

# Chapter 1

## Introduction

### 1.1 Land Resources and Land Use

China has a land area of 9.6 million sq.km., the composition of which is shown in Table 1.1. Currently usable land

accounts for 80.2 per cent of the total land area, i.e., 7.7 million sq.km. The population of China exceeds 1.2 billion, giving an average population density of 156 persons per sq.km.

**Table 1.1: Composition of China's Land Resources**

Type of land resource	Area ('000 km <sup>2</sup> )	Percentage of total
Total	9600	100.0
Cropland*	1267	13.2
Economic forest land	34	0.3
General forest land	1214	12.6
Natural grassland	2856	29.8
Sparse wood and shrub land	447	4.7
Wasteland suitable for afforestation	779	8.1
Sand desert and Gobi (rock desert)	1160	12.1
Slightly rocky mountains	430	4.5
Tundra	150	1.6
Permanent snow alpine area	50	0.5
Marshland	110	1.1
Coastal beach	13	0.1
Inland waters	270	2.8
Urban, industrial and transportation land	670	7.0
Others	150	1.6

\* About 67,000 sq.km. within the cropland area are unsuitable for cultivation and should be returned to forest or grassland.

Sources: Institute of Geography (1983); Wang Xianjin (1988)

The large population is in the process of urbanisation, and economic development is rapid. The amount of many land types is insufficient for needs. Conflicts between construction land, cropland, woodland, and pasture, and productive activities, environmental protection, and conservation of biological diversity are conspicuous.

Arable land accounts for 13.2 per cent of the total land area, i.e., 126.7 million ha, which is 0.105 ha per capita. In the period 1957-86, construction, desertification, and soil erosion reduced cropland by 40.7 million ha. In the same period, 25.1 million ha of wasteland were reclaimed. The net result was a decrease of 15.6 million ha of cropland, or an average of 538,000 ha per year. If this decline continues, croplands will decrease by 7.5 million ha to 119.2 million ha by 2000 when the population will reach 1.26 billion. Cropland will then average 0.094 ha per capita. In fact, the trend may be more pronounced because undeveloped arable land has been almost exhausted, and rarely is it possible to reduce growth of construction land and natural destruction of cropland.

There are not enough macro measures for adjustment and controlled land use. In particular, laws, regulations, and policies for land-use adjustment do not take into account needs brought about by economic reform and market development. In addition, land management at the micro-level is not faultless. Inevitably this leads to land degradation.

## 1.2 Land Degradation

In China, degraded lands are widespread. Economic loss caused by ecological deterioration and land degradation is great, directly influencing sustainable

development of the society, economy and environment. Land degradation falls mainly into the following categories.

- Desertification

Desert and deserted land area amount to 153.3 million ha, 15.9 per cent of the total land area. The direct economic loss caused by wind erosion and desertification amounts to 4.5 billion yuan<sup>1</sup> per year. Deserted land has increased by more than 100,000 sq.km. since 1949. Cultivated land area influenced by desertification amounts to 10 million ha, accounting for 7.9 per cent of total cultivated land.

- Soil erosion

Soil erosion has either destroyed or seriously impaired about 1.63 million sq.km., 17 per cent of the total land area, compared with 1.16 million sq.km. at the beginning of the 1950s. Eroded cropland amounts to 44.5 million ha, 35.1 per cent of total cultivated land. In the Loess Plateau, the cradle of ancient Chinese civilisation, soil erosion affects 43 million ha, about 82 per cent of its total area. The flow of topsoil into the Yellow River has been vividly called a 'massive haemorrhage of the main artery of China'. The area of 'inferior land' and 'red desert' caused by serious soil erosion in mountain and hilly areas in southern China has increased by more than 38 per cent since the 1950s. 'Rock-desertification' owing to soil erosion in the karst mountainous and hilly areas of south-western China is especially shocking.

### Salinisation and glaciation

The area of salinised cropland covers about 6.67 million ha in northern China. Salinisation, mainly scattered in arid and semi-arid regions, results from poor soil

1 There is 8.25 yuan to US \$.

drainage and improper irrigation practices such as excessive irrigation, flood irrigation, and irrigation without drainage. In coastal areas of eastern China, it is mainly caused by seawater flowing backwards. In addition, soil glaciation is serious in southern China, affecting 20–40 per cent of paddy fields.

