



Desertification combating in China

- Governmental efforts and technical transfer

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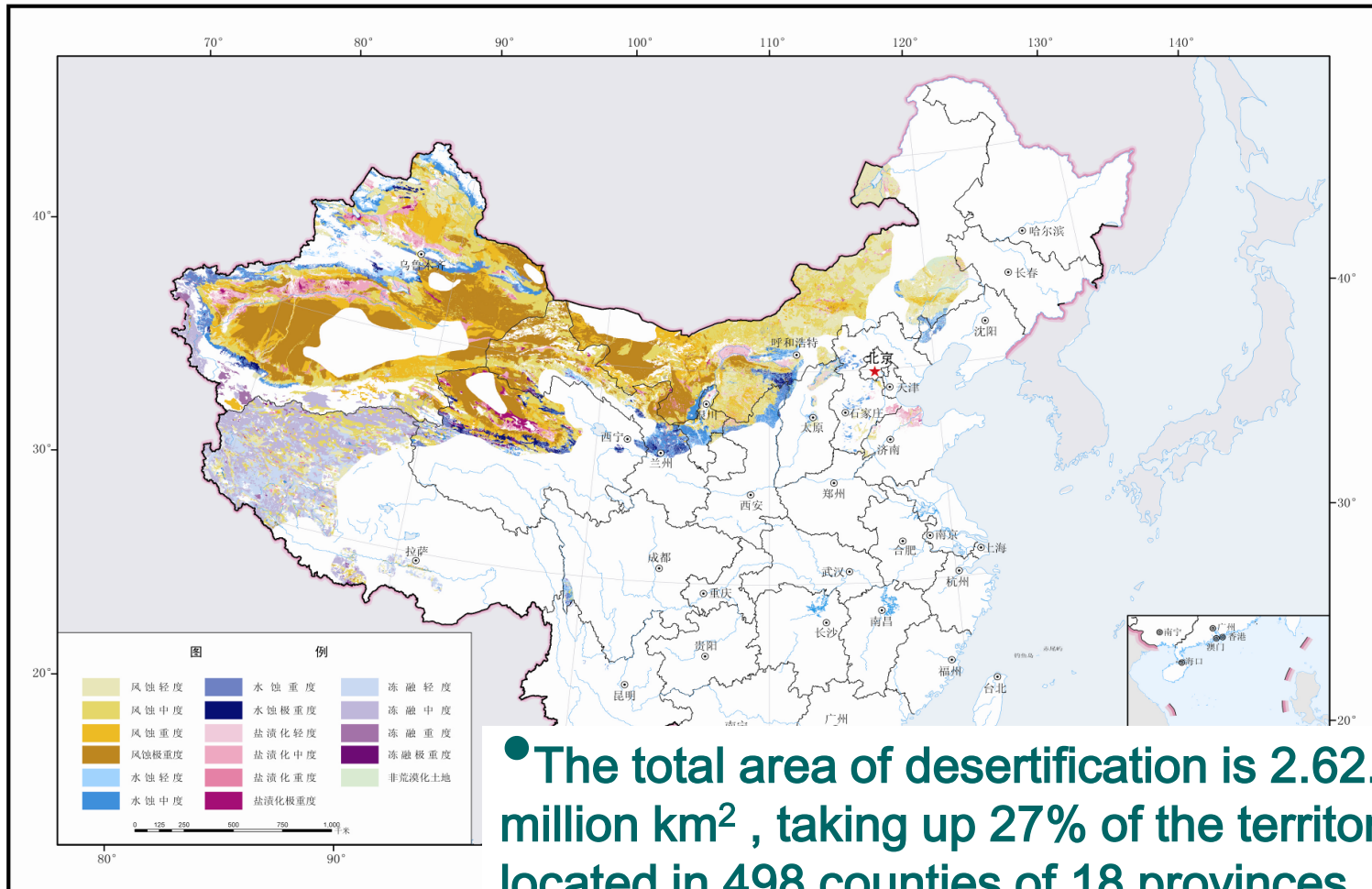
I. Desertification in China

