

## LAND CONSERVATION CAMPAIGN, INTEGRATED MANAGEMENT AND LOCAL PARTICIPATION IN CHINA

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### **Abstract**

In an effort to halt the soil erosion, desertification and sandstorms, the Chinese government has recently launched a series of land conservation programs with focuses on the country's north, northwest and southwest areas where the problems are severe. This paper provides an overview of the current status of the major land conservation projects and their environmental and social-economic significance, as well as challenges encountered. Conflicts of interests and objectives among different entities involved are elaborated. Impacts on grain production and implications for the food economy are discussed in light of the options for meeting the increasing food demand. The analysis highlights the importance of improving cooperation and integration across different administrations and at different levels of governments, and a participation of local communities in the planning and management for achieving the goals of land conservation campaign and the hinterland development. The necessity and mechanism for internalizing the environmental externality of land degradation are also addressed.

Additional Keywords: soil erosion, desertification, sandstorms

### **Introduction**

It is estimated that desert area and the area affected by desertification cover one third of the territory of China. Every year, deserts eat up 2460 km<sup>2</sup> of land in the north (Fan and Zhou, 2001). Inappropriate human activities have been widely recognised to be an important and direct cause of the problem. Relentless land reclamation, deforestation and overgrazing have led to continued losses of vegetative cover and topsoil. The denuded land smoothes the way for wind to blow, intensifying sandstorms not only in the areas where the sand originates but also in the eastern part of the country and beyond. In south western China, particularly the upper reach of the Yangtze River, soil erosion and deforestation have caused serious land degradation. The build-up of sediment in streams and rivers leads to rises in riverbeds. This, together with the continuous encroachment of agriculture to lakes and wetlands along rivers, was largely responsible for the 1998 Yangtze River floods.

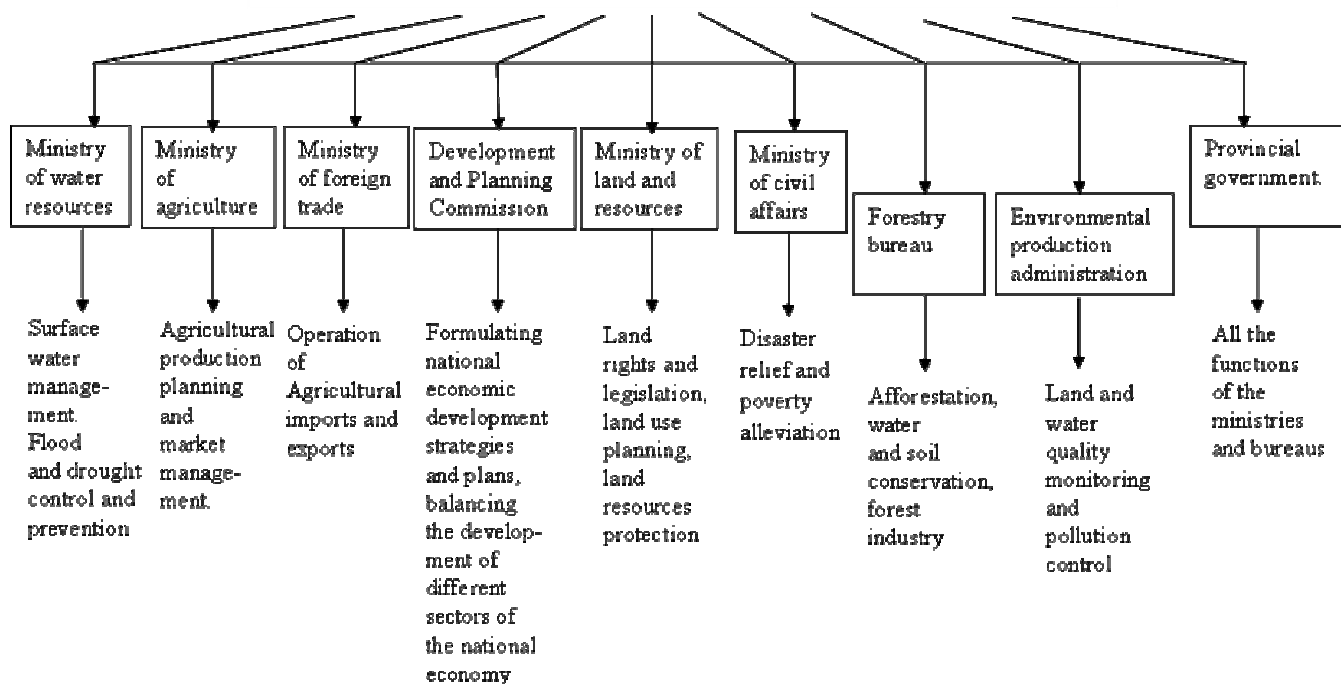
Faced with the severe environmental degradation and tremendous social and economic cost, Chinese leaders seem to have learned the lesson that the marginal gains of land reclamation and logging can not cover the losses caused by floods and sandstorms. Heightened public awareness of environment problems and the concern about the international image of Beijing have also urged the government to take more aggressive actions. To combat the environmental degradation, a series of land conservation projects have been launched in recent years. Consolidation of the 'three-north forest shelter belt' is one of them. Other key projects include creating a natural forest protection network in the upper reach of the Yangtze River and upper and middle reaches of the Yellow River, returning farmlands to forests and grasslands (*tuigeng huanlin*) in the areas approximately the same as the forest protection project, and building a sand prevention ecological circle surrounding Beijing and Tianjin (*huan Beijing-Tianjin fangsha zhisha shengtaiquan*). The government vowed to halt the aggravation of the problems and to rehabilitate and restore the ecosystem within the coming 10 to 15 years (Yao, 2001). The land conservation campaign seems to mark a change in the paradigm of economic growth in China.

