LEGAL CHALLENGES OF INTERNATIONAL ENVIRONMENTAL LAW ENFORCEMENT ON TRANSNATIONAL BOUNDARY POLLUTION

Nwala Paul[1]

ABSTRACT

The release of harmful and toxic substances into the environment becomes inevitable due to increased industrialization and the interconnectivity of states in the world. Environmental Pollution has therefore become part of a global challenge and its scope has grown to be a transnational boundary. This is accounted for by climate change, an outbreak of infectious air, water, or animals/birds born disease epidemics or pandemics, and other environmental hazards that cut across countries. This paper from the legal perspective analyzed the challenges that exist in the administration and effectiveness of International Environmental Laws as it concerns transnational boundary pollution. This article applied content analysis of literature on transboundary pollution as an international relations problem. The analysis is limited to works analyzing the problem of transboundary pollution through a mainly qualitative lens, majorly using secondary data gotten from international law, international relations, and public policy disciplines. Transnational or Transboundary pollution originates in one country but is capable of causing damage to another country's environment by crossing borders through pathways like water and air. International Environmental Law (IEL) is concerned with the attempt to control pollution and the depletion of natural resources within a framework of sustainable development. Enforcement of these laws has faced several challenges ranging from a limited understanding of these laws: the adoption of short-term goals by international communities, and multinational companies, and the issue of criminal jurisdiction in public international law while neglecting long-term consequences and

[1] Nwala Paul is with the Department of International Law and Diplomacy, The West African Union University, Cotonou, Benin Republic, princepaulnwala@gmail.com

effects such as the conflict between economic growth and environmental protection. This paper suggests that international laws should also be made easy to understand, especially for the locals. Fines or criminal liability should be increased for violators of existing environmental laws and alternative means of waste exposure, and management should be considered by states and transnational corporations.

Keywords: Enforcement, Environmental Pollution, International Law, Legal and Transnational Boundary Challenges.

INTRODUCTION

The concept of the global commons is important to an understanding of transboundary pollution. As both population and production increase around the globe, the potential for pollution to spill from one country to another increase. Transboundary pollution can take the form of contaminated water or the deposition of airborne pollutants across national borders. Transboundary pollution can be caused by catastrophic events such as the Chornobyl nuclear explosion. It can also be caused by the creeping of industrial discharge that eventually has a measurable impact on adjacent countries. It is possible that pollution can cross state lines within a country and would indeed be referred to as transboundary pollution. This type of case is seldom held up as a serious policy problem since national controls can be brought to bear on the responsible parties and problems can be solved within national borders. It is good to understand how interstate environmental problems might develop and to have knowledge of those regulatory units of the national government that have legal jurisdiction on environmental pollution issues (Fridgin, 2022).

Transboundary pollution takes many forms and can be perpetrated by both private industry and government activities. It is difficult if not impossible to litigate on an international scale. It is sometimes difficult to determine who the polluter is when the pollution is "creeping" and not a catastrophic incidence. Airborne transboundary pollution is extremely difficult to track due to the pervasive nature of

the practices that produce it. Global solutions to transboundary pollution can only be successful if all nations agree to implement controls to reduce known pollutants and take responsibility for accidents that damage the environmental quality of other nations (Fridgin, 2022).

The negative justice of this issue is that it is the most industrialized nations that are producing these pollutants due to increased production and too often, the pollution rains down on developing countries that have neither the resources nor the technical expertise to clean up the mess (LaDou, 1992). Only recently, due to international agreements between nation-states, there has been a significant reduction in the deposition of acid rain. The Clean Air Act Amendments of 1990 in the United States helped to reduce emissions from coal-burning plants. In Europe, sulfur emissions are being reduced due to an agreement among eight countries (Fridgin, 2022). International environmental problems are characterized by problems that involve the use of common pool resources - air, water, ocean, and forests – that are owned by no one nation; human and environmental impacts of the problems that transcend the borders of any one country. Impacts of such problems as acid precipitation, ozone depletion, and air pollution are not felt only within countries where the problems are often created. International Environmental Problems require international Cooperation to resolve them (LaDou, 1992). This paper examines the issue of transboundary pollution in a global context and identifies the capacity of international instruments to address it. Specifically, it discusses the establishment of regional agreements and conventions that directly address transboundary pollution. Additionally, recommendations are made for the development of appropriate enforcement policy regarding the appropriate use of the environmental laws available in the international environment

Definition of Concept

Transnational boundary pollution is pollution that originates in one country but is capable of causing damage to another country's environment, by crossing borders through pathways like water or air

(Varkkey, 2019). Pollution can be transported across hundreds and even thousands of kilometers. The incredible distances that pollution can spread means that it is not contained within the boundaries of any single nation. This is why it is called 'Transnational Pollution'. One of the problems with transnational or transboundary pollution as it is often called is that it can carry pollution away from a heavy emitter and deposit it onto a nation whose emissions are relatively low. Another problem with transboundary pollution relates to the quote above. Since 'All things connect', the heavy pollution that is evident in the developed world also becomes evident in remote areas (Varkkey, 2019).

