

Agro-Environment: Desertification

The Effect of Agricultural Management Policies on Tackling Desertification in China



Introduction

Desertification is a severe environmental problem in North and central of China, because of a complex interplay of environmental and land-management factors (1). The deserts and desertified land of China over 1.74 million square kilometre, 18% of the total land area including 30 provinces, cities and autonomous regions (2).

Causes are divided into direct and indirect factors.

•Direct factors:

- I. Unsustainable land consumption;
- II. Inappropriate land and water use;
- III. Climate change.

•Indirect factors:

- I. Population growth;
- II. Economic policy and legislative conditions;
- III. Socio-political framework conditions;
- IV. Science and technology.

Adverse social consequences reflecting the failure of effective environmental protection, as there are health problems, mass migration and resettlements; contribute to the dissatisfaction of local people.

Historical Environmental Laws

China's environmental law evolved and developed over three periods since 1949.

• 1949-1976, destruction by ignorance environment policy.

During the period of the "Cultural Revolution" and Mao's "Great Leap Forward" policy, there is rarely any progress achieved.

• 1972-1990, turning point.

China signed the United Nations Stockholm Declaration in 1972. The State's responsibility for the protection of the environment was firstly added to the constitution in 1978 by Deng. At the same year, Chinese government launched "Three Norths Shelter-Belt Project". In 1979, the first environmental law "the Environmental Protection Law" (EPL) was introduced. After that, during 1980-1990, China has issued a variety of laws on marine, water pollution, forest, grassland, and air control laws, etc.

• 1990-now, further improve and implementation.

Current Institutional Framework

In China's institutional framework, the National People's Congress (NPC) and the State Council are the highest body of legal system which are centralized power from setting new laws. The Commission for the Protection of Environmental and Natural Resources (ENRPC) coordinates environmental protection work under the State Council, and develops environment-related policies and guidelines. The State Environment Protection Administration (SEPA) is one of the administration of NPC. The Ministries of Agriculture, Energy, Forestry and Water Resources link between NAP and local implementations. Local people's congresses and respective standing committees provide in accordance with superior legislation and regulations. Environmental Protection Law (EPL), at local level, represents the decentralized power structure from provincial level down to the levels of cities, counties and townships.



Three Norths Shelter-Belt Project Implementation

One of the most important implementation programs under China NAP is the Three Norths shelter-belt programme, also known as the Great Green Wall, which is probably the largest project worldwide (3). It is a series of human-planted forest strips around 2,800 miles (4,500 km) long in Northwest, Northeast, and North central regions. It is designed to hold back the expansion of the Gobi Desert (6). China's environmental legal framework is started from early 1970s after the country's attendance at the Stockholm Conference on Human Environment (5). After that, since 1978, the Chinese government decided to promote forestry by providing the Ministry of Forestry with the mandate, among other things, to oversee timber production in state-owned forests and afforestation across the country. Due to master planning, the Ministry functioned via administrative linkage with forestry departments at the provincial level, forestry bureaus at the county level, and work stations at the grass-roots level of townships. Meanwhile, the Chinese Academy of Forestry, which came into being in 1958, was strengthened, and several forestry colleges were expanded under the auspices of the Ministry (7). The Three Norths Project started at November 1978 under the China National Action Plan (NAP) No. 244 for reconstruction conventional forest on project regions signed by the State Council, and it will end at 2050. The whole project is divided into 3 phases, 8 stages according to the documents. The purpose of this project is to rise up forest coverage from 5.05% to 14.95% by growing 53.4 km² trees on eight main deserts, four main sand-lands, and their peripheral regions (8).

