Chapter 9
Comprehensive Chinese Government Policies to Combat Desertification

Zhan-Bin Li, Peng Li, Ping-Ping Huang, and Xiao-Jun Liu

Abstract Desertification in China is a serious and mounting environmental problem. Thus, combating it is of great importance to the ecological safety and socioeconomic development of the country. Many laws and regulations have been previously enacted by the Chinese central government. However, implementation of these laws and regulations still requires better management, and successful desertification prevention needs better cooperation between various stakeholders. Moreover, with its rapid growth over the past few decades, China must balance ecological, social and economic development and protection by instigating greater wisdom in decision making. Given the seriousness of the environmental issue, the country has accumulated great experience with prevention and mitigation of desertification. Currently, however, greater effort is required to effectively manage desertification control, including: (1) improving laws and regulations, and perfecting management and monitoring systems; (2) extending investment channels for desertification prevention; (3) strengthening both basic and applied research; (4) improving the ecological compensation mechanism; and (5) strengthening societal awareness of desertification issues and prevention.

Keywords Desertification • Legislation system • Scientific research • Ecological compensation • Societal awareness • Comprehensive management

Z.-B. Li (✉) • X.-J. Liu
Institute of Soil and Water Conservation, Chinese Academy of Sciences and Ministry of Water Resources, Yangling, Shaanxi 712100, China
e-mail: zbli@ms.iswc.ac.cn

P. Li • P.-P. Huang
Xi'an University of Technology, Xi'an, Shaanxi 710048, China
e-mail: lipeng75@163.com

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9.1 Introduction

According to the results of the third desertification monitoring program in 2004, desertification areas in China have increased to 2.636 million km^2, with resulting direct economic losses at some 54 billion Chinese Yuan (CNY, which was about 0.16 U.S. dollars as of May 2012) (Zhang and Ning 1996) and further indirect economic losses two to eight times the direct costs (Zhang et al. 1994).

To combat desertification, the Chinese government launched a series of policies, including the Three North Protection Forest Project, Natural Forest Protection Program, Sandstorm Source Control Project in and around Beijing and Tianjin, plus the Grain-for-Green Project and Returning Cropping Land to Forage Land Project. In addition, legislation has also seen great progress, with the Chinese government successfully enacting the Grassland Law of the People's Republic of China (P. R. China), Law of the P. R. China on Water and Soil Conservation, and the Law of the P. R. China on Prevention and Control of Desertification. Through these efforts, desertification prevention in China has seen some improvement. However, despite such initiatives and partial improvement in local environments, desertification remains a serious issue because of continuing policy and implementation difficulties (Guo and Zhou 2010).

Thus, it is essential that policy implementation be improved by clarifying the shortcomings of policy content and development. In this chapter, we analyze desertification prevention policies and management systems in China and discuss ways forward, including: (1) improving laws and regulations, and perfecting management and monitoring systems; (2) extending investment channels for desertification prevention; (3) strengthening both basic and applied research; (4) improving the ecological compensation mechanism; and (5) strengthening societal awareness of desertification prevention.

9.2 Revising Laws and Regulations and Improving Management and Regulation Systems

Combating desertification is an important part of the national economic and social development plans of the Chinese government. In the past 50 years, the country has held four national desertification control conferences and has launched the National Project for Prevention and Control of Desertification and the Three-North Shelterbelt System Construction Project. In the late 1990s, the government enacted important environmental schemes and policies such as China's Agenda 21, the National Program for Eco-environmental Construction Planning of China, the Forestry Action Plan (within Agenda 21), and the China National Action Plan to Implement the United Nations Convention to Combat Desertification. By implementing the Western Development Strategy, China has laid an ecological foundation for simultaneous planning, implementation, and development of the economy, as well as of the ecological environment. In 2010, the National Major Functional Zone Plan of

China presented the "Two Barriers and Three Belts" framework to combat desertification, which was also the focus of 25 important ecological functional zones in the country.

