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The Success Story and Sustainability of the Ozone Layer Recovery

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ABSTRACT Discovering that the ozone layer was depleting, a concerted international intervention has proven to produce success because the report from the United Nations is to the effect that the ozone layer is recovering. History was made when the news broke that the ozone layer which was considered to be depleted as a result of human release and emissions of harmful chemicals and substances has started healing and that it has rebound. This news is quiet encouraging and it is an indication that the cooperation and joint agreement of the world community has resulted in solving environmental problems threatening the planet earth and human existence. While the success and the gains made are applauded, the international community is admonished not be complacent; but should be more vigilant and persistent in their efforts so that the gains made thus far might not diminish. Therefore, the gains must be sustained in all aspects. More importantly, it is pertinent to point out that while sustaining the gains, it must not produce another environmental problem. It should rather be sustained and strengthened and could be used as a reference point in solving other environmental threats and challenges confronting the earth and human beings. This paper looks at the issues surrounding ozone depletion, the interventions made by the international community to solve the problem and the need to sustain the gains and success made thus far.

INTRODUCTION

The depleting of the ozone layer affects the whole world. When it was discovered that the ozone layer had started depleting, the international community did not fold its arms and do nothing (Turley 1989). The world community intervened promptly because they foresaw the catastrophe and doom that will happen to the planet earth if drastic action is not taken to retard and out rightly curb the emissions of chemicals causing ozone depletion (Haas 1992). Against the backdrop of the proof that the ozone layer had started depleting and was negatively impacting on the environment and the planet, the international community converged in Montreal, Canada in 1987 in order to come up with a binding agreement that would ensure the protection of the ozone layer. Therefore, in September, 1987 a treaty was signed by the world community which was very unique in the international diplomacy, because pundits believed that the protocol would be impossible to achieve as the issues were so complex and arcane. The treaty was hailed as "the most significant international environmental agreement in history, a monumental achievement and unparalleled as a global effort" (Benedick 1998). The protocol prescribed massive reductions in the use of several extremely hitherto useful chemicals such as chlorofluorocarbon gases (CFC) contained in most products "air conditioners, aerosol sprays, solvent, vehicles, plastics, insulation, pharmaceuticals, computers, electronics, and firefighting equipment." Scientists' evidences showed that "as these substances were released into the atmosphere and diffused to its upper reaches, they might cause future damage to a remote gas stratospheric ozone layer that shields life on earth from potentially disastrous levels of ultraviolet radiation" (Benedick 1998). Thus, the negotiators of the agreement agreed and established target dates for replacing products that had become synonymous with modern standards of living, even though the requisite technologies did not yet exit then. It is pertinent to mention that even though products such as CFC were useful, they were abandoned in order to protect against the depletion of the ozone layer. Remarkably, the protocol was not drafted to be rigid; rather, it continues to be revised in order to control the chemicals and broaden their numbers to include additional ozone-depleting chemicals as they become identifiable.

The recent announcement by the United Nations that the protective ozone layer which was previously scientifically proven as depleting is finally starting to rebound and the ozone

layer is no longer declining. This is an indication of the positive results and success of the unified efforts of the world community to address and solve the threat to the world. The improvement in the ozone layer is therefore unique environmental good news that occurred as a result of willingness of the world community to address and solve the ecological crisis (Cordero 2000).

Literature Review

Even though mankind may be applauded for the massive technology advancement in the 20th century till date, the advancement has taken its toll on the earth's resources. These technologies are being used to prospect, explore and extract earth's resources, some of which contain noxious and harmful substances being emitted to the environment and causing different environmental problems to the human race. These environmental problems can only be addressed effectively at the international level and not at the local or regional level because the problems are universal in nature. The problems have been categorically classified as 'international reality' consisting of ozone depletion, acid rain, international hazardous waste transport and global warming.

In 1974 scientific investigation revealed that "that chemical we produced could harm the stratospheric ozone layer. The ozone layer protects the earth against excessive ultraviolet radiation, which could cause damage and mutations in human, plant, and animal cells. The scientists found that the chlorofluorocarbon gases (CFCs), which were widely used and viewed as posing no harm, could migrate to the stratosphere, remain intact for decades to centuries, and by releasing chlorine, break down the ozone layer" (Weiss 2016). As a way of intervention for the purposes of addressing the problem, "in 1977 the United Nations Environment Programme (UNEP) concluded a World Plan of Action on the Ozone Layer, which called for intensive international research and monitoring of the ozone layer, and in 1981, UNEP's Governing Council authorized UNEP to draft a global framework convention on stratospheric ozone protection" (Weiss 2016). This intervention produced "a framework agreement in which States agreed to cooperate in relevant research and scientific assessments of the ozone problem, to exchange information, and to adopt "appropriate measures" to prevent activities that harm the ozone layer. The obligations are general and contain no specific limits on chemicals that deplete the ozone layer" (Weiss 2016).

