

中国荒漠化和沙化状况公报

A Bulletin of Status Quo of Desertification
and Sandification in China



国家林业局

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前言

为准确掌握我国荒漠化和沙化土地现状和动态变化情况，根据《中华人民共和国防沙治沙法》、《国务院关于进一步加强防沙治沙工作的决定》的规定，国家林业局于2009~2010年组织相关部门的单位和专家开展了第四次全国荒漠化和沙化监测工作。本次监测共调查图斑592万个，获取各类监测数据2.5亿个，获得了我国荒漠化和沙化土地现状及动态变化信息。

本监测期信息起止时间为2005年初至2009年底。监测结果显示，截至2009年底，我国荒漠化土地面积为262.37万平方公里，沙化土地面积为173.11万平方公里。与2004年相比，5年间荒漠化土地面积净减少12 454平方公里，年均减少2491平方公里。沙化土地面积净减少8587平方公里，年均减少1717平方公里。

监测结果表明，我国土地荒漠化和沙化整体得到初步遏制，荒漠化和沙化土地面积持续减少，局部地区仍有扩展。本公报根据第四次全国荒漠化和沙化监测结果编写，简要介绍了截至2009年我国荒漠化和沙化状况的最新信息，旨在使社会各界了解我国荒漠化和沙化状况，了解防治工作取得的成效及面临的严峻形势，坚定防治信心，继续关心和支持我国的防沙治沙事业。

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PREFACE

To attain an accurate master of the land desertification and sandification status and dynamic condition in China, the State Forestry Administration in accordance with the Desertification Prevention and Control Law of the People's Republic of China, the State Council's Decision of Further Strengthening the Work of Desertification Prevention and Control, carried out the 4th round of national desertification and sandification monitoring from 2009 to 2010 with involvement of experts and technicians from relevant departments and institutions. Totally 250 million sets of data obtained from the 5,920,000 field survey compartments and mapping units, have been consolidated as analytical information elaborating the status and dynamic condition of the desertification and sandification in the country.

The monitoring covers the period from early 2005 to end 2009. It's results indicate that by the end of 2009, the desertified land area of China was 2,623,700 square kilometers and the sandified land area 1,731,100 square kilometers. Compared with those in 2004, over 5 years the net desertified land area decreased by 12,454 square kilometers with an annual reduction of 2,491 square kilometers while the sandified land net reduction was 8,587 square kilometers with an annual average reduction of 1,717 square kilometers.

The monitoring results indicate that the development process of land desertification and sandification in China has been primarily curbed in general. Desertification and sandification keep falling off by total acreage of but kept expanding in partial locations. This report based on the results of the 4th China National Desertification and Sandification Monitoring briefed the latest information of the desertification and sandification status in China by 2009, in an attempt to inform the public of the current status of desertification and sandification in China, the achievements made and the challenges faced with for enhanced confidence in and support to the work of the desertification prevention and control in China.

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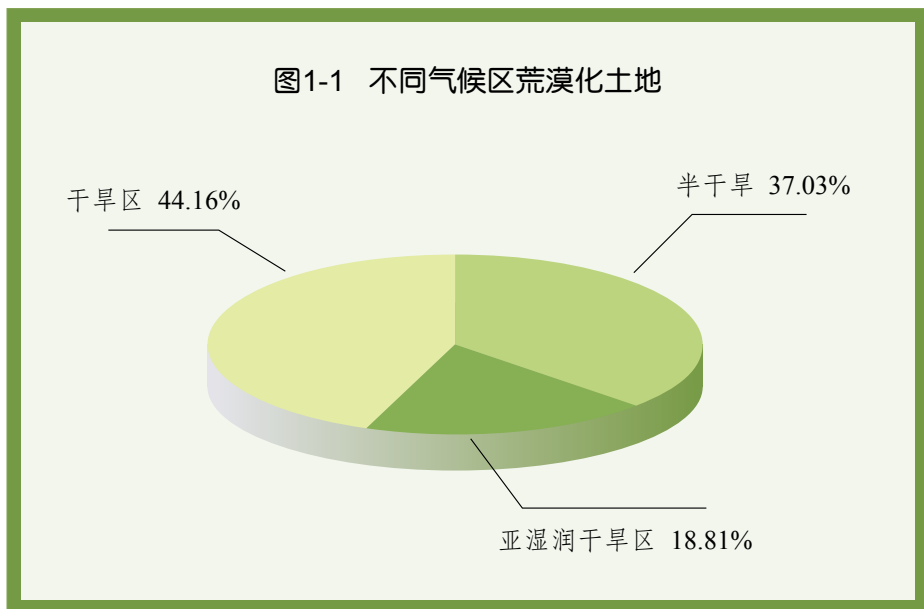
A Bulletin of Status Quo of
Desertification and Sandification in China

荒漠化^①和沙化^②土地现状

（一）荒漠化土地现状

截至2009年底，全国荒漠化土地总面积262.37万平方公里，占国土总面积的27.33%，分布于北京、天津、河北、山西、内蒙古、辽宁、吉林、山东、河南、海南、四川、云南、西藏、陕西、甘肃、青海、宁夏、新疆18个省（自治区、直辖市）的508个县（旗、区）。

1. 气候类型区荒漠化现状。干旱区荒漠化土地面积115.86万平方公里，占荒漠化土地总面积的44.16%；半干旱区荒漠化土地面积97.16万平方公里，占37.03%；亚湿润干旱区荒漠化土地面积49.35万平方公里，占18.81%（图1-1）。

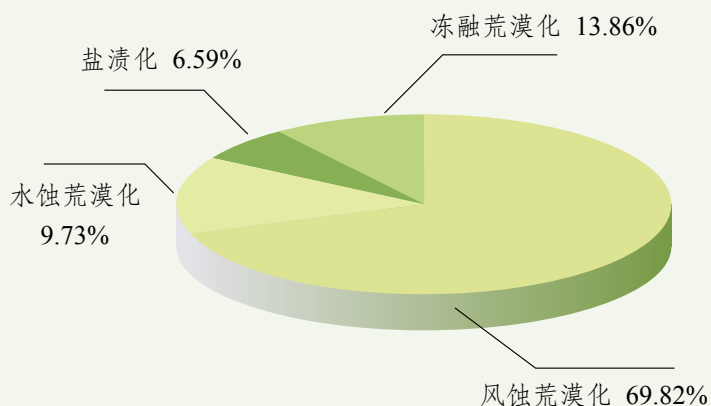


2. 荒漠化类型现状。风蚀荒漠化土地面积183.20万平方公里，占荒漠化土地总面积的69.82%；水蚀荒漠化土地面积25.52万平方公里，占9.73%；盐渍化土地面积17.30万平方公里，占6.59%；冻融荒漠化土地面积36.35万平方公里，占13.86%（图1-2）。

① 本公报中的荒漠化是指包括气候变异和人为活动在内的种种因素造成的干旱、半干旱和亚湿润干旱区的土地退化。这些地区的退化土地为荒漠化土地。

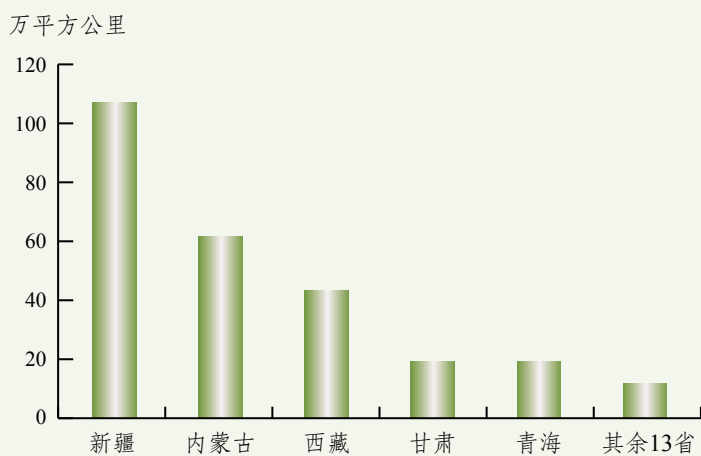
② 本公报中的沙化是指在各种气候条件下，由于各种因素形成的、地表呈现以沙（砾）物质为主要标志的土地退化，具有这种明显特征的退化土地为沙化土地。

