

**SHOULD SEAS HAVE STANDING? A CRITICAL STUDY OF PLASTIC MARINE  
DEBRIS AND POLLUTION LAWS IN INTERNATIONAL AND SOUTH AFRICAN  
LAW**

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This dissertation is dedicated to **God**, my parents **Neville** and **Vijay Naidoo**, my 'parents' **Dr Rajen** and **Mala Thejpal** and to my *anna* **Kamalesh Naidoo**.

## DECLARATION

I, **RUCHIR NAIDOO**, declare that

The research reported in this dissertation, except where otherwise indicated, is my original work.

This dissertation has not been submitted for any degree or examination at any other university. This dissertation does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:

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## ABSTRACT

Historically, the ocean was considered to be inexhaustible and impervious to harm. However, we now find the oceans to be susceptible to such harm and in a fragile state as a result of anthropogenic influences. Ocean pollution is predominantly due to land-based marine pollution (about 80%) and the lion's share is due to plastics. Plastics, although convenient and cheap, have costly environmental effects. These are associated with their persistence, non-degradability, toxic potential and their devastating physical impacts on the marine ecosystem. The primary research approach for this dissertation has been a literature review which included the use of electronic databases and secondary sources available in libraries. This dissertation critically analyses the adequacy of international and national legislation in addressing the contentious modern issue of plastic marine debris and land-based marine pollution laws. Specific attention is paid to how international legal developments influence the form and nature of national statutes relating to marine pollution. In this analysis an evaluation of several law/policy developments is presented and comments are made pertaining to their various social, economic and political aspects. The limitations identified include the limited jurisdiction over dominant sources of plastic pollution, the lack of enforceable standards and enforcement mechanisms. The research findings show that South Africa contributes to the growing problem of plastic marine debris and that, in spite of the National Environmental Management: Integrated Coastal Management Act 23 of 2008 being a specific statute for the protection of South Africa's coasts and oceans, plastic marine litter continues to find its way into the ocean and there are no specific regulatory measures in place which address this problem. A major flaw in the Act is that there is no legal definition for land-based marine pollution or marine litter included. As an interim measure it is suggested that the Act should be amended to accommodate such concerns. The African Marine Debris Summit in 2013 and the Green and White Papers on the National Environmental Management of the Ocean are examples of recent policy developments; however, there are no measures in place concerning implementation. The study notes the need for refinement of existing statutes and, recognising the protracted time period it takes to develop binding statutes coupled with the progressive worsening of this problem, concludes that there is a desperate need for interim measures to be taken.

## CHAPTER ONE:

### GENERAL BACKGROUND

#### 1.1 Background

In 2012 alone, 280 million tonnes of plastic had been manufactured globally. However, less than half of it had been recycled; the lion's share of the remainder litters the earth, often finding its way into our oceans.<sup>1</sup> With the continuing rise in human demands coupled with unsustainable practices, it is estimated that by 2050 the planet will host a further 33 billion tonnes of plastic.<sup>2</sup> This poses a significant threat<sup>3</sup> to the marine environment that historically has been ignored.

Scientific studies have concluded that approximately 80 percent of marine debris consists of land-based plastic waste.<sup>4</sup> There is a growing trend of inherently 'wicked problems'<sup>5</sup> such as 'garbage patches'<sup>6</sup> being found within the world's oceans, which have been linked to having significantly adverse impacts on the water quality, marine life forms and ultimately humans.<sup>7</sup> The seas thus face uncontrolled consequences with potentially irreversible harm in the near future.

Globally, measures have been taken towards addressing the aforementioned problem. Nationally, South Africa's legislative stance towards this issue remains somewhat obscure. However this has been recognised as a global problem that needs to be tackled at a national level. Recent developments such as the African Marine Debris Summit in 2013<sup>8</sup> exemplify some of the initiatives already taken in this direction.

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<sup>1</sup> C. M Rochman & M.A Browne, 'Policy: Classify plastic waste as hazardous', *Nature*, Vol 494, 2013. P169.

<sup>2</sup> Ibid. P169.

<sup>3</sup> A threat to the health of the eco-system and varying life forms sustained by same.

<sup>4</sup> O. Goldberg, 'Biodegradable Plastics: A Stop Gap Solution for the Intractable Marine Debris Problem', *Texas Environmental Law Journal* Vol 42, 2012. P311.

<sup>5</sup> "A problem described by Hastings as one that is dynamic, trans-boundary, difficult to define and solve due to its complex nature "E. Hastings & T. Potts, 'Marine Litter: Progress in developing an integrated policy approach in Scotland', *Marine Policy*, Vol 42, 2013. P50.

<sup>6</sup> "Garbage Patches" in this context refer to vast accumulations of plastic marine debris in the ocean, as a result of pollution and ocean currents. Reports have indicated formations of such across the sea-board, such as the Pacific Ocean and in recent times in South African waters.

<sup>7</sup> J. R. Coulter, 'A Sea Change to Change the Sea: Stopping the spread of the Pacific Garbage Patch with small scale environmental legislation', *William and Mary Law Review*, Vol 51, 2010. P1963.

<sup>8</sup> Available at: <http://www.marinelittersolutions.co.za/our-projects/african-marine-debris-summit.aspx> (Accessed 13 May 2014).

While there are laws concerning the pollution of the marine environment, there is a need for legislation aimed particularly towards reducing the influx of plastic marine debris. This dissertation considers recent legal and policy developments.

### **1.1.1 Statement of Purpose**

The toxic impacts that plastic marine debris has on the marine environment undermine the South African constitutional right to access to an environment which is not detrimental to human health.<sup>9</sup> The purpose of this study is to investigate the issues of plastic marine debris and critically analyse the legal mechanisms aimed at alleviating this problem, at both international and national levels. In consideration of both the adequacy of same and the potential need for transformation, through critical analysis of past and present practices, insight shall be gained into what might be best practice for the future. This review is done in the context of South Africa's ambitions as a developing nation and the environmental responsibilities it has assumed.

### **1.1.2 Rationale**

The research for this paper critically explores the rationale for a national change in approach to plastic marine debris and pollution. Specifically this paper aims to shed new light on this approach by critically analysing old practices. Research will include critical examination of the National Environmental Management Act (NEMA);<sup>10</sup> highlighting its positive and negative aspects and an evaluation of South Africa's commercial needs as a growing developing nation against their responsibility to protect the marine environment.

The ultimate objective is to inform readers, as to whether there is a need for South Africa to adopt a new national structure towards plastic manufacturing, reducing the influx of land based plastic sources into the marine environment and to provide a sound conceptual framework of Attention will be placed on South Africa's policy papers<sup>11</sup> on ocean governance at a national level, and their potential to enhance this governance by membership of emerging international agreements that are focussed on plastic marine debris.

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<sup>9</sup> Section 24 of the Constitution of the Republic of South Africa, 1996.

<sup>10</sup> National Environmental Management Act 107 of 1998 (NEMA).

<sup>11</sup> See respectively:

Green Paper on the National Environmental Management of the Ocean, Published as GN 586 in GG 37586 on 29 April 2014. (Green Paper)

White Paper on the National Environmental Management of the Ocean, Published as GN R426 in GG 37692 on 29 May 2014. (White Paper)

### 1.1.3 Research Questions

1. What is South Africa's contribution towards the creation and continuation of the said problem?
2. Are the legal mechanisms for the proper governance of land-based marine pollution (specifically marine debris) adequate at both international and national levels?
3. What recommendations can be made to enhance such laws? Would such improvements be politically, socially and economically viable?
4. What lessons can South Africa learn from other countries (in particular, developed nations) in respect of addressing the said problem?
5. Will South Africa be willing and able to accommodate any new changes?

## 1.2 Literature Review

The proposed research paper will depend on a number of literature sources, in order to assess the aforementioned research problem and draw suitable recommendations.

### 1.2.1 The Problem

In 1608 Hugo Grotius, in his formative text 'The Freedom of The Seas' (*De Mare Liberum*)<sup>12</sup> described the oceans as being;

... that expanse of water which antiquity describes as the immense, the infinite, bounded only by the heavens, parent of all things; the ocean which the ancients believed was perpetually supplied with water not only by fountains, rivers and seas, but by the clouds and by the very stars of heaven themselves; the ocean which, although surrounding this earth, the home of the human race, with the ebb and flow of its tides, can neither be seized nor inclosed; nay, which rather possesses the earth than is by it possessed.<sup>13</sup>

This furthered a notion that the sea was created by nature for common use and that essentially the resources within the ocean were inexhaustible and impervious to human harm.<sup>14</sup> Couzens et al have noted that this has led to the general approach that the seas may be utilised, by everyone and for any purpose.<sup>15</sup> According to Dyke this vision, although flawed and

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<sup>12</sup> H. Grotius, 'The Freedom of the Seas' (*De Mare Liberum*), 1608, Translated by R. Van Deman Magoffin, *Oxford University Press*, 1916. Available at : [http://files.libertyfund.org/files/552/Grotius\\_0049\\_EBk\\_v7.0.pdf](http://files.libertyfund.org/files/552/Grotius_0049_EBk_v7.0.pdf) (Accessed 17 March 2014).

<sup>13</sup> Ibid. P81.

<sup>14</sup> Ibid.

<sup>15</sup> E. Couzens, M. Lewis & V. Surban, 'Dumping the seafill: The Integrated Coastal Management Act of 2008. international controls in dumping at sea and a sea change in approach', *SAJELP*, Vol 45. 2010. P46. (Authors Referencing A. D'Amato & J.L Hargrove, 'Environment and the Law of the Sea: A Report of the Working Group on Ocean Environment', *American Society of International Law*, Vol 5, 1974. P1-60.)

outdated, continues to dominate the world's perspective of the oceans in modern times.<sup>16</sup> This flawed mentality perpetuates unsustainable practices with disregard for the environments' integrity. In contrast, we now bear witness to the limited and the vulnerable nature of the ocean.

Dumping wastes into the aquatic environment is an age-old practice, dating back to the 'beginning of human civilization'<sup>17</sup> According to Tunley, the recent unsustainable practices of humankind have significantly degraded the health and integrity of the world's coastal and maritime environments.<sup>18</sup>

The Worldwide Fund for Nature (WWF) 2010 *Living Planet Report* is evidence of such unsustainable practices as it illustrates that human demands placed on the environment in recent times have exceeded the rates of consumption of all prior generations.<sup>19</sup>

Ryan has noted that the inexpensive, strong, durable and flexible nature of plastics has made them a favourite amongst manufacturers across the commercial spectrum.<sup>20</sup> Therefore, the increase in economic activity logically leads to a rise in the production, consumption and disposal of plastics, in turn leading to a rapid increase of plastic litter within the marine environment.<sup>21</sup> Famed American ecologist Garrett Hardin has noted, in his landmark article 'The Tragedy of the Commons',<sup>22</sup> that we have now locked ourselves into a system of 'fouling our own nest', as it is cheaper to discharge wastes into the commons when compared to purifying them.<sup>23</sup>

Scientific studies have concluded that approximately 80 percent of marine debris consists of plastic waste,<sup>24</sup> making it the dominant form of marine debris. Aquatic pollution has become

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<sup>16</sup> J. M. Dyke, 'Sharing Ocean Resources- In a Time of Scarcity and Selfishness', *University of Hawaii Publications*, 2000. Available at: [http://www.hawaii.edu/elp/publications/faculty/JVD/Sharing\\_Ocean\\_Resources.pdf](http://www.hawaii.edu/elp/publications/faculty/JVD/Sharing_Ocean_Resources.pdf), (Accessed 4 March 2014). P1.

<sup>17</sup> M. Shahidul-Islam & M. Tanaka, 'Impacts of pollution on coastal and marine ecosystems including coastal and marine fisheries and approach for management a review and synthesis', *Marine Pollution Bulletin*, Vol 48, 2004. See Abstract.

<sup>18</sup> K. Tunley, 'State of Management of South Africa's Marine Protected Areas', *WWF South Africa Report Series: 2009/Marine/001*, 2009. P15.

<sup>19</sup> Living Planet Report 2010 Summary, *World Wide Fund for Nature*. Available at: [http://awsassets.panda.org/downloads/lpr\\_summary\\_booklet\\_final\\_feb\\_2011.pdf](http://awsassets.panda.org/downloads/lpr_summary_booklet_final_feb_2011.pdf), (Accessed 12 April 2014).

<sup>20</sup> P.G Ryan, C. J Moore, J.A Van Franeker & C.L Moloney, 'Monitoring the abundance of plastic debris in the marine environment', *Phil.Trans. R. Soc*, Vol 364, 2009. P1999.

<sup>21</sup> Ibid.

<sup>22</sup> G. Hardin, 'The Tragedy of the Commons', *Science*, Vol 163. 1968.

<sup>23</sup> See Hardin, Note 22. P1245.

<sup>24</sup> See Goldberg, Note 4. P311.

a cause for global concern, as scientific studies have proven that plastic's presence is having an adverse effect on the oceans water quality,<sup>25</sup> on marine life and ultimately on humans.<sup>26</sup> Should such patterns of unsustainable behaviour be perpetuated, we shall find ourselves in the near future facing uncontrollable and irreversible consequences.

According to Hardin, in circumstances where there are multiple individuals who act independently in their own short term self-interests, their actions shall ultimately destroy a shared resource and shall be against the long terms interest of all.<sup>27</sup> The accumulation of plastic marine debris in our ocean, resulting in 'garbage patches' floating in our commonage,<sup>28</sup> can most definitely be described as a tragedy of the commons. It appears that because the oceans are a global commons and a shared resource free for all to use, this abuse is inevitable.

### **1.2.2 The Solution**

Young has noted that legislation is essentially a device that 'can enable action, eliminate obstacles, or clarify rights and interests'.<sup>29</sup> In continuation of the above, within the context of this problem, it is logical to deduce that environmental policy would be the means of rescuing our ocean from potential 'plasticide'.<sup>30</sup> Hastings has asserted that the practice of disposing wastes generated on land in the sea is by no means a new occurrence. However, with the introduction of more durable materials, such as plastics, into the marine environment coupled with the increased global concern regarding oceanic protection, there has been an increase in global and national environmental policy containing legislative mechanisms that encapsulate the broader principles of sustainability, in the context of water quality.<sup>31</sup>

Glazewski<sup>32</sup> has noted that due to the relative adolescence<sup>33</sup> of environmental law, the form and substance of national policy is a reflection of global interests and multilateral environmental agreements. A critical discussion of such international policies, serves as a suitable point of departure. Examples of such agreements that South Africa is party to are the

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<sup>25</sup> See Shahidul-Islam and Tanaka, Note 17. P624.

<sup>26</sup> See Coulter, Note 7. P1963.

<sup>27</sup> See Hardin, Note 22. P1243-1245.

<sup>28</sup> A term used to describe the ocean in perspective of Hardin's theory. As the ocean is the common heritage of mankind.

<sup>29</sup> T. R Young, 'The Legal Framework for MPA's and Successes and Failures in their incorporation into National Legislation', Expert Workshop on Marine Protected Areas and Fisheries Management, *FAO Fisheries Report*, No. 825, 2006. P250.

<sup>30</sup> 'Plasticide' in this context refers to grave, irreversible damage being inflicted upon the ocean as a result of plastic marine debris.

<sup>31</sup> See Hastings, Note 5. P49-55.

<sup>32</sup> J. Glazewski, *Environmental Law in South Africa*, Third Edition, 2013. P25:30.

<sup>33</sup> Such youth is attributed to this sub-discipline in contrast to other legal counterparts.

Convention on the Prevention of Marine Pollution of Dumping of Wastes and Other Matter (London Convention),<sup>34</sup> the International Convention for the Prevention of Pollution from Ships (MARPOL)<sup>35</sup> and the United Nations Convention on the Law of the Sea (UNCLOS).<sup>36</sup>

Glazewski is of the opinion that the London Convention is to be regarded as one of the more successful marine pollution treaties, based on the fact that from 1979 to 1987, the recorded dumping of industrial wastes into the ocean reduced from 17 to 6 million tonnes.<sup>37</sup> Rochman and Browne extended a similar diagnosis to MARPOL. Whilst commending its complete ban concerning the disposal of plastics at seas, they assert that the problem had managed to worsen progressively, based on scientific evidence.<sup>38</sup>

Scientific data reveals that 20 percent of plastic marine debris found in such ‘garbage patches’ in the oceans, are a result of dumping at sea. Therefore the success of these treaties are essentially limited, as they fail to address the predominant cause of plastic marine debris which is land-based marine pollution. UNCLOS is the only global treaty which has provided for the specific issue of land-based sources of marine debris.<sup>39</sup> However this treaty has also been described as a failed effort in the context of this problem by Coulter, as its provisions concerning marine debris are ‘too vague to facilitate a comprehensive solution’ and served as a ‘bare framework’ which aims at the oceans’ protection.<sup>40</sup>

In light of the above and in consideration of the current status of plastic marine debris in the world’s oceans, it can be said that current measures have failed to address the problem. This failure is arguably due to laws being based on inadequate scientific data.

National legislative measures can be diagnosed in a similar fashion. In South Africa, as the National Environmental Management Act (NEMA),<sup>41</sup> the National Environmental Management: Integrated Coastal Management Act (NEMICMA)<sup>42</sup> and the National Water Act (NWA),<sup>43</sup> serve as the primary environmental policies relating to the pollution of this resource. However, the concept of marine debris remains largely unaddressed in national

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<sup>34</sup> The Convention on the Prevention of Marine Pollution of Dumping of Wastes and Other Matter, of 1972.

<sup>35</sup> International Convention for the Prevention of Pollution from Ships of 1988.

<sup>36</sup> United Nations Convention on the Law of the Sea of 1982.

<sup>37</sup> See Glazewski, Note 32. P25:30.

<sup>38</sup> See Rochman and Browne, Note 1. P169–171.

<sup>39</sup> Article 3 of UNCLOS.

<sup>40</sup> See Coulter, Note 7. P1966.

<sup>41</sup> National Environmental Management Act 107 of 1998. Hereafter referred to as the NEMA.

<sup>42</sup> National Environmental Management: Integrated Coastal Management Act 23 of 2008. Hereafter referred to as the NEMICMA.

<sup>43</sup> National Water Act 36 of 1998. Hereafter referred to as the NWA.

environmental policy.<sup>44</sup> This reinforces Coulter's notion that current measures constitute a mere legal framework and are too vague to yield effective results.

Recently a survey conducted by Ryan reveals the existence of a 'garbage patch' similar to those described above, forming off the coast of South Africa, within the South Atlantic Ocean.<sup>45</sup> This is evidence of a potentially grave problem in our 'back-yard', and therefore there is a need to adjust national laws, at their stage of relative infancy, or risk falling into the common theme of pollution policy formulation of 'too little being done too late'.

### 1.2.3 The Canary in the Coalmine

Coulter describes these 'plastic garbage patches' found in the ocean as 'a canary in the aquatic coalmine', indicative of an environmental crisis in urgent need of legal attention. Couzens et al have noted that South Africa had illustrated a 'sea change in its approach' within the national sphere.<sup>46</sup> South Africa has shown great promise in addressing environmental issues within the marine environment. By replacing the approach of the 1972 London Convention with that of the 1996 protocol, South Africa has arguably reflected an 'admirable shift in understanding the problem of treating the sea as a sea fill'<sup>47</sup> and has taken significant steps towards dealing with this problem'.<sup>48</sup>

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<sup>44</sup> Specifically in Chapter 8 of the NEMICMA which deals with land based sources of marine pollution.

<sup>45</sup> P.G. Ryan, 'Litter Survey detects South Atlantic Garbage Patch', *Marine Pollution Bulletin*, Vol 79. 2014. P 221.

<sup>46</sup> Up to 1996 the primary international law instrument relevant to dumping at sea was the Convention on the Prevention of Marine Pollution of Dumping of Wastes and Other Matter of 1972 (London Convention). Much of the London Convention's success is attributed to the constant 'updating' of the agreement as periodic amendments and resolutions had strengthened its controls and expanded its ambit. However these 'updates' were being done at the international level and the reciprocal domestic laws remained outdated, not reflecting these amendments. Therefore, for over a decade national legislation had been inconsistent with the MEA, through permitting conduct prohibited by the MEA.

The 1996 Protocol was intended to replace the London Convention. The Protocol is completely different to the parent Convention, especially in that it provides for a least harmful substances list (White List) of substances that may be dumped at sea; where conversely, the London Convention had opted for a series of lists providing for most harmful substances (Black List), inferring that anything else could be dumped. The approach taken by the Protocol covers more legal ground and leaves less room for parties to deviate from the Protocol.

South Africa has ratified the Convention and had implemented it into national law through the Dumping at Sea Control Act of 1980, but has now ratified the Protocol, integrating the new approach within the Integrated Coastal Management Act of 2008. Both laws remain relatively operational however NEMICMA seems to prevail as law for most instances. Making changes to international law require much time and can be a very tedious process and it is admirable that South Africa had ratified the 1996 Protocol and took steps to transform domestic laws to incorporate the approach of the 1996 protocol, deliberately replacing the approach of the 1972 London Convention. This has revealed an admirable shift in understanding the problem of treating the sea as the sea fill. – Refer generally Couzens et al, Note 15.

<sup>47</sup> 'Seafill' being a term suggested in the article, to represent the nature of the traditional landfill, existing within the marine environment.

<sup>48</sup> See Couzens et al, Note 15. P65.

This reflects more importantly, a willingness at a national level to accept dynamic changes in meeting a dynamic problem. This supports Coulter's notion, whilst waiting for an effective international agreement to address this problem, an approach that is 'local in scale and global in scope' be taken, to address such issues.

Such measures have been anticipated with the formulation of policy papers<sup>49</sup> on the 'Environmental Management of the Ocean'.<sup>50</sup> The relevant facets of this policy document worthy of being highlighted are that the policy objectives of NEMO empower the passing of potential legislation such as the 'National Environmental Management Ocean Act' that gives 'effect to ocean stewardship responsibilities contained within the ambit of section 24 of the Constitution and assist South Africa in fulfilling its contribution to Chapter 17 of the Rio Declaration'.<sup>51</sup> With South Africa being a party to UNCLOS, Glazewski has stated that the publication of this paper is 'welcome, significant and long overdue',<sup>52</sup> and a 'vital step towards improved ocean governance and a significant opportunity for the marine scientific community to make a contribution'. In relation to this the issue of plastic marine debris pollution may very well find itself being addressed here.

#### **1.2.4 Recommendations:**

Couzens et al have argued that, essentially, this shift in mind-set could be extended to other areas of environmental concern. In aligning the above notion to the scope of this research topic, this seems as viable an option as the notion concerning the 'Black and White listing of pollutants'.<sup>53</sup> Dyke feels that doing so would assist national environmental agencies in preventing the further accumulation of marine debris in the ocean. Rochman and Browne congruently suggest that should the most problematic plastics be classified as hazardous and

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<sup>49</sup> 'Green Papers' are essentially governmental policy documents, which indicate some direction of legislative thought; this is open to comment at this stage and is vital for the scientific community, to make a contribution towards the potential management of ocean affairs. Generally a 'White Paper' follows suit, which reflects the governmental policy with regards to said affairs. These papers may potentially serve as the foundation for future legislation.

<sup>50</sup> Notably the Green Paper and White Paper on NEMO.

<sup>51</sup> Green Paper on the National Environmental Management of the Ocean, Published as GN 586 in GG 37586 on 29 April 2014, Vol 586. P14.

