

Forests and Forestry in China

----The Status, Challenges and Perspectives

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International Year of Forests

The year 2011 was declared the **International Year of Forests** by the United Nations to raise awareness and strengthen the sustainable forest management, conservation and sustainable development of all types of forests for the benefit of current and future generations.

Global Forest Resources Assessment 2010

Main report



2010年森林资源评估

主报告



References

- Working group of sustainable development of forestry in China, 2003, < The Strategy of Sustainable Development of Forestry in China >.
- SFA, < The Guideline for Protection and Use of Forest land of China (2010-2020) >.
- UNFAO, 2010, The Country Report of China, <Global Forestry Resources Assessment 2010>.

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Basic Information of China



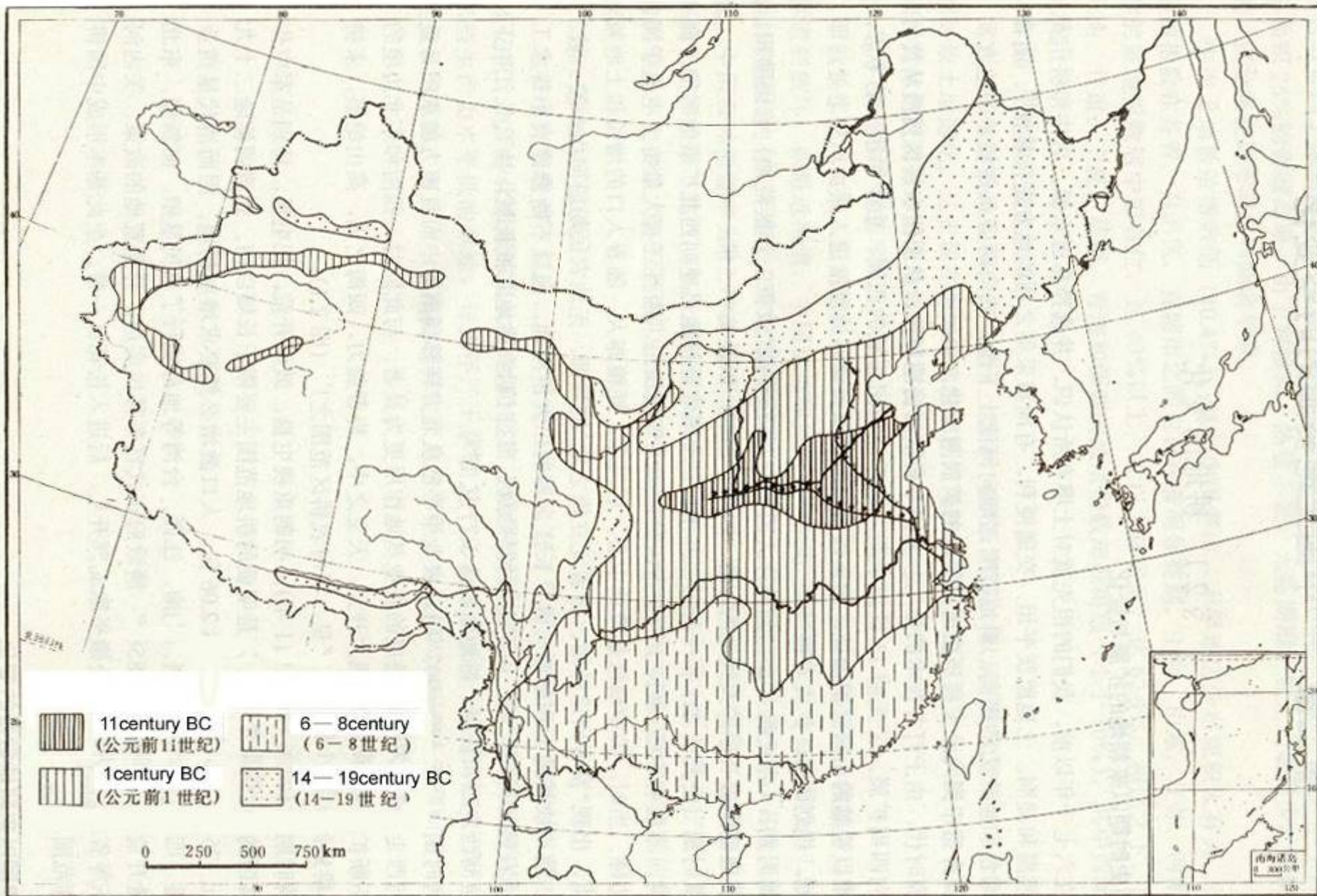
Size: 9.6 mil km² (0.36 mil km²)

Population: >1.34 bil (0.083 billion)

