbedrijf midden nederland | Environmental friendly; Efficiency (RMN, 2010); Responsibility for people and environment; CSR; ISO 14001; Environmental management plan; Complies with environmental laws and regulations; Prevent environmental pressure; Improve environmental performance; Contribution employees (RMN, 2010a) |
| | ZRD | Efficiency; Sustainable; CSR (ZRD, 2013) |
| | De Meerlanden | Waste is a source; 100% recycling (Meerlanden, 2012); Cooperation for a clean and sustainable environment; Innovation (Meerlanden, 2012a); Sustainability; Quality of life; Closing the cycle; PPP; Prevention of waste (Meerlanden, 2012b); Advice developing countries; Waste coaches (Meerlanden, 2012c); ISO 14001; ISO 26000; VCA certificate (Meerlanden, 2012d) |
| | Wolfswinkel Reiniging B.v. | Quality; ISO 14001; VCA certificate (Wolfswinkel reiniging, n.d.) |
| | RAD | Efficient processing; Waste is a source for new products (RAD Hoeksche Waard, 2010); Plastic Heroes bags (RAD Hoeksche Waard, 2010a) |
| | Milieu Service Brabant | Management of waste and residues (Milieu Service Brabant, 2013) |
| | Afvalzorg | Adequate management systems (NV Afvalzorg Holding, 2007); CSR; PPP; ISO 14001; VCA certificate (NV Afvalzorg Holding, 2007a) |
| Waste processing organisations | Afvalbeheer Noord-Groningen BV | Stimulation composting at home (Afvalbeheer Noord-Groningen, 2013) |
| | Nihot Recycling Technology B.V | Efficient systems; Minimize landfilling; Re-use (Nihot, 2012); VCA certificate; National and international environmental laws and regulations (Nihot, 2012a) |
| | ARN BV | Reducing fossil fuel; Modern technologies (ARN B.V., 2013) |
| | Afval Energie Bedrijf (gemeente Amsterdam) | 99% re-use; reduction CO ₂ ; (AEB, 2013) ISO 14001; VCA certificate (AEB, 2013a) |
| | Sortiva | Investments in clean technologies; Sharing knowledge; Corporate social responsibility; (Sortiva, 2013) BRL 2506 (Sortiva, 2013a) |
| | 4PET Recycling bv. | ISO 14001 (4petrecycling, 2013) |
| | Rodepa Plastics BV | Saving energy; Reduction CO ₂ (Rodepa plastics, n.d.) |
| | Attero | CSR; Cooperation; Innovation; Source for re-use; Environmentally conscious processing (Attero, n.d.); PPP; Sustainable (Attero, n.d.a) |
| | Ensartech | Contribute to a cleaner environment; Processing highly polluted waste streams; (Ensartech, 2009) |
| | Twence | Waste is a source for re-usable materials; Renewable sources; Respect for people and the environment; CSR; PPP (Twence BV, 2013) |
| | GP Harmon Recycling | Sustainability; New products; Innovation (GP Harmon Recycling, n.d.); Environmental responsibility; Exploring for more efficient nonconventional sources (GP Harmon Recycling, n.d.a) |
| | Nedvang | From waste to resource; Waste prevention; Re-use (Nedvang, n.d.) |
| | Indaver | Green economic grow; Qualitative and sustainable solutions; Sustainable |

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| | | processing; Total Waste Management (Indaver, n.d.); Responsible and sustainable business; Minimum impact on people and environment; Environmental legislation; Internal training; Awareness; Reduce impact and emissions (Indaver, n.d.a); Quality; VCA certificate; NTA 8080; ISO 14001 (Indaver, n.d.b); Environmental regulations; Periodic inspection (Indaver, n.d.c) |
| | Broeckx Plastic Recycling bv | Client focused (Broeckx Plastic Recycling BV, 2005) |
| | Shanks | Re-use; Energy generation; Efficient and responsible waste processing (SHANKS, 2013); Innovation; CSR (SHANKS, 2013a) |
| | Sumi Recycling | Recycling into new products (Sumi Recycling, 2012) |
| Waste collection and processing organisations | Omrin | Sustainability; Innovation (Omrin, n.d.); Habitat (Omrin, n.d.a); Ladder van Lansink (Omrin, n.d.b); Waste is a source; conscious employees (Omrin, n.d.c). |
| | Milieu Express | Efficiency; New materials; Recent developments environment (Milieuexpress, 2013) |
| | GAD (Gewestelijke Afvalstoffen Dienst) | Creating environmental awareness; Education; Environmental management system; ISO 14001; Separation at the source; National Waste management Plan (GAD, 2009) |
| | Noord Nederlandse ReinigingsDienst (NNRD) | Waste is source; Sustainability; CSR; Sustainable processing systems; PPP (NNRD, n.d.) ISO 14001; Reduction impact on the environment; Avoid a waste of energy; Creating awareness among employees and partners (NNRD, n.d.a) |
| | AVRI | ISO 14001; CSR; Sustainable supply chains; Education; re-use (Avri, 2013) |
| | Dusseldorp | PPP; Waste is no waste (Dusseldorp, 2013) |
| | Van Vliet Contrans | Care for the environment; Innovation is the green factor; Ladder van Lansink; CO2 performance ladder certificate niveau 3; ISO 14001 (Vvcontrans, 2013) |
| | Van den Enden | Sustainable and environmental responsible processing and transportation (Cvdenden, 2013) |
| | Hummel recycling | Certified by FNOI; Tüv certificate (Hummelrecycling, n.d.) |
| | Scherpenzeel b.v. | CSR; Maximum re-use; Innovation (Scherpenzeel, 2008) |
| | P. van der Kooij Group | Efficient collection (P van der Kooij, n.d.); High quality; ISO 14001; VCA certificate (P van der Kooij, n.d.a) |
| | HVC | Environmental efficiency, acceptable costs and society (HVC, 2011); Waste does not exist; Waste prevention; Education program (HVC, 2011a) |
| | Van Gansewinkel | Waste does not exist (Van Gansewinkel, n.d.) |
| | Putman Group | Client focused; Knowledge and skills; Social standards and laws; Profitability; Continuity (Putmangroep, n.d.) |
| | Visser A.T.R. b.v. | Techniques for simple, effective and environment friendly collection; Optimal logistic processes for reduction of CO2; advanced processing equipment; Law and regulation requirements (Visser, n.d.) |
| | Hummel Recycling | Tüv certificate; Certified by FNOI (Hummelrecycling, n.d.) |
| | KLOK | Ladder van Lansink; Environmental requirements (KLOK, 2013); ISO 14001 (KLOK, 2013a); CSR; self-reflection (KLOK, 2013b) |
| | Langezaal | Environmental engineering requirements; Re-use (BWEB, n.d.) |
| | Van den Noort | Meets the highest environmental quality requirements; VCA certificate (Van den Noort, n.d.) |
| | Stoel Milieu | Responsible collection, processing and recycling; Making more from waste (Stoelmilieu, 2013) |
| | VG Recycling | ISO 9001; Quality (VG Recycling, n.d.) |
| | Kempenaars Recycling | OPK certified (Kempenaars, n.d.) |
| | Collin | Economic, environmental and social responsible (Collin, n.d.); Sustainable developments; Cradle to Cradle (Collin, n.d.a); ISO 14001; VCA certificate (Collin, n.d.b) |
| | Kras Recycling | Process in a responsible manner; Mankind and environment (KRAS, 2011); OPK certificate; Member Association of Plastic Recyclers; Member VMK (KRAS, 2011a); High quality processing method; Sustainability policy (KRAS, 2011b) |
| | Sita | Reliable and sustainable waste management; Fastprint Eco (SITA, 2010); Optimal and sustainable re-use; Recovering valuable resources; E-COO (sustainable waste management from the workplace) (SITA, 2010a) |
| | Granuband B.V. | Environmental friendly recycling; RecyBEM-certificate; Vaco certificate (Granuband, n.d.) |
| | VAR | Stimulation re-use; Balance between economic, social and environmental aspects (VAR, 2008); ISO 14001; CO2 performance ladder; Tüv certificate (VAR, n.d.); Periodic inspections; Environmental management system (VAR, n.d.a) |
| | Toll Milieu | Care for the environment; Solutions for waste problem; Laws and regulations for waste (TOL, 2013) |
| | GP Groot | Connected to the environment; Sustainable; CSR (GP Groot, n.d.) ISO 14001; Certificate CO2; (GP Groot, n.d.a) |
| | PCC | Duurzame verwerking (Pccafval, n.d.) |
| | Heemsbergen Recycling | Green heart (Heemsbergen Recycling, n.d.); Environmental quality; Quality management system; Environmental requirements; VIHB certificate |

