

## Strategies to Overcome Marine Pollution Caused by Plastic Waste to Protect Marine Environment in Indonesia

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### Abstract

*Nowadays marine pollution become a serious problem in the world especially in Indonesia. Marine scientists have found harmful impact of marine pollution to marine environment, ecosystem and humans, there-quarter of all marine debris is plastic, a persistent and potentially hazardous pollutant. Plastic can be chemically harmful to wildlife, either because themselves potentially toxic or other toxic pollutant, the situation become worse when it come to marine pollution caused by micro plastic, micro plastic is very dangerous for the ecosystem and the human in the world. Public awareness to participate in maintaining the marine environment is decreasing day by day. Some people do not realise that microplastic are so danger to marine environment because most plastics in the ocean break up into very small particles, plastic is one of the kind of marine debris and it can come in all shapes and size, but those that are less than five millimeter in length. Indonesia is the second-biggest-contributor to ocean after China, with some estimates suggesting it is source of about 10% of global plastic pollution, if this problem can not be solved, there could be more plastic than fish in the ocean. Unfortunately up to present we do not have any effective method to clean up the ocean, the only thing that we can do is reduce the use of plastic in daily life. Marine pollution is become global problem so that is why we need some strategies to solved this problem, based on international frame work Indonesia and others contries should do cooperation with others country and based on national legal frame works government should make special regulation to protect marine environment. Pollution from land-based sources, either directly by urban or agriculture discharger or indirectly through water.*

**Keyword:** Marine, Pollution, ASEAN

### Abstrak

Saat ini pencemaran laut menjadi masalah serius di dunia khususnya di Indonesia. Ilmuwan kelautan telah menemukan dampak berbahaya dari pencemaran laut terhadap lingkungan laut, ekosistem dan manusia, seperempat dari semua sampah laut adalah plastik, polutan yang persisten dan berpotensi berbahaya. Plastik secara kimiawi dapat berbahaya bagi satwa liar, baik karena berpotensi beracun atau polutan beracun lainnya, situasinya menjadi lebih buruk jika menyangkut pencemaran laut yang disebabkan oleh plastik mikro, plastik mikro sangat berbahaya bagi ekosistem dan manusia di dunia. Kesadaran masyarakat untuk ikut menjaga lingkungan laut semakin hari semakin berkurang. Beberapa orang tidak menyadari bahwa mikroplastik sangat berbahaya bagi lingkungan laut karena sebagian besar plastik di lautan pecah menjadi partikel yang sangat kecil, plastik adalah salah satu jenis sampah laut dan dapat datang dalam berbagai bentuk dan ukuran, tetapi yang lebih kecil. dari lima milimeter panjangnya. Indonesia adalah penyumbang terbesar kedua untuk lautan setelah China, dengan beberapa perkiraan menunjukkan bahwa Indonesia adalah sumber sekitar 10% dari polusi plastik global, jika masalah ini tidak dapat diselesaikan, mungkin ada lebih banyak plastik daripada ikan di lautan. Sayangnya sampai saat ini belum ada cara yang efektif untuk membersihkan laut, yang bisa kita lakukan hanyalah mengurangi penggunaan plastik dalam kehidupan sehari-hari. Pencemaran laut sudah menjadi masalah global sehingga diperlukan beberapa strategi untuk mengatasi masalah ini, berdasarkan kerangka kerja internasional Indonesia dan negara lain harus melakukan kerjasama dengan negara lain dan berdasarkan kerangka hukum nasional pemerintah harus membuat peraturan khusus untuk melindungi lingkungan laut. Pencemaran dari sumber-sumber di daratan, baik secara langsung oleh pembuangan perkotaan atau pertanian atau tidak langsung melalui air.

**Kata Kunci:** Kelautan, Polusi, ASEAN

## I. Introduction

God has created human being to manage and bring the prosperity to the world. Human being can use the natural resources dan keep the environment<sup>1</sup>. The human beings have the power to use the environment but they should not do some activities that can bring natural damage. In the real life human being sometime make damage to the environment.

The ocean has played an important part in human history, primarily for transport and more limited extent as a source of food. Since ancient times ships have sailed the seas to carry on trade, to catch fish, to make war and to search for new land. And yet it is only in the last few decades that mankind came to realise the true potential of this vast area, which covers 71 per cent of earth's surface<sup>2</sup>.

