

# Soil Pollution Status, Sources and Control Methods in China

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**Abstract:** Soil is the solid foundation for our survival and development. With the progress of society, our country pays more and more attention to soil pollution. Soil pollution can cause the quality and yield of agricultural products to decline, pollute groundwater and surface water resources, affect air quality, lead to soil pollution in regional areas, and cause the destruction of ecological environment and the sharp decline of biodiversity. These problems will affect China's future sustainable development and social stability, so a detailed analysis of the sources of soil pollution is conducive to analyzing the nature of pollutants and pollution methods, which plays an important role in the prevention and control of soil pollution. And to introduce to the public some new technologies of soil pollution control, new ideas and the future direction of soil remediation.

**Keywords:** Soil pollution, Sources of soil pollution, Hazards of soil pollution, Repair technique, Development.

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## 1. Introduction

With the progress and continuous development of Chinese society, metal pollution, industrial production, the application of pesticides and fertilizers, and the disposal of polluting materials have all caused pollution to China's soil environment, and further led to the degradation of soil resources and the degradation of ecosystems. The Chinese nation and the soil have been inseparable since ancient times, "Neijing" said: "The native, the birth of all things and the law of heaven and earth." Food is grown from the land, harvest can raise a people, the ancients believe that "soil is the foundation of all things." As a big agricultural country in China, soil is the solid foundation for our survival and development, so the prevention and control of soil pollution is a key part of China's development. The phenomenon of soil pollution is easy to have a negative impact on the food safety of agricultural products. The harmful molecules and substances produced by pollutants will decompose into pollution products and accumulate in the soil "soil → plants → human body", or through the transmission chain of "soil → water → human body", so that pollutants are indirectly absorbed by human body, threatening human life and health safety. As a result, the comprehensive health level of the people is jeopardized, which not only affects China's comprehensive national strength but also relates to the foundation of China's future sustainable development [1]. The situation and sources of soil pollution in China were studied deeply in order to adopt accurate and efficient prevention and control methods to improve soil pollution control technology.

## 2. Main Source of Pollution

Soil is a strategic resource for human survival and prosperity. Food, fiber and other essential materials that are necessary for human survival and life are closely related to soil [2]. Soil refers to the loose surface of the land surface with fertility characteristics and can grow plants. China has a vast territory, the cultivated land area ranks third in the world, and the application amount of chemical fertilizer ranks first in the world in recent years. In agriculture, soil refers to the soil cultivated by human beings on the basis of natural soil. The

cause of soil pollution is the process of pollutants entering the soil and settling down through a variety of ways, and its quantity, quality and speed far exceed the capacity of the soil to accommodate and purify, resulting in the physical and chemical properties of the soil, composition and characteristics are different from the original shape, and the natural ecological balance of the soil is unbalanced. [3] The main sources of soil pollution are mainly divided into inorganic contamination, organic pollution and biological pollution, including heavy metals, pesticides, agricultural film /POPs, radionuclides, pathogens/viruses, and new biomass pollution. Harmful microorganisms brought by municipal sewage, sludge and manure; Biological pollutants mainly include soil pathogenic microorganisms, parasites, human and animal manure fertilization, domestic sewage, hospital sewage containing pathogens and industrial wastewater, and improper disposal of diseased animal carcasses will all lead to soil pollution [4].

### 2.1. Soil is contaminated with heavy metals

The accumulation of heavy metals in the soil exceeds the maximum plant demand and tolerance, showing symptoms of toxicity or plant growth is not harmed, but the excessive content of certain metals in the harvest causes human and animal injury [5]. The main sources of heavy metal pollution can be divided into two categories: man-made and natural sources. The main sources of man-made heavy metal pollution are atmospheric settlement in factories, sewage irrigation, solid waste disposal, mining and smelting, irrational use of pesticides and fertilizers, exhaust emissions from transportation vehicles and household garbage [6]. Daily life produces "three wastes" wastewater, waste gas, waste residue discharge. The increase of heavy metal particles in the atmosphere will lead to the pollution of heavy metals in the atmosphere and the toxic effects of different chemical reactions. Atmospheric pollutants in Chinese cities include smoke, suspended particles, and human-absorbable suspended particles (dust float), etc. The natural sources are metal deposits, volcanic eruptions, and earth forming parent rock/material [7].