<sup>52</sup> J. Glazewski, 'Ocean governance: A first step', South African Journal of Science, 2013, P 1- 2. Available at: [http://www.sajs.co.za/sites/default/files/publications/pdf/Glazewski\\_commentary.pdf](http://www.sajs.co.za/sites/default/files/publications/pdf/Glazewski_commentary.pdf), (Accessed on 5 May 2014.)

<sup>53</sup> Plastics listed in such regards would correlate to Plastics being biodegradable, safe and re-useable falling within the scope of the white list.

become replaced with the use of safer materials within the next decade; the amount of plastic the earth is expected to host by 2050 may be reduced to 4 billion tonnes.<sup>54</sup>

Historically, in the context of marine litter, environmental policy has been ‘approached in an isolated sector managed separately from other policy domains’.<sup>55</sup> This is an outdated method that has clearly failed us. Dautel asserts that this form of cross-study, where policies ‘learn from one another’, basing the formulations of policy models on the successes of others advocates the development of a ‘hybrid clean up model’.<sup>56</sup>

This is congruent with what Couzens et al have argued for. As the oceans are being viewed in a new light, our radical shift in policy approach makes the incorporation of the above recommendations appear theoretically possible, as the world and South Africa have welcomed innovative change in policies in mitigation of environmental harm, especially towards harm to the ocean and its resources.<sup>57</sup>

### **1.2.5 The Gap**

In the context of this problem it can be seen that not only does hazardous plastic debris in the environment create risk and adversity for humans, neighbouring life forms and future generations but that also outdated legislative measures and management policies further encourage the continuation of this problem.

The present writer has not found any substantive treatise dealing with the subject of evaluating South Africa’s laws and international policies in relation to pollution via plastic marine debris to assist with developing a conceptual framework for the proposed ‘NEMO’.<sup>58</sup> Accordingly this dissertation aims to contribute to knowledge by addressing this apparent gap in the literature.

## **1.3 Research Design and Methodology**

### **1.3.1 Research Design**

After careful consideration of the aims of this research paper, the appropriate research design for this study is that of qualitative research in an area that has been underexplored and

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<sup>54</sup> See Rochman and Browne, Note 1. P169–171.

<sup>55</sup> See Hastings, Note 5. P5.

<sup>56</sup> S. L. Dautel, ‘Transoceanic Trash: International & US Strategies for the Great Pacific Garbage Patch’, *Golden Gate University Environmental Law Journal*, Vol 3, 2009. P200- 202.

<sup>57</sup> See Couzens et al, Note 15. P66.

<sup>58</sup> Proposed ‘National Environmental Management of the Oceans Act’.

thereby contains a rather limited body of literature. Qualitative research provides for in-depth focus and understanding whilst drawing on a more focussed selection of cases<sup>59</sup>.

## **1.3.2 Research Methodology**

### **1.3.2.1 Conceptual Framework**

The theoretical approach this dissertation adopts is one which stems from a practical environmentalist perspective. From this perspective, the inherent wealth of the environment is considered worthy of greater protection in comparison to the wealth pursued by capitalist society, taking into the economic and social considerations relevant to South Africa as a developing nation.

### **1.3.2.2 Literature review**

The dominant research methodology technique employed shall be one of comparative research, in which the dissertation will contrast the varying legislative mechanisms governing marine pollution.<sup>60</sup>

This dissertation shall primarily utilise the findings of non-empirical<sup>61</sup> desk top research. This shall be achieved primarily through the critical analysis of ‘black letter’ legal material, but may also extend into an interdisciplinary approach<sup>62</sup> regarding the methodology concerning the aforementioned research. This is crucial in order to understand the body of knowledge available and gaining insight into the apparent trends within both legal and scientific literature.

The aim of this study is to obtain valid and reliable information in the world of science and scientific research (epistemology) before suggestions or recommendations can be made from a legal perspective.

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<sup>59</sup> Such as various primary and secondary sources of law for example: the Constitution, statutes, common law, judgements, policy documents – Green Papers, policies of government departments, journals and papers by NGO’s.

<sup>60</sup> With attention primarily directed towards the issues of plastic marine debris, stemming from land based sources.

<sup>61</sup> The non-empirical approach had been chosen as this research paper is concerned with reviewing the existing body of knowledge, critically analysing existing concepts within the respective bodies of knowledge and constructing theories and models.

<sup>62</sup> An approach such as this requires the author to step out of the traditional boundaries of their respective discipline and engage in the collection and analysis of data from surrounding fields. Due to the nature of Environmental Law, this approach appears apt. Due to the fact that environmental legislation of this nature is constructed in relation to the findings of the scientific community.

### **1.3.2.3 Data Gathering**

The units of analysis that are relevant to this form of research shall mostly consist of relevant primary and secondary sources of information, within the legal body of knowledge and secondary sources of scientific literature. With regards to the nature of the sample area this research paper is concerned with, there are no issues concerning internal or external validity.

### **1.3.2.4 Analysis and Interpretation**

The information that has been gathered during the varying stages in the research journey will accordingly be critically analysed, categorised and interpreted for themes, patterns and trends within their respective fields.

Data shall be analysed using the ‘Meta Science of Critical Theory’.<sup>63</sup> Critical Theory would enable the researcher to reflect on the current status, understand and reflect on reasons why this is the current status; and understand justifications for certain actions, lessons that can be learnt and make informed recommendations for improvements. In relation to the aims and purpose of this research paper this approach seems to be the most apt.

To maintain a strong sense of objectivity throughout the construction of this dissertation, the research, analysis and interpretation were ‘sound boarded’<sup>64</sup> with my supervisor.

## **1.4 Ethical Issues**

Due to the nature of the research engaged in and data retrieved as a consequence of desktop research, the findings consist mostly of black letter law<sup>65</sup> and varying secondary sources of law. No interviews were conducted.

## **1.5 Anticipated Limitations**

As the topic of this dissertation is one that is rooted within a predominantly international cause for concern and has not previously been engaged with at a national level, there may be some difficulty met with regards accurately to animating the proposed topic within a South African context. Solutions that have been developed and implemented on an international level, particularly those formulated by developed/ first world nations, may not be of direct

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<sup>63</sup> J. Mouton, *How to succeed in your Masters & Doctoral Studies*, Van Schaik, 2001. See generally P137- 139.

<sup>64</sup> A term used to indicate an informal discussion between the Author and the Supervisor, for the purposes of guidance throughout the ‘research journey’.

<sup>65</sup> Statutes, rules, acts, laws and provisions that are or have been written down, codified, or indicated somewhere in legal texts throughout history of specific state law

application within the South African context, as this may not be feasible due to the inherent nature of a developing/ third world country.

## **1.6 Structure of dissertation**

- **Chapter One:** General Background
- **Chapter Two:** Plastics: The Problem
- **Chapter Three:** Case Study: 'Garbage Patches' in the Ocean
- **Chapter Four :** International Aspects
- **Chapter Five:** South African Aspects
- **Chapter Six:** Recommendations and Conclusion

## CHAPTER TWO:

### PLASTICS: THE PROBLEM

#### 2.1 Introduction

Plastics have reached into the core of our modern lives and become a staple of our age; however, only a superficial understanding of plastics is known, whilst its true nature remains hidden. A cursory analysis of our immediate environment reveals that plastics are one of the most widely used materials in the world;<sup>66</sup> plastics thus clearly constitute a vital component of the range of products used in modern society.<sup>67</sup>

Freinkel appropriately styles plastics to being that of omnipresent nature<sup>68</sup> - as they are 'everywhere alive to touch and eye'.<sup>69</sup> All aspects of our daily modern life contain plastics along with their contributions to nearly all product areas.<sup>70</sup> It can be asserted that plastic, an inherently alien substance, has now been naturalised.<sup>71</sup>

##### 2.1.1 What are Plastics?

The etymology of the term 'Plastics' traces development back to its Greek origin '*plastikos*' which translates to 'fit for moulding'.<sup>72</sup> Plastics are famed for their malleable characteristics, as they are capable of being used across a spectrum of temperatures. Furthermore their resistance to both chemical and light exposure account for their durability.<sup>73</sup> Such characteristics have made plastics of great benefit to humanity as their varied uses include food, medicine, clothing and public health applications and, packaging; building materials; and vehicles.<sup>74</sup>

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<sup>66</sup> J. Hammer, M. H. S. Kraak, J. R. Parsons, 'Plastics in the Marine Environment: The Dark Side of a Modern Gift', *Reviews of Environmental Contamination and Toxicology*, Vol 220, 2012. P1.

<sup>67</sup> A. L. Andrady & M.A Neal, 'Applications and societal benefits of plastics', *Phil.Trans. R. Soc.B*, Vol 364, 2009. P1980.

<sup>68</sup> J. A. Amato, 'Plastic: A Toxic Love Story by Susan Freinkel (review)', *Journal of Social History*, Vol 46, 2013. P812.

<sup>69</sup> Ibid.

<sup>70</sup> See Hammer et al, Note 66. P1.

<sup>71</sup> J. L. Meikle, 'Material Doubts: The Consequences of Plastic' *Environmental History*, Vol 3, 1997. P1.

<sup>72</sup> See Hammer et al, Note 66. P2.

<sup>73</sup> See Andrady and Neal, Note 67. P1977.

<sup>74</sup> G. A Harse, 'Plastic, the Great Pacific Garbage Patch, and International Misfires at a Cure', *UCLA Journal of Environmental Law and Policy*, Vol 29, 2011. P332.

The term ‘plastics’<sup>75</sup> encompasses approximately 20 groups of plastics,<sup>76</sup> each borne from a range of synthetic or semi synthetic materials. Plastics are primarily synthesised from chemicals such as oil, natural gas and coal.<sup>77</sup> Plastics are considered to be incredibly versatile materials<sup>78</sup> as they are inexpensive, robust, lightweight, and corrosion resistant with high chemical and thermal insulation properties.<sup>79</sup> Such characteristics make plastics an indispensable facet of modern life.<sup>80</sup>

### 2.1.2 History of Plastics

If any single material dominates everyday life in the last four decades of the 20th century it was undoubtedly plastics.<sup>81</sup> It is safe to assert that plastics are ubiquitous in modern life.<sup>82</sup> Humans have been using natural plastics for far longer than we have anticipated,<sup>83</sup> as their existence can be traced back to ancient times.<sup>84</sup> The advent of synthetic plastics formally emerged in the 19<sup>th</sup> century.

In the 19<sup>th</sup> century, ivory had found purpose amongst all spheres of everyday life, ‘from buttonhooks to boxes, from piano keys to combs’.<sup>85</sup> One of ivory’s primary uses was to produce billiard balls.<sup>86</sup> The vast uses of this natural material created an insatiable demand for ivory resulting in a growing concern that there would soon be ‘no more elephants left to keep the game tables stocked with balls’.<sup>87</sup> The situation became dire in the northern part of

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<sup>75</sup> ‘Plastics’ refers to a multitude of synthetic organic compounds that have a polymeric structure, whereas the term ‘Plastic’ is predominately descriptive referring to the materials ability to be shaped or moulded - See Hammer et al, Note 66. P2.

<sup>76</sup> R. C. Thompson, S. H. Swan, C. J. Moore & F.S. vom Saal, ‘Our Plastic Age’, *Phil.Trans. R. Soc.B*, Vol 364, 2009. P1973.

<sup>77</sup> See Hammer et al, Note 66. P3.

<sup>78</sup> See Thompson et al, Note 76. P1973.

<sup>79</sup> Ibid.

<sup>80</sup> R. U Halden, ‘Plastics and Health Risks’, in *Annual Review of Public Health*, Vol 31, 2010. P179.

<sup>81</sup> See Amato, Note 68. P812.

<sup>82</sup> See Halden, Note 80. P179.

<sup>83</sup> L. Knight, ‘A brief history of plastics, natural and synthetic’, *BBC News Magazine*, 16 May 2014, Available at: <http://www.bbc.com/news/magazine-27442625> , (Accessed 20 May 2014).

<sup>84</sup> The Olmecs in ancient Mesoamerica circa 1600 BC, had been the first to use such polymers to process a natural rubber to make figurines, bands and balls - See Hammer et al, Note 66. P2.

<sup>85</sup> S. Freinkel, ‘A brief History of Plastic’s Conquest of the World’, *Scientific American*. 29 May 2011, Available at: <http://www.scientificamerican.com/article/a-brief-history-of-plastic-world-conquest/> (Accessed 20 May 2014).

<sup>86</sup> Ibid.

<sup>87</sup> Ibid.

Ceylon<sup>88</sup> with a reported minimum of at least 1 million pounds of ivory being consumed each year.<sup>89</sup> This ‘ivory crisis’ was imminent; and indeed just that, a crisis.

In response to the depletion of limited natural resources the earliest scientific developments of plastics began around 1860. In 1863, Phellan and Collender<sup>90</sup> advertised ‘a handsome fortune’<sup>91</sup> to be awarded to the person who could ascertain a suitable alternative for ivory.<sup>92</sup> In such desperate times human ingenuity had risen to the occasion, as a young inventor by the name of John Wesley Hyatt in response invented ‘celluloid’<sup>93</sup> in 1869.<sup>94</sup> Although intended as a substitute for ivory, celluloid found a host of extended applications<sup>95</sup> in items considered being luxurious and affordable to only the upper crust of society had now become within reach of the masses. Plastics allowed the public to buy into a previously restricted sphere of life. In that context a pamphlet from Hyatt’s manufacturing company declared that:

As petroleum came to the relief of the whale, so has celluloid given the elephant, the tortoise, and the coral insect a respite in their native haunts; it will no longer be necessary to ransack the earth in pursuit of substances that are constantly growing scarce<sup>96</sup>

The year 1907 arguably marked the birth of the modern plastic era when Belgian-American chemist Leo Hendrik Baekeland invented ‘Bakelite’.<sup>97</sup> The world’s first fully synthetic polymer composed of natural molecules had arrived and was being used in wide range of sources from telephone handsets to engine parts.<sup>98</sup>

This creation of Bakelite marked a shift in the development of new plastics.<sup>99</sup> Due to various advantages found in using synthetic materials, this spurred interest and research conducted in the field of plastics as scientists would now stop searching for materials to emulate nature and rather seek to ‘rearrange nature in new and imaginative ways’.<sup>100</sup>

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<sup>88</sup> Under British rule the island was then known as Ceylon; now it is known as Sri Lanka.

<sup>89</sup> See Freinkel, Note 85.

<sup>90</sup> Available at:

<http://dwb4.unl.edu/Chem/CHEM869E/CHEM869ELinks/qlink.queensu.ca/~6jrt/chem210/Page2.html>  
(Accessed 21 June 2014)

<sup>91</sup> Reward equated to the equivalent of ten thousand US dollars in gold -See note 8.

<sup>92</sup> Ibid.

<sup>93</sup> This invention was a cellulose derivative and was quite successful commercially.

<sup>94</sup> See Freinkel, Note 85.

<sup>95</sup> Further application was found in the manufacturing of combs which had been previously been made out of ivory and other natural resources.

<sup>96</sup> S. Freinkel, *Plastic: A Toxic Love Story*, Houghton Mifflin Harcourt, 2011. P17.

<sup>97</sup> See Knight, Note 83.

<sup>98</sup> See Hammer et al, Note 66. P3.

<sup>99</sup> See Freinkel, Note 85.

<sup>100</sup> Ibid.

The 1920s and 1930s saw many new plastic products being brought into our environment. In 1926, the modern form of Polyvinyl chloride (PVC) had been invented.<sup>101</sup> During the same period many other useful plastics such as Polyvinylidene chloride (PVDC) Nylon, Plexiglas and Teflon had also emerged.<sup>102</sup>

This proliferation of plastics was largely attributed to the boom in the petrochemical industry,<sup>103</sup> which saw the chemical companies that invented new polymers align themselves with the petroleum companies who controlled the core ingredients of those polymers.<sup>104</sup> Chemical producers then realized there is no point in discarding wastes created in the processing of crude oil and natural gases, the previously worthless by-product ethylene could be salvaged and profitably reused as a raw material for polymers.<sup>105</sup>

Undoubtedly, the demand for plastics significantly increased during the Second World War<sup>106</sup> due to the great military value given to copper, aluminium and steel.<sup>107</sup> ‘New recruits’ such as acrylic, polyethylene, nylon and styrofoam had found their home in the battle.<sup>108</sup> The plastics and polymers flourished within the industrial sphere under the hands of material manufacturers, machine builders and mould makers.<sup>109</sup>

With the end of the Second World War, none of the new recruits had been ‘decommissioned’.<sup>110</sup> As the war marked the beginning of mass production of plastic for during the war there had been a great leap in the production of plastics, almost quadrupling from 96 million kilograms being produced in 1939 to 371 million kilograms being produced in 1945.<sup>111</sup> By 1979, the rate of plastic production in America exceeded the national rate of their steel production. Hence it can be concluded that the Second World War had changed the world and given birth to the industrial plastic age.<sup>112</sup>

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<sup>101</sup> See Hammer et al, Note 66. P3.

<sup>102</sup> Available at: <http://www.dordan.com/blog/bid/216706/A-brief-history-of-plastics> (Accessed 23 June 2014)

<sup>103</sup> See Freinkel, Note 96. P7.

<sup>104</sup> Ibid.

<sup>105</sup> Ibid.

<sup>106</sup> See Amato, Note 68. P813.

<sup>107</sup> See Hammer et al, Note 66. P3.

<sup>108</sup> Plastics had been pressed into a variety of tools during the war. Ranging from trivial items such as the standard issue comb contained in the servicemen’s hygiene kit to far more significant uses such as mortar fuses, parachutes, aircraft components, antenna housing, bazooka barrels and a host of other purposeful applications. – See Freinkel, Note 85.

<sup>109</sup> See Hammer et al, Note 66. P3.

<sup>110</sup> See Amato, Note 68. P813.

<sup>111</sup> See Freinkel, Note 85.

<sup>112</sup> See Hammer et al, Note 66. P3.

Technological advances within the plastics industry continued to be made-marked by the German chemist Karl Zeigler's development of polyethylene in 1953 and Italian chemist Giulio Natta's development of polypropylene in 1953. Both chemists each received a Nobel Prize in chemistry for their research into polymers.<sup>113</sup>

By 2010, plastics and polymers constituted at least 80% of the global Chemical Industry's 70 000 product range.<sup>114</sup> Plastics form the 'inside and outside'<sup>115</sup> of the major markets of the world. Due to synthetic chemistry developments a vast array of polymers had now come to coat the surface of human lives as we know it and 'with a touch of poetry plastic can now be considered the membrane of our lives'.<sup>116</sup>

### 2.1.3 Toxicity of Plastics: Additives

The pliability of plastics allows the vast and complex needs of modern man to be met. However, this modern gift paradoxically upon closer inspection also reveals itself to be somewhat of a curse. As the gift that is of benefit to man's industrial and consumerist aspirations proves to be equally detrimental to the health of the earth, the ocean and to man himself.

The use of chemical additives allows plastics to meet the constantly fluctuating needs of modern man. Additives are chemical compounds that are added to plastics during the manufacturing phase to enhance their performance by altering their specific properties.<sup>117</sup> However the use of such additives,<sup>118</sup> create health concerns as potentially harmful additives such as Bisphenol A (BPA) and Polybrominated Diphenyl Ethers (PBDE) can be directly transferred to humans through contact with plastics.<sup>119</sup> Additionally, toxic metals such as lead and chromium have also been detected in plastics.<sup>120</sup>

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<sup>113</sup> Available at: <http://www.dordan.com/blog/bid/216706/A-brief-history-of-plastics> (Accessed 23 June 2014)

<sup>114</sup> See Amato, Note 68. P813.

<sup>115</sup> Inside meaning the factory and internal processing equipment and outside meaning end product and packaging.

<sup>116</sup> See Amato, Note 68. P812.

<sup>117</sup> See Hammer et al, Note 66. P5.

<sup>118</sup> Referred to as plasticizers. This group includes stabilizing agents, flame retardants, anti-oxidants and other chemicals such as antimicrobials that give each type of plastic their unique properties.

<sup>119</sup> For instance transfer may occur through flexible toys being mouthed by infants and lining the insides of edible products we consume. Such toxic chemicals can enter our bodies through food and water we consume or even through absorption through our skin. – B. Walsh, 'The Truth About Plastic', Time Magazine, 10 July 2008, Available at: <http://content.time.com/time/magazine/article/0,9171,1821664,00.html> . (Accessed 25 May 2014).

<sup>120</sup> See Hammer et al, Note 66. P5.

A hazard-ranking model established in accordance with the United Nations Globally Harmonized System of Classification and Labelling of Chemicals,<sup>121</sup> had concluded that the chemical ingredients of more than 50 % of plastics are hazardous.<sup>122</sup> Thus appears the dark side to this modern gift as these additives augment an already complex problem by leaching such harmful substances in our environment with lethal impacts on both the environment and man.

#### **2.1.4 Toxicity of Plastics: Health Risks**

Plastics are predominantly perceived as inert objects however as plastics age and gain exposure to both heat and stress, they have shown to release trace amounts of certain ingredients<sup>123</sup> especially the harmful substances such as BPA. Such harmful substances are mostly contained in one particular class of chemicals known as Endocrine Disrupting/Modulating Chemicals (EDC's) has been the centre of much scientific research due to their potential adverse effects on humans.<sup>124</sup> Both scientific and medical research suggest that EDC's contribute to obesity, development of cancer, reduction in human sperm counts and cause developmental abnormalities in both males and females.<sup>125</sup>

With modern technological advancements scientists are becoming increasingly successful at detecting small concentrations of toxic metals and hazardous chemicals within our bodies. Reportedly, it has been observed that even trace amounts of such toxins can have grave impacts on human health.<sup>126</sup>

BPA, a core ingredient in modern plastics, is known to increase oestrogen levels in humans.<sup>127</sup> Items with BPA can break down especially when heated, stressed or washed.<sup>128</sup> This bolsters concerns as many BPA products are manufactured and marketed for the

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<sup>121</sup> United Nations Globally Harmonized System of Classification and Labelling of Chemicals, 2011. (GHS). See generally.

<sup>122</sup> See Rochman and Browne, Note 1. P170.

<sup>123</sup> See Walsh, Note 119.

<sup>124</sup> See Harse, Note 74. P339.

<sup>125</sup> Ibid. P339.

<sup>126</sup> B. Walsh, 'The Perils of Plastic', Time Magazine, 1 April 2010, Available at: [http://content.time.com/time/specials/packages/article/0,28804,1976909\\_1976908\\_1976938-1,00.html](http://content.time.com/time/specials/packages/article/0,28804,1976909_1976908_1976938-1,00.html) . (Accessed 25 May 2014).

<sup>127</sup> Ibid.

<sup>128</sup> Ibid.

purposes of being reusable and microwaveable although re-use and heating are known to cause leaching of BPA into the food or beverage contained within.<sup>129</sup>

Upon breaking-down chemicals leach into our food and water then enters the human body. BPA was found in a certain study to be in the bodies of 95% of the Americans population.<sup>130</sup> 'It (un)naturally appears that you're not living in the modern world unless you have BPA inside your body'.<sup>131</sup> Apparently there is no possibility of escaping the toxic snare of additives because of the plastics industry's dependence on the use of additives, as without them most common products would not be available today.<sup>132</sup>

## **2.2 Plastics Production**

The current usage and disposal rates of plastics breed numerous environmental health problems. Apart from consuming 4% of the world's oil and gas production, a non-renewable resource that is being used as feedstock for plastics<sup>133</sup> a further 4% generates energy for plastic production.<sup>134</sup> Hence this modern infatuation with plastics is placing unsustainable demands on our planet. In great irony, plastic being initially created as a means of conserving non-renewable resources, is now threatening to deplete those resources.