EFFECTS OF TRANSITIONAL ENVIRONMENTAL POLLUTION

Air pollution is the largest killer of humans, globally accounting for around 8.8 million premature deaths annually and reducing human life expectancy by an average of 2.9 years (Lelieveld et al., 2020). According to the World Health Organisation, 91 percent of the world's population breathes polluted air (Davis, 2020), defined as the contamination of the atmosphere by physical, biological, or chemical agents that produce measurable adverse effects on humans, animals, vegetation, or materials (Zawar-Reza & Spronken-Smith, 2005). In Southeast Asia alone, 2.6 million fatalities annually are linked to outdoor air pollution (Saengmanee, 2021). Outdoor air pollution is caused mainly by the combustion of petroleum products or coal by motor vehicles, industry, and power stations. In some countries, the combustion of wood or agricultural waste is another major source. Pollution can also originate from industrial processes that involve dust formation (for example, from cement factories and metal smelters) or gas releases (for instance, from chemical production). Indoor sources also contribute to outdoor air pollution, and in heavily populated areas, the contribution from indoor sources can create extremely high levels of outdoor air pollution. Catastrophic emissions of organic chemicals, as occurred in Bhopal, India, in 1984 can also have major health consequences (McGranahan and Murray 2003; WHO 1999).

Data is difficult to obtain; however, due to the delayed release of public information, the limited availability of longitudinal studies,

and the dense concentration of monitoring stations in cities, which are the main focus of region-wide comparative air pollution studies (Paoin et al., 2021; Thomas, 2019). Research on the governance of air pollution in Southeast Asia also tends to either prioritize regional-level cooperation among ASEAN (Association of Southeast Asian Nations) member states or studies of individual cities, resulting in a deficit of knowledge about how cross-border flows of environmental harm (re)shape social and spatial inequalities at other scales of governance within and between countries. While most pollution can be said to be of "local" - or national - origin, requiring local solutions, air pollution can also be a transboundary problem requiring agreement by governments worldwide or regionally on measures to deal with it. Pollution in its entirety has gross implications for the health and well-being of people in every country.

CLIMATE CHANGE

Climate change is also known as global warming or the greenhouse effect. The inter-Governmental Panel on Climate Change (IPCC) (2021) stated that there is a possible rise in the average global temperature of 1 degree Celsius by 2025 and 3 degrees Celsius before the end of the 21st century. The atmosphere also contains a small amount of water vapour, carbon dioxide, methane, nitrous oxide, and ozone; these are sometimes referred to as greenhouse gases as they keep the earth's surface about 30 degrees Celsius warmer than it would otherwise Fossils (IPCC,2021). fuels – coal, oil, and gas – are by far the largest contributor to global climate change, accounting for over 75 percent of global greenhouse gas emissions and nearly 90 percent of all carbon dioxide emissions (United Nations, 2019). As greenhouse gas emissions blanket the Earth, they trap the sun's heat. This leads to global warming and climate change. The world is now warming faster than at any point in recorded history. Warmer temperatures over time are changing weather patterns and disrupting the usual balance of nature. This poses many risks to human beings and all other forms of life on Earth. Climate change occurs as a result of various human activities that result in transboundary pollution. Various activities cause

transboundary pollution. But because of space and time, two vital causes of transboundary pollution resulting in climate change are discussed here. These are:

Generating power: Generating electricity and heat by burning fossil fuels causes a large chunk of global emissions. Most electricity is still generated by burning coal, oil, or gas, which produces carbon dioxide and nitrous oxide – powerful greenhouse gases that blanket the Earth and trap the sun's heat. Globally, a bit more than a quarter of electricity comes from wind, solar, and other renewable sources which, as opposed to fossil fuels, emit little to no greenhouse gases or pollutants into the air. (United Nations, 2019).

Manufacturing goods: Manufacturing and industry produce emissions, mostly from burning fossil fuels to produce energy for making things like cement, iron, steel, electronics, plastics, clothes, and other goods. Mining and other industrial processes also release gases, as does the construction industry. Machines used in the manufacturing process often run on coal, oil, or gas; and some materials, like plastics, are made from chemicals sourced from fossil fuels. The manufacturing industry is one of the largest contributors to greenhouse gas emissions worldwide (United Nations, 2019).

Climate change has numerous grave implications on the international space, some of it is; As greenhouse gas concentrations rise, so does the global surface temperature. The last decade, 2011-2020, is the warmest on record. Since the 1980s, each decade has been warmer than the previous one (United Nations,2019). Nearly all land areas are seeing more hot days and heat waves. Higher temperatures increase heat-related illnesses and make working outdoors more difficult. Wildfires start more easily and spread more rapidly when conditions are hotter. Temperatures in the Arctic have warmed at least twice as fast as the global average. Destructive storms have become more intense and more frequent in many regions. As temperatures rise, more moisture evaporates, which exacerbates extreme rainfall and flooding, causing more destructive storms. The frequency and extent of tropical storms are also affected by the warming ocean. Cyclones, hurricanes, and typhoons feed on warm waters at the ocean surface. Such storms

often destroy homes and communities, causing deaths and huge economic losses (United Nations,2021).