The Chinese government launched a series of policies and legislation to combat land desertification in the late 1990s, including the Forest Law of the P. R. China, the Grassland Law of the P. R. China, the Law of the P. R. China on Water and Soil Conservation, and the Environmental Protection Law of the P. R. China. Among these, the Law of the P. R. China on Water and Soil Conservation, implemented on June 29, 1991 and its revision implemented on March 1, 2011, discussed prevention, control, and legal supervision of soil and water loss in detail, and put forward new ideas for prevention, control, monitoring, and management of desertification. On August 31, 2001, the Law of the P. R. China on Prevention and Control of Desertification was adopted at the 23rd Session of the Standing Committee of the Ninth National People's Congress, and was officially implemented on January 1, 2002 as part of the country's commitment to desertification mitigation through relevant laws and regulations. The Law of the P. R. China on Prevention and Control of Desertification was the first national-level law specifically dedicated to tackling desertification in the world. It not only filled the legislation gap by improving technologies for and managerial experience in the control of desertified land in relation to legal principles and systems, but also achieved cross-departmental merging of legislation on resources at a larger scale (Du 2004). Following the principles of "Protection First, Positive Control, and Proper Utilization," the Law of the P. R. China on Prevention and Control of Desertification specifically details national and local regulations and plans for prevention and control of desertification, prevention of land sandification, control of sandified land, and mandatory safeguard measures and legal responsibilities (Liu 2008).

The Chinese National Action Plan to Combat Desertification has implemented and organized large-scale development of cross-region, cross-basin, and cross-industry ecological projects, enhanced organization safeguard measures to combat desertification, accelerated desertification prevention work, and achieved evident ecological, social, and economic benefits. Such work has effectively controlled desertification in some regions. Moreover, the State Council has promulgated a series of administrative regulations such as the Regulations on Conversion of Farmland to Forests (January 20, 2003), Decision of the CPC Central Committee and State Council on Accelerating the Development of Forestry (June 25, 2003), and the Decision on Further Strengthening the Prevention and Control of Desertification (September 8, 2005). Additionally, local governments in desertified regions have enacted corresponding local regulations and rules to help combat desertification.

The Chinese government has also established a relatively robust organization and management system, which includes 18 ministries, commissions, and financial institutions, called the Chinese National Coordinating Group to Combat Desertification, to work towards desertification minimization across the country. In addition, the National Bureau to Combat Desertification was established in 1997 with the approval of the State Commission Office for Public Sector Reform, and is responsible for organizing, coordinating, managing, and instructing relative to the nationwide desertification issue. After 8 years of continuous effort, a monitoring

organization system was established. Within this, the Chinese National Desertification Monitoring Center and Northwest Institute of Forest Inventory, Planning, and Design were designated as provincial centers for forest survey and design, and autonomous regions designated as sub-centers. The Chinese government actively participated in international cooperation under the United Nations Convention to Combat Desertification. The government hosted international conferences related to this convention, established regional networks to cooperate with international organizations and governments in relation to common environmental issues, and developed international partnerships under the convention framework.

The implemented laws and regulations as well as the robust organization structure and management systems provide a legal foundation and reliable safeguards to combat desertification in China. However, problems remain in relation to legal countermeasures. With economic development, the revision of relevant laws and policies in the country, and increasing desertification research, existing legislation is unable to solve many problems that occur in practice. Such problems are typified by unclear authorities and responsibilities of governments and undefined property rights for resources, creating conflict between stakeholders and impacting the prevention and control of desertification. For example, the period of forest ownership is undefined and, to date, China has undergone five major forest land use rights system reforms. These frequent reforms have led to unstable use and operation of farmland, such that many farmers have become apathetic toward the prevention and control of desertification. Regarding actual desertification mitigation in China, there are also issues related to law abidance and law enforcement. For example, many precious Chinese medicinal plants such as *Hippophae rhamnoides*, *Lycium chinense*, and *Glycyrrhiza uralensis* grow in arid desert regions; despite repeated orders that strictly ban unauthorized excavation and collection such plants, laxity in law enforcement and punishment has led to continued illegal harvesting, and consequent erosion and land desertification. Thus, lenient law enforcement in some regions has contributed to continued illegal activity that destroys forest resources. Such ineffective prevention of desertification demands strong laws and law enforcement to ensure implementation of all prevention systems and to improve relevant legislation.

Therefore, the following tasks require urgent attention to effectively monitor and prevent future desertification: (1) clearly define authorities for coordinated cooperation among various departments; (2) define property rights to increase interest by organizations and individuals engaged in desertification mitigation; (3) strengthen law enforcement to enhance management; and (4) improve the desertification monitoring, forecasting, and warning system.

9.3 Expanding Investment Channels for Combating Desertification

To ensure the sustainable development of desertification prevention and control, it is necessary to change existing production and operation modes, i.e., to transform the public welfare mode into an industrialized mode for expanding investment

opportunities. Currently, desert exploitation requires great investment, but achieves little benefit and has a long return period (Bu 2008). Therefore, it is necessary to adopt a win–win, strategy-based investment plan in which all enterprises, investors, governments, and local populations can offer and obtain successful investment in the field of environmentally sound technologies. Bilateral and multilateral cooperation is also necessary for environmental protection, to expand investment avenues for controlling desertification.

