A DEVASTATING EFFECT OF SOIL POLLUTION ON ENVIRONMENT

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Abstract *:* Soil pollution is one of the greatest threats to the environment, especially as populations and industrial economies expand. There are studies to suggest that several plant species may be useful in reducing the migration of such pollution further down the soil column or perhaps even into the ground water. Given its widespread natural habitat, dandelions (Taraxacum officinale) are an appealing prospect for such soil remediation. The bentgrass family (genus Agrostis) is also an attractive candidate for study, as some species of this group have also been studied for metal uptake. Uptake of metals by a plant is when the plant takes the metals out of the soil and somehow stabilizes it away from the rest of the soil matrix. This experiment will examine the ability of dandelion and a native-Alaskan strain of bentgrass to uptake metal contaminants from its growth medium, which is most often soil. For purposes of the control of extraneous variables, the soil will be replaced by a hydroponic nutrient solution and glass wool for stabilization. Research of this nature is necessary for the Alaskan landscape: since this state has a colder climate than the other areas in which phytoremediation has been studied, cold-tolerant plants have rarely been studied for this ability. In addition, invasive species need to be excluded from this type of study in Alaska, as the preservation of wild flora is important to our state ecosystem. If a native species of plant with phytoremediation abilities can be found, this plant can be planted along the roadsides of Alaska to lessen the detrimental impact of pollution from vehicular traffic. Depending on the approximate location of the isolated metals, it may also be possible to harvest these plants and process them to extract the metals.

IndexTerms- **pollution,bentgrass,phytoremediation,soilcolumn.**

I. Introduction

With an ever-increasing population and expanding industrial economies, there is a corresponding increase in environmental pollution. Contaminants in roadside soil can easily be found in many areas of the world, and these contaminants, some of which are metals, can be identified and quantified. Studies have been performed on roadside soils and dust to analyze anthropogenic sources of metal contamination (Jaradat & Momani, 1999; Nouri & Naghipour, 2002; Ayodele & Oluyomi, 2011; Zhu, Bian & Li, 2008; Duong & Lee, 2011; Cervantes, 2005; Amusan, Bada & Salami, 2003). Other sources of other metals have been attributed to vehicles and industry, such as copper, iron, and manganese from vehicle break pad use and general engine wear. Some metals, such as lead and manganese, are not biologically useful. Even if metal has biological functions, they can exist in too high of concentrations so as to be toxic, such as the case with iron, zinc and copper. This toxicity leaves plants struggling to live in such polluted soils. The contamination can also leach through the soil strata and eventually into the local water supply, a resource essential to every land-dwelling organism. To decrease the detrimental impact of this pollution, some changes to the environment can be made. Phytoremediation, or the rehabilitation of soils by use of plants, can be easily utilized: by planting certain species of plants, contaminants in the soil can be isolated by various means in different parts of the plant.

II. What is Soil Pollution?

Any undesirable change in the physical, chemical or biological properties of the soil, which is harmful to environment, living organisms and plants, is called ‘soil pollution’. It adversely affects human nutrition and crop production and productivity, and the quality and utility of soil. Cadmium, chromium, copper, pesticide, chemical fertilizer, weed, toxic gases etc. are major soil pollutants. For example, if pesticides are used while farming, then it affects the plants and the soil apart from killing the insects.

III. The Problem of Soil Pollution

The problem of soil pollution arises due to mixing of toxic and polluted materials in the soil. Illegal dumping is the biggest reason for soil pollution, which adversely affects the quality of soil and the health of people living on it. Soil pollution also spreads through polluted water absorbed by the soil. Chemical compost used in agricultural work, litter and dirt also badly pollutes the soil. The soil is also polluted by the mineral oil spread on the land accidently. Pollutants present in the air also contribute to polluting the soil. Through the rain water, pollutants present in the air descend on the ground which ultimately results into polluting the soil. Soil is an important natural resource on Earth that is essential to run the life of humankind and animals by producing vegetation, grains and other natural substances required for food and living. Fertile soil on Earth is essential for the production of crops which is essential for the food of all living beings. Fertility of the land is severely affected due to the inclusion of toxic elements in the soil due to chemical fertilizers, pesticides, and industrial effluents. Let us take into the accounts some statistics. Between the years 1999 to 2000, the farmers worldwide used 18.07 million tonnes of chemical fertilizers and the use of chemical fertilizers is still going on uninterruptedly. These toxic chemicals pollute the soil and ultimately enter the food chain and infect us with dangerous diseases. Even the newborn babies and infants take birth with many types of physical inefficiency due to this phenomenon. About 1000 square miles of land in Tacoma, Washington had been polluted in minutes due to airborne pollutants falling on the ground; hence the incident is cited as a grave instance of soil pollution. Harmful chemicals present in the air pour down as acids in the form of rain and contribute to raising the soil pollution to dangerous levels. The direct effect of polluted soil is on the health of men and animals. The crop produced in the soil polluted by harmful chemical substances causes cancer and other incurable diseases by reaching the body of humans and other living organisms. Due to the large-scale industrialization, industrial effluents are continuously discharged in wastewater. As a result, heavy metals are mixed in soil, turning it toxic. World scientists have warned from time to time that if there is no attention given on time to soil pollution, it can lead to disastrous consequences. Due to polluted soil, there is an adverse effect on the yield of crops too. Along with the other countries, thousands of hectares of agricultural land in many parts of India have lost their fertility through the constant use of chemical fertilizers.