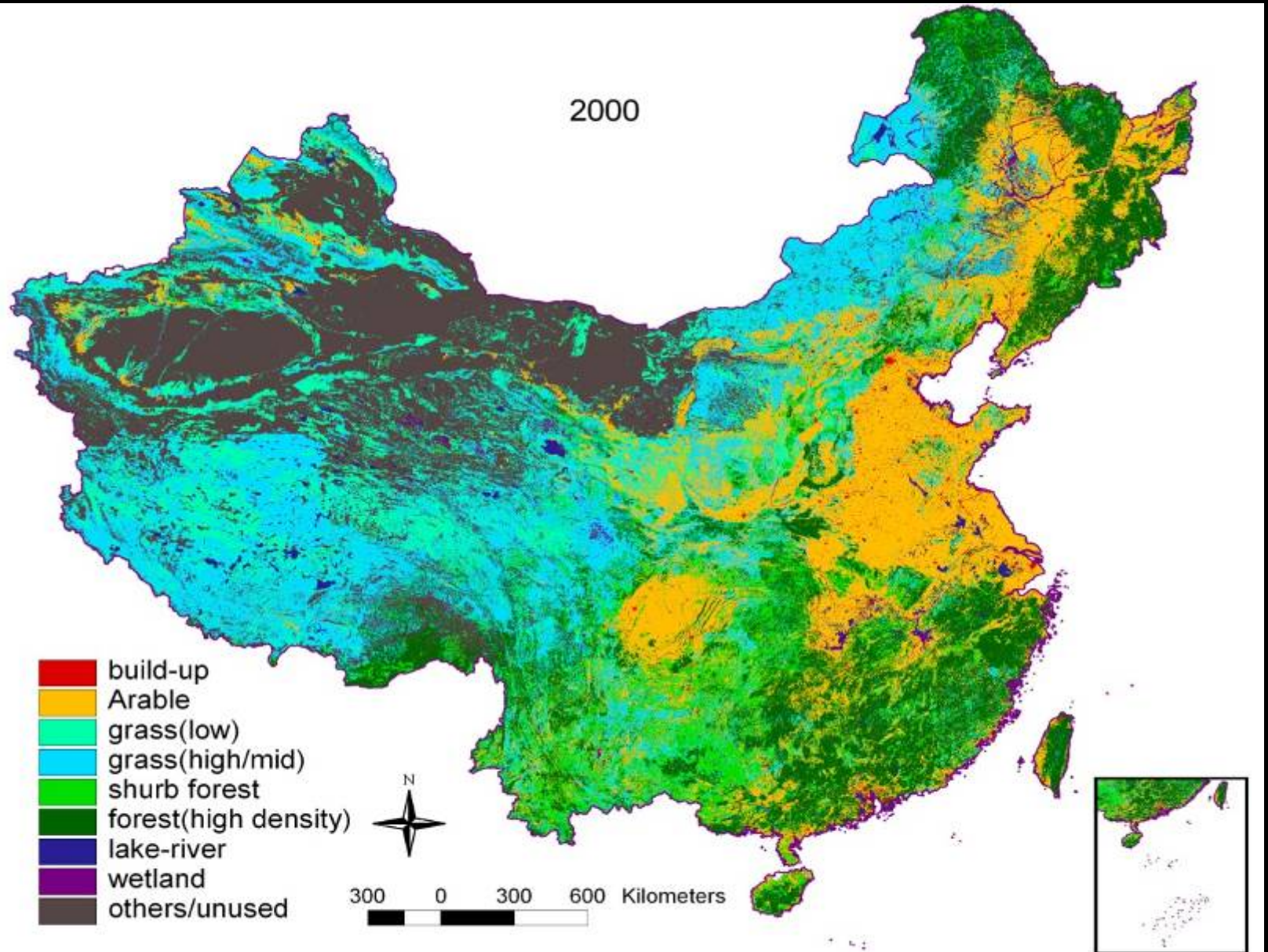
Annual increase : 7 mil

History: >7000 years





Map of Land Use in 2000



- **Divers Climate:**
**N-S: Temperate, sub-tropical
and tropical region**

E-W: Humid to dry land

- **Various topographic
conditions:**

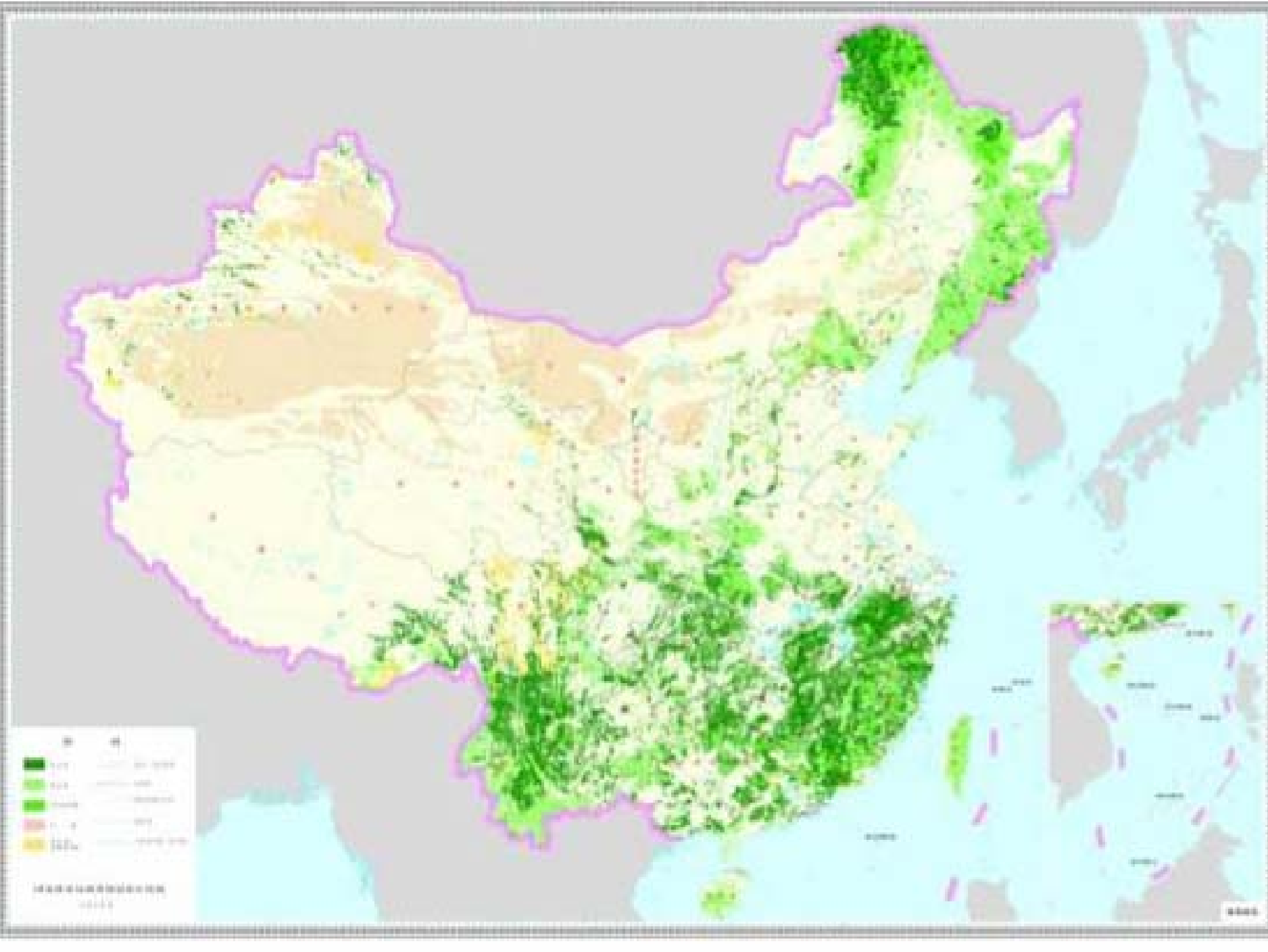
**High mountain and
plateau---50%**