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| | | (Heemsbergen Recycling, n.d.a); CSR (Heemsbergen Recycling, n.d.b) |
| | Nijssen Recycling b.v. | Sustainable resource policy; Efficiency; Living in balance with nature (Recycling.nl, n.d.); Waste is new source; Ladder van Lansink (Recycling.nl, n.d.a) |
| | Paro | Operates environmentally responsible; Efficient transportation; Aware; Environmentally friendly solutions; ISO; VCA certificate (Paro, n.d.) |
| | Daly Plastics bv | Recycling; Reward for recyclable plastic strap; Clean, healthy and beautiful living; Environment does contribute to a happy feeling |
| | Sonepa Plastics | Quality (Sonepa, n.d.) |
| | Kunststof Recycling Nederland B.V. | Sustainable processing; Re-use (Kunststof Recycling Nederland, n.d.) |
| | Bowie | VCA certificate (Bowie, n.d.); Attention for sustainability; Saving scarce resources; Environmental friendly techniques; Reducing CO2 emissions; Investments in new materials; Regular quality tests (Bowie, n.d.a) |
| | De Paauw Recycling | Modern machinery; Environmental legislative frameworks (Paauw Recycling, n.d.) |
| | Afvalverwerking Stainkoeln | ISO 14001; (Stainkoeln, 2012) Cooperation Vagroen (Stainkoeln, 2012a); Cooperation ZRNN; From waste to raw material (Stainkoeln, 2012b) |
| Waste water treatment companies | Biothane | Protecting nature; Conserving water resources; Reduce ecological footprint; Innovative technologies (Biothane, 2013) |
| | Veolia Water | Sustainable development perspective; Conserve and protect resources; Promote access to water services; Develops alternative resources; Reducing environmental impacts; Promoting eco-citizenship (Veolia Water, 2010); Sustainable water management; Awareness; Educational initiatives; (Veolia Water, 2010a); Biodiversity; Environment eco-monitoring networks; Ecosystem sensitivity analyses (Veolia Water, 2010b) |
| | Veolia Water Solutions & Technologies | Grow sustainability; Social responsibility commitment; Protect and resource recovery (Veolia Water Solutions & Technologies, 2013) |
| | Morselt water technology | Economic and environmental friendly waste water treatment; Efficient separation (Morselt Borne BV, 2012) |
| | Heros Sluiskil | Innovation; Unique systems and machines; Sustainable contribution; Sustainable thinking and working; Discharging the environment; Recycling waste streams (HEROS B.V., 2013) |
| Other | SAB Stichting Afvalstoffen en Vaardocumenten Binnenvaart | Reduction shipping waste; Collection network; Delivery structure (SAB, 2012) |
| | Knapzak Benelux BV | Simple collection system (Knapzak Benelux B.V., 2013) |
| | NWMP | Promoting cooperation for environmental benefits; Promote sustainability; Exploit international opportunities; Sustainable society (NWMP, n.d.) |
| | Janus Vaten | ISO 14001 (Janus Vaten, 2013); Sustainability; Minimum quantities residual waste; Minimum energy use and emissions; Innovation (Janus Vaten, 2013a) |