图1-2 不同类型荒漠化土地



3. 各省区荒漠化现状。主要分布在新疆、内蒙古、西藏、甘肃、青海5省（自治区），面积分别为107.12万平方公里、61.77万平方公里、43.27万平方公里、19.21万平方公里和19.14万平方公里，5省（自治区）荒漠化土地面积占全国荒漠土地总面积的95.48%；其余13省（自治区、直辖市）占4.52%（图1-3）。

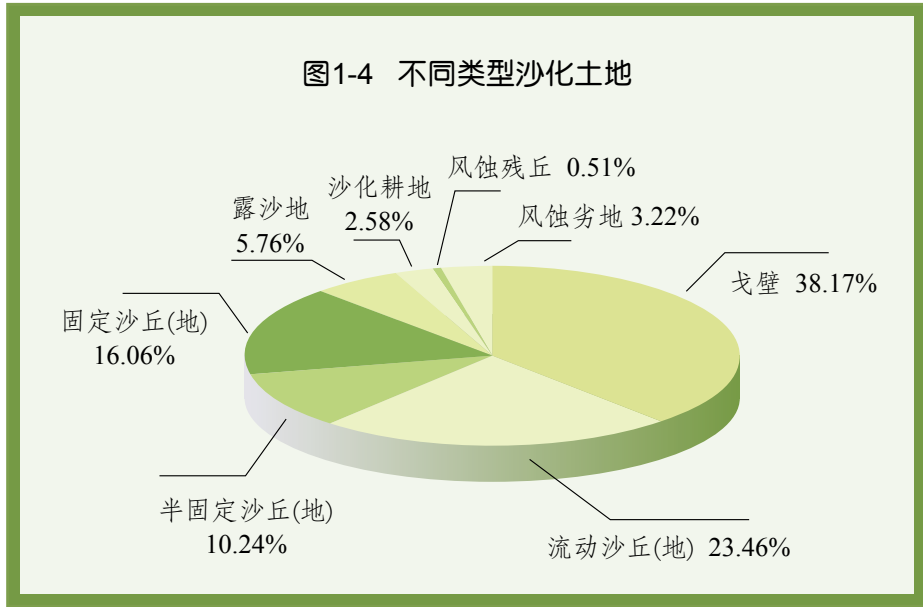
图1-3 各省区荒漠化土地



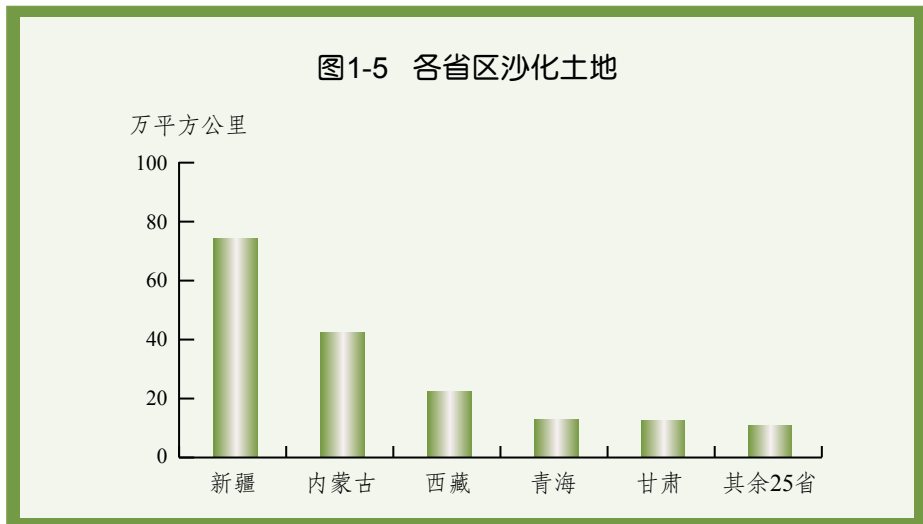
（二）沙化土地现状

截至2009年底，全国沙化土地面积为173.11万平方公里，占国土总面积的18.03%，分布在除上海、台湾及香港和澳门特别行政区外的30个省（自治区、直辖市）的902个县（旗、区）。

1. 各沙化土地类型现状。流动沙丘（地）40.61万平方公里，占全国沙化土地面积的23.46%；半固定沙丘（地）17.72万平方公里，占10.24%；固定沙丘（地）27.79万平方公里，占16.06%；露沙地9.97万平方公里，占5.76%；沙化耕地4.46万平方公里，占2.58%；风蚀残丘8898平方公里，占0.51%；风蚀劣地5.57万平方公里，占3.22%；戈壁66.08万平方公里，占38.17%；非生物工程治沙地66平方公里（图1-4）。



2. 各省区沙化土地现状。主要分布在新疆、内蒙古、西藏、青海、甘肃5省（自治区），面积分别为74.67万平方公里、41.47万平方公里、21.62万平方公里、12.50万平方公里、11.92万平方公里，5省（自治区）沙化土地面积占全国沙化土地总面积的93.69%；其余25省（自治区、直辖市）占6.31%（图1-5）。



