

# Legal remedies against the plastic pollution of the oceans

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## 8 Valorisation Addendum

This section aims at fulfilling the provision under article 22.5 of the Regulation governing the attainment of doctoral degrees at Maastricht University. The valorization addendum briefly discusses relevance, target groups, products, innovation, and implementation of the thesis, in a “process of creating value from knowledge by making knowledge suitable and/or available for economic and/or societal use and translating that knowledge into products, services, processes and entrepreneurial activity”.<sup>712</sup>

1. **Relevance:** What is the social (and/or economic) relevance of the research results, in addition to the scientific relevance?

The increasing amount of plastics being released into the environment, and specifically into the oceans, is alarming and with severe consequences for nature and for humankind. Plastic pollution is already the largest environmental harm caused by humankind,<sup>713</sup> together with climate change. Data are alarming, with estimates that at least 8 million tons of plastic end in the oceans yearly, and that, if the pace continuous, by 2050 there will be more plastics than fishes in the oceans.<sup>714</sup> Nevertheless, the production of plastics not only keeps increasing, at a growing rate, but it also increases faster than the world population growth.<sup>715</sup> Many impacts of plastic pollution, especially on human health, are still unknown. However, research already shows that we are eating,<sup>716</sup> drinking,<sup>717</sup> and even breathing<sup>718</sup> plastics. Besides, nature is suffering in countless ways, such as animal deaths by starvation and entanglement,<sup>719</sup> destruction of coral reefs,<sup>720</sup> transportation of invasive species,<sup>721</sup> and the spread of toxic materials.<sup>722</sup>

The legal field may contribute towards a solution on different levels, such as national, regional, and international, and from different perspectives of the problem. This thesis deals with the international approaches and the possibilities for a mix between public and private initiatives to address the problem of the plastic pollution in the oceans (or plastic soup), both from recovering the plastics that are already there and from preventing further pollution from entering the oceans.

The thesis has, therefore, social, environmental and economic relevance – for consequences as well as for potential solutions –, in addition to its scientific relevance. Socially, there is the need to prevent and mitigate the adverse consequences of the plastic pollution, such as the effects on coral reefs which destroy the earning sources of many families, or the pollution that reaches beaches and poses a risk to leisure and sports, or even on the most basic aspects affecting human health. Environmentally, the impacts are numerous on nature as a whole, but mainly leading to the death of animals by starvation or entanglement. Economically, the impacts are not only the effects of social and environment problems raised, but also the issues involved in the production-consumption logics, and the costs that will come with transitioning to less plastic and/or to a circular economy. From the three dimensions of relevance, comes the urgent need for science to deal with the problem, and, therefore, the importance of the contributions of the thesis lies mainly in the legal field, which is only starting to look for solutions for the plastic soup.

<sup>712</sup> Rathenau Institute (2016).

<sup>713</sup> Parker (2018).

<sup>714</sup> Valavanidis and Vlachogianni (2014).

<sup>715</sup> Andrady (2017, p. 13); Plastics Europe (2016a. p. 1); World Bank (2017).

<sup>716</sup> Haffner (2009).

<sup>717</sup> Carrington (2017).

<sup>718</sup> Vianello (2019).

<sup>719</sup> De Guchte (2005); Tekman, Gutow, and Bergman (2017).

<sup>720</sup> De Guchte (2005).

<sup>721</sup> De Guchte (2005).

<sup>722</sup> Haffner (2009).

In such a context, I conducted the research in four intermediate steps until arriving at the answer to the research question.

The first step was understanding the current status of the plastic pollution in the oceans and which potential technical and technological solutions are being developed. The overview allowed an indication of the data to be prioritized when moving towards solutions, for instance: (i) 80% of the plastic ending in the oceans comes from land-based sources; (ii) packaging answers for 26% of the volume of plastic used; (iii) 50% of the plastic produced is used only once; (iv) there are methodologies already available to prioritize action; (v) attempts and partial solutions seem to be emerging everywhere – geographically and from public and private initiatives – although they are still far from solving the plastic soup; and, consequently, (vi) it is necessary to have further investments in research, technology, and innovation, for the development of solutions involving all stages that lead to the plastic pollution of the oceans, as well as to recover the tons of plastics that are already in the oceans; and (vii) the main issues vary, depending on the country where the pollution originates, especially between the so called developing and developed world.