Appendix IX Certification of companies

| Certificate | Contents of certificate | Certificate within stakeholder sector | Amount of certificates |
|-------------------------|--|---|------------------------|
| ISO 9001 | ISO 9001 sets out the requirements of a quality management system (ISO, 2013) | Design and manufacturing Coastal and marine industry | 9 2 |
| ISO 14001 | ISO 14001 includes a framework for companies and organisations to establish an environmental management system (ISO, 2013 ^A). | Design and manufacturing Coastal and marine industry | 8 1 |
| ISO 22000 | ISO 22000 specifies requirements for a food safety management system where an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption (ISO, 2009). | Design and manufacturing Coastal and marine industry | 1 1 |
| HACCP | HACCP (Hazard Analysis and Critical Control Points) is a food safety system (Voedingscentrum, n.d.). | Design and manufacturing Coastal and marine industry | 1 2 |
| VCA 2008/5.1 | VCA stands for Safety, Health and Environment and is meant for safer working environments and to decrease the amount of accidents (VCA, 2011). | Design and manufacturing | 1 |
| BRC | The BRC Global Standards are a leading global safety and quality certification programme (BRC Global Standards, 2012). | Design and manufacturing | 1 |
| Cradle to Cradle | The Cradle to Cradle certification qualifies products across five quality categories, which are social fairness, material health, material reutilization, renewable energy and water stewardship (Cradle to Cradle Products Innovation Institute, 2011). | Design and manufacturing | 1 |
| ISO/TS 16949 | The ISO/TS 16949 norm describes the requirements for a quality management system. It lays down specific requirements for the design and development, production and, if applicable, installation and service of products supplied to car manufacturers. (Bedrijfszorg, 2013) | Design and manufacturing | 1 |
| ASC | ASC is a qualification for responsible aquaculture fish (WWF, 2013). | Coastal and marine industry | 4 |
| Global GAP | Global GAP sets standards for the certification of agricultural products around the globe (Global GAP, n.d.). | Coastal and marine industry | 3 |
| Green Key | The Green Key certificate complies to strict standards on the field of sustainability, environment and CSR (Green Key, 2013). | Coastal and marine industry | 2 |
| MSC | MSC is a certification regarding well managed fisheries which originate from sustainable sources. The certificate is an indicator for consumers to see if the fish originates from sustainable sources (MSC, n.d.). | Coastal and marine industry Retail | 8 1 |
| VIHB | The VIHB certificate is for transportation of plastic and paper waste (Ipt, n.d.). | Waste management | 1 |

Appendix X Interviews

Sabic Europe

Nowadays it is hard to imagine a life without plastics. The material has many advantages; it is functional, convenient and cheap. The production of plastics increased enormously in the past 40 years. About 10 million tons of plastic has been produced in 1950, which increased till 300 million tons of plastic per year. In the 80's, a factory produced between 50 and 100 thousand tons every year. A lot of new factories are built since then and nowadays a factory produces around 400 thousand tons every year. The growth is caused by the growing demand for plastics, according to Mr S. Kaasenbrood (director of PlasticsEurope Netherlands and employed at Sabic Europe). When there will be no change, in 30 years the amount of produced plastics will be 700 million tons, which will lead to different kinds of problems worldwide. Different stakeholder meetings showed the plastic product itself and the waste management system of the Netherlands are not the cause of the problem but waste handling of humans. Environmental problems occur when people do not know how to handle these plastic products correctly. (S. Kaasenbrood, personal communication, 16-05-2013)

PlasticsEurope is a European trade association and thereby the voice of European plastics manufacturers (PlasticsEurope, 2013). The association performs activities on three main items: environment and climate; consumer protection, including for example the use of plastics; and resource efficiency, including waste and marine litter. The plastic production industry is working on the subject of marine plastics since 2010 and aims to reduce the problem by the following methods: prevention, research and awareness. (S. Kaasenbrood, personal communication, 16-05-2013)

Sabic Europe (Saudi Basic Industries Corporation) is a producer of plastics, chemicals and innovative plastics (Sabic, 2012), and member of PlasticsEurope. Two years ago, the company started the campaign 'Let's really talk plastics' to raise awareness and starting among its employees. The information distributed by the campaign about different plastic aspects is available for everyone. The campaign still needs to be further developed in which PlasticsEurope could play a major role. By providing information and raising awareness, the image problem of the plastic industry could be reduced. Many people think the problem of marine plastics is caused by the production of plastics. Some people even try to ban plastics because of its environmental consequences. But as mentioned before, as long as the plastic product does not end up in the environment, it will cause no harm. However, Mr S. Kaasenbrood says "If you do not need it, do not buy it".

When selecting the material for products, a fair comparison needs to be taken. The criteria for the products need to be compared for all optional materials. It is hard to switch from plastics to another material because plastic has often more advantages than other materials in most cases. The value of plastics is underestimated, even though everyone uses plastic products on a daily basis. Besides, Sabic Europe and PlasticsEurope participate in a project of the Dutch Polymer Institute (DPI) together with companies like Stichting the Noordzee and Van Gansewinkel. (S. Kaasenbrood, personal communication, 16-05-2013) The aim of the project is to find the source of the problem of marine plastics followed by closing the lifecycle of plastics (Bolt, A., personal communication, 02-05-2013). The role of Sabic Europe and PlasticsEurope is to participate in the thinking process and Sabic Europe contributes by its expertise on materials as well. (S. Kaasenbrood, personal communication, 16-05-2013)

The collaboration between the industry, environmental organisations and science is very pleasant in the Netherlands, says Mr S. Kaasenbrood. Different opinions are respected and could be discussed. Solutions for environmental problems could be found by assembling the different expertise. Therefore cooperation is very important to make progress. Important influencers are environmental organisations which raise awareness and show the problem of marine plastics. Also the media influences the plastics production sector. Companies do not want a bad reputation which could be caused by the media. The media is able to draw attention and to make the plastic production sector alert which could motivate for changes in behavioural activities. However, the driving force to make change in future behavioural activities is laws and awareness within the society. (S. Kaasenbrood, personal communication, 16-05-2013)