In managing the environment our guiding principle is the concept of sustainable development which sets as development 's objective "the ability for present generation to meet their needs without jeopardizing the ability of future generation to meet their needs". More than that, the benefit of development whether now or in the future, should be shared in equity by all. This is not only because it is morally appropriate but also because persisting inequities and excessive discrepancies in level on human walfare will pose threats to security.<sup>3</sup>

The protection of wild was one of the concern of international environmental regulation. Although the focus of this regulation has changed significantly over time, from primarily economic consideration to conservation consideration per se and increasingly to a combination of both (through 'natural capital' and 'ecosystem services ' approaches), this body of norm – tackling issues as diverse as the exploitation of fur seals,<sup>4</sup> whaling<sup>5</sup>, endangered spices, the pre

Air and water pollution are not the only environmental problems that have international aspects. Some world resources such as seabed mineral and ocean fish can be effectively dealt with international agreement. What nations do to clean up domestic pollution affects international commerce since the cost of pollution control can change the the competitive position of case domestically. And how nations regulate international transportation and import to eliminate source of pollution can also have a profound impace on trade. Nation can achieve economies and foriegn policy benefits by undertaking joint research and environmental information sharing with other nation.

Nowadays, marine pollution become global environmental issue in the world especially in Indonesia. The world Economic Forum foresees that the ocean will be populated by more plastic than fish (by weight) by 2050. Indonesia is the second-biggest-contributor to ocean after China, with some estimates suggesting it is source of about 10% of global plastic pollution, if the global problem continue unchecked, there could be more plastic than fish in the ocean. Unfortunetly up to present we do not have any effective methode to clean up the ocean, the only thing that we can do is reduce the use of plastic in daily life.

Indonesia's 260 million population uses an estimated 9,8 billion plastic per year-many of which wash into rivers and end up into ocean.<sup>6</sup> Marine scientists have found the impact harmful of marine pollution to sea life, ecosystem and humans, there-quarter of all marine debris is plastic, a persistent and potentially hazardous pollutant. Plastic can be chemically harmful to wildlife, either because themselves potentially toxic or other toxic pollutant, the situation become worse when it come to marrine pollution caused by micro plastic, micro plastic is very dangerous for the ecosystem and the human in the world. Plastic in the ocean has

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<sup>1</sup> Al-qu'an Surah Al-Jasiah : 13:

<sup>2</sup> Alfred H.A. Soons, *Marine Scientific Research and the Law of the Sea*, Aseer Instituut, Hague, page.5

<sup>3</sup> Emil salim, *Environmental Management Problem of The Sea*,

<sup>4</sup> Convention between the United States, Great Britain, Japan and Russia Providing for the Preservation and Protection of ful Seal, 7 July 1991, 37 Stat.154, TS 585

<sup>5</sup> Convention for the Regulation whaling, 24 September 1931, available at [www.ecolex.org](http://www.ecolex.org).

<sup>6</sup> [www.weforum.org](http://www.weforum.org)

a vast and detrimental on ocean wildlife and habitats and is found in every corner, from Arctic to the Antarctic.<sup>7</sup>

Up to present there is no effective method to clean up the polluted ocean, all we have to do are just reduce the use of plastic material. It should be obvious that environmental problems do not stop at national boundaries nor are they stopped by ideological barriers. Air and water pollution are environmental problems that have international implications.<sup>8</sup>

## II. Discussion

### 1. Indonesia as archipelagic State

Republic of Indonesia is the world's largest archipelagic state, consist of with more than 18.000 island and over 7,9 milion square kilometres of the sea, that is why Indonesia has the second coastline in the world ( 54,176 km of seaside). With this geographical situation



Public awarness about the the decreasing of the quality of the environment is continue since 1960, but in the other hand people in the world are worry about the condition of the environmental damage that endanger the waelfare and the daily life. waste that spread all over the ocean, mangrove forest in the world become strong evident that polluton caused by rubbish is serious problem.<sup>9</sup> Hence, with a population of almost 250 milion people, Indonesia would produce 187.336 tonnes of municipal solid water each day.

The pollution has caused damage to marine fisheries and post great impacts on beach tourism. It is essential to know the characteristics of waste discharge into coastal water and the assimilative capacity of the sea in order to standard of the effluents Humanity has ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generation to meet their own needs.<sup>10</sup>

The situation become worse when it come to marine pollution by plastic waste. Plastic waste that enters the ocean have a multitude of cumulative and long-lasting impact on human health and marine life, and also affect certain economic sectors and navigation. The dangers posed by plastic wastes. Plastic particles are typically grouped into categories depending on

<sup>7</sup> www.oceannunite.org.

<sup>8</sup> Irving J. Sloan, Environmental and The Land (second edition), Oceana Publications, Inc. Dobb Ferry, New York , 1979. Page 63

<sup>9</sup> Daud Silalahi, Pengaturan Hukum Lingkungan Laut Indonesia dan Implikasinya Secara Regional, Jakarta, Percetakan negara RI, 2006, page..241.