II. Governmental efforts

III. Technical transfer

Desertification Distribution in China

中国荒漠化土地类型及程度分布图

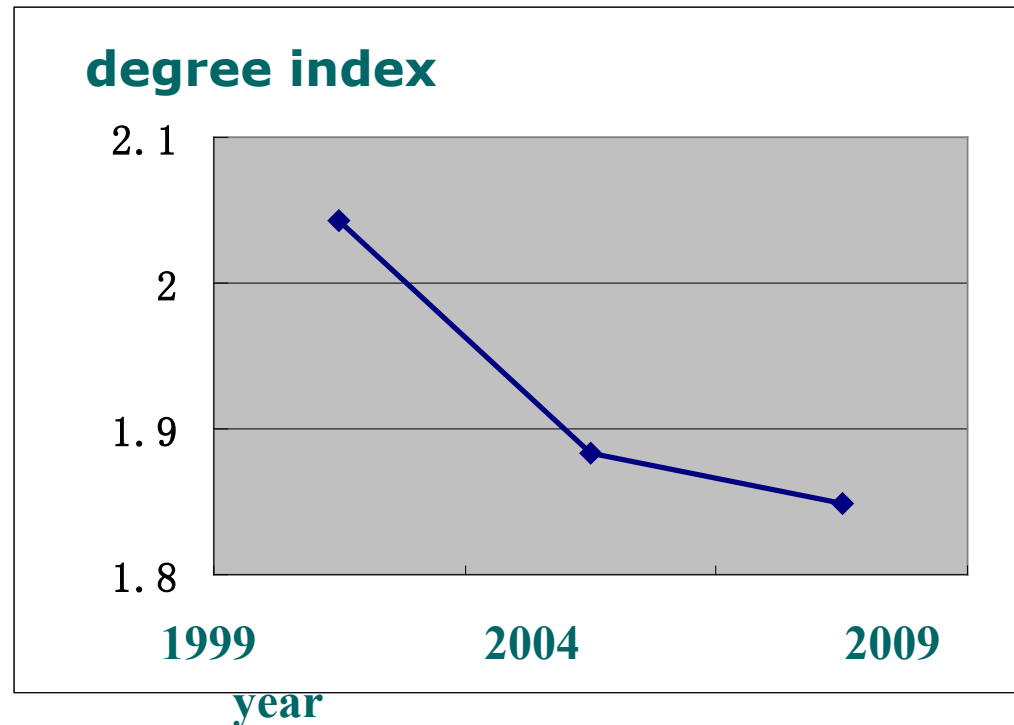


● The total area of desertification is 2.62.37 million km², taking up 27% of the territory, located in 498 counties of 18 provinces. (SFA 2010)

The change of the average degree index of land desertification

year	1999	2004	2009
average degree index of land desertification	2.04227	1.8834579	1.849336

The average degree of desertification in China is decreasing since 1999.



**1994-1999, annual
increase of sandy
desertification 3436km²**

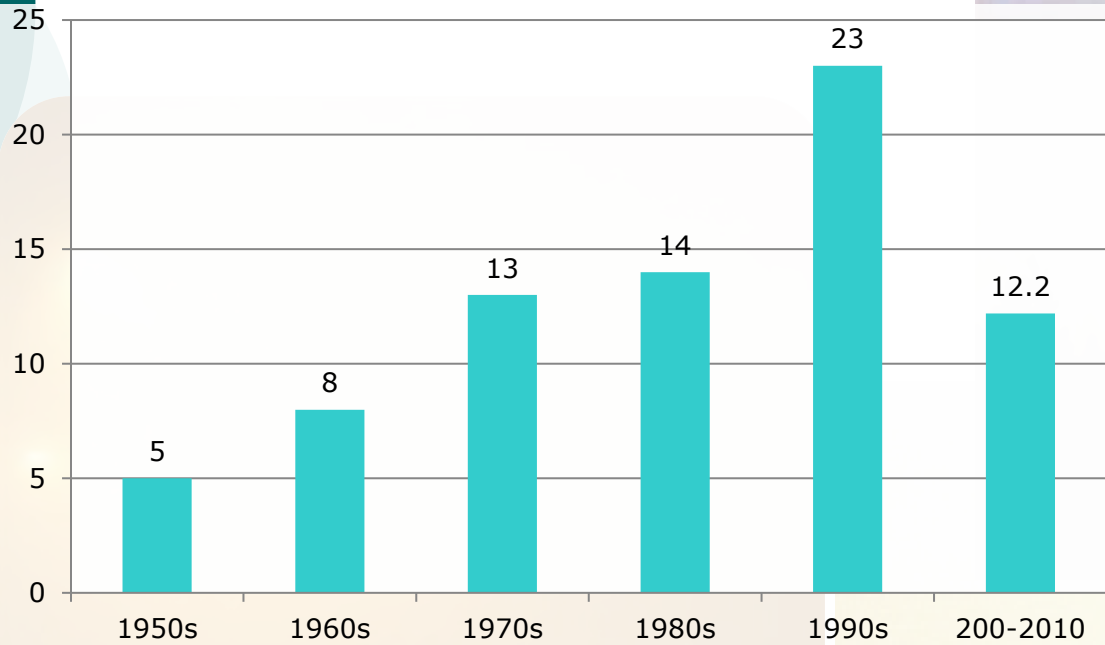


**Annual reverse of
1283km² sandy
desertification**

**Third round national
desertification monitoring**



Annual Average Dust and Sand Storms (DSS) in China in 20th Century and recent 10years