Sabic Europe mainly uses the material naphtha (petroleum distillate) to produce and all materials are oil based. Oil is converted into petrol, kerosene and naphtha in the refineries of for example Shell in Antwerpen. Thereafter naphtha

is transported by pipelines to Sabic Europe's factory in Geleen. The way of product transportation is one of the restrictions to switch to renewable resources like organic materials since the production has to be completely reorganised which brings high costs. Financial progress is the main driving force for the industry. Also, the availability of renewable resources is small in the Netherlands. According to Mr S. Kaasenbrood, renewable resources are only possible when the factory is located in the surroundings of high biomass, like in countries as Brasil or the USA. Out of 300 million tons, only two million tons of plastic are produced out of organic materials nowadays. Probably a small growth of the use of renewable sources will occur. It will be a cautious and slow process since the competition is at a global scale. Four per cent of the total oil production is used for the production of plastics. In the opinion of Mr S. Kaasenbrood, the use of oil for plastics will not give any problems in the future. It will take a very long time until oil resources run out. Besides renewable energy is emerging, which could replace the fuels used for cars. Currently, 90 % of the total oil production is used for cars. (S. Kaasenbrood, personal communication, 16-05-2013)

Besides the use of fossil fuels, the plastic production sector is very sustainable, according to Mr S. Kaasenbrood. The sector has a low water usage, a high material efficiency and does not have harmful emissions. Waste management is well regulated within Sabic Europe. At the factory, different waste streams are separated as much as possible and thereafter collected and processed by Van Gansewinkel, waste service company and energy supplier (Van Gansewinkel, 2013). All plastic waste from the production is collected and recycled by Ravago. This company is specialised in industrial plastic waste and produces new raw materials out of waste. (S. Kaasenbrood, personal communication, 16-05-2013)

The plastic production sector does not have a responsibility for causing the problem of marine plastics, according to Mr S. Kaasenbrood. The sector produces plastics but does not have an influence on the throw away behaviour of citizens. Mr S. Kaasenbrood thinks citizens have high responsibility for the problem of marine plastics. The only physical intervention which could be taken by the plastic production sector is acting responsible and minimising pollution as much as possible. Sabic Europe takes this responsibility of prevention. The sector is willing to collaborate and improve its behaviour to decrease the problem of marine plastics. As Mr S. Kaasenbrood said: "Plastic does not belong in the sea". (S. Kaasenbrood, personal communication, 16-05-2013)

Anonymous material conversion company

An in- depth interview with an anonymous conversion company showed that the use of recycled materials for plastic products is well possible. The materials used for its products are mainly plastics received from bottles, seatbelts and airbags. No waste created by the company is lost; the created waste will be collected, separated, recycled at a recycling company and come back to the company to be reused within its products. But the recycling stream does not seem to be reliable enough for the production of pipeline (valves). Pipeline (valves) is not allowed according international regulations, when these are made of recycled materials. The bandwidth of a recycled plastic material is too high to succeed the safety requirements, and is therefore not allowed for pipelines which need to transport gas for example. Also the use of bio plastics made from sustainable organic material is not ready for these kinds of products so far. (Anonymous, personal communication, 14-05-2013)

Many optimisations projects intern are running, where material reduction and cycle time reduction are part of. A material manager is employed to find the best quality streams for the production process and is searching for good suppliers as well, which also produce in a responsible way. A Decree of activities is also applied at the company. (Anonymous, personal communication, 14-05-2013) This decree includes regulations to prevent environmental pollution (Rijksoverheid, 2012) and to create awareness on the impact a company has on the environment. Therefore the company has carried out an intern research on the impact on the environment for each department within the company. Instead of the use of plastic cup, the office switched to cups of glass. Waste streams are all mapped in detail and are also monitored. To save the amount of used materials, reduce costs and to improve quality, a foaming agent is added to the product. Another method to save the amount of materials, is trying to reduce the amount of packaging material to an absolute minimum. Some clients restrict the company to pack certain products before sending. Most of the packaging material exists already out of carton boards instead of plastic boards and the used wrapping foil is as thin as possible. An annual environmental report is published every year to be transparent to the stakeholders of the company. (Anonymous, personal communication, 14-05-2013)

The future of the company will exist of continuous environmentally improvement of products, which is also restricted by the ISO 14001 certificate. The ISO 14001 certificate is a standard which is internationally accepted. The standard outlines how to put an effective environmental management system in place, so during growth the environmental impact will be reduced (British Standard Institution, 2013). This has to do with the weight, the material of the products and where the material origins. Also increasing closed recycling streams and increasing use of recycled material will be considerations for the future. (Anonymous, personal communication, 14-05-2013)

Restrictions to initiate activities on better plastic handlings are not directly present. A business case is needed but it does not always have to be economic profitable when it is environmentally profitable. Investments within the company are also made while not recouping. However, restrictions do occur. It happens sometimes that recycling streams with the right quality are not (frequently enough) available or that the price is too high. (Anonymous, personal communication, 14-05-2013)

Media seems to play an important factor by raising awareness and informing of companies. Due to several articles in journals, papers and on television, awareness about the plastic soup will increase. The power of the media should not be underestimated and could be well used for good purposes. However, the media is often influenced by lobby parties like Shell and Total. These parties try to reduce the media attention for the plastic problem because they benefit when their oil is used for plastic production. Think tanks come up with advices and aspects which can be useful for companies to take over. But also clients do have an influence on conversion companies. Some clients ask for products made out of recycled materials. If companies do not carry out green, the chance they can deliver to large parties is reduced to a minimum. Next to media and clients, laws and regulations restrict companies as well, monitored by an inspector, which keep the companies aware. (Anonymous, personal communication, 14-05-2013)

The influence the company has itself on the plastic lifecycle, is divided in two parts. The first part is the influence upstream, including the suppliers. When suppliers see a company as potential client, the suppliers are mostly willing to invest in new technologies or materials and are in their turn able to realize sustainable aspects upstream. The second part is influence downstream directed to customers. By a returning system due to deposits, the company strives to get back all its materials. But the company is also quite sure that none of its sold products has found its way to the sea. The returning percentage of the products is only 50 % but most of the used products are bought up by third parties and sold again. Other products which are used for other purposes will end up with other waste, and will be separated and recycled by waste management companies. The end of life value is high and there are aspects which can be brought to attention, which the company does by technical marketing. The influence is limited but possible. (Anonymous, personal communication, 14-05-2013)