There are, however, many challenges faced by China in its land conservation campaign. Among them, the most critical are those related to the institutions governing the land resources, local communities concerned and options for meeting the country's growing food demand. This study aims to address the major challenges in China's land conservation campaign and provide some insights into the formulation of policies to deal with them.

### **The Governance Segmentation of Land Resources**

China's land resources management system involves many administrations with each of them having rather different interests. The segmentation and sometimes conflicts in the management often present constraints to the effective implementation of land conservation programs. Figure 1 shows the administrative entities involved and their major roles in the system.

## Governance of Land Resources and Conservation



**Figure 1. Land administrative entities and their responsibilities**

The Ministry of Land and Resources is responsible for the administration, investigation and development of land resources, the legal basis for land ownership and land use rights, land use planning and agricultural land protection. It also has the mandate of giving approval to land uses for non-agricultural purposes, typically urban residential and industrial buildings, roads and high ways. The ministry consists of a vertical hierarchy with subordinate bureaus and offices at the provincial, county and township levels.

The State Forestry Bureau has a similar vertical hierarchy as the Ministry of Land and Resources at all levels of administration. The bureau was formerly the Ministry of Forestry before the restructuring of the state council in 1998. Until the mid-1990s, it was mainly in charge of the management of state logging companies. With the increasing emphasis on environmental protection, as well as the exhaustion of many forests, its mandate has gradually shifted to protecting forest resources, managing afforestation and environmental conservation activities. The conservation projects specified previously are all commissioned by the State Forestry Bureau.

Apart from the Ministry of Land and Resources and the State Forestry Bureau, many other ministries and bureaus are also involved directly and/or indirectly in the land conservation programs. The Ministry of Agriculture is responsible for stipulating crop-sown area plans and production targets and setting prices for agricultural produce. The Ministry of Water Resources has the mandate for water conservation, prevention of erosion, urban water and rural irrigation management. The Ministry of Foreign Trade operates import and export activities according to the plans made by the State Development Planning Commission who is also in charge of grain procurement, storage and distribution through its Grain Department. Environmental Protection Administration is responsible for environmental protection and monitoring. Provinces, which have a high degree of autonomy, are entrusted with the mandate of governing all aspects of social and economic affairs in their jurisdictions through subordinate branches and offices of ministries and bureaus at the provincial level and below. Under this administrative setting, subordinate branches and offices are accountable to both the ministries and bureaus to which they belong and the government of provinces where they locate.

The Ministries involved all work within their own hierarchical frameworks. There is no direct administrative link between them. Given the different responsibilities of individual administrative entities, their interests and objectives often vary. It is inevitable that a policy formulated by one administration could be contradictory to the objectives of another administration.

