

Factors affecting the sustainable effectiveness of afforestation in Wuwei City, Gansu Province

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Abstract: With the rapid development of the human society, countless resources are consumed, and the environment is worsened. Thus, promoting afforestation projects should be enhanced right away. Based on the basic situation of afforestation in Wuwei city, Gansu province, this paper analyzes the problems and challenges in aspects of the allocation of resources, management and planning, propaganda, and education, etc. in afforestation. In view of the difficulties faced by afforestation, it puts forward suggestions from aspects of striving for higher support, clarifying management and planning, and expanding influence. This research paper dedicates in achieving the long-term sustainability and effectivity of afforestation and promoting ecological civilization construction in order to protect the environment, improve citizens' living standards, and accentuating sustainable development.

1. Introduction

As the society is growing vigorously nowadays, the environment is worsened. Afforestation, a solution to reverse humans' damage towards the environment, needs to be taken seriously.

1.1 The macro background of modern society

Nowadays, the society is developing at a rapid speed. Meanwhile, global resources and the environment are being sabotaged continuously. Especially, the humankind's severe destruction on forests. In order to meet the development, forest resources have been wildly consumed, and carbon dioxide emissions remain high. Status quo, global population is increasing, global warming is persistently existing, water pollution and land desertification problems are becoming constant issues. These countless cases are pushing environmental protection and sustainable human development to be hot topics. This leads to the result of environmentally friendly forestry industry, which presents economic values, to receive attention. Forestry industry includes afforestation, which provides a guarantee for the sustainable development of ecological environment. Since the 1980s, the Chinese government has started to establish massive afforestation programs. After paying abundant efforts and imposing myriad plans over years, the aggregate afforestation area has exceeded 380 million acres up to 2019 [1]. In addition, to achieve the goal of "carbon neutrality", China is further boosting afforestation efforts. The case of Wuwei City in Gansu Province is a practical example,

which is also a microcosm of contemporary China's attitudes towards environmental protection.

1.2 The meaning of the research paper

According to relative studies, afforestation can not only help residents to increase their income, contributing to poverty alleviation, but also enhance the vitality of ecological development, improve the ecological environment, and provide excellent conditions for lively ecological environment [2]. To obtain long-term sustainability of humanity, afforestation will be a key element. By fastening its development, biodiversity can be preserved, and climate change can be mitigated. Furthermore, flood resistance and disaster resistance can be obtained. Currently, many people are striving on developing and studying afforestation. However, long-term effective research and practical enforcement are still lacking. Based on the basic information of afforestation in Wuwei City in Gansu Province, this paper makes effort to point out and analyze existing problems and obstacles in afforestation in China. Additionally, this paper suggests ideas so as to contribute to sustainable development of afforestation. This paper aims to supplement the theoretical research on sustainable progress of afforestation, provide exemplary theories for current and future practical afforestation projects, and help residents who live in Wuwei City and other areas to ameliorate the environment and promote regional economic development at a certain extent.

2. Context

2.1 Basic information of Wuwei City

Wuwei is a city located in the middle part of Gansu Province in China which is rich in historical and cultural elements. It is at the intersection of Loess Plateau, Tibetan plateau and Mongolian-Xin Plateau. While it is an area with temperate continental arid climate, it has a severe temperature difference between day and night [3]. In fact, the average annual temperature in Wuwei is 7.1 degrees Celsius. In addition, it is beset by drought, sandstorms, heavy rains, and other natural disasters. Besides, Wuwei City has a high population density. By 2020, the permanent population in Wuwei City amounts to more than 1.4 million. Its regional GDP reached about 60 billion yuan, an augmentation of 6% over the previous year. The primary sector and the tertiary sector are main industries in the economy [4]. In recent years, Wuwei City has mainly focused on ecological issues in the environment. It has been striving for carrying out afforestation projects, cultivating ecological culture, stimulating the growth of non-wood product forest industry, promoting energy conservation and carbon dioxide emission reduction, and improving environmental quality. Afforestation can not only improve people's living environment, but also increase local employment rate and citizens' income. Nevertheless, there are still plenty of difficulties that Wuwei City is facing during its development currently.

