

## **Environmental Challenges – Focus on Indian Ocean: Evaluation of International Climate Change Agreements and Protocols**

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### **Abstract**

*Environmental challenges are posing serious threats not only to humanity but to all creatures on Earth. Countering rapid ecological degradation in the last two decades has been a source of serious stress for the international community. According to United Nations Framework Convention on Climate Change (UNFCCC), human imprint is contributing to climate change due to many factors. The retrospective study highlights oil spills, plastic pollution, nuclearization, Illegal Unreported and Unregulated Fishing (IUUF), domestic waste, agricultural waste, and heavy metal pollution as reasons towards environmental degradation and negative impacts on marine ecosystems. Analytical study of international efforts for ecological protection highlights certain limitations to implementing international agreements and protocols. Parties' non-compliance to surrender their sovereignty before international organizations is a serious matter. Such a situation needs revisiting the international attitude towards environmental protection not for the current population but for generations to come. Descriptive research approach employed for comparative analysis of international efforts results in region-specific recommendations. Consent of all participating states to make concrete efforts to save Earth's ecosystem will worth more for action. Regularly revised international regulations and protocols as per*

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*circumstantial needs will help to secure seas and maritime environment.*

**Key Words:** *Basel Convention, Climate Change, International Climate Change Agreements, Illegal Unreported and Unregulated Fishing*

## **1. Introduction**

*“The six years since the Paris Climate Agreement have been the six hottest years on record. Our addiction to fossil fuels is pushing humanity to the brink. We face a stark choice: Either we stop it — or it stops us.”*

UN Climate Change Conference-COP 26

Antonio Guterres- Secretary General

Environmental degradation is defined as introduction of hazardous or toxic elements to our environment and resultant degenerative impact on all life forms and undesirable changes in Earth’s atmosphere. This deterioration largely stems from exhaustion of natural resources, toxic release from fossil fuel, overpopulation, destruction of wildlife and other ecosystems. The environmental degradation poses health risks to animal and plant life and has pushed humanity to the verge of an apocalypse. Environmental degradation has also affected world oceans. World governments have contributed towards relieving this undue pressure on environment i.e., emission reduction, population control and helping developing countries overcome environmental problems; however, still massive efforts are needed to do away with this menace.<sup>2</sup>

World oceans are no distant objects but components of all life forms on Earth. From food to stability in the climate, we are dependent on our oceans which are home to the most of Earth’s biodiversity. Many of these life forms cater for protein food for one and half billion people. Furthermore, oceans produce 50% of the oxygen in our atmosphere. Above all, world economy is heavily dependent on the

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<sup>2</sup> Peter B Chambell, “The climate has changed before, But this is different – look at the archeological record,” *The Guardian*, November 9, 2017,

oceans. According to estimates, by 2030, approximately 40 million people will have been employed in the sea-based industry.<sup>3</sup> From maritime tourism and trade to fishing and sea-mining, our dependence on the oceans increased exponentially. However, harmful human activities have exacerbated the cycle of degeneration, pressing heavily on the overall health of the oceans.

‘Climate Change’ “denotes to long-term change in the statistical distribution of weather patterns (e.g., temperature, precipitation etc.) over decades to million years of time. Climate on Earth has changed on all time scales even since long before human activity could have played a role in its transformation.<sup>4</sup> But UNFCCC<sup>5</sup> defined Climate Change as” “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.” However, the IPCC definition of Climate Change includes change due to natural variability alongside human activity<sup>6</sup> Australian Government’s DCCEE.<sup>7</sup> Webpages describe Climate Change- as ‘our climate is changing, largely due to the observed increases in human produced greenhouse gases.’”

Greenhouse gases “absorb heat from the sun in the atmosphere and reduce the amount of heat escaping into space. This extra heat has been found to be the primary cause of observed changes in the climate system over the 20th century. Thus, in the environmental discourse different stakeholders have characterized Climate Change as mainly the change in modern climate augmented by human activities. The adverse human activities for example burning fossil fuel, deforestation etc. are considered likely to bring change in some climatic aspects. “AIP<sup>8</sup> maintains that the rise of environmentalism in the early 1970s raised public doubts about the benefits of human activity for the planet

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<sup>3</sup> UN Web Report, “The Ocean: Life and Livelihoods,” *UN. Org*, August 6, 2021,

<sup>4</sup> Chambell, 2017.