**Hills and lower
mountains----38%**

Plains -----12%

- **Very rich in
biodiversity**

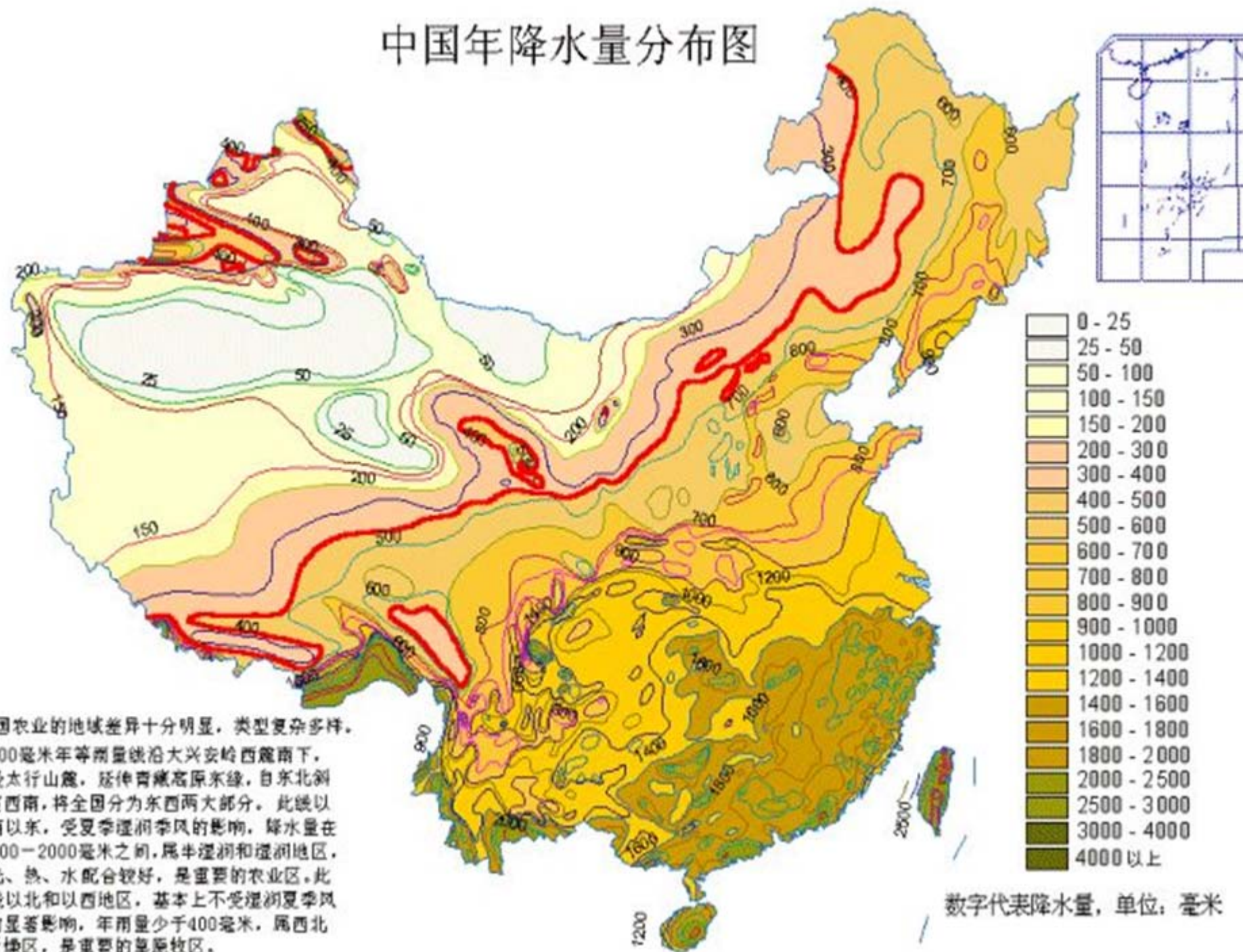




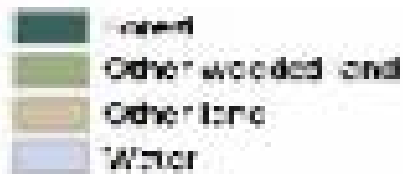
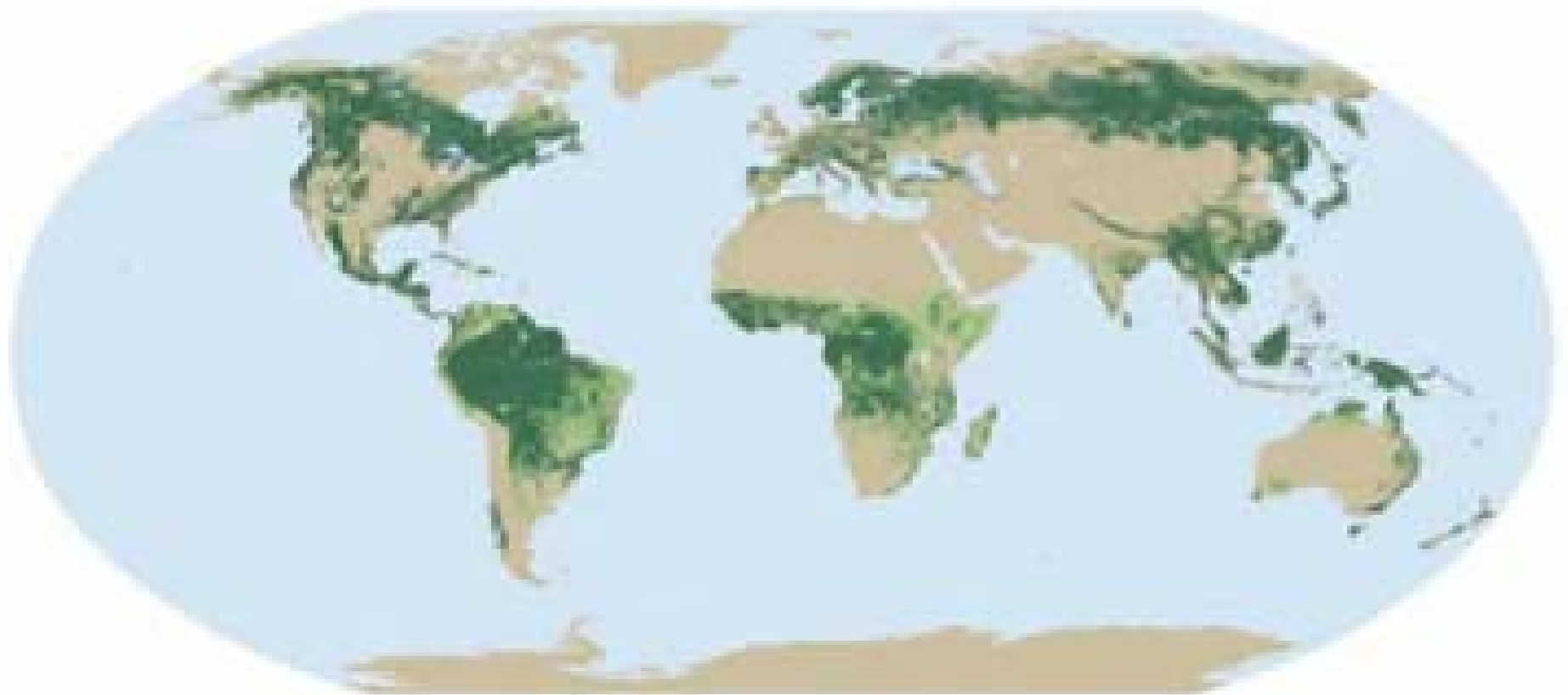
	0-100m		Capital
	100-500m		Major city
	500-1000m		International border
	1000-2000m		Province border
	2000-3000m		County border
	>3000m		Major river