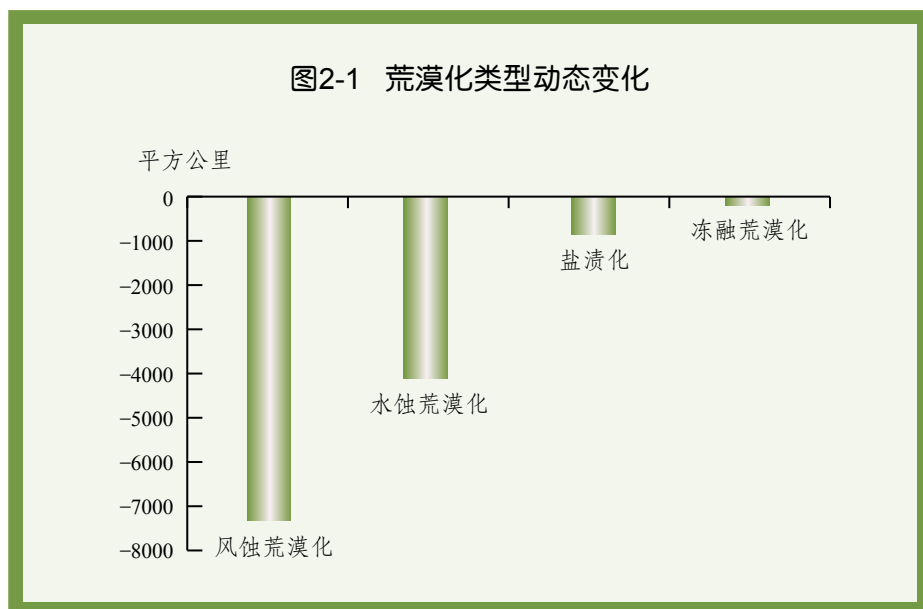


荒漠化和沙化土地动态^①

（一）荒漠化土地动态变化

与2004年相比，全国荒漠化土地面积减少12 454平方公里，年均减少2491平方公里。

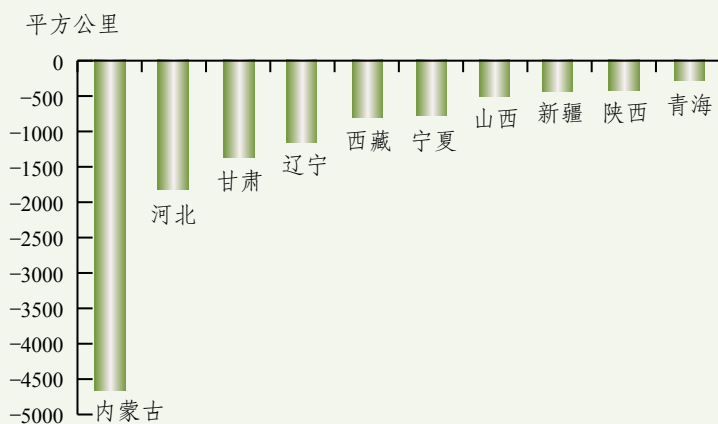
1. 荒漠化类型动态变化。与2004年相比，风蚀荒漠化土地减少7391平方公里，水蚀荒漠化土地减少4115平方公里，盐渍化土地减少830平方公里，冻融荒漠化土地减少118平方公里（图2-1）。



2. 各省区荒漠化动态变化。与2004年相比，18个荒漠化省（自治区、直辖市）的荒漠化土地面积全部净减少。其中，内蒙古减少4672平方公里，河北减少1802平方公里，甘肃减少1349平方公里，辽宁减少1153平方公里，西藏减少789平方公里，宁夏减少757平方公里，山西减少490平方公里，新疆减少423平方公里，陕西减少406平方公里，青海减少284平方公里（图2-2）。

^① 第三次全国荒漠化和沙化监测是2004年进行的，故本公报中的荒漠化和沙化土地动态变化，除特殊所指外，均为2009年与2004年相比结果。

图2-2 主要省区荒漠化动态

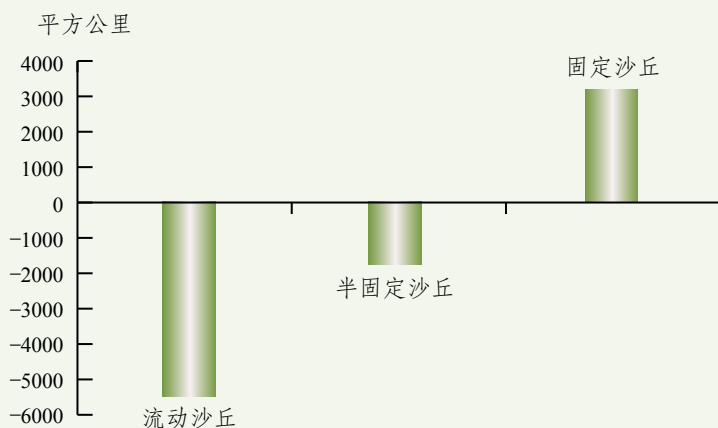


（二）沙化土地动态变化

与2004年相比，全国沙化土地面积净减少8587平方公里，年均减少1717平方公里。

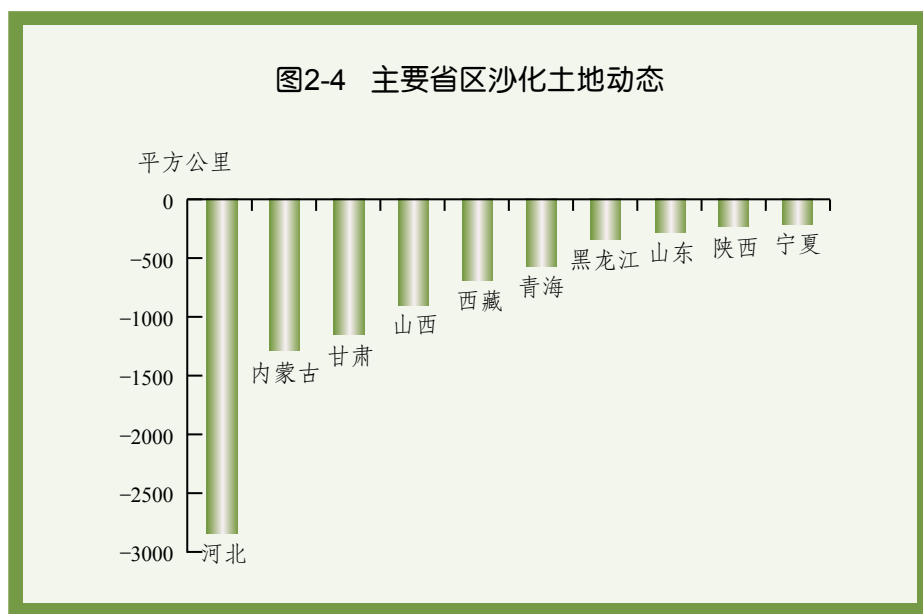
1. 沙化土地类型动态变化。与2004年相比，流动沙丘（地）减少5465平方公里，半固定沙丘（地）减少1619平方公里，固定沙丘（地）增加3271平方公里（图2-3）。

图2-3 主要类型沙化土地动态变化



2. 各省区沙化土地动态变化。与2004年相比，绝大部分省（自治区、直辖市）沙化土地面积都有不同程度的减少。其中，河北减少2782平方公里，

内蒙古减少1253平方公里，甘肃减少1121平方公里，山西减少877平方公里，西藏减少657平方公里，青海减少548平方公里，黑龙江减少330平方公里，山东减少262平方公里，陕西减少212平方公里，宁夏减少204平方公里（图2-4）。



三

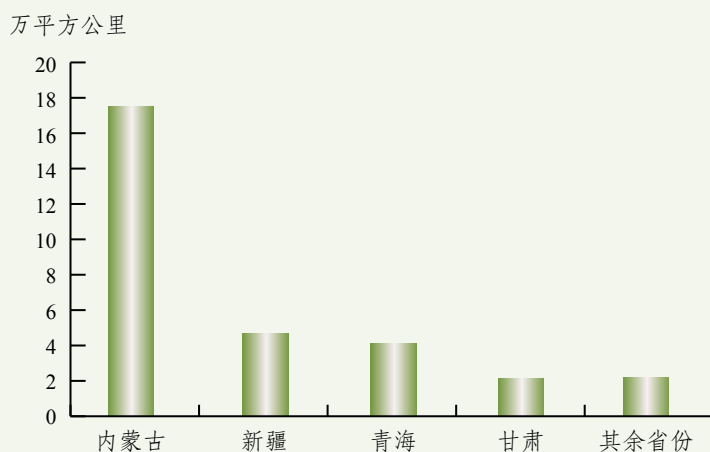
具有明显沙化趋势的土地状况

具有明显沙化趋势的土地主要是指由于土地过度利用或水资源匮乏等原因造成的植被退化，生产力下降，地表偶见流沙点或风蚀斑，但尚无明显流沙堆积形态的土地。目前虽然还不是沙化土地，但已具有明显的沙化趋势。

（一）具有明显沙化趋势的土地现状

截至2009年底，全国具有明显沙化趋势的土地面积为31.10万平方公里，占国土总面积的3.24%。主要分布在内蒙古、新疆、青海、甘肃4省（自治区），面积分别为17.79万平方公里、4.75万平方公里、4.16万平方公里、2.18万平方公里，其面积占全国具有明显沙化趋势的土地面积的92.86%（图3-1）。