One way to reduce emissions of greenhouse gases as a form of transboundary pollution the local authorities can assist in curbing climate change. For example, reducing fossil fuel emissions of carbon dioxide through energy conservation and energy efficiency programmes; stopping the destruction of forests; planting trees to reabsorb carbon dioxide from the atmosphere; encouraging the use of timber from sustainably managed sources for building, rather than energy-intensive materials such as steel, bricks, and cement; encouraging the reduction in use, and where possible elimination, of products containing CFCs; reducing transport emissions.

Acidic Rain

The term "acid rain" was used as long ago as 1858 to mean rain made more acidic by acid gas pollution. A more accurate term is acid deposition. Wet deposition occurs when pollutants are carried in rain, snow, mist, and low cloud; pollutants may be wet-deposited after being carried long distances. Dry deposition is the direct fallout of acid pollutants and mostly occurs close to the source of emission (Pandey and Nathwani, 2003). Acid rain is caused by a chemical reaction that begins when compounds like sulfur dioxide and nitrogen oxides are released into the air.

These substances can rise very high into the atmosphere, where they mix and react with water, oxygen, and other chemicals to form more acidic pollutants, known as acid rain. Sulfur dioxide and nitrogen oxides dissolve very easily in water and can be carried very far by the wind. As a result, the two compounds can travel long distances where they become part of the rain, sleet, snow, and fog that we experience on certain days. However, Human activities are the main cause of acid rain. Over the past few decades, humans have released so many different chemicals into the air that they have changed the mix of gases in the atmosphere. Power plants release the majority of sulfur dioxide and much of the nitrogen oxides when they burn fossil fuels, such as coal, to produce electricity. In addition, the exhaust from cars, trucks, and

buses releases nitrogen oxides and sulfur dioxide into the air. These pollutants cause acid rain.

Chemical pollution of surface water can create health risks because such waterways are often used directly as drinking water sources or connected with shallow wells used for drinking water (IARC, 2004). In addition, waterways have important roles in washing and cleaning, fishing and fish farming, and recreation. Another major source of drinking water is groundwater, which often has low concentrations of pathogens because the water is filtered during its transit through underground layers of sand, clay, or rocks. However, toxic chemicals such as arsenic and fluoride can be dissolved from the soil or rock layers into groundwater. Direct contamination can also occur from badly designed hazardous waste sites or from industrial sites. In the United States in the 1980s, the government set in motion the Superfund Program, a major investigation and cleanup program to deal with such sites (U.S. Environmental Protection Agency 2000).

Pesticides and other chemical contaminants that enter waterways through agricultural runoff, stormwater drains, and industrial discharges may persist in the environment for long periods and be transported by water or air over long distances. Acid rain is very harmful to agriculture, plants, and animals. It washes away all nutrients which are required for the growth and survival of plants. Acid rain affects agriculture by the way it alters the composition of the soil. It causes respiratory issues in animals and humans. When acid rain falls down and flows into the rivers and ponds it affects the aquatic ecosystem. It alters the chemical composition of the water, to a form that is actually harmful to the aquatic ecosystem to survive and causes water pollution.

Acid rain also causes the corrosion of water pipes, which further results in the leaching of heavy metals such as iron, lead and copper into drinking water. It damages the buildings and monuments made up of stones and metals. The worst of it, acidic rain may disrupt the function of the endocrine system, resulting in reproductive, developmental, and behavioral problems. Endocrine disruptors can reduce fertility and increase the occurrence of stillbirths, birth defects, and hormonally

dependent cancers such as breast, testicular, and prostate cancers. The effects on the developing nervous system can include impaired mental and psychomotor development, as well as cognitive impairment and behavior abnormalities (WHO and International Programme on Chemical Safety 2002).

DEFORESTATION AND DESERTIFICATION

Deforestation can be defined as cutting down trees that lead to the usage of forest land for other purposes. It can be defined as the clearing of forested land purposely or naturally. The term deforestation commonly refers to cutting down all or most of the trees in forest areas. While Desertification is a type of land degradation in drylands in which biological productivity is lost due to natural processes or induced by human activities whereby fertile areas become increasingly arid. It is the spread of arid areas caused by a variety of factors, such as climate change and overexploitation of soil as a result of human activity. Environmental pollution contributes to the factors that causes deforestation and desertification especially where such chemical emissions in the atmosphere are dispersed on plants and trees through acidic rain falls and are been absorbed by the forestry with negative effects. At times oil spill and fire explosions resulting from oil and gas pipelines, installations facilities and gas flaring could be very devastating on forest and as such could contribute to deforestation and desertification problems.