Scale
1:10,000,000

中国年降水量分布图



世界NDVI（归一化植被指数）图



Number of Species in China and the World

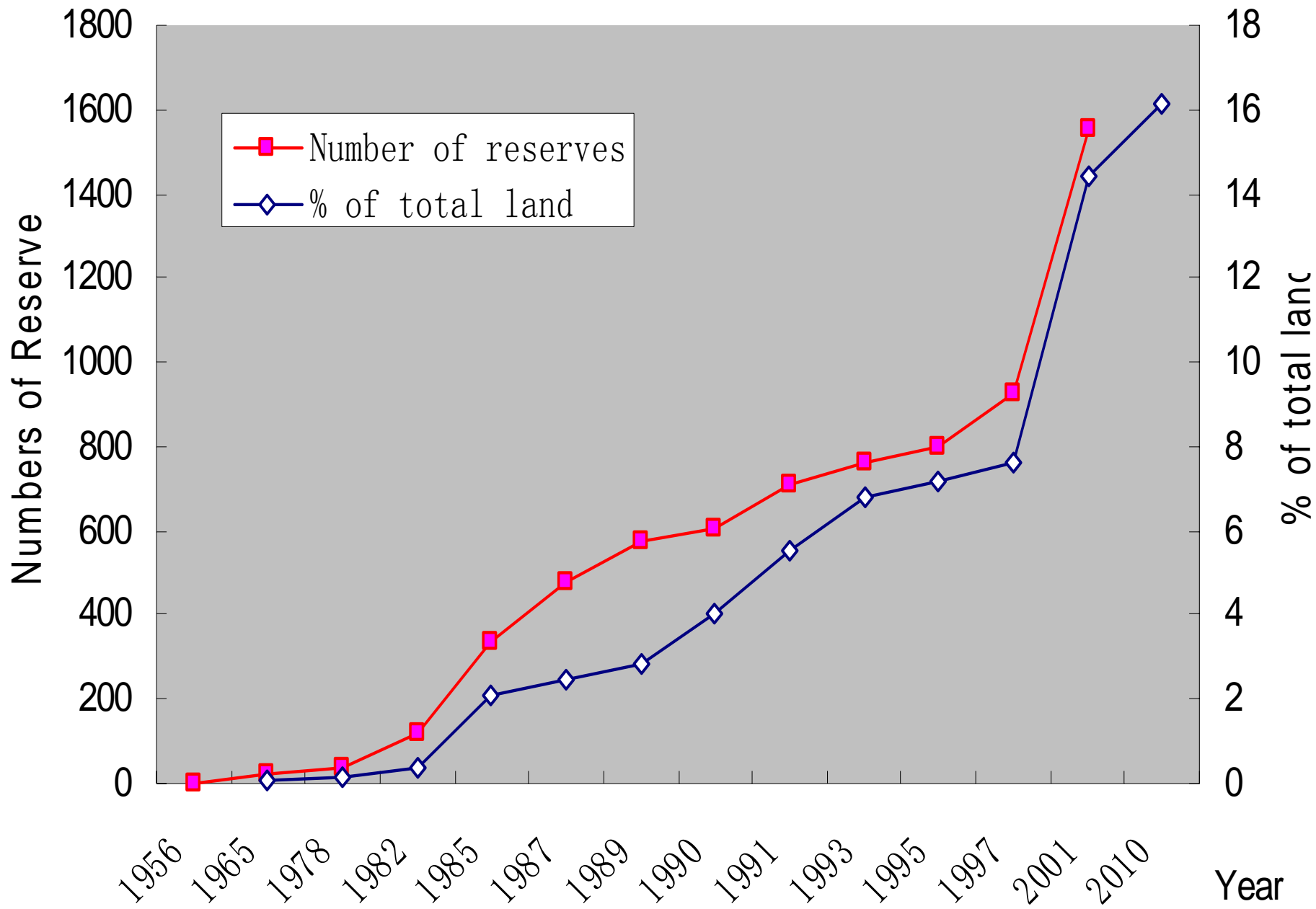
Taxa	Spp. of China (SC)	Spp. Of World (SW)	SC/SW (%)	Estimated Nos. In the world
Mammals	499	4,000	12.5	5,000
Birds	1,186	9,040	13.1	11,000
Reptiles	376	6,300	6.0	
Amphibians	279	4,184	7.0	
Fishes	2,804	19,056	12.1	28,000
Insects	40,000	751,000	5.3	1,500,000
Bryophytes	2,200	16,600	13.3	
Pteridophytes	2,600	10,000	26.0	
Gymnosperms	200	520	37.8	
Angiosperms	25,000	220,000	11.4	
Fungi	8,000	46,983	17.0	1,500,000
Bacteria	500	3,060	16.3	30,000
Algae	5,000	26,900	18.6	60,000

Number of Endemic Genera or Species in China

Taxa	Known gen. or spp.	Endemic gen. or spp.	%
Mammals	499 spp.	73 spp.	14.6
Birds	1,186 spp.	99 spp.	8.3
Reptiles	376 spp.	26 spp.	6.9
Amphibians	279 spp.	30 spp.	10.8
Fishes	2,804 spp.	440 spp.	15.7
Bryophytes	494 gen.	8 gen.	1.6
Pteridophytes	224 gen.	5 gen.	2.2
Gymnosperms	32 gen.	8 gen.	25.0
Angiosperms	3,116 gen.	232 gen.	7.4

- **Economic development in last 30 yrs :**
Annual increase GDP--9% ; 11% for 2010
- **Policies of conservation:** Tremendously changed since 1999
- **Reserves:** Very fast growing in last 30 years





Important Data of Forests in China



Definition of forest

- **Canopy density ≥ 0.2**
- **Canopy density of shrubs ≥ 0.3
in W. China only**
- **Size ≥ 0.0667 ha (1/15 ha).**

