

Forum : Environment and Sustainable Development

Agenda : On measures to mitigate the impact of industrialization on soil and air pollution

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Introduction

Industrialization is a very important state of development of the modern world, it has gradually become the reliance of a lot of countries in the world, mostly MEDCs. It brings transformation of the countries, and it earns the status and the structure of the basis of worlds economy and business. The advent of industrial development revamped patterns of human settlement, labor, and family life. The changes set in motion by industrialization ushered Europe, the United States of America, and much of the world into the modern era.

The start of industrialization can be trace back to the 1750s in the Great Britain, due to the commerce and economic development from the 15-17th century of the Great Britain, it is mainly cause by the emergence of capitalism, the create a stable government, the discovery of new energy source such as coal, and the effects of agriculture revolution. The credibility of Adam Smith's book *The Wealth of Nations* has mentioned and give credibility of the economic system of capitalism, capitalism is the economic system that encourage less government intervention and more market freedom; therefore, it promotes entrepreneurs to seek more profit also invest in their businesses, thus more profit requires mass efficient production. Meanwhile the government has implemented policies such as free trade, rule of law, property rights etc. which is very important, and it also urges the occurrence of industrialization. Industrial Revolution was the mining of resources such as coal, which were vital to the processes of industrialization. For instance, Britain was the first to industrialize and had large supplies of coal present in the country. Coal was a necessary ingredient in the industrial process as it fueled the steam engines that were used in trains, ships, and all other sorts of machinery. All these practices are historically call industrial revolution. Since then, Britain has started industrialization as a pioneer followed and learned by other country until now.

Industrialization has brought the world many benefits, the most significant benefit is economy growth & development, industrialization has led to periods of economic growth. New technologies make work easier, faster, and better, which can increase the output and profits of a business. Industrialization also led to urbanization, when an area becomes more industrialized, urbanization tends to follow. The industrialization of an area will boost communications and transportation, people will be occupying less space, increasing, and improving the workforce. More institutions that could be beneficial for general development can established nearby the industrial base, such as but not limited to educational institutions, banks, health facilities, and entertainment centers etc. These establishments flourished due to the increase in population in industrialized areas, which resulted in more business happening. As the society is developing, industrialization has also provided work opportunities, Increased industrialization can reduce unemployment and poverty rates in specific regions. Industrial development has brought more jobs to large and small businesses, which has opened more opportunities for those who might otherwise have lost their jobs. It also brings jobs to people near industrialized areas such as suburbs. Industrialization has four main points of impact - air, water, soil and habitat. The biggest problem is air pollution, caused by smog and emissions from burning fossil fuels. The US EPA regulates more than 80 different toxins in industrial pollution, from asbestos and dioxins to lead and chromium. Despite these regulations, industry remains

one of the world's worst producers of air pollution. Soil pollution is another problem closely related to industrialization. Lead is the most common form of soil pollution, but other heavy metals and toxic chemicals can also seep into the soil and contaminate any crops that grow in it.

Key Terms

Industrialization - The development and a process of a country from a focus on agriculture to reliance on manufacturing.

Urbanization - The process of making an area more city-like, countries pursue this strategy to create more job opportunities, making higher incomes and create greater collaboration and innovation opportunities. Another main reasoning of invasive practice that accelerates deforestation.

Ozone layer destruction - A layer in the earth's stratosphere located in the altitude of around 10km. It contains a high concentration of ozone which absorbs ultraviolet radiation from the sunlight. It may be destructed through the increasing level of greenhouse gases.

Greenhouse gases - Gases that contribute to greenhouse effect by absorbing infrared radiation. Examples of these are water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

Greenhouse effect - The natural process that warms the earth's surface due to not reflected radiation being re-radiated by greenhouse gases. The increasing amount of greenhouse gases increasing greenhouse effect, which causes the acceleration of global warming

Less economically developed country - LEDC (plural LEDCs) Initialism of less economically developed country

More economically developed country - MEDC (plural MEDCs) Initialism of more economically developed country.