OTHER EFFECTS

There is a representational dimension to the slow violence of deteriorating air quality (Nixon, 2011). How air pollution is narrated, and by whom, is linked to the social production of scale, the primary means by which ecology is rendered political (Rangan & Kull, 2009). Techno-scientific narratives dominate public discussion of air pollution in Thailand while the slow violence of social, health and economic impacts remain largely hidden from sight. Here, the science of air pollution is not in question, but its public representation becomes problematic when it is used to serve the interests of powerful state

actors and major polluting industries while reinforcing the marginal position of already vulnerable sections of society within broader sets of power relations and economic processes (Collins, 2010; Marks, 2015).

This unequal representation is especially important in Thailand, which has the world's largest wealth gap with the richest one percent controlling almost 67 percent of the country's wealth (Lindsay, 2019). Moreover, these wealth inequalities have bred *'other kinds of inequality… built into the structure of society and the attitudes of its members,'* including via privileged access to legal and political power structures (Phongpaichit & Baker, 2015, p. 17). As Mostafanezhad and Evrard (2021) point out in their study of northern Thailand, this power imbalance leads to selective recollections of air pollution in official accounts that create or reinforce existing vulnerabilities by narrowly determining what constitutes a disaster and selectively narrating who is impacted by it.

Air pollution needs to be treated as a challenge for transboundary environmental governance (within as well as in between countries) rather than solely for transnational governance (across countries) or urban governance (within and between cities and extended urban populations). Transboundary political ecology, as a contribution to the political ecology of scale, is useful for scaling up analysis of air pollution to the supranational level as well as down to the (sub-)national scale of governance (Miller, 2021a; Salisbury et al., 2012). It can be applied to analyse the governance of fluid gases and particulate matter that traverse multiple borders. Air sheds, in contrast to watersheds, defy clear spatial resolution due to the difficulties involved in separating and retrieving clean air from polluted air (Véron, 2006).

Atmospheric conditions such as wind, humidity and other weather conditions significantly affect these cross-border flows and further re-pattern the unequal socio-spatial distribution of transboundary air pollution. Moreover, air, usually understood to be a passive entity, unsettles and disrupts everyday bordering practices when it shifts shape to become a fugitive entity that requires multi-sited forms of ecological stewardship to mitigate its dispersal (Miller, 2020).

CASE STUDIES OF TRANSBOUNDARY POLLUTION

Thailand Transnational boundary Pollution

In the context of Thailand, accounting for approximately 32,200 premature deaths in 2019 (Nikam et al., 2021), Thailand's severe air pollution problem reduces average life expectancy by 2 years (Roengjit, 2019). The seasonal and uneven spatial dispersal of air pollutants within Thailand; however, creates hidden social and economic impacts that disproportionately affect already vulnerable sections of Thai society. Known legally and colloquially in Southeast Asia as 'haze,' chronic air pollution blankets Thailand's national capital of Bangkok from November to February each year (Fotiou & Perkins, 2021), largely to the detriment of low-income households and outdoor workers in the construction, transport and hospitality sectors who cannot insulate themselves in purified indoor settings.

By contrast, northern Thailand experiences the worst effects of unregulated biomass burning between February and April, disrupting agricultural and tourism livelihoods, adversely affecting community health, and, in the longer term, contributing to flows of out-migration (Mostafanezhad & Evrard, 2021; Sakdapolrak & Sterly, 2020). The transboundary nature of Thailand's air pollution problem extends well beyond its national borders to affect neighboring Cambodia, Laos, Myanmar and Malaysia, and vice versa.

Transnational boundary pollution law poses the challenge of addressing environmental problems irrespective of boundaries in an international legal system that values, above all, territorial sovereignty of individual States. Over the years, several international disputes have resulted over damages that occurred when one State's pollutants crossed into another State's territory.

The United States Transnational Boundary Pollution

The Trail Smelter case of 1941 is considered the landmark case of transboundary pollutant litigation. In this controversy, the United States claimed that damage was caused to the State of Washington by fumes from a smelter located seven miles from the international border in Canada. The U.S. initially rejected the decision of the International

Joint Commission and the case was then referred to arbitration under a 1935 treaty. In March 1941, the United States was awarded the arbitral decision which asserted the principle that a State has responsibility for any environmental damage it creates even beyond its territorial limits.' Specifically, the tribunal found that based on principles of international law (Fernandez,2002):

> ''no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or person therein, when the case is of serious consequence and the injury is established by clear and convincing evidence" (US Environmental Protection Agency,1999)

The Trail Smelter case underscored the fact that ecological effects know no boundaries; they can spill across geopolitical frontiers and cause cumulative externalities worldwide. Perhaps the most significant aspect of the Trail Smelter case was that it required States to do more than make reparation for environmental damage-it also recognized the duty of States to take appropriate measures to protect the environment. This case gave rise to the concept that even a sovereign nation owes surrounding States some protection from pollution which is created within its jurisdiction. The Trail Smelter case was unique in that it was one of the first cases to address an amorphous type of transboundary pollution (USA Environmental Protection Agency, 1999).