### **Lack of Local Participation in the Management of Land Conservation Programs**

Official sources have claimed that farmers whose land is affected generally welcome the land conservation campaign (State Forest Bureau, 2002). A field survey by the author in Huailai, Fengning and Zhangbei counties to the north of Beijing supported this claim in principle. However, it must be pointed out that farmers' acceptance of the land conservation programs is largely backed by the fact that the amount of grain compensation is more or less adequate to cover the loss of grain on the returned land where the yield is often low. The land conservation campaign itself is rather the resolution of the central government facing the tremendous social and economic losses caused by environmental degradation and the increasing pressure from the public. Local governments and farmers where the programs are implemented have generally been excluded from the planning and management process. This situation reflects the legacy of the planned economy in which top-down command and coercion are typical ways in mobilizing grassroots (Xu and Cao, 2001).

The field survey conducted in the three counties found that with the exclusion of locals in planning and management process, farmers whose land and production are affected participate in the land conservation programs for no other reason than to receive food and/or cash. They passively follow the instructions from external forces and are not motivated to develop locally suitable land conservation methods. The material incentives, therefore, could have given a misleading impression that local people are supportive of the externally driven initiatives. The absence of the locals in the land conservation planning and management has led to many problems arising and being left unattended. The following are some of the major problems existing in the areas where the field survey was conducted:

- (1) Agricultural related activities decreased and labor surplus (unemployment/underemployment) increased. Many farmers are idle at home not knowing what else they can do;
- (2) The production intensity on the remaining agricultural land and non-timber forests increased. There is a high risk of increasing non-point pollution due to the increased use of chemical fertilizers and pesticides in pursuing higher yields on the remaining land;
- (3) Farmers prefer to plant economic and commercially valuable trees but the government requires them to plant trees of high ecological benefits. There is a conflict between the government objectives and farmers' interests;
- (4) The compensation period is too short to allow farmers to gain benefits from the trees they plant and to shift to other activities. There is a general worry about the sources of income beyond the compensation period;
- (5) Local land management institutions, especially at the township and village levels, are not adequately empowered to respond to the changes associated with the land conservation programs. The role of local land management agents is mainly to implement the land conservation plans made by the higher level of authorities. There is little link between national land conservation objectives and the locally suitable land management measures derived from the knowledge and wisdom of locals.

The problems found in the survey areas are not unique but common in the land conservation programs as suggested in the literature. However, they by no means cover all the problems encountered in other areas. Many studies have shown that the problems arising in different areas are closely associated with site-specific conditions concerning socio-economy, natural environment, tradition and culture (Xu and Cao, 2001; Lin *et al.*, 2003). The exclusion of locals often makes the policies stipulated by outsiders unsuitable for solving local land degradation problems. Although the situation has drawn some attention among policymakers lately and some pilot projects addressing local problems have been put on trial, the involvement of locals in land conservation programs overall is far lacking. Given China's political system and the legacy of the planned economy, an adequate local participation in decision making may not happen any time soon.

### **Environmental Externality and Rural Development**

In China, for a long time during the history of the People's Republic, land use rights were not clearly defined and farmers had no written contract stating the terms of and rights to the land they used. Although the land administration law enacted in 1998 issued a 30-year use term for rural land, readjusting landholdings based on demographic changes remains widely practiced and poses threat to farmers' land tenure security. This has partly been responsible for the continued malpractice in the use of land resources. Farmers have little incentive to make long-term investment on their land because there is no guarantee that they will retain all the benefits from the investment. They are also not accountable for the negative effect of land degradation due to the absence of their responsibilities. This reduces their effort in land conservation on the one hand and weakens the awareness of the consequences of land degradation on the other. The provision of the compensation in the current land conservation programs may reduce the degradation on the targeted areas. It will not stop the unsustainable practices on the

remaining land. Solely relying on the infusion of funds from the central government to halt land degradation, therefore, is not viable. It is important to establish a land tenure system in which land rights and responsibilities are clearly defined and enforced, and land owners have the incentive to protect their land.