The second step was to clarify the importance of international action, even for preventing further plastic pollution and to highlight aspects to avoid common pitfalls in the North-South world dynamics. From there, the third step was to analyze the eleven international instruments – such as conventions, protocols, and agreements – that somehow relate to the plastic pollution problem. It made clear that no international law, neither hard law nor soft law, yet provides convincing solutions. That, together with the fact that private companies are directly and closely related to the problem, is the reason why the fourth step was to look at Corporate Social Responsibility (CSR) and other private initiatives to face the plastic soup.

This fourth step was made through four case studies: (i) the New Plastic Economy, which is, in summary, a compromise from several multinational companies to tackle the plastic pollution problems; (ii) the Dutch Deals, that have been in place in the Netherlands for several years and consist of a voluntary partnership between the government and private actors to solve environmental problems, and that already have some examples related to plastics; (iii) the Dow Jones Sustainability Index, which evaluates companies in the stock market based on a few socio-environmental indicators; and (iv) companies reporting in general. It concluded that none of the four cases succeed in all of the indicators of effectiveness. The one showing better results in such an assessment is the Dow Jones Sustainability Index, which is, however, not yet considering plastics in its assessment. Nonetheless, it also concluded on many positive aspects of those actions and why companies would indeed engage in the fight against the plastic soup, being mainly: (i) public relations and marketing; (ii) attracting investments; (iii) choice on how to act towards change; (iv) influence on policy-making; and (v) achieving financial benefits or incentives.

The fifth step was, then, the final one. I applied economic tools to analyze the previous conclusion. It made it possible to summarize lessons learned into two aspects that may guide an effective start on how to construct a mix between public and private initiatives to face the plastic pollution in the oceans: (i) prioritizing sources and emissions to be addressed; (ii) enhancing the roles of governments, companies, and civil society. It finalized proposing a mathematical, objective, approach for applying the conclusions to the practical challenges, through a simple equation. Finally, the economic analysis allowed the identification of three basic needs to construct a mix of private pathways and public international regulation to face the problem of the plastic pollution of the oceans: (i) to involve States, companies, and civil organizations, and to potentialize the roles that each of them play best; (ii) to establish priorities by applying the mentioned equation; and (iii) when using instruments from public international law, to both: a. Choose structures that are already functioning, when available – such as UNCLOS, the London Convention, GPA or Agenda 21 –, instead of creating new ones; b. Consider the lessons learned: address all sources of plastic pollution and integrate ecosystems; establish guidelines, targets, and indications; foresee reviewing and compliance mechanisms; strengthen technical, scientific, and financial resources; clarify economic impacts; and gather and interpret data and information.

**2. Target groups:** For who, outside academic circles, are the research results of interest and why?

Because of the broad repercussions of the issue, the results of the research may be of interest to several circles. Its intended target groups, outside academic circles, are mainly international policy-makers, companies, and NGO's, since it addresses the roles which each of them are playing and which they may have in constructing a regulation mix.

To what concerns international policy-makers, the conclusions actually give the steps, by indicating not only which factors have to be taken into consideration, but also how to prioritize among the several different possibilities of action. Other groups may also benefit from the research outcomes, especially in the regulation levels not addressed by the thesis – such as national and regional – and for who the conclusions may be adapted. For instance, national governments may adapt the conclusions to the local context when setting priorities, designing policies, and dialoguing with national companies – or with international companies based in their countries.

The same can be done by companies themselves and by civil society. By addressing the findings of the thesis, companies could learn how CSR may be implemented and how they may benefit themselves from contributing to preventing further plastic pollution and from contributing to the clean-up of plastics. Also, they could learn how to do so by being leaders, instead of laggards, which is essential in a competitive market.

Other than that, individuals may be impacted, mainly by raising awareness of the subject through the data regarding the amount and the consequences of the plastic pollution. Additionally, by understanding their critical role in changing daily habits and by organizing themselves to act in a broader picture. In that sense, understanding of the roles of governments and companies is also critical, because individuals and civil organizations have an important role to pressure them towards action.