The Deepwater Horizon Oil Spill (the Gulf of Mexico oil spill) is an industrial disaster that began on April 20, 2010, in the Gulf of Mexico on the BP-operated Macondo Prospect, considered to be the largest marine oil spill in the history of the petroleum industry and estimated to be 8% to 31% larger in volume than the previously largest, the Ixtoc I oil spill, also in the Gulf of Mexico (Fernandez, 2002). The U.S. Federal Government estimated the total discharge at 4.9 million barrels (210 million US gal; 780,000 m3). After several failed efforts to contain the flow, the well was declared sealed on September 19, 2010. Reports in early 2012 indicated that the well site was still leaking. The Deepwater

Horizon oil spill is regarded as one of the largest environmental disasters in American history (Fernandez,2002).

A massive response ensued to protect beaches, wetlands and estuaries from the spreading oil utilizing skimmer ships, floating booms, controlled burns and 1.84 million US gallons (7,000 m 3) of oil dispersant. Due to the months-long spill, along with adverse effects from the response and cleanup activities, extensive damage to marine and wildlife habitats and fishing and tourism industries was reported.

In Louisiana, 4,900,000 pounds of oily material was removed from the beaches in 2013, over double the amount collected in 2012. Oil cleanup crews worked four days a week on 89 km of Louisiana shoreline throughout 2013. Oil continued to be found as far from the Macondo site as the waters off the Florida Panhandle and Tampa Bay, where scientists said the oil and dispersant mixture is embedded in the sand. In April 2013, it was reported that dolphins and other marine life continued to die in record numbers with infant dolphins dying at six times the normal rate. (Fernandez,2002). One study released in 2014 reported that tuna and amberjack that were exposed to oil from the spill developed deformities of the heart and other organs that would be expected to be fatal or at least life-shortening and another study found that cardiotoxicity might have been widespread in animal life exposed to the spill (Fernandez, 2002).

LEGAL PROVISIONS ON INTERNATIONAL ENVIRONMENTAL PROTECTION

Modern international environmental law dates to approximately 1972 when countries gathered for the United Nations Stockholm Conference on the Human Environment, and the United Nations Environment Programme (UNEP) was established. Many important legal developments took place in the period surrounding the Conference, including the negotiation of the Convention on International Trade in Endangered Species, the London Ocean Dumping Convention, the World Heritage Convention, and the first of the UNEP regional seas conventions. Since then, there has been a rapid rise in international legal instruments concerned with the environment,

to the point that we are concerned today with developing new means for coordinating the negotiation and implementation of related agreements, in particular their administrative, monitoring, and financial provisions. Since 1970, hundreds of international environmental instruments have been concluded. Including bilateral and multilateral instruments (binding and nonbinding), there are close to nine hundred international legal instruments that have one or more significant provisions addressing the environment Jeffrey, 1992.

Environmental law is a foundation for environmental sustainability and the full realization of its objectives is ever more urgent vis-à-vis growing environmental pressures. Violations of environmental law undermine the achievement of all dimensions of sustainable development and environmental sustainability. International Environmental Law (IEL) is concerned with the attempt to control pollution and the depletion of natural resources within a framework of sustainable development. It is a branch of public international law - a body of law created by states for states to govern problems that arise between states. The UN Environment Assembly - the highest-level UN body ever convened on the environment - opened on 23 June 2014 at the United Nations Environment Programme (UNEP) headquarters in Nairobi. UNEA feeds directly into the General Assembly and has universal membership of all 193 UN member states as well as other stakeholder groups. With this wide reach into the legislative, financial and development arenas, the new body presents a ground-breaking platform for leadership on global environmental policy (UNEP,2002).

UNEP addresses environmental issues at the global and regional levels. Its core objectives are to serve as an authoritative advocate for the global environment, to support governments in setting the global environmental agenda, and to promote the coherent implementation of the environmental dimension of sustainable development within the UN system. One of its key mandates is to promote the development and implementation of international environmental law. UNDP has also conducted a comparative experiences analysis of environmental justice

trends as a joint endeavour between UNDP's governance and environment and energy expertise and capacities (Jeffrey 1992).