## 2.2. Contamination of radioactive elements

Soil radioactive elements are one of the important sources of soil pollution, such as nuclear production activities such as nuclear industry, nuclear power, nuclear weapon production and testing, as well as medical, mechanical, scientific research and other work units in the process of the release of radioactive isotopes and radioactive substances [8] dust, wastewater and waste. Industrial waste water, waste gas, waste residue discharge, nuclear power plant reactor leakage and nuclear tests. Certain mineral deposits or radioactive elements and compounds in nature gather and may indeed lead to the diffusion of radioactive materials through the decomposition and weathering of minerals. These substances can enter the soil and cause excessive levels of radioactivity in nearby soil, a phenomenon commonly referred to as the "natural diffusion zone." The accumulation of radioactive materials in the soil can have a negative impact on the environment and ecosystems. Long-term exposure to high levels of radioactive substances can lead to various pathologies in living organisms and pose a threat to the stability of ecosystems. In dealing with such problems, it is necessary to integrate the knowledge of the interaction of multiple disciplines such as natural science, environmental science and engineering. By gaining a deeper understanding of how radioactive substances behave in the environment, their effects can be better predicted and controlled to protect human health and the sustainable development of ecosystems [9]. Some human activities, such as uranium mining, processing and utilization, can also lead to soil radioactive contamination.

## 2.3. Application of pesticides and fertilizers

From a small point of view, due to the lack of education and experience, the irrational use of pesticides and fertilizers led to the continuous increase of harmful substances in the soil, and the lack of degree control caused irreversible impacts on the production and metabolism of crops. Excessive use of pesticides and fertilizers may have a negative impact on soil in various aspects. The cause of soil pollution is that the chemicals contained in pesticides and fertilizers, such as organochlorine, organophosphorus pesticides, nitrogen, phosphorus, potassium and other elements, may accumulate in the soil under excessive use, resulting in soil pollution. This can cause harm to soil ecosystems, affecting soil quality and biodiversity. This can affect the soil microbiome: Excessive pesticides and fertilizers may inhibit beneficial microorganisms in the soil, such as bacteria and fungi, disrupting the balance of the soil microbiome. This reduces the biological activity of the soil and affects nutrient cycling and ecosystem function. Contaminate water bodies because pesticides and fertilizers can enter nearby water bodies through farm runoff, seepage, and farm drainage, causing water pollution. This not only endangers aquatic life, but may also have a negative impact on drinking water sources and aquatic ecosystems [10].

## 2.4. Soil acidification and salinization

Soil acidification and salinization are caused by excessive accumulation of nitrogen, phosphorus and other elements in some fertilizers in the soil, which may lead to soil acidification [11]. In addition, excessive application of nitrogen fertilizer will increase the content of nitrate nitrogen in soil and promote the production of soil salinization. The source of soil nutrient imbalance is that excessive fertilizer

use may lead to the imbalance of nutrients in the soil, especially nitrogen, phosphorus, potassium and other elements. This can affect plant growth, increasing the accumulation of certain nutrients in the soil while reducing the availability of others. To mitigate these negative impacts, sustainable agricultural practices, including precision fertilization, crop rotation and fallow, and the use of organic fertilizers, can be adopted to protect the health of soil ecosystems to the greatest extent possible [3].

