Forum: Environment Committee

Issue: Minimizing the environmental effect caused by manufacturing widespread technological products

Student Officers: Doğa Fadıllıoğlu, Dilşah Gülkan, Süeda Hallaç

Positions: President Chair, Deputy Chairs

Introduction

Technology is a major part of everyone's life, and for the most part, we use it to better our lives. However, with the advanced use of technology comes pollution. New technological products are usually onerous to the environment. This harm can be caused by the exploitation of resources to be used in technological products, or from toxic byproducts of technological production. This very first technology and its impact on the natural environment brought greenhouse gas emissions, which accumulated through more than a million years of widespread use of fire.

Yet, delegates must bear in mind that a great deal of technological developments are for the betterment of the industry, communication, transportation, and human life. However, as is the case with several other large-scale practices, technological production and waste disposal is currently being dealt with in ways that are disruptive to the environment. Thus, the purpose of this chair report is not to limit the use of technology, which, if done in the right way can in fact be used to better the environment's current state, but instead to place regulations and develop solutions that will reduce environmental harm caused by technology.

Definition of Key Terms

Heavy and Light Metals: Heavy metals refer the metals with higher density such as mercury, lead, chromium and arsenic, whereas light metals are those with lower density such as aluminium, magnesium and titanium. Both types of metals are used while manufacturing electronic devices.

Deforestation: The permanent destruction of forests in order to utilize the land for other uses. Mining and extraction of metals for the technology industry is a major cause of deforestation.

Mine Tailing: Also referred as mine dumps, mine tailings are the waste substances left over after the targeted valuable material of an ore is taken. When mixed with water or soil, mine tailings may harm the ecosystem, as well as the human health.

Carbon Footprint: The amount of carbon dioxide produced and released into the atmosphere. Individuals', organizations', or even countries' carbon footprints can be calculated.

General Overview

The effects of technologies underline early twenty-first century global challenges. On the one hand, since the enlightenment, technology, especially science-based technology, has offered the promise of a better world through the elimination of disease and material improvements to standard of living. On the other hand, resource extraction, emission of dangerous materials, and pollution of air, water and soil have created conditions for unprecedented environmental catastrophe and have already caused irreversible damage to the biosphere. While the future might promise a vast acceleration of technological innovation, the scale and impact of environmental degradation may reflect this vast acceleration as well (UNEP, 2013). Technologies have affected society and its surroundings, including the environment, in a number of ways. In many societies, technologies have helped develop more advanced environmental problems, including global warming. Many technological processes produce unwanted by-products known as pollution, and deplete natural resources, to the detriment of Earth's environment. Various implementations of technologies influence the values of a society and new technologies often raise new ethical questions (WHO, 2013).

The environment is the sum total of all conditions and influences that affect the development and life of all organisms on earth. These living organisms vary from the lowest micro-organisms such as bacteria, virus, fungus, etc. to the highest, including humans. Each organism has its own environment. The word "environment" can mean many things to many people.

Some consider it to be preservation of a scenic natural landscape or dwindling wildlife species. According to some, it is industrial pollution or threat to citizens' amenities caused by the building of a road or a big factory. Others may treat it as the mother of natural resources-energy, land, water, atmosphere and minerals (Anil and Arnab, 2001). The natural environment comprises all natural occurring surroundings and conditions in which living things grow and interact on Earth. These include complete landscape units that function as natural systems without major human intervention occurring within their boundaries. They also include universal natural resources that lack clear-cut boundaries such as; air, water and climate. Environment (Biophysical) refers to the physical and biological factors along with their chemical interactions that affect an organism where pollution is important. Knowledge environment include; social practices, technological and physical arrangements invented to facilitate collaborative knowledge building, decision making, inference or discovery (Anil and Arnab, 2001).

Environmental-wide Green Procurement

Green procurement is the integration of environmental performance considerations into the procurement process. Goods and services are considered green when they have a lesser or reduced effect on human health and the environment than competing goods or services that serve the same purpose (Canada, 2005). It includes the following;

- Looking at how needs could be met without new purchasing.

- Choosing a manufacturer who can demonstrate good environmental management

practices; and

    - Buying goods that are produced with fewer resources, do not use or release toxic substances, are energy efficient, or are easily disassembled for reuse and recycling.

Deforestation

Forests cover 31% of the land area on the planet. They help people thrive and survive by, for example, purifying water and air and providing people with jobs; some 13.2 million people across the world have a job in the forest sector and another 41 million have a job that is related to the sector. Many animals also rely on forests. Eighty percent of the world's land-based species, such as elephants and rhinos, live in forests. Forests also play a critical role in mitigating climate change because they act as a carbon sink—soaking up carbon dioxide that would otherwise be free in the atmosphere and contribute to ongoing changes in climate patterns.