9.3.1 Industrialized Desertification Control

A new era has begun in combating desertification. It combines desertification control with local economic and social development, and introduces public and private capital into desertification prevention for the social, economic, and ecological benefit of all participants. Relying on the Project of Conversion of Farmland to Forests, Yulin farmers have changed their traditional practices of extensive cultivation to the planting of grasses, mulberry, apricot, Chinese jujube and other fruit trees. In Ordos City, Inner Mongolia, a novel prevention strategy has been developed. It focuses on low-carbon economic development, new energy resources to combat desertification, and green industries to improve local wealth and wellbeing. Kubuqi Desert is the seventh largest desert in China. Through 20 years of relentless effort, the Inner Mongolia Elion Resources Group Company has invested more than 3 billion CNY to create oases in desertification-affected areas, developing a remarkable desert economy. The company has helped reverse desertification, increase local income, and enhance environmental protection and enterprise profits through industrialization methods.

9.3.2 International Cooperation

The Chinese government continues to cooperate internationally in bilateral, multilateral, and regional manners to tackle desertification. Bilateral cooperation is an important constituent of China's international cooperation. Since the country signed the first bilateral environment cooperation protocol with the USA, the State Environmental Protection Administration has, on behalf of the national government, signed bilateral environment cooperation documents with 33 countries, including Germany, Korea, Australia, Canada, France, and the Netherlands. Based on these documents, China has set up a bilateral cooperation framework covering the entire world, which primarily consists of non-reimbursable, assistance-based afforestation projects. Since the mid-1980s, the national government has actively expanded cooperation with international organizations to carry out assistance activities in arid regions of China. Such organizations include the United Nations World Food Programme (WFP), Food and Agriculture Organization (FAO), United Nations Development Programme (UNDP), Global Environment Facility (GEF),

International Fund for Agriculture Development (IFAD), World Bank (WB), Asian Development Bank (ADB), and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

To strengthen environmental cooperation and negotiations put forth at the first summit meeting in 1999, China, Japan, and Korea commenced the Tripartite Environment Ministers Meeting (TEMM) in the same year. The TEMM is held consecutively in the three countries to solve common environmental problems and promote sustainable regional development. A joint statement of the TEMM is signed by the ministers after every meeting. China hosted the second and fifth TEMMs in 2000 and 2003, respectively. As the main regional environmental cooperation mechanism in Northeast Asia, the TEMM has collaborated and made substantial achievements in sand-dust storm monitoring, the Acid Deposition Monitoring Network in East Asia (EANET), development plans for environmental education networks and human resources of the three countries, ecological conservation in Northwest China, protection of fresh water resources, and environment-friendly industry.

9.4 Strengthening Basic and Applied Research

Since the end of the last century, with rapid development and application of new theories and technologies, desertification prevention research has entered a new era. Adapting to the general trend of international desertification prevention research, desertification is considered a serious environmental and socioeconomic problem, and comprehensive research should be conducted from a natural, social, and economic viewpoint. Strengthening basic and applied research is key to comprehensive desertification prevention.

9.4.1 Strengthening International Cooperation and Exchange in Desertification Mitigation Research

With constantly developing international cooperation and exchange, strengthening research on fundamental applications to reduce or eliminate desertification is necessary for international prevention and control. The 2009 Kubuqi International Desert Forum, held in Ordos City, Inner Mongolia, adopted the 2009 Kubuqi International Desert Forum Declaration. Forum attendees stated that governments of various countries should enhance technological guidance and support to combat desertification, promote strong cooperation among academic organizations, scientific research institutions, relevant local governments and enterprises, increase support to government-owned scientific research institutions, and encourage various private organizations to devote themselves to scientific research and industrialized applications of desertification control. Significant effort must be made to popularize prevention and control measures that prove effective in mitigating desertification in China.

The forum attendees also stated that as environmental and desertification problems are common issues faced by humankind, international cooperation must be increased and communication between relevant academic organizations must be enhanced to augment sharing of global desertification prevention and restoration technologies. Relevant organizations of the United Nations and international desert forum organizations must assume more responsibility in this respect. Popularization and application of advanced desertification experience, scientific technologies, and new materials must be encouraged worldwide. Forum attendees called on governments of various countries to implement more flexible and positive policies for the turnover of funds, technologies, personnel, and materials related to prevention and control of desertification.