<sup>10</sup> Kathy Wilson Peacock ( foreword by Jeremy Carl) Natural Resources and Sustainable, Fact on File, New York, 2008, page. 183.

their size (as measure by their diameter). The table summarizes some standard ranges for a given particle category.<sup>11</sup>

Plastic category	Diameter
Nanoplastic	<0,0001 mm
Small microplastic	0.00001-1mm
Large microplastic	1-4.75 mm
Mesoplastic	4.76-200 mm
Macroplastic	>200mm

**Picture 1** : particle sof micro plastick as pollutan in the marine environment



sumber:www.elsevier.com/locate/marpolbul

Some people do not realise that microplastic are so danger to marine environment because most plastics in the ocean break up into very small particles, plastic is one of the kind of marine debris and it can come in all shapes and size, but those that are less than five millimeter in length.

Plastic in our oceans can arise from both land-based or marine sources. Plastics pollution from marine sources refers to the pollution caused by fishing fleets that leave behind fishing nets, line, ropes, and sometimes abandoned vessels Pollution from land-based sources share a dominant part of all pollutan entered the sea, rivers, estuaries, pipeline and outfall structures are included into land-based sources of marine pollution. State (coastal and continental) are obliged to establish laws, regulation, and other administrative measure to prevent land-based pollutan from entering the marine environment.

At the global level, best estimates suggest that approximately 80 percent of ocean plastic come from land-based sources, and remainig 20 percent from marine sources. Of the 20 percent marine sources, it is estimated that around half (10 percentage points) arises from fishing fleets (uch as nets, lines and abandoned vessel). This is supported by figures from the United Nations

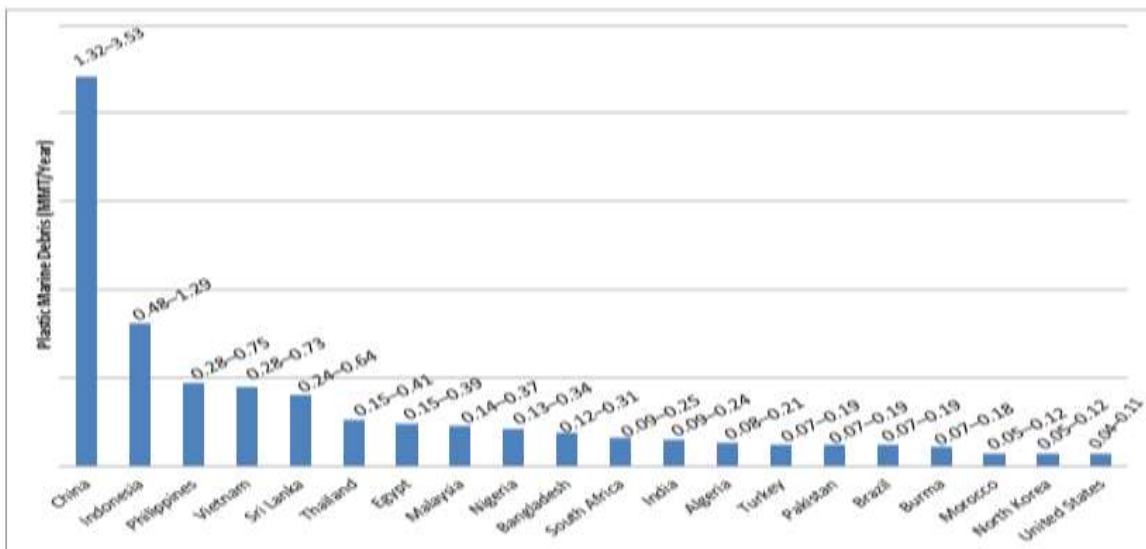
<sup>11</sup> Eriksen,M.,lebreton, L.C., Carson, H.S., Theil, M.,Moore, C.J.,Borerro J.C.,...&Reisser,J ( 2014). Plastic Pollution in the world's oceans: more than 5 trillion plastic pieces weighing over 250,000 tons afloat sea. Plos one, 9(12), e111913. Available at: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111913>.

Environment Programme. Which suggests abandoned, lost, or discarded fishing gear contributes approximately 10 percent to total ocean plastic.<sup>12</sup>

In general, the activities in land (land-based sources) that can bring pollution such as: (land-based pollution, deforestation, disposal of industrial waste, sewage disposal, disposal of agricultural waste, solid waste disposal, mangrove and swamp conversion, and reclamation. The activities in the sea that can bring pollution such as: shipping, ocean dumping, mining, oil exploration and exploitation, mariculture, and fishing. Land-based pollution is the biggest contributor of marine pollution, its responsible for 75 %-80% from all pollutant in the sea.