But forests around the world are under threat, jeopardizing these benefits. The threats manifest themselves in the form of deforestation and forest degradation. The main cause of deforestation is agriculture (poorly planned infrastructure is emerging as a big threat too) and the main cause of forest degradation is illegal logging. We're losing 18.7 million acres of forests annually, equivalent to 27 soccer fields every minute.

Deforestation is a particular concern in tropical rain forests because these forests are home to much of the world's biodiversity. For example, in the Amazon around 17% of the forest has been lost in the last 50 years, mostly due to forest conversion for cattle ranching. Deforestation in this region is particularly rampant near more populated areas, roads and rivers, but even remote areas have been encroached upon when valuable mahogany, gold, and oil are discovered.

Mine Tailings and the Environment

Tailings are a type of rock waste from the mining industry. When a mineral product is mined, the valuable portion is usually embedded in a rock matrix called ore. Once the ore has been stripped of its valuable minerals, sometimes through the addition of chemicals, it is piled up into tailings. Tailings can reach immense proportions, appearing in the form of large hills (or sometimes ponds) on the landscape.

Tailings deposited as large piles can cause a variety of environmental problems:

    -Slumps, landslides: Tailing piles can be unstable, and experience landslides. In 1966, in Aberfan, Wales, a hill of mining debris famously collapsed onto buildings, resulting in 144 deaths. There are also cases where wintertime avalanches occurred on tailings, with loss of life for residents below.

    -Dust: Dry tailing deposits contain small particles that are picked up by the wind, transported, and deposited on communities nearby. In the tailings of some silver mines, arsenic and lead is present in the dust in high enough concentrations to cause serious

health problems.

-*Leaching:* When rain falls on tailings, it leaches away materials that can create water pollution, for example, lead, arsenic, and mercury. Sulfuric acid is sometimes produced when water interacts with tailings, or it can be a by-product of ore processing. As a result, highly acidic water leaks from the tailings and disrupts aquatic life downstream. Tailings from copper and uranium mining often produce measurable levels of radioactivity.

Tailing Ponds

Some mining wastes become very fine after they have been ground up during processing. The fine particles are then generally mixed with water and piped into impoundments as a slurry or sludge. This method cuts down on dust problems, and at least in theory, the impoundments are engineered to let excess water flow out without leaking tailings. Coal ash, while not a type of tailing, is a coal burning by-product stored the same way, and carrying similar environmental risks.
In reality, tailing ponds also carry several environmental risks:

- *Dam failure:* There have been numerous instances where the dam holding back the impoundment collapsed. The consequences to the aquatic communities below can be serious, for example in the case of the Mount Polly Mine Disaster.

- *Leaks:* Tailing ponds can be hundreds of acres in size, and in those cases, leaks into surface and ground waters are probably inevitable. The heavy metals, acids, and other contaminants end up polluting groundwater, lakes, streams, and rivers. Some very large ponds in Canada's tar sands operations leak large amounts of tailings in the underlying soil, in the aquifer, and ultimately into the nearby Athabasca River.

- *Wildlife exposure:* Migrating waterfowl has been known to land on tailing ponds, and in some cases with dramatic consequences. In 2008, about 1,600 ducks died after landing on a tar sands tailing pond in Alberta, contaminated by floating bitumen, a tar-like substance. However, simple deterrent measures can reduce that risk significantly.

Carbon Footprint

Today, the term "carbon footprint" is often used as shorthand for the amount of carbon (usually in tonnes) being emitted by an activity or organization. The carbon footprint is also an important component of the Ecological Footprint, since it is one competing demand for biologically productive space. Carbon emissions from burning fossil fuel accumulate in the atmosphere if there is not enough biocapacity dedicated to absorb these emissions. Therefore, when the carbon footprint is reported within the context of the total Ecological Footprint, the tonnes of carbon dioxide emissions are expressed as the amount of productive land area required to sequester those carbon dioxide emissions. This tells how much biocapacity is necessary to neutralize the emissions from burning fossil fuels.

Heavy Metals

Heavy metal pollution continues to be one of the most important global threats. Out of twenty classified toxic heavy metals, half of them are released at higher concentrations with high potential to human health and the environment. One of the main sources of water pollution is the discharge of industrial contaminated sewage effluents with heavy metals, such as Ag, As, Au, Cd, Co, Cr, Cu, Hg, Ni, Pb, Pd, Pt, Rd, Sn, Th, U and Zn. Continuous discharge of heavy metals into the environment and their accumulation cause adverse effects on terrestrial and aquatic environments as well as the population.

