

The importance and strengthening measures of forest cultivation in ecological environment construction

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Abstract: As the lungs of life on earth, forests play an irreplaceable role in maintaining ecological balance and promoting sustainable development. However, due to illegal logging, climate change and the continuous expansion of human activities, forest ecosystems are facing unprecedented threats, biodiversity is severely damaged, and ecological services are gradually weakened. In view of this urgent problem, this paper deeply analyzed the importance of forest cultivation in ecological environment construction, systematically identified and discussed the main challenges faced at present, and proposed a series of practical strengthening measures on this basis, hoping to effectively cope with the challenges, and then realize the restoration of forest resources and the sustainable development of ecological environment.

1. Introduction

Forest cultivation is a comprehensive discipline integrating ecology, biology and forestry management that aims to promote the restoration, growth and sustainable use of forest resources through scientific methods and strategies, including the planting, care and improvement of trees and woodlands to maintain biodiversity and increase the yield of wood and non-wood products. At the same time maintain and enhance the forest ecosystem service function. Through proper planning and management, it can help to achieve water conservation, carbon storage and biological habitat protection. In the context of global ecological and environmental challenges and climate change, scientific and reasonable implementation of forest cultivation is particularly important. It is not only the key to achieve sustainable utilization of forest resources, but also an important strategy to build a healthy ecological environment and promote biodiversity protection.

2. The importance of forest cultivation in ecological environment construction

2.1 Conservation of biodiversity

Forest ecosystems are critical underpins of the Earth's biodiversity and provide unmatched natural services. Plant resources play a fundamental role, while wildlife see them as essential habitat. Forests are not only the cradle of diverse life, but also important maintainers of ecological balance. However, the loss of forest area directly threatens this balance, resulting in a drastic reduction in the living space of plants and animals, which in turn prevents their normal reproduction. Such ecological degradation not only reduces species diversity, but can also trigger irreversible ecosystem changes. Therefore, protecting and enhancing the integrity of forest ecosystems is key to maintaining biodiversity[1]. In the process of implementing the ecological civilization construction project, our country takes forest cultivation as an important strategy to restore biodiversity. Through effective forest cultivation, stable and rich habitats can be provided, ensuring the health and prosperity of plant and animal populations. This involves not only planting more trees, but also maintaining and improving existing forest ecosystems. For example, through management measures, the natural resilience of forests can be enhanced and the natural succession of species diversity within ecosystems can be promoted. At the same time, careful management of specific areas can help protect rare and endangered species and ensure their survival and reproduction. This approach

not only preserves biodiversity, but also enhances forests' ecological services, such as climate regulation, air purification and water conservation.

2.2 Mitigation of climate change

Forest cultivation plays a vital role in mitigating climate change. The natural functions of forests include purifying the air, absorbing carbon dioxide, and releasing oxygen, which is essential for regulating the global carbon cycle and reducing greenhouse gas concentrations. With the acceleration of social construction and industrialization, a large number of exhaust emissions have become the main driving force for global warming. In this context, increasing tree resources through forest cultivation can absorb large amounts of carbon dioxide generated by the use of energy sources such as coal and natural gas. This not only helps to reduce greenhouse gases in the atmosphere, but also has a positive impact on the survival and development of human beings and other living things by improving air quality.

Through its unique regulatory role, forests can also effectively control temperature and humidity, and then have a regulatory effect on regional climate. This regulatory effect is of great significance for slowing down the greenhouse effect and improving the climatic conditions in the region. By increasing forest cover and improving forest quality, this regulatory capacity can be enhanced to respond more effectively to climate change[2]. At the same time, forests can also improve the overall ecological environment quality and provide more suitable living conditions for organisms. In today's increasingly severe global climate change, strengthening forest cultivation is not only an effective way to mitigate climate change, but also an important strategy to protect the ecological environment and promote sustainable development.

2.3 Soil and water conservation and purification

Forest ecosystem plays an important role in soil and water conservation and purification through its unique natural structure and function. Trees and other vegetation can effectively prevent soil erosion by fixing soil through roots, which is extremely important for maintaining surface stability and preventing soil erosion. Forest ground cover, such as dead leaves and branches, not only reduces the impact of rain, but also promotes water infiltration, thereby reducing surface runoff and increasing groundwater recharge. This natural regulatory mechanism not only protects soil resources, but also helps maintain the balance and stability of the water cycle. In addition, by absorbing and storing water, forests can provide water sources in dry periods and mitigate the impact force of floods in flood periods, thus playing an important role in regulating regional hydrological conditions and disaster prevention and reduction[3].

In terms of water purification, forests also show their irreplaceable functions. Forest soil and vegetation can effectively filter and adsorb impurities in precipitation, reduce suspended matter and pollutants in water, and thus improve water quality. In addition, microbial communities in forest ecosystems participate in complex biogeochemical cycles capable of breaking down and transforming various organic and inorganic substances to further purify water bodies. Therefore, maintaining and enhancing the soil and water conservation and purification functions of forests are essential for protecting water resources and maintaining the health of the ecological environment. With increasing environmental pressures, forest cultivation and restoration is a key way to protect water and soil resources and maintain ecosystem services. Through scientific forest management and protection measures, the soil and water conservation and purification functions of forests can be effectively improved, providing a solid guarantee for the sustainable use of water resources and the long-term health of the ecological environment.