Marine pollution has been an ever present problem since the advent of large-scale agriculture activity and industrialization. However, significant laws and regulation at an international level to tackle the problem came only in mid-twentieth century. During United Nation Convention on Law and the sea in early 1950s, the various stakeholders come together to deliberate and formulate laws, pertaining to marine pollution.<sup>13</sup>

According to research led by Jambek said that every years about 4,8 Milion metric ton enter plastic waste ending up into ocean, it caused Indonesia places the biggest pollutan after china. Indonesia is the second biggest contributor to ocean plastic after China



Base on the chart above, Indonesia is the second-biggest-contributor to ocean after China, with some estimates suggesting it is source of about 10% of global plastic pollution, if the global problem continue unchecked, there could be more plastic than fish in the ocean. Unfortunately up to present we do not have any effective methode to clean up the ocean, the only thing that we can do is reduce the use of plastic in daily life.

Some people do not realise that microplastic are so danger to marine environment because most plastics in the ocean break up into very small particles, plastic is one of the kind of marine debris and it can come in all shapes and size, but those that are less than five millimeter in length

According to the United Nation Environment Programme, plastic microbeads first appeared in personal about fifty years ago, with plastics increasingly replacing natural ingredients. As recently as 2012, this issue was still relatively unknown, with abundance of

<sup>12</sup> UNEP & FAO (2009), abandoned, lost or otherwise discarded fishing gear. FAO Fisheries and Aquaculture Technical Paper No.523: UNEP Regional Seas Report and Studies ano.185. Available at : <http://www.fao.org/docrep/011/i0620e/i0620e00.htm>.

<sup>13</sup> <https://www.mapsofindia.com>

products containing plastic microbeads on the market and not a lot of awareness on the part of consumers<sup>14</sup>

Human existence depends on a stable and sustainable natural resources base. The marine and coastal environment in Southeast Asia harbour such as a resources base. Thus, there is a value in maintaining the marine and coastal environments in a state of supporting use of marine resources.

## 2. Strategies

So many people have gone to the beach and enjoy the marine environment, but unfortunately most of people throws trash everywhere, especially plastic material such as; plastic bottle, plastic bag, straws, etc. We have to make sure that our activities in the marine environment are not polluting the marine environment. It is true that we have the right to enjoy the environment but, in the other hand we also responsible to protect the our environment, according to general principle of law “ *Sic utere tuo ut alienum non laedas*” that said:

“ no states has the right to use or permit of its territory in such a manner as to cause injury by fumes in or to the territory of another and that measure of control were necessary”

According to International Law of the sea said that : When states have reasonable grounds for believing that planned activities under their jurisdiction or control may have caused substantial pollution of or significant and harmful changes to the marine environment, they shall, as far as practicable assess the potential effects of such activities on the marine environment and shall communicate report of the result of such assessment.

The existence of a general duty to cooperate is well established in international law. This duty is formulated , inter alia, in Principle 4 of UN General Assembly Resolution 2625 on the ‘ Principles of International Law Concerning Friendly Relation and Cooperation among states’ . In some cases, the content of the duty can be defined by an international tribunal. In the environmental context, the duty of cooperation has been construed as requiring the exchange of information, the joint evaluation of the environmental impact of certain activities or more recently, the consultation of the secretariat of an environmental treaty of particular relevance to the case. At its most basic level, cooperation will in all event require notification of, and consultation with potentially affected state.

In managing the environment our guiding principle is the concept of sustainable development which sets as development ‘s objective “the ability for present generation to meet their needs without jeopardizing the ability of future generation to meet their needs”. More than that, the benefit of development whether now or in the future, should be shared in equity by all. This is not only because it is morally appropriate but also because persisting inequities and excessive discrepancies in level on human welfare will pose threats to security.<sup>15</sup>

Regarding the obligation of activities that entail potentially serious risk, two main approaches were possible. On the other hand some expert suggested the creation of strict liability regime. Under the system, any damage caused by a high-risk activity would be borne by the state of origin irrespective of its level of negligence.

## III. Conclusion

Nowadays, marine pollution become global environmental issue in the world especially in Indonesia. Some people do not realise that microplastic are so dangerous to marine environment because most plastics in the ocean break up into very small particles, plastic is one of the kind of

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<sup>14</sup> <http://oceanservice.noaa.gov>

<sup>15</sup> Emil salim, Environmental Management Problem of The Sea,

marine debris and it can come in all shapes and size, but those that are less than five millimeter in length. It should be obvious that environmental problems do not stop at national boundaries nor are they stopped by ideological barriers. Air and water pollution are environmental problems that have international implications

In the international frame work The existence of a general duty to cooperate wheter regional or multilateral are well established ' Principles of International Law Concerning Friendly Relation and Cooperation among states" also can be one of the strategies to overcome marine pollution caused by plastic waste, with cooperation the states can make agreement, action plan or exchange information about marine pollution caused by plastic waste.

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