According the interviewed company, already at the start of the product chain a responsible approach should be taken regarding the production of plastics. There should be no use of micro plastics and harmful plastics and the recyclability of products should be kept in mind as much as possible. That responsibility does the sector have for the contribution to and reduction of marine plastics. But consumers play a large part in the problem of marine plastics according to the company. The manufacturers do create these plastics but do not directly throw it into the (marine) environment. The company indicates not to be directly responsible for contributing to plastic in sea, and especially not due to their returning system and 'green' production process. To prevent the consumer leak, plastic products like the micro plastics should preferably not be made but when this production cannot be prevent, it will be important to close the recycle stream. Large players in the production chain should take the lead in making sustainable changes. Smaller players need to be aware of the problem and the possibilities to change, and should follow the large players within the sector. (Anonymous, personal communication, 14-05-2013)

All stakeholders have their responsibility, whether in contributing to the problem, or in preventive and/or reactive actions to reduce the problem. There are still parties which do not take their responsibility but that is mostly caused due to the costs which are the driving force of most companies. There will be no change if there is too little benefit for the companies. It is not possible for a single company to pioneer, without the other companies to go along. It might lead to bankruptcy of the company. Due to the requirements of the clients, these companies will be forced into changes. The awareness increases and positive actions are initiated within the sector. (Anonymous, personal communication, 14-05-2013)

The main problem is not caused by the Netherlands. The Netherlands are already very aware of recycling and is actively involved in the problem. The main problem areas are countries like China, India, America and maybe Brazil, where no recycling streams are present in a valuable way. These companies should take their responsibility. But before pointing out to other countries, the most optimal results should be achieved in the Netherlands as well. The company says “It would be great when there will be global awareness”. (Anonymous, personal communication, 14-05-2013)

Anonymous packaging company

An interview with an anonymous company from the packaging industry shows that several activities on the field of packaging materials are undertaken. The used materials for the company’s products are glass, plastics and carton. The environmental impact of plastic bottles has been properly researched in the last few years before the company started to use them. It became clear that actions should be taken to continuously improve this impact. At the start of the production of plastic bottles, the recyclability was well considered. Important issue was the willingness of the company not to use virgin materials for its products and prefers a focus on recyclable, reusable and renewable materials. Packaging development is centrally regulated in the innovation centrum, where packaging specialists test new developed alternative materials, including materials which have an environmental perspective. The business cases the packaging specialists develop can be seen as CSR (Corporate Social Responsibility) cases as well. The packaging specialists need to convey the CSR case towards the marketer, to make sure the marketer is aware of the design and the used materials. In search of new materials and opportunities a partnership with another packaging company is running, named the Green Bottle. One of the materials used in the new bottle is ethanol, derived from organic plant material. However, in Europe a discussion (the food for fuel discussion) is still going on about the social consequences of using plants for plastic production. If this happens with materials from underdeveloped countries these plants cannot be used for food anymore and disadvantage people in third world countries, meaning that social consequences are tied to the use of organic plant materials. But the interviewee is not very supportive to the Green Bottle, and strives to a better overall solution; A product which is made out of organic materials and also fully recyclable. The company also tries to reduce packaging material as much as possible and uses recyclable material where possible. However, the economic feasibility and profit are mostly the driving force for sustainable choices instead of the environment. The interviewee indicates that the focus of economic aspects might transfer more towards social aspects in the future, due to the social commitment of people. (Anonymous, personal communication, 13-05-2013)

Restrictions to become more sustainable on the field of packaging are nowadays food safety and quality. These are the most important factors for the company, because products need to be well protected. This protection lies primarily in the material of the packaging what makes the process of replacing packaging materials for other materials complicated. It is important for companies to keep the quality of products to the quality standard. Sustainable packaging might be good for the environment but might lead to bad quality of products and thereby violate the reputation of the company. Recycled and thin packaging material can become very vulnerable, raising the chance on food safety. Reducing the quantities of packaging materials might also lead to other materials which are for example not recyclable. It can conclude that the environmental impact will be larger as the waste now needs to be burned. So it is important to be aware of all consequences when decisions are made. Another restriction is the margin of products. Within the food industry, margins are small so the space for companies to distinguish themselves is not great. When new materials enter the market, companies have to realize whether it is financially feasible or not. Too high product prices or no margins could become crucial for the company. (Anonymous, personal communication, 13-05-2013)

The influence of the company on other stakeholders is not large. It is not a big player on the market and indicated is that it is a restriction in the degree of influencing other stakeholders. To influence successfully, the main player of the chain needs to be reached. The company experience is that it is hard to influence other companies in foreign countries. The interviewee says it is often the ‘take it or leave it’ principle. Regarding the employees of the company, improvements can be made as the awareness of the employees’ increases. Currently the companies’ awareness of the marine plastics issue is not very high. The anonymous interviewee told that probably 80 % of the people even would not know what the problem with marine plastics is. The plastic problem is not a prominent problem for the company itself. Conveying the awareness of the management towards employees is organised independently at each

location. Each location is allowed to organise their own conditions based on laws and regulations. (Anonymous, personal communication, 13-05-2013)

Next to the possibility to influence, the company itself experiences external influences as well. Customer reputation is very important to the company and consumers are therefore very important in influencing packaging companies by for example the packaging design. But the company indicates that consumers are not much aware of the environmental aspects of a product and only care about the price and do not send out any other signals. As citizens, people are aware of environmental problems and are involved. However, companies have to take the initiative with sustainable business cases. Also legislation and regulations affect the packaging sector. The European Directive of Packaging sets guidelines for all countries and each country has to implement these in its own laws. The organisation of that process lies with each country. In the Netherlands, these regulations are formed in the Framework Packaging agreement, which is concluded by all stakeholders of the packaging stream. A packaging institute is created to carry out researches in cooperation with several universities. All companies within the Netherlands are required to do an annual statement of all used packaging materials. The last influence comes from other companies and countries. Due to the 'best practices' principle can be learned from colleague companies and countries. Measures which were successful by these parties might be applicable for other companies as well. (Anonymous, personal communication, 13-05-2013)