KEY DECLARATIONS & TREATIES DECLARATIONS

Two major declarations on international environmental law are the Declaration of the United Nations Conference on the Human Environment and the Rio Declaration on Environment and Development. These are discussed below

a) **The Declaration of the United Nations Conference on the Human Environment (the 1972 Stockholm Declaration) (UN Doc. A/CONF/48/14/REV.1 (1972)**

This declaration represented the first major attempt at considering the global human impact on the environment, and an international attempt to address the challenge of preserving and enhancing the human environment. The Stockholm Declaration espouses mostly broad environmental policy goals and objectives rather than detailed normative positions. The UN website provides introductory information, procedural history and preparatory documents associated with the Declaration, as well as the full text of the Declaration.

b) **The Rio Declaration on Environment and Development (UN Doc. A/CONF.151/26 (vol. I))**

This was a short document produced at the 1992 United Nations Conference on Environment and Development (UNCED), known as the Rio Earth Summit. The Rio Declaration consists of 27 principles intended to guide future sustainable development around the world. The 1992 Rio Declaration on Environment and Development defines the rights of the people to be involved in the development of their economies, and the responsibilities of human beings to safeguard the common environment. The declaration builds upon the basic ideas concerning the attitudes of individuals and nations towards the environment and development, first identified at the United Nations Conference on the Human Environment (1972).

The Rio Declaration states that long-term economic progress is only ensured if it is linked to the protection of the environment. If this

is to be achieved, then nations must establish a new global partnership involving governments, their people and the key sectors of society. Together human society must assemble international agreements that protect the global environment with responsible development.

Principles of the Rio Declaration

There are several principles to the Rio Declaration:

i. People are entitled to a healthy and productive life in harmony with nature.
ii. Development today must not threaten the needs of present and future generations.
iii. Nations have the right to exploit their own resources, but without causing environmental damage beyond their borders.
iv. Environmental protection shall constitute an integral part of the development process.
v. Eradicating poverty and reducing disparities in living standards in different parts of the world are essential if we are to achieve sustainable development whilst meeting the needs of the majority of the people.
vi. Environmental issues are best handled with the participation of all concerned citizens.
vii. The polluter should, in principle, bear the cost of pollution.
viii. Sustainable development requires better scientific understanding of the problems. Nations should share knowledge and technologies to achieve the goal of sustainability.

TREATIES

Customary law and general principles relating to the environment, such as the 'precautionary principle' and sustainable development, are evolving but it is arguable whether any have yet become normative rules. The speed with which awareness of global environmental problems has reached the international political agenda has meant that customary law has tended to take second place to treaty law in the evolution of legal norms, and treaties have been the main method by

which the international community has responded to the need to regulate activities which threaten the environment. There are hundreds of bilateral and multilateral environmental treaties creating states' rights and obligations (Jeffrey,1992). The UN Environment Program (UNEP) and the UN Commission on Sustainable Development have negotiated many of these treaties.

The following Conventions exist to counter the trend of Transboundary Pollution:

i. Vienna Convention for the Protection of the Ozone Layer, 1985, and Montreal Protocol on Substances that Deplete the Ozone Layer, 1987
ii. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989
iii. Convention on Biological Diversity, 1992, and Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2000
iv. United Nations Framework Convention on Climate Change, 1992 (UNFCCC)
v. Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997
vi. United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1994 (UNCCD)
vii. Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997
viii. The Australian Treaty Database on the DFAT website can be searched by subject and lists all environmental treaties to which Australia is a party, as well as information about the treaty process and adoption into domestic law.
ix. International Environmental Law Disputes & Judicial Remedies

It must however be stated that there is no international court for the environment. Environmental disputes have been litigated before a wide range of adjudicative bodies - global and regional, judicial and

arbitral. Many multilateral environmental regimes have 'non-compliance procedures' which are typically non-judicial (OUP, 2014). Disputes between States concerning international environmental law can be heard in the International Court of Justice (provided the dispute is between States that have declared that the ICJ has compulsory jurisdiction). Environmental protection disputes between States and non-state actors such as individuals, communities and corporations can also be heard in international human rights courts such as the European Court of Human Rights and the African Commission of Human and Peoples' Rights.

CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION JULY 2007

The Convention on Long-Range Transboundary Air Pollution, often abbreviated as Air Pollution or CLRTAP, is intended to protect the human environment against air pollution and to gradually reduce and prevent air pollution, including long-range transboundary air pollution. It is implemented by the European Monitoring and Evaluation Programme (EMEP), directed by the United Nations Economic Commission for Europe (UNECE).

The convention opened for signature on November 13, 1979, entered into force on March 16, 1983. The Convention, which now has 51 Parties, identifies the Executive Secretary of the United Nations Economic Commission for Europe (UNECE) as its secretariat. The current parties to the Convention are shown on the map.

The Convention is implemented by the European Monitoring and Evaluation Programme (EMEP) (short for Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe). Since 1979 the Convention on Long-range Transboundary Air Pollution has addressed some of the major environmental problems of the UNECE region through scientific collaboration and policy negotiation.