The global production of plastics has shown an average increase of 9% annually. Only 1.5 million tonnes had been produced in 1950 and by 2009 this amount increased to 230 million tonnes of plastics being produced each year.<sup>135</sup> It becomes apparent that the annual global consumption rate of plastics has steadily risen over the past seventy odd years. Soaring from virtually nothing in 1940 to approximately 270 million tonnes in current times.<sup>136</sup>

## **2.3 The Ocean and Plastics**

The world's oceans are key to sustaining life on earth, constituting a conduit for approximately 90% of the world trade, and for connecting markets, people and livelihoods.

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<sup>129</sup> See Harse, Note 74. P340.

<sup>130</sup> R. Harth, 'Health and Environment: A closer look at plastics', Science Daily, 2013, Available at: <http://www.sciencedaily.com/releases/2013/01/130123133928.htm> , (Accessed 5 March 2014).

<sup>131</sup> Ibid.

<sup>132</sup> See Hammer et al, Note 66. P5.

<sup>133</sup> J. Hopewell, R. Dvorak & E. Kosior, 'Plastics recycling: challenges and opportunities' Phil.Trans. R. Soc.B, Vol: 364, 2009. P2115.

<sup>134</sup> Ibid.

<sup>135</sup> See Hammer et al, Note 66. P4.

<sup>136</sup> See Freinkel, Note 96. P8.

<sup>137</sup> Although understanding that marine environments are responsible for many crucial global ecological services and provide a range of benefits for human prosperity, humans continue to put the oceans under risk of irreversible damage.<sup>138</sup> In light of the above, plastic marine debris is a grave cause for concern.

### **2.3.1 Land-based Marine Pollution**

Ocean based marine debris is beyond the scope of this paper as there are many regulatory controls existing that are relative to the dumping of wastes at sea. Conversely land-based marine debris seems to be an age old problem that is relatively under regulated and underexplored especially within the national sphere.

Land-based marine pollution (LBMP) for the purposes of this dissertation shall be considered as the direct or indirect anthropogenic introduction of materials that have been generated on land and have been introduced to the marine and coastal environment through point and or non-point sources, which are inherently alien to the natural, undisturbed marine environment, having detrimental or possibly detrimental impacts upon such introduction.

The world's oceans and coastal waters are primarily polluted through sources of land-based marine pollution (LBMP).due to the traditional attitude held that the sea is regarded as a 'sink' for man's wastes.<sup>139</sup> This archaic attitude has given LBMP the dubious honour of being a major source of marine pollution, constituting approximately 80% of all marine pollution.<sup>140</sup>

LBMP stems from a host of sources such as seepage in the form of storm water run-off occurring in both urban and rural settings, waste that has drifted down rivers, marine outfall pipelines, the transporting of wastes out to sea and the deliberate dumping of wastes generated on land.<sup>141</sup> Subsequently a variety of toxic substances find their way into coastal waters through either point or non-point sources.<sup>142</sup> In the case of plastic marine pollution it

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<sup>137</sup> B. Ki-Moon, 'The Oceans Compact: Healthy Oceans for Prosperity', An initiative of the United Nations Secretary General, 2012. Available at: [http://www.un.org/depts/los/ocean\\_compact/SGs%20OCEAN%20COMPACT%202012-EN-low%20res.pdf](http://www.un.org/depts/los/ocean_compact/SGs%20OCEAN%20COMPACT%202012-EN-low%20res.pdf) , (Accessed 23 November 2014). P1.

<sup>138</sup> The environmental issues of overfishing, climate change, acidification of the ocean from absorbed carbon emissions, hypoxia, increasing chemical pollution, loss of biodiversity and unsustainable coastal area development are examples of the anthropogenic harm caused to the marine environment. – Ibid.

<sup>139</sup> See Glazewski, Note 32, P25:4.

<sup>140</sup> Ibid. P25:10.

<sup>141</sup> Ibid. P 25:4.

<sup>142</sup> Ibid. P 25:4.

often occurs through a myriad of non-point sources. Inland urban areas significantly contribute to the problem as lightweight plastics enter coastal waters via storm drainage systems that discharge into the rivers and sea.<sup>143</sup>

It is a modern trend to cover and contain nearly all manufactured consumer goods in plastic. The recovery of this material does not provide readily realizable profits;<sup>144</sup> consequently plastics have become the fastest growing waste group.<sup>145</sup>

### **2.3.2 Marine Debris**

Currently our industrialised society produces vast quantities of materials, which greatly lack recovery infrastructure.<sup>146</sup> With the introduction of synthetics such as plastics, the nature of this waste has changed dramatically as humans have now generated refuse that nature cannot digest.

With 50% of the world's population staying within 80 kilometres of the ocean,<sup>147</sup> coupled with the fact that the world's oceans are downhill making them downstream from human habitats.<sup>148</sup> It becomes inevitable that such refuse finds its way into the world's oceans, moving to innumerable nautical habitats. However, marine debris is not limited to densely populated habitats and is found across all of the world's oceans, even in isolated areas far from obvious sources of human contact.<sup>149</sup>

The accumulation of this rubbish in the world's oceans and coastal waters is known as marine debris.<sup>150</sup> Marine debris can either be land-based or sea-based, depending on its entrance into the ocean. Marine Debris includes any form of processed or manufactured material that has

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<sup>143</sup> See Harse, Note 74. P335.

<sup>144</sup> C.J. Moore, 'Synthetic polymers in the marine environment: A rapidly increasing, long-term threat', Environmental Research, Vol 108, 2008. P132.

<sup>145</sup> Ibid.

<sup>146</sup> M. Allsopp, A. Walters, D. Santillo & P. Johnston, 'Plastic Debris in the World's Oceans Report', UNEP, 2013, P1- 44. Available at:

[http://www.unep.org/regionalseas/marinelitter/publications/docs/plastic\\_ocean\\_report.pdf](http://www.unep.org/regionalseas/marinelitter/publications/docs/plastic_ocean_report.pdf) , Accessed 4 March 2013. P9.

<sup>147</sup> See Harse, Note 74. P335.

<sup>148</sup> Ibid. P335.

<sup>149</sup> L. Jeftic, Seba Sheavly & E. Adler, 'Marine Litter: A Global Challenge', UNEP, 2009 Available at: [http://www.unep.org/regionalseas/marinelitter/publications/docs/Marine\\_Litter\\_A\\_Global\\_Challenge.pdf](http://www.unep.org/regionalseas/marinelitter/publications/docs/Marine_Litter_A_Global_Challenge.pdf) (Accessed 17 November 2014). P8.

<sup>150</sup> See Allsop et al, Note 146. P9.

been abandoned or disposed of in the marine environment consisting of items made or used by humans that have intentionally or unintentionally found their way into the ocean.<sup>151</sup>

### 2.3.3 Plastic Marine Debris

The previous investigation into the nature of plastics creates context for the gravity of the present threat to the marine environment - plastic marine debris. An unanticipated effect of the 'Plastic Age' was the materials ability to exist and persist in innumerable shapes, sizes and colours throughout the global maritime environment.<sup>152</sup> Over the past 60 years there has been an increasing phenomenon in the contamination of the world's coastal waters and oceans by synthetic non-biodegradable materials, as evidenced by their contribute to 80% contribution to all marine debris.<sup>153</sup> This relentless attack on the world's oceans is a result of inappropriate waste management, incidental pollution and improper human behaviour.<sup>154</sup>

This threat can be categorised in three broad classes: macro-debris,<sup>155</sup> meso-debris<sup>156</sup> and micro-debris.<sup>157</sup>

In terms of their durability, low molecular weight and lower production costs, plastics have become a favourite amongst both manufacturers and consumers alike.<sup>158</sup> However, it is these key features that make improperly handled plastics a significant environmental threat.<sup>159</sup>

Owing to their low costs and relatively inexpensive manufacturing process plastics are considered as short lived items, where approximately 50% of plastics produced are intended for single use disposable applications.<sup>160</sup> Coupled with their light, durable nature and the

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<sup>151</sup> R. C. Thompson, B. E. La Beller, H. Bouwman & L. Neretin, 'Marine Debris as a Global Environmental Problem: Introducing a solutions based framework focussed on plastic', *A STAP Information Document*, 2011. P11.

<sup>152</sup> See Moore, Note 144. P131.

<sup>153</sup> See Allsop et al, Note 146. P10.

<sup>154</sup> See Hammer et al, Note 66. P6.

<sup>155</sup> Macro debris is considered to be larger parts of such debris. Examples of such being that which are generally greater than 20 millimetres. Items such as Buoys, abandoned fishing nets and plastic bags - See Hammer et al, Note 66. P6.

<sup>156</sup> Meso debris consists primarily of preproduction plastic resin pellets otherwise known as 'nurdles', which have a maximum diameter of 5mm. It is because of this small size that they are negligently expelled into the environment. Coupled with the fact that they are highly persistent thus they travel far and frequently find their way into coastal waters. Traces of such are found in coastal waters across the globe. – Ibid.

<sup>157</sup> Micro debris consists of plastic fragments generally less than 5mm in diameter. Essentially due to the nature of plastics and their degeneration, both macro and meso debris at some point in time will become micro debris. –Ibid.

<sup>158</sup> J. Hopewell, R. Dvorak & E. Kosior, 'Plastics recycling: challenges and opportunities' *Phil.Trans. R. Soc.B*, Vol: 364, 2009. P2115

<sup>159</sup> See Ryan et al, Note 20. P1999.

<sup>160</sup> See Hopewell et al, Note 158. P2115.

purely synthetic nature of plastics, causes vast quantities of ‘end-of-life’ plastics to accumulate in landfills<sup>161</sup> or travel from source areas such as coastal states into the ocean, persisting there for extended periods of time.<sup>162</sup>

Plastics adversely impact the lives of marine inhabitants and ultimately humans. Their presence greatly detracts from both the quality and quantity of ocean water needed to sustain healthy life,<sup>163</sup> in turn diminishing the oceans resources.<sup>164</sup>

#### **2.3.4 Degradation of Plastics Debris**

Plastics’ physical characteristics show high resistance to both ageing and minimal biological degradation. This process ordinarily entails a slow breakdown, through a combination of photodegradation, mechanical abrasion and oxidation.<sup>165</sup> Plastics persist in our environment for decades under direct sunlight exposure and even longer in their absence.<sup>166</sup> As water bound plastics take much longer to degrade than their terrestrial counterparts as a result of the lower temperatures and reduced exposure to UV rays found in marine habitats.<sup>167</sup>

In addition to their remarkably slow degradation, plastics are different to other forms of refuse that may find their way into the oceans. In the sense that, instead of breaking down into various chemical components most plastics continuously break down into smaller and smaller pieces forming a further threat known as ‘microplastics’. These fragments degrade until the point that they ultimately become individual polymer molecules and must endure further biodegradation before becoming bioavailable.<sup>168</sup> However, an unknown amount of time is required for the complete biodegradation of marine plastics. Seemingly it appears that plastics, like diamonds, are forever.

#### **2.3.5 Dangers and Impacts of Plastic Marine Debris**

Ironically the properties that have made plastics a great benefit for mankind have also made them a lethal threat towards wildlife.<sup>169</sup> Once reaching the ocean, plastics move to innumerable habitats causing a series of complex problems, none of which appear to be fully

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<sup>161</sup> See Hopewell et al, Note 158. P2115.

<sup>162</sup> See Hammer et al, Note 66. P5.

<sup>163</sup> See Harse, Note 74. P332.

<sup>164</sup> Ibid.

<sup>165</sup> See Ryan et al, Note 20. P1999.

<sup>166</sup> Ibid.

<sup>167</sup> Ibid.

<sup>168</sup> See Harse, Note 74. P335.

<sup>169</sup> See Hammer et al, Note 66. P19.

understood; however, it is accepted that each of these problems bear great significance. A non-exhaustive list of aesthetic, environmental, human health, economic and commercial concerns follows.

### 2.3.6 Physical Impacts

Aesthetically, such plastic debris tends to collect and concentrate along the coastal beaches and shorelines, traditionally these beaches are culturally significant as for the communities they serve they are considered to be important recreational sites.<sup>170</sup> Furthermore, terrestrial and marine-originating plants may accumulate along the high-tide strandlines, which have a tendency to amass significant amounts of plastics and other non- destructible, manufactured materials.<sup>171</sup> This results in health issues, harm to the local ecosystem and its participants, economic losses and expensive clean-up activities. Plastic refuse degrades beaches across the world, detracting from the experiences of beach visitors thereby having an adverse impact on the tourism industry.<sup>172</sup> In 1996 it was reported that the Kwa-Zulu-Natal (KZN) coastal municipality had spent approximately ZAR 8 million to clean beaches.<sup>173</sup>

The environmental implications of plastics in our oceans are cause for great concern due to the direct affects these materials have on marine life. Specifically, plastics predominantly affect marine life through entanglement, ingestion, smothering and aiding the introduction of invasive species.<sup>174</sup>

Entanglement and ingestion of plastics are the two dominant causes of death in marine organisms<sup>175</sup> Over 250 species of marine wildlife have been identified as being affected by entanglement in and ingestion of plastic materials.<sup>176</sup> Some plastics are considered macro debris, especially abandoned fishing nets often referred to as ‘ghost nets’, which continue to function in the water after being abandoned, often entangling marine inhabitants, killing them through strangulation, drowning and starvation- through reduction of their feeding

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<sup>170</sup> See Harse, Note 74. P336.

<sup>171</sup> Ibid.

<sup>172</sup> See Moore, Note 144. P132

<sup>173</sup> B. J. Goble, R. P van der Elst & L. K. Oellermann, *Ugu Lwethu- Our Coast: A profile of coastal Kwa Zulu-Natal*, First Ed, Cedara. 2014. P 147.

<sup>174</sup> See Harse, Note 74. P336.

<sup>175</sup> See Hammer et al, Note 66. P32.

<sup>176</sup> See Harse, Note 74. P336.

efficiency.<sup>177</sup> These nets may continue to function for extended periods of time and ensnare vast quantities of marine life.<sup>178</sup>

Plastic debris is often ingested accidentally by marine life<sup>179</sup> as it resembles natural foods.<sup>180</sup> However, such ingestion may weaken the consumer and kill. Specifically through starvation as they are given a false sense of satiation after consumption, this generally leads to death.<sup>181</sup> Furthermore there is the risk that plastic compounds may absorb potentially harmful toxic compounds from the water which upon ingestion leaches hazardous chemicals into the animals' body.<sup>182</sup>

It is estimated that 10% of the roughly 280 million tonnes of plastics produced each year is bound to end up in our oceans, with at least 70% of that eventually sinking to the oceans floor threatening subterranean life forms.<sup>183</sup> Upon reaching the bottom of the ocean plastics are 'doomed to a slow and yet permanent entombment',<sup>184</sup> as that environment lacks the UV exposure and warmth conducive for the biodegradation of plastic. Subsequently this settlement, threatens the bottom dwelling, filter feeders of the ocean as they are unable to distinguish between plankton and plastics.<sup>185</sup> Additionally, there is the concern of 'Smothering', as settled and floating plastic can 'edge out plankton and the species that feed on it'.<sup>186</sup> In some parts of the ocean, the presence of plastic is reported to outweigh that of plankton by a ratio of 46:1.<sup>187</sup>

The presence of marine plastic debris provides for the introduction of invasive alien species.<sup>188</sup> Plastic debris poses a threat to marine species as it occupies and destroys the habitats where new life would emerge,<sup>189</sup> in doing so the delicate balance of the aquatic

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<sup>177</sup> See Moore, Note 144. P132.

<sup>178</sup> See Allsop et al, Note 146. P18.

<sup>179</sup> Particularly many species of seabirds, marine mammals and sea turtles have been shown to eat plastic debris – examples of such animals include 'turtles, petrels, penguins, albatross, and shearwaters; skuas, gulls, and auks; coastal birds and other seabirds; dolphins, baleen whales and toothed whales; earless and true seals; sea otters, fish and crustaceans' – See Harse, Note 74. P336.

<sup>180</sup> For example, sea turtles are known to consume semi floating plastic bags as they are often mistaken for jellyfish and plastic pellets, bottle caps, pieces of toys and various other pieces of plastic are often ingested by marine vertebrates and sea bird species – Ibid.

<sup>181</sup> See Moore, Note 144. P132.

<sup>182</sup> See Allsop et al, Note 146. P19.

<sup>183</sup> R. Vannela, 'Are We Digging Our Own Grave Under the Oceans?', *Environ. Sci. Technol.*, Vol 46, 2012. P 7932

<sup>184</sup> See Harse, Note 74. P338.

<sup>185</sup> Ibid. P338.

<sup>186</sup> Ibid.

<sup>187</sup> Ibid.

<sup>188</sup> Ibid. P338.

<sup>189</sup> See Moore, Note 144. P135.

ecosystem is disrupted. Though the physical effects of plastics on the marine environment are significantly worthy of attention, the chemical dangers to marine and human health caused by such plastics have been understated.

### **2.3.7 Chemical Impacts**

Plastic debris can leach chemical contaminants into marine waters that is absorbed by marine species. Such chemical contaminants are very harmful substances such as BPA that further leech into our environment. Fragments of plastic broken from larger objects and nurdles (plastic resin pellets) are sinks and sources for persistent organic pollutants (POP's) and xenoestrogens in marine settings,<sup>190</sup> which may be consumed by invertebrates at the bottom of the food chain. Such consumption has far reaching effects, through these pollutants climbing up the food chain and eventually contaminating humans.<sup>191</sup>

## **2.4 Conclusion**

Scientific studies conducted across the world have revealed that plastics are now not just ubiquitous in our immediate terrestrial environment but also in marine environments. Our modern infatuation or as Freinkel describes it as our 'love affair' with plastics, began almost a century ago, had seen the first plastic revolution that birthed the 'Plastic Age', which changed the face of our environment forever, enabling the explosive growth of the industrial and commercial sector. However, we had erred greatly when choosing the materials to make plastics and now experience the adverse effects of our decisions as plastics result in severe environmental degradation and unnecessary human exposure to toxic substances.

Due to the environmental and human health impacts that have come to light in recent times, we begin to realise that this relationship is unhealthy. With severe detrimental effects becoming increasingly evident each year we continue to consume more and more plastics. We are indeed trapped in an unhealthy dependence, a toxic relationship.<sup>192</sup> It becomes clear that modern society finds itself in dire need of a second plastic revolution; one in which we re-evaluate our approach to plastics and their place in modern society.

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<sup>190</sup> See Moore, Note 144. P133.

<sup>191</sup> See Hammer et al, Note 66. P5.

<sup>192</sup> See Freinkel, Note 96. 'Foreword'.

## **CHAPTER THREE:**

### **CASE STUDY: ‘GARBAGE PATCHES’ IN THE OCEAN**

#### **3.1 Introduction**

The largely popular ‘throwaway lifestyle’<sup>193</sup> of the modern consumer has caused unprecedented amounts of wastes to accumulate within both terrestrial and aquatic environments. This mentality is fairly recent, as previously the same products were packaged in recyclable or re-useable materials such as glass, paper and metal, which have now been replaced by the ‘unruly beast’ we now know as plastics. Thus plastics have become a hallmark characteristic of modern society’s detrimental way of life.

However this short term convenience of consuming and discarding various forms of plastics bears an ‘inconvenient truth’. Considering that only 5 percent of plastics produced are recovered,<sup>194</sup> it is a rarity that the consumables we dispose of on a daily basis are recycled in a closed loop. With no value found in recovering such wastes at the end of their life cycle, 50 percent of the remainder lies buried in landfills and the rest is considered ‘unaccounted for’- littering the earth’s landscapes, and much eventually washed out to sea. Consequently the oceans have become a global repository for much of the waste we generate.<sup>195</sup>

#### **3.2 The Great Pacific Garbage Patch**

Recently the increased media coverage of the frequent accumulation of plastic debris within the ocean, has given rise to terms such as ‘garbage patch’; ‘plastic soup’ and ‘ocean landfill’. Media reports coupled with the activities of non-governmental organizations (NGO’s) have begun to create awareness regarding this particular phenomenon. However, in comparison to the other environmental threats facing the ocean there has been inadequate media coverage. Furthermore the fact that there is no existing international convention created solely for the purposes of mitigating such harm, this is evidence that the world has not yet ‘woken up’ to this problem.

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<sup>193</sup> Such a lifestyle is characterised by our mere pursuit of ‘acquisition’ and ‘enjoyment’ of the fruits within the world. Once we have consumed and satisfied the ends of our acquisition we blatantly discard the shell/packaging.

<sup>194</sup> Available at: [http://5gyres.org/what\\_is\\_the\\_issue/the\\_problem](http://5gyres.org/what_is_the_issue/the_problem). (Accessed 14 July 2014).

<sup>195</sup> P. Kershaw, S. Katsuhiko, Sangjin Lee, J. Samseth & D. Woodring, ‘Plastic Debris in the Ocean : Yearbook 2011’, *UNEP*, 2011. Available at: [http://www.unep.org/yearbook/2011/pdfs/plastic\\_debris\\_in\\_the\\_ocean.pdf](http://www.unep.org/yearbook/2011/pdfs/plastic_debris_in_the_ocean.pdf) , (Accessed 14 July 2014). P21.

With the above phenomenon outlined the evils of modern plastics are best illustrated through one particularly chilling example found within the ‘world’s largest landfill’ in the Pacific Ocean: the Great Pacific Garbage Patch ‘GPGP’.<sup>196</sup>

The GPGP is an accumulation area of highly concentrated plastic marine debris within the North Pacific Ocean.<sup>197</sup> The North Pacific Subtropical Gyre is in a remote and relatively uninhabited area located within the centre of the Pacific Ocean, spanning over 16 million square kilometres.<sup>198</sup> Within such areas, a combination of the earth’s rotation and high atmospheric pressure slows the oceans currents and moves them into a clockwise spiral. Faster currents that circulate outside of this area push debris into this vortex where they become trapped.<sup>199</sup>

Historically this gyre has been considered to be nutrient dense as it was host to rich concentration of plankton and varying organisms;<sup>200</sup> however, in recent times it has become home to debris drawn from across the Pacific seaboard.<sup>201</sup> It is now estimated that there are approximately 2.72 kilograms of plastic present within the gyre for every 500 grams of naturally occurring organic matter. Although the exact amount is difficult to verify it is generally accepted that the amount of plastics is increasing with time.

For centuries such areas have acted as a natural garbage disposal for the Pacific, as historically the debris involved was purely natural and organic materials, which would eventually biodegrade into water and carbon dioxide.<sup>202</sup> Through the introduction of synthetic materials into our lives such aquatic digestion remains a distant memory, as in our efforts to protect goods against natural deterioration ‘we have now created a class of products that defeat even the most creative and insidious bacteria- plastics’.<sup>203</sup>

Subsequently two distinct aggregations of debris now exist within the Pacific gyre respectively dubbed the Eastern and Western Garbage Patches. The Western Garbage Patch is situated east of Japan and West of Hawaii,<sup>204</sup> and the Eastern Garbage Patch is located near

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<sup>196</sup> See Harse, Note 74. P333.