<sup>5</sup> UNFCC Web, “Fact Sheet: Climate Change science – the status of climate change science today,” *UNFCC*, 2023,

<sup>6</sup> UNFCC Fact Sheet, 2023

<sup>7</sup> Annual report, Coordination and Reporting of Australia’s Climate Measures,” *ANAO.Gov*, April 20, 2010,

<sup>8</sup> Spencer R. Weart, *The Discovery of Global Warming* (Harvard University Press: 2009).

which in other way turned the curiosity about climate into anxious concern. Since then, concern about anthropogenic global degradation spreads which ignited numbers of international cooperation, programs and meeting of concerned stakeholders including representatives from interested community other than the scientist only.<sup>9</sup>

Programs and meetings in 70s appear to take place to explore and acknowledge the extent of anthropogenic Climate Change. Global Atmospheric Research Program (GARP) organized by World Meteorological Organization (WMO) and the International Council of Scientific Unions (ICSU) in 1974 are relative example. Examination of the highly complex problem of the physical basis of Climate change: a theoretical review of climate.<sup>10</sup> Another example could be the first World Climate Conference (WCC) organized by the WMO in 1979.

Whereas some significant events in 1980s and 90s, can be said, were inclined to devise methods to address it. For example, Montreal Protocol of the Vienna Convention in 1987 imposes international restrictions on emission of ozone destroying gases. Two major events in 1990s, one, '92 conference in Rio-de-Janeiro produces UN Framework Convention on Climate Change and another '97 International conference produces Kyoto Protocol (came into effect in 2005) that set targets for industrialized nations to reduce greenhouse gas emissions.<sup>11</sup> Kyoto Protocol is regarded the most significant commitment in addressing Global Climate Change so far. That's why as it expires at the end of 2012, through different conventions, from UNFCCC to Conference of the Parties (COP-17) to the convention, held in November–December 2011 in Durban, South Africa, the world nations are continuing to strive to negotiate what may become the post-Kyoto.<sup>12</sup> Within latest Conference of Parties (COP-26) decides, resolve to pursue efforts to limit the temperature increase to 1.5 degrees C, which gives this lower temperature threshold even greater

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<sup>9</sup> Weart, 2009.

<sup>10</sup> H. Flohn, "Climate and energy: a scenario to a 21st century problem," *Climatic Change* 1, no. 1, (1977): 5-20.

<sup>11</sup> Weart, 2009.

<sup>12</sup> Sheila M. Olmstead and Robert N. Stavins, "Three key elements of a post-2012 international climate policy architecture," *Review of Environmental Economics and Policy* 6, no.1 (2012): 65-85,

emphasis than in the Paris Agreement.<sup>13</sup> In addition, the pact asks nations to consider further actions to curb potent non-CO<sub>2</sub> gases, such as methane, and includes language emphasizing the need to phase down unabated coal and phase-out fossil fuel subsidies.<sup>14</sup>

Literature review highlights that due to technological advancements and industrial revolution development in maritime sector is observed. In contrary, this progress ends up in varied and more complex nature of pollutants and grave impact on maritime climate. International protocols and agreements need to be updated as per changing scenarios and global climate status. Moreover, all signatory states need to abide by the set rules to keep global environment survivable for generations to come. Research discussion ahead evaluate international climate protocols and highlights area of improvement.