The Convention has been extended by eight protocols that identify specific measures to be taken by Parties to cut their emissions of air pollutants:

i. Protocol on Long-Term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) (1984)
ii. 1985 Helsinki Protocol on the Reduction of Sulphur Emissions
iii. Nitrogen Oxide Protocol (1988)
iv. Volatile Organic Compounds Protocol (1991)
v. 1994 Oslo Protocol on Further Reduction of Sulphur Emissions
vi. Protocol on Heavy Metals (1998)
vii. Aarhus Protocol on Persistent Organic Pollutants (1998)
viii. 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (1999)

The aim of the Convention is that Parties shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution. Parties develop policies and strategies to combat the discharge of air pollutants through exchanges of information, consultation, research and monitoring.

The Parties meet annually at sessions of the Executive Body to review ongoing work and plan future activities including a work plan for the coming year. The three main subsidiary bodies - the Working Group on Effects, the Steering Body to EMEP and the Working Group on Strategies and Review - as well as the Convention's Implementation Committee, report to the Executive Body each year.

LEGAL CHALLENGES OF INTERNATIONAL ENVIRONMENTAL POLLUTION

The gap between promulgating and enforcing laws can be explained as follows:

First, the understanding of laws in general and environmental laws in particular by the public is limited. This is partly because environmental laws are written using complicated language that is very difficult for the public to understand. Meanwhile, locals are both polluters and victims of pollution. They are not fully aware of the consequences of their actions. Second, many communities, organizations, and companies still operate for short-term gains, without consideration of long-term targets or impacts on the environment,

society or future generations. Third, in terms of public administration, even though the government claims that environmental protection is an important concern, when conflicts between economic and environmental benefits arise, economic growth is still prioritized.

Fourth, the awareness and capacity of authorities to handle violations of the law is weak with cumbersome procedures to enforce the law. Detection of violations does not always lead to action. When penalties are issued, fines are often low and there is no requirement for the defendant to take steps to restore the breach. Although companies may pay the fine it may be cheaper than investing in modern sewage discharge technology to prevent further breaches. The lack of follow-up means, that one violation may be repeated many times. Fifth, various factors deny local people access to justice to protect their rights. Primarily, local people lack the resources to bring proceedings.

While criminal cases need the responsibility of competent agencies, in civil cases, plaintiffs may have to provide adequate evidence by themselves. The high cost of equipment for testing for pollutants (and the delay in obtaining results) makes is a significant challenge for locals wanting to bring civil proceedings. In addition, local unemployment sometimes means that polluting companies are not requested to close. Similarly, provinces eager to increase employment and income may not always conduct environmental impact assessments (EIA) before issuing operating licenses.

The Politics of local environmental issues often Conflict with that of International Politics on the Environment.

a) In less developed countries, illiteracy, poverty, hunger and internal conflicts influence and/or limit the domestic perception of environmental problems.
b) In rich countries, private managers of corporations wield far-reaching powers over stakeholders and employees and therefore make decisions that affect the public without any clearly defined responsibility to the people.

Corporate managers also wield a lot of influence on politicians and public policy by virtue of their ability to make political campaign

contributions. Aside the campaign contributions, the powerful Corporate Managers lobby Congress and Senate to pass laws that favor Industry against the Environment.

In addition, Local events and internal politics compel leaders to commit to different stands prior to such international conferences on the environment. The countries often fail to reach agreements on such pre-formulated principles without first seeking advice from home. The countries of the world have markedly different perspectives about the attention that global environmental problems must receive as against the economic and social problems at home. Finally, the rich and poor countries of the world do not agree on who must take responsibility for causing the environmental problems we face today, and how the cost of addressing the environmental problems should be shared.

LEGAL REMEDIES FOR INTERNATIONAL ENVIRONMENTAL POLLUTION

Having considered several challenges pertaining the effectiveness of measures against international environmental pollution, the following remedies could be adopted;

1. The Criminal Code should be revised so that penal liability is borne by the head of the company/organization.
2. The Environmental Law should be amended to be easier to understand, and more detailed. Measures should be identified to promote the participation of agencies, organizations, households and individuals in environmental protection.
3. A reward mechanism should be implemented to encourage business, organizations and local people to detect violations and take action to address pollution at the local level.
4. Fines should be increased for persons who commit violations despite understanding the negative impacts of polluting the environment
5. It is imperative to examine cases in which the concerned state agencies administer inappropriate and improper legal measures, particularly to investors, state economic groups, etc., or in granting licenses to steel, cement, chemicals mills, etc.

6. Make personnel who grant licences to environment-damaging businesses accountable, as well as the chairmen of People's Committees in localities that violate environmental law.
7. An alternative means for waste disposal should be adopted by states, corporations and companies in order to save the environment.

CONCLUSION

Environment pollution is a wide-reaching problem and it is likely to influence the health of human populations. The enforcement of environmental law on transboundary pollution continues to be less effective due to the domestic interest of the State in view. Environmental pollution is tangled with unsustainable anthropogenic activities, resulting in substantial public health problems. Policymakers in developing countries need to design programs, set standards, and take action to mitigate the adverse health effects of air pollution. Healthy people mean human resources are the main object of any successful business or country. These societal beneficial efforts need to carefully adapt available knowledge from other settings, keeping in mind the differences in pollutant mixtures, concentration levels, exposure patterns, and various underlying population characteristics.