<sup>197</sup> Ibid. P332.

<sup>198</sup> See Dautel, Note 56. P182.

<sup>199</sup> Ibid.

<sup>200</sup> Ibid.

<sup>201</sup> Ibid.

<sup>202</sup> See Harse, Note 74. P334.

<sup>203</sup> Ibid.

<sup>204</sup> See Dautel, Note 56. P183.

the coast of the North-western Hawaiian Islands, between California and Hawaii.<sup>205</sup> These two patches collectively form what we know to be the GPGP.

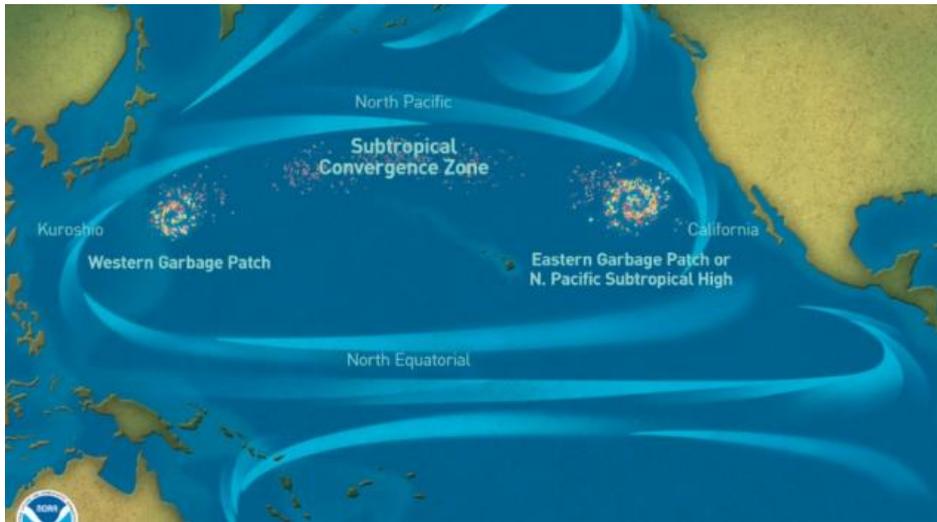


Figure 1: The above image illustrates the North Pacific Gyre, with the locations of the Western and Eastern patches within the GPGP.<sup>206</sup>

The GPGP is estimated to host 100 million tonnes of garbage; the exact quantity, however, remains unknown as some plastics bob above the surface of the water, while others sink.<sup>207</sup> Furthermore it would be nearly impossible to quantify the ‘patch’, as there is no way of accounting for the presence of micro and sub-surface plastics in such waters. However, the physical problem looks much different to that of a conspicuously located island of trash as its name suggests, it is better likened to that of a ‘soup’ than to a solidified plastic island.<sup>208</sup> This likeness is due to the presence of microplastics.

### 3.3 The burgeoning concern over microplastics

This phenomenon of oceanic ‘garbage patches’, exists simultaneously on both a smaller and a larger scale: whereas the number of individual plastic pieces found within the GPGP appear to be large. However, the majority of pieces of plastic marine debris found within the gyres are in fact very small.<sup>209</sup>

Microplastics are tiny plastic particles which are less than 5mm in diameter. Although these plastics are found scattered throughout the world’s oceans, their concentrations are the

<sup>205</sup> See Dautel, Note 56. P183.

<sup>206</sup> Available at: <http://ocean.si.edu/ocean-news/ocean-trash-plaguing-our-sea>, (Accessed 15 July 2014).

<sup>207</sup> See Dautel, Note 56. P183.

<sup>208</sup> See Goldberg, Note 4. P314.

<sup>209</sup> Ibid.

highest within the GPGP.<sup>210</sup> However in the last 40 years, high concentrations of microplastics have been observed across the seaboard.<sup>211</sup> Microplastics are found dispersed along shorelines, ‘adjacent to polluted and industrialized areas of both Northern and Southern Hemispheres’ and in the Sargasso Sea, the Mediterranean Sea, the Cape Basin in the South Atlantic, New Zealand’s inshore waters, the Western North Pacific, the North Pacific and the South Pacific gyre.<sup>212</sup>

‘Primary microplastics’ stem from industrial sources, commonly exemplified as plastic resin pellets, which find their way into the marine environment as a result of poor design and operations management. ‘Secondary microplastics’ are formed through processes of UV fragmentation and thermo oxidative breakdown.<sup>213</sup>

As more scientific data emerges it is becoming clear that genuine cause for concern lies in respect of microplastics, as such tiny fragmented pieces of plastic keep breaking down but never completely biodegrades.<sup>214</sup> Microplastics resemble the diet of many aquatic species, leading to adverse consequences upon ingestion. The ingestion of microplastics has been extensively documented, its presence found within a range of marine organisms.<sup>215</sup> Such ingestion is not limited to these organisms and they also pose potential harm to human health, after leaching toxins into marine organisms after consumption, through creating a pathway for the transport of harmful chemicals through the food chain.<sup>216</sup>

Within the consumer based market increasing attention has been given to the use of microplastics. Many of these products, such as toothpastes, facial cleansers and a host of other cosmetic products contain ‘microbeads’ – which are microplastics that are sometimes used to replace natural ingredients.<sup>217</sup> These ‘microbeads’ are not filtered out during wastewater treatment and are released directly into inland water bodies, as microplastics are commonly found in effluent as tiny fibres after synthetic textiles are washed.<sup>218</sup>

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<sup>210</sup> See Goldberg, Note 4. P308.

<sup>211</sup> J. Smith, *UNEP Yearbook 2014: Emerging issues in our global environment*, UNEP, Available at: [http://www.unep.org/yearbook/2014/PDF/UNEP\\_YearBook\\_2014.pdf](http://www.unep.org/yearbook/2014/PDF/UNEP_YearBook_2014.pdf), (Accessed 15 July 2014). P50.

<sup>212</sup> Ibid.

<sup>213</sup> Ibid.

<sup>214</sup> See Goldberg, Note 208. P325.

<sup>215</sup> These organisms include and are not limited to seabirds, mussels, fish and zooplankton.

<sup>216</sup> See Smith, Note 211. P50.

<sup>217</sup> Ibid.

<sup>218</sup> Ibid.

Recently in Kwa-Zulu Natal, there has been concern raised over the possibility of microplastics having disastrous effects on marine life. A recent study conducted by marine experts<sup>219</sup> concluded that that ‘the levels of microplastics pollution in Durban Bay are exceptionally high’.<sup>220</sup> This study revealed the presence of microplastics in the digestive systems of more than 68 percent of fish in Durban.<sup>221</sup> Although this threat is not new, it shall continue to adversely affect the ecosystem and marine organisms.

### 3.4 Gyres

The world’s oceans are dynamic, interlinked and interdependent systems. They are composed of complex rotating current networks that circulate water around the world. In the open ocean, both wind and water currents combine, forming enormous, swirling vortexes of water known as gyres.<sup>222</sup>

These gyres are responsible for the redistribution of heat and nutrients across the seaboard.<sup>223</sup> However, this natural motion of wind and ocean currents also carries forth plastic marine debris.<sup>224</sup> Many common types of plastics are buoyant and have travelled great distances to even the most remote regions of the world, such as the Arctic and the Antarctic.<sup>225</sup>

Plastics are commonly observed on coastal shorelines; however, such debris tends mostly to accumulate inside of the subtropical convergence zones, as the circulating currents tend to trap debris.<sup>226</sup> Once trapped within such convergence zones plastics either float at surface level, remain suspended beneath the surface or sink. The durable and persistent nature of plastics has caused them to accumulate and form what resembles ‘garbage patches’ across the world’s oceans.

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<sup>219</sup> This particular research study was conducted by Deborah Robertson Andersson and Gan Moodley of the University of KwaZulu-Natal’s (UKZN) School of Life Sciences.

<sup>220</sup> K. Pillay, ‘Plastics threat to KZN fish’, *Daily News*, 6 October 2014, Available at: <http://www.iol.co.za/dailynews/news/plastic-threat-to-kzn-fish-1.1760404#.VFtGOMIBeob>, (Accessed 15 September 2014)

<sup>221</sup> Ibid.

<sup>222</sup> See Dautel, Note 56. P183.

<sup>223</sup> Ibid.

<sup>224</sup> M. Gold, K. Mika, C. Horowitz, M. Herzog & L. Leitner, ‘Stemming the Tide of Plastic Marine Litter: A Global Action Agenda’, *Pritzker Environmental Law and Policy Briefs*, Vol 5, 2013. P7.

<sup>225</sup> See Kershaw et al, Note 195. P21.

<sup>226</sup> See Smith, Note 211. P49.



Figure 2: A model simulation of the distribution of marine litter in the ocean, showing plastics converging in all five of the oceans main gyres, namely; the North and South Atlantic gyres, the North and South Pacific gyres and the Indian Ocean gyre.<sup>227</sup>

Due to the increasing concerns about the accumulation of persistent plastic debris items in the oceans, many studies have employed surface drifter data to predict the movements of litter floating at sea surface.<sup>228</sup> All such models envisage that such persistent debris is bound to accumulate in the middle of the oceans sub-tropical gyres forming such ‘garbage patches’.

The five most notable gyres within the world’s oceans are found in the Indian, North Atlantic, South Atlantic, North Pacific and South Pacific oceans.<sup>229</sup> Although it is the North Pacific Garbage Patch that is the best known, recent discoveries reveal that there are now four other replicate plastic garbage patches, representing each respective gyre.

Given the detrimental effects of plastic, especially within the marine environment, such accumulations are of great concern. With the infamous ‘garbage patch’ not bound to the Pacific, spreading and appearing across all corners of our ocean coupled with the facts; that these problems cannot simply be ‘cleaned up’ and they are expanding at an alarming rate as global production, consumption and disposal are continuously rising.<sup>230</sup>

Temporal trends remain vague; however, as plastics production have shown an annual production increase by almost 5 percent coupled with the fact that most plastics do not

<sup>227</sup> See Gold et al, Note 224. P4.

<sup>228</sup> See Ryan, Note 45. P220.

<sup>229</sup> See Smith, Note 211. P49.

<sup>230</sup> See Goldberg, Note 208. P317.

readily biodegrade in marine environments, it appears likely that the concentration of plastics in our ocean have been increasing and will continue to increase over time.<sup>231</sup>

### 3.5 South Africa and the South Atlantic Garbage Patch

In the context of this problem South Africa gains much attention, as it is a BRICS<sup>232</sup> nation that is amongst the leading developing nations. Therefore the production and consumption of plastics shall be rising in accordance with the country's industrial pursuits, naturally exaggerating this issue of plastic marine debris.

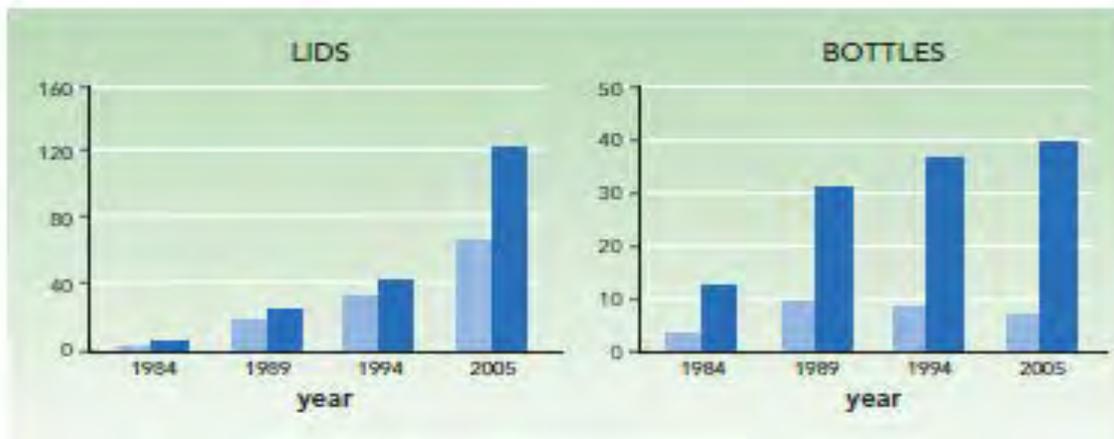


Figure 3.<sup>233</sup>

It can be seen from figure 3, there is a rising trend in the presence of plastics present on South Africa's coastal shorelines. The x-axis represents the respective number of lids and bottles found on South African beaches, whereas the y-axis indicates the time period.

The lighter shaded bars represent data taken from 376 beaches with regular municipal cleaning programs. The darker bars reveal data from 14 beaches with no formal cleaning programmes. The above data reveals that over a 20 year period till 2005, the quantity of bottle caps show a 10 fold increase in their presence on the shoreline. With the rising amount of plastics present within South African coastal environments, coupled with their inability to biodegrade, it follows that the national rise the accumulation of marine debris is inevitable.

<sup>231</sup> See Gold et al, Note 224. P3.

<sup>232</sup> 'BRICS' is an acronym which denotes the association of five major emerging national economies, namely Brazil, Russia, India, China and South Africa. These are developing or newly industrialised nations which are said to have fast growing economies. – Available at: <http://www.brics5.co.za/about-brics/>, (Accessed 10 January 2015)

<sup>233</sup> See Thompson et al, Note 151. P6.

Litter is ubiquitous within SA's coastal environment and the waters throughout its EEZ, with the highest concentrations of marine debris being near urban centres. However, litter discarded off the West Coast of Australia has been also known to reach and accumulate on the South African east coast.<sup>234</sup> South Africa's levels of ingestion and entanglement by marine organisms are recorded to be on par with the highest recorded levels elsewhere in the world, adversely affecting several threatened species and prospects of tourism.<sup>235</sup> Despite having apparently adequate institutional arrangements and technical means, South Africa faces severe marine litter issues as retail products are heavily packaged and 'large proportions of the population having limited access to formal waste disposal options'.<sup>236</sup>

A recent litter survey assessing the abundance of marine debris, between Cape Town (South Africa) and Tristan da Cunha (Brazil) detected similar litter aggregations, forming a 'garbage patch'.<sup>237</sup> 97% of this patch consisted of plastic debris.<sup>238</sup> This survey further concluded that such debris had stemmed from land-based sources.<sup>239</sup>

### **3.6 The Tragedy of the Commons**

Garrett Hardin had postulated a theory named the 'Tragedy of the Commons',<sup>240</sup> in which he reflected upon the both the nature of humankind and our interactions with the environment.

The main illustration used in Hardin's landmark article depicted a finite amount of land and resources that is open to all and being shared by various herdsmen. It is expected, he argued that each herdsman, acting rationally and in their own self-interest, increases the number of their herd – trying to keep as much livestock as possible, in a rational attempt to maximise their individual gain. The apparent benefit of adding a single animal to their herd is direct and wholly theirs, as the effects of overgrazing are borne by all herdsmen equally, thus the 'negative externalities' of their actions seem less severe. It is obvious in this light, that the rational, self-interested herdsmen pursue their own selfish interests.<sup>241</sup> However, the tragedy lies not in what one herdsman does but rather collectively, how they as a 'class' follow the

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<sup>234</sup> See Jeftic, Note 149. P84.

<sup>235</sup> Ibid. P83.

<sup>236</sup> Ibid. P85.

<sup>237</sup> See Ryan, Note 45. P220.

<sup>238</sup> Ibid.

<sup>239</sup> Ibid. P223.

<sup>240</sup> Tragedy is not to be interpreted as sadness but rather the dispassion we portray towards the degradation of our environment.

<sup>241</sup> See Hardin, Note 22. P1244.

same behavioural pattern as each rational herdsman continues to ‘increase their herd without limit - in a world that is limited’.<sup>242</sup>

Severe degradation of the common land follows and eventually its resources are exhausted. This example focusses on self-interest and ‘taking out’ of the commonage.<sup>243</sup> However Hardin also stated that this very **tragedy** reappears in the context of pollution; although not concerned with what has been taken out of the commons, but rather with what we have put in.<sup>244</sup>

The emergence of ‘garbage patches’ across our seaboard, might indeed be considered to be a ‘Tragedy of the Commons’.<sup>245</sup> As previously mentioned, Hardin maintains that in circumstances where ‘multiple individuals are acting independently with their own short term, self-interests in mind, this selfishness leads to the destruction of the shared resource which is ultimately against the long term interests of all.’<sup>246</sup>

With capitalism and materialism being the hallmark characteristics of modern society, along with the modern convenience of plastics parallels the notion of ‘many actors, working without a shared mission of preservation having built up waste within our commonage; the oceans.’<sup>247</sup> Plastics manufacturers and individual consumers actively benefit from consuming plastics however they do not directly bear the costs of the negative externalities that result from plastics entering the marine environment.<sup>248</sup>

Thus as ‘rational’ beings we have locked ourselves into a system of ‘fouling our own nest’ - as it is cheaper to discharge such persistent wastes into our commonage without purifying them first.<sup>249</sup> Furthermore, this ‘tragedy’ is also a side-effect to what Hardin had termed to be an ‘evil of population’. As the population increases so shall the generation and influx of wastes into our immediate environment also increase.

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<sup>242</sup> See Hardin, Note 22. P1244.

<sup>243</sup> Ibid.

<sup>244</sup> Ibid.

<sup>245</sup> See Coulter, Note 7. P1964.

<sup>246</sup> See Hardin, Note 22. P1243-1245.

<sup>247</sup> See Coulter, Note 7. P1964.

<sup>248</sup> Ibid.

<sup>249</sup> See Hardin, Note 22. P1245.

The current issues of ‘plastic sea-fills’ within our ocean shall not only persist but progressively exacerbate should the beneficiaries of plastics continue to remain exempt from paying towards the associated negative externalities.<sup>250</sup>

Hardin states that there is no technical solution to the contentious issues that face the environment; concluding that this is a problem which rather requires an extension in morality.<sup>251</sup>

### 3.7 Conclusion: Should Seas Have Standing?

While Hardin’s piece emphasised the decline of the environment from a scientific perspective, as noted above he believed the solution to lie within the moral, not solely within the technological sphere of human life, for which the law is a natural fit, as it is a system of regulating the collective morality of individuals, for a greater common good.

This provided a natural setting for another classic article in the environmental context – Christopher Stone’s ‘Should Trees Have Standing’,<sup>252</sup> which had been published in 1972, and which dealt with the ‘unthinkable’<sup>253</sup> idea of extending legal rights to natural objects and the environment. Stone asserted that the evolutionary hallmark of mankind, human thought and moral development, lies in the continual extension of legal rights and social sympathies<sup>254</sup> to ‘lesser beings’.<sup>255</sup> As this extension of legal rights to some new ‘lesser’ entity had always been ‘unthinkable’, but is also a mark of evolution in human thought on the subject up to this point.

This article had extended the reach of environmentalism to legal discourse; as in that very same year, in the case of *Sierra Club v Morton*,<sup>256</sup> ‘Justice Douglas borrowed Christopher Stone’s brilliantly serious whimsy’<sup>257</sup> to suggest that the trees (including the environment in

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<sup>250</sup> See Coulter, Note 7. P1964.

<sup>251</sup> Ibid, See Generally: Abstract

<sup>252</sup> C.D Stone, ‘Should Trees have Standing? – Towards Legal Right for Natural Objects’, *Southern California Law Review*, Vol 45, 1972. P450 – 501.

<sup>253</sup> ‘Throughout legal history, each successive extension of rights to some new entity has been, therefore, a bit unthinkable’ – Ibid. P456.

<sup>254</sup> Ibid, P450.

<sup>255</sup> A cursory analysis of such legal evolution being evident reveals originally that ‘non-coloureds’ were the primary holders of legal rights and benefits, which in time saw an extension of equal legal regard to all races and nations, to the disabled, to lower animals and finally to the environment.

<sup>256</sup> *Sierra Club v Morton*, 405, U.S, 727, (1972).

<sup>257</sup> P.L Baude, ‘Sierra Club v Morton: Standing Trees in a Thicket of Justifiability’, *Indiana Law Journal*, Vol 48, 1973. Available at: <http://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=2816&context=ilj> , (Accessed 15 April 2014). P205.

its entirety) are deserving of legal rights and protection in stating that: ‘The voice of an inanimate object, therefore, should not be stilled’.<sup>258</sup>

Ultimately, it may be that humans will look back on our present society and say that it was unthinkable that we did *not* grant the natural world (animals, trees and even seas!) rights (‘standing’ in Stone’s terminology), enforced through human agency of course – even though we might currently think it unthinkable that the natural world should *be* given such rights.

Thus the views of Stone are parallel to Hardin’s as they both turn on a moral axis; furthermore Stone’s views build well on Hardin’s as, in order to address this ‘complex’ problem as Hardin suggested, a shift in mind-set is needed along the lines of what Stone suggests. Granting rights to and accommodating the interests of the ocean within the legal arena, through granting legal standing, may be construed as a means of cultivating morality within society. As through this extension in rights, a moral extension naturally follows, thus the ‘commons’ may be afforded greater respect and protection in the future.

Hardin had stated that ‘ruin is the destination towards which all men rush in a society that believes in the freedom of the commons’.<sup>259</sup> However there is no place for the enjoyment of absolute freedom and rights in modern society.<sup>260</sup> In reminding ourselves of laws relevance within society, the key function of the law lies in protecting recognised interests from identified harms.<sup>261</sup> Boundaries are set by the rights of others and the needs of society justify the imposition of restrictions on the exercise of rights. Thus, through giving the ocean inherent legal rights shall limit this ‘freedom of the commons’ and save the commonage from imminent ruin. There needs to be a fundamental shift in thinking that should guide international and national agreements, and this fundamental shift would translate to giving the oceans ‘legal standing’. Although this may seem radical, in the context of the aforementioned discussion of the commons, it is the view of the author that this would be an important shift in the way national and international agreements are constructed. This change will radically influence the nature of recommendations that would be proposed in the concluding chapter.

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<sup>258</sup> See *Sierra Club v Morton*, Page 405 U.S 750.

<sup>259</sup> See Hardin, Note 22. P1245.

<sup>260</sup> As freedoms and rights must be limited for the proper functioning of society.

<sup>261</sup> M. Stallworthy, *Understanding Environmental Law*, First Ed, Thomson, Sweet & Maxwell, 2008. P202.

## **CHAPTER FOUR:**

### **INTERNATIONAL ASPECTS**

#### **4.1 Introduction**

This dissertation shall now turn to exploring the current international attempts at addressing plastic marine debris and the shortcomings of these efforts. Despite growing awareness of the detrimental environmental impacts of such oceanic garbage patches, the threat remains largely unaddressed by law at both global and national levels. Plastic marine debris, which forms approximately 80 percent of all marine debris has only (relatively) recently entered international discussion.<sup>262</sup> International, national, state and local laws allude to the issues surrounding marine debris, both indirectly and expressly.<sup>263</sup>

A survey of such laws reveal that there are potentially effective approaches to deal with the issues of plastic marine debris however there is no ‘silver bullet’<sup>264</sup> as existing instruments have failed to control or reduce plastic marine litter.<sup>265</sup> Being a global commons care for the world’s oceans and seas, has been a matter requiring ‘international communication and agreement since the dawn of civilization’.<sup>266</sup>

#### **4.2 International Agreements**

By no means is the recognition of pollution in our oceans a recent discovery, nor are the attempts to prevent and reduce it. However the nature of solutions has varied over the past 50 years. There are few global legal instruments aimed towards the prevention and management of marine debris both at land and sea.<sup>267</sup>

Of more concern, existing international agreements primarily cater for sea-based sources of plastics, which are estimated to be responsible only for a minority percentage of the plastics present in our oceans.<sup>268</sup> Whereas the instruments that do concern the issues of land based

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<sup>262</sup> See Goldberg, Note 4. P325.