## 2. The Indian Ocean

The third largest body of water in the world and surrounded by one of the most densely populated areas, the Indian Ocean is strategically one of the most important geographical entities. It is bounded on the West by Africa and Arabian Peninsula, on the North by Southern Asia, on the East by Sunda islands and Australia and on the South by the Southern Ocean. The impact of environmental degradation is more pronounced in the Indian Ocean both due to anthropogenic and geographical factors. The Indian Ocean, surrounded from three sides by the most populous areas in the world, has been crucially important for trade for the regional as well as extra regional people. Indian Ocean is where a huge load of world's containerized traffic carrying goods and commodities passes through. This large-scale trade activity has also resulted in more pollution in the ocean. Startling statistics say that the introduction of pollutants and rise of water level are more rapid in the Indian Ocean than anywhere else.<sup>15</sup>

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<sup>13</sup> Press Brief, "COP-26: Key outcomes agreed at the UN climate talks in Glasgow," *Carbon Brief*, November 15, 2021,

<sup>14</sup> *Carbon Brief*, 2021

<sup>15</sup> News Report, "Indian Ocean warming at higher rate than other oceans, says IPCC report," *Business Insider*, August 9, 2021,

Majority of surrounding coastal states are underdeveloped and this too has added to the ever-growing environmental hazards in the area.

Reasons behind pollution and warming of the Indian Ocean are diverse, largely natural, and anthropogenic. From overpopulation, failure to meet objectives of ratified agreements on environment, destruction of ecosystems, coral reef and other plant and animal life, oil spillage and nuclearization are the most pressing concerns.

### **3. The Nature Of Environmental Problems Affecting The Oceans**

The nature of factors affecting our oceans are diverse and many. Major environmental problems are as under:

#### **3.1 Oil Spill**

Oil spill from ships is damaging to environment and ocean ecosystems. Connecting Africa, East Asia and Middle East with Europe, the Indian Ocean provides vital sea routes for international trade. Heavy traffic carrying petroleum and related products cross these important sea routes. Large reserves of oil and gas are found in Arabian Peninsula, India, Iran and Australia and estimates show that a staggering 40% of the world's offshore oil and gas supply comes from the Indian Ocean. This is, however, not without any downsides to it. Oil spill in the Indian Ocean has caused more damage to the ocean health than anywhere in the world. It has been estimated that around 106 tonnes of petroleum and related products are discharged in the Indian Ocean annually. From 1975 to 1988, 38 tanker and non-tanker incidents were recorded.<sup>16</sup> Oil spill from ships causes serious damage to environment by destruction of marine life. Recent incidence of massive oil spillage in Mauritius can have serious impact on environment for decades to come.<sup>17</sup>

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<sup>16</sup> Tayyab Saify and S.A. Chaghtai, "Source of Pollution in Indian Ocean – Risk and Management," *Chemical Spills and Emergency Management at Sea*, (1988): 479,

<sup>17</sup> UNEP Report, "How to manage the damage from oil spills," *UN Environment Programme*, October 7, 2021,

### 3.2 Plastic Pollution

The Indian Ocean receives 15 million tonnes of plastic waste annually.<sup>18</sup> This threatening amount of plastic will remain in the Ocean for next one thousand years before it degenerates. Surrounded by densely populated developing coastal states, the Indian Ocean receives 1 trillion pieces of plastic each year and has become the second most polluted ocean after North Pacific.<sup>19</sup> It is needless to say that this plastic pollution results in destruction of marine life. According to UNESCO data, approximately, one million marine animals die from plastic waste per year in the oceans which is alarmingly high.<sup>20</sup>

### 3.3 Nuclearization

Recently, due to India's ambitious program, the Indian Ocean has become nuclearized. It gives rise to proliferation and safety risks. Commenting on AUKUS deal, Dr Green described the plan as "tantamount to putting floating Chernobyl's in the heart of Australia's cities."<sup>21</sup> Reactor accidents and release of radioactivity into the water during normal operations and maintenance are dangerous for environment.<sup>22</sup> Thus, nuclearization of the zone will add to the gravity of the environment issues in the Indian Ocean.

### 3.4 Illegal Unreported And Unregulated Fishing (IUUF)

As of 2018, IUUF was a 23.5 billion<sup>23</sup> trade on the global black market. IUUF is not only a grave threat to fish stock but is also damaging for ocean environment and can potentially injuring or killing one odd criminal is not threat to environment unless those are killed in millions at one time. The Indian Ocean is home to 14% of global wild

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<sup>18</sup> Prasad Kariyawasam, "A Healthy Indian Ocean feeds, protects, and connects all South Asians," *World Bank Blogs*, March 30, 2021,

<sup>19</sup> Kariyawasam, 2021.