General Overview

Industrialization has numerous benefits, and it also comes with negative effects on all countries, but it has more negative effects on LEDCs, due to the trend of globalization and the special global economic circumstance---MEDCs tend to develop technology and LEDCs tend to the factories of MEDCs, since the factor of production tends to be cheaper than the MEDC countries. This practice has promoted industrialization in the LEDCs, leading to drastic development of LEDC industries, increasing employments, but it has also brought all the negative effects of industrialization to these LEDCs.

LEDCs is expected to have incomplete infrastructure, unfinalized policies and fragmentary pollution control systems, these factors have all made the industrialize effect of air pollution and soil pollution greater and harder to deal with in LEDCs. Meanwhile, LEDC government has the dilemma of promoting economic growth by

raising quantity of production or protect the environment and its own ecosystem by promoting sustainable and environmentally friendly production.

China

Since the 1978 economic reform, China has progress in many areas, especially in its industrial sector, but analysis shows that the rapid industrialization has made eastern China face more serious pollution pressure. The most serious impacts of industrial pollution are reflected in the degradation of water bodies and soil ecosystems, 16.1% of the sampling points were found to have excessive pollution. Inorganic contamination such as cadmium, mercury, arsenic, copper, lead, chromium, zinc, and nickel were found in 82.8% of the contaminated sites. Organic pollutants, such as DDT, are the second most common.

A comparison with the results of the second soil survey shows that three decades of rapid economic growth also means rapid pollution of China's land. Furthermore, research has shown that the worsen air pollution from 1999-2011, is highly affected by the rapid industrialize practices in China, in addition, the main energy source that is widely use in China is coal, a cheap but very polluting source.

In 1990, 76.2% of energy was generated by coal in China, even though this number has drastically drop in the last 3 decades, 57.7% of energy remains to showcase that coal is still an unreplaceable source of energy. According to the WHO estimation, about 656,000 people in China has died from air pollution affect in a year.

Bangladesh

Bangladesh is the most polluted countries on Earth and one for the main problems was the raising of its industries, it has caused a lot of issues from industrial smog, with factories and small local businesses concentrated in cities.

Particularly prominent are the brick kilns, and cities such as Dhaka are known for their high-yield brick production, estimated to produce more than a billion bricks a year.

Air pollution kills 195,000 Bangladeshi each year, according to WHO 2016 estimates. Furthermore, this study found that industrial soils in Bangladesh were heavily contaminated with lead (7.3–445 mg/kg). High levels of lead were found in fish muscle and food, including leafy and non-leafy vegetables collected from different parts of Bangladesh.

Brazil

The causes of pollution in Brazil are many and, in some ways, quite unique, many fuel sources throughout the country are very dependent on ethanol, so the pollutants in the air are different from other countries, although there are many similarities between Brazil and the rest of the world. cause of pollution.

Other causes of pollution in the country include factories and industrial areas, many of which again use fossil fuels such as coal. This, in turn, has resulted in massive amounts of toxic smog and haze entering the atmosphere, many of which have little or no regulations on their polluting emissions.

India

In 2019, as part of a global survey, 21 of the 30 most polluted cities were found to be in India. This pushes India to 5th place as a country, according to data published by iqair.com. The US AQI value

averaged 152 and PM2.5 was recorded at 58.08 $\mu\text{g}/\text{m}^3$. This concentration is 5 times higher than the concentration recommended by the World Health Organization (WHO). This is an overall improvement over the 2018 figure of 72.54 $\mu\text{g}/\text{m}^3$. This means there are serious health problems in most of the country.

Over 50% of pollution comes from industry, followed by 27% from vehicles, 17% from crop burning and 7% from home cooking. More than 2 million Indians are killed by air pollution. Causes of death included stroke, diabetes, lung cancer and myocardial infarction. Also, this year, State of the Global Air 2020 noted that air pollution is now the largest risk factor for death among all other forms.

Thailand

Thailand's industrial sector causes air, water, and soil pollution, which has serious impacts on human health, food security, and also on the marine ecosystems.