- **Forest coverage :**

**China---8.0% in 1949 to 20.36% in 2008
(65% for natural forest and 35% for plantations)**

Germany---- 30%

World---31%

- **Forest types:**

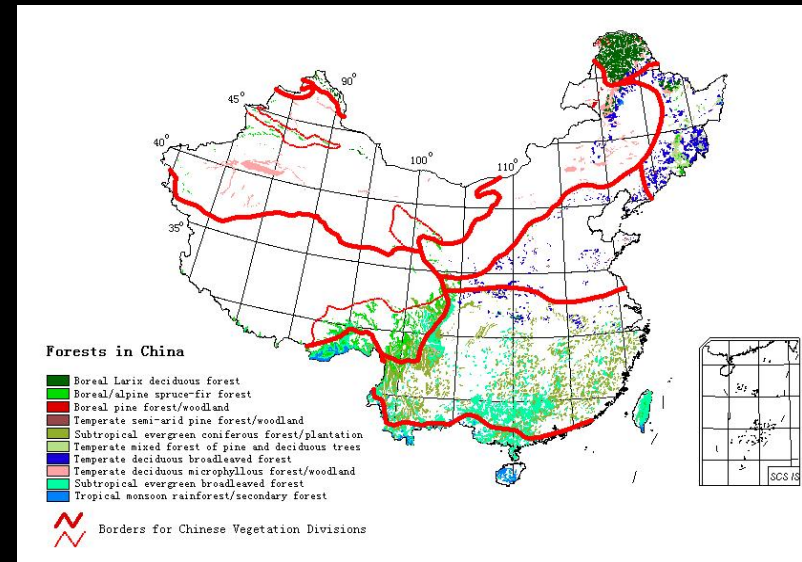
Boreal forest

Temperate mixed forest

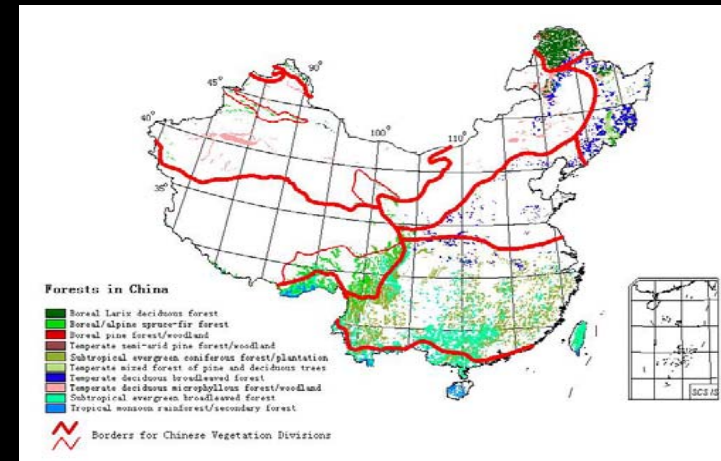
Warm temperate deciduous forest

Sub-tropical evergreen forest

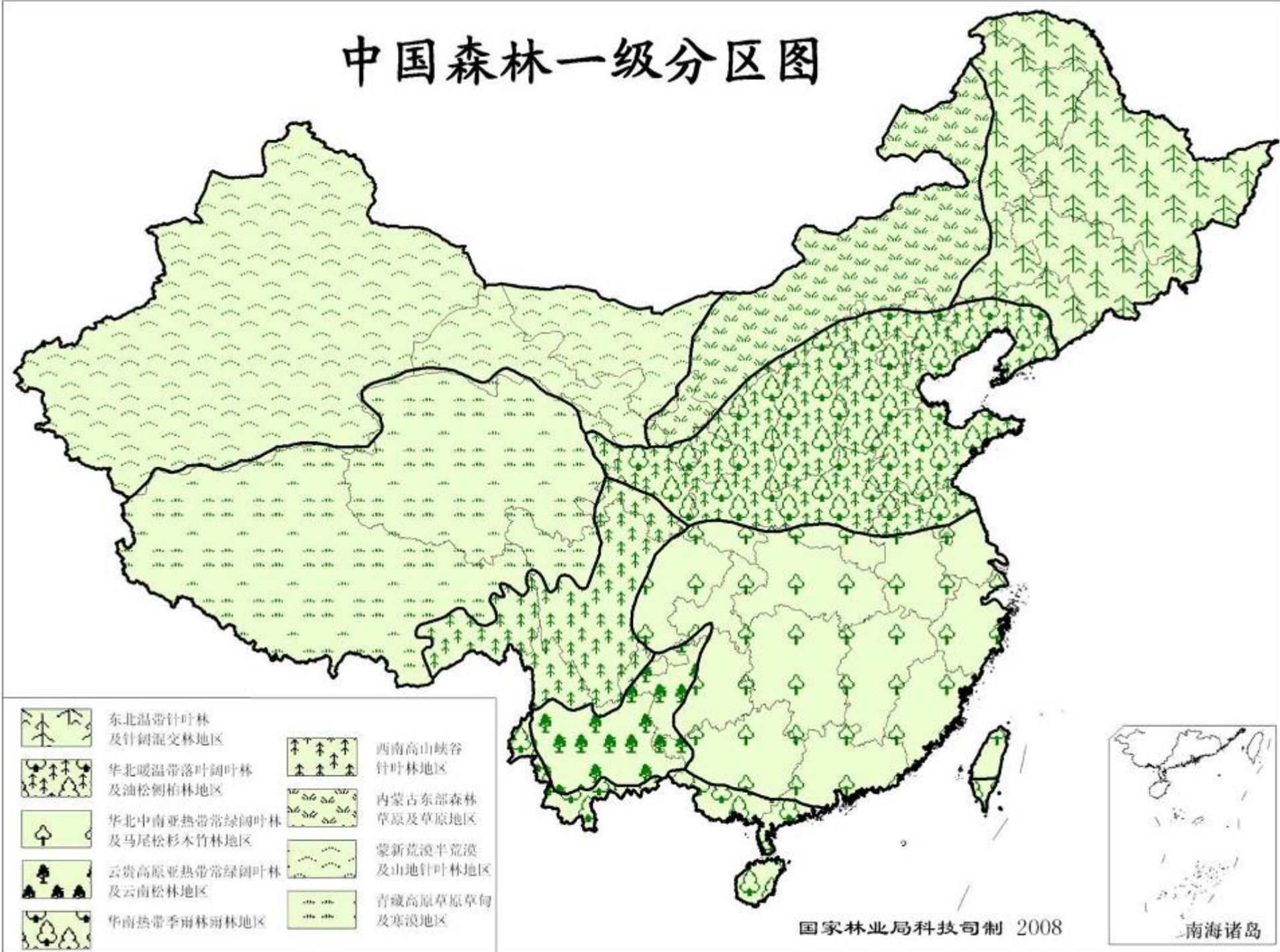
Tropical rain forest



- **Uneven distribution:**
 - 95% in east part
- **Natural forest---N.E. and S.W.**
- **Plantations----S. , N.E. and S.W.**
- **Forest area:**
 - China----195 mil ha in 2008
 - Germany---- 10.7 mil ha in 2005
- **Stocking volume:**
 - China----13.21 bil m³ in 2008
 - (87 % by natural forest and 13 % by plantations)
 - Germany----3.2 bil m³ in 2005