<sup>20</sup> Report, "Facts and Figures on Marine Pollution," *UNESCO.Org*, 2023,

<sup>21</sup> Daniel Keane, "Nuclear-powered submarines have 'long history of accidents', Adelaide environmentalist warns," *ABC News*, September 17, 2021,

<sup>22</sup> Thomas Curren, "Nuclear Powered Submarines: Potential Environmental Effects," *IAEA.Org*, October 1988,

<sup>23</sup> SLF Report, "Blast Fishing in the Indian Ocean," *Stop Illegal Fishing*, April 18, 2018, <https://stopillegalfishing.com/press-links/blast-fishing-in-the-indian-ocean/>

fish catch.<sup>24</sup> However, the use of explosives, harmful fishing gear and large-scale illegal fishing has not only resulted in diminishing fish stock, but also in destruction of marine ecosystems such as coral reefs. A breakthrough report by WWF has found regulatory gaps in the existing legal frameworks for fisheries. These gaps have caused intensified illegal fishing activity adding to the worsening environmental conditions in the Indian Ocean.<sup>25</sup>

### 3.5 Domestic Waste

Domestic waste contains organic substances like nitrogen and phosphorus. This matter is required by the marine ecosystems; however, excess of this can have negative impact and can cause imbalance in environment. Moreover, excess nitrogen and phosphorus can cause over-fertilization known as eutrophication. This over-fertilization can result in the profuse growth of a particular type of algae limiting the diversity in the species.

Domestic wastes also contain large amounts of inorganic matter. In smaller amounts, this matter is essential for growth of animal and plant life, but uncontrolled and excess discharge of such waste into sea can cause serious damage to environment. Coastal tourism is a thriving industry worldwide and unsustainable tourism practices too add greatly to the environmental issues related to oceans.

### 3.6 Agricultural Waste

Survival conditions wage a war on insects, weeds, and pests. As per a study of 88 countries conducted by International Fertilizer Industry Association (IFADATA), in timeline of 1961-2010, these countries used 110 million tonnes of fertilizers per year.<sup>26</sup> China used the most fertilizer, i.e. 21.6 million tonnes each year followed by United States 17.6 million tonnes per year. On average, eighteen countries consumed more than one million tonnes fertilizers

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<sup>24</sup> WWF, “Unregulated Fishing on the high seas of the Indian Ocean,” *WWF.EU*, November 2, 2020,

<sup>25</sup> WWF, 2020

<sup>26</sup> Yongbo Liu, Xubin Pan and Junsheng Li, “A 1961-2010 record of fertilizer use, pesticide application and cereal yields: a review,” *Agron Sustained Development* 35, (2015): 84.



annually.<sup>27</sup> Out of this huge quantity, approximately 25% can expectedly reach the marine environment and cause severe damage to marine ecosystem. Agriculture waste contaminates the ocean water, deplete oxygen concentration, yield algae bloom which leads to disruption of entire marine ecosystem due to creation of dead zones.

### 3.7 Heavy Metal Pollution

Marine pollution caused by oil and related products has long been in the limelight in media and research organizations. Yet, there are other forms of pollution with more threatening impact on marine environment. One such source of pollution is toxic heavy metals. Sources of this pollution are both natural and anthropogenic. Natural causes include underwater volcanic eruptions, etc. and human activities include submarine metal ores and petroleum extraction.

The list, however, cannot be limited only to these two reasons. It also involves river runoff, industrial and domestic discharges of heavy metals from under-sea mining of minerals and metals for industrial use. These under-sea human activities result in introduction of significant amounts of heavy metals in the marine ecosystems where these toxic metals remain for a long time. Some of these metals causing damage to ocean ecosystem health are mercury, cadmium, and lead. Consumption of fish contaminated by these heavy metals has resulted in spread of diseases.

Very much like most of the organic pollutants, these metals cannot be degraded chemically or biologically. They can change their oxidation state after long exposure to ocean water; however, they cannot be removed from there. It is alarming to note that a few metals having undergone chemical reactions produce such products as are high in toxicity. These inorganic pollutants can alter enzyme-related natural magnification in the food chain hierarchy.<sup>28</sup> This causes plants and animals become a serious health hazard when consumed.