Defining land rights lays the foundation for implementing land conservation measures. However, it may not be sufficient to halt land degradation. As long as the return from reclaiming land, overgrazing and deforestation is greater than that from the land conservation, which is often likely in the short run, farmers may continue the unsustainable practices. Poverty can only reinforce such practices. For this reason, direct government intervention is necessary. There are many ways by which the government can exercise its power to influence land use decisions. For example, the government may tax farmers for the unsustainable use of land. These taxes can be used for land conservation and other environmental projects. Also, the government can subsidize certain land uses that are environmentally sustainable. Whatever measures the government may use, one thing that can be sure: without internalizing the externality of land degradation, land conservation programs will be costly, ineffective and unlikely to sustain.

### Food Supply Options and Their Environmental and Socio-economic Implications

Despite the efforts that China has made in tackling soil erosion and land degradation since the 1970s, the problems have continued and even worsened in many areas. The failure to reconcile the conflicts between increased food demand and land protection has been partly responsible. The 'grain first' policy and the pursuit of food self-sufficiency have often meant compromising the environment by converting forests and grasslands into farmland.

It must be pointed out that the redoubled effort in land conservation in recent years has been backed largely by the abundant domestic food supply. China has accumulated huge stockpiles of grain after several consecutive bumper harvests since 1996 (Yang and Zehnder, 2001). The 'grain for green project' helps to reduce the stockpiles. Meanwhile, the provision of grain also bears objectives of facilitating structural adjustment in agriculture and poverty alleviation in the western and northern provinces (Zhu, 2002). However, without a long-term strategy for meeting a growing demand for food in both the project targeted areas and the rest of the country, compromising the environment for food production may resume when the market supply turns tight. Given China's limited land and water resources, meeting the increasing food demand will be a daunting task. There are a number of options that China may take. Figure 4 shows these options and their socio-economic and environmental implications.

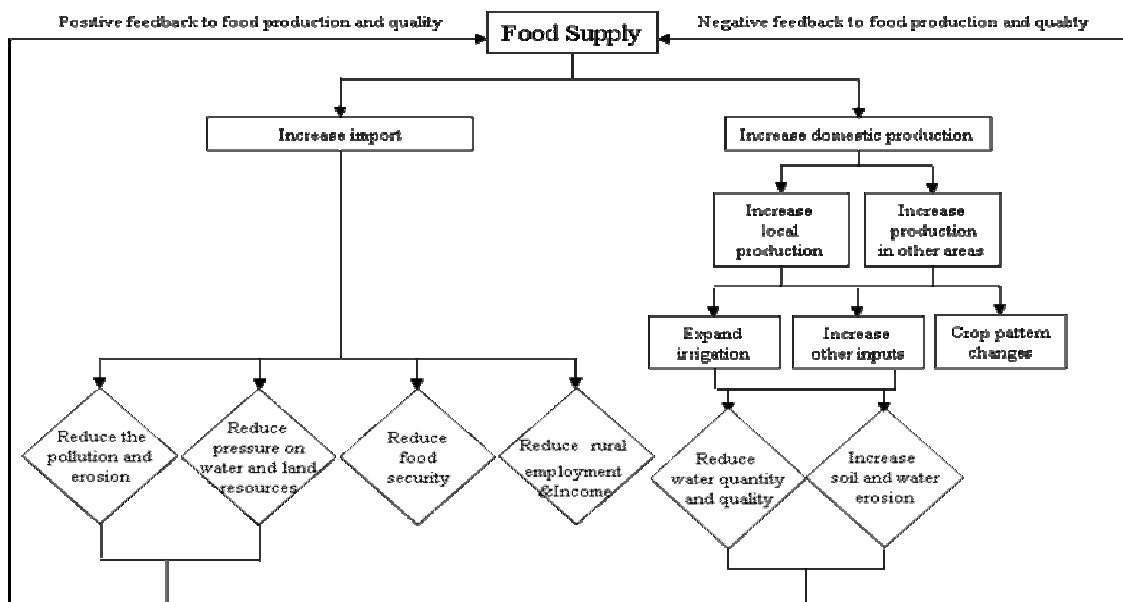


Figure 2. Options for increasing grain supply and their implications

Many studies have shown that China has a potential to raise production by increasing output per unit area. Most of the land with high yield potential, however, is in the southeastern and coastal areas (Fischer and Sun, 2001). Since the 1980s, the loss of agricultural land in these areas has been substantial. It is unlikely that this trend will be halted

in the near future (Skinner *et al.*, 2001). Meanwhile, the low and sometimes even negative profits of grain production have led to a continuous shift of land from grain crops to vegetables, fruits and other non-cereal products, further squeezing grain production (Yang, 1999).