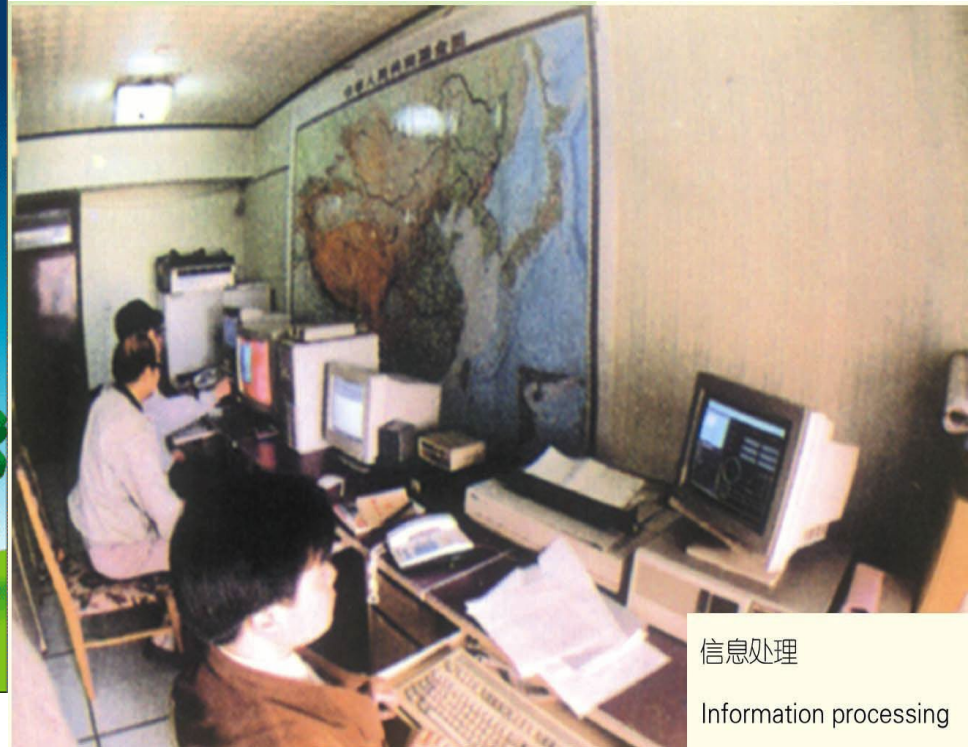
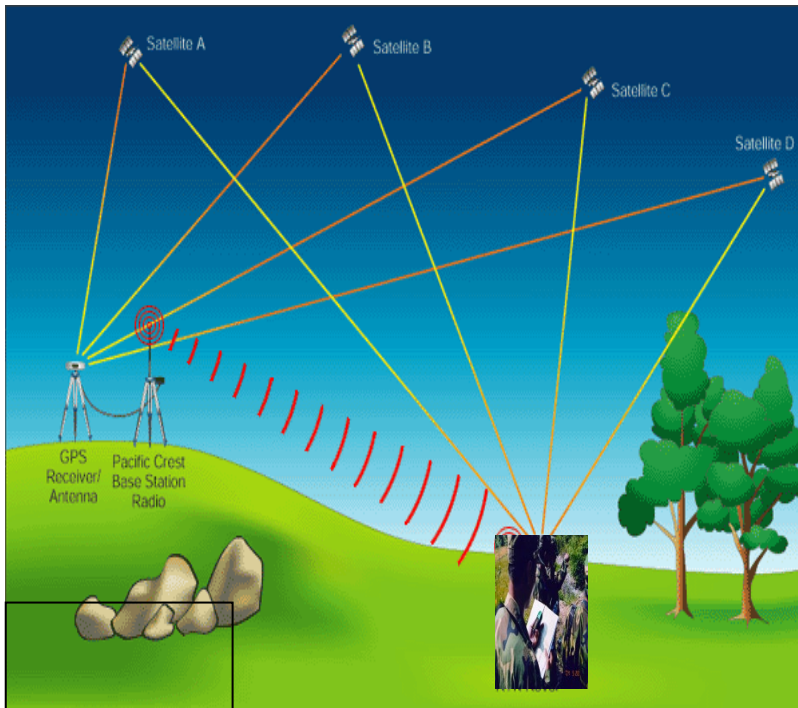


Governmental efforts –Basic principles

- Integrated desertification combating into State social and economic development plan
 - **Taking action based on laws,**
 - **Applying scientific based approaches**
 - **Integrated management and cross-department cooperation ,**
 - **Governmental efforts supported by social mobilization and all stakeholders participation**

Strengthen Scientific support to provide basis of national Programming

- Monitoring and assessment system
- Dissemination of best practices



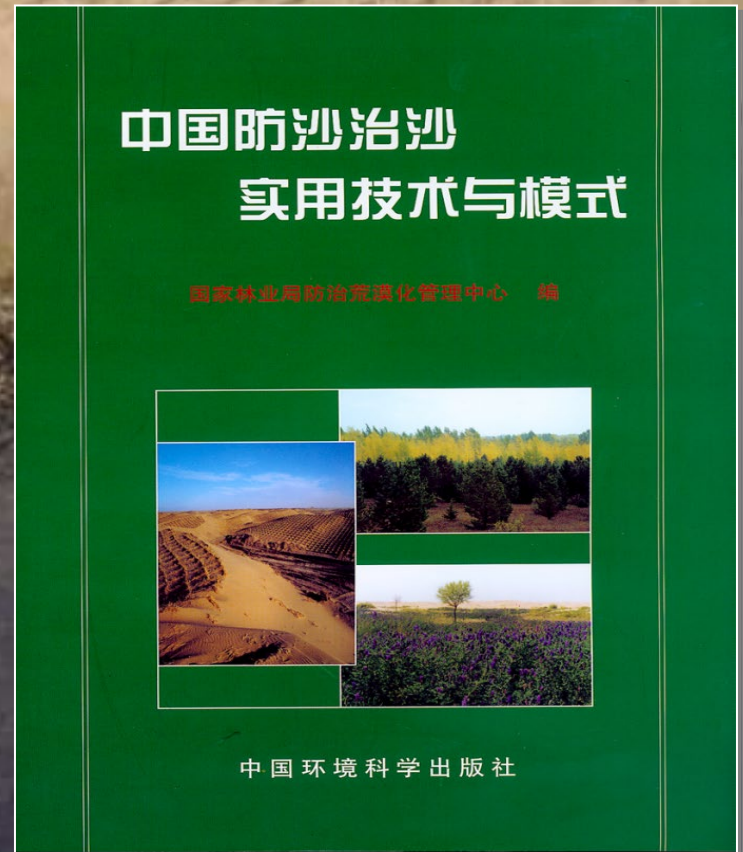
信息处理

Information processing

● **Compilation of best practices**



Expert consultation for scientific decision-making



BEST PRACTICES FOR LAND DEGRADATION CONTROL IN DRYLAND AREAS OF CHINA

PRC-GEF Partnership on Land Degradation in Dryland Ecosystems
China-Land Degradation Assessment in Drylands