Discussion

In the project area, 30.6 million ha of afforestation is planned, at a cost of ¥4 billion (around half billion euro). From 1978 to 2003, 23.5 million ha of grassland was planted with trees. Average annual precipitation increased and evapotranspiration decreased in response to warming of the climate of the Three Norths region from 1952 to 2005, 29.1% of China's area was converted into forest by afforestation (Figure 1). The deserts in China have expanded to cover an additional 1560 km²/yr from 1950 to 1975, and 3600 km²/yr after 1998 (9). Accompanying this desertification, sandstorms have increased in frequency and intensity in recent years. China's implementation of large-scale afforestation throughout the country's arid and semiarid regions has ignored differences in topography, climate and hydrology, all of which can affect tree survival. The overall survival rate of trees planted during afforestation projects has been only 15% in the region.

The reasons are as follows:

•Inefficient use of investment;

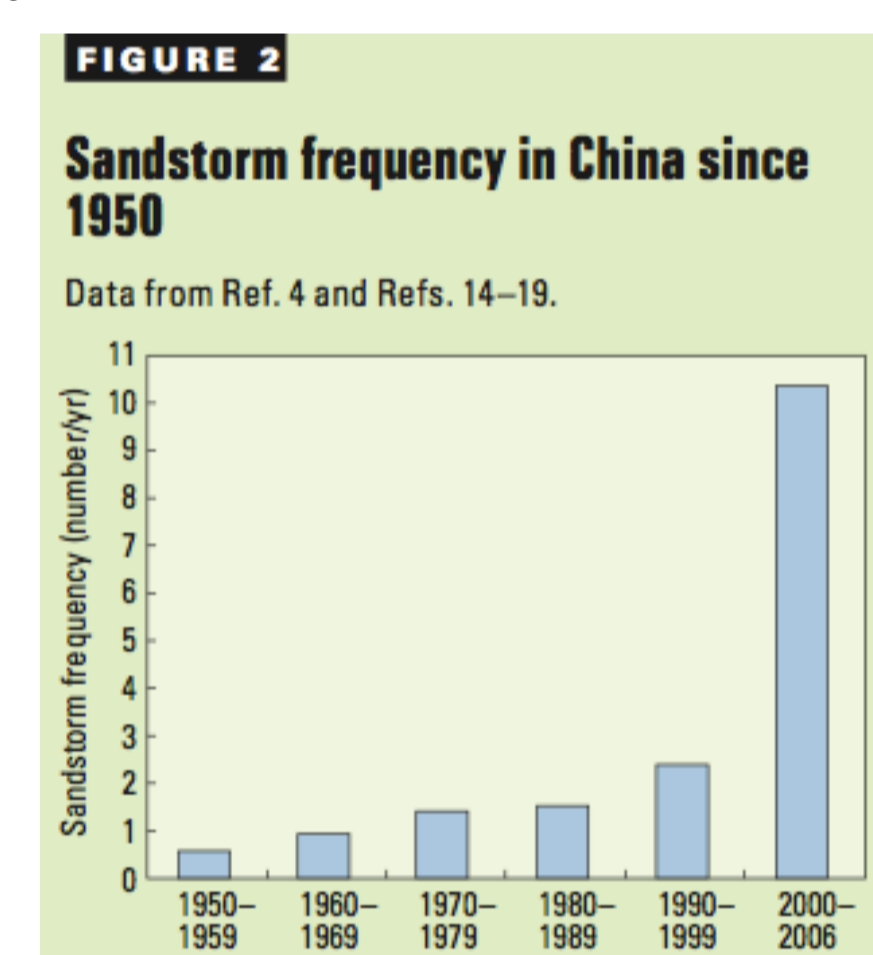
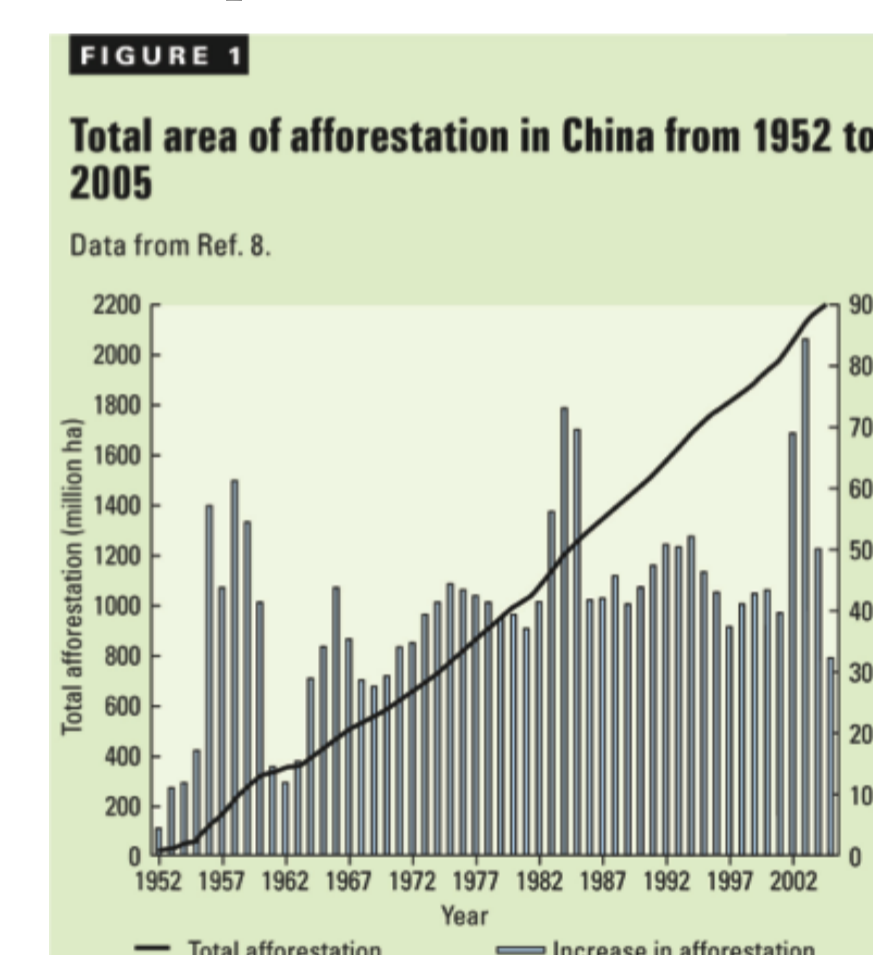
From the data above, although Chinese government invests a great amount of money, it seems receive little positive reflections from implementation. Too much money was put in initial afforestation stage rather than improvement strategies for controlling survival rate of trees.