9.4.2 Theory of Sand Industry

Qian (1984) first proposed the concept of a sand industry as a knowledge-intensive, agriculture-based industry developed on "sterile land," which utilizes all achievements from modern scientific technologies related to physics, chemistry, and biology. It also uses the photosynthesis of plants to fix and transform solar energy. Today, the sand industry provides output value up to 100 billion CNY on 1.50 million km^2 of desert (the Gobi) and desertified land in China, to exploit new food sources for human beings. Its continued emergence will lead to a new industrial revolution, and currently includes oasis agriculture, forestry (protection forest, forest and orchard, and desert shrub), animal husbandry, and development and use of economic plants (including unique Chinese medicinal and textile plants).

Development of the sand industry is progressive and follows the principle of development from lower to higher levels and from local to global scales. That is, the principle of "intensive operation and sustainable development in a scientific and reasonable manner, by taking measures adapted to local conditions" (Liu 2009). The essential purpose of the industry is to realize intensive, efficient, sustainable, and diverse resource exploitation in desert areas, for ensuring mutual promotion and harmonic development of economic, social, and ecological benefit (Liu 2009).

The knowledge-intensive sand industry has become a new growth point of economic development in Ordos City. For more than 20 years, combating desert encroachment near Ordos has changed from focusing on vegetation plantation to focusing on industrial development, and the city has gradually formed four green pillar industries (wool, meat, milk, and medicine). These have become novel leading industries in the "Conversion of Farmland to Forests and Pasture to Grassland" project.

The Gansu Sanxin Agriculture and Forestry Technology Company, located in the Hexi Corridor of Gansu, has introduced new fruit and vegetable species from the USA and cultivated up to 100 characteristic sand-industry products, including the famous "black tomato." Compared with common tomatoes, the black tomato contains more lycopene, vitamin C and antioxidants. It has moderate acidity and sweetness and intense fruit flavor, as well as very high nutrient and medicinal values. Local farmers can now earn more than 8,000 CNY per year net income through black tomato planting.

9.4.3 Present Situation and Development Trends in Technologies Used for Desert Transformation

In the past 100 years, utilization of sand areas has mostly focused on exploitation of minerals, energy resources, and biological resources (light, heat, water and soil), with the development of industrial mineral exploitation being the fastest. The main objective in sand areas is to control highly destructive wind and associated sand disasters. Desertification control currently includes biological, technical engineering, and chemical sand-fixing measures. Beyond sand fixation and sand-dust storm control using novel sand-fixing agents and lignin-based sand-fixing materials, determining how to exert specific functions of biological technologies for effective transformation and control of the desert has attracted significant scientific attention. Since 1998, there have been six ideas for biological technology-based desertification control:

1. Searching for rare psammophytic plants and enhancing research on their breeding and ecological properties, to provide pioneer plants for transformation of desert areas
2. Introduction of psammophytic plants with strong adaptability to desert areas, and enhancement of research on their drought resistance and ecological properties
3. Use of specific microorganisms to transform the nature of the desert. For example, strengthening the study of silicate bacteria that may be used to change sand into soil
4. Development of biopolymers with high water absorption (which can be produced by some microorganisms) to transform the desert
5. Use of genetic engineering technologies to construct and cultivate drought-resistant plants for desert transformation
6. Combination of various organic wastes with effective aerobic and anaerobic microorganisms, to assist in desert transformation

With deepening and rapid development of biological technology research, scientists have proposed new ideas on how to effectively control desert expansion in recent years:

1. Introduction of plants with strong drought resistance and symbiotic nitrogen-fixing capability, e.g., *Hippophae rhamnoides* and *Glycyrrhiza uralensis*, which are closely linked with nitrogen-fixing microorganisms that not only increase nitrogen nutrition in plants, but also gradually increase organic matter and fertilize the desertified base. This is helpful for the transformation of desertified land, and for growing and breeding these plants and creating products with high added value. One action thereby serves multiple purposes.
2. Introduce the energy plant *Jatropha curcas*, which is barren-resistant and can build a symbiotic relationship with mycorrhizal fungi. It can grow in arid environments and its fruits provide quality biofuel, which is sulfur-free, pollution-free, nontoxic, completely natural, and biodegradable. The biofuel can be used as a substitute for diesel. If used as inoculants, symbiotic mycorrhizal fungi can improve the seed breeding ability and fuel yield of *Jatropha curcas*.