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<sup>27</sup> Liu, et. al., 2015.

<sup>28</sup> Mobin Siddiqi and Rafia Azmat, "The Arabian Sea – Marine Pollution Viz A Viz Existence and Implementations of International Preventative Laws," *Polaris – Journal of Maritime Research* 1, no. 1 (2019), 70. <https://bahria.edu.pk/polaris/the-arabian-sea-marine-pollution-viz-a-viz-existence-and-implementation-of-international-preventative-laws/>

This massive pollution from varying sources has contributed to exponential deterioration of environment and is thus posing serious health risks to plant and human health. It has affected the health of the ocean largely in the form of marine life destruction. Many of the species of fish and other marine animals have sustained damage due to worsening environmental conditions.

Most of the coral reefs in the Indian Ocean have been declared as endangered species. Large patches of coral reefs have disappeared due to massive use in the cement industry.<sup>29</sup> Many forms of marine vegetation, such as mangroves, have also sustained damage. Mangroves are immensely important for ocean ecosystem health. They are home to many species of fish, crabs, and prawns. However, mangroves along the coastal areas are fast diminishing which can have serious consequences for environment.

At present, overexploitation of seafood stock, depletion of coral reef, oil spillage from ships, troughing of pollutants and toxins into the ocean and the like, have wreaked havoc and if this continues, there will be no future.

#### **4. International Protocols And Agreements On Environmental Degradation**

International Environmental Agreements (IEAs) are signed treaties that regulate or manage human impact on the environment to protect it. The number of environmental conventions has increased 38-fold worldwide since enforcement of Stockholm Convention in 1972. World governments and non-governmental organizations have contributed towards checking marine pollution and its impact on environment. Some of the most notable conventions/agreements/international protocols regarding environmental degradation are as under:

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<sup>29</sup> R. Sen Gupta and S.Y.S. Singbal, "Marine Pollution in the Indian Ocean: problems, prospects and perspectives," *Journal of Fisheries Association* 18, (1988): 342,

#### **4.1 Ramsar Convention**

Signed in 1971 in Ramsar, Iran, Ramsar Convention is the only international protocol that focuses only on wetlands. The convention mandates the participants/members to adopt National Wetland Policies based on the concept of ‘wise use’. By 2018, more than 2300 wetland areas were included in Ramsar List.<sup>30</sup>

#### **4.2 London Convention and London Protocol**

Signed in 1972 the convention on the prevention of marine pollution by dumping of waste and other pollutants is also known as the London Convention. It is one of the first international protocols for the conservation of the marine environment from harmful human activity. The convention applied to the deliberate disposal of waste into ocean from vessels, aircraft or any other platform. In 2006, this convention transformed into a new, free standing and more protective treaty. London Protocol strictly prohibits the transport and disposal of hazardous waste into the sea.<sup>31</sup>

#### **4.3 Kyoto Protocol**

Oceans exert a major influence on climate system. For decades, the oceans have trapped 93% of excess heat produced by excess greenhouse gases<sup>32</sup> Signed in 1997, Kyoto Protocol addresses the issue by mandating the members to cut back on their carbon emissions.

#### **4.4 The International Convention for the Prevention of Pollution of the Sea by Oil (1954)**

This convention prohibits the deliberate disposal of certain hazardous elements into the oceans, including oil wastes, dredging and land-produced waste, excluding the oil pollution caused by usual

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<sup>30</sup> UN Water, “Ramsar Convention on Wetlands,” *UN Water.Org*, 2023,

<sup>31</sup> EPA Report, “Ocean Dumping: International Treaties,” *EPA.Org*, 2023,

<sup>32</sup> Yassir A. Eddebbbar, Natalya D. Gallo, and Lauren B. Linsmayer, “The Ocean and UN Framework Convention on Climate Change,” *ASLO Pubs*, July 15, 2015,

operational discharge of ships. Pakistan and Afghanistan are parties to the convention.<sup>33</sup>

#### 4.5 MARPOL Convention

The Convention for the Prevention of Pollution from Ships (MARPOL) is dedicated to prevention of marine pollution produced by the operational discharge of oil and other hazardous substances and to curtail the discharge of such harmful chemicals and substances<sup>34</sup> (MARPOL is divided into different Annexes according to different categories of contaminants, each of which regulates different types of emissions from ships. All these Annexes have so far been ratified by a number of nations.