- Land pollution

The emission of waste water, waste gas and waste residue in urban and industrial zones, and the increasing application of chemical fertilisers and pesticides has seriously increased land pollution. Polluted cropland amounts to 10 million ha, of which 3.33 million ha is polluted by sewage irrigation, 5.33 million ha by atmospheric pollution such as acid rain and fluorine pollution, and 0.9 million ha by solid wastes and garbage. The annual loss of grain caused by cropland pollution amounts to approximately 12 million tonnes.

- Mined land

In the process of exploiting mineral resources, topsoil is destroyed by stripping, sinking, and piling up waste ores and slag. It is estimated that mined land covers 13.33 million ha. Coal mining has caused the most serious damage. About 13,000 ha of land is destroyed each year, and usually it is land in the plains with high capability.

- Declining land capability

Lack of manure application on cultivated land has caused a decline in organic content of soil. The components of chemical fertiliser have led to an imbalance in nitrogen, phosphorus, and potassium. Now, average organic content of soil is one to two per cent and less than 0.6 per cent in nine per cent of cultivated land. Fifty-nine per cent of cultivated land

is deficient in phosphorus, 23 per cent is deficient in potassium, and 14 per cent is deficient in both phosphorus and potassium. Application of vast amounts of chemical fertiliser has resulted in soil that is hardened and impervious to water and has caused a reduction in land capability.

Among the above types of land degradation, land desertification and soil erosion are the most widespread and have the greatest influence. Both occur in impoverished regions. It is stated in *China's Agenda 21: The White Book on Population, Environment and Development of China in the 21<sup>st</sup> Century* (SPC and SSTC 1994) that there are two regions of extreme poverty. One is the 'Three Wests' (Hexi West, Dingxi West, and West Hai-gu) in the arid region of the Loess Plateau, and the other is the karst region of Yunnan, Guangxi, and Guizhou provinces. The former is seriously threatened by desertification, and the latter by rock-desertification.

### 1.3 Strategies for Sustainable Land Use

Huge population pressure and land-resource shortage and degradation present an enormous challenge to China. Sustainable development strategies for land-resource use have been established in *China's Agenda 21* (SPC and SSTC 1994) which represents the views and long-term policy of central government.

One approach is to improve the legal system of land administration and policy so as to protect arable land and promote sustainable use of land resources. It includes the following.

- A new law on land administration has been devised and was promulgated in 1998. It pays more attention than was formerly the case to land-use control and conservation of farmland.

- Reform of land-resource use is being accelerated. In order to ensure rational use and reasonable allocation of land resources, close attention will be paid to land-use planning.
- Conservation areas of fundamental farmland are being established to protect cropland from construction. More than 80 per cent of total farmland is classified as conservation areas of fundamental farmland.
- Information systems on land-resource management will be established and a detailed census of land resources will be carried out at certain intervals.

Another important approach is to rehabilitate degraded land and improve the quality of land resources. It includes the following.

- Improvement of soil fertility, expansion of the irrigated farmland area, and prevention of soil pollution, especially cropland pollution.
- Plantation of trees and conservation of forest resources.
- Promotion of monitoring, preventive measures and management of soil erosion, and major efforts at soil conservation.
- Further advancement of the prevention and management of desertification and degradation of land.
- Major efforts to develop eco-farming practices.
- Strengthening conservation of wetland.

#### **1.4 Land Policy and Its Relevance to Land Degradation**

China has undertaken profound reforms in recent decades. Policies have changed fundamentally and this kind of change has obvious impacts on the economy, society, and environment. In land use,

management, and administration regimes, laws and policies were absent or inappropriate 20 years ago; they have been established gradually and have improved since 1978. There is a delay between policy-making and its implementation. Although some policies were made several years ago, the implementation processes are slow in some regions, especially in remote areas.

Many laws and policies about land, forest, agriculture, water resources, nature conservation, and environmental protection exist. There is often an overlap between policies, leading to a conflict of rights and responsibilities, as well as to the overstepping of authority between departments. The policy-making process needs to change from many separate forms into a comprehensive and unified one.