## 2.5. Pollution of land by garbage caused by production and living

Nowadays, changes in people's lifestyle and living habits, such as the increase in take-out boxes, cosmetics, waste electronic products, etc., have resulted in an increase in the types of household garbage and a diversification of garbage varieties. Some of the garbage containing toxic substances cannot be decomposed by natural degradation, and they are constantly subjected to wind erosion and leaching. In the long run, there will be a large number of toxic substances and even some carcinogens in the soil, resulting in serious soil pollution. The mixture of different pollutants produced by diversified domestic waste makes it more difficult to control, because there is organic pollution, inorganic pollution and microbial pollution [12]. At the same time, the rise of animal husbandry, although to meet the requirements of people's food, clothing, housing and transportation. However, because some farms do not meet the standards of the farming model, or some small family farms, these farming waste treatment is not standardized, or excessive use of hormones to accelerate the growth of animals, resulting in pollution of the surrounding water and farmland. According to the investigation, the water pollution caused by a pig is more than 7 times that caused by humans, and the water pollution caused by raising sheep or cattle is even more serious [13].

## 3. Current Situation of Soil Pollution in China

China's soil pollution problem is relatively serious, mainly from industrial wastewater, pesticides, fertilizers and municipal waste. Some heavy metal elements such as cadmium, lead, mercury and so on accumulate in the soil, affecting the growth of crops and human health. In addition, some organic pollutants such as polycyclic aromatic hydrocarbons and organochlorine also exist in some soils. According to the existing state of pollutants, it can be divided into single pollution, compound pollution and mixed pollution. The remediation of contaminated soil in China began in the 1970s, mainly with the study of agricultural remediation measures. In the 1980s and 1990s, research on other restoration techniques was gradually carried out. The research on phytoremediation technology is in-depth, but the research is still insufficient. At the same time, the domestic soil desertification and soil acidification problems are also relatively serious, which not only affects the growth of crops, but also poses a threat to the ecological environment.

The characteristics of soil pollution include 1. Regionality: soil conditions in different regions are different, geographical environment is different, human living habits are different, and soil itself has low mobility, so soil pollutants will accumulate in specific areas. 2. Lag: Soil pollution is a long-term cumulative process that requires the gradual introduction of plants, atmosphere, rain and organisms. Moreover, there

are many causes of soil pollution that people tend to ignore, so the data update is slow [14]. 3. Irreversibility: The formation of soil is a long-term evolution process of the earth. Once soil and pollutants combine and react, it is almost difficult to completely remove pollutants [15]. The overall situation of soil pollution in China is very severe, and some special areas have serious heavy metal pollution and high risk pollution. The various forms of soil pollution make it difficult to control and prevent pollution, and China's soil environmental supervision and management system is not perfect. All these problems have a comprehensive impact on the current state of soil pollution in China [16].

## **4. Background of Soil Pollution and Significance of Prevention and Control**

### **4.1. Background of soil pollution**

With the rapid growth of China's population and the rapid development of industry, as well as the former foreign countries dumped their electronic waste in China, a large number of solid wastes were piled and dumped on the surface of the soil, harmful wastewater continued to penetrate into the soil, and harmful gases and drifting dust in the atmosphere continued to accumulate in the soil as rain fell. As a result, a large amount of solid waste continues to be piled up and dumped on the soil surface, harmful waste water penetrates into the deep soil, and harmful gases and drifting dust in the atmosphere gradually accumulate as rain falls on the soil. [17] These factors make soil pollution gradually aggravated and widespread. Soil quality and land productivity are affected by pollution, which leads to the continuous decline of water and air environmental quality, and damages the sustainable development of agriculture. At the same time, soil pollution poses a serious threat to human health and environmental safety, not only affecting the construction of a beautiful China, but also violating people's expectations for a better life. China only started soil control work in the early 21st century. Compared with water and air pollution control, China's control mechanism, legal system, technology and market in soil pollution control are still relatively weak. The background of soil pollution in China is a complex problem that requires the joint efforts of the government, enterprises and the public to solve.