#### 4.6 Basel Convention

1989, the United Nations Environment Programme (UNEP) adopted the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal. Basel Convention is the first effort to establish an agreement on international standards to control the dumping of harmful toxins. Plastic, produced on land, eventually makes its way to the oceans. Given the colossal amount of plastic dumped in the oceans, Basel Convention's 2019 plastic waste amendment deals with the menace of dumping of plastic into the world oceans.<sup>35</sup>

#### 4.7 Paris Agreement

First adopted in December 2015 by 196 parties at during COP 21 in Paris, the Paris Agreement emerged as a legally binding international treaty on climate.<sup>36</sup> Enactment of the Paris Deal demands social and economic transformation, centered on the available scientific knowledge and technology. This international

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<sup>33</sup> Mobin Siddiqi and Rafia Azmat, "The Arabian Sea – Marine Pollution Viz A Viz Existence and Implementations of International Preventative Laws," *Polaris – Journal of Maritime Research* 1, no. 1 (2019), 70.

<sup>34</sup> IMO, "MARPOL," *IMO.Org*, 2023

<sup>35</sup> Basel Convention, "Amendments of Annexes II, VIII, and IX, to the Basel Convention," *Basel Int*,

<sup>36</sup> UNCCC, "The Paris Agreement," *UN. Org*, 2023,

protocol functions on a five-year cycle of perpetually ambitious climate action executed by the countries. The Blue Cop was held in Madrid, Spain. A principal outcome of this conference was an agreement to conduct an Ocean and Climate Change Dialogue as a part of the UNFCCC Climate Dialogues. In December 2020, the dialogue was conducted online. The dialogue emphasized on the existence of a strong link between the climate and world oceans, and the need to continue to find opportunities to bolster ocean-climate action within the UNFCCC, in future COPs as well as across UN agencies.

#### **4.8 Stockholm Convention**

The Stockholm Convention is an international treaty aiming to safeguard environment and human health from the impact of persistent organic pollutants (POPs). The Convention entered into force on May 17, 2004.<sup>37</sup>

This Convention, currently regulating 29 POPs, makes it imperative on the parties to adopt certain control measures to reduce or eliminate 29 POPs. For the POPs produced on purpose, the Convention requires parties to prohibit their production and usage. The Stockholm Convention also requires parties to limit trade activity in such matter. As for unintentionally produced POPs, the Convention asks parties to develop national action plans to check releases and to apply “Best Available Techniques” to restrict them. The Stockholm Convention also endeavors to ensure the management of stockpiles and waste containing POPs.

### **5. International Protocols And Their Limitations**

We have hundreds of international laws and protocols enforced, yet there have always been gaps between legislation and implementation of such environmental protocols. Such efforts have been under-resourced, poorly coordinated and faced lack of implementation methods. Lack of political will also impacts efforts for climate change and emission reduction. In fact, we have never had such a great number of international protocols and treaties; however, climate change, soil erosion and other

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<sup>37</sup> UNCCC, 2023.

harmful human activities are increasing steadily. Every year treaties are signed, objectives are set, but the will to implement any plans is not there. Generally, these treaties are not binding enough to ensure compliance and practical application to any useful level.

As mentioned earlier, many international protocols to address environmental degradation have been framed and enforced; however, so far none has made it to any substantial mark. Kyoto Convention, for example, is considered to have failed due to inherent structural flaws, short timeframe of action and binding targets with regards to emission reduction.<sup>38</sup> Kyoto Protocol was actually bound to fail from its inception as it didn't involve the largest and fast expanding economies. It excluded developing countries from stringent objectives and the USA didn't sign it up. The protocol aimed at reducing global emission and thereby keep global warming and rising sea levels in check; however, the last decade has seen a considerable spike in global carbon emissions.