The responsibility the packaging sector has is indirect. But the anonymous company finds it important to collect and reuse plastic materials and considers itself responsible for taking care of that aspect. 'Prevention is better than solving', says the anonymous interviewee, 'and make sure the used materials are recyclable'. All stakeholders contribute to the aspect of prevention but improvements are always possible. The importance lies with the need for all involved parties to contribute and positive energy should be created. (Anonymous, personal communication, 13-05-2013)

FWS

FWS (Dutch organisation soft drinks, water and juices) is the umbrella organisation for the entire soft drinks sector, with main task to represent the interests of different stakeholders. To meet this task FWS creates, for example, agreements with municipalities and the Ministry of Infrastructure and Environment to find the balance between different interests. An important aspect is the Framework Packaging agreement. Recently the agreement is signed for the next ten years by the packaging sector, municipalities and the Ministry of Infrastructure and Environment for collaboration to close the chain of plastic materials. Therefore the whole industry needs to meet agreements, like a certain amount of plastic collection; a minimum use of 25 % recycled plastic in new plastic bottles; no free plastic bags in supermarkets; etc. FWS its code of conduct is another example for its role in the society, which includes all aspects for both environmental and social sustainability. Large steps are taken within the packaging sector in the last few years, like a high weight reduction of plastic bottles, higher percentages of recycled plastic materials and no PVC is used anymore. Cost considerations are the main driving force to economize and have often positive effects for sustainability. Fossil raw materials become more expensive and recycled plastic materials are relatively cheap. But European legislation sometimes constraints further improvements of sustainable packaging and cost reductions. The legislation protects PET producers within Europe from the PET produced and collected in Asia. When the legislation would be abandoned, much more PET would be available and the prices would be much lower. But the European Union is afraid for bankruptcy and unemployment of its own producers. For the purchasers it would be very attractive and there would be a lot of recycled PET available, leading to possibilities to work with 100% recycled materials. This leads to tensions between PET producers, PET purchasers and PET users, which is currently a limiting factor. Other limiting factors are the need for continuity of businesses and therefore the need of business models which include a payback time of the investment costs; environmental benefits are often abstract for businesses in case of money; and the choice for materials of the packaging is a marketing and commerce, and food safety case as well. (T. Juriaanse, personal communication, 06-05-2013)

The packaging sector becomes more aware of the problem of marine plastics since there is more attention for the subject due to, for example, environmental organisations and the umbrella organisation like FWS at European level. The sector is mainly influenced by these two parties because these have the most concrete information and legislative proposals. The packaging sector is influenced by activities in its surroundings as well. Environmental

organisations, the government and consumers have an image of the sector because of the packaging of products. A good reputation is important for packaging companies. The companies want their consumers to associate its products with something delicious, and not with litter. Therefore the sector wants to show it produces responsible products and it is working on environmental cases seriously. This could be achieved by the European PET bottle platform, established by the industry. The platform aims to evaluate technologies and products, to permit innovations on new PET bottles for the PET recycling industry in Europe, while reducing environmental and economic impacts (EPBP, n.d.). Reuse and recycling is important to close the plastic life cycle as much as possible; a product chain with high quality in the future in which a minimum of new materials are needed. (T. Juriaanse, personal communication, 06-05-2013)

According to Mr T. Juriaanse (Manager Sustainability and Supply Chain Management at FWS) shared responsibility for the problem of marine plastics lies with the entire plastic product chain, including the packaging sector. But the main responsibility for causing the problem lies with the behaviour of consumers. Waste management is very important as well for closing the plastic lifecycle. The waste management system in the Netherlands is relatively well organised but there are large global differences which is a major part of the problem. It is important to find the cause of the problem, what the contribution of all actors in the plastic product chain is to the problem, including the packaging sector and other sectors. The packaging sector takes its responsibility for the problem of marine plastics by collaboration and acting according to the Framework Packaging agreement. Making agreements are important to make a change, since the packaging sector is a leader in the life cycle of plastic. Major brands are important in driving innovation, as they strive for positive associations with their brand. For FWS, support from members, as well as good cooperation with other stakeholders and actors within the plastic product chain is required to be able to implement any type of measures regarding packaging. (T. Juriaanse, personal communication, 06-05-2013)

Jumbo

Supermarkets deal every day with plastics in terms of packaging and plastic bottles. Plastic bottles are the largest part of plastics at supermarket Jumbo. A large amount of plastic bottles are returned to supermarkets. The supermarket concern Jumbo takes in all returnable deposit bottles, including the bottles originating from any other supermarket. The return of deposit bottles to supermarkets takes time and money by the work it entails. But it relieves the environment as the bottles will be recycled. For this reason, Mr B. Degenhart (entrepreneur of Jumbo Leens) thinks the abolition of returnable deposit bottles is not the best initiative. The head office of Jumbo, located in Veghel, imposes requirements for products and packaging methods within the supply chain. Jumbo Veghel is currently working on the Jumbo's own brand to make products and packaging more sustainable, and can influence producers of major brands as well. Next to the influence Jumbo can have on stakeholders, stakeholders can have an influence on Jumbo as well. Jumbo operates based on seven certainties where the desire of the consumer comes first, meaning consumers have a big influence on the sustainability of the company. Sustainable products are often more expensive and this price difference needs to be paid but most consumers are not willing to do so. The entire process is a combination of manufacturers, suppliers and consumers. (B. Degenhart, personal communication 13-05-2013)

Although Mr B. Degenhart does not experience trouble of the plastic problem within the supermarket, he is aware of the problem of marine plastics because he fears for the future of next generations. There is currently no exchange of the awareness of the management to the employees since the supermarket is just owned by Mr B. Degenhart but when all other aspects are set, he is willing to involve his employees with the awareness as well. There are several activities related to plastic within Jumbo, where employees are already aware of. All plastic consumed in the Jumbo at Leens, like plastic bags, are biodegradable. Each Jumbo supermarket contains a bin where consumers can leave their plastic bags so other consumers can re-use these. If consumers want to buy a new plastic bag they have to pay 10 euro cents. This stimulates them to take their own bag or to use the used-plastic bags. Jumbo communicates its sustainability policy to consumers but it is hard to influence their behaviour, especially outside the supermarket. In the opinion of Mr B. Degenhart, the responsibility for causing the problem of marine plastics lies mainly at the consumers who need to deal with plastic in a responsible way. The entire population is responsible for the environment they live in, and for causing and reducing the problem of marine plastics. Jumbo and the whole sector take their responsibility. Supermarkets have to deal with thousands of consumers weekly, so they need to know how to deal with the environment. One supermarket does not have influence on reducing the problem but when the

whole jumbo concern cooperates, a large distribution on awareness and a reduction of the problem can be made. Jumbo Veghel is working on processes and sustainability cases every day by, for example, talking with stakeholders like manufacturers. Mr B. Degenhart discusses with waste management stakeholder Sita about the method to deal with waste, so the best method for waste management will be achieved. Different waste streams are separated within the Jumbo in Leens; organic waste, residual waste, plastic and cardboard. The separation of waste is an on-going process. (B. Degenhart, personal communication, 13-05-2013)