Ozone depletion was discovered by a British survey team in 1982. The team discovered an extensive depletion of the ozone layer and subsequently a panel was set up to intensify the investigation and it found that the Antarctic ozone had depleted and there was an evidence of large hole in it (Turley 1989). Undoubtedly, human activities have been linked to ozone depletion (Hengeveld 1991). This is the reason why industry, government and non-governmental organisations have acted on the scientific evidences to develop three key Instruments addressing ozone depletion namely; the Vienna Convention for the Protection of the Ozone Layer.

(Vienna Convention for the Protection of the Ozone Layer Vienna, 22 March 1985), the Montreal Protocol on Substances that Deplete the Ozone layer (The original Montreal Protocol was agreed on 16 September 1987 and entered into force on 1 January 1989) and the Nitrogen Oxides Protocol (The 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes). These interventions were specifically made in order to protect the ozone from destruction, which they have been able to achieve significantly as it has been evidenced that there is a substantial improvement in ozone layer.

It is pertinent to mention that initially, there was resistance from the producers and consumers of CFC and the United Nations had to intervene by asking members nations to accelerate the implementation of the Protocol (Benedick 1998). This is against the backdrop that there were collective benefits to be derived by all nations, the environment and the planet (Parson 2003).

The earth's atmosphere is in itself very unique in the sense that it has tremendous ability to support life and contains "a protective high level ozone layer which acts as a screen against harmful ultra violet radiation from the sun" (Dietrich et al. 2006). The earth's constituents include gases that serve as an insulating blanket around the planet, keeping surface temperatures within the range necessary for the presence of liquid water and hence life as they exist till date (Hagevald 1991).

However, what is worrisome and very agitating is the unnatural release of gasses into the atmosphere. These gasses are mostly odourless, invisible and are silent killers as their effects are not immediately apparent but take very long time to manifest (Hengeveld 1991). The release of these gases is contributing to changes in the composition of the atmosphere. Considering that the atmosphere is the earth's most vital life support system, such changes will inevitably have a major impact on the biosphere. These changes were the reasons for the gradual depletion of the protective ozone layer in the upper atmosphere.

The concern is that the planet is changing at an increasing rate. The change is caused by two major factors namely human activities as a result of rapid technological development together with an unprecedented expansion of human population both of which began in the 18th century (Silver and DeFries 1992). Technological development has made the exploration, exploitation and excavation of natural resources embedded in the ground possible (Porter and Cunningham 2004). However, this technological breakthrough also made it possible to invent and create vast quantity of environmentally harmful products and by-products (Mowery and Rosenberg 1991). The other factor of change was the rapid growth of the global human population from approximately 600 million at the beginning of the eighteenth century to more than 5 billion today (Goldewijk 2005). This has compounded the environmental problem with the result that human activities are now on such a scale as to rival the forces of nature in their influence on the environment (Goudie 2013).

Goldewijk (2005) noted the impact and consequences of population increase on the earth and pointed out that "the earth's surface has changed considerably over the past centuries. Since the start of the Industrial Revolution in the early 1700s, humans from the Old World started to colonize the "New World". The colonization processes led to major changes in global land use and land cover. Large parts of the original land cover have been altered for example; deforestation leading to extra emissions of GHG's to the atmosphere and enhancing global climate change." Other human factors which are impacting harmfully on humans are the rapid changes in land-use, increased industrialisation, and a voracious appetite for energy and different natural resources wherever they are located on the planet (Hengeveld 1991). There is definitely a price to pay for this and some of the consequences of these developments are the production of smog, water pollution, impoverished and contaminated soils (Yu et al. 2011). In order to address these consequences, most of the governments have put in place a very strong anti-pollution legislation.

It is against the backdrop of the changes in the atmosphere and the depletion of the protective ozone layer that "the emergence of scientific evidence that emissions of chlorofluorocarbons (CFCs) were depleting the stratospheric ozone layer prompted an epistemic community of atmospheric scientists and concerned policymakers to push for regulations regarding CFC use" (Haas 1992). Collectively and severally, the world community pulled all resources together to fight ozone depletion (Bell 1994). Assistance came from different parts of the world and there were exchange of ideas for purposes of addressing the problem. The CFC was rigorously regulated in terms of production and consumption (Renzulli 1991). Most importantly, all products emitting the harmful substances that are causing the ozone depletion were identified and through extensive research replaced with more efficient safe products (Rowland 1989). The implementation by the world community is reducing the level of pollution and this can be attested to by the success recorded in the shrinking of the hole in the ozone layer.

Statement of the Research Problem

The encouraging report issued by the United Nations and confirmed by scholars and scientists to the effect that the ozone layer which was recorded years back to be depleting has started recovering, this is a wakeup call to strive to do more in order to sustain the success recorded thus far. Complacency on the part of the international community will be very fatal and massive depletion of the ozone layer could occur, activities, particularly human activities that made the ozone layer to deplete reoccur. Therefore, all interventions and efforts that were put into the recovery of the ozone layer need to be intensified by constantly improving, updating and strengthening them. These are the recipes for sustaining the gains made so far. Sustaining the protective nature of the ozone layer is possible with the support of the world community

and continuous efforts to curb emissions of harmful substances depleting the ozone layer (Chasek 2013).