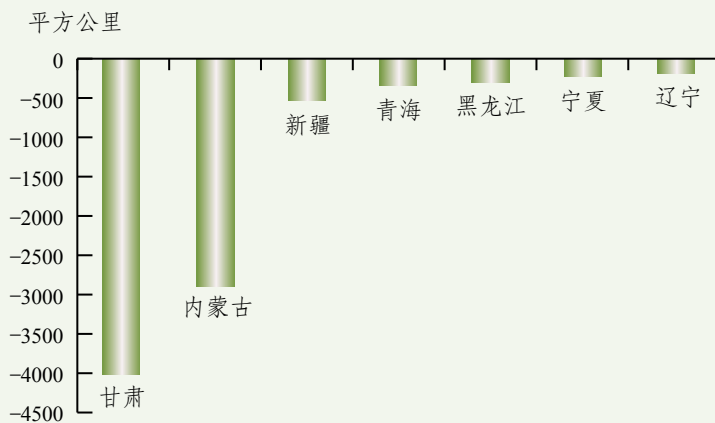
图3-1 具有明显沙化趋势的土地分布



(二) 具有明显沙化趋势的土地动态变化

与2004年相比，全国具有明显沙化趋势的土地面积减少7608平方公里，年均减少1522平方公里。其中，甘肃减少3989平方公里，内蒙古减少2862平方公里，新疆减少523平方公里，青海减少332平方公里，黑龙江减少287平方公里，宁夏减少217平方公里，辽宁减少201平方公里（图3-2）。

图3-2 具有明显沙化趋势的土地动态变化



四

荒漠化和沙化总体趋势

监测结果显示,我国土地荒漠化、沙化呈整体得到初步遏制,荒漠化、沙化土地持续减少,局部仍在扩展的局面。

1. 荒漠化、沙化土地面积持续净减少。2000~2004年荒漠化、沙化土地分别年均净减少7585平方公里、1283平方公里,2005~2009年分别年均净减少2491平方公里、1717平方公里。

2. 土地荒漠化和沙化程度减轻。与2004年比,轻度荒漠化土地增加3.47万平方公里,中度减少1.69万平方公里,重度减少6800平方公里,极重度减少2.34万平方公里。轻度沙化土地面积增加2.73万平方公里,中度减少9906平方公里,重度减少1.04万平方公里,极重度减少1.56万平方公里。

3. 植被状况进一步改善。一是沙化土地植被平均盖度由2004年的17.03%提高为2009年的17.63%,5年间提高0.60%;二是固定沙地增加,半固定、流动沙地减少。5年间固定沙地增加3271平方公里,流动沙地减少5465平方公里,半固定沙地减少1619平方公里;三是植物多样性增加。在京津风沙源工程范围的典型草原区,多样性指数未治理区域仅为1.80,治理区域达到2.13。

监测显示,受过度放牧、滥开垦、水资源的不合理利用以及降水量偏少等综合因素的共同影响,川西北高原、塔里木河下游等区域沙化土地处于扩展状态,但扩展的速度已经趋缓。

五

土地荒漠化和沙化净减少的成因分析

我国土地荒漠化、沙化呈持续净减少之势,主要原因是:党中央、国务院高度重视荒漠化、沙化防治工作,采取了一系列重大战略举措;沙区各级党委政府真抓实干,各部门密切配合;全社会广泛参与,沙区人民群众的艰苦奋斗。这也说明,只要按照中央的要求,加大力度,持之以恒地开展防治工作,土地荒漠化、沙化是可以得到遏制的。

1. 强化植被保护是防治荒漠化和沙化的重要基础。各地认真实施《防沙治沙法》、《森林法》、《草原法》等,普遍推行了禁止滥放牧、禁止滥开垦、

禁止滥樵采的“三禁”措施，有效保护了林草植被。

2. 实施工程治理，是改善沙区生态环境的根本途径。“十一五”期间国家继续实施了京津风沙源治理、三北防护林、退耕还林、退牧还草、天然林保护、草原建设与保护、水土保持等一批与防沙治沙相关的重点生态建设工程，为实现持续好转奠定了重要基础。

3. 活化治理机制，是鼓励社会力量参与防沙治沙的动力源泉。中央关于全面推进集体林权制度改革、关于加强防沙治沙工作等一系列决策，激发了土地沙化治理者的投入积极性。

4. 实施扶持政策，是推进治沙工作的有力措施。国家实行了生态公益林补偿和草原补贴政策，一些地方实行了治沙财政补助政策，对沙区林草植被恢复和保护起到了良好作用。而且对解决农牧民生计，促进生产方式转变，减轻人口压力有明显作用。

5. 树立典型，以榜样的力量推动治沙工作是有利抓手。在2007年召开的全国防治沙大会上，温家宝总理提出防沙治沙要发扬胡杨精神，并以榜样的力量推动治沙工作。沙区涌现出像治沙英雄王有德、石光银等一大批治沙带头人，他们的行为和精神带动了广大群众，为治沙工作作出了积极贡献。

另外，这些年西北地区降水偏多，也促进了植被的恢复和改善。据监测，近10年来西北地区降水比常年偏多。本监测期与上个监测期相比，北方荒漠化地区降水量总体上持平，局部地区有所增加，降水对促进这些地区天然植被自然修复和工程治理效果的提高发挥了积极作用。

六

荒漠化、沙化的严峻形势及其防治措施

监测分析表明，我国土地荒漠化、沙化的严峻形势尚未根本改变，土地沙化仍然是当前最为严重的生态问题。

1. 我国是世界上荒漠化、沙化面积最大的国家，而且还有31万平方公里具有明显沙化趋势的土地。

2. 川西北、塔里木河下游等局部地区沙化土地仍在扩展。

3. 我国北方荒漠化地区植被总体上仍处于初步恢复阶段，自我调节能力仍较弱，稳定性仍较差，难以在短期内形成稳定的生态系统。

4. 人为活动对荒漠植被的负面影响远未消除，超载放牧、盲目开垦、滥采滥挖和不合理利用水资源等破坏植被行为依然存在。

5. 气候变化导致极端气象灾害（如持续干旱等）频繁发生，对植被建设和恢复影响甚大，土地荒漠化、沙化的危险仍然存在。

上述情况表明，土地荒漠化、沙化仍是中华民族的心腹之患，严重威胁国家生态安全，严重制约社会经济可持续发展，是重大的民生问题。加大力度，加速荒漠化、沙化防治刻不容缓。

1. 强化植被保护。继续推行禁止滥樵采、禁止滥放牧、禁止滥开垦的“三禁”制度，加大林草植被保护力度。充分发挥生态系统自我修复功能，依法推进沙化土地封禁保护区建设，促进荒漠植被自然修复。

2. 推进工程治理。深入推进防沙治沙重点工程建设，进一步完善工程布局，加大沙尘源区治理力度。坚持因地制宜，因害设防，适地适树，乔灌木相结合，大力开展林草植被建设，努力增加沙区植被覆盖度。

3. 优化政策机制。大力推进沙区林权制度改革，进一步明晰产权、活化机制，落实各项优惠政策。遵循物质利益驱动原则，坚持增绿与增收、治沙与治穷相结合，优化扶持政策，活化工作机制，调动广大群众参与防沙治沙的积极性。