3. Challenges of forest cultivation in ecological environment construction

3.1 Illegal logging and forest degradation

In the current ecological environment construction, forest cultivation faces many challenges, among which illegal logging and forest degradation are particularly prominent. Although China's

ecological environment construction continues to advance, ecological forestry projects are also steadily carried out, but the actual progress and effect are often seriously threatened by illegal logging. Illegal logging will directly lead to the reduction of forest resources, but also destroy the structure and function of forest ecosystems, exacerbate the loss of biodiversity, and lead to a series of environmental problems. At the same time, due to the large loss of forests, the carbon storage capacity is reduced, which in turn affects the regulatory function of global climate change. In addition, land degradation and soil erosion caused by forest degradation are becoming increasingly serious, which not only affects the productivity of land, but also easily threatens the quality and quantity of water resources.

Although China has carried out a series of regulations and measures at the legal and policy level to control illegal logging activities and protect and restore forest resources, the actual effect is still unsatisfactory. One important reason is that some people's awareness of ecological and environmental protection is far from enough, and the phenomenon of deforestation and occupying mountains and fields is still very common in some areas. This kind of behavior reflects the individual population's lack of understanding of the importance of ecological environment protection and the fuzzy understanding of the relationship between individual behavior and the national ecological environment. In addition, although the construction of ecological forestry projects is important, it takes a lot of time and energy, and the supervision in the implementation process is insufficient, which often makes it difficult to effectively curb illegal activities. Therefore, how to enhance the public's awareness of ecological protection, strengthen the enforcement of laws and regulations, and how to ensure the efficiency of ecological environment construction, while strengthening the supervision and crackdown on illegal logging behavior, are the main challenges facing the current forest cultivation.

3.2 The pressure of ecological environment change

The change of ecological environment has brought great pressure to forest cultivation, mainly in the aspects of climate change, biological invasion and the decline of ecosystem service function. Climate change, especially changes in temperature and precipitation patterns, directly affects forest growth and distribution. Warming may lead to more frequent forest fires, while changes in precipitation patterns may cause droughts or floods, which are serious threats to forest health and biodiversity[4]. In addition, climate change may also cause outbreaks of pests and diseases, causing further damage to forest ecosystems. Taken together, these factors pose a major challenge to forest cultivation, affecting not only the growth and structure of forests, but also the ecosystem services they provide.

Biological invasion is another important factor putting pressure on forest cultivation. With the acceleration of globalization, more and more exotic species have been introduced into new environments. Some alien species can rapidly multiply and spread in new environments, becoming invasive species and posing a serious threat to local ecosystems. These species may compete for the survival resources of native species, destroy native biodiversity, and change the structure and function of ecosystems. In some cases, invasive species can even alter the chemical and physical properties of soil, which can have long-term effects on forest ecosystems. Therefore, biological invasions not only pose a threat to forest health, but also pose additional challenges for forest cultivation and management.

In addition to climate change and biological invasions, the decline of ecosystem services is an important challenge. With population growth and economic development, human demand for forest resources is increasing, leading to overexploitation and destruction of forests. This not only reduces forest cover, but also leads to a decline in ecosystem services such as soil and water conservation, carbon storage and biodiversity conservation. Once these service functions are damaged, not only the ecological environment will suffer irreversible damage, but also human well-being and social and economic development will be affected. Therefore, how to find a balance between protecting forest resources and meeting human needs to maintain the stability and sustainability of ecosystem services is a major challenge facing forest conservation.

3.3 Loss of biodiversity

Biodiversity is not only the foundation for the health and stability of ecosystems, it is also key to ensuring the continued prosperity of the natural world and human society. However, due to a range of human activities such as forest destruction, habitat loss, climate change, pollution and overexploitation, the world's biodiversity is decreasing at an unprecedented rate. Especially in forest ecosystems, once the destruction occurs, not only the survival of rare and endangered species is threatened, but also the resilience and stability of the entire ecosystem will be damaged by the reduction of biodiversity. Every extinction of a species is a weakening of the functioning of an ecosystem, ultimately affecting the health of the entire ecosystem and the well-being of humans.

In addition, biodiversity loss increases the vulnerability of ecosystems to external threats. The richness of species diversity within ecosystems contributes to the formation of complex food webs and interactions, and this complexity can improve the resilience and adaptability of the system to environmental changes. However, when biodiversity decreases, systems become less complex and resilient, and less resistant to invasive species, the spread of disease, and extreme weather events. This not only exacerbates the rate of species loss, but can also lead to a further decline in ecosystem services, creating a vicious cycle. Therefore, the loss of biodiversity is not only the extinction of organisms themselves, but also a great threat to the sustainable development of the entire ecosystem and even human society.

