

Hesheng Afforestation: Turning Desert into Green Land

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After driving about 40 km due south of Hohhot city, you arrive in a rough area with low mountains. Through the flourishing wild grass, you see lines of green *pinus sylvestris* (Scots pine), some of which are over one meter high.

This is Horinger County of Hohhot. Looking at the scene before your eyes, you would hardly believe that this area was once a desert. The land was deteriorating seriously and there were almost no plants. However, now with the recovery of the vegetation, many wild animals which could rarely be seen, including rabbits, red foxes, ducks, chukars, pheasants and partridges, now show up frequently in the area. A new eco-system is now being built.

This dramatic change is the result of the “Inner Mongolia Shengle International Eco-System Prototype Project” which was launched in 2010.



Before the project



After the project

This project was meant to rebuild and maintain a healthy and stable near-nature eco-system of 40,000 mu (about 26,666,667 m²) on a deteriorating piece of land within 30 years. Funded by the Lao Niu Foundation, the project, which receives professional technical guidance from The Nature Conservancy (TNC) and China Green Carbon Foundation, is implemented by Inner Mongolia Hesheng Eco-Afforestation Company.

Founding of the Company

Inner Mongolia Hesheng Eco-Afforestation Company (Hesheng Eco-Afforestation) was founded in 2008. It has four pillar businesses: eco-nursery-gardens, restoration of the eco-system and afforestation, eco-breeding and biomass energy development. The company is devoted to becoming “a pioneer company in restoring the eco-system

and an innovative company in building the eco-environment”.

In order to further improve its capacity in afforestation and building ecosystems, the company set up Hesheng Afforestation Research Institute in 2013 in order to conduct research on the plant industry, achieve innovations in the application of core techniques in afforestation in arid and semi-arid areas, and develop new techniques so as to make contributions to areas such as plant-nurturing, green-city building and the restoration of ecosystems.

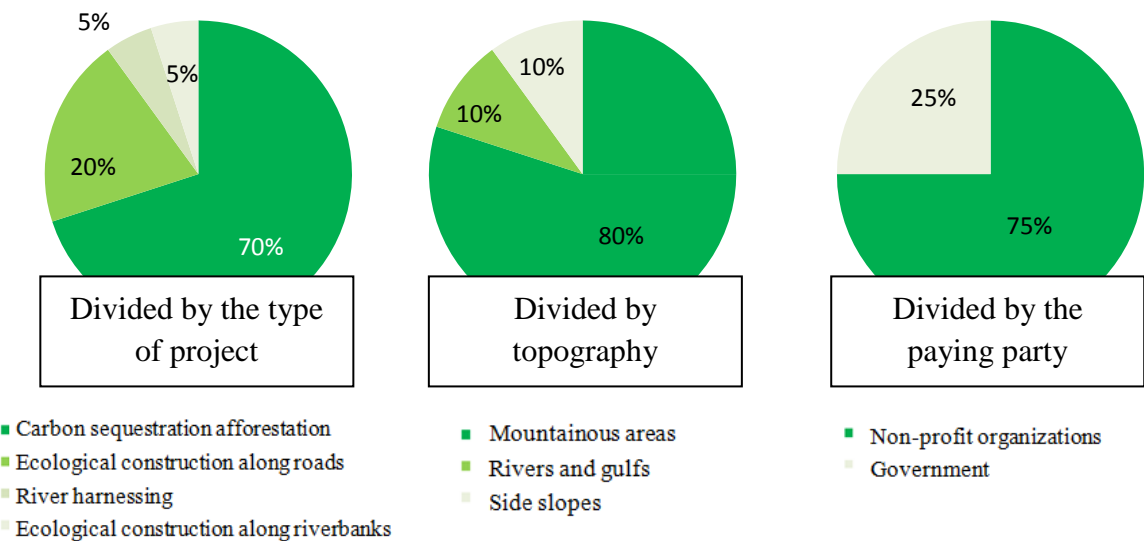
After six years of fast development, the company has now grown to a large scale, its income in 2013 exceeding 200 million yuan.

Introduction of Its Core Businesses

Hesheng Afforestation focuses on arid and semi-arid areas. On the basis of eco-afforestation, it is devoted to the protection and restoration of the ecosystem. By managing barren mountains, carbon sequestration afforestation and conducting consultations in related areas, the company has contributed a lot to the construction of the ecological shelter zone important to northern China.

Ecological restoration now accounts for around 65% of the company’s business. In the future, the number will stay above 50%. So far, the company has completed ecological restoration work on 350,005 mu (about 23,336,667 m²) of land and on-going restoration work covers 6,000 mu (about 4,000,000 m²).