中国森林一级分区图



中國森林二級分區圖



Forests of China



Classification of forests

- **Timber forest** Forest land supplying industrial wood.
- **Firewood forest** Forest land yielding heat energy materials
- **Economic forest:** Forest land only for non-wood forest product, not include fruit forest.
- **Protection forest** Forest land designated for ecological protection.
- **Special purpose forest** :Forest land mainly for tree species resources conservation, ecological environment protection, forest tour and scientific experiments, including experimental forest, reserved-seed forest

Classified forest management

- Non-commercial forest (2020: 40% of forestland) :
for regulating and cultural services
 - Protection forest
 - Special purpose forest
- Commercial forest (2020: 16.1% of forestland):
for provisioning services
 - Timber forest
 - Economic forest
 - Firewood forest

- **Forest cover per capita in 2008:**

China---0.132 ha

Germany---0.13 ha

World---0.60 ha

- **Volume per capita in 2008:**

China---9.421 m³

Germany---34.2 m³

World---72 m³

- **Volume/ ha in 2003:**

China---80 m³

Germany>300m³/ha

World---114m³/ha



- **Canopy density:**
China---0.54
World---0.70
- **Annual consumption**
in 2010: 432 mil m³
(increasing 5.72 mil m³ /yr)
- **Annual timber production**
in 2010: 81 mil m³



- Imported wood and wood products in 2010:

Volume---184 mil m³

Value---U.S.\$ 47.5 bil

Mostly from U.S.A. (12.88 %),

Indonesia(11.03%), Thailand (10.36%).

Malaysia (9.9 %) and Russia (7.4 %)

- Exported wood and wood products in 2008:

Volume--- 77.88 mil m³

Value--- U.S.\$ 46.3 bil

Mostly to U.S.A. (23.98 %), Japan (9.72 %),

HK (5.24 %), U.K. (4.62 %) and Germen (3.23 %)

Goals made in 2003

Year	Cover (%)	Timber production (mil m ³)	Volume (m ³ /ha)
2010	20.3	160 (60 % from plantations)	84
2020	23.4	300 (70 % from plantations)	90
2030	25.5	300 (80 % from plantations)	95
2050	>28	300 (80 % from plantations)	118

Note: The timber production was 81 mil m³
and its 39.44% from plantations in 2008 only.

Challenges Facing Forests and Forestry in China

- **Huge demands by big population and fast growing economy**
- **Conflicts between conservation and development**
- **Low capabilities for providing provisioning, regulating and cultural services, mainly caused by poor management**

Current States and the Gap of wood supply

- **wood consumption in 2010---432 mil m³**
- **Annual wood consumption in 2015---
>500 mil m³ probably**
- **The gap of annual wood supply in near future
--- >100 million m³**
- **Need very long time to meet the needs by
ourselves**

Six national programs for forest conservation and sustainable development



1. Natural Forest Protection Program

- Proposed in 1999.
- Duration: 11 years (2000-2010).
- Implementation area: 734 counties in 17 provinces, located in the upper reaches of Yangtze, Upper and middle reaches of Yellow Rivers, and other important distributed areas of natural forests in N.E. China and other places.
- Investment: U.S.\$ 11 bil, from central and local governments and other sources.