Ekofish Group

Ekofish Group, a Dutch flatfish fishing company, is aware of the problem of marine plastics and is highly involved with sustainability. The company received the first MSC (Marine Stewardship Council) certificate within the Netherlands but nowadays 75 % of the fishing companies are MSC certified. Ekofish Group collaborates with environmental organisations and research institutes like Wageningen University to find solutions to environmental cases. The company also possesses a training ship for young, future fishermen and tries to educate these future fishermen on the subject of marine litter. However, more action could be taken. The young generation needs to be faced with their behavioural activities regarding litter and education about marine litter is very important for the young generation to make them more aware of the problem of marine plastics. But conveying their awareness to other colleagues seems an obstacle. Colleagues will often not accept advice and comments on the subject of marine litter by a colleague fisherman, which might lead to a bad reputation of the Ekofish Group among fisherman. Processes of awareness need to be implemented by an outsider. Pro Sea, for example, is working on marine education and awareness. Mr J. de Boer (Captain PD147 Enterprise, Ekofish Group) would like to take more actions and measures but the societal support is little. (J. de Boer, personal communication, 22-04-2013)

On board, the caught fish is stored in trays. When the fish has been landed, the fish will be packaged in packaging prescribed by supermarkets. Collaboration with supermarkets will be useful to influence the method of packaging and to stimulate more sustainable packaging. The fishing sector itself is mainly influenced by consumers. When consumers ask for sustainability, the fishing sector is willing to comply; when consumers do not want sustainable products, nothing will change and improve. Government parties are not influencing the fishing sector on a way that will improve behaviour of companies. More regulations and laws are not a solution for the problem. (J. de Boer, personal communication, 22-04-2013)

Just like the shipping sector, fishing companies have to describe their waste handling in a Garbage Management Plan as well. Ekofish Group is acting regarding the regulations but indicates it is hard to separate waste on board due to the limited space. Only chemical waste is separated from residual waste and returnable deposit bottles always return to the supermarket. The company also indicates that very little plastic waste is produced on board. According Mr J. de Boer, waste disposal is not well regulated at most ports in the Netherlands. In most ports, the costs of waste management facilities are not included in the port charges and fishing vessels have to pay a several hundreds of euros for releasing their waste. MAIN (Maritime Waste Collection Netherlands) collects maritime waste, like unused fuel but does not collect residual and separated plastic waste. Caught waste is retained on board and released upon arrival in the port. When fishing companies have to pay to release the caught waste, they are not willing to retain it on board anymore. Through to the Fishing For Litter project, deposit of caught waste is free of charge, including old fishing gear. (J. de Boer, personal communication, 22-04-2013)

Ekofish Group does not undertake negative material problems from plastics in sea, just like Amasus Shipping B.V.. While sailing on some shipping routes, a lot of floating plastic bottles is seen by the crew and each catch contains several plastic bottles as well. Besides, Mr J. de Boer mentioned that paint residues and its cans are a large problem for the marine environment. Sometimes fishing nets got stuck in the propeller, most of the time caused due to own mistakes. When the fishing net is released from the propeller, the net is taken on board. Most fishing companies use orange rope to protect fishing gear against abrasion. The orange rope wears off, unravels and disappears into sea. Sometimes fishing gear is also lost due to a large rock for example but this gear is often fished by other fishing boats and brought ashore again. (J. de Boer, personal communication, 22-04-2013)

According Mr J. de Boer, the fishing sector is not responsible for creating and reducing the problem of marine plastics. They consider themselves only responsible for the loss of fishing gear at sea. The responsibility the fishing

sector is willing to take regarding the contribution to reducing the problem lies with catching waste and bringing it ashore. An opportunity could be to deploy the fishing sector for this duty, according Mr J. de Boer. The sector is currently working to be more sustainable on several subjects. Restrictions for other colleagues and stakeholder sectors are needed at a certain stage, for example for the manufacturing sector. Mr J. de Boer also indicates the problems regarding marine litter in other parts of the world; 'What is normal in some parts of the world, might be all but normal in other parts of the world'. It will take time to create awareness all around the globe. Ekofish Group takes its responsibility for the problem and the whole fishing sector is gradually working to sustainability but improvements can always be made. (J. de Boer, personal communication, 22-04-2013)

Amasus Shipping B.V.

International policy and regulations for the shipping sector are established by the International Maritime Organization (IMO). The organisation, part of the United Nations, is responsible for the prevention of marine pollution by shipping and the security of shipping (IMO, 2013). Some countries apply the regulations of IMO itself, other countries make their own regulations based on the IMO regulations. The national law of the Netherlands obligates Dutch vessels to have a Garbage Management Plan on board. A shipping company has to describe their waste handling in the Garbage Management Plan, linked to the framework of existing legislation. Within the law, it is allowed is to dump organic waste overboard beyond 12 nm, except special areas like the Nord Sea. Prohibited is to dump any kind of waste within 12 nm from land. Shipping companies will get the International Safety Management certificate when these are acting according the law. The purpose of the International Safety Management certificate is to afford an international standard for the safe management of ships and to prevent pollution (IMO, 2013a). All shipping companies sailing under the Dutch nation flag possess the International Safety Management certificate. The conditions of vessels and the compliance with regulations are inspected by the Port State Control and recorded in a central data base (IMO, 2013b). (H. Melles, personal communication, 17-04-2013)