<sup>263</sup> See Coulter, Note 7. P1965.

<sup>264</sup> Ibid. P1965.

<sup>265</sup> See Goldberg, Note 4. P325.

<sup>266</sup> See Glazewski, Note 32. P25:11.

<sup>267</sup> See Thompson et al, Note 151. P24.

<sup>268</sup> See Gold et al, Note 224. P8.

marine pollution are largely limited in scope or non-binding.<sup>269</sup> This dissertation shall now turn to discuss such relevant instruments.

#### **4.2.1 The Nature of International Agreements: Hard law and Soft Law.**

International mechanisms and instruments addressing the issue of plastic marine debris fall into the category of being either ‘hard law’ or ‘soft law’.<sup>270</sup> These are not formal terms but rather ‘descriptions’ that academics use to describe the nature of international law. Although these descriptions appear distinct they often overlap, as every single international convention is essentially a compromise containing both elements of hard and soft law.

Hard law agreements usually apply to particular jurisdictional areas of the marine environment, as determined by the contracting parties.<sup>271</sup> It is important to bear in mind for this section that this distinction is not always apparent, as almost every binding convention comprises both hard and soft law elements. Such instruments commonly refer to a document that contains detailed information on the standards that must be met by contracting parties. The more onerous the binding provisions in a treaty are, the more years of negotiation are likely to be required to finalise or alter the document.<sup>272</sup>

Existing agreements serve as foundations upon which the addition of new action plans that address more specific issues such as the assessment of marine litter and strategic monitoring can be integrated and implemented.<sup>273</sup> This approach is suggested as this foundation supports multiple annexes which provide further detail about factors such as the criteria to establish and address priority pollutants and to application to a specific pollution source.<sup>274</sup>

Sadly, many hard law obligations within international legal instruments are neither implemented nor enforced. A further weakness lies in the fact that although annexes to protocols are created legally binding, Party states can often choose which annexes they want to be bound by, thus the overall effectiveness of the convention is lost.

Conversely ‘soft law’ signifies ‘laws’ that do not have any legally binding obligations upon party states, often appearing as declarations, resolutions and regional strategic plans.<sup>275</sup> Soft

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<sup>269</sup> See Gold et al, Note 224. P9.

<sup>270</sup> Ibid. P8.

<sup>271</sup> Ibid. P9.

<sup>272</sup> Ibid.

<sup>273</sup> Ibid.

<sup>274</sup> Ibid.

<sup>275</sup> Ibid.

law agreements are usually adopted through international institutions, intergovernmental organizations and conferences.

## **4.2.2 (Apparently) Hard Law**

### **4.2.2.1 The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter <sup>276</sup> (London Convention)**

This Convention is generally considered to be one of the more successful<sup>277</sup> pollution-related treaties of the 1970's.<sup>278</sup> South Africa signed the original convention in 1972 and ratified it in 1978.<sup>279</sup> This Convention was specifically 'designed to provide the basic framework for global control of the deliberate disposal of all wastes in the ocean'<sup>280</sup> and has been in force since 1975.

Article 3 specifically prevents countries from depositing at sea wastes that have been generated on land, by banning 'any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea'.<sup>281</sup> This prohibition is achieved through the use of a permitting system, in which Party states are required to issue permits to their nationals, for loading wastes within their territory<sup>282</sup> or for the dumping of wastes from ships under its flag at high sea.<sup>283</sup>

The definition of 'sea' contained in section 3 of article 3, is listed as 'all marine waters other than the internal waters of States'. Thus, through implication this Convention does not concern itself with the issue of dumping wastes through the State's internal waters or its ocean outfalls.<sup>284</sup> Thus although the London Convention created a formidable international safeguard against irresponsible dumping practices and clean seas, these measures only served as a guard against sea-based dumping as opposed to land-based sources of marine pollution.<sup>285</sup>

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<sup>276</sup> The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 1972, hereafter referred to as the London Convention.

<sup>277</sup> Reiterating the fact that, the rate of industrial wastes being dumped at sea had dropped from 17 million tonnes in 1979 to 6 million tonnes in 1987.

<sup>278</sup> See Glazewski, Note 32. P25:30.

<sup>279</sup> Ibid. P25:31.

<sup>280</sup> See Harse, Note 74. P345.

<sup>281</sup> London Convention, See Article 3.

<sup>282</sup> Ibid, See Article VI (2)(a).

<sup>283</sup> Ibid, See Article VI (2)(b).

<sup>284</sup> See Harse, Note 74. P346.

<sup>285</sup> Ibid.

#### 4.2.2.2 The United Nations Convention on the Law of the Sea<sup>286</sup> (UNCLOS)

The UNCLOS has been described as the ‘most elaborate world order bargain struck by the international community’.<sup>287</sup> This treaty refines the historical notion of Grotius’s *Freedom of the Seas*, through recognising the sovereign right that coastal states have over territorial waters, and to the natural resources that fall within the 200 nautical mile exclusive economic zone (EEZ).<sup>288</sup> Also the UNCLOS is the only international treaty of global scope that addresses the issue of LBMP. The treaty came into force in November 1994 and currently there are 162 party nations. South Africa ratified this treaty on the 23<sup>rd</sup> of December 1997.

The UNCLOS defines ‘pollution of the marine environment as: ‘the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality or use of seawater and reduction of amenities’.<sup>289</sup>

Part XXII of the UNCLOS contains provisions concerning the ‘Protection and Preservation of the Marine Environment.’ Article 192 declares that there lies a shared general obligation amongst all nations to protect and preserve the marine environment.<sup>290</sup> The general provisions concerning the marine protection mandate are contained in Article 194- ‘States shall take... all measures consistent with this Convention that are necessary to prevent reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities, and they shall endeavour to harmonise their policies in his connection’.<sup>291</sup> The Articles 194 (2), 195 and 196 forbid nations from polluting the environments of other countries,<sup>292</sup> turning one form of pollution into another<sup>293</sup> and assisting the spread of invasive species.<sup>294</sup> Therefore a nation may be held in violation of such provisions if they contribute to the plastic marine debris problem,<sup>295</sup> as microplastics drift into and pollute the environments of other states, as

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<sup>286</sup> The United Nations Convention on the Laws of the Sea of 1982. Hereafter referred to as UNCLOS.

<sup>287</sup> See Glazewski, Note 32. P2:21.

<sup>288</sup> Ibid.

<sup>289</sup> UNCLOS, See Article 1(4).

<sup>290</sup> UNCLOS, See Article 192.

<sup>291</sup> UNCLOS, See Article 194.

<sup>292</sup> UNCLOS, See Article 194(2).

<sup>293</sup> UNCLOS, See Article 195.

<sup>294</sup> UNCLOS, See Article 196.

<sup>295</sup> See Goldberg, Note 4. P328.

they travel ocean currents they often cross transnational boundaries,<sup>296</sup> indirectly providing transport for invasive species.

Section 5 of the UNCLOS, is dedicated to the international and national mechanisms aimed at the prevention, reduction and control of pollution to the marine environment. Article 207 explicitly refers to issue of LBMP.<sup>297</sup> This provision acknowledges that inland waterways are often pathways to the ocean and highlights the necessity of protecting the ocean against ‘toxic, harmful and noxious substances, especially those that are persistent’.<sup>298</sup>

This provision of the UNCLOS serves three important functions. Firstly it ‘provides stimulus for national legislatures to develop and improve their own laws’.<sup>299</sup> Secondly ‘it serves to encourage co-operation to this end on the part of neighbouring states. Lastly it offers a legal basis for the incorporation of pollution control policy and relevant institutional arrangements, especially in coastal areas.’<sup>300</sup>

The UNCLOS falls short as a tool for improving the oceans conditions for two reasons: firstly, such ‘garbage patches’ as the GPGP<sup>301</sup> are outside any national water sovereignty line established in the treaty,<sup>302</sup> and secondly the provisions contained in the UNCLOS are too ambiguous to facilitate a comprehensive solution.<sup>303</sup> Article 207 of the UNCLOS upon closer inspection proves to be one of the weakest provisions of Part XII, as this provision is far too ambiguous. Article 207 includes no explanation of existing international standards or

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<sup>296</sup> See Goldberg, Note 4. P328.

<sup>297</sup> Article 207 contained in Section 5 of the UNCLOS, reads as the following:

1. States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, taking into account internationally agreed rules, standards and recommended practices and procedures.2. States shall take other measures as may be necessary to prevent, reduce and control such pollution.3. States shall endeavour to harmonize their policies in this connection at the appropriate regional level.4. States, acting especially through competent international organizations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control pollution of the marine environment from land-based sources, taking into account characteristic regional features, the economic capacity of developing States and their need for economic development. Such rules, standards and recommended practices and procedures shall be re-examined from time to time as necessary.5. Laws, regulations, measures, rules, standards and recommended practices and procedures referred to in paragraphs 1, 2 and 4 shall include those designed to minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment.

<sup>298</sup> UNCLOS, See Article 207(1) and (5).

<sup>299</sup> See Goldberg, Note 4. P328.

<sup>300</sup> Ibid. P329.

<sup>301</sup> Although the United States have not ratified the UNCLOS, it has recognised the same mile markers of sovereignty, namely the 200 nautical mile EEZ.

<sup>302</sup> See Coulter, Note 7. P1966.

<sup>303</sup> Ibid.

how ‘other measures’ should be developed by a nation to meet such standards.<sup>304</sup> There are no minimum compliance requirements for any other sources of pollution such as dumping at sea and from seafaring vessels.<sup>305</sup> It appears that Party states are obligated to adopt regulations and laws which are to be no less effective than the accepted international standard.<sup>306</sup> Concerning LBMP, party states may now use their own discretion whilst merely taking into account the international standards.<sup>307</sup>

In the case of developing countries this very problem is amplified as Article 194 gives developing nations a ‘licence of reluctance’<sup>308</sup> as the phrases ‘best practicable means at their disposal’ and ‘in accordance with their capabilities’ seemingly allow developing countries to implement proportionally weaker restrictions on land-based sources.<sup>309</sup> Therefore it becomes clear that Article 207 is essentially a bare legislative framework with ambitious goals, providing no means to that end. As although it recognises the existence of LBMP it merely requests that the party states address this contentious issue through domestic means.

#### **4.2.2.3 International Convention for the Prevention of Pollution from Ships.<sup>310</sup> (MARPOL)**

MARPOL was a result of the International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL) in 1954, which originally intended to combat the threat of maritime oil pollution. The MARPOL built and elaborated on OILPOL, and has effectively subsumed it.<sup>311</sup>

MARPOL concerns itself with the various technical aspects of pollution from ships at sea. The arduous requirements contained in Annexure 2 of MARPOL<sup>312</sup> had made many states reluctant to adopt the MARPOL Convention of 1973. The Protocol to the MARPOL Convention was adopted in 1978, which relieved parties from adopting all five annexures

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<sup>304</sup> See Goldberg, Note 4. P328.

<sup>305</sup> Ibid. P329.

<sup>306</sup> Ibid.

<sup>307</sup> Ibid.

<sup>308</sup> Ibid.

<sup>309</sup> Ibid.

<sup>310</sup> International Convention for the Prevention of Pollution from Ships, 1988. Hereafter referred to as MARPOL

<sup>311</sup> G.A. Harse, ‘Plastic, the Great Pacific Garbage Patch, and International Misfires at a Cure’, *UCLA Journal of Environmental Law and Policy*, Vol 29, 2011. P348.

<sup>312</sup> Annexure 2 contained detailed rules and standards concerning harmful substances carried by sea in packages forms.

concurrently.<sup>313</sup> South Africa acceded to the 1973 Convention in 1978 and to the 1978 Protocol in 1984.<sup>314</sup>

The thrust of the MARPOL Convention 1973/1978 is to prevent and regulate intentional operational discharges rather than deal with its consequences. MARPOL's Annexures cover various technical aspects pollution from ships at sea however the most relevant to the issue of plastic marine debris is discussed under the fifth Annexure. The amendments to Annex V on garbage from ships were amended in March 2010 and became effective on 1 May 2011.<sup>315</sup>

Annex V contained in MARPOL 1973/1978, Prevention of Pollution by Garbage from Ships, is the most relevant portion of the convention when considering international strategies towards combating plastic as an oceanic pollutant.<sup>316</sup> Annex V essentially deals with different forms of garbage and specifies the distances from land and the manner in which they must be disposed of however the most important facet of this Annex lies in the complete ban on dumping into the sea of specific forms of plastics.<sup>317</sup> This ban extends specifically to plastic items such as 'synthetic ropes, synthetic fishing nets and plastic garbage bags'.<sup>318</sup>

#### **4.2.2.3.1 Revised MARPOL Annex V**

The Marine Environment Protection Committee (MEPC), in 2006, established an intercessional group to develop a framework for the comprehensive review of MARPOL Annex V, to assess the effectiveness in addressing the sea-based sources of marine debris.

IMO (International Marine Organization) efforts have been fruitful concerning the revision of the MARPOL Annex V provisions aimed at prohibiting almost any garbage discharges from ships at sea, upgrading the port reception facilities and developing a port reception facilities database as a component of the Global Integrated Shipping Information System.<sup>319</sup>

In 2011 the revised MARPOL Annex V had been adopted and had come into force on 1 January 2013. In 2012, the MEPC adopted the *2012 Guidelines for the implementation of MARPOL Annex V* and the *2012 Guidelines for the development of garbage management plans*.

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<sup>313</sup> See Glazewski, Note 32. P25:16.

<sup>314</sup> Ibid.

<sup>315</sup> Ibid.

<sup>316</sup> See Harse, Note 74. P349.

<sup>317</sup> Ibid.

<sup>318</sup> MARPOL, See Annex V, at reg. 3(1)(a) , 5(2)(a)(1).

<sup>319</sup> See Thompson et al, Note 151. P25.

The revised Annex V now wholly forbids the discharge of all garbage into the sea, except as provided otherwise in regulations 4, 5, and 6 of the Annex, which are related to food waste, cargo residues, cleaning agents and additives and animal carcasses.

### **4.3 Overarching weaknesses of MEA's**

Upon gauging the competence of multilateral environmental agreements to address the problem of plastic marine litter, although they appear in theory, to be potentially helpful, their inherent weaknesses make them unlikely to lead to significant reductions of plastic marine debris. This inefficiency is referred to below, with respect to the limited jurisdiction of such instruments, inadequate scope regarding the main sources of pollution, the lack of enforceable standards and the insufficient penalties which mean that no existing MEA comprehensively regulates this problem of plastic marine debris.

#### **4.3.1 Limited Jurisdiction over dominant sources of plastic pollution**

The complex nature of plastic marine debris problems has obvious international dimensions. Due to the fact that plastic debris are often transported over long distances by ocean and wind currents, it appears that the people in the areas most plagued by the litter, exercise very little power over the production, consumption and disposal of that litter.<sup>320</sup>

Even where existing international instruments include clear jurisdictional limitations, these often obstruct the effectiveness of the MEA's enforcement. As plastic litter usually aggregates within gyres, this portion of the marine environment is located within the high seas - falling outside the jurisdiction (200 nautical mile EEZ) of any particular nation or group of nations.<sup>321</sup>

The various opt-out provisions and exemptions encompassed in existing international MEA's perpetuate the behaviours of carelessly handling plastics at sea, further limiting the effectiveness of the treaties.<sup>322</sup> It appears that no single international agreement covers all main sources of plastic marine litter, whereas many existing agreements make direct exemptions for major sources.<sup>323</sup>

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<sup>320</sup> See Gold et al, Note 224. P7.

<sup>321</sup> Ibid.

<sup>322</sup> Ibid. P9.

<sup>323</sup> Ibid.

For example UNCLOS does not fine seafaring vessels for the ‘incidental’ loss of otherwise prohibited waste.<sup>324</sup> The London Convention fails to regulate ship-generated waste and explicitly allows for disposals ‘incidental to or derived from the normal operation of vessels.’<sup>325</sup> Although MARPOL’s Annex V broadly prohibiting the ‘discharge into the sea of all plastics’,<sup>326</sup> the accidental loss or disposal of plastic resulting from damage to the ship or its equipment remains exempt.<sup>327</sup> Furthermore, numerous Party nations have not yet ratified Annex V.

#### **4.3.2 Lack of Enforceable Standards**

A common flaw of the existing international agreements is their lack of enforceable standards.<sup>328</sup> This deficiency is illustrated through UNCLOS requesting that party nations merely ‘endeavour’ to use the ‘best practical means’ to reduce marine pollution in ‘accordance with their capabilities’. This ambiguity makes these laws difficult to define and enforce as it is difficult to grasp what the ‘best practical means’ and ‘in accordance with their capabilities’ require of nations with differing capacities, environmental circumstances and legal systems.<sup>329</sup>

#### **4.3.3 Lack of Enforcement Mechanisms**

The fines imposed under current MEA’s lack the severity to effectively deter unlawful behaviour. For example, MARPOL does not expressly provide for the imposition of specific penalties for violations.<sup>330</sup> Alternatively, the instrument instructs each party to establish their own domestic penalty framework through enabling legislation.<sup>331</sup> Once such penalty frameworks have been established, the punishments often lack severity and are not enough to deter such future behaviour.<sup>332</sup>

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<sup>324</sup> See Gold et al, Note 224. P9.

<sup>325</sup> London Convention, Article 1, See Paragraph 4.2.1.

<sup>326</sup> MARPOL, See Annex V, at Reg 3.2.

<sup>327</sup> MARPOL, See Annex V, at Reg 7 (1)

<sup>328</sup> See Gold et al, Note 224. P10.

<sup>329</sup> Ibid.

<sup>330</sup> Ibid, P11.

<sup>331</sup> Ibid,

<sup>332</sup> North America has a comprehensive domestic penalty scheme implementing the laws of MARPOL, The Act to Prevent Pollution from Ships. However according to the U.S. Office of Accounting , less than 10 percent of cases brought under MARPOL had resulted in penalties, whereby most often cases were dismissed with warning or referral of case to the ship’s flag state. Parties that had incurred fines had usually penalized an average of \$6, 200 per case. – See Gold, Note 224. P11.

## 4.4 Soft Law

### 4.4.1 Global soft law instruments containing specific provisions for marine debris:

In response to the UNCLOS mandate coupled with the rising concern of the increasing levels of LBMP, the United Nations Environment Programme (UNEP) had developed three soft law frameworks addressing this issue between 1985 and 1995.<sup>333</sup>

Such soft law paradigms are plagued with a lack in enforcement authority, inconsistent participation and erratic adherence to their guidelines.<sup>334</sup> Until recently, these paradigms have collectively failed in addressing plastics as a rapidly increasing, persistent pollutant within the marine environment.

### 4.4.2 The Montreal Guidelines for the Protection of the Marine Environment from Land-Based Sources (Montreal Guidelines)<sup>335</sup>

The Montreal Guidelines are the first of these frameworks and were drafted in 1985. This instrument was essentially a reiteration of the UNCLOS, bearing the same deficiencies – providing vague applicable international standards and a lack of prescribed technical standards.<sup>336</sup>

On a positive note however, the Montreal Guidelines did extend the definition of ‘marine pollution’ from damage to marine life to ‘harm to marine ecosystems’.<sup>337</sup> This extension of care encompasses non-living factors, indicating that such factors are vital to the prevention of marine pollution.<sup>338</sup> Furthermore the Montreal Guidelines had gained praise in the context of marine debris, as it had created a ‘black list’<sup>339</sup> of materials that are to be wholly prohibited and eliminated from the marine environment. Plastics are not expressly listed as such however blacklisted items include ‘persistent synthetic materials which may seriously

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<sup>333</sup> See Goldberg, Note 4. P330.

<sup>334</sup> Ibid.

<sup>335</sup> Montreal Guideline for the Protection of the Marine Environment from Land- Based Sources, Decision of the UNEP Governing Council (May 24 1985)

<sup>336</sup> . See Goldberg, Note 4. P330.

<sup>337</sup> The Montreal Guideline for the Protection of the Marine Environment from Land-Based Sources (Montreal Guidelines). See 1 (a).

<sup>338</sup> See Goldberg, Note 4. P330.

<sup>339</sup> The criterion for ‘black list substances’ are contained in Annex II of the Montreal Guidelines, which read as:

(a) Substances that are not readily degradable or rendered harmless by natural processes; and (b) substances that either : (i) give rise to dangerous accumulation of harmful material in the food chain; or (ii) endanger the welfare of living organisms causing undesirable changes in the marine ecosystems; or (iii) interfere seriously with the harvesting of sea foods or with other legitimate uses of the sea; and (c) pollution by these substances necessitates urgent action.

interfere with the legitimate uses of the sea'.<sup>340</sup> However there is still much room for improvement as the use of a 'black list' had been considered outdated, per the 1972/1996 London Convention/ Protocol. Cross-refer to the discussion outlined under section 1.2.3 and footnote 46.

#### **4.4.3 The United Nations Conference on Environment and Development of 1992 (UNCED and Agenda 21)** <sup>341</sup>

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro adopted Chapter 17 of Agenda 21, which dealt with the protection of the world's coastal areas, seas and oceans, along with the 'rational use and development of their living resources'.<sup>342</sup> Chapter 17 was considered to be a great improvement on the Montreal Guidelines for numerous reasons. Firstly, it acknowledges the threat of plastics and explicitly lists these as part of the 'contaminants that pose the greatest threat to the marine environment'.<sup>343</sup> This provision within the chapter further elucidates that as land-based sources of marine pollution should 'be of particular concern...since they exhibit the at the same toxicity, persistence and bioaccumulation in the food chain' as '...there is still no global scheme to address marine pollution from land based sources'.<sup>344</sup> Secondly, Chapter 17 advocates for the adoption of the precautionary approach to the issue of LBMP. In the context of plastic pollution, the precautionary principle advises an 'anticipatory, rather than reactive, approach ... including clean production techniques, recycling, waste audits and minimisation, construction and/or improvement of sewage treatment facilities'.<sup>345</sup> Lastly, Chapter 17 greatly emphasises the importance of national and regional co-operation.<sup>346</sup>

#### **4.4.4 The Global Programme of Action for the Protection of the Marine Environment from Land-Based Sources (GPA)** <sup>347</sup>

The GPA had emanated from the Washington Conference held in 1995. The GPA went even further than Chapter 17 in recognizing and addressing plastic litter as a distinct category of

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<sup>340</sup> Montreal Guidelines, See Annex II, at 1.4.

<sup>341</sup> The United Nations Conference on Environment and Development of 1992 (Agenda 21)

<sup>342</sup> Agenda 21. Chapter 17

<sup>343</sup> Ibid. See 17.18.

<sup>344</sup> Ibid. See 17.18

<sup>345</sup> Agenda 21, Chapter 17, See 17.21

<sup>346</sup> Ibid, See 17.6-17.17 See generally, 17.116-17.123.