2.2 The situation of afforestation

Status quo, China is implementing policies of developing afforestation. It is reinforcing insisting the ideology that "clear water and green mountains are gold and silver assets". Since the 1980s, China has embarked on a large-scale afforestation program. By 2019, China's forest coverage rate has reached 22.96% [1]. China is still working on planting trees and achieving carbon neutrality currently. Wuwei City in Gansu Province is also responding to China's call of improving the ecological environment and carrying out afforestation projects. By 2021, Wuwei City has finished 154800 acres of artificial afforestation. Moreover, 2.796 million trees have been planted obligatorily [4]. According to field investigation, Hesheng Village, which is in Quanshan Town, Minqin County,

Wuwei City, Gansu Province, has a desertification control and afforestation project plan in 2024. The project plans to establish a 400 acres of sand-control shuttle forest in the ecologically fragile area in Hesheng Village. The land preparation method is cave preparation. The planting density is 84 caves per acre and the aggregate investment is approximately 620,000 yuan. In addition, Gulang County, which is in Wuwei City, Gansu Province, also holds projects to prevent and control desertification in its northern area. Overall, China has contributed to afforestation for years and it is still actively conducting afforestation. Towns and counties in China are making plans and carrying out actions to establish afforestation successively. They are making efforts to improve not only the environment, but also residents' living standards and happiness.

3. Existing problems in afforestation

3.1 A lack of financial resources and human resources

One of the difficulties faced by afforestation is short of resources. To begin with, there is a lack of financial support. Since there are a lot of afforestation projects across the country, the government cannot fund fully for each project. It can only provide partial support. The rest of the funds need to be obtained by crowdfunding, organized by the town and the county, or gaining help from organizations like charitable foundations. Secondly, human resources are scarce. Due to the lack of bonus and other salary and welfare benefits, as well as highly intensive works, people would rather choose jobs that can offer them higher salaries and better working environment instead of determining to do afforestation works. This leads to the result of the reality that afforestation is lacking in manpower resources and the propulsion of afforestation is getting harder. Lastly, high-end technology resources are insufficient. Since technical elites are usually in cities and afforestation is operated in remote areas, afforestation projects are always lacking in technical assistances [5]. There is a short of publicity and promotion of afforestation in cities, resulting in people's low awareness of afforestation projects. This affects the recruitment of sophisticated technological workers. In short, solving these problems requires considering multiple aspects and factors, adopting diverse measures, and increasing supplies of human resources and financial resources towards afforestation projects.

3.2 Plans and management aren't accurate and practical enough

Currently, one of the problems existing on afforestation projects is unclear management plans. Firstly, the lack of geographical knowledge. Since in counties and towns where afforestation is carried out are lacking in geographical knowledge, plans are often imposed based on basic field visits, which can only observe superficial phenomena and results. As a result, there are many hidden problems and dangers that are not yet discovered. They may cause economic losses and wastes of resources. Additionally, the management is chaotic. As plans are not detailed enough, confusions are likely to happen during the process of afforestation development, affecting the sustainability of afforestation projects. Finally, there is a deficit of managerial knowledge. Since the government has not introduced and imposed certain managerial systems and given out planning template or other related information, administrative staffs in counties and towns do not have adequate managerial knowledge. Thus, the planning presented in afforestation projects are lacking in scientific bases. In a nutshell, unscientific plans and management are causing wastes and stagnation. Scientific and reasonable planning should take into account various factors like climate, environment, ecological needs, etc. Only in this way can we achieve long-term sustainable development of afforestation [6].

3.3 Promotion and education towards afforestation need to be enhanced

Afforestation requires publicity and education in order to boost people's awareness of forest conservation and let the country to attach importance to afforestation. In many regions where economy is not highly developed, the locals lack the awareness of protecting the environment and carrying out afforestation. Moreover, they often damage forest resources unconsciously [7]. Therefore, it is very important to promote and propagandize afforestation. Firstly, forest workers are not familiar with scientific methods of executing afforestation. Secondly, the public is lack of awareness of afforestation. Many people have not looked into afforestation before. Hence, they do not know that afforestation is beneficial to fixing climate change and other aspects and did not make positive contributions to afforestation. Thirdly, the local government should further support the afforestation industry. Active publicity and education of afforestation will promote the government to pay more attention to ecological issues such as water and soil erosion. As a result, the government will increase support for the afforestation industry. In conclusion, publicity and education are extremely important for afforestation. Only by enhancing people's awareness of afforestation can the afforestation industry become prosperous.