4. Concrete measures to strengthen forest cultivation and build ecological environment

4.1 Implement sustainable forest management

The implementation of sustainable forest management is an important strategy to solve ecological and environmental problems, especially to combat ecological challenges such as desertification and vegetation degradation. This requires a comprehensive and long-term perspective, not only to increase forest cover, but also to maintain the ecological integrity and function of forests. Sustainable forest management focuses on balancing the use and protection of forest resources, aiming to ensure that forests can sustainably provide essential ecological services while maintaining their biodiversity and productivity[5].

In practice, sustainable forest management involves scientific planning and protection of existing forests to reduce disturbance and destruction of forest ecosystems. This includes establishing strict logging rules, protecting key ecological areas, and reducing impacts on forest structure and function through rational logging methods and cycles. In addition, large-scale afforestation activities are also an important component of sustainable forest management. By increasing the forest coverage rate, the risk of land desertification can be effectively reduced and the ecological stability of the region can be improved. At the same time, afforestation can also help restore degraded forest ecosystems and enhance their biodiversity and ecological service functions.

However, sustainable forest management is more than the application of a series of technologies and methods; it is a complex process involving multiple interests and needs. Effective policy support and legal frameworks are therefore key to ensuring the successful implementation of sustainable forest management. For example, in Linxian County, the strict implementation of the Shanxi Environmental Protection Regulations and other relevant laws and regulations, and the investigation and rectification of special environmental problems in the ecosystem of Luliang area are important measures to achieve sustainable forest management. At the same time, the establishment of ecological restoration companies, the organization of the "green shield" special action of nature reserves, and the strengthening of regional ecological restoration work are all effective ways to improve the regional green area and enhance the stability of the ecosystem.

4.2 Carry out adaptive ecological restoration

With the increasingly serious urban environmental pollution problems such as industrial waste and domestic waste, how to use forests and vegetation to purify the environment and solve these problems has become the focus of global attention. Forests and vegetation, as natural tools for

purifying the environment, can absorb and filter pollutants, improve air quality and promote ecological balance. Therefore, based on forest cultivation, a plan to control urban environmental pollution can not only improve the forest coverage rate and green area in the region, but also effectively improve air quality and provide an important boost for the construction of urban ecological environment.

In practice, adaptive ecological restoration requires a deep understanding and study of the characteristics and needs of local ecosystems. This includes a comprehensive consideration of regional climate, soil, water and biodiversity to ensure the effectiveness and adaptability of restoration measures. In addition, forest cultivation is not only closely related to local forestry development, but also has an important impact on regional economic development. Therefore, when carrying out adaptive ecological restoration, it is also necessary to consider its coordination with regional economic development to ensure that forest cultivation can bring ecological benefits and promote economic growth. This requires comprehensive measures to be taken in forest cultivation, not only to increase the green area, improve air quality, but also to promote the high growth of forestry output value[6].

For Linxian, it is an important part of urban ecological environment construction to plan the battle against haze, carry out special actions to control haze with an iron hand and improve urban air quality. By strengthening the forest cultivation work and improving the urban green area, it can not only effectively increase the environmental pollution control ability of the ecosystem, but also help complete the control work of environmental pollution problems such as haze. This requires more scientific, systematic and targeted measures in forest cultivation, such as the selection of tree species suitable for the local environment, the implementation of rational vegetation allocation and management strategies, and the strengthening of monitoring and assessment of forest health and ecological service functions.

4.3 Implement biodiversity conservation

Implementation of biodiversity conservation is key to ensuring that forests and vegetation sustain biodiversity and promote ecological balance. Forests and vegetation are important habitats for many species, and their health status directly affects the maintenance of biodiversity. A large number of species extinction cases in history have revealed an indisputable fact: overexploitation of forest resources will directly threaten the habitat of species, and then bring about a "hole" in the balance of the entire ecosystem that is difficult to repair. Protecting biodiversity is therefore not just about protecting a single species, but about the health and stability of entire ecosystems.

In order to effectively implement biodiversity conservation, building a sound legal system is the foundation. The legal system needs to specify protected areas, establish no-logging zones, and crack down on illegal activities that destroy wildlife resources. Although these legal measures can provide a certain degree of protection, in the face of the impact of forest ecological environment changes, the specific implementation needs to be further strengthened. This includes the implementation of afforestation projects and afforestation measures, efforts to restore and restore forest ecosystems, and reduce the impact of human factors on the habitat of organisms.

5. Conclusion

With the deepening of the understanding of the importance of ecological environment, the task of forest cultivation and biodiversity protection becomes more and more urgent and important. Continuing to advance this cause, strengthening the enforcement of laws and regulations, increasing public awareness, and adopting scientific and rational ecological restoration measures will be key to protecting the Earth as our common home. Restoring and protecting forest ecology can not only increase biodiversity, but also provide strong support for sustainable socio-economic development.

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