- 49 cases were collected from 10 provinces and compiled as a book
- covering 10 subcategories and 5 categories of techniques
- including sand dune fixation, re-vegetation, soil erosion control, agro-forestry and utilization of natural resources
- Financed jointly by GEF-China and GEF-LADA project

Check Dam

Xifang County, Gansu Province, P.R.China

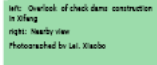
Definition: Check dam is kind of sediment storage dam of 2m below and is built in channels to control the down cutting of channel bed.

Description: The technical demonstration site is located at the Loess plateau with continental monsoon climate, drought and less rain in winter and spring, moderate rainfall in summer and autumn. The amount of average annual rainfall is 326.5 mm and the amount of water surface evaporation is 1421.0 mm. The average frost-free period is 152 days, soil types are Haliqi soil, loessial soil and alluvial soil. Loessial soil fertility which is suitable for growing forest and grass. Runoff modulus is 3264 m³/km², erosion modulus is 4230 t/a/km². The amount of surface runoff of Yuan tableland accounts for 47.4 percent of the total watershed and sediment accounts for 12.4% of the total.

Location siting, Cases: Technology area: 65.0 km² of demonstration area. SNC measure: engineering measures. Land use: sloped land and economic forest. Climate: Semi-arid.

WOCAT database reference: Related approach: Check dam approach. Compiled by: Wang Yongjun, Shi Yu. Location: Jialing Forest University. Date: 2008. September. 2007. Editor's comments: Check dam is widely used for soil and water conservation nation and worldwide, such as Europe and Japan.

Construction steps: 1. Site location and clean base: according to the direction of the design, make out the scheme of the dam base, on the ground clear and remove the 10% layer and seaward lean to a solid bedrock or earth layer build combination grooves on the two sides of filling cliff with a size of 0.2 m to 1.0 m both in width and depth. 2. Clear foundation preparation, layered filling and spilling, the thickness of filling is about 0.1 m to 0.25 m, ramming stone roller or compaction machine can be used as compaction equipment. dry built dam is controlled between 1.2 m and 1.25 m. 3. Spillage excavation, the section dimensions are determined by the design flood, upstream slope is placed by cement and stone masonry, and pointing also to prevent seepage.

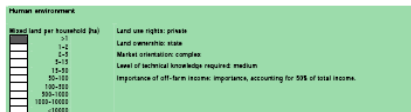
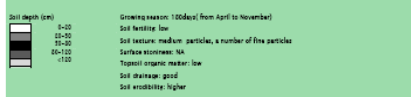
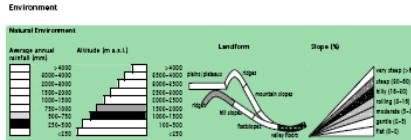
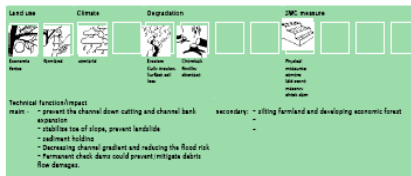


left: Overview of check dam construction in Xifang right: Nearby view. Photographed by Lei Xiebo



Classification

Land use categories



Grass Grid Sand Barrier, Naiman Banner of Inner Mongolia, China

Use straw/bamboo, weed or shrub branches to form square lattice or row shape barrier to anchor the dunes and plant trees and grass inside the grids.

The technical demonstration zone is set in Naiman Banner to cover a land area of 8124 square kilometers. The climate conditions of the zone: 8.4°C in annual mean temperature, 340mm in annual precipitation. It is a crop and livestock farming combined region, where soil suffers severe desertification. Due to underlying economic development and local living standard improvement, Therefore, combating desertification is the top priority for local socio-economic development.

The objective of this technique is to fix dunes, recover vegetation and improve ecological environment.

The technical steps: (1) set grid or row barriers made up of wheat straw or maize stalks in movable sand in spring or autumn. Linear barrier should be configured perpendicular to the wind direction in the sandbars when cooperating wind or singular direction wind is prevailing; grid barrier suit large area of movable dunes with uncertain wind directions with the size of 1.5m*1.5m grid and 20cm cut-offting slope ground. (2) upon completion of the barrier, plant trees and grass in the grid yellow willow (Salix glauca) 0.2m*1.5m in spacing. The cuttings should be prepared before March and stored in sand, and planted immediately after being prepared in autumn. The size of cuttings is at 40cm in length. Remove dry sand and dig a hole in a depth leveling with the surface, then cuttings are planted, and (3) the protection shall be conducted after barrier is set and trees are planted to ban the entry of herbicides and insecticide. Copying of the yellow willow is conducted four years later. The project site enclosure may be relaxed in June through October to allow pasturing according to vegetation restoration condition.

Three years after barrier construction, the planted materials may perish into manure and vegetation is formed inside to fetch a good sand fixation effect.