### **4.2. Significance of soil pollution control**

Soil pollution prevention and control is a long-term and arduous task, which requires the joint efforts and mutual adjustment of the government, enterprises and the public. Soil pollution prevention and control has made great contributions to the protection of the ecosystem. Soil constitutes the basic environmental elements of the ecosystem and is the material basis for human survival. Soil pollution control can prevent soil pollution, protect the ecological balance of the soil, and thus protect the health of the entire ecosystem. For ordinary people, it is very important to ensure the quality and safety of agricultural products. Soil pollution will affect the growth and development of crops, resulting in the accumulation of harmful substances in agricultural products. Soil pollution and prevention can promote economic and social development, and soil is an indispensable resource for economic and social development. Soil pollution will affect the use function of land and hinder the sustainable development of economy and society. Strengthening soil

pollution control can protect the sustainable use of soil resources and promote the sustainable development of economy and society. A good ecological environment is linked to the physical quality of the people, and it is also the foundation for maintaining social stability. Soil pollution may lead to a series of social problems, such as the quality and safety of agricultural products and residents' health problems. Strengthening soil pollution control can prevent and solve these problems and maintain social stability. The government should strengthen supervision, improve relevant laws and regulations, strictly control pollution sources, increase investment, and improve prevention and control awareness. Enterprises should actively take environmental measures to reduce pollutant emissions, while strengthening scientific and technological innovation, such as creating low-cost, faster and convenient soil testing and analysis software, and developing more environmentally friendly production processes and technologies. People should also raise their awareness of environmental protection, actively participate in the prevention and control of soil pollution, and jointly protect our homeland.

## **5. Methods of Pollution Detection**

Soil pollution detection methods cover multiple levels and need to be analyzed from multiple directions, from conventional physical and chemical indicators to advanced analysis technology, the following talk about some detection methods.

The first is soil sample collection. Sample collection is the first step of soil testing, which must ensure the representative and horizontal comparability of samples. Reasonable sampling methods include stratified sampling, depth sampling and so on. Second, the routine physical and chemical index test includes the soil pH value, organic matter content, particle size distribution and other basic indicators, which can provide the basic properties of the soil for our analysis and investigation. Third, heavy metal element analysis refers to the use of atomic absorption spectrometry or inductively coupled plasma mass spectrometry (ICP-MS), etc., to detect the concentration of heavy metal elements in soil, such as lead, cadmium, mercury, etc. Fourth, organic matter detection refers to the use of gas chromatography-mass spectrometry (GC-MS), etc., to detect organic substances in soil, such as pesticides and volatile organic compounds. Fifth, biodetection methods include bacterial toxicity detection, plant growth experiments, etc., by observing the ecological response of organisms to soil to assess soil quality. Sixth, isotope technology refers to the use of isotope dilution method (ID) and other technologies to accurately determine the concentration of specific elements in soil. Seventh, remote sensing technology refers to the use of satellite and aerial remote sensing technology, through the monitoring of land use and vegetation index, preliminary judgment of the possibility of soil pollution. Eighth, biomarkers refer to the use of specific microorganisms or plants in the soil, by detecting changes in their biomarkers to determine the state of the soil ecosystem. Ninth, gas chromatography is an efficient chromatographic separation technology, through continuous flushing detection. The principle is the difference in the composition and partition coefficient of the gas phase and fixed liquid in the chromatographic column. After the sample component is vaporized, it runs along the entire column and undergoes multiple distributions, which constitutes the basic principle of chromatographic analysis.

Due to the difference in the dissolution degree of different components in the chromatographic column, their movement speed in the chromatographic column is also different, so that each component can flow out of the chromatographic column at different time points to promote effective separation [18]. Tenth, atomic fluorescence spectrometry refers to a trace analysis technique that combines the characteristics of atomic absorption and atomic emission spectroscopy. This method has the advantages of simple structure, high sensitivity, easy detection, and no interference to the gas phase, and can quickly analyze multiple elements at the same time. The specific analysis method needs to be selected precisely according to the actual situation. These advanced analytical techniques provide a powerful means for the accurate detection of soil heavy metal pollution. Of course, the application of specific methods should be selected according to the specific analysis of the actual situation [19].