Factories and industrial sectors have a large impact on PM2.5, smog, and overall pollution levels. Thailand produces a lot of goods for the Southeast Asian region, especially food and household items. The processes involved in the industry produce a lot of their own pollution, the chemicals involved in making plastics and other stored items are released into the atmosphere in microscopic form, and the factories themselves emit a lot of smog and drive PM2.5 emissions. 5 into the atmosphere, with this huge demand, industry will generate more and more pollution.

Russia

Russia has inherited environmental problems left over from the collapse of the Soviet Union in 1991. The Soviet Union's emphasis on industrial production and blatant disregard for the environment left Russia facing numerous environmental problems ranging from severe air pollution to radioactive contamination. In addition, the Soviet economy left Russia dependent on a highly energy-intensive military-industrial complex. Despite the closure of many factories and heavy industries in Russia's post-independence economic contraction, the country's economy remains heavily dependent on the extractive industry. In addition, Russia is transitioning to a market economy, which means the government is strongly inclined to promote economic growth rather than environmental protection.

Timeline of Events

Date	Description
1907	Smog Prevention Association of America founded in Chicago.
1928	The U.S. Public Health Service begins examining air pollution in eastern U.S. cities, reporting a 20 to 50 percent reduction in sunshine in New York City.
1941	The Action Club was formed to fight pollution from a paper mill near Augusta, Maine.
1947	The Los Angeles Air Pollution Control District was established; the nation's first Air Pollution Control Bureau.

- 1948 600 people die in "deadly fog" in London.
- 1949 First American Conference on Air Pollution sponsored by the Department of Public Health Services.
- 1950 President Harry Truman says government and industry should join forces to fight deadly smog.
- 1952 4-8 December - Four thousand die in the worst London "killer fog". Vehicles use lights in broad daylight, but the smog is so thick that buses can only operate with guides ahead. By December 8, all traffic except the subway was stopped.
- 1955 Congress passes the Air Pollution Control Act, the precursor to the Clean Air Act of 1963 and subsequent legislation.
The International Conference on Air Pollution is held in New York City.
- 1956 Another deadly smog in London; 1,000 dead. UK Parliament passes Clean Air Act.
- 1967 Congress passes the Air Quality Act/Clean Air Act, authorizing funding to state air pollution control agencies.
- 1970 The first Earth Day, organized by Senators Gaylord Nelson and Dennis Hayes on April 22, established a national political presence for environmental issues. Millions of Americans have demonstrated to purify the air and water and protect nature.
- 1977 Amendments to the Federal Clean Air Act require review of all state ambient air quality standards by 1980. Congress also added additional protections for air quality in Category I national parks and wilderness.
- 1986 On April 26th 1986, the Chernobyl accident happened in Pripyat, Ukraine, the incident has made polluted the soil and it is not suitable for plantation in 3 decades.
- 2003 The Bush Administration introduces "clear sky" legislation to Congress to amend the Clean Air Act (the main federal law governing air quality). New, weaker targets will be set for emissions of sulfur dioxide, mercury and nitrogen oxides from U.S. power plants. According to the NRDC, "The Clear Sky Plan will triple emissions of toxic mercury, increase sulfur emissions by 50 percent, and hundreds of thousands of tons of smog-forming nitrogen oxides. It will also clean up this pollution compared to current law. Delay up to ten years and force residents of heavily polluted areas to wait many more years for clean air than existing Clean Air Acts."