REFERENCES

Aunan K., Patzay G., Aaheim H. A., Seip H. M. (1998). "Health and Environmental Benefits from Air Pollution Reductions in Hungary". *Science of the Total Environment.;212:245–68.*

Blackman, A., S. Newbold, J. S. Shih, and J. Cook. (2000). "The Benefits and Costs of Informal Sector Pollution Control: Mexican Brick Kilns." *Discussion Paper 00–46, Resources for the Future, Washington, DC.*

Brunekreef B., Holgate S. T.(2002) "Air Pollution and Health". Lancet.;360:1233–42. Countries." London: Earthscan.

Dockery D. W., Pope C. A., Xu X., Spengler J. D., Ware J. H., Fay M. E. et al(1993). "An Association between Air Pollution and Mortality in Six U.S. Cities". *New England Journal of Medicine*.;329(24):1753–59.

Fernandez, A. (2002). "Mexico City: Air Pollution Case Study. Environment course. Cambridge,MA: Harvard University. http://courses.dce.harvard.edu/environment/week10em1_new. html .

Hutton, G., and L. Haller. (2004). "Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level". Available at WHO/SDE/WSH/04.04. Geneva: World Health Organization. http://www.who.int/water_sanitation_health/wsh0404/en/ .

International Agency for Research on Cancer. (2004). "Some Drinking Water Disinfectants and Contaminants, Including Arsenic". *Monograph 84. Lyon, France: International Agency for Research on Cancer.*

IPCC (2021). Masson-Delmotte, V.; Zhai, P.; Pirani, A.; Connors, S. L.; et al. (eds.). *Climate Change 2021: The Physical Science Basis* (PDF). Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press (In Press).

Jeffrey, M. I., (1992). "Transboundary Pollution and Cross-Border Remedies". *Canada-United States Law Journal.* Vol. 18, Article 19.

Kjellstrom T., Corvalan C.(1995) "Framework for the Development of Environmental Health Indicators". *World Health Statistics Quarterly.;48:144–54.*

Kjellstrom T., van Kerkhoff L., Bammer G., McMichael T. (1992.) "Comparative Assessment of Transport Risks: How It Can Contribute to Health Impact Assessment of Transport Policies".

LaDou, J. "The Export of Hazards to Developing Countries." In Occupational Health in Developing Countries , ed. J. Jeyaratnam, 340–60. Oxford, U.K.: Oxford University Press.

Larssen, S., F. Gram, L. O. Hagen, H. Jansen, X. Olsthoorn, R. Lesaca, and et .al (1996). URBAIR Urban Air Quality Management Strategy in Asia: Metro Manila Report . Washington, DC: World Bank.

McCarthy, E. M. (2001). "International Regulation of Transboundary Pollutants: The Emerging Challenge Of Ocean Noise". *Ocean and Coastal Law Journal*. Vol. 6, Num. 2, Article 2

McGranahan, G., and F. Murray. (2003). "Air Pollution and Health in Rapidly Developing

McMichael A. J., Anderson H. R., Brunekreef B., Cohen A.(1998) "Inappropriate Use of Daily Mortality Analyses to Estimate Longer-Term Mortality Effects of Air Pollution". *International Journal of Epidemiology.;27:450–53.*

McMichael, A. J., T. Kjellstrom, and K. Smith. (2001). "Environmental Health." In International Public Health, ed. M. H. Merson, R. E. Black, and A. J. Mills, 379–438. Gaithersburg, MD: Aspen.

Pandey M. D., Nathwani J. S. (2003) "Canada Wide Standard for Particulate Matter and Ozone: Cost-Benefit Analysis Using a Life Quality Index". *Risk Analysis.;23(1):55–67*.

Smith, R. S. (2003). "Naturally Occurring Hazards." Article prepared for World Water Day, March 22, World Health Organization, Geneva.
http://www.worldwaterday.org/2001/thematic/natural.html .

U.S. Environmental Protection Agency. (1999). The Benefits and Costs of the Clean Air Act 1990 to 2010 . Report to Congress. Washington, DC: U.S. Environmental Protection Agency. http://www.epa.gov/oar/sect812/ .

UNEP (United Nations Environment Programme). Cleaner Production. Seventh International High-Level Seminar, Prague. Industry and Environment. 2002;25(34):1–109.

United Nations (2019) "Causes and Effects of Climate Change" Available at https://www.un.org/en/climatechange/science/causes-effects-climate-change . Accessed on the 19th of September, 2022

WHO and International Programme on Chemical Safety. 2002. Global Assessment of the State of Science of Endocrine Disruptors . Document

WHO/PCS/EDC/02.2. Geneva: WHO and the International Programme on Chemical Safety.

World Bank. (1999). Pollution Prevention and Abatement Handbook 1998 . Washington, DC: World Bank.