OBSERVATIONS AND DISCUSSION

Improvement in Ozone Layer and Other Environmental Challenges

Undoubtedly, prompt intervention by the world community regarding depletion of the ozone layer has shown that when the world speaks with one voice and acts as one, a lot can be achieved (Trombetta 2010). The success stories on the improvement on the ozone layer is as a result of good leadership shown by the heads of government and presidents of countries that form member states of the United Nations which consists of developed, underdeveloped and the least developed countries. However, the concern is that the same leadership is not being displayed regarding addressing the threat of global warming and climate change confronting the human race (McCright and Dunlap 2011). While scientific evidence has shown that climate change is real and is the main reason for the various bizarre weather events the world is experiencing (Easterling and Evans 2000), some pundits in developed countries like the United States and Canada are still in perpetual denial (Derber 2015). They continuously advance argument against global warming and climate change (Elsasser and Dunlap 2012). As a result, there is incoherent stance on how to tackle and fight this scourge (Sharma 2010). As a matter of fact, the international community is not speaking with one voice this time around unlike the era of ozone depletion. Therefore and more importantly, it is pertinent to point out that the world needs to stand together and fight global warming and climate change (Caney 2005). The success story of the ozone improvement is therefore a perfect reference point that can be used to solve the problem of global warming and climate change as well as other environmental threats and challenges confronting the earth and human beings (Jamieson 2014).

Sustaining the Gains

It is generally accepted that scientific evidences showed that the emissions of chlorofluorocarbons (CFCs) were depleting the stratospheric ozone layer. The interventions and practical efforts made by the world community with regard to the improvement of the ozone layer are commendable in many respects (Susskind and Ali 2014). It shows that whenever the world community speaks and act with one voice without dissent on the issues that are threatening human existence, the outcome of such agreements usually produce sustainable desired results (Said and Funk 2004). It is against the backdrop of this that the epistemic community of atmospheric scientists and concerned policymakers push for regulations regarding CFC use. The role of the members of the transnational epistemic community in "gathering information, disseminating it to governments and CFC manufacturers, and helping them formulate international, domestic, and industry policies regarding CFC consumption and production" (Peter 1992) was very crucial at the beginning of finding solution to the problem of the depleting of the ozone layer. Considering that emissions of CFC is one of the reasons for the ozone depletion, world scientists and particularly the scientists in the United States of America showed that there is a need to look for alternative to CFC and consequent upon this robust and an extensive research was undertaken which produced alternative but serve the same purpose (Ravishankara et al. 2009). As a result of this remarkable breakthrough other countries emulated this and backed their actions by formulating policies and laws that prohibit the use of CFC.

The successes recorded so far such as the replacement of chemicals causing the depletion of ozone layer and the radical recovery of the ozone layer have been remarkable (Kaniaru 2007), but the world community must not be complacent at all (Andersen et al. 2015), hence it has to be vigilant by sustaining, improving and strengthening the gains in order to continuously protect the environment, the atmosphere and the planet earth (Parson 2003). Therefore, scientific and technological innovations that will continue to produce good results should continue to be invested in. Admittedly, the causes of ozone depletion have been identified and will continue to be revealed through a robust research, thus there should be a strong political will on the part of the governments of different countries to continue to implement and enforce numerous ozone improvements strategies, laws and policies that have been put in place at both the domestic and

international levels. The international agreements and the protocols are powerful tools that will continue to have the potential to guide and direct the activities of countries. Industries and producers of various chemicals whether for domestic or commercial consumptions need to ensure that they invest heavily in technology that will produce environmental friendly chemicals (Dale 2003).

By sustaining the gains, the environment will be clean, threat to human existence will diminish and through aggressive sustainable interventions, the threat will be curbed. Consequently, a lot still needs to be done in order to sustain the gains. To this end, there should be continuous support from the world community in conjunction with captains of industries producing chemicals and hazardous substances with common understanding that the environment should be protected and clean at all times. This is said against the backdrop that we all belong to a single human race and our common abode is the planet earth (Jasanoff 2004). It must be protected at all times and made comfortable for human existence.

CONCLUSION

The world is currently experiencing different types of devastating and catastrophic bizarre weather events. The international community is constantly monitoring and reporting the devastating effects of different bizarre weather events. Most of these environmental problems are caused by human activities. Literature on environment and the planet has shown that human beings should be responsible for correcting and reversing the deliberate harm being done to the environment and the planet. An example of how the world community stood firmly together to stop one of the environmental catastrophes is the prompt intervention to stop the depletion of the ozone layers using different strategies, initiatives, measures and so on. The point that needs to be stressed is that whenever success of this nature is achieved, the international community should strive to sustain the achievements. By sustaining the gains means that the international community, chemical industries, car industries and so on should continue to source and use non-harmful substances in their chains of production so as to continue to have sustainable clean environment. More importantly, there should be constant monitoring of human activities that are contributing to the depletion.

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