#### **1.5 A Brief Historical Perspective of Land Administration**

Land administration has taken two basic forms: separated administration and unified administration (Liu Xinhua 1998). Separated administration means various departments establish their own land administration agency and manage land use separately according to their own needs. Unified administration means the central government establishes a special administration agency to unify land policy throughout the country.

##### **1.5.1 Review of the History of Land Administration**

The land-administration system in the period of the Republic of China (1911-49) was the same as that in the feudal dynasties of the past. It depended on the private ownership of land and was implemented through a unified administration. Since the new China was

established in 1949, and as a result of progressive land reform, a new land-administration system based on socialist public landownership has been set up.

During the founding of new China, the land policy department in the Ministry of Internal Affairs of the Central People's Government was responsible for land policy within a unified administration. However, from the mid-1950s to the early 1980s, the land-administration system was separated. It was divided into urban, rural, and departmental administration. Urban land was managed by a real estate administration office that was under the command of a city's civil administration office. The Ministry of Agriculture was in charge of rural land. Various other departments were also responsible. For example, the Railroad Department was responsible for railway land-use management, the Ministry of Communications was in charge of land-use management of road and waterways, the Ministry of Forestry was responsible for forest land management and the Army was in charge of military land.

The separated administration system was used for more than 20 years. Although it made some achievements in land management, practice proved that it was unfavourable to effective conservation and management of land resources and prevention of land misuse, destruction, and casual occupancy of cropland.

### **1.5.2 The Current Land Administration System**

In 1982, a State Land Administration system was formally established. Its establishment marked the unification of the land-administration system. Its main objectives are as follow.

- To manage land use for the whole country

- To co-ordinate and adjust land use by various departments
- To research, formulate, and implement land policies, laws and regulations, and master plans and annual plans
- To administer regional policies for land use

The central government identifies authorities in various departments who are responsible for land-use administration. The current land-administration system has been centralised and integrated. It uniformly administers national land policies for urban and rural land. This reform is clearly defined in the Land Administration Law (1986).

In 1998, the apparatus of central government was transformed and, in particular, land administration institutions were changed. The previous State Land Administration, Ministry of Mineral Resources, State Survey Bureau, and State Ocean Administration were combined into a new Ministry of National Land Resources. The Land Administration Law was revised and unification was further strengthened.

### **1.6 Goals and Methods of This Study**

The main aims of this study are to reveal the relationship between land policy, land management, and land degradation. This kind of study is difficult in China because officials at all levels are sensitive to investigation of policy. In addition, there is little relevant literature. Thus, we focus on the following important aspects according to the definitions, scope, and concepts of ICIMOD and to China's actual conditions.

- Study of policies, laws, and stipulations that relate to land degradation and environmental deterioration, for exam-

ple, land policy, environmental policy, agriculture and forest policy, natural conservation policy, population policy, and poverty elimination policy (at all levels: national, provincial, and local)

- Identification of the part of these policies that has led to or will cause land degradation and environmental deterioration
- Study of the relationship between policies
- Analysis of the role of various administration systems on the process of land degradation
- Analysis of the whole process of policy: policy-making and legislative process, policy implementation, problems of policy enforcement, hidden policy agendas, and proposals for solving these problems
- Analysis of the impact of policies on stakeholders, land-use patterns, and people's livelihood
- Analysis of the response of stakeholders to policies, especially the response of local farmers<sup>1</sup> who are at the primary level of implementation of land, agriculture, and forest policies

- Analysis of the impact of land degradation and environmental deterioration on present policy and the corresponding activities or measures taken by government at all levels
- Comparison of men's rights with women's rights to land, and the impact on land use and management

The Luquan Yi and Miao Nationalities' Autonomous County of Yunnan Province was used for the case study.

In areas of degraded land, people find themselves struggling against the poverty-population-environment spiral. Land degradation in China, of which soil erosion is the most widespread, is particularly apparent in mountainous regions. Many poor people live in these areas. It is unrealistic under the pressure of population growth and increasing demand for natural resources to let degraded land recover naturally by itself. Degraded land needs ecological reconstruction through social investment—mainly from developed regions.

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1 Farmer in this document refers to the rural subsistence farmer