Similarly, Paris Climate Agreement was the most looked upon international deal. Sadly, this too failed to meet its objectives as, by 2016, only 19% of the promised 100 BN dollars was released to the poor states.<sup>39</sup> Many of the experts have been of the view that the Paris Agreement is not ambitious enough to help bring the Earth's temperature at the optimum level. Even at the time of signing, it was not considered ambitious or effective enough to mitigate the environmental challenges.<sup>40</sup>

Moreover, activists and experts have remained skeptic of overambitious UN conference COP-26.<sup>41</sup> It has come under severe criticism as states couldn't meet the targets, they set for themselves. Here is an account of where things went wrong with many of the international regulatory bodies and conventions.

Basel Convention, too, has its own shortcomings. As for the transport of hazardous waste, the exporters have successfully found loopholes in the Basel Convention. The United States, one of the

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<sup>38</sup> Lindsay Maizland, "Global Climate Agreements: Successes and Failures," *Council on Foreign Relations*, November 17, 2021,

<sup>39</sup> Peter Yeung, "Paris Agreement has failed poor countries," *The Independent*, May 16, 2016,

<sup>40</sup> Yenug, 2016.

<sup>41</sup> Maizland, 2021.

biggest producers of waste, did not to ratify it. Moreover, the shortcomings of the convention boil down to undue influence of the developed nations on the developing nations.<sup>42</sup>

Major deficiencies in the implementation of London Convention and London Protocol are to gain largescale participation, especially in the developing coastal nations.<sup>43</sup> Lodging national reports on dumping of waste into oceans are largely ignored and compromising the transparency and effectiveness of the Convention.

The problem greater than environmental degradation itself is mass oblivion, apathy, and above all complete denial of the existence of this problem as many of the sceptics deem claims about environmental deterioration as exaggeration and question the authenticity and severity of environmental degradation. Sceptics and conservatives are of the view that environmental challenges are unreal and unimportant, and this viewpoint has been a kind of countermovement to awareness on environmental issues.

This hazard is no creation of a single nation, nor can it be reversed by any single State. It's a common existential threat emanating largely from harmful human activities. It requires the world nations to spawn a collective resolve in the face of catastrophe and launch collaborative efforts to address it.

Indian Ocean is particularly vulnerable to climate change due to its importance for regional climate systems, economies, and ecosystems. Climate agreements emphasize the development and implementation of adaptation strategies. In the Indian Ocean region, adaptation measures are crucial for addressing the impacts of climate change, such as rising sea levels, changing rainfall patterns, and increased frequency of tropical cyclones. Adaptation efforts may include building resilient infrastructure, implementing sustainable land-use practices, and enhancing water resource management.

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<sup>42</sup> Nikita Shukla, "How the Basel Convention has Harmed Developing Countries," *Earth.Org*, March 10, 2020,.

<sup>43</sup> Olav Schram Stokke, "Beyond Dumping? The Effectiveness of London Convention," *Yearbook on International Co-operation on Environment and Development 1998/99*, Routledge: 1998 [f](#)

Moreover, Climate agreements support the development and improvement of early warning systems for extreme weather events, including those that impact the Indian Ocean region. This is crucial for minimizing the risks associated with events such as cyclones and tsunamis.

## 6. CONCLUSION

UN report on “Global Assessment on Environmental Rule of Law” is one of its kind to discuss cooperative international efforts to protect and conserve environment for generations to come.<sup>44</sup> But alarmingly, despite presence of so many international protocols for environmental protection, implementation of environmental laws is absolutely missing. Despite environment protection organization has been multiplied in numbers but concrete outcome is not observed. International community is reluctant to surrender their sovereignty before any international organization to enforce global environmental laws which might hit their national interests. Parties of all agreements are in uncertainty that either other parties will follow the agreed protocol or not as they are not enforced bindings on the nations as recently US withdrew from Paris agreement. Above all, cost of implementing environmental laws is untenable which offers dimensions of non-compliance to the countries to save them from such financial burden.

UN Secretary-General Antonio Guterres- in UN Climate Change Conference-COP 26 says:

“I urge developed countries and emerging economies to build coalitions to create the financial and technological conditions to accelerate the decarbonization of the economy as well as the phase-out of coal.” He further adds that “These coalitions are meant to support the large emitters that face more difficulties in the transition from grey to green. Let’s have no illusions: if commitments fall short by the end of this COP, countries must revisit their national climate plans and policies”.