4. 严格落实责任。认真落实防沙治沙工作政府负责制，推动防沙治沙单位治理责任制。认真实施省级政府防沙治沙目标责任考核办法，并根据考核结果严格奖惩。

5. 依靠科技进步。推广和应用适用技术和模式，加强技术示范和培训，增加科技含量，提高建设质量。

6. 搞好预警监测。加强监测基础设施建设，建立健全荒漠化和沙化监测预警体系，对荒漠化和沙化动态变化进行适时跟踪监测，为防沙治沙工作提供科学依据。

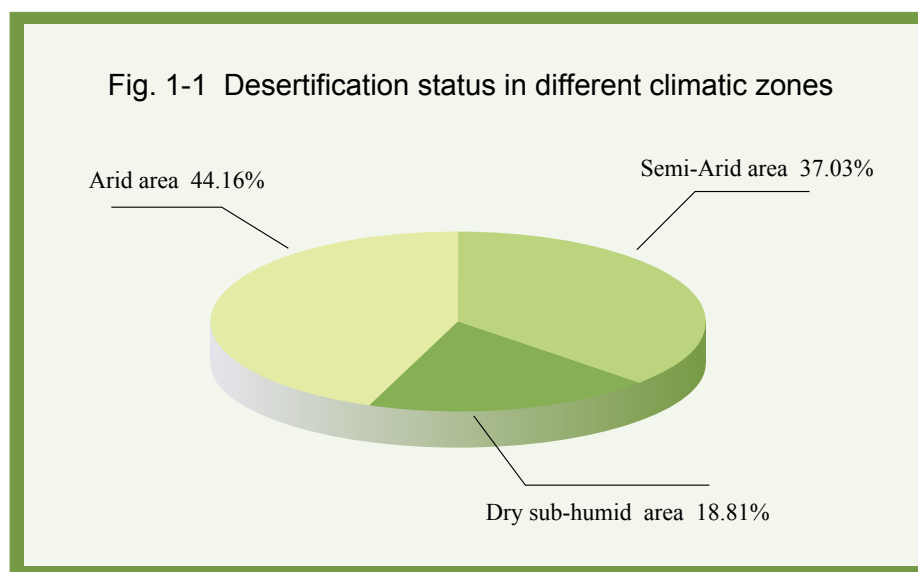
7. 加强部门协作。落实责任、密切配合、齐抓共管，共同做好防沙治沙工作。

I Status of Land Desertification^① and Sandification^② in China

1. Desertification

By the end of 2009, China had a total desertified land area of 2,623,700 square kilometers making up 27.33% of the national territory and located in 508 counties (banners, county-level cities) of 18 provinces (autonomous regions, municipalities) of Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia, Liaoning, Jilin, Shandong, Henan, Hainan, Sichuan, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang.

(1) **Desertification status in different climatic zones.** The desertified land area in arid zone was 1,158,600 square kilometers making up 44.16% of the total desertification acreage; The desertified land area in semi-arid zone was 971,600 square kilometers making up 37.03% while desertified land area in the dry sub-humid zone was 493,500 square kilometers or 18.81% of the total (Fig 1-1).

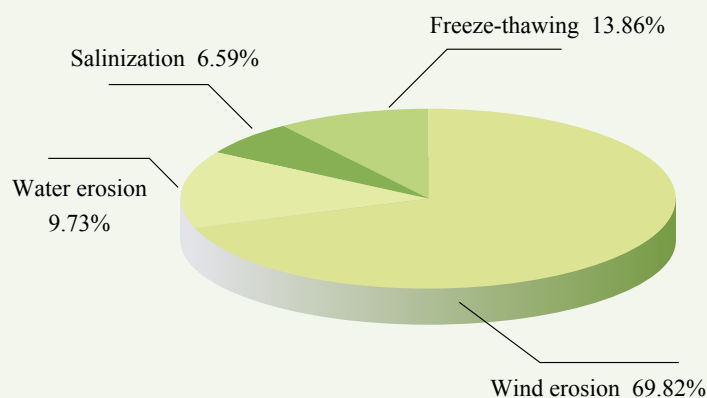


(2) **Status of different types of desertification.** Desertification caused by wind erosion represented 1,832,000 square kilometers or 69.82% of the total desertified land area; the desertification caused by water erosion 255,200 square kilometers or 9.73%; salinization 173,000 square kilometers or 6.59%; and freeze-thawing desertification 363,500 square kilometers or 13.86% of the total (Fig 1-2).

① The term of desertification in this report refers to land degradation in the arid, semi-arid and dry sub-humid areas as result of various factors including climatic variation and human activities. The degraded lands in these areas are desertified lands.

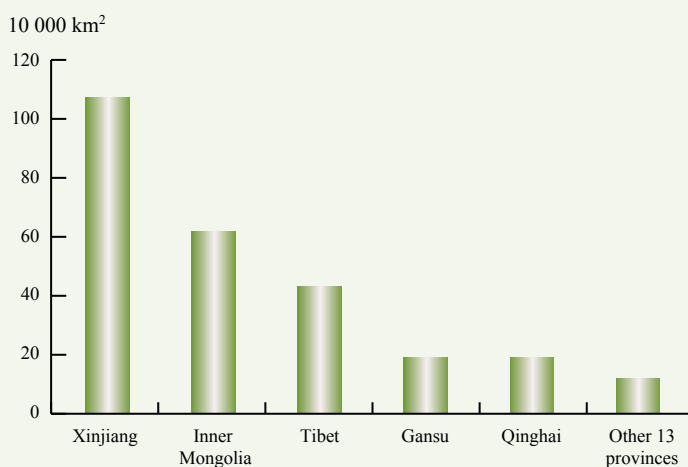
② The sandification in the paper refers to the land degradation characterized by appearance of sand or gravel on ground surface as result of various reasons in all climatic zones. The degraded land with obvious characteristics as above is sandified land.

Fig. 1-2 Distribution of different desertification types



(3) **Desertification status in various provinces.** Desertification mainly occurred in the 5 provinces (autonomous regions) of Xinjiang, Inner Mongolia, Tibet, Gansu, Qinghai with the desertified land area of 1,071,200 square kilometers, 617,700 square kilometers, 432,700 square kilometers, 192,100 square kilometers and 191,400 square kilometers respectively. The accumulative desertified land area of the 5 provinces (autonomous regions) accounts for 95.48% of the total desertified land in China while the other 13 provinces (autonomous regions, municipalities) for 4.52%(Fig 1-3).

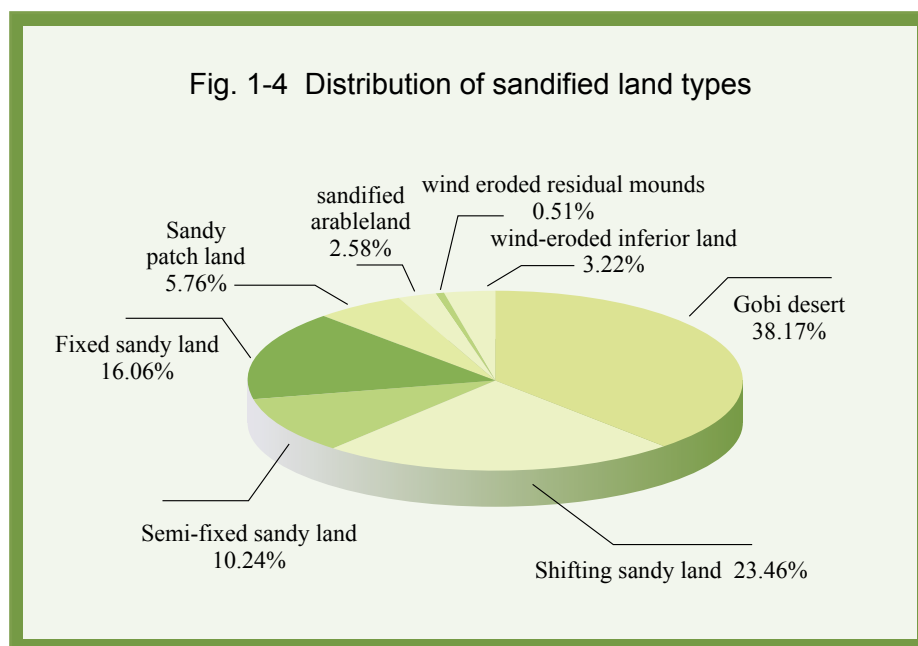
Fig. 1-3 Desertification distribution in various provinces and autonomous regions