IV. Types of Soil Pollution

There are many types of natural and human-born soil pollution:

IV.1 Land pollution from domestic and industrial solid waste

Electronic goods, broken furniture, junk papers, polythene bags, plastic cans, bottles, wastewater, toxic waste from the hospital etc. are examples of solid waste which pollute the soil. Most of this litter is non biodegradable. These wastes affect the soil structure by being blocked in it for long periods. Because these solid wastes do not decay easily, they lie on landfill sites for thousands of years and keep polluting the soil and the environment continuously. In addition to the soil, humans and animals living around these landfill sites are greatly harmed. Household waste, industrial waste etc. contain residues of harmful toxic inorganic and organic chemicals. In these residues, radiation elements such as strontium, cadmium, uranium, ladders are found, which affect the vitality and fertility of the land. Fly ash is a major source of pollution surrounding the industrial area. There are chemicals or other types of waste in industries, which are dumped at some place. So much so that soil becomes polluted and trees and plants do not even grow in such a part.

IV.2 Soil pollution by chemical substances

The use of chemical pesticides and fertilizers has increased for cultivating more crops and these pollutants are making the soil poisonous and in many places the soil has become dead due to excessive use of it.

Producers of fertilizers, insecticides, pesticides, pharmaceuticals produce a lot of solid and liquid waste. Due to leaks from pipes and gutters, pollutants also go into the soil and spread pollution.

In the chemical and nuclear power plants, a large amount of waste is released continuously and due to the absence of proper arrangements for their storage and disposal, these substances pollute the soil. In commercial agriculture, insecticides are being used indiscriminately and inorganic chemical fertilizers are also being used day by day. The chemical fertilizers are polluting the environment and groundwater resources of phosphate, nitrogen and other organic chemical land. The most dangerous pollutants are bioactive chemicals, due to which the micro-organisms of climates and other soil are being destroyed resulting in decreased quality of soil. Toxic chemicals enter the diet chain, so that they reach the top consumer. Bioactive chemicals are also called Creeping Deaths. In the last 30 years, the use of organic chemicals has increased by more than 11 times. India alone is using 100,000 tonnes of bio-chemicals per annum.

IV.3 Continuous deforestation

Trees absorb carbon dioxide from the air; provide oxygen for humans and other organisms. Apart from these, tree plantations are also helpful in prevention of soil pollution and erosion. Tree plantation rejuvenates the lost potency of soil. But unfortunately, we are continuously cutting trees on the millions of acres of land for the wood required for construction and the land required for the cultivation, besides mining work.

V. Factors responsible for soil pollution at a glance

There are many factors responsible for soil pollution such as chemical substances and insecticides, oil spills, landfill dumps and industrial waste etc. Pesticides used in agricultural work are mixed in the air and acid is found in the form of rain. Due to the rapid erosion of forests, the soil has been badly affected by pollution in the world.

Here are prime factors responsible for soil pollution at a glance:

- Continuous drilling in mineral oil and oil wells.