•Farmers lack of knowledge and technical training;

Between top-down policy and bottom-up implementation strategies, there is rarely roles for training not only farmers, but also local policy managers, to understand what kind of trees should they grow, how to grow in a more sustainable way, and why.

•Local people have little awareness.

Not all of the farmers in the project area obey the regulations of convention plantations. In contrast, local people are still farming intensively or feeding livestock in overgrazed area. Some people complain that there is no one really cares about farmer's benefits.



Conclusions

In conclusion, China is one of the most serious influenced countries by desertification, and she has long history of combating with sand. Since 1978, China published a serious of laws and regulations, as well as three norths shelter-belt project from national level to local level to restore ecological system. Multilevel governance and large range of public are involved. Government as the decision-maker and financial supporter invest huge amount of money on convert the situation. However, the effectiveness of tackling desertification is quite low caused by their inappropriate and unsustainable environmental approach. It is obviously simplified policy approach cannot satisfied the complexity natural system requirements. They should take those advices below into account to make the land management more sustainable:

• More resilient afforestation method on vegetation cover at less cost, and stakeholders (different level governments, municipalities, research institutions, individuals and farmers) should be involved.

• Collaborative governance and cooperations between stakeholders should with an approach which is more bottom-up, especially on training knowledge and arising public awareness, rather then the current top-down approach.

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China institutional Framework Diagram