## **6. Remediation Technology of Soil Pollution in China**

Reducing the concentration of soil pollutants is the goal of soil remediation. Reduce the toxicity of pollutants or convert them to non-toxic substances; Reduces the effectiveness of soil pollutants. Ecological restoration of territorial space is an important concept in the construction of ecological civilization under socialism with Chinese characteristics in the new era. It differs from ecosystem restoration in the traditional sense by emphasizing macro-measures and complex factors aimed at restoring the original ecosystem that has been damaged structurally, weakened functionally and further destroyed. The purpose of these restoration projects is to adapt and optimize the spatial structure of the country's land elements, thereby regulating and restoring ecological functions and reducing the negative impact of human activities on the ecosystem. Gradually make unhealthy or ecologically risky ecosystems move towards a virtuous cycle, and finally achieve the ultimate goal of protecting ecosystem health, ensuring landscape ecological safety and promoting regional sustainable development. The change of repair site distinguishes between in situ repair technique and ectopic repair technique. In-situ remediation technology is a treatment and remediation of soil without in-situ excavation, which has the advantage of less damage to soil structure and fertility, and less demand for reprocessing of residues. Ectopic remediation technology is a treatment process after soil excavation. Its advantages are simple control of treatment conditions, good contact with pollutants, and easy control of waste gas and waste generated in the treatment process. But there are drawbacks to the problem of high excavation costs and transportation costs, while the difficulty of re-using the treated soil increases.

### **6.1. Physical-chemical remediation of contaminated soil**

Soil vapor extraction technology, soil leaching technology, solidification/stabilization technology, glass restoration technology, thermal desorption technology, electrostatics technology, soil restoration method, in situ chemical oxidation technology, in situ chemical reduction dechlorination restoration technology, agricultural improvement measures [20].

#### **6.1.1. Soil vapor extraction technology**

The vapor pressure of the soil pores decreases, the

pollutants in the soil are converted into vapor form, and the extraction well is set in the unsaturated soil layer, the air pump extracts the soil air, and the organic matter is discharged from the soil with the air flow. This technology is suitable for the soil with high volatile chemical pollution, and it can be used together with air injection technology, biological ventilation technology, pneumatic fracturing technology, etc.

#### **6.1.2. Soil washing technology**

An effective soil remediation technique that elutes contaminants from soil particles through the action of a eluent. This includes key steps: the eluent diffuses to the surface of the soil, dissolves the contaminant, the eluent diffuses inside the soil, and the eluent diffuses to the liquid. For different pollutants, it is necessary to choose the appropriate eluent. The effect of soil leaching is affected by many factors, such as solid-liquid ratio, PH value, leaching time and particle size. Although soil leaching technology can effectively remove pollutants in soil, soil structure and groundwater will also be affected by this technology [21].

#### **6.1.3. Curing/stabilizing technology**

A technique for immobilizing soil contaminants through physical and chemical processes. It is often used for harmless treatment of soil contaminated by heavy metals and radioactive substances. Curing technology: In this process, the binder is added to the soil to form a hard solid structure between the soil particles to prevent soil erosion and loss. Chemical reactions do not necessarily occur between the contaminant and the binder, but there may be associated chemical interactions between the soil and the binder. Stabilization technology: The contaminant is transformed into a state and form that is less soluble, less migratory, or less toxic. [21]

#### **6.1.4. Glass restoration technology**

As an innovative method of integrated application of in-situ vitrification technology. By inserting the electrode into the contaminated soil and using high temperature heat treatment, organic pollutants and some inorganic compounds were successfully removed from the soil in the process of volatilization or pyrolysis. Subsequently, the pyrolysis products are further processed through a gas collection system to ensure that the treated products meet environmental standards. After cooling, the contaminated soil formed a chemically stable, non-diffusible whole hard glass body, and the harmful inorganic ions were successfully fixed, thus reducing the degree of soil pollution. This glass remediation technology not only has the characteristics of efficient treatment of pollutants, but also slows down the further diffusion of soil pollution through the immobilization of products, and provides a feasible solution for the restoration of soil environment.