<sup>347</sup> The Global Programme of Action for the Protection of the Marine Environment from Land-Based Sources (GPA)

marine pollution, with recommended strategic actions to be taken at global, national and regional levels.<sup>348</sup>

Paragraphs 141 and 142 pay particular attention to plastics:

141. Litter entering into the marine and coastal environment has multiple sources. Source include poorly managed or illegal waste dumps adjacent to rivers and coastal areas, windblown litter from coastal communities, resin pellets used as industrial feedstock's, and litter that is channelled to the marine and coastal environment through municipal storm water systems and rivers. Marine litter is also caused by dumping of garbage into the marine and coastal environment by municipal authorities as well as recreational and commercial vessels.<sup>349</sup>

142. While international action has been taken to prevent the discharge of plastics and other persistent wastes from vessels, it has been estimated that approximately 80 percent originate from land. Floatable litter is known to travel considerable with regional and sometimes broader implications. Resin pellets used as industrial feedstocks circulate and deposit on oceanic scales.<sup>350</sup>

The above paragraphs affirm that 80 percent of persistent wastes originate from land and describe how they are prone to travel once they have entered into coastal and marine environments.<sup>351</sup>

In the Third Intergovernmental Review of the GPA (Manila Declaration)<sup>352</sup> held in 2012, participants discussed the causes for and the ineffectiveness of the GPA and Regional Seas Programme in reducing current levels of marine pollution. This meeting had highlighted land-based marine litter as a priority source category for 2012 to 2016, furthermore this meeting was the first time in which plastic marine debris including microplastics, were specifically referred to as an emerging global issue.<sup>353</sup> The participants deduced that the lack of national enforcement mechanisms and improper waste management practices were the main causes.<sup>354</sup> The increased urbanization and consumption rates of developing nations coupled with the constant rise in population further contributes to the marine debris problem. This is expected from developing countries however due to their industrial pursuits and growing economies.

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<sup>348</sup> GPA, See 54-55 and 140-143.

<sup>349</sup> GPA, See 141.

<sup>350</sup> GPA, See 142.

<sup>351</sup> See Goldberg, Note 4, P332.

<sup>352</sup> The Third Intergovernmental Review of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Sources, 2012. (Manilla Declaration)

<sup>353</sup> See Goldberg, Note 4. P332.

<sup>354</sup> Manilla Declaration, See 2.

#### **4.4.5 UNEP Global Partnership on Waste Management framework (GPWM)**

The trend of improper waste management infrastructures, especially amongst developing nations, sparked the final draft of UNEP's Global Partnership on Waste Management framework.<sup>355</sup>

This framework anticipated that by 2015 the greater share of the world's population would be living in urban centres and that developing nations currently produce nearly the same rate of waste per year as their developed counterparts.<sup>356</sup> The GPWM therefore seeks to build partnerships and increase awareness to meet this rapidly increasing demand through expanding the existing waste infrastructure.<sup>357</sup>

The GPWM aspires towards educating developing nations on the importance of conservation and recycling, through helping developing nations create (or upgrade) systems for waste prevention and waste management.<sup>358</sup> These targets are based on the understanding that the degradation of the marine environment generates poverty through depleting the very basis for social and economic upliftment.<sup>359</sup>

#### **4.4.6 Honolulu Strategy – A Global Framework for Prevention and Management of Marine Debris**

The Honolulu Strategy is a key outcome from the Fifth International Marine Debris Conference (5IMDC) held in 2011. During the conference held in Honolulu, Hawaii a group of experts from 35 countries, research organisations, governments, multinational corporations (such as the Coca-Cola group) and trade associations (including Plastics Europe and the American Chemistry Institute) met to discuss the dangers of marine debris.<sup>360</sup>

The main outcome was a comprehensive global framework aimed at reducing the ecological, human health and economic impacts of marine debris. This strategy is intended to improve collaboration and coordination's amongst a wide array of governments and groups across the world, that are in a position to address the issue of marine debris. The Honolulu Strategy was

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<sup>355</sup> UNEP Global Partnership on Waste Management framework, 2011.

<sup>356</sup> *Ibid.*, At 7.

<sup>357</sup> See Goldberg, Note 4. P333.

<sup>358</sup> *Ibid.* P332.

<sup>359</sup> UNEP Global Partnership on Waste Management framework , 2011. At 7.

<sup>360</sup> S. Leahy, 'A Fatal Addiction to Plastic', *Inter Press Service News Agency*, 1 April 2011, Available at : <http://www.ipsnews.net/2011/04/a-fatal-addiction-to-plastic/>, (Accessed 15 November 2014)

further intended to serve as a common frame of reference for action(s) taken, as well as a tool which develops and monitors existing marine debris initiatives.

There are three primary goals the strategy aspires towards. Firstly, ‘reducing the amount and impact of sea-based sources of marine debris including solid waste introduced into the marine environment’.<sup>361</sup> Secondly, reducing the amount and impact of sea-based sources of marine debris and lastly, reducing the ‘amount and impact of accumulated marine debris on shorelines, habitats and pelagic waters’.<sup>362</sup>

These strategies appear to be of paramount importance in tackling this problem as they target the source of the problem whilst mitigating the adverse impacts of the problem. Although all parties were prepared to meet the targets and goals that were agreed upon, the problem lay in that no specific targets or goals had been set as the document merely invites stakeholders to commit to setting targets and sharing information aimed at reducing marine debris.<sup>363</sup> Although a sound initiative their intentions remain cloaked in ambiguity, hindering proper chances of effectiveness.

#### **4.4.7 The United Nations Conference on Sustainable Development– ‘The Future We Want’, 2012. (Rio +20 Outcome Document)**

In 2012, the world’s nations gathered in Rio de Janeiro, to assess progress made since the United Nations Conference on Environment and Development held there 20 years earlier, in hopes of identifying shortcomings in the multilateral approach.<sup>364</sup> ‘The Future We Want’ was the main outcome document of the summit, which renewed the global commitment to sustainable development and poverty eradication.<sup>365</sup>

In paragraph 163 of this document, the issues of LBMP and plastic marine debris were highlighted. A commitment was made to:

take action to reduce the incidence and impacts of such pollution on marine ecosystems, including through the effective implementation of relevant conventions adopted in the framework of the International Maritime Organization (IMO), and the follow-up of the relevant initiatives such as the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, as well as the adoption of coordinated strategies to this end. We further commit to take action to, by

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<sup>361</sup> Honolulu Strategy, See P19 at 3.0.

<sup>362</sup> Honolulu Strategy, See P19 at 3.0.

<sup>363</sup> See Leahy, Note 362.

<sup>364</sup> See Glazewski, Note 32. P2:11.

<sup>365</sup> Ibid. P2:1.

2025, based on collected scientific data, achieve significant reductions in marine debris to prevent harm to the coastal and marine environment.<sup>366</sup>

Within the final agreement there was great progress made towards addressing this issue of plastic marine debris and its land-based sources. Through particularly highlighting plastic as a cause for concern, preventative corrective measures focussed on minimising plastic wastes at the source can now be taken.

Marine debris was described as one of the major environmental concerns contained within the Rio+20 outcome documents, as it adversely impacts the health of the oceans, marine biodiversity and humans. The document appeals to countries to take significant actions to achieve reductions in marine debris by 2025, to avert harm to the marine and coastal environment.<sup>367</sup> However, the word ‘significant’ remains rather vague and there seems to be a common trend appearing amongst these global efforts.

#### **4.4.8 Global Partnership on Marine Litter, 2012 (GPML)**

The GPML was launched by UNEP during the Rio+20 negotiations, at a side event in Rio de Janeiro, in 2012. The GPML was established with the objective of protecting the environment and human health through the prevention, reduction and management of marine litter.<sup>368</sup> This global partnership works as an ‘overall co-ordinating multi-stakeholder forum’<sup>369</sup> which aims to enhance knowledge and increase awareness surrounding the issue of marine litter. The GPML builds on the Honolulu Strategy, focussing on reducing the amounts and impacts of marine and land based sources of marine debris.

#### **4.4.9 The Oceans Compact: Healthy Oceans for Prosperity, 2012**<sup>370</sup>

UN Secretary General Mr Ban Ki-Moon implored all countries to set national targets for waste water, marine debris and nutrients, in an effort to protect human health and improve the state of the ocean. The Oceans Compact is an effort to set out the strategic vision, focused on delivery regarding the ocean-related mandates of the UN mandates, consistent with the

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<sup>366</sup> The United Nations Conference on Sustainable Development– ‘The Future We Want’, 2012. (Rio +20 Outcome Document), Para 163.

<sup>367</sup> The United Nations Conference on Sustainable Development– ‘The Future We Want’, 2012. (Rio +20 Outcome Document), Para 163.

<sup>368</sup> J. Smith, ‘UNEP Yearbook 2014: Emerging issues in our global environment’, UNEP. Available at: [http://www.unep.org/yearbook/2014/PDF/UNEP\\_YearBook\\_2014.pdf](http://www.unep.org/yearbook/2014/PDF/UNEP_YearBook_2014.pdf), (Accessed 15 July 2014). P 4.

<sup>369</sup> Ibid. P4.

<sup>370</sup> See Ban ki Moon, Note 137.

Rio+20 outcome document ‘The Future We Want’, in a more effective and coherent manner. Aiming to provide all stakeholders with an opportunity to collaborate and attain the common goal of ‘Healthy Oceans for Prosperity’.<sup>371</sup> The importance of this document lies in that it gives some indication of how desperate the situation in our oceans really is, as the UN Secretary General finds it necessary to become involved ‘personally’.

#### **4.4.10 United Nations Environmental Assembly of the United Nations Environment Programme (First UNEA Session – 27 June 2014)**

The concerns contained within the ‘The Future We Want’ outcome document were recalled in the United Nations Environment Assembly (UNEA) of UNEP which, at its first session, on the 27<sup>th</sup> of June 2014 adopted the resolution 1/6 on marine debris and microplastics. The UNEA is a new governing body which replaces the old UNEP Governing Council, since the Rio+20 (UNCSD) in 2012.

This is arguably the most recent important international movement on plastic marine debris and microplastics. Paragraph 58 describes the issue of marine debris, as one that is a ‘complex, multisectoral problem’ and in ‘urgent need of attention’.<sup>372</sup>

The UNEA takes note of existing international mechanisms implemented to promote the ‘sound management of waste that lead to the prevention and minimization of significant adverse effects on human health and the environment’. The UNEA recalls the Manila Declaration, which highlights the relevance of the Honolulu Strategy and recommended the establishment of a global partnership on marine litter.

#### **4.4.11 UNEA Resolution 1/6 on Marine plastic debris and microplastics**

The following excerpts highlight the salient points related to LBMP and plastic marine debris.

*The United Nations Environment Assembly,*

2. *Recognizes* the significant risks arising from the inadequate management and disposal of plastic and the need to take action;
4. *Recognizes* that plastics, including microplastics, in the marine environment are a rapidly increasing problem due to their large and still increasing use combined with the inadequate management and

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<sup>371</sup> See Ban ki Moon, Note 137. P2.

<sup>372</sup> See Paragraph 58.

disposal of plastic waste, and because plastic debris in the marine environment is steadily fragmenting into secondary microplastics;

6. *Notes* that microplastics may also contribute to the transfer in the marine ecosystems of persistent organic pollutants, other persistent, bio accumulative and toxic substances and other contaminants which are in or adhere to the particles;

7. *Recognizes* that microplastics in the marine environment originate from a wide range of sources, including the breakdown of plastic debris in the oceans, industrial emissions and sewage and run-off from the use of products containing microplastics;

8. *Emphasizes* that further urgent action is needed to address the challenges posed by marine plastic debris and microplastics, by addressing such materials at source, by reducing pollution through improved waste management practices and by cleaning up existing debris and litter;

14. *Requests* the Executive Director, in consultation with other relevant institutions and stakeholders, to undertake a study on marine plastic debris and marine microplastics, building on existing work and taking into account the most up-to-date studies and data, focusing on:

(a) Identification of the key sources of marine plastic debris and microplastics; (b) Identification of possible measures and best available techniques and environmental practices to prevent the accumulation and minimize the level of microplastics in the marine environment; (c) Recommendations for the most urgent actions; (d) Specification of areas especially in need of more research, including key impacts on the environment and on human health; (e) Any other relevant priority areas identified in the assessment of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection;

However this UNEA Resolution 1/6 have inherent weaknesses/limitations which are listed below, in which the UNEA:

1. *Stresses* the importance of the precautionary approach according to which lack of full scientific certainty should not be used for postponing cost-effective measures to prevent environmental degradation, where there are threats of serious or irreversible damage;

3. *Encourages* Governments, intergovernmental organizations, non-governmental organizations, industry and other relevant actors to cooperate with the Global Partnership on Marine Litter in its implementation of the Honolulu Strategy and to facilitate information exchange through the online marine litter network;

10. ...encourages Governments to collaborate through relevant regional seas conventions and river commissions with a view to adopting such action plans in their regions;

16. *Encourages* Governments and the private sector to promote the more resource-efficient use and sound management of plastics and microplastics;

17. *Also* encourages Governments to take comprehensive action to address the marine plastic debris and microplastic issue through, where appropriate, legislation, enforcement of international agreements,

provision of adequate reception facilities for ship-generated wastes, improvement of waste management practices and support for beach clean-up activities, as well as information, education and public awareness programmes;

The above are classified as limitations because the use of terms are not compelling and have no specified measurable outcomes.

## **4.5 Regional Initiatives**

In comparison to international agreements, regional initiatives/programmes are less broad and tend to specifically target issues of marine plastic pollution with less ambiguity by taking into account the economic and ecological climate of the region at issue.<sup>373</sup> Furthermore, it is important to acknowledge that regional conventions hold the same legal weight as do international conventions with global scope, as the only material difference lies in the scope of their application.

Regional cooperation is an integral part of successfully addressing this issue of plastic marine debris. Regional programmes are predominately implemented by member states through action plans, which set forth a comprehensive environmental management strategy for the programme and the operational legal framework.<sup>374</sup> There are numerous regional initiatives taken that are specifically concerned with LBMP within the international dimension.

### **4.5.1 The UNEP Regional Seas Programme**

The heavy emphasis placed on regional cooperation by Agenda 21, Chapter 17 had been partially implemented by the UNEP's Regional Seas Program.<sup>375</sup> This movement is an action-orientated programme, initiated in 1974 and finds itself particularly concerned with both the causes and consequences of environmental degradation in marine and coastal areas.<sup>376</sup> It was created to enhance the development of environmental management plans for water bodies shared by two or more nations.<sup>377</sup> The programme consists of regional action plans, in which each plan is underpinned by a regional convention.<sup>378</sup>

Upon analysis of the Regional Sea Action Plans (RSAP) UNEP had found that these smaller scale agreements have failed to alleviate the marine debris problem and were largely

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<sup>373</sup> See Gold et al, Note 224. P10.

<sup>374</sup> Ibid. P10.

<sup>375</sup> See Goldberg, Note 4. P331.

<sup>376</sup> See Glazewski, Note 32. P25:12.

<sup>377</sup> See Gold et al, Note 224. P10.

<sup>378</sup> See Glazewski, Note 32. P25:12.

ineffective, despite their smaller and arguably more manageable constitution.<sup>379</sup> This is most likely due to inadequate funding, poor enforcement, a lack of proper infrastructure and the lack of domestic legislation in most RSAP nations which specifically addresses the marine debris problem. Alternatively litter is regulated under the larger ‘solid waste’ category, which remains largely inadequate, in both implementation and enforcement.<sup>380</sup> The nomadic nature of marine litter and a lack of political visibility, in comparison to other environmental issues, keeps waste management infrastructure and marine debris a low priority.<sup>381</sup>

Currently this programme hosts more than 143 participatory nations, within the 18 regional seas programmes covering: the Arctic, Antarctic, Eastern Africa, Mediterranean Seas, the Pacific, North-East Pacific, North-West Pacific, North-East Atlantic, South-East Pacific, Western Africa and others.<sup>382</sup> Particularly relevant to South Africa are the regional action plans for the Eastern and Western African regions.

#### **4.5.2 The Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region, 1985. (Nairobi Convention)**

The Nairobi Convention area extends from South Africa to Somalia, covering approximately 10 states within the Western Indian Ocean (WIO) region. The WIO region hosts a populace of 178 million people, of which 60 million being coastal inhabitants, living within 100km of the coastline.

This Convention serves as a mechanism for regional co-operation, through harnessing human resources in the Eastern and Southern African region and focussing their efforts towards solving the interlinked problems of the marine and coastal environments including trans-boundary and critical national issues.<sup>383</sup>

The Nairobi Convention specifically highlights the issue of marine pollution from land based sources and activities, stating in Article 7 that:

The Contracting Parties shall endeavour to take all appropriate measures to prevent, reduce and combat pollution of the Convention area caused by coastal disposal or by discharges emanating from rivers,

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<sup>379</sup> See Goldberg, Note 4. P331.

<sup>380</sup> Ibid. P331.

<sup>381</sup> Ibid.

<sup>382</sup> See Gold et al, Note 224. P10.

<sup>383</sup> Available at: <http://www.unep.org/nairobiconvention/> (Accessed 12 November 2014).

estuaries, coastal establishments, outfall structures, or any other land-based sources and activities within their territories.

This Convention deserves praise for specifically including marine debris as a cause for concern and covering the main point and non-point sources of pollution. However the wording is still rather obscure as ‘all appropriate measures’ does not set any specific target therefore the onus remains ‘soft’.

#### **4.5.3 West Indian Ocean Land Based Activities Project (WIO-LaB)**

The WIO States having acknowledged the dire need for better management of their coastal and marine resources, in light of this modern threat, under the ambit of the Nairobi Convention, the WIO-LaB project has been developed and officially began in 2004.

The Project ‘Addressing Land-based Activities in the Western Indian Ocean’ (WIO-LaB) is a consequence of the World Summit for Sustainable Development (WSSD) in 2002 and the Johannesburg Plan of Implementation which requested for the ‘advanced implementation of the GPA’. This projects ultimate goal is to contribute towards sustainably developing the WIO regions, through addressing the sources of LBMP that have adverse impacts on the coastal and marine environment and has been designed to function as a demonstration project for the GPA.

There are three primary objectives of the WIO-LaB Project. Firstly, there is an aspiration towards improving the knowledge base and establish regional strategies for the reduction of stress to the marine and coastal ecosystem by improving the overall quality of the water. Secondly, this project aims to strengthen the regional legal basis for implementing the GPA and preventing LBMP. Lastly, this initiative seeks to develop regional capacity and strengthen the implementation of the Nairobi Convention.

#### **4.5.4 African Marine Debris Summit (2013)**

The first summit ever to focus specifically on the issue of marine debris within African waters took place in Cape Town, South Africa in the month of June 2013. Plastics SA, the South African Biodiversity Institute and the UNEP came together to organise this event, which brings together natural resource managers, marine debris researchers, policy makers and interested NGO’s.

This event highlighted the historical problem of marine debris and its progressive worsening in modern times. The absence of African countries at international conferences, workshops and meetings concerned with marine debris over the past 30 years was further highlighted. Acknowledging the dire need for such presence in modern time, due to the constant rise in the levels of production and use of plastics, and the growing economy and population, their presence becomes a necessity due to the poor waste management infrastructure.

Steyn<sup>384</sup> has stated that his hope that the summit would ‘highlight research advances made across Africa and its bordering seas in the field of marine debris and allow for the sharing of strategies and best practices’.<sup>385</sup> Furthermore, Steyn noted that this meeting should create an opportunity for the development of bilateral or multi-country strategies.<sup>386</sup>

This Summit appears to be an effect of the ‘world waking up to this problem’ as it is the first formal step taken specifically towards solving the issue of marine debris at a regional level, through African countries co-ordinating their efforts and collectively making a commitment to improving ocean health through preventing and reducing marine debris. This creates at least some awareness of the issue and may be a step towards this issue being addressed at a national level.

#### **4.6 Conclusion**

Although international law mechanisms recognise the role of inadequate waste management systems in creating and exacerbating the plastic marine debris problem, these tools fall short in numerous ways.<sup>387</sup>

Firstly, with respect to the ‘hard law’ instruments, UNCLOS cannot be enforced within the context of plastic marine debris as it is impossible to identify the source of plastics in the ocean once entered into the marine environment, often because they have fragmented. Furthermore, such debris accumulates within the gyres that falls outside of the ‘EEZ’ of any nation.<sup>388</sup> Thus even if there was an identifiable source of the litter, no nation would have the authority to enforce the UNCLOS.

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<sup>384</sup> The director of sustainability of Plastics SA.

<sup>385</sup> Available at: <http://www.infrastructurene.ws/2013/04/25/plastics-industry-to-host-first-african-marine-debris-summit/> , Accessed 10 December 2014).

<sup>386</sup> Available at: <http://www.infrastructurene.ws/2013/04/25/plastics-industry-to-host-first-african-marine-debris-summit/>, Accessed 10 December 2014).

<sup>387</sup> See Goldberg, Note 4. P333.

<sup>388</sup> Ibid.

Secondly, the international frameworks mentioned above contain no minimum acceptable standard that nations must meet; furthermore such frameworks are too general to anticipate ‘uniform international compliance in enacting land-based prevention infrastructure and regulation’.<sup>389</sup>

Thirdly, the regulation of land based plastic pollution is essentially a question of local law, international agreements risk encroaching upon a nation’s sovereignty.<sup>390</sup> It is on this note that regional Conventions and initiatives seem to be a more viable option, as this problem is global in scope however effective solutions may be found in more domestic means. Regional treaties have a very important place as they have a number of advantages. Sometimes States can work better together and find more appropriate solutions as they know first-hand of the surrounding conditions and external factors. Therefore, the solutions that are devised by developing nations are more likely to suit their social, political and economic climates. Lastly, no existing international agreement adequately addresses developing nations, as they are becoming major contributors to the plastic marine debris. However should such an adequate international agreement exist, developing nations may still lack the desire and capital to ‘implement responsible waste management infrastructures to the potential detriment of their industrial development’.<sup>391</sup>

Marine debris remains a complex issue that extends outside of the jurisdictional authority and ability of any particular institution or global entity to address.<sup>392</sup> The fundamental problem arguably lies in the lack of synergy between responses aimed at addressing the causes of plastic marine debris and those responses which are aimed at addressing the impacts of plastic marine debris.<sup>393</sup>

While the above-mentioned international mechanisms appear potentially helpful, their collective shortcomings render them largely ineffective and unlikely to minimise the presence of plastic marine litter. The deficiencies in the enforcement of existing regulations, lack of co-ordination between global and regional programmes, together with unsustainable production and consumption patterns continue to exacerbate an already complex problem.

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<sup>389</sup> See Goldberg, Note 4. P333.

<sup>390</sup> Ibid.

<sup>391</sup> Ibid.

<sup>392</sup> See Thompson et al, Note 151. P27.

<sup>393</sup> Ibid.