Naiman Banner used this technique to control the sand in Zhongguo and Wuliuun and achieved outstanding effect. The drying sand source along the Yellow River is primarily prevented by using the grass grid barrier.



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Huangling Loess Terraces, China

soil bench terraces on the Loess Plateau is used to control eroded and degraded gullies into a series of terraces suitable for cultivation.

Loess Plateau in north-central China is characterized by very deep loess parent gullies, occupying 20%-40% of the plateau area, have been heavily degraded by soil and gully erosion. Over the whole Loess Plateau approximately 73,300 of these erosion prone gullies have been concerned by terraces.

The case study area (Changyung County) the land that is suitable for farming has been seriously covered. The total terraces area 1008 km² accounting for 96% of the area and proceeding from valley to the edge. The terraces comprise a near earth with vertical or steeply sloping sides and an approximately flat level top. Depending on farmers preference some terraces beds are edged by a raised (or earth ridge) which retains rainwater, others remain without top. The terraces are 20%-25% the bed with a about 3.5-5 meters with a 1-2 meter rise, including about 2000-2500 cubic meters of soil loss table of technical specifications. Generally the rivers are not appreciably protected, but there may be some soil gullies growing in the upper part. The lower part of the tier is cut vertically in the original soil surface, and has no grass cover, being dry and compact. However it is not erosion-prone since it has a waste structure.

If most of the Loess Plateau, the soil is very deep and therefore well suited to rice construction. In addition to downstream benefits, the purpose is to create a environment for crop production through improved moisture conservation, and fixed farming operations, in an average rainfall year, crop yields on terraces land is higher than that terrace construction. Around terrace retention grass bank on one side for 10-15 years when combined with agronomic measures such as applying (1) rice mulch and planting green manure. Some farmers try to make the bank by quick effective, with good benefit but less cost, especially when dealing with big soil drifting areas.

Left: Aerial view over Changyung county. About 90% of the valley are covered with terraces. Rainfall runoff and erosion maintaining soil fertility and forming terraces are said to be key for raised agriculture in this semi-arid environment. Photo by Li U-Changung.

Right: A 4m high terrace near the source of the loess soil at its depth. The upper part is eroding, and combined with green soil bank and trees. Photo by Naiman Banner.

Location: Changyung County, Gansu Province (loess plateau region), China
 Technology area: 1000 km²
 SNC measure: Structural
 Climate: semi-arid
 WOCAT database reference: CT
 Related approach: Terrace Approach
 Compiled by: Huang Yuxian, ZENG Qun-ling
 Project Management Office: Gansu Land Conservation Research Institute, West Road, Department of Resources and Environment Science, Beijing Normal University, China
 Date: Zhongguo, Soil Information, Washington, March, 2006

Editor's comments: China has history of terraces construction during back thousands of years. Terraces have been considered to be a effective off-site sediment control in the Yellow River and to make better conditions for crop production. The results are effective and spectacular terracing on an area of over 73,000 km².

Sand barriers and windbreaks

固身荆顶固沙造林示意图



粘土沙障与梭梭造林结合固沙



草方格沙障固沙

截流分段分期固沙造林示意图



植物活沙障固沙



条带结合, 在沙丘迎风坡和丘间筑地同时造林



砾石方格沙障固沙



塑料立壁方格沙障固沙

迎风坡上第一道固沙造林



第一道造林后沙丘上部移沙



固沙林

造林后沙丘上部大砂下移, 沙丘固定



阻沙林带



农田林网



第二道造林后沙丘顶部固定

Selection of indigenous species





Full Cover



Separate cover

Fiber bag mulching tree planting



Belt cover



Full cover



Aerial seeding



Run-off Interception

Desert vegetation processing and utilization



白刺果(沙枣)



沙葱



红枣



沙米



覆膜洋芋



组培枣苗



葡萄



- Implement effective protective measures and leave abundant room for self-restoration of the ecosystem
- Implemented well designed projects to increase forest and grass coverage
- Put in place a benefit driven system to mobilize the active participation of the whole society