Major Parties Involved

Sweden

Most of the energy used in Switzerland is obtained from hydroelectric power. The rest of the energy is obtained through nuclear power plants. The energy production results in very low carbon footprint. Switzerland has been protecting and designated a lot of land to National parks. With its greenery spread and a large area protected, it scores high in Biodiversity & habitat.

France

As a member of the European Union, France is trying to impart changes in its environmental policies to reduce its environmental concerns. France is still coping with the legacy of its industrial past. To ensure the reduction in emissions, France is following national and territorial action plans. About 30% of the energy source used is renewable in France.

Denmark

Denmark is a world leader in developing new technologies in wind energy. Denmark has been the first to install World leading wind energy industries. Today, almost 40% of Denmark's energy is obtained from wind turbines. By 2020, the country aims to get 50% of energy from wind, this would contribute to Denmark's 2050 goal. The industries also provide employment to a huge number of people and result in good turnover every year.

Timeline of Events

1820 – 1840	The Industrial revolution occurred, marking the transition from handmade production to machines, new chemical and iron production processes, the increasing use of steam power, the event of machine tools and the rise of the factory system.
5 June 1972	The United Nations Environment Programme (UNEP)

	was formed.
29 December 1972	The London Convention on the Prevention of Marine Pollution by the Dumping of Wastes and Other Matter was opened for signature.
November 13, 1979 - March 16, 1983	The Convention on Long-Range Transboundary Air Pollution opened for signatures.
30 January 1991	The Bamako Convention was signed in Bamako, Mali.
17 March 1992	The Convention on the Transboundary Effects of Industrial Accidents is a United Nations Economic Commission for Europe (ECE) convention signed in Helsinki, Finland.

UN Involvement

The United Nations Environment Programme (UNEP) is an agency formed by the United Nations aiming to combat environmental problems by assisting countries in implementing environmentally sustainable solutions and establishing international or country-specific rules to prevent technology from harming the environment.

The Minamata Convention on Mercury: This convention aims to "protect human health and the environment from the adverse effects of mercury," and currently 128 countries have signed it. A common metal, mercury has effects on soil and water when its use is uncontrolled. Signed by 127 countries, the convention aims to control the global use of mercury through its lifecycle to prevent its human-related releases. It was adopted in a conference held in Kumamoto, Japan on 10 October 2013 and its implementation began on the 16th of August 2017.

Regarding the facilitation and acceleration of environmentally sound technologies, the fourteenth session of the Conference of the Parties (COP) to the Convention in Poznan, **The Beijing High-Level Conference on Climate Change: Technology Development and Technology Transfer** is being convened to support the work of the Parties to the United Nations Framework Convention on Climate Change **(UNFCCC).** This convention does not only negotiate solutions but also aims to provide an opportunity for Member States and other stakeholders to engage and openly consider the current state of technological development and transfer, the major barriers and possible mechanisms for overcoming technology's environmentally harmful side effects through public and private actions, including partnerships.

In 2018, **the UNCTAD Technology and Innovation Report** published is a report subtitled "Harnessing Frontier Technologies for Sustainable Development." It aims to discuss frontier technologies to achieve sustainable development goals for the environment. It discusses the benefits of techniques such as big data analysis, 3D printers, artificial intelligence, Internet of

Things (IoT), and Drones and GPS systems.

Relevant UN Documents

Resolution of the General Assembly in the United Nations Conference on Environment and Development (22 December 1989, A/RES/44/228):
http://www.un.org/documents/ga/res/44/ares44-228.htm

UN Environment Annual Report 2018:
https://www.unenvironment.org/annualreport/2018/index.php#cove

Treaties and Events

The Bamako Convention

The Bamako Convention is a treaty of African nations prohibiting the import of any hazardous waste, including radioactive waste.

Convention on Long-Range Transboundary Air Pollution

The Convention on Long-Range Transboundary Air Pollution is meant to protect the environment against air pollution step by step, including long-range transboundary air pollution. It is enforced by the European Monitoring and Evaluation Programme (EMEP), which is directed by the United Nations Economic Commission for Europe (UNECE).

London Convention on the prevention of Marine Pollution by Dumping of Wastes and Other Matter

The Convention on the prevention of Marine Pollution by Dumping of Wastes and Other Matter, which took place in 1972 and is usually referred to as the "London Convention" or "LC '72," is an agreement to regulate dumping-related pollution in the ocean and to encourage regional agreements supplementary to the Convention. It covers the deliberate disposal of wastes or alternative matter from vessels, aircraft, and platforms into oceans. The convention does not cover discharges from land-based sources like pipes and outfalls, waste generated by incidental traditional operation of vessels, or placement of materials for functions apart from mere disposal.