The ecological restoration projects can be divided into the following types:



The ecological restoration projects receive staunch support from technical expert teams, including experts, talent and resources from the institutes of higher learning and scientific research institutes (like the Nature Conservancy, China Green Carbon

Foundation, University of Toronto, Canada, Beijing Forestry University, Inner Mongolia Forestry College etc.) as well as people working in the forestry industry who have rich experience.

Opportunities Facing the Company

Inner Mongolia is the second largest area in China that is facing desertification, and the demand is huge

The desertified land in Inner Mongolia is the second largest area in China, accounting for 24% of the total desertified area across the country. Within the province, there are five large deserts and five large desertified areas. According to the results of the 4th National Monitoring of Desertification released in 2011, there was a total of 617,700 square kilometres of desert in Inner Mongolia, accounting for 52% of the area in the autonomous region. Desertified land covers 414,700 square kilometres, accounting for 35% of the area in the autonomous region.

Favourable policies

In order to meet the requirements of “building shelterbelts in Northern China, Northeast China and Northwest China” and “building an important ecological safety shelter in Northern China” included in the “No. 8337 Development Plan” of Inner Mongolia, the company launched the project to build a 10,000 mu (about 6,666,667 m²) eco-nursery in 2011. Now, the company has built the largest seedling base of *pinus sylvestris* in Northern China and the largest nurturing base of high-quality arbors suitable for plants in the northern alpine region.

At the same time the *Kyoto Protocol* came into effect, and the *Bonn Agreement* and *Marrakech Accord* agreed to make afforestation the clean energy development project in the first commitment period. This means that developed countries can offset part of their greenhouse gas emissions through the carbon sequestration projects in developing countries. The project is of great significance to the development of the forestry industry.

The industry is in the initial stages and there are no direct competitors

Presently, there are about 430,000 eco-nursery companies that are scattered across China. The market share of the top ten eco-nursery companies is less than 1%, the overall management is relatively backwards, and investment in professional skills is insufficient. In addition, as the nursery of plants has special requirements for climate and other geological factors, the companies must deal with professional subjects. In terms of ecological restoration, there are different problems such as saline-alkaline soil, soil pollution, water management, desert management etc. All these make it more difficult for eco-nursery companies to expand their businesses in to other

regions.

How the Company Demonstrates Its Social Responsibility

Unlike other eco-nursery companies, Hesheng insists on its management concept of “ecological restoration first and business second”. It shoulders its social responsibility in terms of the following four aspects:

1. Focus on ecological restoration projects and allow government to consult and reproduce the company’s ecological restoration model

In recent years, Inner Mongolia has gradually launched many ecological restoration projects. Despite this fact, the situation is still very serious. We face the following two main problems:

- We lack a systematic and scientific plan that is “suitable for specific regions”. Inner Mongolia has a vast area of land and its ecosystem is complicated and diverse. One single restoration method cannot meet the real demands.
- Not enough attention has been paid to the economic value of the restored land and it is hard to maintain sustainability. Ecological restoration is a long-term process, the maintenance after the restoration should not be neglected. Due to a lack of economic return, the restored ecological systems still experience unreasonable interference. It is common to see the restored areas deteriorating after several years.

The “Inner Mongolia Shengle International Eco-System Prototype Project” Hesheng participated in solving these two major problems. The first was addressed by establishing a systematic and scientific ecological restoration plan with technical support, recognising key areas of ecological restoration and reserved areas, determining the goal of restoration and helping the ecological restoration work reach its largest capacity. The other was addressed by building a sustainable restoration model that aims to “promote economic development through ecological restoration and support of ecological restoration through economic development”. This model can also be copied in other regions.