沙枣饮料



沙枣糕点



沙枣

- 
-
- Implemented well designed projects to increase forest and grass coverage

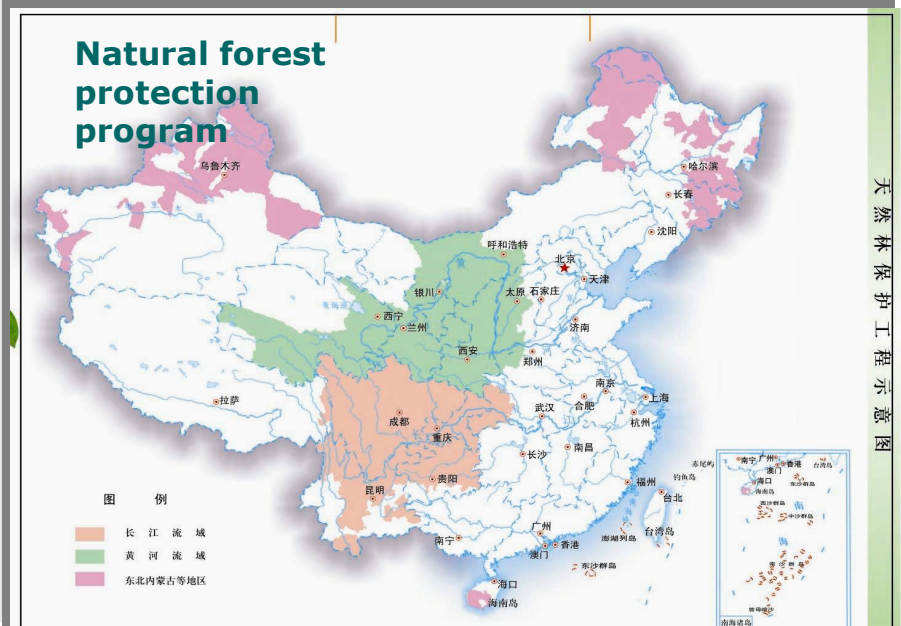
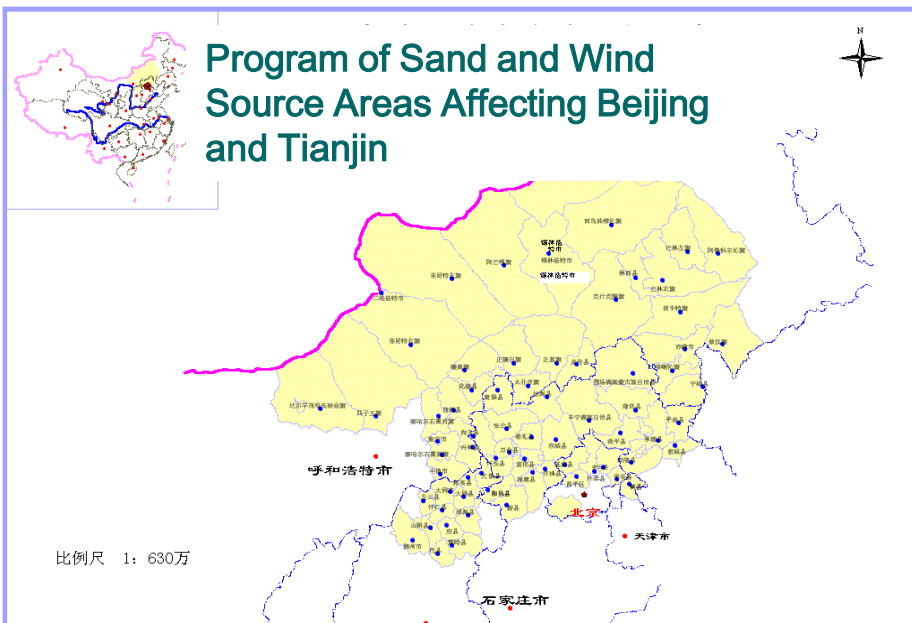
Governmental invested key projects for ecological improvement

- Central Government budget invest
- Local governments implementation
- Farmers participation
- Low input