- China's first "National Survey of Soil Pollution" began in 2005 and was jointly launched by the Ministry of Environmental Protection and the Ministry of Land and Resources. The survey was originally scheduled to be completed in 2010. But delayed until 2014.
- 2005 The report has shown the pollution proportion of heavily polluted enterprise land, industrial waste land, industrial park, centralized solid waste treatment and disposal site, oil extraction area, mining area, sewage irrigation area, and soil on both sides of trunk road is as high as 36.3%, 34.9%, 29.4%, and 21.3%. %, 23.6%, 33.4%, 26.4%, 20.3%. In short, the Heavily polluted areas are mostly affect by industrialization.
- 2013 Air pollution from unrestricted coal use in northern China reduces life expectancy by more than 2.5 billion years for 500 million northern Chinese residents
- 2018 The Food and Agriculture Organization (FAO) of the United Nations has released a new report at the opening of the Global Symposium on Soil Pollution, which warns that the threat posed by soil pollution to agricultural productivity, food security and human health is disturbing, yet the impact of the threat The extent and severity are poorly understood.
- The report, "Soil Pollution: The Hidden Reality," found that industrialization, warfare, mining, and agricultural intensification have all contributed to soil pollution worldwide, and that urban development has led to soil becoming a fill-in for an ever-increasing amount of municipal waste. Buried.

UN Involvement, Relevant Resolutions, Treaties and Events

- Soil Pollution

At its fifth session February 2021, the United Nations Environment Assembly (UNEA5) endorsed the steps taken to implement the resolution on managing soil pollution for sustainable development (UNEA3) adopted at its third session in 2017. Throughout this resolution, the United Nations Environment Programme (UNEP) calls on Member States and invites relevant United Nations organizations to address soil pollution in the global environment, food security and agriculture, development and health agendas in an integrated manner, especially through the use of existing scientific Prevention methods and risk management.

In June,6th 2021, the report of Global assessment of soil pollution has been launched in Rome, Italy. It has included the different reasons of soil pollution, the global status of soil pollution, the impact of soil pollution on human, vegetations, food security etc. it has also launched the assessment standards of soil pollution.

- Air pollution

In 2017, The third session of the United Nations Environment Assembly (UNEA-3) adopted 11 resolutions submitted by Member States.

The "Draft Resolution on Prevention and Reduction of Air Pollution to Improve Global Air Quality" calls for cross-sectoral action by member states to reduce air pollution in all its forms. Among its recommendations, the resolution urges Member States to:

Consider joining or partnering with relevant global initiatives, such as the Climate and Clean Air Coalition and the Global Methane Initiative, as appropriate

Promote actions to reduce air pollution in urban and rural areas, including by encouraging urban and local governments to consider participating in the BreatheLife campaign, as appropriate

Possible Solutions

Encourage countries to investigate and experiment on polluted areas

Since the area has been heavily polluted by industrialization, countries should consider investigating and experiment on this specific land to not only see the cause of industrialization and pollution. By getting the data of this countries can find more ways to minimize the effect of industrialization to other areas, to investigate on the harmfulness of pollution to human. These data can help the government to set up an emission amount for pollution base on real scientific research data to further regulate emission from industrialization.

Urge countries to regulate and legislate laws

Countries should set up or adjust the law about industrial pollution based on its circumstance of pollution and industrialization. Since the demand of industrialize produces has been more and more inelastic due to the rapid development of modern world and population, old regulations of pollution should be adjusted with new laws, such as increasing the existing carbon tax (if it exists in the country) in the country. Certain laws, regulations and legislations can also encourage industries to produce more environmental-friendly produces with environmental-friendly ways, by incentivizing the industries to produce could build up the market and encourage firms and industries to join the market. Hence pollution decreases.

Advice and promote further use carbon tax and industrial land tax

Carbon tax is an environmental tax that is levied according to the amount of emissions for certain goods or services that cause carbon dioxide emissions. Carbon dioxide is now widely recognized as the main cause of global warming. The purpose of the carbon tax is to curb the excessive emission of carbon dioxide into the atmosphere through tax means, thereby slowing down the process of climate warming. Carbon taxes are more common in the transport and energy sectors. A carbon tax was first proposed by David Gordon Wilson in 1973. A carbon tax is a form of carbon pricing.

Industrial land tax is a new concept, and it could be possibly used to regulate the size of factories and land for industrial purposes, by having this tax, the owners of the factor will no longer just pay the rent of the land to the country but also more tax within this rent, the tax can be added with proportion of the growth of using land, and it will be collected annually. This tax could affectively restrict the industries to build big factories and emit big amount of pollution.

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