Forest Management and Afforestation for Sand Prevention and Desertification Control in Saihanba Forest Farm in Hebei Province

1.Title

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2. Background

Saihanba Forest Farm is located in the Bashang area in the northern part of the Weichang Manchu and Mongol Autonomous County of Chengde City, Hebei Province (283 km away from the center of Beijing), and belongs to the southern margin of the Hunshandake Sandy Land in Inner Mongolia. In 1962, the former Ministry of Forestry of China decided to establish Saihanba Forest Farm with the purpose of improving the local natural environment, blocking the Beijing-Tianjin sand source, water conservation, and building the ecological barrier in the northern part of the capital. For more than half a century, several generations of Saihanba have worked hard and tirelessly to build the world's largest artificial forest farm in the plateau desert with sparse forests, serious wind and sand storms, and cold and dry weather condition, creating a miracle, turning wasteland and sandy land into forests and oases.

3. Implementation period: 1962 till now.

4. Implementation stage

Afforestation stage (1962-1983): Saihanba entrepreneurs overcame the harsh natural environment and the difficulty of living, eating noodles, drinking water made from ice and snow, living on horse racks, sleeping on the cellar. They have improved the afforestation machinery and seedling planting shovel from the Soviet Union, summarized successful experiences of forest

sustainable management, including full-light seedling, three-and-a-half-shovel seedling planting, afforestation on site with poor condition, forest tending and utilization. Large scale afforestation has been carried out, including mechanical afforestation, artificial planting and closing hillsides afforestation.

Forest management stage (1983-now): after the large-scale afforestation state, it entered into the stage of "forest management as the core, with emphasis on afforestation and protection". For more than 30 years, the Saihanba people have conducted forest management consistently and scientifically, achieving a double increase in forest area and stocking volume.

5. Relevant implementing parties

National Forestry and Grassland Administration (former Ministry of Forestry, State Forestry Administration), CPC Hebei Provincial Committee and Hebei Provincial Government, Provincial Forestry and Grassland Bureau (former Provincial Forestry Department, Provincial Forestry Bureau), and CPC local committees and governments, Saihanba Machinery Forest Farm, etc.

6. Beneficiaries

The people of Beijing, Tianjin, Hebei and the surrounding areas.

7. Total investment costs and composition

Since its establishment, a total of CNY 1.2 billion has been invested, of which CNY 700 million is from the central government, and CNY 500 million is self-raised.

8. Project level: State and local level.

9. Impact of mitigating and adapting climate change

At present, the area of forested land in Saihanba Forest Farm has increased from 240,000 mu to 1.12 million mu. The forest coverage rate has

increased from 12% (the early stage of the forest farm) to 80% and the stocking volume has increased from 330,000 m^3 to 10.12 million m^3. Compared with the initial stage of the forest farm, the microclimate in Saihanba and its surrounding areas has been effectively improved. The frost-free period has increased from 52 days to 64 days. The annual average windy days have been reduced from 83 days to 53 days, and the average annual precipitation has increased from less than 410 mm to 460 mm. According to actual measurements, the average temperature difference between the inside and outside of the forest is 2.5 °C, and the average humidity increased by 3.69 %.

10.Social, economic and environmental impacts

According to the Chinese Academy of Forestry, the total value of forests and wetlands in Saihanba is CNY 20.6 billion, and the value of ecological services is CNY 14.2 billion. Each year, the stored carbon dioxide in the forests reaches 814,100 tons, the forests also release 570,600 tons of oxygen, release about 10,500 tons of terpene, absorb 13,400 tons of sulfur dioxide, 1,200 tons of nitrogen oxides, and 156,400 tons of dust. The Saihanba Forest Farm attracts more than 500,000 tourists every year, with a total income of more than CNY 44 million (entry tickets). A total of CNY 600 million has been brought to the local community through seedlings cultivation, forest tourism and recuperation and other related industries, and forest tourism and other green industries have accounted for more than 50% of the total revenue of the forest farm. The desert known as "covered by yellow sand, and no trees for flying birds" have become the vast forests and an important ecological barrier for Beijing and Tianjin.

11.Relevant figures and charts

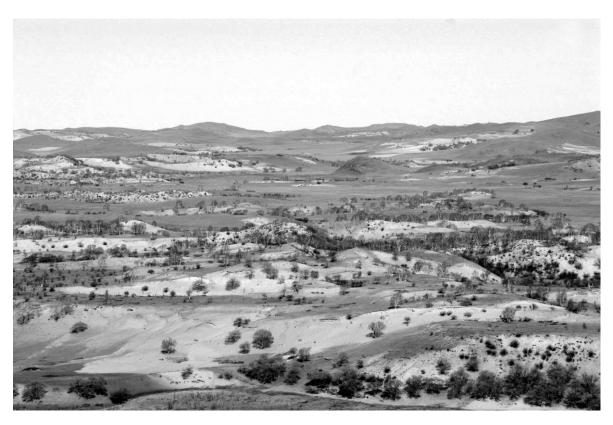**Figure 1: Wasteland before the establishment of forest farm**

Figure 2: Wasteland before the establishment of forest farm

Figure 3: Mechanical afforestation

scene

Figure 4: Afforestation achievement

Figure 5: Pine forest

Figure 6: Clear water and green mountain

Figure 7: 10,000 ha forest at present