Within the framework of the national law, a Quality, Health, Safety and Environmental (QHSE) policy is implemented by Amasus Shipping B.V., to obtain and retain the International Safety Management Certificate. The QHSE manual, in which the behavioural activities and the procedures are described, is used on board by the crew. Posters with information about waste management are on board to make the crew continuously aware. The behavioural activities of the crew are supervised by the office, so improvements on the waste management can be implemented when needed. (H. Melles, personal communication, 17-04-2013)

Amasus Shipping B.V. strives to separate waste in appropriate containers. The crew on board is responsible for the waste separation but there is little insight in the effective compliance of the crew members. The crew members also keep track on the storage capacity for waste. Waste compactors are available on some vessels to increase the storage capacity. The waste is retained on board and released upon arrival in the port. No waste is dumped overboard but it is hard to prevent small accidents like the loss of small pieces of waste. There are currently no plans for further improvements for waste management on board of the vessels, due to the limited possibilities on a vessel. The waste disposal in ports is well regulated nowadays. The costs of waste management facilities are included in the port charges. A record should be maintained to keep track of what waste is retained on board and what is released upon arrival in the port but there is not much compliance on this regulation. (H. Melles, personal communication, 17-04-2013)

Amasus Shipping B.V. is aware of the environment and the problem of marine plastics in general but there is not a specific point of view regarding plastic litter. "Balance between nature and economy is very important to us. Having the most little impact on the environment, is a responsibility you take as ship owner from an environmental point of view, also regarding plastics", says Mr H. Melles (fleet manager at Amasus Shipping B.V.). The company does not undertake negative problems from the plastic in sea. Only once a large fishing net got stuck on the propeller of a ship near Africa but this net got released by drifting and found its way back to sea because it was too heavy to take it on board. The economic position of the company is leading whether environmental related measures are implemented or not. But on a certain point, laws and regulations of governments obligate companies to implement the, then applicable, measures. The shipping sector is mainly influenced by the government since the government makes the industry aware of the environment by laws and regulations. The customers of shipping companies are influencing the

sector as well by having requirements on sustainability and looking for a responsible company with quality. (H. Melles, personal communication, 17-04-2013)

The whole shipping sector has a certain kind of responsibility regarding the plastic problem since the sector makes use of the environment. This is why the sector needs to act responsible and to minimise pollution as much as possible. Amasus Shipping B.V. takes its responsibility by the compliance of the Garbage Management Plan and the QHSE manual. The whole shipping sector contributes by trying not to increase the plastic problem. (H. Melles, personal communication, 17-04-2013)

Van Gansewinkel

“Waste does not exist” is the message of Van Gansewinkel, waste service company, raw material and energy supplier (Van Gansewinkel, 2013). Van Gansewinkel is working on closing the life cycle of waste through Cradle to Cradle. Van Gansewinkel works on recycling of technical plastic materials within the subsidiary company COREC. Van Gansewinkel collects waste from municipalities and transfers it to sorting stations of Nedvang. Currently, waste from households is not recycled and goes to incineration plants, including the not separated plastics. Van Gansewinkel works on a project to receive and recycle more plastics out of household waste by the process of a profitable post-separation plant. The project takes several years to complete. But garbage is cleaner and has higher quality when separated at the source. The disadvantage of separated plastic is the high logistical costs because it is not possible to collect a high weight amount of plastic waste at once, which consideration has to be made. It is hard to separate household waste but techniques are improving and businesses are changing through packaging which makes it easier to remove plastics by post-separation. Van Gansewinkel motivates companies to separate their waste by placing special containers for each kind of waste, which reduces the amount of residual waste. Plastic is divided in seven groups of different plastic materials. These plastics need to be separated as well since all materials have different melting characteristics. The quality of plastic materials must be maintained during the recycling process to produce new products with high quality. Van Gansewinkel stimulates the plastic industry to reuse plastics and other raw materials. By stimulating the industry, Van Gansewinkel helps the industry to close the life cycle of plastic. In the field of (marine) litter, Van Gansewinkel is involved in several litter campaigns. Van Gansewinkel is participating in a project of the Dutch Polymer Institute (DPI) together with Stichting De Noordzee and industrial partners like Sabic Europe. The aim of the project is to find the source of the problem of marine plastics following by closing the lifecycle of plastic. (A. Bolt, personal communication, 02-05-2013)

The employees of Van Gansewinkel are environmentally aware since the company is working on environmental services and also due to the environmental subjects the employees are working on and which they convey to society. At the office, the different waste streams are collected separately in the appropriated bin which is a product of EcoSmart, part of Van Gansewinkel Group B.V.. Van Gansewinkel is aware of the problem of marine plastics. In 2011, Van Gansewinkel was asked by radio- and television broadcaster VPRO to participate in the episode of ‘Beagle, in the wake of Darwin’ about plastics and marine litter. Boskalis participated to investigate how to extract marine litter out of the sea and Mr A. Bolt (project manager at Van Gansewinkel Group B.V.) went for four weeks on the ship to investigate how the extracted marine litter could be processed. During the journey, he realised it is an enormous problem which will become even larger when no action will be taken. Plastic seems to be everywhere which makes it not achievable to clean the ocean. Prevention due to a correct waste management system, and raising awareness by education about recycling, are necessary to prevent the increase of marine plastics. Research on the problem is very important as well. “Throw away behaviour causes the problem of marine litter, it is a social problem”, says Mr A. Bolt. (A. Bolt, personal communication, 02-05-2013)

According van Gansewinkel, the waste management sector is not responsible for causing the problem but is willing to take responsibility as far as possible for reducing the problem by sharing their knowledge and as long as it is a business case. Laws and policies stimulate the separate collection of certain waste streams. The main obstacle is the economic feasibility. Van Gansewinkel is influenced by the media, for example; ‘cradle to cradle’ emerged within the company due to an episode of radio- and television broadcaster VPRO about the ‘cradle to cradle’ system. Van Gansewinkel is able to influence their customers, to encourage them to use recycled materials for their products. This already happened with the Senseo device of Philips. (A. Bolt, personal communication, 02-05-2013)

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