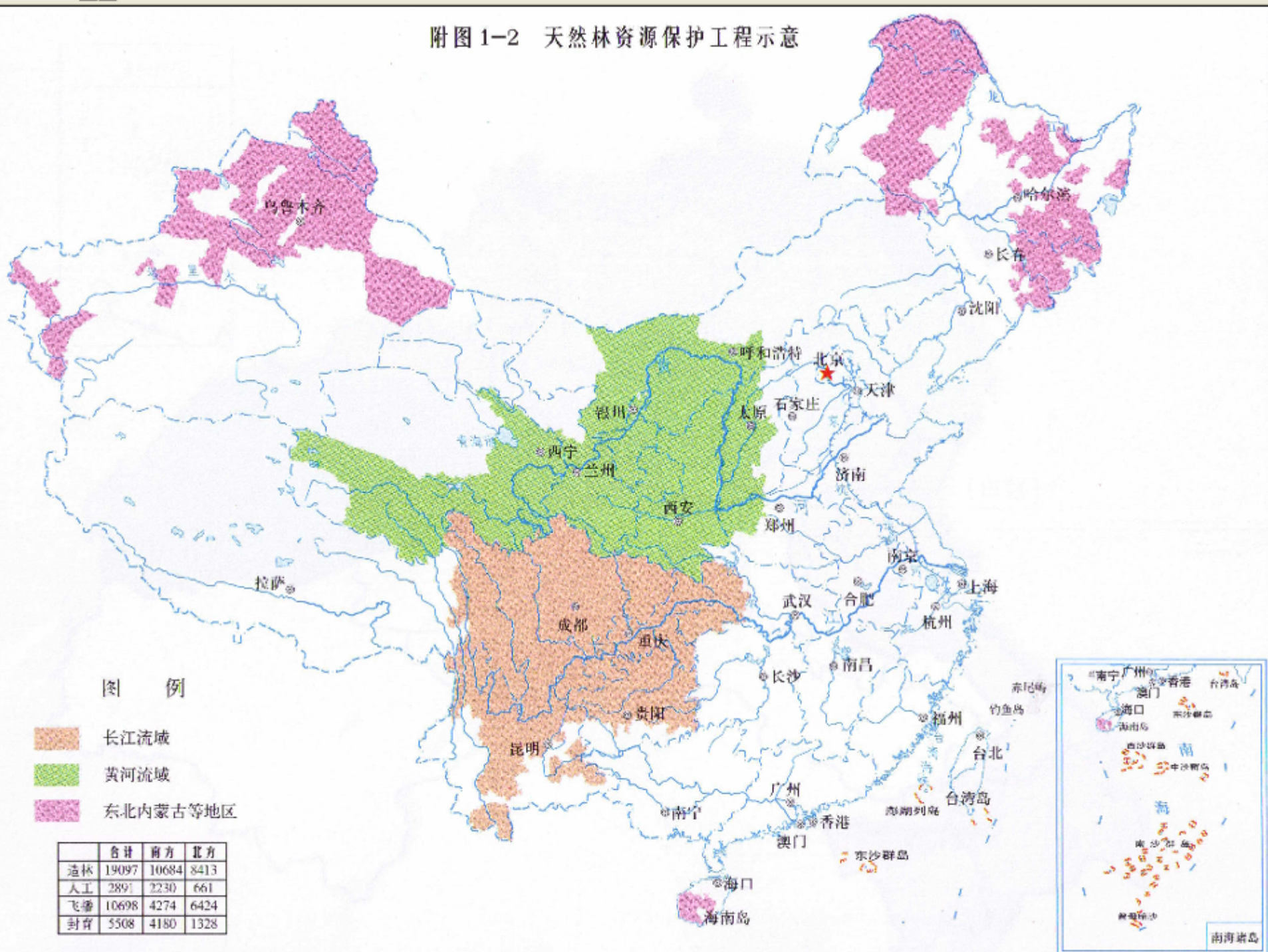


- **Objectives:**

- Effectively protecting 94.1 mil ha natural forest .
- Reducing consumption of forest resource 61 mil m³/yr.
- Increasing forest cover from 17.52% to 21.24% in the implementation area.
- Finding alternatives for 0.74 mil forest workers.



附图 1-2 天然林资源保护工程示意

















2. Program for Conversion of Cropland to Forest or Grassland

- **Goals:** To stop growing crops on the slopes deeper than 25° in the mountainous regions, and then converting them to forest or grassland.
- **Objectives:** Converting cropland to forest or grassland for 14.67 mil ha and making plantation 17.34 mil ha.



Implementation area:

25 provinces.

Duration:

10 years (2001-2010)

Approaches:

Laws and regulations

Public awareness

Financial compensation
to farmers by cash,
grains and seedlings.



附图 1-4 全国退耕还林工程示意











3. Three-north Shelterbelt Development Program and Shelterbelt Development Program along Yantze River

- Three-north Shelterbelt Development Program

Started in 1978

Implementation area: 590 counties.

Goal: Making plantation 7.56 mil ha and restoring natural forest 1.94 mil ha

Budget---U.S.\$ 1.2 billion in 2001.

- Shelterbelt Development Program along the Yantze River

Started in 2001

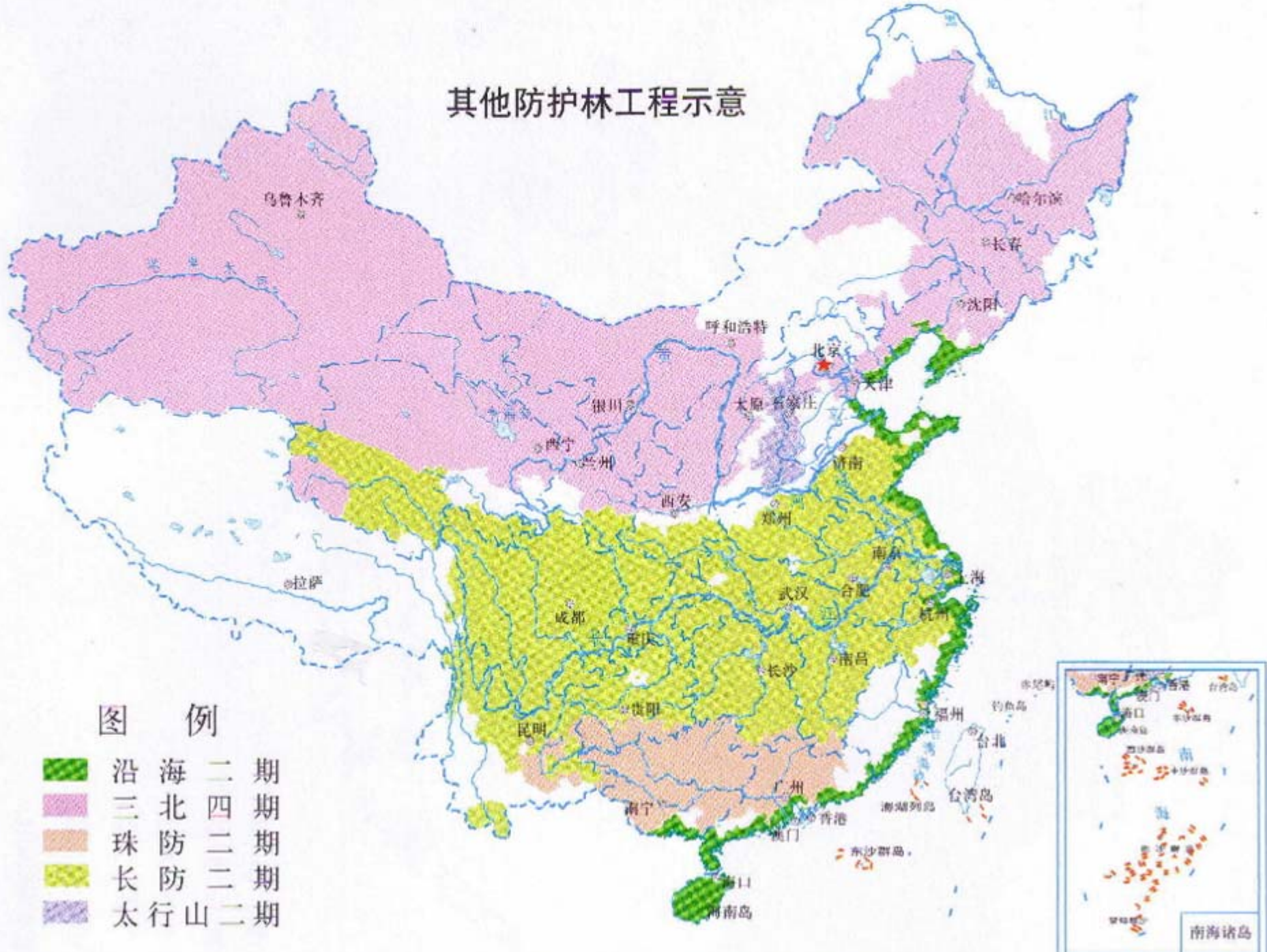
Implementation area: Yantze River

Goal: Making plantation 5.78 mil ha and Restoring natural forest 6 mil ha.