2. Sandification

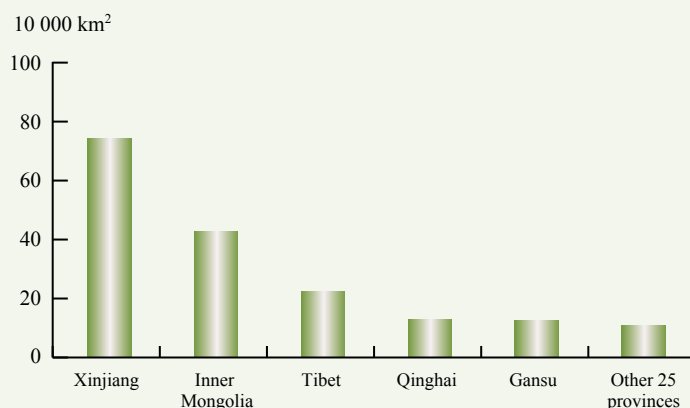
By the end of 2009, China had a total sandified land area of 1,731,100 square kilometers making up 18.03% of the national territory and located in 902 counties (banners, cities) of the 30 provinces (autonomous regions, municipalities) other than Shanghai, Taiwan, Hong Kong and Macao.

(1) **Distribution of different sandification types.** The area of shifting sand dunes (lands) was 406,100 square kilometers making up 23.46% of the total sandified land area of the whole country; The area of semi-fixed sand dunes (lands) was 177,200 square kilometers or 10.24%; Fixed sand dunes (lands) 277,900 square kilometers or 16.06%; the area of sandy patch land 99,700 square kilometers or 5.76%; sandified arable land 44,600 square kilometers or 2.58%; wind eroded residual mounds 8,898 square kilometers or 0.51%; wind eroded inferior lands 55,700 square kilometers or 3.22%; Gobi desert 660,800 square kilometers or 38.17%; non-biological treated sandy lands 66 square kilometers (Fig. 1-4).



(2) **Sandified land distribution in various provinces and autonomous regions.** The sandification occurred mainly in the 5 provinces (autonomous regions) of Xinjiang, Inner Mongolia, Tibet, Qinghai, Gansu with the area respectively of 746,700 square kilometers, 414,700 square kilometers, 216,200 square kilometers, 125,000 square kilometers, 119,200 square kilometers. The sandified land area of the 5 provinces (autonomous regions) made up 93.69% of its total of the whole country and the remaining 25 provinces (autonomous regions, municipalities) for 6.31% (Fig 1-5).

Fig. 1-5 Distribution of sandified land in various provinces and autonomous regions



II

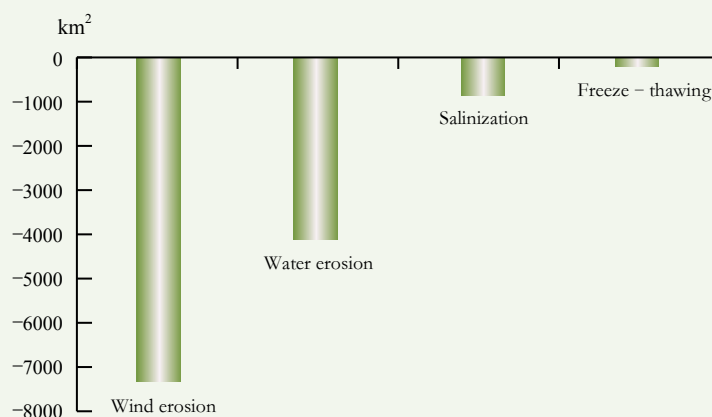
Dynamic Changes of Land Desertification and Sandification

1. Desertification

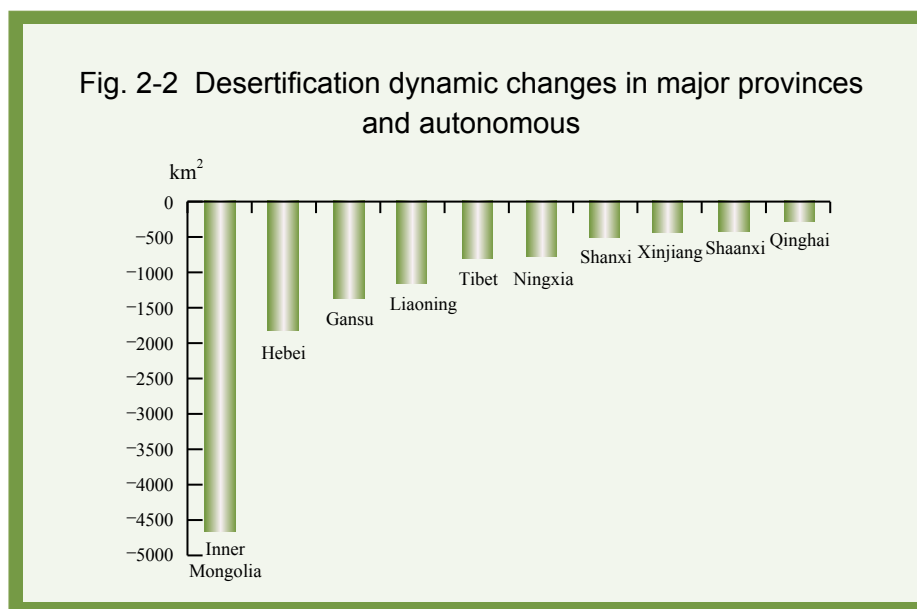
Compared with 2004, the desertified land area for the whole country dropped by 12,454 square kilometers with an annual reduction of 2,491 square kilometers.

(1) **Dynamic changes in terms of different desertification types.** Compared with 2004, the area of wind eroded desertified land decreased by 7,391 square kilometers, water eroded desertified land decreased by 4,115 square kilometers, while that of the desertified land caused by salinization decreased by 830 square kilometers and the desertified land caused by freeze-thawing decreased by 118 square kilometers (Fig. 2-1).

Fig. 2-1 Dynamic changes of different types of desertified land



(2) **Desertification dynamic changes at provincial level.** Compared with 2004, 18 provinces (autonomous regions, municipalities) had net decrease of their desertified land areas, among which Inner Mongolia decreased by 4,672 square kilometers, Hebei by 1,802 square kilometers, Gansu by 1,349 square kilometers, Liaoning by 1,153 square kilometers, Tibet by 789 square kilometers, Ningxia by 757 square kilometers, Shanxi 490 square kilometers, Xinjiang by 423 square kilometers, Shaanxi by 406 square kilometers and Qinghai by 284 square kilometers (Fig. 2-2).



2. Sandification

Compared with 2004, the total sandified land area of China had a net decrease of 8,587 square kilometers with an annual reduction of 1,717 square kilometers.