- Mining activities to achieve the essential minerals need to run heavy industries. Wreckage from mining is put in a nearby place. Debris from the excavation of minerals such as stone, iron, ore, mica, copper, etc., eliminates the fertile power of the soil. Together with the water at the time of the rain, the debris goes far away and pollutes the soil.
- Accidents arising during mining activities such as accidents due to accident from oil wells, expansion of oil on land, or during the mining activity for obtaining uranium etc.
- Leakage from pipes being used to transmit oil to the refining plants by the tanks being made for underground oil storage.
- Acid rain carries dangerous levels of pollutants in the air.
- Use of chemical fertilizers to get more crops during agricultural work.
- Industrial accidents due to which hazardous chemicals are mixed in the soil.
- Roads and places where debris is deployed.
- Dehydration of contaminated water in soil.
- Soil disposal of waste, oil and fuels.
- Disposal of atomic waste.
- Construction of landfill and illegal dumping spots.
- Ashes born after burning coal.
- Large amount of electronic waste production.

VI. Effects of Soil Pollution

Pollutants mix in soil and make it toxic and the chemical changes in the natural form of the soil begin to take place. By polluting the soil, in a way, we are destroying the foundation of the food chain. Polluted soil is also contaminating drinking water in the rivers and other sources of water through rain water. Due to chemical fertilizers and bio-chemical chemicals, an imbalance in the entire ecosystem is created.

VII. Soil Pollution: Global Scenario

Russia, China and India are among the countries in the world where pollution of toxic land is spreading rapidly. Chernobyl in Ukraine is remembered for the world's largest nuclear power accident. After nuclear power accidents, pollutants enter the land also; millions of acres of agricultural land are damaged. The land of Kabai in southern African country Zambia was severely damaged by heavy metals pollution in the year 1987. In La Oroia in Peru, the soil has been polluted due to excessive mining of lead, copper and zinc.

China's Linfen City's land has been polluted due to excessive coal mining and pollution of toxic chemicals like arsenic in the soil. Due to soil pollution because of the world's largest chromite mines in Sukinda of Odisha in India, the lives of the people in this city has become jeopardized. Pesticides are poisonous to human health.Due to excessive production of chemicals such as petrochemicals, pesticides, pharmaceuticals; the soil has become poisonous in Vapi city of Gujarat.

In a study conducted in Uttarakhand in January 2011, it has come to the light that the consumption of urea has increased by two and a half times in a year. Earlier where average four bags of urea were used in the fields, now 10 bags are being used. The use of potash and phosphorus is decreasing and the use of urea is increasing. According to agricultural scientists, this is happening due to the damage done to the top soil of the soil. Deforestation of the upper surface of the soil in mountainous districts is increasing rapidly. This is also leading to the loss of rain. With the increased use of urea, soil health is messing up. The use of unbalanced manure causes the soil to become diseased.

Due to the human activities, a serious problem has been found in the form of soil erosion and soil pollution. The Ministry of Forests of the Government of India estimates that about 57% of the total land of India has been damaged in some way or the other. According to an estimate, about 47 percent of the total area of India is cultivated on agriculture, of which approximately 56-57 percent of the fertile strength has decreased. Similarly, the shadow area of trees is less than 40 percent of the 55 percent of the total forest areas. The figures clearly show the magnitude of the situation.

VIII. Measures to Prevent Soil Pollution

There is a need to make stringent rules for reducing soil pollution and preventing it completely. Considering the far-reaching effects of soil pollution, control over it is absolutely necessary. The existence of animal kingdom and plant world is based on soil. The soil is the wealth of the farmers; its deprivation of properties is not only a loss to farmers but to the country's economy, human health, organisms, and vegetation too.

Throughout the world, the United States and other countries have succeeded in controlling soil pollution through the development of strong regulators, although no major progress in this direction has been made in many large Asian countries such as India and China.

Significantly, in the US, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) has succeeded in establishing several rules for the use of soil, due to which thousands of infected sites have been cleaned up out there. In England, many rules have been made to prevent soil pollution by which the people of the places facing the problem of soil pollution are educated in this regard. Certainly, there is a need to adopt strict rules to control soil pollution, some of which are as follows:

VIII.1 Domestic waste control

Soil pollution is increasing due to accumulation of domestic waste. There is a need to work according to a well-planned strategy. Most food in household waste is organic waste; to control it, we must store our food more efficiently in the fridge. In this way, we can reduce the waste of food as well as reduce the production of organic waste and prevent these harmful substances from getting into the soil.

VIII.2 Proper disposal of industrial waste

Chemical pollutants are found in large quantities in industrial wastes, which have a large role in polluting the soil. There is a need to make strict rules for proper disposal of industrial waste and ensure strict adherence to them. The garbage from the factories should be sent to the purifying plants first and they should be immersed only after proper treatment.