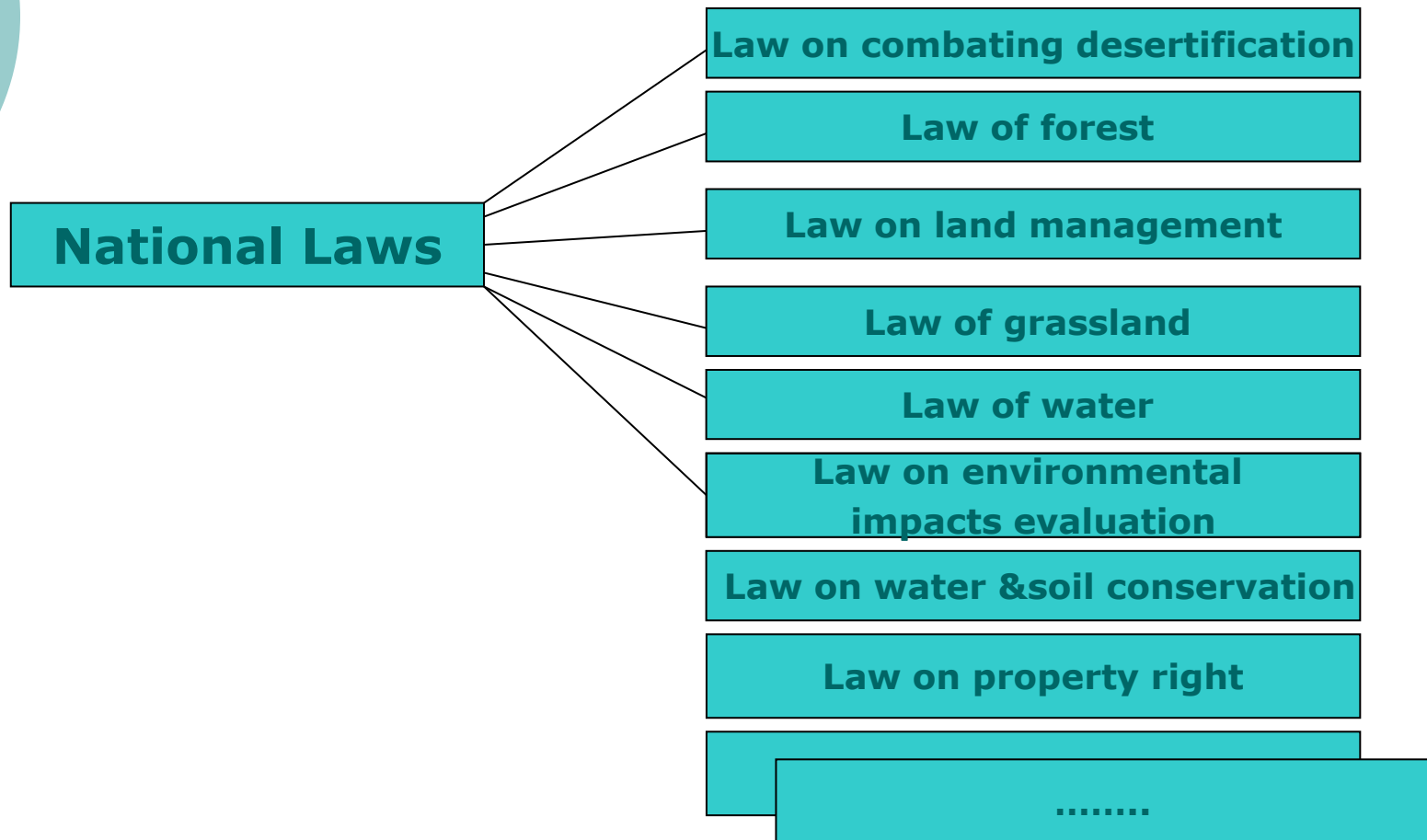


三北防护林体系建设四期工程分区示意图

天然林保护工程示意图



○ Law framework based regulatory measures to control unsustainable land use





Regulatory policy to regulate unsustainable economic practices:

Restriction on over cutting, over grazing

Grassland ecological protection and construction.

Water utilization and water saving policy

Environmental impact evaluation system

Put in place a benefit driven system to mobilize the active participation of the whole society

- Governmental payment and provision of ecological good (PES, Forest ES, GrassES)
 - Ecological improvement project, Land use Transition, Forest management,
- Market system for Forest ecological payment
- Market based sustainable commercial forest management
 - Collective forest property right reform 70years land use right,
 - Logging permission for sustainable use

By incentive policy driving

Private investment



● Farmers participation



- 2007年温家宝总理接见全国治沙劳模
- Premier Wen Jiabao met with working models in 2007

Government payment

Compensation and subsidies to farmers

○ Grain for Green

Duration 8years+
afforestation,25provinces

Soil erosion &flood

- ✓ Cropping easement slope land and sandy land at the Yellow river basin and Yangtz River basin
- ✓ Reforestation: Plantation structure: 7:3 (ecological: economical)

Compensate loss of farmers

- ✓ Grain compensation:
2150kg/ha/year Yangtz River
1500kg/ha/year Yellow River
- ✓ Cash subsidies :750yuan/ha/year
- ✓ Cash for seedlings:
750yuan/ha/year

Second phase: the second 8-year, all cash payment

○ Forest Ecological Benefit Compensation Fund

Duration 10years+ management

Improving forest ecosystem services

Water heads, natural reserves and post afforestation management

- ✓ Forest protection and management
Refforestation, tending, fire, pest disease

Compensation to input of organization, collectives, individual farmers

- ✓ Cash payment: 75yuan/ha/year

Sustainable management of commercial forest

Targeting: Commercial forest (70% commercial : 30% ecological in southern China)
sustainable forest management SFM (local) Vs SFM (Int.)


Objectives: sustainable development of timber and wood production not compromising ecological security, improving income of local forest farmers

- Collective forest property right reform
- Empowerment and return forest property right to farmers
 - Land use right 70 years
 - Forest property right
 - ownership, management, gaining profit
- Logging permission system reform
 - Logging quota application – Sustainable forest management program based on year of tree +market demand
- Timber procurement by forestry department--- market based
- Services provided to individual farmers in land transfer, pest and disease control
- Loan and credit support for forest farmers

Establish mechanism that combine incentives with accountability and heighten the sense of responsibility of all Levels of Local governments

- Agreement between provincial and central government on annual target of the land degradation control.
- Reporting and evaluation and assessment of the performance and effectiveness of provincial governments.
- Linking desertification control with leading governor's official term evaluation.
- Punishment and reward.



- 
- **Ensure Coordination among various departments and full participation of the Whole society in the fight against desertification.**
-

CCICCD 19 ministries

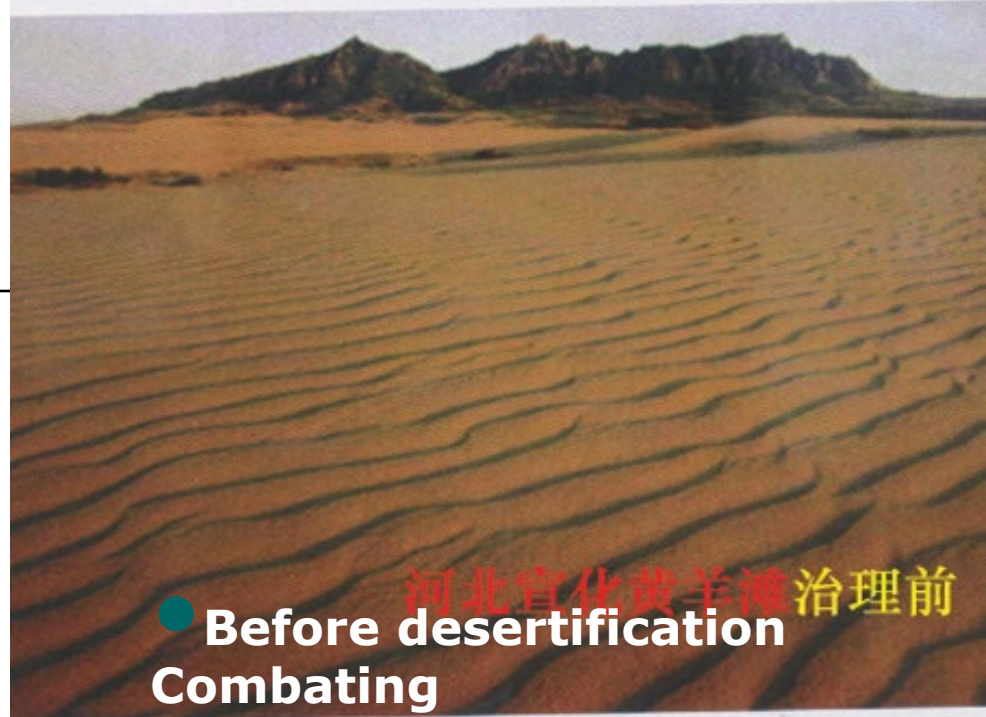
- **State Forestry Administration**
- **Ministry of Foreign Affairs**
- **Ministry of Finance**
- **National development and reform commission**
- **Ministry of agriculture**
- **Ministry of water resources**
- **Ministry of environmental protection**
- **State council leading office for poverty alleviation**
- **Ministry of science and technology**