#### **6.1.5. Thermal desorption technology**

Thermal desorption is different from incineration in that the latter destroys pollutants through high temperatures, while the former does not.

#### **6.1.6. Electrodynamic technology**

Direct current electric field is directly used to treat contaminated soil. Through electrolysis, electromigration, electroosmosis, electrophoresis and other processes, the current generates electrolytic effect through the electrode to enrich pollutants and thus concentrate the contaminated ions in the soil solution [21].

#### **6.1.7. Restoration of guest soil**

Dilution is the mixing of clean soil with polluted soil with

few pollutants to reduce the content of soil pollutants. This can be done in two ways: by moving into clean soil; Deep soil is ploughed up and mixed with contaminated topsoil. The second step is covering the soil. Cover clean soil over contaminated soil to prevent contaminants from entering the food chain. The clean soil layer should have a certain thickness, so that the plant roots will not spread to the polluted soil through growth, otherwise it may promote the growth of plants. The third step is to change the soil. A method of removing contaminated topsoil and replacing it with clean soil. Soil change is the best solution of this kind of method. Soil change is also one of the most thorough restoration measures. The condition of soil exchange is to have a clean soil source and a disposal site.

#### **6.1.8. In situ chemical oxidation technology**

Contaminated areas are drilled at different depths, and pumps inject oxidizing agents into the soil to react with contaminants and reduce their concentration. [21]

#### **6.1.9. In situ chemical reduction and dechlorination repair techniques**

Innovative remediation technology designed for groundwater contamination that spreads in patches across a region. Traditional remediation techniques are often inadequate in the treatment of deep groundwater pollution, while in-situ chemical reduction and deoxygenation remediation techniques achieve efficient degradation or fixation of pollutants by creating chemically active reaction zones or reaction walls. The key to this technology is the use of chemical reducing agents to reduce pollutants to an insoluble state, thus significantly slowing the migration of pollutants in the soil environment and reducing their bioavailability. It is unique in that it can effectively deal with groundwater pollution at a deeper level, providing a feasible solution for complex groundwater pollution scenarios. By reducing the mobility of pollutants, this technology is expected to significantly reduce the ongoing threat of groundwater to the soil environment and create more favorable conditions for the sustainable use of groundwater resource.

#### **6.1.10. Agricultural improvement measures**

This measure is to reduce the availability of soil heavy metals, inhibit the transfer of soil heavy metals to crops, thereby reducing the impact of pollutants on crops and the accumulation of pollutants, the use of general agricultural production technology. Modified materials are used to adjust the REDOX state of the soil [22].

### **6.2. Phytoremediation**

The technology includes plant extraction and plant degradation. Phytoremediation uses various biochemical reactions of plants to remove pollutants and make soil harmless [17].

## **7. Strengthen Prevention and Control of Soil Pollution**

Soil pollution prevention and control work has a long way to go, and it needs to start from many aspects: In order to establish a stable legal framework system, laws and regulations related to soil pollution prevention and control must be established and improved, so as to clarify the responsibilities and obligations of soil pollution prevention and control measures. To provide legal protection and basis for soil pollution prevention and control. Increase publicity:

through various channels and media, publicize the harm of soil pollution and prevention knowledge, and improve the public's environmental awareness and participation. Strengthen supervision: strengthen the supervision of pollution sources such as enterprises and factories, strictly control pollutant discharge, and prevent industrial wastewater, waste gas, waste residue and other pollution to the soil. In addition, companies and factories that violate the standards will be held accountable and punished severely, which is expected to have a deterrent effect. Scientific and rational application of fertilizers and pesticides: promote scientific fertilization and application technology, reduce the use of fertilizers and pesticides, and prevent excessive use of soil pollution. Increase the use of organic fertilizer: organic fertilizer can increase the nutrients of soil organic matter and improve the soil purification capacity, and the use of organic fertilizer should be appropriately increased. Biological control: Breeding earthworms and other organisms in the soil, the self-purification ability of the soil can be effectively improved, and urban waste can be better treated. Promote scientific and technological innovation: strengthen scientific and technological research and development of soil pollution prevention and control, promote advanced prevention and control technology and equipment, and improve prevention and control efficiency. Establish a soil pollution monitoring system: Establish a sound soil pollution monitoring system, regularly monitor and evaluate key areas, and timely discover and solve soil pollution problems. Strengthen the implementation of responsibilities: clarify the responsibilities of governments at all levels and relevant departments, formulate strict assessment standards, and incorporate soil pollution prevention and control into the local government performance assessment index system. Reduce the emission of pollutants from the source: The purpose of reducing the addition of chemical reagents is to improve the utilization efficiency of soil, strengthen the careful monitoring and accurate evaluation of agricultural land, and make the discovery and solution of soil pollution problems more timely. Establish a soil pollution prevention and control information platform: Establish a soil pollution prevention and control information platform, integrate the resources of the government, enterprises, society and other aspects, to achieve information sharing and collaborative governance. Through the information platform, monitoring data and prevention and control information can be released in a timely manner to provide decision-making support for relevant enterprises and departments. Promoting green development: We will promote green development, optimize the industrial structure, encourage enterprises to adopt environmentally friendly technologies and cleaner production methods, reduce pollutant discharge, and prevent and control soil pollution at its source. The protection of our land resources requires multi-party efforts, the government must increase investment in soil pollution prevention and control efforts, including capital, technology, manpower and other aspects of investment to provide security for prevention and control work. Soil pollution prevention and control work needs the joint efforts and participation of the whole society, starting from all aspects, take a variety of measures, through publicity and education, so that the public understand the harm of soil pollution and prevention knowledge, improve the public awareness of environmental protection and participation. At the same time, the government and social organizations can carry out various environmental protection activities to

encourage the active participation of the public. Work together to protect our land resources [23].

## 8. Future development direction and trend of Chinese soil in agriculture

In general, with the increasing attention of the people and the government to soil pollution, in order to meet the needs of the growing population and economic development, the sustainable use of soil resources will become a priority goal. The government and society will pay more attention to the ecological value and resource value of soil, and take a series of measures to protect and improve soil quality and promote the sustainable use of soil. The general background of territorial ecological restoration has put forward higher requirements for green development in the traditional sense of contaminated soil treatment and restoration, and with the progress of science and technology, the pollution situation will inevitably show a general trend of decline. It is also influenced by environmental policy, economic development, technological progress and social needs. Issues such as soil repair, protection and reuse will eventually become increasingly important, and with the increase of environmental awareness and the aggravation of soil pollution problems, soil protection and restoration will become the focus of government and society. With the continuous innovation and development of soil pollution prevention and control technology, new technologies and methods will be continuously developed and improved, and the effect and efficiency of soil pollution prevention and control will be greatly improved by identifying shortcomings and filling gaps [24]. With the acceleration of urbanization and the adjustment of agricultural structure, agricultural land will face greater development and challenges. The government and society will pay more attention to the protection and development of agricultural land, and take a series of measures to improve agricultural output and efficiency, while reducing soil damage and pollution. Of course, the future development of China's soil must be to create better ecological conditions and safer food safety efforts.

## 9. Conclusion

In the current situation of continuous development of agricultural science and technology, as well as the advancement of industrialization process, people pay more and more attention to the construction of ecological environment, in order to maintain the foot of this piece of land that has nurtured us for thousands of years, not to destroy our "roots". Through the upgrading research of soil pollution prevention and control technology, the advanced green soil remediation technology and the promotion of new varieties of plants that are beneficial to the soil environment are promoted. It is not only necessary to deeply analyze the degree of soil pollutants exceeding the standard, but also to reasonably design the control and restoration plan of soil pollutants exceeding the standard, and to improve and improve the soil natural environment in strict accordance with the implementation standards and regulations. It is believed that China's soil pollution control will be successful, standardized and scientific because of our efforts, and reduce the cost of soil remediation and prevention. These studies hope to provide some help for the relevant people and make some suggestions for the social transformation to a new stage.

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