3. Develop microalgae, including blue algae and green algae for transformation of desertified land. In nature, color crusts are often distributed on the surface layer of arid rocks, which contain different organisms, including lichen (a symbiosis of blue algae and fungi). With the introduction of water, organisms in the crusts resume their life activities. Given this characteristic, transgenic plants with high drought resistance and extremely strong vitality can be cultivated from these crust organisms via transgenic technology, which can in turn boost effective desertification control.
4. The Biological Carpet Desertification Control Project is being initiated in China. The Chinese Academy of Sciences and related domestic institutions are exploring new ways to comprehensively use microorganisms and organism crusts of spore plants for desertification control. The principle is to take naturally formed organism crusts in arid, semiarid, and desert regions as "templates" and use modern biological technologies to duplicate them, so that activated desert surface layers are covered with "carpets" of organism crusts. Drifting sand is thereby controlled and desertification mitigated (Ke 2005).

9.4.4 Exploitation and Use of Water Resources in Sand Areas

Desert regions have arid climates, low vegetation coverage, strong wind and sand activity, scarce precipitation, intense evaporation, and water-deficient sand layers (He and Zhao 2002). Enhancing exploitation and use of water resources in desert regions is the main means for accelerating mitigation of desertification (Xue et al. 2005; Wang et al. 2003a, b). Currently, desert water resources are primarily provided by cross-basin water diversion, artificially induced water, changing the sand area microclimate, exploiting groundwater, transforming and using salty and sea water, dew and fog water resources, and developing various water saving technologies.

9.5 Improving Ecological Compensation Mechanisms

Ecological compensation is also called payment for ecosystem services. It means improving ecosystem status or establishing a new habitat with equivalent ecosystem functions or quality in a destroyed region, for compensating degradation of or damage to the functions or quality of the existing ecosystem caused by economic development or construction, to maintain ecosystem stability (Li 2005). In terms of the law, ecological compensation means that to resume, maintain, and enhance the ecological functions of an ecosystem, the country charges (or taxes) for exploitation or utilization of natural resources that degrade ecological functions. The country or beneficiaries of ecological protection offer economic or non-economic compensation to organizations or individuals who have relinquished their interests, for improving, maintaining, or enhancing ecological service functions.

Because of such considerations as great social benefit and difficult capital recovery, it is especially important to establish an ecological compensation mechanism in desertified regions (Lv and Gao 2009). The ecological compensation mechanism is, in fact, both an interest compensation and conflict coordination mechanism. The interest compensation mechanism means using normalized system construction to realize interest transfer between the central and local authorities and between different local authorities, to achieve reasonable inter-regional interest distribution (Xu et al. 2010). This mechanism is mainly embodied in the establishment of normalized financial transfer payment systems.

Problems faced in construction of an ecological compensation mechanism in the Western Regions presently include the following: (1) the "department-led" environmental protection system has undefined responsibilities and low-efficiency ecological protection, residents in ecologically protected areas receive little benefit, and ecologically protected areas have large populations in poverty; (2) the "project-specific" compensation mode affects long-term stability of ecological policies and sustainability of ecological protection; (3) the "blanket" compensation standard, low compensation standard, and coexistence of under-compensation and over-compensation influence the lives of residents in the ecologically protected areas; (4) ecological compensation financing channels are limited, mainly relying on transfer payments from central financial agencies, so the central government experiences high pressure; and (5) providers and receivers of ecological benefits are not clearly defined, and ecological compensation policies are neither scientific nor reasonable.

Relative to improving the ecological compensation mechanism in the Western Regions, the Department of Economics of the Chinese Academy of Governance (Wang and Dong 2007) forwarded the following countermeasures: (1) establish an ecological compensation mechanism based on long-term sustainable economic and social development, and raise the mechanism from policy level to law level, using the legal system to ensure the existence and development of the rights of Western Region residents; (2) enhance the stability of ecological protection policies, extending the period of ecological protection subsidization of the Conversion of Farmland to Forests Project by category, according to regional features; (3) set up financial transfer payment systems favorable to ecological protection and construction, and add an "ecological compensation" sub-item under "financial transfer payment"; (4) establish a "horizontal funds transfer" compensation scheme among local governments, so that the developed regions receiving benefits from ecological protection directly execute financial transfer payments to poor areas, providing ecological protection; (5) impose an "ecological tax" to provide long-term and stable sources of ecological compensation funds; (6) define the provider and receiver of ecological benefit and establish quantitative compensation standards scientifically and reasonably, on the basis of "Ecological Functional Zoning"; and (7) establish an eco-environment assessment index system and an assessment system for utilization efficiency of ecological compensation funds, to scientifically measure the eco-environment value and raise the utilization efficiency of ecological compensation funds.