IV. Improvements made

- Ecological improvement
- Diverse income generation
- Capacity building
- Awareness raising

Ecological condition improved

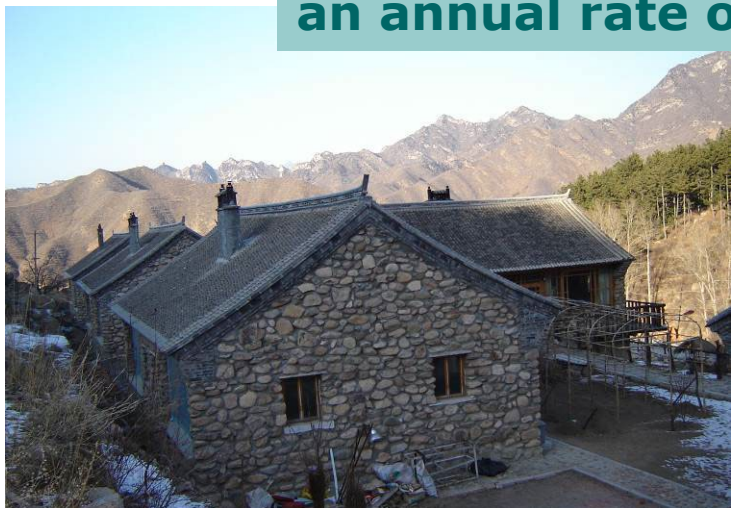


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- Take Beijing and Tianjin Sand Wind source control project for instance, it makes a completion of total 5.76 million hectares of forestry management, forest coverage rate increased from 12.4% in the beginning to the current 17.1%;
 - "Three North" Shelterbelt achieve the accomplishment of 24.67 million hectare forest conservation areas, forest coverage rate has seen an amount up from 5.05 percent in 1977 to the present 10.51%.

Livelihood improvement and income generation



● Rural poverty population decreased at an annual rate of 6.8%.



Capacity building



Awareness raising



密云水库水源保护区存在的问题

Problems of Water Resources in the Watershed of the Miyun Reservoir

水资源匮乏、供需矛盾突出
The shortage of water resources and the conflict caused by differences between water supply and demand.

由于快速社会和经济发展的水质污染问题严重
Pollution caused by rapid social and economic development of the region.

水源保护林结构单一、质量和效益低下等，不能发挥好涵养水源的作用。
Inefficiency of the protection forests due to their uniform structure and unsatisfactory tree tending practices.

水土流失严重，加剧了旱灾
Soil erosion is serious, aggravating drought.

由于水土流失造成的大量泥沙淤积在河道中，加剧了旱灾。
The need for water resource protection forms a hindrance to the development of the local economy, thus making difficult the enhancement of the living standard of the local population.

water problems

学校节水

Water saving in schools

家庭用水
Water saving in daily life

农业节水灌溉
Water saving in agriculture

工业水再利用
Water saving in industry

节水任务艰巨
Consciousness building

利用先进节水设施、设备
Utilization of advanced water-saving facilities and equipment

节水“第二资源”——污水处理、循环利用
The second water resource—Recycling

我完成了！
我还有一项任务呢！
节水任务艰巨

节水任务艰巨

V. Technical transfer

**LADA project Supported
Asian workshop on land
assessment**



**Stakeholders
meeting and field
investigation in
Wengniute County**

Seminar under China Africa Forum



- June 17, 2011 opening seminar for African countries on combating desertification
- Field trip in Hebei

- 13 countries, 33 Governmental officers
- 3 weeks lectures and field trip
- Policy and technical seminar



- **Training workshop hosted by China Forestry Academy under UNEASPEC project on NEA DDS mitigation for Mongolian**



- **1week training**
- **Lectures + field trip**
- **Policy and technical courses**

- **Opening ceremony
Attended by CCICCD and
Mongolian committee to
combat desertification**



Visit waste water Treatment Plant



Experiencing Mongolian culture ecotourism





- Losing session
- Award of certificate

- Bilateral training similar natural condition
- Focus on common issues ,
- Base for piloting project



Thank you.