VIII.3 Recycling and Reuse

To reduce the production of soil pollutants, it is necessary that we focus on the recycling and reuse of the items. For example, if you want to throw furniture from your house in the trash, then you should also look for prospects through which you can modify and reuse that furniture.

Like the furniture, we can recycle many waste products in the house, and we can reduce the production of garbage and prevent soil pollution. By throwing domestic waste into landfill sites, we unintentionally increase the amount of carbon in the soil, which is a major factor in soil pollution. Recycling and re-use for the protection of soil is very important.

VIII.4 Other measures

1. Limit the use of chemicals in life and adopt Integrated Pest Management.
2. In the place of chemical fertilizers, the fundamental properties of soil should be strengthened by adopting Integrated Plant Nutrient Management.
3. Use of chemicals like gypsum and pyrites as suggested by scientists for the improvement of salinity-rich soil.
4. In order to overcome the water logging in farms, arrangements for drainage are very essential.
5. Soil erosion should be prevented by banning forest erosion and adopting soil conservation systems to protect its nutrients.
6. *Land*use regulations including *zoning* can reduce the problem of land erosion.
7. The construction and implementation of the schemes required to protect the land which is destroyed by floods is essential.
8. It is absolutely essential to focus on land utilization and crop management.

IX. Soil pollutants: Soil pollution comprises the pollution of soils with materials, mostly chemicals, that are out of place or are present at concentrations higher than normal which may have adverse effects on humans or other organisms. It is difficult to define soil pollution exactly because different opinions exist on how to characterize a pollutant; while some consider the use of pesticides acceptable if their effect does not exceed the intended result, others do not consider any use of pesticides or even chemical fertilizers acceptable. However, soil pollution is also caused by means other than the direct addition of xenobiotic (man-made) chemicals such as agricultural runoff waters, industrial waste materials, acidic precipitates, and radioactive fallout.

Both organic (those that contain carbon) and inorganic (those that don't) contaminants are important in soil. The most prominent chemical groups of organic contaminants are fuel hydrocarbons, polynuclear aromatic hydrocarbons (**PAHs**), polychlorinated biphenyls (**PCBs**), chlorinated aromatic compounds, detergents, and pesticides. Inorganic species include nitrates, phosphates, and heavy metals such as cadmium, chromium and lead; inorganic acids; and **radionuclides** (radioactive substances). Among the sources of these contaminants are agricultural runoffs, acidic precipitates, industrial waste materials, and radioactive fallout.

Soil pollution can lead to water pollution if toxic chemicals leach into groundwater, or if contaminated runoff reaches streams, lakes, or oceans. Soil also naturally contributes to air pollution by releasing volatile compounds into the atmosphere. Nitrogen escapes through ammonia volatilization and **denitrification** . The decomposition of organic materials in soil can release sulfur dioxide and other sulfur compounds, causing acid rain. Heavy metals and other potentially toxic elements are the most serious soil pollutants in sewage. Sewage sludge contains heavy metals and, if applied repeatedly or in large amounts, the treated soil may accumulate heavy metals and consequently become unable to even support plant life.

In addition, chemicals that are not water soluble contaminate plants that grow on polluted soils, and they also tend to accumulate increasingly toward the top of the food chain. The banning of the pesticide DDT in the United States resulted from its tendency to become more and more concentrated as it moved from soil to worms or fish, and then to birds and their eggs. This occurred as creatures higher on the food chain ingested animals that were already contaminated with the pesticide from eating plants and other lower animals. Lake Michigan, as an example, has 2 parts per trillion (ppt) of DDT in the water, 14 parts per billion (ppb) in the bottom mud, 410 ppb in amphipods (tiny water fleas and similar creatures), 3 to 6 parts per million (ppm) in fish such as coho salmon and lake trout, and as much as 99 ppm in herring gulls at the top of the food chain.

The ever-increasing pollution of the environment has been one of the greatest concerns for science and the general public in the last fifty years. The rapid industrialization of agriculture, expansion of the chemical industry, and the need to generate cheap forms of energy has caused the continuous release of man-made organic chemicals into natural ecosystems. Consequently, the atmosphere, bodies of water, and many soil environments have become polluted by a large variety of toxic compounds. Many of these compounds at high concentrations or following prolonged exposure have the potential to produce adverse effects in humans and other organisms: These include the danger of acute toxicity, mutagenesis (genetic changes), carcinogenesis, and teratogenesis (birth defects) for humans and other organisms. Some of these man-made toxic compounds are also resistant to physical, chemical, or biological degradation and thus represent an environmental burden of considerable magnitude.

