

Good Practice on Implementing the UN Strategic Plan for Forests (2017-2030) - 40-Year Experience of the Three-North Shelterbelt Program (TNSP)

Executive Abstract:

In order to improve the ecology and environment and increase the forest cover in northwest, north and northeast China (hereinafter referred to as the “Three-North” region), the Chinese government launched the Three-North Shelterbelt Program (TNSP) in 1978, which covers 13 provinces (autonomous regions or municipalities) across northern China with a total area of 4.069 million square kilometers, and established the Bureau of the Shelterbelt Program in Northeast, North and Northwest Region of China (the Three-North Bureau) to manage the Program. A 73-year development plan has been formulated for the TNSP, in which the Program was divided into three stages (1978-2000, 2001-2020 and 2021-2050) and eight phases, aiming at increasing the forest cover from 5.05% to 14.95%.

Following four decades’ continuous endeavor, the TNSP has achieved remarkable results. It has greatly increased the forest cover and effectively combatted desertification in the program area, improved the overall situation of serious wind-sand hazards and soil erosion, enhanced the resilience and adaptability to natural disasters and climate change, which have contributed to the realization of the Global Forest Goal (GFG) 1 of the United Nations Strategic Plan for Forests 2017-2030 (UNSPF) and Sustainable Development Goal (SDG) 13 and 15 of the 2030 Agenda for Sustainable Development. The TNSP has also greatly improved the ecological situation in the region, increased grain production and made great achievements in the construction of forest product bases. Tens of millions of local people have been alleviated from poverty stably thanks to the development of forest and fruit related industries. These achievements demonstrate that the TNSP is a good example for achieving GFG 2, and SDG 1, 2, and 8. Additionally, it is also a good practice in achieving GFG 4 and SDG 15 and 17 as it mobilizes funds and strengthens public-

private partnerships at all levels through various channels.

In the coming decades, the Chinese government will continue the TNSP program with the goal of increasing the forest area in the region to 33.558 million ha, forest cover to 14%, forest stock volume to 260 million m³, and the ecological security shelterbelt in north China basically completed by 2020. By 2050, when the Program is completed, the ecological security shelterbelt system with rational layout, optimized structure and diversified functions in windy-sandy region, plain areas of northeast and north China, loess plateau, and desertified region in the northwest will be completely accomplished. These efforts will keep contributing to the achievements of the GFGs and SDGs.

Introduction

The environment deterioration in northwest, north and northeast China (hereinafter referred to as the “Three-North” Region) is a long-standing issue due to complicated reasons. In order to improve the ecology and environment and increase the forest cover of this region, the Chinese government decided to launch the Three-North Shelterbelt Program (TNSP) in 1978, which covers 13 provinces (autonomous regions or municipalities) in northern China with a total area of 4.069 million km², and establish the Bureau of the Shelterbelt Program in Northeast, North and Northwest Region of China (the Three-North Bureau) to manage the TNSP. Following overall planning and meticulous organization, a 73-year development plan has been formulated for the TNSP, in which the Program was divided into three stages (1978-2000, 2001-2020 and 2021-2050) and eight phases. The Program aims to increase the forest cover from 5.05% to 14.95%. Currently, it has entered its fifth phase.

In the past four decades, the TNSP has kept pace with the times, and formulated plans based on the actual conditions at different stages. Tremendous endeavors have been made through policy, technical and financial measures to promote the ecological improvement of the “Three-North” region with notable results achieved.

1. Basic information of the program

Development plans: At the start-up stage of the program, the objective of the overall plan was to establish a highly-productive and large-scale biotic community with woody plants as the main body. The community complies with the natural and economic laws of the “Three-North” region and takes advantage of both the nature and human efforts, aiming at establishing a protective forest system on the basis of protecting current vegetation and vigorously carrying out afforestation. At the same time, it was determined that the program should always take the production and life of local people into consideration and adapt to local conditions. Countermeasures should also be implemented against specific disasters. The plan should have priorities, and should be implemented from the vicinity to places further away, from easy steps to

difficult ones. Afforestation includes fostering shelter forests, cash trees, fuelwood forests, timber forests, and trees planted along roads and rivers and surrounding villages and houses in the forms of networks, patches and belts, creating an arbor-shrub-grass compound landscape. Afforestation should be complemented by enclosure measures and forest management. Plantations were established in different ways, including seedling planting, direct seeding, aerial seeding, mountain closure and various other afforestation models.