2. When economic benefits conflict with environmental benefits, we make the latter one the priority

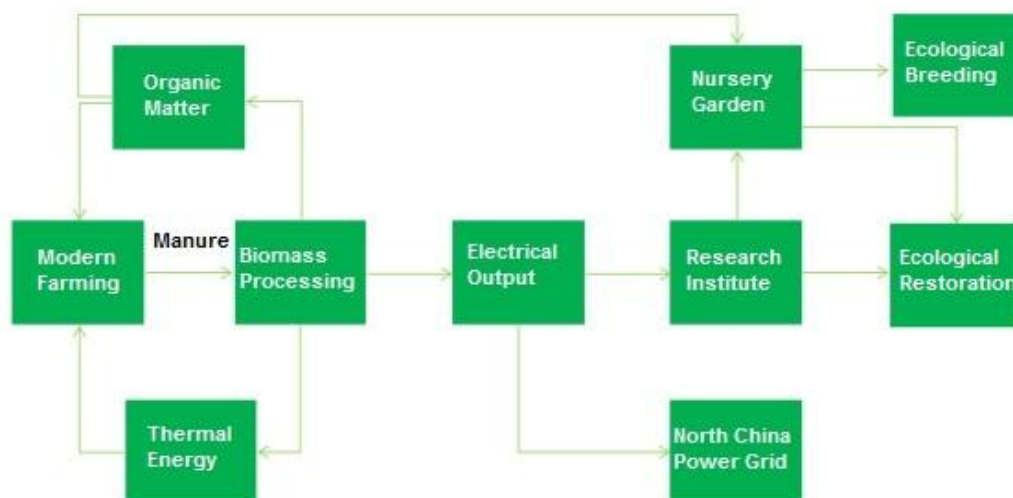
Hesheng Afforestation Research Institute was built according to the requirements of sustainable green buildings. It used highly efficient insulation technology, clean and renewable energy technology, indoor landscape and water environment design technology, garbage classification and recycling technology, a noise and dust reduction system, automated building control system and other low-carbon and

environment-friendly technologies. Because of this, the cost of the building is much higher than ordinary office buildings.

It is estimated that through effective energy conservation methods, the institute can save 308 tons of standard coal during one heating season. That is equal to reducing 719 tons of carbon dioxide emissions, which would need 38,600 2-meter-high trees to absorb it for one year.

3. We promote sustainable recycling models

The major businesses of Hesheng Afforestation are closely interconnected with each other, therefore it is possible to achieve a recycling economy (shown below). For example, the company is located near the Aoya Prototype Pasture of Mengniu Dairy. In order to avoid serious pollution of the environment caused by cow dung, our company imported advanced technologies and facilities from Germany and built the largest dung processing project for dairy farms in China. After biomass processing, the dung of more than 10,000 cows will become methane gas that can generate as much as 30,000 kWh of electricity per day and more than 9.6 million kWh per year. With such methods, we can reduce about 25,000 tons of carbon dioxide emissions in one year. The electricity generated will also sustain the daily operation of the Hesheng Institute, with most of the electricity generated being transmitted through the Northern China Grid. In addition, through natural fermentation of the manure mixture in the remains of the biogas tanks, we can get 50 tons of organic fertiliser and 500 tons of liquid organic fertiliser every day. Part of the finished product will be used to nurture the farms of Mengniu Dairy, the pastureland of farmers in the surrounding areas and planting bases of pastures. Some of it will also be used to nurture the ecological nurseries.



4. Economic benefits for local farmers through participation in the activities

related to afforestation and forests

Let's look at the example of the "Inner Mongolia Shengle International Eco-system Prototype Project". Agriculture and animal husbandry are the major sources of income in the region. Because of the low production force and backward production mode of the agriculture and animal husbandry sector, as well as the impact of natural disasters such as droughts and sandstorms, the agriculture and husbandry production output of this region is very low. According to research statistics, the average annual income in this community is about 3,200 yuan. In some villages, the average annual income is as low as 800 yuan. In the region, 74% of the people live under the national poverty line.

When we implemented the project, local communities and farmers participated in the management and operation activities related to afforestation and forests voluntarily. Altogether, more than 10,000 people have benefitted by joining in the work such as land preparation, nurturing seedlings, and planting, nurturing, managing and protecting trees.

- Job creation: The project can create more than 1.14 million temporary workdays. Local farmers and herdsmen can find jobs in their communities, which is conducive to social stability.
- Income increase: Compared with 2011, the average income increased by 34%. If we calculate by full workdays, every day every worker earns 150 yuan more. The work duration is generally around 3 months.
- Economy under the trees: In the future, the restored land will be handed over to the farmers. With the help of high-quality seedlings, farmers can enjoy economic benefits with the guidance of the company by selling high-quality eco-products.

Copying the Cooperation Model of Combining Companies with Non-Profit Organisations

The scale of public enterprises launched by huge public capital

From 2010 to 2013, the Lao Niu Foundation invested more than 170 million yuan into the "Inner Mongolia Shengle International Eco-system Prototype Project". This project was the first big project Hesheng Afforestation won, and provided vital funds in its initial stages.