Finally, it is interesting to note that one of the reasons for choosing the Law and Economics methodology – apart, of course, from its scientific adequacy – is to facilitate communication with the business sector, which is more familiar with the economic language than with other scientific approaches.

**3. Activities and products:** In which actual products, services, processes, activities or commercial activities can the research results be applied and given shape?

The main application is, naturally, in public policy-making, which may be guided by the results of the research. However, commercially speaking, the research results may help leading-companies in shaping more sustainable policies, even by reaching out to governments to initiate joint efforts and by trying to diminish the costs of implementation and to shape common solutions.

In a general perspective, the results of the research are meant to be applied in – mainly legal – activities and products directed at preventing further plastic pollution and diminishing the plastic soup. As well as legal solutions to enable financing for the efforts for cleaning up the oceans from the already existing plastic pollution.

The thesis also already presents a final product by itself: clear approaches, indications, and steps on how to build a mix of public regulation and private initiatives to fight the plastic soup, in a process preferably orchestrated by governments, but with horizontal contributions also from companies and civil society. In that sense, the equation and the clear steps provided are a finished product, ready to be implemented.

**4. Innovation:** To what extent can they be called innovative compared to the existing range of products, services, processes, activities and commercial activities?

The thesis brings different innovative perspectives. Mainly, it addresses a legal approach towards a comprehensive solution for the plastic pollution in the oceans, which, to the best of my knowledge, has not been done so far.

An important innovation brought by the thesis is the careful distinction between the incentives and instruments that may prevent further plastics from going into the oceans, and the actions regarding the recovery of the millions of tons of pollution that are already there. With this, the thesis makes it clear that *ex ante* and *ex post* need different, and integrated, instruments at different levels to be effective. More than that, the thesis indicates possible ways to analyze such effectiveness and indicates by which instruments and which approaches to begin the international fight against the plastic pollution in the oceans.

Finally, the conclusions of the thesis – indicated in topic number 1 of this valorization addendum – are, of course, innovative. They bring a clear final product: the steps indicating how to build a mix of public regulation and private initiatives to face the plastic soup.

**5. Planning & Implementation:** How will these valorisation plans be implemented? What is the schedule, what are the possible risks, what are the market opportunities and what are the costs?

The innovative character of the analysis of the thesis means that there are costs and risks involved in implementing the discussed changes. However, these are costs and risks related to market opportunities, for companies, and to enhancing social and environmental balance, for governments. In other words, they are the regular costs for sustainable innovation.

Unfortunately, this also means that these are costs that are difficult to convince companies that they should incur. The companies that could contribute the most with diminishing plastic production and, consequently, plastic pollution, are those whose products are highly dependent on plastics but, at the same time, could be replaced by a different material that is already available. To illustrate, we can take the example of the beverage industry, which could replace plastic bottles by glass ones or even new materials, as the edible packaging described in the research. However, the bigger corporations, such as Coca-Cola or Nestlé, for example, are not willing to do so on a large scale anytime soon, because of the costs that it would require for the production. Actually, they are, so far, not even willing to provide information and data regarding their contributions to the plastic chain.

On the other hand, the thesis demonstrates that it may be interesting for companies to join efforts on the prevention of further plastic pollution. From the four case studies of private initiatives, it summarizes five main reasons why companies would engage, as already described in the topic number 1 of this valorization addendum. In addition, the thesis makes clear that the role of government and civil society is essential so companies truly act, jointly with States setting the goals and the pace for implementation.

The costs to recover the millions of tons of plastics that are already polluting the oceans are also huge. In this case, they even include, necessarily, investments in research to develop technology for such cleaning, as well as for making profitable use of the recovered plastics. In that case, public regulation plays a larger role, for example, enabling funding and collaborating with legal solutions – such as property rights or flags to vessels. Private initiatives are of course also welcomed, mainly by (partially) financing research and actions from civil society, as happens with The Ocean Cleanup Foundation. All of that is also discussed in detail in the thesis.

Regarding timing and schedule, most of the actions could start immediately, although involving plans of short, medium, and long terms. The results, on the other hand, will mostly take longer to be

achieved, which is the main reason why the actions should be initiated immediately to face such an urgent matter. Feedback and constant assessment of the actions implemented are essential, and those come afterwards, mostly with medium and long terms planning.