After entering the second phase of the program, the guiding principle was to develop an ecological-economic shelterbelt forest system prioritizing ecological benefits, combining ecological, economic, and social benefits, and coordinating ecological governance with economic development, and ecological improvement with poverty alleviation. During the third phase of the program, supports were offered to key regions, and the development of regional shelter forest systems was initiated and implemented in a step-by-step manner. It was proposed that by the year 2000, a number of shelter forests of varying scales should be fostered in the west part of northeast China, eastern Inner Mongolia, Beijing, Tianjin, northern Hebei, the Loess Plateau, the Mu Us Sandy Land, and the Oases of Xinjiang.

During the fourth phase of the program, while continuing to build an ecological-economical shelterbelt forest system, the concept of quality management was followed throughout the phase in order to further improve the quality and efficiency of the program. After entering the fifth phase of the program, the plan is to focus on key regions, carry out large scale afforestation, and build a number of shelter forest bases of over one million mu (1 mu=1/15 ha). During this phase, the concept of shelter forest management is proposed and adopted, and restoration of degraded forest is included into the program.

Policy mechanisms: During the first phase of the program, the economic contract system was piloted. In the first place, agreements were signed between the Three-North Bureau and the forestry departments (bureaus) of relevant provinces

(autonomous regions or municipalities). Then, contracts were signed between provincial governments and their subordinates consecutively, until the ground level, with clear identification of tasks, investment, deadlines and responsible persons. Policies of “contracted afforestation”, “he/she who planted the trees owns the trees while allowing inheritance and transferring” and “joining the efforts of the state, the collectives and the individuals” were carried out.

During the second phase of the program, efforts were made to strengthen the target responsibility system of governments at all levels while vigorously advancing engineering afforestation. In combination with the implementation of the rural double-tier management system reform and the policy of facilitating tree planting, the afforestation policy mobilizes "dual labors" (voluntary labor and paid labor) in tree planting. Besides, the planning, standards, afforestation, and check & acceptance were unified with activities conducted by individual households. In the third phase of the program, the target responsibility system for governments at all levels was further strengthened, and the responsibility system for provincial governors, city mayors, county, township and village heads for the program development and greening objectives of government officials during their tenure were established. The "four wastelands (referring to unused barren mountains, gullies, hills and shoals)" auction and shareholding co-operative afforestation policies were carried out so as to further strengthening the auctioning of the "four wastelands" through formulating and promulgating a series of policies and measures.

During the fourth phase of the program, the concept and method of project management and modern quality management were gradually introduced into the Program, and pilot project management was carried out, especially the establishment of the system of "delegating targets, tasks, funds and responsibilities to provinces". The project legal person system, bidding system and reimbursement system have been widely implemented in various localities, improving the scientific management of the program. At the same time, the reform of collective forest tenure system was actively put forward, contributing to the standardization of the program. Every tree and each

patch of plantations were allocated to the planters. The afforestation project integrated rights and benefits with responsibilities, and planting was followed by tending and management measures. In the fifth phase of the program, the technical principle of "planting the trees according to the availability of water resource" was proposed and followed, the ecological risk assessment system was established, and the concept of reporting loss and reduction of afforestation area was put forward. The restoration of degraded forests was regarded as part of newly established plantations, and thus enjoying the subsidy for newly established plantations. The ecological forests for public welfare established by the Three-North Program were included in the scheme of national and local compensations to ecological forest in principle.

Technology applications: In the 1980s, the focus was on achieving breakthroughs in individual technologies such as container seedling, drilling deep-planting, ploughing deep-planting, dryland planting, and combined runoff drought-resistant afforestation. Following the promotion and application of such technologies, the afforestation survival rate was raised by 23%. At the same time, the technologies of well-timed aerial seeding and enlarging the size of tree seeds were applied, enabling the successful aerial seeding in the so-called "forbidden zones" with the annual rainfall of 200 mm or less deemed unsuitable for aerial seeding.

In the 1990s, the Three-North Program shifted its focus from promoting individual technologies to providing comprehensive technology support. Portfolio afforestation and forest management technologies were assorted according to different conditions of different regions, and technology experimental zones were developed to explore and summarize models of afforestation and management to be demonstrated and promoted in other regions. Additionally, 10% of national funding was allocated exclusively for the promotion of applicable technologies. Exclusive project application and exclusive investment allocation guaranteed fundamentally the promotion of technologies. The "Three-North Engineering Technology Promotion Award" was established, which had motivated scientists and technicians to promote more than 1,200 advanced and applicable technologies that were deeply welcomed by

the farmers, covering an area of more than 3 million ha. The technologies have improved the quality of the project, and the afforestation preservation rate has increased from 60% to over 85%.