Lao Niu Foundation's public spending on the environment successfully helped the launch of the public enterprise of Hesheng Afforestation. At the same time, this project put forward relatively higher requirements for the management and ideas of Hesheng. During the operation process Hesheng accumulated practical experience and improved its technical skills. With that experience, Hesheng Afforestation has since been able to carry out larger projects. It gradually attracted the attention of the

government and other enterprises. Therefore, to a certain extent, Lao Niu Foundation indirectly nurtured a public enterprise through launching project bidding, with very exciting results.

TNC provides professional technical guidance in vegetation restoration

TNC sent experts to provide guidance on the project. At the beginning, they conducted a lot of exploration and made overall plans. Their objective was to find a series of plans that could restore vegetation with the principle of planting trees and grass in suitable areas under the guidance of advanced scientific theory as well as practical experiments.

In order to further evaluate the effectiveness of the vegetation restoration in the afforestation area, the project introduced a long-term scientific monitoring mechanism. For example, by monitoring the increase in height of the plants, the increase of new branches, the growth direction of the new branches and the increase of plant coverage in the project area, we can compare the growth of different varieties of plants under different management methods and in different planting mixes. According to the monitoring results, *pinus sylvestris* and *caragana korshinskii* kom outperform the others in all the four above-mentioned indicators, and are therefore the most suitable plants for afforestation. In addition, shrubs grow better if they are planted together with arbors. All the monitoring results are consistent with the designed afforestation expectations, which further proves the scientific nature of this project in ecological restoration. TNC's professional strength gives staunch support to the success of the project.

We use a strict indicator system to monitor the project and the seedling survival rate is very high

Lao Niu Foundation made it clear in the bidding that it needs a high-standard carbon sequestration project and it had a high requirement for the survival of the seedlings. After winning the bid, Hesheng Afforestation implemented the indicator system required in the strictest sense.

Lao Niu Foundation cares a lot about the Shengle International Eco-system Prototype Project, consulting frequently with Hesheng Afforestation in order to keep informed of the project's progress. The experts of TNC also came to the project areas and gave their advice. It was under the coordination of the three parties that the large-scale ecological restoration project was carried out in an orderly way with high-quality results. Compared with the seedling survival rates of other ordinary vegetation restoration projects which were between 30% and 40%, the seedling survival rate of Hesheng Afforestation reached around 85%.

The patience of the capital made the project focus on long-term effects

There is a Chinese saying that states, “In order to make a newly-planted tree survive, 30% of the effort is in the planting process, while the remaining 70% is about the maintenance and nurturing of that plant.” However, nurturing and maintenance always costs a lot. Most of the planting projects are not responsible for the long maintenance period. For example, generally the maintenance period of government projects is no longer than three years. The environmental protection organisations responsible for the tree-planting network projects in Tongliao just withdrew after finishing the tree planting process.

In comparison, Lao Niu Foundation has a maintenance period of 30 years. The patience of the foundation has also influenced public enterprises such as Hesheng and helps them realise that the long-term goal is more valuable than short-term interests.

Future Influence Expansion

After six years of development, Hesheng Afforestation has formed a chain of “designs, plans, implementation and maintenance”. It is more professional in terms of skills and management, which was reflected in the ecological construction in Horinger County. In the future, Hesheng Afforestation will expand its business in Inner Mongolia and also arid and semi-arid areas outside of Inner Mongolia.

In the future business expansion, the following three models will take precedence.

1. Government-guided:

Government plays a leading role in ecological management. The central government and local governments are gradually launching ecological management projects in key areas. For example, the government is building a national-level ecological safety shelter comprehensive test zone in Gansu Province. Hesheng Afforestation can participate in this national ecological restoration project with its rich experience.

2. Foundation-guided:

We can continue with the foundation-guided model in the “Inner Mongolia Shengle International Eco-system Prototype Project”. Hesheng Afforestation can work with the Laoniu Foundation and other foundations to copy the ecological restoration model in other regions of Inner Mongolia.

3. Company-guided:

China has already required coal and mining enterprises to enhance their efforts in ecological restoration. They should follow the principles of “developing while conserving the ecosystem, conserving the ecosystem through development, being responsible for conservation when developing and being responsible for the restoration if damage is caused”. Therefore, coal and mining enterprises will become potential paying parties in the future ecological restoration projects.

Conclusion:

As one of the public enterprises in the environmental field, Hesheng Afforestation inspired us in three important ways with its fast development in just six years:

- Public (patience) capital plays a key role in the development of public enterprises.
- In the environmental field, government is an important factor in helping the public enterprises in their latter development period.
- In order to work on a large scale, we need to grasp the market opportunities, recognise our positions correctly and be equipped with strong capabilities (talent and technology)