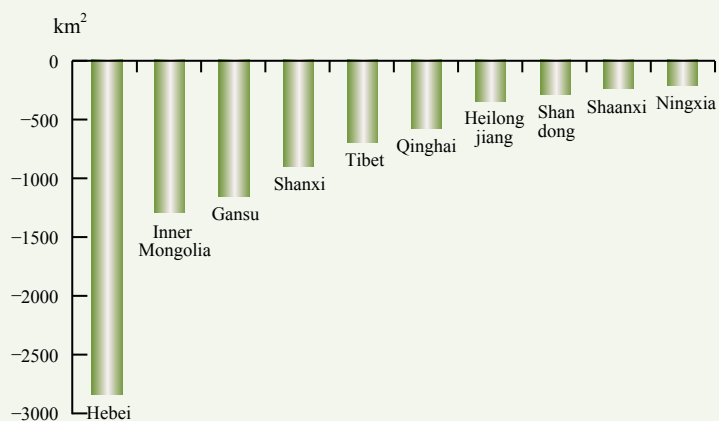
(1) **Dynamic condition of different types of sandified land.** Compared with 2004, the shifting sand dunes (lands) decreased by 5,465 square kilometers, semi-fixed dunes (lands) decreased by 1619 square kilometers and fixed sand dunes (lands) increased by 3,271 square kilometers (Fig 2-3).

(2) **Dynamic condition of sandification in various provinces and autonomous regions.** Compared with 2004, most of the provinces (autonomous regions, municipalities) affected had their sandification land areas decreased to different extents, with Hebei by 2782 square kilometers, Inner Mongolia by 1,253 square kilometers, Gansu by 1121 square kilometers, Shanxi by 877 square kilometers, Tibet by 657 square kilometers, Qinghai by 548 square kilometers, Heilongjiang by 330 square kilometers, Shandong by 262 square kilometers, Shaanxi by 212 square kilometers and Ningxia by 204 square kilometers (Fig 2-4).

Fig. 2-3 Dynamic changes of sandified land of major types



Fig. 2-4 Dynamic changes of sandification in major provinces and autonomous regions



III

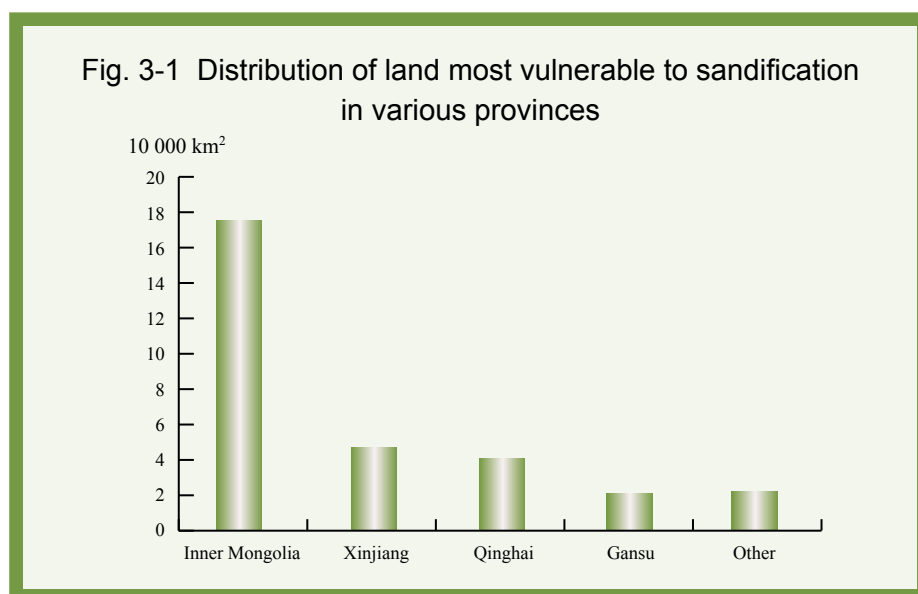
Status of Land Most Vulnerable to Sandification

Land most vulnerable to sandification refers to the land with vegetation degradation, productivity reduction and with witnessed shifting sand patch or wind erosion traces on land surface as results of excessive land use and water resource scarcity but no obvious drift sand piles formed. That is, these lands have obvious sandification tendencies although currently they are not sandified.

1. Present condition of the lands most vulnerable to sandification tendency.

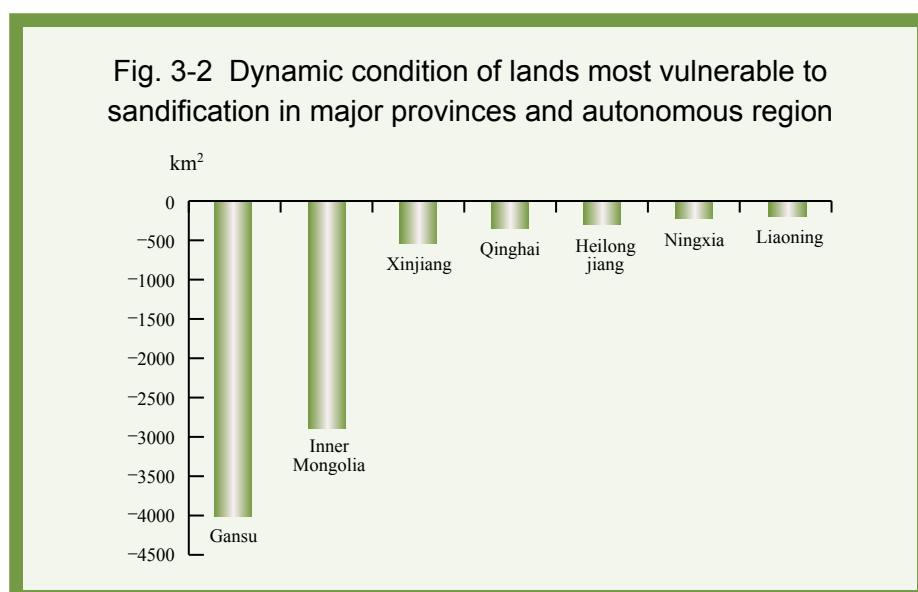
By the end of 2009, China had 311,000 square kilometers of land most vulnerable to sandification comprising 3.24% of total national territorial area. These lands spread mainly in

Inner Mongolia, Xinjiang, Qinghai and Gansu provinces (autonomous regions) with respective acreages of 177,900 square kilometers, 47,500 square kilometers, 41,600 square kilometers and 21,800 square kilometers making up accumulatively 92.86% of the total national area of lands most vulnerable to sandification (Fig 3-1).



2. The dynamic condition of the lands most vulnerable to sandification

Compared with 2004, the land most vulnerable to sandification in China decreased by 7,608 square kilometers with the annual reduction of 1,522 square kilometers or reduced area of Gansu by 3,989 square kilometers, Inner Mongolia by 2862 square kilometers, Xinjiang by 523 square kilometers, Qinghai by 332 square kilometers, Heilongjiang by 287 square kilometers, Ningxia by 217 square kilometers and Liaoning by 201 square kilometers (Fig 3-2).



IV

General Tendencies of Land Desertification and Sandification

The monitoring results indicate that the land desertification and sandification have been curbed in general, with a continuous reduction of total area, but expansion in partial locations.

1. The desertified and sandified land areas in continuous reduction.

From 2000 to 2004, the net area of desertified and sandified land decreased annually by 7,585 square kilometers and 1,283 square kilometers respectively, and from 2005 to 2009 decreased annually by 2,491 square kilometers and 1,717 square kilometers respectively.