After entering the fourth phase of the Program, more than 100 afforestation models were developed and promoted. According to the needs defined by functional land planning, the ecological protection forests, ecological-economic forests and ecological landscape forests were promoted in the “Three-North” region. Since 2004, 5 million yuan from the central government was allocated annually to promote key technologies that are mature and effective. During the fifth phase of the Program, technology support was synchronized with the planning, design, implementation and check & acceptance of the program. According to the actual situation of the Three-North Program area, economically efficient arbor species and fine sandy land plant varieties with strong resistance, wide adaptability, and long life were promoted, such as *pinus sylvestris*, *pinus tabulaeformis*, *larix gmelinii*, and *platycladus orientalis*. The existing technology advantages were integrated, and a number of effective management modes promoted, such as mechanized afforestation in arid areas, afforestation with drought-resistant and water-retaining agents, and application of green plant growth regulators. The forestry technology promotion teams were formed at the provincial, prefecture, county, and township levels, and various technical training courses were held.

Program Priorities: The first phase of the Program was closely integrated with the development of basic farmlands and pastures along the Great Wall in the agro-pastoral zone, focusing on the establishment of farmland shelterbelts, pasture shelterbelts, wind-breaking & sand-fixing shelterbelts in key regions, and the soil and water conservation forests. In the second phase of the Program, the establishment of high-standard farmland shelterbelt system was carried out in key plain areas, and the sand control demonstration zone was developed in the main wind-blown areas. The water conservation forests and soil and water conservation forests were established through combined biological and engineering measures in key soil erosion areas.

The third phase of the Program focused on key projects and building key ecological defense lines. In Beijing, Tianjin, and the northeastern provinces, a large-scale regional inter-connected shelter forest system with reasonable layout has been built across river basins, mountains and provincial boundaries. The fourth phase of the program focused on the Horqin, Mu Us, Hulunbuir, Hexi Corridor and Xinjiang Oases. More than 70% of the national investment and establishment tasks were for sand control, and more than 326,800 ha of desertified land were improved. The fifth phase of the program focused on key regions, scale management, and establishment of a number of shelter forests with scale of over one million mu. A total of 18 key areas were planned. Establishment of 13 “million-mu” shelter forests was initiated, such as the wind-breaking & sand-fixing shelterbelt dominated by mongolian pines in the Horqin sandy land of Liaoning province.

Investment: Over the past four decades, the program has always been adhered to the central government investment guidance, focusing on building a diversified investment mechanism. In the initial stage, the investment from the central government took up the major part, complemented by labor input from the local, which has achieved great results. With the fading out of the system of "dual labors", and increasingly difficult site conditions, only by steadily increasing the central subsidy funds and giving full play to the leverage and guiding role of the central investment, could the policy-oriented financial capital and social capital be oriented to the program, building a diversified investment mechanism. Additionally, a specialized afforestation mechanism was explored, combining large-scale national land greening actions, guiding the financial input from various sources, including state-owned enterprises, private enterprises, foreign enterprises, the collectives, individuals, and social organizations, cultivating a number of specialized enterprises focusing on ecological protection and rehabilitation.

2. Major achievements of the program

According to the result of the comprehensive evaluation of the 40-year Three-North

Program conducted by the Chinese Academy of Sciences, through four decades' continuous efforts, the Three-North Program has established a total of 31.093 million ha of preserved plantations, the forest cover of the Program area has raised from 5.05% in 1977 to 13.57%, and the standing stock volume has increased from 720 million m³ to 3.33 billion m³, bringing enormous ecological, economic and social benefits.

Firstly, it has improved the harsh ecological conditions and broadened the space for local people's survival and development. Along the sandy line extending for thousands of kilometers from Heilongjiang in the east to Xinjiang in the west, a total of 336,200 km² of desertified land have been put under control. The condition of desertification has been transformed from aggravated expansion at the end of the last century to continuous shrinking at an average rate of 1183 km² per year currently. The three major sandy lands, namely Horqin, Mu Us and Hulunbuir, have all achieved the reversal of desertified land. The recovered area of soil erosion is more than 400,000 km². The vegetation coverage of forests and grass on the Loess Plateau under control is over 60%, and the sediment inflow into the Yellow River is reduced by more than 400 million tons annually. According to scientific researches, from 1980 to the end of last century, forest carbon storage in northwest and north China increased significantly. From 1982 to 2011, the maximum leaf area index (LAI) of the Three-North Program region shows that it has become one of the most significant areas of vegetation change in China in the past 30 years. The Three-North Program has greatly increased the forest cover and effectively prevented desertification in the project area, improved the overall situation of serious wind-sand hazards and soil erosion, enhanced the resilience and adaptability to natural disasters and the impact of climate change. These efforts contribute to the realization of the Global Forest Goal (GFG) 1 (1.1-1.4) of the UNSPF, and SDG 13 (13.1) and 15 (15.1-15.3) of the 2030 Agenda for Sustainable Development.