4. Methods of improvement

4.1 Enlist resource support

In order to achieve advanced development, afforestation projects should endeavor to obtain support in finances, policies and techniques. Firstly, solicit financial support. Special funds should be set up so that afforestation projects can have more funds to purchase saplings and equipment. Furthermore, these funds can be used to improve the welfare of workers [8]. This will attract more people to take part in afforestation projects, promoting afforestation projects and achieving improvements in ecological modification. Secondly, innovated and supportive policies should be implemented. The local government in Wuwei, Gansu Province, should ask workers who are dealing with afforestation projects about whether they have encountered difficulties and update policies in real time. As a result, afforestation projects can get better policy support. Finally, more skilled personnel should be put into afforestation projects. Technical talents will inject "fresh blood" into afforestation projects, improving the technical ability of afforestation workers. Technical talents will ensure the operation of afforestation projects can be effective and reasonable, reducing cases of wasting resources and using resources irrationally. At present, what afforestation projects need the most is resource support. Afforestation projects can only be better if they get more help in all sorts of aspects.

4.2 Strengthen planning and management

Afforestation projects need to intensify management of personnel, resources and land in order to develop efficiently. Firstly, professional management teams should be introduced into afforestation projects. Excellent management talents know how to use limited number of resources to create maximum benefits. They understand how to use the land resources with the highest efficiency without deteriorate the land. Afforestation projects can gain more achievements in a shorter time through their suggestions and plans, ensuring afforestation projects can be implemented smoothly. Secondly, allocate resources rationally. Finances, materials, humans, and other aspects of afforestation projects as well as related departments involved should be measured utterly. Afforestation resources should be invested reasonably in correct and effective directions so as to avoid wasting resources [9]. Finally, plan the layout scientifically. Based on the consideration of

combination with the actual local conditions such as climate, temperature, and terrain, a more reasonable and scientific afforestation plan should be formulated to ensure its beneficial ecological outcomes and sustainability. In short, it is extremely important to strengthen the management team, resource allocation and actual planning of afforestation projects. It can vigorously promote afforestation projects and achieve great results in the near future.

4.3 Intensify publicity and education

Afforestation projects need more publicity to get more attention and support. Firstly, broaden the channels of publicity. Utilize various channels such as new media (such as social media and online platforms), traditional media (such as television and radio), and offline advertising to promote and achieve full coverage of publicity, attracting more attention to afforestation projects. Secondly, hold publicity activities more often. Through holding activities of afforestation content such as offline afforestation publicity activities like lectures and ecological environmental protection education and training, more people are guided to participate in afforestation and boost environmental protection awareness. Thirdly, use celebrity effect. By inviting celebrities to endorse afforestation projects or join in afforestation activities personally, the celebrity effect will bring greater attention and influence to afforestation projects. Finally, demonstrate results regularly. Afforestation projects' progress should be displayed regularly. In addition, future targets of afforestation should be explained to the public routinely. As a result, afforestation can receive continuous attention, and the public can know more about afforestation projects and contribute support. In short, it is necessary to strengthen the publicity of afforestation, guide all sectors of society to participate in ecological environment protection, and promote sustainable development[10].

5. Conclusion

Located in northwest China, the city of Wuwei in Gansu Province is currently promoting afforestation projects actively, which can not only protect and optimize the environment, but also promote the economic development of Wuwei. However, afforestation projects are still facing plenty of problems and difficulties during the implementation process, which inhibit the sustainability and effectiveness of afforestation projects and stop further development. These problems are reflected in the aspects of resources, management, publicity, etc. In terms of resources, afforestation projects are relatively short of funds, manpower and other resources. Due to this problem, it is impossible to carry out afforestation thoroughly. In terms of management, the management and overall planning of afforestation projects are not scientific and reasonable, resulting in afforestation projects cannot reach their optimum efficiency. In terms of publicity, the publicity of afforestation projects is inadequate, resulting in the public not able to deeply understand the relevant content and progress of afforestation projects. In order to eliminate problems in afforestation projects and make afforestation projects more effective, this paper puts forward the following suggestions. First of all, afforestation projects should strive for more funds, manpower, policies and other support, letting afforestation projects to be rich in resources and equipment. Secondly, afforestation projects should strengthen management and planning to make sure sustainable benefits of afforestation projects. Finally, the publicity of afforestation projects should be increased. Moreover, a good atmosphere of more people in the society willing to join in the construction of ecological environment should be formed. To sum up, through industriously developing afforestation projects, letting afforestation to play its important role in ecological environmental protection and sustainable development, the construction of a beautiful green planet is promoted.

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