Numerous attempts are being made to decontaminate polluted soils, including an array of both *in situ* (on-site, in the soil) and off-site (removal of contaminated soil for treatment) techniques. None of these is ideal for remediating contaminated soils, and often, more than one of the techniques may be necessary to optimize the cleanup effort.

The most common decontamination method for polluted soils is to remove the soil and deposit it in landfills or to incinerate it. These methods, however, often exchange one problem for another: landfilling merely confines the polluted soil while doing little to decontaminate it, and incineration removes toxic organic chemicals from the soil, but subsequently releases them into the air, in the process causing air pollution.

For the removal and recovery of heavy metals various soil washing techniques have been developed including physical methods, such as attrition scrubbing and wet-screening, and chemical methods consisting of treatments with organic and inorganic acids, bases, salts and chelating agents. For example, chemicals used to extract radionuclides and toxic metals include hydrochloric, nitric, phosphoric and citric acids, sodium carbonate and sodium hydroxide and the chelating agents EDTA and DTPA. The problem with these methods, however, is again that they generate secondary waste products that may require additional hazardous waste treatments.

In contrast to the previously described methods, *in situ* methods are used directly at the contamination site. In this case, soil does not need to be excavated, and therefore the chance of causing further environmental harm is minimized. *In situ* biodegradation involves the enhancement of naturally occurring microorganisms by artificially stimulating their numbers and activity. The microorganisms then assist in degrading the soil contaminants. A number of environmental, chemical and management factors affect the biodegradation of soil pollutants, including moisture content, pH, temperature, the microbial community that is present, and the availability of nutrients. Biodegradation is facilitated by aerobic soil conditions and soil pH in the neutral range (between pH 5.5 to 8.0), with an optimum reading occurring at approximately pH 7, and a temperature in the range of 20 to 30°C. These physical parameters can be influenced, thereby promoting the microorganisms' ability to degrade chemical contaminants. Of all the decontamination methods bioremediation appears to be the least damaging and most environmentally acceptable technique.

X. Causes of Soil Pollution

The redundant, ever-increasing use of chemicals such as pesticides, herbicides, insecticides and fertilizers is one of the main factors causing soil pollution by increasing its salinity making it imperfect for crop bearing and adversely affecting the microorganisms present in the soil, causing the soil to lose its fertility and resulting in the loss of minerals present in the soil, thus causing soil pollution and killing off more than just the intended pest. Other types of soil contamination typically arise from radioactive fallout, the rupture of underground storage tanks, percolation of contaminated surface water to subsurface strata, leaching of wastes from landfills or direct discharge of industrial wastes to the soil, unfavorable and harmful irrigation practices, improper septic system and management and maintenance, leakages from sanitary sewage, acid rain falling onto the soil, fuel leakages from automobiles, that get washed away due to rain and seep into the nearby soil and unhealthy waste management techniques, which are characterized by release of sewage into the large dumping grounds and nearby streams or rivers.

XI. 8 Devastating Effects of Soil Pollution

The contamination or degradation of soils impacts heavily on the health of plants. Humans are also affected in numerous ways either directly or indirectly. Polluted soil can harm humans by making contact with the soil or consuming vegetation produce from contaminated soils. Children are even more susceptible to the harms of soil pollution since they spend most of their time playing in close contact with the soil. Thus, soil pollution has a long list of effects.

Some of the main soil pollution effects are as discussed below:

XI.1. Endangering Human Health

More than 70% of the soil pollutants are carcinogenic in nature, intensifying the chances of developing cancer in the humans exposed to the polluted soils. Long-term exposure to benzene and polychlorinated biphenyls (PCBs), for instance, is linked to the development of leukemia and liver cancer respectively.

Soil pollutants can also cause skin diseases, muscular blockage, and central nervous system disorders. Humans can be affected indirectly due to bioaccumulation or food poisoning. It happens when people consume crop produce that is grown in the polluted soils or when they consume animal products that eat plants from polluted soils. As a result, humans suffer from acute illnesses and may experience premature death.

For example, high concentrations of lead or mercury in the soil can endanger the functionality of kidneys and liver. It can also hamper brain development in children and cause adverse neurological disorders.