Convention on the Transboundary Effects of Industrial Accidents

The Convention on the Transboundary Effects of Industrial Accidents is a United Nations Economic Commission for Europe (ECE) convention signed in Helsinki, Finland, on the 17th of March 1992, that entered into force on 19 April 2000. The Convention is intended to guard individuals and also the environment against industrial accidents. The Convention aims to stop accidents from occurring, or reducing their frequency and severity and mitigating their effects, if needed. The Convention promotes active international cooperation between countries, before, throughout and once an industrial accident. The Convention helps its Parties – that is, States or regional organizations tied to the organization – to anticipate industrial accidents which will have transboundary effects and organize responses for such accidents in case they occur. The

Convention also encourages its Parties to assist one another within the event of an accident, to collaborate on analysis and development, and to share data and technology.

Evaluation of Previous Attempts to Resolve the Issue

-WWF has been working to protect forests for more than 50 years. WWF works with governments, companies, communities and other stakeholders to promote certification for responsible forest management practices, combat illegal logging, reform trade policies, protect forested areas, and more.

- As industry has grown and taken an increasingly large role on the global scene, the relationship between industry and those who try to address the side effects from industry on the environment has been one of constant change, of push and pull.Historically, it has usually taken some time before policy makers can really realize the specific damage that certain technologies can cause. This means that there is often a significant amount of damage done before policies can be adapted. However, there is a fairly successful track record of identifying and eventually curbing the impacts of industry on the environment. For example, through policy and the improvement of new technologies, air pollution from manufacturing in England has been greatly decreased since it was at its worst through successful communication between manufacturers and policy makers.

-Paris Climate Agreement: The climate pact approved in Paris in December 2015 represented a huge historic step in re-imagining a fossil-free future for the planet. It is remarkable that nearly 200 countries around the world—including oil-exporting nations—agreed to keep global temperature rise well below 2 degrees Celsius *and*, to the surprise of many, went even further by agreeing to pursue efforts to limit the increase to 1.5 degrees above pre-industrial levels.The agreement aims to terminate end to fossil fuel use well before 2050. That is within 31 years. The agreement itself implies that committing to the 2-degree limit will involve far more than just a transition to clean energy; managing land to support many competing needs also will be part of the solution. If the world truly moves out of fossil fuel fast and furiously, demand for substitutes—for instance forests as a fuel source—could place tremendous new pressures on our planet if not managed well. At the same time, the agreement references reducing emissions through "sustainable management of forests and enhancement of forest carbon stocks in developing countries." The agreement also says it "aims to strengthen the global response to climate change…in a manner that does not threaten food production."

-Well established physicochemical technologies to remove heavy metals and other contaminants from sewage effluents already exist. These include cementation, ion exchange, precipitation, electrocoagulation and electrowinning. However, these technologies are not cost-effective and needs skilled personnel for operation, generation of hazardous by-products and are inefficient for detoxifying low heavy metal concentrations. Compared to conventional technologies, bioremediation is easy to operate, low metal concentration can be detoxified with high efficiency, self-sustaining system where the right microbes grow depending on the availability of the contaminant, harmful products are not produced and it can be operated in combination with conventional technologies. The isolation and identification of heavy metal resistant bacteria in sewage effluent may contribute to efficient technologies to remove heavy

metal pollutants from sewage effluents before being discharged to environment.

Possible Solutions

An environmental problem caused by manufacturing technology can be solved also by technology. For example, changing the materials used in electronic devices into materials that can be recycled or give less harm to the environment during extraction is possible through technology. Both governments and private companies have a major role in terms of making the manufacturing process more environmentally friendly. Governments should have policies regarding regulating the carbon emissions and waste of factories and regularly do inspections. Companies should be responsible for documenting their waste products and the fact that they use environment friendly facilities. Last but not least, both should ensure that the mine tailings are handled properly, not given to environment without necessary purification processes.

Bibliography

"CONVENTION ON THE TRANSBOUNDARY EFFECTS OF ... - unece."
https://www.unece.org/fileadmin/DAM/env/documents/2006/teia/Convention%20E%20no%20annex%20I.pdf. Accessed 14 Mar. 2019.

"Convention on the Prevention of Marine ...."
http://www.imo.org/en/OurWork/Environment/LCLP/Pages/default.aspx. Accessed 14 Mar. 2019.

"Convention on Long-Range Transboundary Air Pollution - unece."
http://www.unece.org/fileadmin//DAM/env/lrtap/welcome.html. Accessed 14 Mar. 2019.

"The Bamako convention | UN Environment."
http://www.unenvironment.org/explore-topics/environmental-rights-and-governance/what-we-do/meeting-international-environmental. Accessed 14 Mar. 2019.

New Technology Can Fix Global Problems If Managed Well,
unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=1753.