Multiple cropping has been one of the means of expanding sown areas. Before the 1980s when grain self-sufficiency was the paramount priority for the national security, the multiple cropping index increased alongside the expansion of irrigation. During the past 20 years, however, the multiple cropping index in the southeastern regions has seen a decline in response to the rising opportunity costs of grain production. Double cropped-rice dropped from 12.1 million hectares in 1978 to 7.8 million hectares in 1999. In some northern areas, notably Beijing and Tianjin, the multiple cropping index has declined due to the aggravation of water scarcity and the reduction in irrigated areas (Yang and Zehnder, 2001).

The application of chemical fertilizers has contributed greatly to the remarkable growth in grain production during the past two decades, particularly in the 1980s. However, there has been a diminishing return to fertilizer inputs in the later years (Yang, 1999). Meanwhile, non-point pollution caused by chemical fertilizers and pesticides has become a serious environmental hazard in the eastern and central regions. Many scientists have voiced concerns that the intensification of farming systems may not be sustainable because of systematic degradation of the resource base and environment (Huang *et al.*, 2002).

The above analysis suggests that relying on intensifying grain production to meet the increasing demand is neither environmentally sustainable nor economically viable. This gives rise to the consideration of importing grain from the international market. Such a consideration is also pushed by China's accession to the World Trade Organization. An increase in grain import is likely in the coming years as China is obliged to reduce its agricultural subsidies and import tariffs. Whether or not the Chinese government will opt for import to meet the increasing food demand remains a question. Concerns about rural employment, farmers' income, food security, political independence and social stability, common arguments against food import in many countries, will continue to deter the Chinese government to give up the food self-sufficiency ideology. If not, however, the goal of the current land conservation campaign may not be attainable as suggested by the past experience.

## **Conclusions**

China's effort in land conservation has been remarkable, given the country is still at a relatively early and rapidly growing stage of economic development and has to deal with very heavy population pressure. Its impacts and repercussions are far beyond the mitigation of sandstorms, desertification and soil erosion. The campaign raised a series of questions regarding institutions, environmental protection, food security and rural development in China. It presented a fresh case study to the literature on the multiple challenges in designing, implementing and maintaining sustainable land resources management.

Investment, though necessary, is not sufficient to solve the problem of land degradation. A successful land conservation program requires an institution in which land resources are governed in an integrated manner and all stakeholders are engaged in the planning and management process. Such an institution is far from established in China. The vertical hierarchy of different administrative bodies and the lack of horizontal interaction and cooperation among them weaken the effectiveness of land conservation effort. The exclusion of locals in the planning and management undermines the sustainability of land conservation programs. Solely relying on the provision of compensation to farmers to ensure the compliance is not economically viable in the long-run. The unsecured land tenure and unclearly defined responsibility allow continuous degradation of land outside the program-targeted areas without penalty. The failure to internalize the externality of land degradation prolongs malpractices in land use.

Sustaining the land conservation campaign amid the persistent increase in food demand presents a daunting challenge to China. Further intensifying agricultural production by raising material inputs, particularly chemical fertilizers and pesticides, on the remaining land is not a viable way to meet the growing demand. More emphasis has to be paid to production systems that not only strive for a high production but for maintaining environmental quality. On top of this, food import is expected to play an increasing role in China's food supply despite the controversies it involves.

There are multiple constraints that make solutions to the multi-dimensional land conservation goals difficult to achieve. This study addressed the importance of integrated management, local participation and a long-term food supply strategy for an effective and sustainable land conservation campaign. Many relevant issues raised in this paper, however, remain to be elaborated by further studies. For example, how should the current institutional setting be reformed to enable an integrated land management? How much does the government need to pursue its land conservation goals given the large areas of the country susceptible to land degradation? How can the locals be involved in the planning and management of land conservation? Who should bear the burden of financing the direct and indirect costs of implementing the land conservation programs? Needless to say, the answers to these questions will have profound impacts on the fate of the land conservation programs in China.

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