## CHAPTER FIVE:

### SOUTH AFRICAN ASPECTS

#### 5.1 Introduction: South African Oceans and Coastal Habitats

South Africa is a maritime nation that holds jurisdiction over one of the world's largest exclusive economic zones<sup>394</sup> and it happens to be 'uniquely situated at the juncture of two of the world's great oceans and on an economically viable maritime navigation route'.<sup>395</sup> South Africa's ocean space is a relatively pristine environment that is resource rich, as the undercurrents that surround the coast of South Africa display rich biodiversity and are extremely productive.<sup>396</sup> The ocean and the availability of its resources<sup>397</sup> are a great asset<sup>398</sup> as they represent substantial economic and development opportunities<sup>399</sup> for both current and future generations.<sup>400</sup>

Historically the predominant human uses of the ocean was limited to marine transport and the harvesting of marine living resources; however, since the advent of the 20<sup>th</sup> century we have witnessed the growth in both the intensity and range of maritime exploitation.<sup>401</sup> Human use of South Africa's oceans has now extended to innovative methods of energy production, eco-tourism and the extraction of minerals, oil and gas.<sup>402</sup>

With South Africa being a coastal state; it is common for such an economy to be greatly dependant on accessing import and export sea trade routes.<sup>403</sup> Contemporary studies reveal the direct economic contribution to South Africa's GDP (Gross Domestic Product) in 2010 to be approximately 4.5 %.<sup>404</sup> There is potential to increase the oceans input to the domestic GDP rating, and coherent, balanced and sustainable ocean management policy holds the

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<sup>394</sup> GN R426 in GG 37692 on 29 May 2014. P6.

<sup>395</sup> See Glazewski, Note 32. P25:48.

<sup>396</sup> GN R426 in GG 37692 on 29 May 2014. P9.

<sup>397</sup> In reference to both living and non-living oceanic resources.

<sup>398</sup> GN R426 in GG 37692 on 29 May 2014. P6

<sup>399</sup> Such opportunities emanate from both traditional exploitative avenues such as shipping, mining and fishing to relatively modern opportunities ; such as advancements in the fields of medicine, food production and energy production- See GN R426 in GG 37692 on 29 May 2014. P9

<sup>400</sup> GN R426 in GG 37692 on 29 May 2014. P9.

<sup>401</sup> Ibid.

<sup>402</sup> Ibid.

<sup>403</sup> Ibid.

<sup>404</sup> Ibid.

promise of realising such potential through promoting greater economic development opportunities within the ocean'.<sup>405</sup>

However, this vibrant coastline with its hazards and its surrounding nautical setting are becoming increasingly vulnerable to the adverse effects borne from various pollution sources. This threatens the integrity of the ocean and limits the ability of future generations to benefit from our great coastline. Thus a vital need exists to balance the economic opportunities and environmental integrity.

## 5.2 Structure of National Environmental Law

South Africa prides itself in its bountiful share of nature's gifts, but, as is the case globally, the last few decades have seen an increasing deterioration in the environmental quality in the Southern African region.<sup>406</sup> Environmental Law seems the obvious safeguard against such deterioration. However, the relative infancy of environmental law, in comparison to most other disciplines of law within South Africa,<sup>407</sup> coupled with the fact that environmental problems are indifferent towards any established political boundaries, renders the nature of environmental law in its entirety particularly dependant on the influence of international developments.<sup>408</sup> Therefore the more momentum a particular issue gains amongst the international community the more likely it is to be addressed within the national arena.

### 5.2.1 Sustainable Development

The model definition of 'Sustainable Development' had been created as a result of such international discourse.<sup>409</sup> This concept of Sustainable Development has in time, arguably developed into becoming the '*grundnorm*'<sup>410</sup> of contemporary environmental law, as it is the

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<sup>405</sup> GN R426 in GG 37692 on 29 May 2014. P9.

<sup>406</sup> See Glazewski, Note 32. P1:6.

<sup>407</sup> L. J Kotze & A. du Plessis, 'Some Brief Observations On Fifteen Years Of Environmental Rights Jurisprudence In South Africa', *Journal of Court Innovation*, Vol 157, 2010, Available at : [http://law.pace.edu/sites/default/files/IJIEA/jciKotze\\_South%20Africa%203-17\\_cropped.pdf](http://law.pace.edu/sites/default/files/IJIEA/jciKotze_South%20Africa%203-17_cropped.pdf) , (Accessed 15 April 2014). P174.

<sup>408</sup> See Glazewski, Note 32. P2:25.

<sup>409</sup> The concept had been described as: '...development that meets the needs of the present without compromising the ability of future generations to meet their own needs'=World Commission on Environment and Development, *Our Common Future*, (The Brundtland Report), (1987) at 43.

<sup>410</sup> Term coined by Hans Kelsen describing 'The foundational norm that constitutes the unity in the multitude of norms by representing the reason for validity of all norms that belong to this order' - D. Johnson, S. Pete & M. du Plessis, *Jurisprudence: A South African Perspective*, Lexis Nexis, 2008. P131.

‘fundamental building block around which environmental law norms have been fashioned, both internationally and in South Africa’.<sup>411</sup>

It is aimed at balancing the growing concerns of the international community, pertaining to environmental protection, economic development and social upliftment, into the decision making platform, at all levels of governance.<sup>412</sup> Forming an integral part of our law as it balances the competing demands of development and environmental protection,<sup>413</sup> this concept becomes of great importance in the context of South Africa’s industrial aspirations as a developing nation and its commitment to the environment.

### **5.3 Existing Specific Regulatory Framework**

The status of laws pertaining to LBMP and marine debris within South African national law remains in relative obscurity, despite the gravity of the issue. Within national legislation there is no express legal definition of LBMP nor is there anything specifically pertaining to plastic marine debris. This legal deficiency is likely to exacerbate the scale and adverse effects of this problem. There are, however, more general provisions which advocate for the overall protection of the environment, in which LBMP and marine debris can be argued for.

#### **5.3.1 Structure of National Legislation and General Regulatory Framework**

The closest link that can be found to LBMP in national legislation is probably the general definition of ‘pollution’ contained in section 1 of NEMA as:

Any change in the environment caused by- (i) substances;  
(ii) radioactive or other waves; or  
(iii) noise, odours, dust, heat,  
emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

The introduction of marine debris and other synthetic materials are anthropogenic changes in the environment. In the absence of specific legislation, it is necessary that we consider the structure of our national law and the general provisions that may be applicable to this particular environmental issue.

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<sup>411</sup> See Glazewski, Note 32. P5:19.

<sup>412</sup> See Glazewski, Note 32. P2:25.

<sup>413</sup> Ibid. P1:17.

### 5.3.1.1 The Constitution

The end of the Apartheid era and the promulgation of the 1996 Constitution were ‘evolutionary milestones’ for South Africa, which saw the passing of legislative documents that extend the benefit of law, even further to embrace the interests of ‘lesser-beings’.<sup>414</sup>

The Constitution now provides for the express inclusion of an enforceable substantive environment right,<sup>415</sup> which ‘has sparked the unprecedented development of the domestic environmental law and governance framework’.<sup>416</sup> This constitutional right to an environment that is not harmful to human health is contained in section 24, which reads as:

Everyone has the right to:

- (a) an environment which is not harmful to their human health or well-being; and
- (b) have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that:
  - (i) prevent pollution and ecological degradation;
  - (ii) promote conservation; and
  - (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

It may be deduced from the above that there is a parallel to be drawn between the need to protect the environment and the sanctity of human life, furthermore that the government has a role to play in the preservation of the environment which it should be actively involved in and held accountable for.

In Rachel Carson’s seminal book *Silent Spring*, she asserts in the following quote that part of the most basic of human rights surely should be ‘the right of the citizen to be secure in his own home against the intrusion of poisons applied by other persons’. Through greed, ignorance and negligence, we can see that the government allows ‘poisonous and biologically potent chemicals’ in the form of plastics to fall ‘indiscriminately into the hands of persons

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<sup>414</sup> Speaking contextually, in pre-1994 Apartheid South Africa) the ‘White’ race was similarly granted such favour in respect of the law, whilst people of colour had been considered ‘second class citizens’. With the advent of the Constitution all beings regardless of colour had been granted equal standing before the law.

<sup>415</sup> Section 24 of the Constitution of the Republic of South Africa, 1996.

<sup>416</sup> See Kotze et al, Note 407. P157.

largely or wholly ignorant of their potentials for harm'.<sup>417</sup> Therefore the continued use and lack of awareness concerning additives in plastics surely argues for the realisation of this right.

### 5.3.1.2 The National Environmental Management Act (NEMA)

The NEMA is the foundation of national environmental legislation. It converts the constitutional environmental right, which exhorts the passing of 'reasonable legislative and other measures'<sup>418</sup> into a more concrete reality,<sup>419</sup> by extending its reach to create 'specific environmental management Acts'.<sup>420</sup> This particular extension was intended to 'bolster the enforcement of these statutes, by and large by establishing posts for environmental management inspectors, at both national and provincial departments of environmental affairs, according the necessary powers in this regard'.<sup>421</sup>

Through the incorporation of this constitutional right within NEMA, the scope of Sustainable Development has considerably widened, by extending the consideration of this principle to include a host of other guiding environmental management principles.<sup>422</sup> These principles contain emerging international environmental norms such as the precautionary principle,<sup>423</sup> preventative principle<sup>424</sup> and the polluter pays principle.<sup>425</sup>

These additional principles are disguised as 'relevant factors to be considered' in addition to that of Sustainable Development.<sup>426</sup> Such relevant factors that require due and concurrent consideration<sup>427</sup> serve as the general framework for which environmental management and implementation plans are to be formulated.<sup>428</sup> These principles must be considered by organs

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<sup>417</sup> Silent Spring'- Foreword by Linda Berry, Available at : <http://www.science.smith.edu/~jcardell/Courses/EGR100/protect/reading/SilentSpring.pdf>, (Accessed 14 April 2014). P xv.

<sup>418</sup> See Section 24 (b) of the Constitution of the Republic of South Africa, 1996.

<sup>419</sup> See Glazewski, Note 32. P7:7

<sup>420</sup> As a result of the National Environmental Amendment Act, which altered the Chapter 7 by including the enforcement of NEMA and the 'specific environmental management acts' – Ibid, P7:31.

<sup>421</sup> See Glazewski, Note 32. P7:31.

<sup>422</sup> As Section 2 (1) (a) provides this extensive list.

<sup>423</sup> This principle rests on the need to recognise the permanent nature of certain environmental harms therefore it is better to avoid any possible harm than to try to remedy it later – See M. Kidd, *Environmental Law*, 2nd edition, Juta Law, 2011. P9.

<sup>424</sup> This principle requires that environmental degradation should be prevented- See Ibid. P10.

<sup>425</sup> Polluter pays principle is discussed in Section 2 (4)(p) of the NEMA, This principle basically entails that the person responsible for creating the pollution, must bear the costs for preventing or dealing with such pollution caused by that activity, instead of passing such costs onto someone else.- See Ibid. P8.

<sup>426</sup> Section 2(1)(a) of NEMA,

<sup>427</sup> Section 2(1)(a) (i) to (viii) and Section 2(1)(b) to (r) of NEMA.

<sup>428</sup> Section 2(1)(b) of NEMA

of state, which obliges them to take such considerations when making decisions of performing actions where the protection of the environment is concerned. The status of these principles however are not 'hard', in the sense that they are not binding but rather exist as guiding principles.

### **5.3.1.2.1 Statutory Duty of Care**

This provision of NEMA reflects a statutory duty of care,<sup>429</sup> obliging persons responsible for pollution to take 'reasonable measures' that prevent the pollution caused from 'occurring, continuing or reoccurring'.<sup>430</sup> NEMA imposes this duty to take 'reasonable measures' onto every person<sup>431</sup> who causes, has caused or may cause' harm to the environment.<sup>432</sup> This duty rests on individuals who own, control or occupy land, on which activities are performed or undertaken, or any other situation exists, which has would or is likely to significantly pollute the general environment.<sup>433</sup>

It should be noted that the NWA also hosts a similar provision found in section 19 which reflects the logic of NEMA's statutory duty of care. Although the NWA's provision is founded on similar logic they differ in the extent of their applicability as the NWA narrows the scope of this statutory duty owed through stating that it particularly vests in persons who own, control or occupy land, on which activities or process, are performed or undertaken, or any other situation that exists which has, would or is likely to pollute a water resource.<sup>434</sup>

### **5.3.1.3 The NEM: Integrated Coastal Management Act (NEMICMA)**

The NEMICMA<sup>435</sup> was created with specific regard to coastal and marine pollution. Many of the marine pollution laws in South Africa emanate from and are developed in accordance international conventions<sup>436</sup>

In South Africa's national law, such conventions that have been acceded to are incorporated into national legislation giving effect to the substantive content of such conventions.

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<sup>429</sup> Section 28 of NEMA.

<sup>430</sup> See Section 28(1) of NEMA.

<sup>431</sup> It is commonly interpreted to mean that every person who owes this duty should own or occupy land upon which environmentally harmful activities exist.

<sup>432</sup> See Section 28(1) of NEMA.

<sup>433</sup> Section 28(2) of NEMA.

<sup>434</sup> See Section 19(1) and 19(b) of the NWA.

<sup>435</sup> National Environmental Management: Integrated Coastal Management Act 23 of 2008.

<sup>436</sup> M.Kidd, *Environmental Law*, Second Ed, Juta & Company Limited, 2011. P173.

International conventions are dynamic in nature due to regular amendments being passed, altering their substantive quotient.

Section 3 of NEMICMA affirms the State's duty to fulfil environmental rights in the coastal environment:

In fulfilling the rights contained in section 24 of the Constitution of the Republic of South Africa, the State-

(a) through its functionaries and institutions implementing this Act, must act as the trustee of the coastal zone; and

(b) must, in implementing this Act, take responsible measures to achieve the progressive realisation of those rights in the interests of every person.

The State therefore has a duty to ensure that the coastal environment is not harmful to the health of 'every person', however the presence of plastics in the ocean and in local fish stocks pose such a threat and detract from the 'progressive realisation of those rights'.

### **5.3.1.3 Statutory Duty of Care**

Section 58 of NEMICMA contains a statutory duty of care akin to section 28 of NEMA, which states that section 28 of NEMA applies to any impact caused by a person which has an adverse effect on the coastal environment.<sup>437</sup> It can be seen that the scope of this duty is extended under NEMICMA as section 58(2) imposes this obligation onto 'any person who produced or discharged a substance which caused, is causing or likely to cause an adverse effect'. This therefore does not limit the harm to be caused by persons in control of land or premises nor does this duty require a significant amount of harm to be caused. In the context of plastic marine debris and LBMP; and the significant harm tied to these environmental threats, there is a duty that is in continuous breach

An analysis of Chapter 8 (Marine and Coastal Pollution) of NEMICMA is outlined below. Chapter 8 deals with various forms of marine and coastal pollution, more specifically containing provisions that relate to LBMP. However there are no definitions of LBMP and marine debris contained within, and there is nothing that explicitly recognises LBMP in its own right. No references are made towards plastics in anyway as the general definition of

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<sup>437</sup> Section 58(1) of NEMICMA.

pollution contained in section 1 of NEMA remains applicable for NEMICMA. The only provision that explicitly recognises a facet of LBMP is outlined below.

### 5.3.1.3.2 Discharge of effluent – Section 69 of NEMICMA

This section states that no person is allowed to dump effluent into coastal waters<sup>438</sup> without being issued a permit from the Minister.<sup>439</sup> In section 1 ‘coastal waters’ is defined firstly as marine waters that form part of the internal waters or nations territorial sea as envisaged in the Maritime Zones Act 15 of 1994 and as ‘any estuary’.

‘Effluent’ is defined within the same section as waste liquid that has originated on land and is discharged into the problem. Sadly, there is no inclusion of ‘coastal and marine debris’ or LBMP within the definitions section, however there had an inclusion of a new and elaborate definition of ‘dumping at sea’,<sup>440</sup> a minority contributor to marine pollution. In brief reiteration, any persons who wish to discharge effluent into such coastal waters need to apply for a permit to do so. In terms of section 69 (7), the Minister in considering such application must take into account ‘all relevant factors’.<sup>441</sup>

An extension of the term community, as it embraces non-humans that are dependent on the coastal environment for survival as members of the community. This extension reflects South Africa’s willingness to accord the ocean greater respect and recognise the inherent rights of the ocean. This appears to be a further indication of an ‘evolutionary milestone’. Furthermore the Minister must take into account the likely impact of the proposed disposal will have, in addition to current impacts, this reflects the application of the principle contained in Section 2(b) of NEMA. This extension of the term community is parallel to South Africa’s ‘sea change in approach’, which reflected an ‘admirable shift in understanding the problem of treating the sea as a sea fill’<sup>442</sup> when the approach of the 1972 London Convention was replaced with that of the 1996 Protocol.

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<sup>438</sup> Definition of Coastal Waters extended to include the internal and territorial waters referred to in NEMICMA Section 1 and ss3 and 4 of the Maritime Zones Act 15 of 1994.

<sup>439</sup> Section 69 (1) of NEMICMA.

<sup>440</sup> See Glazewski, Note 32. P25:45.

<sup>441</sup> Section of NEMICMA defines ‘interests of the whole community’ to have mean:  
The collective interests of the community determined by:

(b) adopting a long term perspective that *takes into account the interests of future generations in inheriting coastal public property and a coastal environment characterised by healthy and productive ecosystems and economic activities that are ecologically and socially sustainable.*

(c) taking into account the interests of other living organisms that are dependant on the coastal environment,

<sup>442</sup> See Couzens et al, Note 15. P65.

## 5.4 Law/ Policy Developments

Although the legislative sphere in the context of LBMP and plastic marine debris is sorely lacking, there has been some momentum gained in light of recent national discourse.

### 5.4.1 Ministerial Speeches

On the 6<sup>th</sup> of June 2013, during the African Summit for Marine Debris held in Cape Town, the Honourable Deputy Minister of Water and Environmental Affairs, Ms Rejoice Mabudafhasi, had given the opening remarks, in which she said the following:

Marine debris is not just an unsightly issue having a negative impact on tourism and human health but it also is responsible for deaths of a myriad of the creatures that inhabit the marine environment.

I am reminded again that 80 percent of all plastic found in the sea has its origins on land through littering and poor waste management so this negative impact on the environment can be reduced and even stopped.

The Department of Environmental Affairs through the Branch: Oceans and Coasts is entrusted with the primary mandate of overseeing the development and implementation of relevant policies to protect, conserve and sustainably utilise resources of South Africa's ocean environment.<sup>443</sup>

From the above it can be inferred that this problem is now on South Africa's radar and we have woken up to the severity of this crisis. Thought precedes speech which in turn precedes action. With the Deputy Minister speaking on this topic and the urgent need to address the problem, there surely is momentum being gained at a national level which ought to create 'waves of change' in the near future.

### 5.4.2 Operation *Phakisa*

This initiative is aimed at being part of the government's economic transformation programme. The operation was designed to enhance the implementation of policy and programmes. The first phase of this programme focusses solely on unlocking the economic potential of South Africa's relatively unexplored oceans. The ocean is said to have the ability to contribute to the GDP up to ZAR 177 billion and create 801 million direct jobs.<sup>444</sup>

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<sup>443</sup> 'Opening remarks by Honourable Deputy Minister of Water and Environmental Affairs, Ms Rejoice Mabudafhasi during the African Summit on marine debris at SANBI Kistenbosch, Cape Town', 6 June 2013, Transcript available at: <http://www.gov.za/opening-remarks-honourable-deputy-minister-water-and-environmental-affairs-ms-rejoice-mabudafhasi>, (Accessed 20 November 2014)

<sup>444</sup> Available at: <http://www.sanews.gov.za/south-africa/operation-phakisa-move-sa-forward>, (Accessed 20 November 2014).

In realising this potential the government has identified four specific sectors that Operation *Phakisa* will target, namely<sup>445</sup>:

- Marine transport and manufacturing activities, such as coastal shipping, trans-shipment, boat building, repair and refurbishment;
- Offshore oil and gas exploration;
- Aquaculture and
- Marine protection services and ocean governance.

This Operation becomes relevant to LBMP in that it focusses on aspects of oceans governance and marine protection. It would be in the country's best economic interests to preserve the integrity of the ocean as its resources are susceptible to the ills of pollution. Through developing an institutional mechanism such ends may be achieved. Furthermore, with the proposed 'industrialisation' of the oceans, pollution is a natural side effect of such economic pursuits. As the danger tied to economic development must be curtailed through environmental protection as this is morally correct and required by implicitly by law.

#### **5.4.3 The Green Paper on the National Environmental Management of the Ocean (NEMO), 2014.**

The Green Paper on the National Environmental Management of the Ocean (NEMO) a forerunner to the White Paper outlined below, was published for public comment during October 2012. Its stated intention was to form part of their continuing efforts towards the development and implementation of a comprehensive regulatory system to manage, protect and conserve the marine environment. This articulates the Government's vision for an effective domestic response to complex environmental problems such as oceans acidification, overfishing, chemical pollution and additional pollution in the form of plastic marine debris.

#### **5.4.4 The White Paper on the National Environmental Management of the Ocean (NEMO), 2014.**

South Africa's deliberations on oceans governance policy saw the publication of a comprehensive White Paper published in May 2014.

This paper is a step towards the drafting and promulgation of specific oceans management legislation as it acknowledges the vital importance of our oceans and reaffirms the county's

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<sup>445</sup> Available at: <http://www.operationphakisa.gov.za/operations/oel/pages/default.aspx> , (Accessed 20 November 2014).

commitment to protecting the marine environment. The proposed policy encourages the use of the oceans for economic gain through exploiting the opportunities presented by both living and non-living resources. In light of such economic development, the White Paper envisages the development of domestic environmental legislation which aims at improving the management and development of South Africa's oceans.<sup>446</sup>

Specifically this White Paper aims to develop an integrated approach to oceans governance policy; accordingly the strategic objectives have been outlined below:<sup>447</sup>

- Supporting and coordinating the implementation of the relevant statutory and institutional frameworks;
- Establishing mechanisms for inter-sectorial data collection and sharing;
- Creating and maintaining a shared national knowledge base on the human use, status and functioning of the ocean;
- Establishing integrated ocean sustainable development and conservation ocean plans by the undertaking of strategic environmental impact assessments and the use of spatial planning tools;
- Enhancing national human and technical capacity to better understand and utilise ocean resources and opportunities; and
- Pursuing regional and international cooperation and governance mechanisms.

SA's approach to Oceans Governance will require the mobilisation of resources as the White Paper deals with issues of finance, education, and developing science and technology. It furthermore recognises the critical role of education and enhanced information, with regards to the effective development of legal policy. The increased availability of science based information is critical for policy decision making and supports the effective management and conservation of our ocean and coastal environment.

This policy development is a glimmer of hope. This proposed partial solution seems to be the perfect vessel to implement and enhance South Africa's existing International and Regional commitments pertaining to LBMP and plastic marine debris at a domestic level.

## **5.5 Conclusion**

Clearly SA is not short of environmental law, however there is indeed a shortage of effective and specific environmental law.<sup>448</sup> In light of recent policy developments there appears to be some hope for specific environmental provisions addressing LBMP and plastic marine debris

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<sup>446</sup> Available at: [https://www.environment.gov.za/whitepaper\\_nationalevironmental\\_management\\_ocean](https://www.environment.gov.za/whitepaper_nationalevironmental_management_ocean), (Accessed 20 November 2014).

<sup>447</sup> Ibid.

<sup>448</sup> I. Currie & J. De Waal, *The Bill of Rights Handbook*, Fifth Ed, Juta Law, 2010. P521.

especially in the proposed NEMO. However, addressing a problem through legislative acknowledgement and solving the problem remain worlds apart in reality. Internal deficiencies in enforcement will continue to hinder the effectiveness of any legislation no matter how specific.

What is required is to recognise the true value of the ocean and fundamentally change our attitude to how we value the oceans. In light of South Africa's recent policy developments there is movement towards this direction. Although laudable efforts have been made, the actual development of sound and compelling legislation may take too long.