In summary, ecological protection in the western desert regions is not just a simple ecological compensation problem, and a thorough solution to this problem is

dependent on social and economic development in the Western Regions. Therefore, ecological protection can only be truly successful by using compensation to adjust economic and industrial structures and to improve the modes of production and lives of the population in those regions, especially desert areas, thereby mitigating eco-environmental pressure.

9.6 Strengthening Societal Awareness of Desertification Prevention

Although China continues to work toward its control, desertification continues to increase. Inadequate prevention awareness and understanding of desertification hazards have led to a public disconnect between desertification mitigation and the local living environment, economic development, and poverty alleviation. Many people do not associate interest-driven, short-term behavior with long-term interests of future generations, and do not follow the philosophy of "prevention first" (Jiang and Lu 2007). It is therefore essential to strengthen long-term awareness and education, so that individuals and organizations understand the importance and urgency of desertification control and that its prevention is an issue for all of society.

June 17 is the World Day to Combat Desertification and Drought. Every year in China, local governments organize and carry out multiple theme-based commemorative activities to mark this day. First, large-scale activities are held in public places to publicize the severe situation of desertification and sandification in the country. These activities also increase public knowledge about sandified land mitigation technologies and approaches, to enhance social responsibility and participation in tackling desertification and protecting the environment in desert areas. Second, the serious hazards of desertification and sandification are publicized to encourage government attention at all levels, and to increase support from various authorities for and active participation of the general public in combating desertification. Third, issues in combating desertification are reported via newspapers, television stations, and the Internet, to ensure comprehensive social publicity.

Through such publicity, some real changes have been achieved, and social awareness of desertification issues has improved. The following tasks should be introduced in the future:

1. Actively cultivate professional people and conduct technical training for combating desertification. Adopt preferential policies and actively encourage and attract talent to engage in scientific desertification research, and improve talent's benefits, production and living conditions. Moreover, encourage implementation of scientific research training systems, and adopt professional visitation and invitation programs for diverse training on managing personnel and technicians at multiple levels.
2. Broadly mobilize all levels of society to focus on and support desertification mitigation, and make full use of the People's Liberation Army, Chinese People's

Armed Police Force, People's Militia, labor unions, Women's Federation, Communist Youth League, and other social organizations. Recognize and reward organizations and individuals who have achieved significant performance in confronting desertification.

3. Actively explore new mechanisms and methods for mass prevention and control of desertification under new situations, and establish a public complaint reporting and supervising mechanism. Governments should create various conditions to facilitate public supervision of individuals and enterprises that destroy the environment. For example, a telephone number, mailbox, and website dedicated to complaint reporting can be established and publicized, with personal information kept confidential to protect the safety of those making complaints. Further, a mechanism providing grant honors and awards may be established.
4. Widely implement publicity and educational programs to improve ideological and social understanding of environmental issues. Organize campaigns to disseminate information and keep relevant information available to the public, and involve the public in education and publicity activities. Encourage the establishment of associations that focus on increasing public awareness of desertification. Compile and exchange education and public awareness materials on combating desertification, and implement relevant education and publicity schemes. Establish school courses according to educational standards in desertified regions, and cross-discipline participation schemes to incorporate desertification and drought awareness into the education curriculum so that environmental protection and desertification mitigation are tackled by the whole of society.

9.7 Conclusions

China is seriously threatened by desertification. For a long time, the central government has made a significant effort to combat desertification and has achieved remarkable outcomes. The main experience and progress of the Chinese government in combating desertification is as follows:

First, combating desertification is regarded as the main focus of state ecological safety by the central government, and effective laws and regulations have been enacted and rational management systems established.

Second, existing production and operation modes for combating desertification have been altered by transforming the public welfare mode into an industrialized mode for expanding investment opportunities. At the same time, there has been greater bilateral and multilateral environmental protection cooperation toward expanding investment avenues for combating desertification.

Third, by strengthening international cooperation and adopting new technologies, the knowledge-intensive sand industry has become an example of sustainable development and desertification control.

Fourth, it is important to establish rational ecological compensation mechanisms to adjust economic and industrial structures, and to improve both modes of production and the lives of the population in the Western Regions.

Finally, it is essential to strengthen long-term publicity and education, so that individuals and organizations in desertified regions understand the importance and urgency of desertification control, and that combating desertification is an issue important to all of society.

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