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<sup>44</sup> UNEP Report, “Environmental Rule of Law: First Global Report,” *UN Environment Programme*, 24, January 2019,



Capitalism has not given us the climate crisis alone but technological industrialism, and essential urge of socialism as well. Environmental damage under socialism has been as bad as or worse than under capitalism. Hegemonic struggle among interest groups with different level of available resources is creating turmoil. As, for economic revolution, carbon emission cannot be replaced which is directly contributing towards global warming and environmental threat. According to climate science denial is prevalent among rich and poor who place personal 'freedoms', small government, low taxes and national sovereignty before protection of the climate, despite the warnings of impending catastrophe. It reflects an entrenched worldview fixed not only on a particular understanding of the relationship of the individual to society but on the role of human beings on the planet. Human imprint on the global environment has now become so large and active that it rivals some of the great forces of nature in its impact on the functioning of the Earth system.

Recently conducted COP 28 in Nov-Dec 2023, exposit that there has been insufficient progress made in national climate plans. The conclusion of the first global stock take at COP 28 is seen as a turning point to scale up efforts in addressing climate change.<sup>45</sup> It is emphasized that immediate action is necessary to avoid the catastrophic consequences of climate change. The conference in Dubai is considered a pivotal moment for making strategic decisions and achieving meaningful outcomes to combat climate change. The United Arab Emirates, which presides over the talks, has also focused on the cycle of conflict and climate change, making COP 28 the first to address this connection. However, it's important to note that the president of COP 28 has dismissed demands for a phase-out of fossil fuels, claiming there is no scientific basis for such a move.

## RECOMMENDATIONS

In light of the discussion following recommendations are proposed to cater deteriorating environmental conditions particularly in Indian Ocean region:

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<sup>45</sup> UNFCCC Report, "Fact sheet: Climate Change science – the status of Climate Change science today," UNFCCC, 2011,

1. Water conservancy is important to be adopted to avoid water waste and runoff.
2. Optimized mass transit systems to make vehicles contributing less to reduce carbon footprint of petrol-based vehicles.
3. Development of economic cum environmental alliances for ‘Safe Future of Planet’
4. Use of Non-toxic chemicals may be encouraged for domestic purposes to avoid contamination of water reservoirs.
5. “Reduce, Reuse and Recycle” had to conserve natural resources and landfills.
6. Periodical revisions in national policies are needed in every country to revisit national contribution to global environment protection.
7. Environment Protection and Awareness Campaigns (EPAC) have to be launched not only to make people aware of the importance of environment and gauging their responsibility. But EPACs at national and international level have to be launched to make responsible authorities realize of their responsibilities.
8. Regional environment protocols/ agreements have to be developed which must be region and climate specific as environmental factors and conditions vary.
9. Industries have to commit carbon neutrality by developing eco-friendly industrial units and production houses.
10. Marine Protected Areas had to be highlighted to make safe havens for marine life for rebuilding and restoring after trickling down impact of ocean pollution i.e., oil spilling and plastic pollution etc.
11. Technological advancements are needed in industries to minimize human footprint and solid industrial waste.
12. Impact evaluation studies may help to prioritize industrial and infrastructural projects.

13. From cultivation to storage to consumption, food industry is responsible for over 8% of global emissions. Developing environment-friendly processing and storage mechanisms and consuming food in a sensible and balanced manner can ensure a reduction in global emission by a significant margin.
14. The non-proliferation regimes should be strengthened, and more safeguards should be developed to undermine the proliferation of nuclear weapons as well as the nuclear-propelled vessels in the Oceans.
15. New and innovative technological means should be employed to clean up oceanic pollution. For example, semi-autonomous systems can dive deeper and travel farther for exploring and clean the ocean from pollutants.
16. Governments should take strict measures for eradicating illegal, unreported and unregulated fishing (IUUF). The use of plastic nets and other harmful fishery tools not only contaminate the ocean but also threaten the natural marine lifecycle.

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