Secondly, great economic benefits have been achieved, and rural industrial structure adjustment and regional economic development have been promoted. According to

the assessment of the Chinese Academy of Sciences, the shelterbelt forests established by the Three-North Program create an annual ecological service value of 2.23 trillion yuan (around US\$ 3300 billion). Shelterbelt forests were established surrounding 44.1% of the farmland in the Program area with 31.093 million ha of farmland having been effectively protected. The grain output has increased by 8-15% or 423 million tons accumulatively in the past 40 years. The above achievements contribute to GFG 2 (2.1 & 2.3) and SDG 1 (1.5), 2 (2.3 & 2.4) and 8 (8.2 & 8.3). At the same time, a number of fruit industry belts have been built in the Loess Plateau, Xinjiang Oases and Yanshan Mountains, which have become a new growth point to promote rural rejuvenation and economic and social development. At present, there are 4.63 million ha of economic forests in the “Three-North” region, with an annual output of 48 million tons of fruits and nuts, accounting for about a quarter of the national total output, valuing 120 billion yuan. About 15 million people have been alleviated from poverty stably relying on fruit plantation and related industry. This also contributes to GFG 2 (2.1 & 2.2) and SDG 1 (1.2, 1.4). The Three-North Program has attracted tens of thousands of farmers to contract for harnessing barren hills and deserts, boosting forestry and increasing income, with 5 billion working days of labor having been input to the program in accumulation. Such outstanding farmers as Shi Guangyin, Niu Yuqin, Shi Shuzhu, and Yin Yuzhen were awarded the honorary title of "desertification combating heroes/heroines" by the nation. All walks of life have also actively participated in afforestation and greening to help solve the practical difficulties facing the development of the Three-North Program, which has greatly improved the ecological situation in the region, increased grain production and achieved remarkable results in the development of forest product bases. The program creates a large number of employment opportunities, eliminates poverty, promotes the contribution of forest ecosystems to food security and promotes local economic growth. It highlights the economic, social and environmental benefits of forests and is a model example for achieving GFG 2(2.1-2.3), SDG 1 (1.5), 2 (2.3 & 2.4), 4 (4.4) and 8 (8.2 & 8.3).

Thirdly, an immortal green milestone has been established and China’s ecological

improvement cause has been propelled actively. In the past 40 years, against the decreasing forest area and the expanding desertification area globally, the people of the "Three-North" region have created the miracle of "turning sand into green". They have provided China's solutions and contributed China's experience for global ecological governance. In the arduous struggle against the sandstorm, a large number of heroic model figures emerged, casting the spirits of persistent hard work and indomitable effort as the core of the "Three-North" spirit, which have won wide praise at home and abroad. In 1988, the Three-North Program was praised by Mr. Deng Xiaoping, China's top leader of the day, as the "Green Great Wall". Since 1987, more than 10 implementing units of the Program have been awarded "Global 500 Roll of Honor" by the United Nations Environment Program. In 2003, the Three-North Program was awarded "the world's largest afforestation program" by the Guinness World Records headquarters.

The Three-North Program has received wide support from the international community. According to incomplete statistics, it has received 58 aid projects from 25 countries and more than 10 international organizations and social organizations, with over 1.6 billion yuan. The international assistance enhanced the capability of implementing the Three-North Program and mitigated the difficulty of insufficient investment. The Three-North Program mobilizes investment in forestry and strengthens public-private partnerships at all levels through various channels, representing excellent practice in achieving GFG 4 (4.2) and SDG 15 (15.b) and 17 (17.16 & 17.17).

The exploration and practice of the Three-North Program have presented "China Solution" for the international community. 38 international training courses on desert control, shelter forest establishment, ecological restoration and industrial development have been held by Gansu Institute of Desertification Control. More than 1,000 trainees from 76 countries have participated in the trainings, which demonstrate that the Three-North Program is providing experience that can be promoted and effectively applied in many other countries, thus contributing to SDG 17 (17.9).

In the coming decades, the Chinese government will continue the TNSP program with the goal of increasing the forest area in the region to 33.558 million ha, forest cover to 14%, forest stock volume to 260 million m³, and the ecological security shelterbelt in north China basically completed by 2020. By 2030, efforts will be made to achieve the overall targets of the TNSP 15 years in advance, namely the newly established forests will reach 10 million ha, forest cover will be over 15%, and forest stock volume will be raised to 4.27 billion m³. The ecological environment of the “Three-North” region will be fundamentally improved and the goal of building a beautiful “Three-North” region be basically achieved. By 2050, when the Program is completed, the ecological security shelterbelt system with rational layout, optimized structure and diversified functions in windy-sandy region, plain areas of northeast and north China, loess plateau, and desertified region in the northwest will be completely accomplished. These efforts will keep contributing to the realization of the GFGs and SDGs.