XI.2. Economic Losses

Crops and plants grown on polluted soils can accumulate poison to an extent deemed unfit for human consumption. Consequently, it leads to enormous economic losses. In some parts of the world, heavily polluted soils with metals and chemicals such as lead, asbestos, and sulfur are considered unfavorable for crop production and cannot be used to grow crops.

The crops grown in the soils and the nearby lands are often poisoned with heavy metals and chemicals thus, discarded after harvesting because of high toxicity levels. According to China's agricultural sector, for instance, about 12 million tons of polluted grains are subjected to disposal on an annual basis, costing Chinese farmers economic losses of up to 2.6 billion U.S. dollars.

XI.3. Air and Water Contamination

Polluted soil by natural means contributes to air contamination by discharging volatile compounds into the atmosphere. So, the more the toxic contaminants in the soil, the higher the level of toxic particles and foul gasses emitted into the atmosphere. Soil pollution can also lead to water pollution if the toxic chemicals and materials like dangerous heavy metals leach into groundwater or contaminate storm water runoff, which reaches lakes, rivers, streams, or oceans.

XI.4. Effect on Plant Life

When soils are repeatedly contaminated and accumulate large amounts of poisonous materials and chemicals, the soil reaches a point where it cannot support plant life. Soil pollutants interfere with soil chemistry, biology, and structure. When these changes occur, beneficial soil bacteria, soil microorganisms, soil nutrients, and soil chemical processes begin to deteriorate to an extent where they diminish soil fertility.

The ecological balance is lost completely. On this basis, the soil becomes unsuitable for crop survival or any other form of vegetation. If the plants die, then it means animals dependent on the plants will also die. This leads to migration of the larger animals and predators to other regions to find food supply, gradually leading to a reduction in wildlife and extinction.

Soil pollution can as well change plant metabolism and lower crop productivity. Besides, when plants take up the soil contaminants, they pass them up the food chain, endangering the health of animals and humans.

XI.5. Acidification

Soil pollution allows emission of relatively large quantities of nitrogen via denitrification, volatilization of ammonia, and the decomposition of organic materials in the soil. As a result, this releases sulfur compounds and sulfur dioxides into the atmosphere, causing acid rain.

In the long-run, it leads to a continuous cycle of pollution whereby the acid rain reduces soil chemistry and nutrients, which would further contribute to ecological balance disturbance and soil erosion. Furthermore, acidic conditions hinder soil ability to cushion changes in the soil PH, leading to the death of plants due to unfavorable conditions.

XI.6. Diminished Soil Fertility

The most evident and crucial element of the soil is its fertility. Once the soil is contaminated with chemicals and heavy metals or degraded due to human activities such as mining, its fertility depreciates and might even be lost entirely. The harmful chemicals and heavy metals in the soil decrease soil microbial and chemical activity.

The chemical elements can also denature active enzymes that revitalize healthy soil activities. Soil acidification as a consequence of pollution also leaches away essential natural minerals like magnesium and calcium.

XI.7. Changes in the Soil Structure

Acidification, diminished soil fertility, and death of soil organisms in the soil can lead to changes in soil structure. This is because soil microorganisms help in breaking down organic matter that promotes soil structure regarding vitality and water penetration as well as retention.

XI.8. Increase in Soil Salinity

The increase in soil salinity, salinization, is an effect of salt accumulation in the soil. Salts occur naturally in the soil. However, increased accumulations are linked to soil pollution. Irrigation and agricultural processes that discharge nitrate and phosphate deposits in the soil are the primary contributors to increasing salt levels in the soil.

Increased soil salinity makes it difficult for plants to absorb soil moisture and reduces groundwater quality. Crops and plants grown in these regions combined with other soil pollutant effects are highly poisonous and can cause severe health disorders when consumed.

XII Conclusion

Soil, like climate, is also a natural resource, which provides food and living to the creatures/animals. The contribution of land is to organize the water cycle, nitrogen cycle, energy cycle etc. As far as the question of human activities is concerned, land is the basis of all economic activities till the time of harvesting.

As is well known, food is produced from the earth, which is the basic need of human beings. Therefore its purity and purity are very essential. Man is polluting this natural resource from his activities, which is affecting the soil fertility. The use of chemical fertilizers is being done on a large scale to produce more grains for the increasing population. It is necessary to curb this tendency, otherwise we will completely lose the fertility of the soil and the next generation and the life of various creatures will be in jeopardy. The far-reaching consequences of soil pollution can be so dangerous that the very future of human civilization is at stake.

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