## **CHAPTER SIX:**

### **RECOMMENDATIONS AND CONCLUSION**

#### **6. Introduction**

For the international community to sincerely address the aforementioned contentious environmental problem, the following suggestions are some considerations which should be taken into account, upon revising and refining existing or upon drafting future MEA's.

As a driving philosophy, it would merit adopting the approach that even though the seas do not currently have 'legal standing' in their own right, we might usefully begin to move toward according recognition that the seas have inherent value. In the future it may seem in hindsight that it was 'unthinkable' that we had not recognised such inherent rights of the ocean.

The world's oceans must be recognised as being interdependent and there is a need to consider the direct and indirect causes of this problem. As this problem is rooted in mankind's industrial pursuits, in finding a solution there is a definite need to strike a balance between the commercial, industrial and the sustainable impacts of plastics.

#### **6.1 General MEA – Recommendations**

A potentially effective MEA must satisfy the following 3 main criteria:

##### **6.1.1 Comprehensive and Stable Participation**

Due to the interdependent nature of ecosystems in the oceans, all existing and future international instruments need to be on the same foundational level, which allows them to cooperate and work closely with another. This would help to mitigate the common problems of fragmentation and duplication which are present both in many MEA's and in international environmental legal regimes generally.

Such participation must not be limited to participatory nations/signatory parties in the aversion of this environmental threat as the public must be educated, especially in light of their everyday choices that may have potentially detrimental effects on the environment. NGO's, civil society and industry should be given greater rights to participate in international negotiations and states should be given greater responsibility to educate citizens.

Increasing participation and including the public, results in the enhancement of the public's awareness, this may further lead to improvements in scientific research. In order to ensure that the contributions made by Non-Governmental Organisations (NGO's) are effective, they must be strategically used and offered incentives. Enhancing scientific research is imperative as it is considered to be an indication of an agreement's effectiveness.

### **6.1.2 Participatory countries must accept deep commitments**

Members of the international community desperately need to deliver more than a comforting promise of support. An observation of past practice reveals that grand promises, coupled with improper execution naturally yields inconsequential results. Furthermore, there is much needed departure from Party nation's harmful 'business as usual' mindset's, to rectify a growing problem. Such a general mindshift would need to be one that moves away from the modern trends of over consumption, over-exploitation and the unsustainable use of resources.

### **6.1.3 High Compliance Rates**

Participatory states will only be able to honour promises made through the implementation of a potent enforcement mechanism. Effective compliance mechanisms are vital to the success of MEA's, for in their absence no party is obliged to implement the convention. Incentives should be offered to enhance performance of substantive obligations and compliance. The institutions that are established such as (monitoring, reporting and verification working groups) need to be effective and have an efficient report back mechanism that enhances communication between them and headquarters, which monitors performance. Signatory Party nations should take the initiative to establish and maintain the efficiency of such sub-groups.

## **6.2 Incentives**

Furthermore changing the approach to environmental policy instruments to one that is incentive based may yield more effective implementation, greater compliance and more laudable results. According to the 'stance' taken by policymakers, economists divide environmental policy instruments into 2 broad categories:

### **6.2.1 Command and Control Approach.**

This approach is rather rigid and provides little flexibility in achieving goals, with examples being strict technology and performance standards that must be met. Such an approach falls

under a conventional system that does achieve results however they are not economically feasible nor are they cost effective. This approach is largely inadequate as the application of law tends to be costly and slow, resource intensive and with harmful environmental impacts being present before the law is introduced; this approach is inherently reactive rather than preventative.<sup>449</sup> The law should take the initiative and address the cause rather than the effect.

### **6.2.2 Market-based Incentive approach**

A departure from the conventional stance taken towards environmental policy, this approach provides for greater flexibility in making environmental progress. As they provide for including incentive to look for more effective ways of realising environmental aspirations. Economists assert that the Market based incentive approach will be more cost effective, leading to the development and implementation of improved compliance technology.

Through this balancing of commercial interests – cost effective methods may yield enthusiastic implementation. Furthermore, in a society plagued by capitalism, employing the carrot rather than the stick, shows opportunity for personal gain which is most likely to be more appealing based on the nature of society. Incentive based instruments that require less administrative expenses and fewer resources to implement will lead to broader application and greater effectiveness

### **6.3 Specific International Recommendations**

The above outlines some of the reasons illustrating why existing international instruments are deficient in effectively addressing the issue of plastic marine debris. Efforts at international and domestic levels to address this problem are required.

Currently there is no international law which effectively addresses the severity and scale of this crisis. The international community must take steps towards developing an MEA which reflects the scope and scale of the Montreal Protocol. As previously highlighted this Protocol has an effective compliance regime which is why it is often held in high regard as a model. However although we might be able to learn from it the situation is not the same.

A more recent and appropriate MEA, which works on a smaller scale would be “The Minamata Convention on Mercury of 2013”.<sup>450</sup> This convention was designed to prevent

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<sup>449</sup> See Glazewski, Note 32. P26:46.

<sup>450</sup> The Minamata Convention on Mercury of 2013. Hereafter referred to as the Minamata Convention.

mercury from damaging the environment worldwide; this does provide a lesson in how difficult international environmental governance can be. As it was quite difficult to get the Minamata Convention in place to deal with mercury, it will likely be even more difficult to get a specific convention in place to regulate plastics which are used on a far greater scale than is mercury.

This instrument should include clear, enforceable marine debris standards as well as strong monitoring, tracking and reporting mechanisms. The enforcement mechanisms should be strengthened and harsh penalties should be introduced.<sup>451</sup>

Granting the long process of establishing MEA's, it is advised that policy actions be taken that enhance the scope and enhance enforcement within existing international law.<sup>452</sup> International law, however is unlikely to be capable of solving this problem in its own capacity, therefore it is imperative that smaller scale programs and policies be implemented at local, national and regional levels of government as partial solutions.<sup>453</sup> The following represents a non-exhaustive list of considerations.

### **6.3.1 The advent of a specific Plastic Marine Debris Convention**

The goal of 'achieving significant reductions in marine debris to prevent harm to coastal and marine environments' contained in the Rio+20 outcome document, might be attained through the implementation of a new, aggressive international regime. This instrument should acknowledge the harm ill-managed plastics pose to the environment, economies and people; and should additionally strictly regulate the disposal of plastics, addressing the main sources of plastic pollution. Such regulation concerning land based sources should draw from the standards contained in the GPA.<sup>454</sup>

This new MEA should take cues from the Montreal Protocol, as it is generally regarded as successful and position itself towards a complete ban on the damaging types of plastic marine debris such as microbeads and nurdles, whilst supporting a transition towards viable substitutes such as biodegradable plastics. These steps towards transition can be exemplified

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<sup>451</sup> See Gold et al, Note 224. P11.

<sup>452</sup> Ibid.

<sup>453</sup> Ibid.

<sup>454</sup> See Gold et al, Note 224. P12.

through the MEA calling for a ‘phase out of all plastics that are not recycled at a rate of 75 percent or higher by a certain date’.<sup>455</sup>

Admittedly, the development of an appropriate MEA and the time taken for its adoption will likely take many years; however, this MEA will become increasingly necessary due to the constant production of plastics and the worsening of the marine debris problem.<sup>456</sup> Thus there is a dire need for the global community to generate momentum for the creation of such an agreement by laying down its foundational framework now.<sup>457</sup>

Ultimately, it is hoped for that the global community, with assistance from NGO’s, local governments and business/industry, and with more information and understanding concerning the plastic marine debris crisis will move towards the negotiation of a new international agreement. However, the creation of a new MEA is not realistic so there should be more focus place on strengthening existing controls rather than replacement.

### **6.3.2 Enhance existing international law instruments**

Noting the rapid worsening of this problem and the long journey towards a new MEA, a short term solution would lie in the enhancement of existing international legal obligations, specifically narrowing exceptions, improving current penalty structures and enforcement mechanisms.<sup>458</sup> Furthermore, all MEA’s that relate to plastic marine debris should incorporate enhanced data collection that is freely available to party nations, NGO’s and the general public. This improvement on collection and publication of data will facilitate the enforcement of legal obligations.<sup>459</sup>

### **6.3.3 Recommendations to Regional Initiatives**

The UNEP is focussed on strengthening regional efforts as opposed to creating new global agreements; such efforts at regional levels related to this issue may be improved in the following ways.

Firstly, it is imperative that the terms ‘marine debris’ and ‘plastics’ are explicitly included within such agreements. Activities that generate plastic marine litter should be included within regional agreements and the scope of activities should not be limited to specific

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<sup>455</sup> See Gold et al, Note 224. P12.

<sup>456</sup> Ibid.

<sup>457</sup> Ibid.

<sup>458</sup> Ibid.

<sup>459</sup> Ibid. P14.

coastlines and territorial seas but must extend to cover ‘all in land activities throughout the entire watershed of the protected waterbody’.<sup>460</sup> Secondly, in enhancing compliance party nations should outline clear procedures that assist with the domestication of this legal framework.<sup>461</sup> Furthermore, if new regional efforts are taken it must be ensured that the agreement’s wording is narrow and explicit, with funding and enforcement mechanisms.<sup>462</sup>

Enhanced information on plastics can help promote the formulation of stronger policies and co-ordinate the efforts of policymakers worldwide. Through this improved information all nations, including developing nations may require importers of plastic goods to collectively fund an ‘end of life’ recycling, re-use and clean-up program which may minimise the import of plastics.<sup>463</sup>

## **6.4 Specific Recommendations for South Africa**

International law, however is generally hindered by the (usual) need for it to be incorporated into national legislation and then be enforced by individual states. South Africa is no exception. In addressing the contentious environmental problem mentioned, the following suggestions should be considered.

### **6.4.1 Legislative improvements**

In combatting the problem of plastic marine debris and LBMP in South Africa, a comprehensive, unique legal definition of the terms ‘LBMP’ and ‘marine debris’ must be included in NEMICMA and the proposed NEMO. Through identifying a problem and giving it a legal definition it is more likely to be dealt with directly. Furthermore, there should be more standards included which apply to controlling land-based sources of marine debris. South Africa needs to move towards providing for a comprehensive regulatory framework embracing waste management and sustainable development. However in enhancing the scope of this regulatory framework policy makers should employ the use of simple and unambiguous language. As with regards to NEMICMA itself, the complexity and technicality

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<sup>460</sup> See Gold et al, Note 224, P14.

<sup>461</sup> Ibid.

<sup>462</sup> Ibid.

<sup>463</sup> Ibid.

of the Act need to be addressed.<sup>464</sup> More effective compliance mechanisms should be set in place, possibly with a funding mechanism to support implementation.

South Africa's ocean management policy and legislation are arguably amongst the finest in the world, as the coast is treated as a 'single but multisectoral resource for the benefit of all, representing a cornerstone for development'.<sup>465</sup> However mere presence of impressive values and laws, are equivalent to a shallow promise should there be a lack in implementation, as the success of these laws greatly depends on their supporting infrastructure and effective implementation. It is the opinion of the author that the most effective implementation essentially lies with the Courts.

#### **6.4.2 Enhanced Implementation**

Although South Africa's national laws appear to be environmentally sound, holding great promise for addressing concerns of maritime degradation, there remains a distinction between existence and application. Success is currently limited, by the imperfect application of these celebrated laws.

The courts essentially are the tool, which interprets, applies and enforces the constitutional environmental right.<sup>466</sup> Prior judicial shortcomings have included the failure to properly, interpret, apply or in some case even recognise the relevance of a provision or concept.<sup>467</sup> This mirrors both the superficial understanding effect of environmental laws and the detrimental effects of pollution. There is a need to educate the judiciary to create more consistency in their 'considering, interpreting and applying environmental law'.<sup>468</sup> There is indeed a need to promote the 'Greening of our Judiciary' conscience.

In addition, a provision contained within the Constitution and NEMA, which not only provides for the establishment of an 'Environmental Court', but also the allocation of funds and personnel necessary to create and maintain the effective functioning of such a court.<sup>469</sup>

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<sup>464</sup> M. Kidd, 'Annual Survey of South African Law, Environmental law', South African Law Review, 2009. P399.

<sup>465</sup> See Goble et al, Note 173. P166.

<sup>466</sup> See Kotze et al, Note 407. P158

<sup>467</sup> M.Kidd, 'Greening the Judiciary', *Potchefstroom Electronic Law Journal*, Vol 3, 2006, Available at: [http://dSPACE.nwu.ac.za/bitstream/handle/10394/1743/2006x3x\\_Kidd\\_art.pdf?sequence=3](http://dSPACE.nwu.ac.za/bitstream/handle/10394/1743/2006x3x_Kidd_art.pdf?sequence=3), (Accessed 23 November 2014). P7.

<sup>468</sup> Ibid. P9.

<sup>469</sup> Such courts have been created in the past, In Hermanus in 2003 and Port Elizabeth in 2007, both however had been shut down due to the non-allocation of funds from the Department of Justice and Constitutional Development., despite having an impressive track record. – See Kotze et al, Note 407. P162.

The Judges of (and lawyers with rights of appearance within) such courts must hold some form of expertise<sup>470</sup> in matters concerning (in this case) environmental pollution. With a deeper understanding there will be environmentally sound decisions based on fair appreciation of scientific merit,<sup>471</sup> truly giving effect to section 24.<sup>472</sup>

### 6.4.3 Bans

In 2003, thin plastic bags had been banned in South Africa. The government set a charge for thicker plastic bags and took a portion of it as a levy to fund environmental projects. The use of plastic bags had initially decreased by 90 percent; however, consumption has slowly increased since.

There should be a complete ban across the world on the most common damaging forms of plastic marine debris such as microbeads, nurdles, polystyrene foam food packaging and single-use plastic bags.<sup>473</sup> South Africa has made regulations addressing the use of plastic bags.<sup>474</sup> Essentially this banned the manufacture, commercial distribution and trade of plastic carrier bags which fail to comply with the specific requirements in terms of the Standards Act.<sup>475</sup> These regulations although greatly reducing the amount of single use plastic bags had raised much concern about creating a loss of jobs.<sup>476</sup>

Similar bans have been adapted across the globe and have yielded much success. In China, for example, upon implementing a policy ban on thin plastic bags and requiring consumers to pay for thicker 'sanctioned' bags the amount of plastic bags used had decreased by 40 billion bags.<sup>477</sup> This illustrates that consumer behaviour can be altered through policy and reduce marine debris. This would greatly limit harm to the oceans; however, this is a less viable alternative for economic reasons.

The US state of Illinois recently enacted a complete ban on the use of microbeads, in which manufacturers have been told to phase out microbeads completely by 2019.<sup>478</sup> This ban was

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<sup>470</sup> Expertise in fields such as: Environmental and Administrative Law, coupled with a basic understanding of environmental sciences.

<sup>471</sup> See Kidd, Note 467. P12.

<sup>472</sup> Section 24 of the Constitution of the Republic of South Africa, 1996.

<sup>473</sup> See Gold et al, Note 224. P20.

<sup>474</sup> GN R 625 in GG 24839 of 9 May 2003

<sup>475</sup> M. Kidd, *Environmental Law*, 2nd edition, Juta Law, 2011. P177.

<sup>476</sup> Ibid.

<sup>477</sup> See Gold et al, Note 224. P20.

<sup>478</sup> A. Sifferlin, 'Know What's In Your Face Wash: Why Illinois Banned Microbeads', *Time Magazine*, 24 June 2014, Available at: <http://time.com/2917462/why-illinois-banned-microbeads/>, (Accessed 12 December 2014)

said to have owed its success through much industry cooperation. There are now similar bans being sought in Ohio, New York and California.<sup>479</sup>

South Africa can learn from the state of Illinois, through adopting a similar smaller scale ban on microbeads. This appears likely as at the first African Marine Debris Summit in South Africa, plastics associations recognised their important role in fighting marine litter and had made a commitment to promote comprehensive science based policies which prevent marine litter.<sup>480</sup> This commitment made (although on paper) creates hope that such cooperation will be made at a national level in banning microplastics. As the issue of microplastics has already revealed itself to be cause for much concern in the local sphere, this potential ban is a step in the right direction and may create future waves of change.

#### **6.4.4 Taxes**

The reality is that the economic advantage of plastics will generally trump environmental concerns,<sup>481</sup> and therefore the prospect of taxing the most harmful types of plastics is more likely to be accepted than a complete ban. Placing a consumer tax on plastic products will dramatically reduce their use; however, this remains as an inadequate solution.<sup>482</sup> A tax that would seem viable is one which is placed on plastics and packaging manufacturers which goes towards a shared fund aimed at alleviating environmental (mostly marine) impacts.

#### **6.4.5 Extended Producer Responsibility Programs (EPR)**

As most marine litter originates on land, it is vital to prevent such litter from entering the oceans therefore the EPR programs can play a vital role in preventing such entry. Such programs hold the manufacturer liable for their products and packaging through to the end of its lifecycle.<sup>483</sup> Furthermore these programs incorporate fee schemes which ensure that manufacturers capture excess waste for recycling and to ‘pay for waste management services at the end of the supply chain’.<sup>484</sup> The fee is directly proportional to the amount of waste generated therefore EPR programmes entice companies to reduce the amount of plastic packaging used on their merchandise. Creating such producer responsibilities appears

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<sup>479</sup> J. Flesher, ‘Illinois Microbeads Ban Came With Industry Cooperation’, *Huff Post: Green*, 18 August 2014, Available at: [http://www.huffingtonpost.com/2014/06/18/illinois-microbeads-ban\\_n\\_5508703.html](http://www.huffingtonpost.com/2014/06/18/illinois-microbeads-ban_n_5508703.html), (Accessed 12 December 2014)

<sup>480</sup> Available at: <http://www.plasticsinfo.co.za/images/4541.pdf>, (Accessed 12 December 2014).

<sup>481</sup> See Coulter, Note 7. P1993.

<sup>482</sup> Ibid.

<sup>483</sup> See Gold et al, Note 224. P17.

<sup>484</sup> Ibid. P18.

socially and environmentally sound as it mirrors the ‘cradle to the grave’<sup>485</sup> and ‘polluter pays’ principles.

#### **6.4.6 A move towards bio-degradable plastics**

Such enhancements have the potential to eliminate the existing flaws highlighted over the past decade, including specifically amending regulations concerning plastics. In combatting the issue of ‘ghost fishing’ and entanglement, Regional fisheries management organizations (RFMO’s) need to adopt management standards that minimize gear loss and the impacts of lost fishing gear.<sup>486</sup> Furthermore, the use of plastic gear should be replaced with biodegradable alternatives to minimize such impacts.<sup>487</sup>

Furthermore steps need to be taken across the world to stop plastics from being the icon of the packaging industry. In doing this the world will see more ‘ocean-friendly’ litter and debris that is less likely to persist. Requiring industry to produce and distribute biodegradable packaging items (such as biodegradable bags<sup>488</sup>) is a more environmentally friendly option than current practice. The downside to this alternative is that the production costs of biodegradable bags are approximately 8 times more than their traditional counterparts; therefore, it is unlikely that ‘ocean friendly plastics’ reach our oceans in the near future.

#### **6.4.7 Recycling**

Offering a redemption fee upon the return of plastic packaging for certain products such as beverage bottles boosts recycling rates. There are many such facilities in the United States and if more nations adopted this, there would be a global improvement in the management of LBMP.<sup>489</sup> Redemption fees can be structured to further protect the environment by offering a higher fee if the bottle and cap are returned together as bottle caps are prevalent amongst coastal shorelines and are commonly found in the stomachs of large sea birds.<sup>490</sup> Such fees can be extended to synthetic fishing gear and other harmful items to encourage the return and

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<sup>485</sup> A principle which rests on the basis that the person who has initially created a harmful substance remains responsible for the remainder of the life cycle of that substance. –See M. Kidd, *Environmental Law*, 2nd edition, Juta Law, 2011. P11.

<sup>486</sup> See Gold et al, Note 224. P14.

<sup>487</sup> Ibid. P14.

<sup>488</sup> These items are made from plant polymers which would degrade faster than traditional plastic bags in ocean water –See Coulter, Note 7. P1989.

<sup>489</sup> See Gold et al, Note 224. P18.

<sup>490</sup> Ibid. P18.

proper disposal of such items.<sup>491</sup> This practice may help to create new jobs and combat unemployment.

Legislation should not however be misconstrued as a ‘white knight’ which arrives and saves the ocean. This responsibility is shared and there is a need to recognise the role of schools, NGO’s, municipalities and other members of society in accomplishing this end. Social awareness and public education are imperative and through good citizenship implementing the motto ‘reduce, re-use, recycle’ plastic is less likely to enter into the ocean.

## **6.5 Conclusion**

There is much controversy surrounding the problems that plastics cause in modern times, which stem largely from political, legal and economic interests. The costs associated with ‘cleaning up’ the plastics provide ‘ample fodder for the opponents of environmental preservation’.<sup>492</sup> However environmental preservation is a question of morality and one that is primarily an issue of ‘right versus wrong’. Surely, it is wrong to destroy the habitability of our planet and ruin the environment for all future generations.<sup>493</sup> A simple personal contribution that can be made is to reduce the amount of plastic products used, although this is difficult seeing that almost every modern product contains plastics or microplastics. Consumers can at the minimum attempt to properly dispose of items they purchase and make an effort to buy environmentally friendly products.<sup>494</sup>

South Africa has a responsibility to wisely manage the coastal area and oceans with their unique natural resources and complex relationships with people, guiding behaviour and actions in the coastal zone to ensure that its benefits can be sustainably and equitably distributed.<sup>495</sup>

The ills associated with a rapidly increasing population and the economic ambitions of a developing nation are likely to lead to a greater influx of marine litter unless measures are taken immediately. There is an adage which reads ‘Don’t sell your soul to fill your belly’. In our ardent pursuit of worldly wealth, convenience and industrialisation, whilst maintaining our ‘business as usual approach’, we have traded the health of our oceans, which is of unparalleled value, in exchange for plastic.

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<sup>491</sup> See Gold et al, Note 224. P18.

<sup>492</sup> See Coulter, Note 7. P1993.

<sup>493</sup> Ibid, P1994,

<sup>494</sup> See Goble et al, Note 173. P148.

<sup>495</sup> Ibid. P165.

We need to begin to accord the seas of the world greater recognition – and even to begin to think the ‘unthinkable’ and consider giving recognition to their ‘inherent’ value. Analogous to ‘Save the whales’ and ‘Save the rhino’ the new cry should be ‘Save our Seas’. Legislation alone cannot force people to care for the health of the environment and the oceans; such care must come from within.

In addressing the research questions outlined in the beginning, the findings of the research show:

- that South Africa significantly contributes towards this problem;
- that the legal mechanisms at international and national levels are in need of refinement;
- there are specific recommendations that have been made regarding refining such laws that have been outlined in chapters 4 through to 6. There is a dire need to be a balance struck between sustainable development and economic viability in implementation;
- there are many lessons South Africa can learn from its developed counterparts; and
- South Africa appears willing to address such problems – however, enabling legislation is wanting.

The Author has faith that such issues are on their way to being truly addressed. However, it behoves us not to ignore the challenges which remain to us as individual members of society:

*‘Unless someone like you ... cares a whole awful lot ... nothing is going to get better ... It's not’.*<sup>496</sup>

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<sup>496</sup> J.M Held, ‘Dr Seuss and Philosophy: Oh, the Things You Can Think!’, Rowmann and Littlefield, 2011. P 202.

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