2. Land desertification and sandification severity in reduction.

Compared with 2004, light desertified land increased by 34,700 square kilometers, moderate desertified land decreased by 16,900 square kilometers, severe desertified land decreased by 6,800 square kilometers, and extreme desertified land decreased by 23,400 square kilometers. Meanwhile, light sandified land increased by 27,300 square kilometers, moderate sandified land dropped by 9,906 square kilometers, severe sandified land dropped by 10,400 square kilometers, extreme sandification declined by 15,600 square kilometers.

3. Vegetation condition in further improvement.

Firstly, the average vegetation coverage of the sandified lands rose from 17.63% in 2004 to 17.03% in 2009 with an increase of 0.60% within 5 years. Secondly, the area of fixed sand land increased while the area of semi-fixed and shifting sand land decreased. Within the 5 years, the fixed sand land increased by 3,271 square kilometers while the shifting sand land decreased by 5,465 square kilometers and semi-fixed sand land decreased by 1,619 square kilometers. Thirdly, the plant diversity increased. In the typical grasslands within the project area of the Beijing-Tianjin Sand Source Combating Program, the plant diversity index was 1.80 in the area to-be-treated but 2.13 in the treated area.

The monitoring indicates that due to the joint impacts of overgrazing, excessive land reclamation, irrational water use and precipitation reduction etc., the regional sandification at highlands of northwest Sichuan, lower reaches of the Tarim River were in expansion although the expansion speed tended to slow down.

V

Cause Analysis of The Continuous Net Reduction of Desertified and Sandified Land

The total area of desertified and sandified land in China has been in continuous reduction that is mainly attributed to the following factors: the great attention attached by the central government and series of significant strategic measures adopted, down-to-earth actions taken by the local governments with close coordination among their line agencies and the wide public participation and arduous efforts made by the local people. This also proves that the leadership of the central level plus consistent vigorous inputs made in the work of prevention and control can curb the land desertification and sandification.

1. Strengthened vegetation protection as a fundamental basis of desertification and sandification prevention and control.

By the close observation of *the Desertification Prevention and Control Law, the Forest Law, the Grassland Law* etc., the “triple prohibitions (i.e., prohibitions of excessive open grazing, excessive land reclamation and excessive firewood collection)” have been carried out widely in affected area that promote vegetations protection effectively.

2. Implementation of ecological projects as the basic channels of improving eco-environmental quality of the affected areas.

During period of the eleventh five-year plan, China implemented a series of ecological improvement programs such as Beijing-Tianjin Sand and Dust Storm Source Combating Project, the Three-north Shelterbelt Forest Construction Project, the Cropland Conversion Project, the Pastureland Conversion Project, the Natural Forest Protection Project, the Grassland Rehabilitation and Conservation Project, the Soil and Water Conservation Project etc. These key projects contributing to desertification control established solid foundation for continuous improvement of the ecological quality in desertification affected areas.

3. Activation of the operational mechanism as impetus to motivate the public participation in sand prevention and control.

The central government promulgated series decisions regarding collective forest tenure reform and enhancing desertification prevention and control etc. arouse enthusiasm of stakeholders participating in desertification control. .

4. Implementation of supporting policies as effective measure to push forward sandification control.

The central government’s compensation or subsidy for the public ecological forest and grassland, some local governments implemented financial subsidization for sand control have played important roles in vegetation recovery and protection. These policies also contributed to livelihood improvement of the farmers and herdsman, promoting restructure of production

pattern and alleviating population pressure.

5. Models set up to promote the work of sandification control.

At the National Conference on Desertification Prevention and Control convened in 2007, the premier Wen Jiabao called for the Spirit of *Populus euphratica* and learning from models to push forward desertification prevention and control. It is the action and spirit of those models including the “sand-combating heroes” of Wang Youde, Shi Guangyin, motivated the local people to engage themselves in the sandification combating work.

In addition, the higher precipitation level in northwest China over the past years promoted to certain extent the vegetation recovery and improvement.

According to the monitoring, the precipitation in northwest China in the past ten years exceeded the normal level. The precipitation in the period of 4th monitoring kept even with that in the last monitoring cycle in most of the northern desertification affected areas and rose only in partial locations. Addition of precipitation made positive contribution to natural vegetation rehabilitation and maintenance of the ecological project implementation achievements.

VI

Challenges of Desertification and Sandification and Countermeasures

The monitoring results analysis shows that the stern situation of land sandification and desertification in China has not fundamentally changed, and sandification remains the most serious ecological problem of the country, for the following reasons.

1. China is the country with largest area of desertified or sandified lands in the world and 310,000 square kilometers of land most vulnerable to sandification.
2. The sandification of certain areas such as northwest Sichuan, lower reaches of the Tarim River is in expansion.
3. The vegetation in the desertified area in northern China is still in preliminary recovery with weak self regulation capability, poor stability, thus difficult to form steady ecological system in a short period.
4. Negative impacts of human activities on desert vegetation are not at all eliminated. Such irrational practice of overgrazing, unwise reclamation, excessive pick-dig harvesting and irrational water use keep damaging the vegetations.
5. Climate change led to frequent extreme meteorological disasters (such as lasting droughts), which had significant impacts on vegetation establishment and recovery. The danger of land desertification and sandification remains.

The analysis above shows that land desertification and sandification persisted as a

serious threat to national ecological security, a restriction to socio-economic sustainable development, a vital livelihood issue and a serious hidden danger to the Chinese nationality. Vigorous efforts, accelerated treatments to desertification and sandification await urgent actions and measures to:

1. Strengthen vegetation protection.

The "triple prohibitions" should be carried out continuously to intensify vegetation protection. Sandified land closure and protected area construction should be conducted in accordance with the law, to enable a full play of the ecosystem resilience to promote natural restoration of desert vegetation;

2. Push forward ecological project implementation.

The implementation of the key projects of desertification prevention and control should be pushed forward to further improve overall layout of the program and enhance the treatment to major sand source areas. Good practices of "operations according to local specific conditions", "suitable tree species selection for suitable sites", "integrated development of vegetation complex of arbors, bushes and grass" etc. should be insisted in vegetation construction for a higher vegetation coverage;

3. Optimize policy mechanism.

The forest tenure reform should be pushed in the desertification affected areas by further clarifying the forest property rights, activating the mechanism and executing the preferential policies. The material incentive principle needs to be followed to mobilize wide participation by combining ecological improvement and income generation, integrating desertification control and poverty alleviation, optimizing supporting policies and actualizing the operational mechanism;

4. Finalize responsibilities.

The government responsibility system of desertification prevention and control should be implemented, and the entity responsibility system of desertification prevention and control should be finalized. The performance assessment and evaluation regulation on desertification prevention and control responsibility of the provincial government should be conducted by delivering reward and punishment;

5. Depend on science and technology advances.

Suitable technologies or operational patterns should be disseminated by reinforcing technical demonstration and training, improving technology application level and raising construction quality;

6. Improve early warning and monitoring.

The monitoring infrastructure construction should be strengthened to establish sound desertification and sandification early warning and monitoring system, and to track the

desertification and sandification dynamic on timely basis to provide scientific evidence for decision making and action taking;

7. Strengthen inter-sector cooperation.

Concrete efforts should be made jointly by all relevant departments in desertification prevention and control by means of clarifying roles and responsibilities and advancing close cooperation and collaboration .



Map of Distribution of Desertification in China



中国沙化土地现状分布图 (2009)

Map of Distribution of Sandification in China