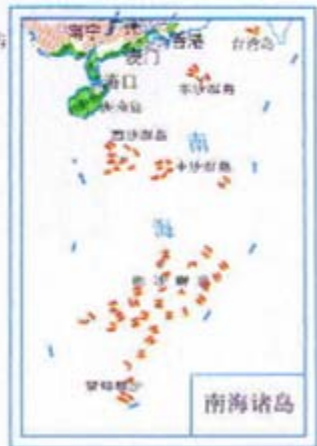
Investment----U.S.\$ 2.5 bil in 2001



其他防护林工程示意



- 图 例
- 沿海二期
 - 三北四期
 - 珠防二期
 - 长防二期
 - 太行山二期













4. Wildlife Conservation and Natural Reserves Development Program

- **Goals:**
 - Protecting key endangered animals and plants.
 - Increasing number and improving facilities for conservation *in situ* and *ex situ*
 - Establishing an advanced national reserve network.
- **Duration:** 50 years (2001-2050)
 - Phase 1 (2001-2010): Protecting 16.14 of land
 - Phase 2 (2011-2030): to 16.8% of land.
 - Phase 3 (2031-2050): to 18% of land.
- **Investment:** U.S.\$ 30 mil in 2001.













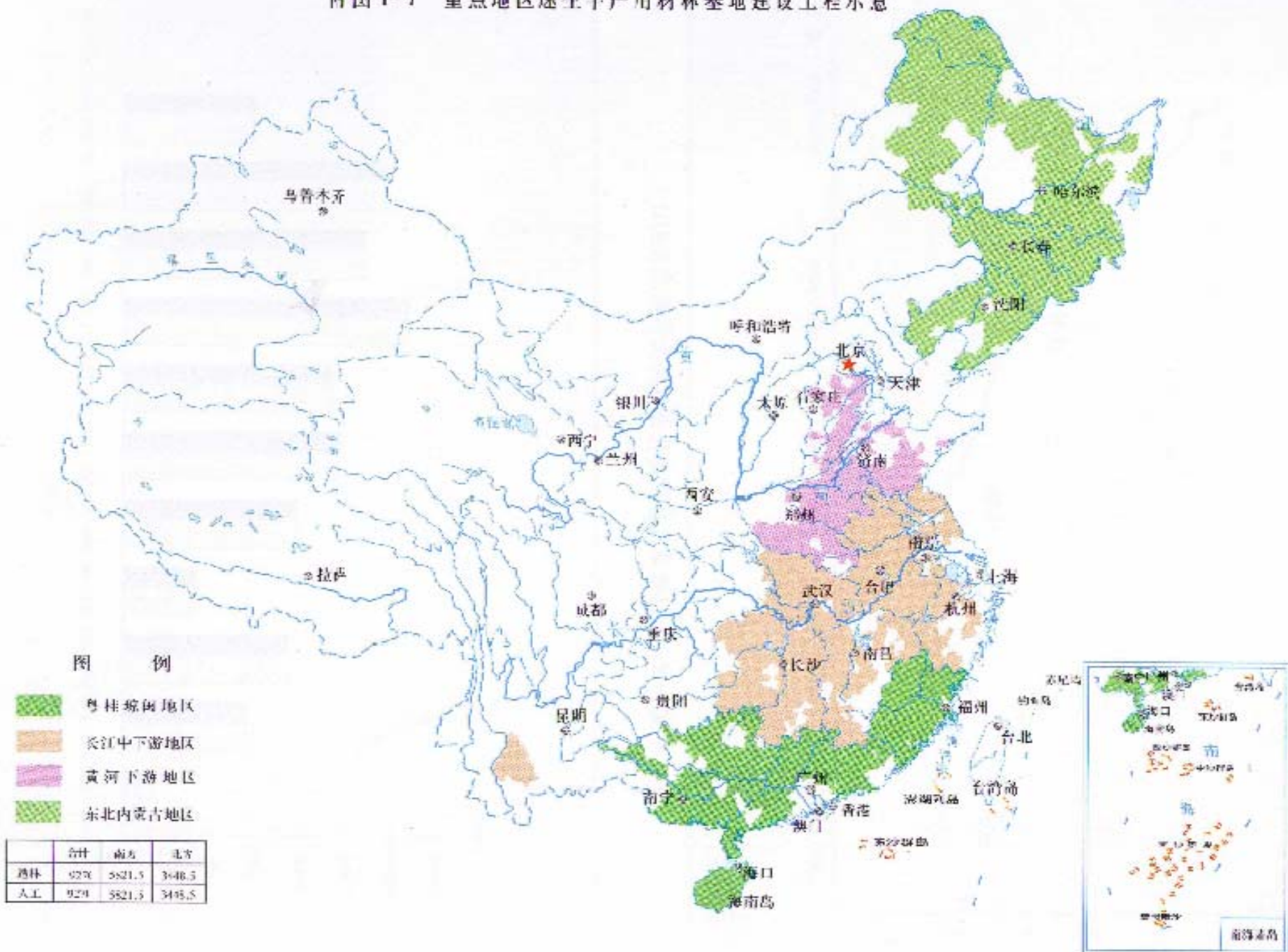
梭梭 (*Haloxylon ammodendron*) 林

5. Forest Industrial Base Development Program in Key Regions with a Focus on Fast-growing and High-yield Timber Plantations

- **Implementation Area:**
18 provinces with better site conditions.
- **Duration:** 15 years (2001-2015)
- **Goals:**
Planting 13.33 mil ha timber production forests
Providing 13 mil m³ timber/year in 2015.
Meeting 40% of national needs of woods.



附图 1-7 重点地区速生丰产用材林基地建设工程示意























Solutions meeting these challenges

- Suitable governmental policies at different levels
- Keeping going the ongoing national programs
- Improving management
- Strengthening research for forest management



Suggestions

- Protecting the mutual natural forests as gene pool of biodiversities
- Managing the secondary forests as close to natural forests, but with higher productivity and other services, through multipurpose forest management
- Developing the men-made forests with highest productivities through intensive management

Conclusions

- Although China is a country with rich forest resources and biodiversities, but with very limited amount by per capital.
- Great achievements have been made for improving forest resources in last decade.
- Long way to go for conserving forest resources and meeting the needs of wood supply in the future.
- The main task in the new phase of forestry development----
tremendously increasing the productivity of forest ecosystems through insensitive management while continuously increasing the forest cover.
- By the excellent natural conditions and fast growing tree species, the sub-tropical plantations should play key role for increasing forest resources.
- Forest ecological researches should make greater contributions for improving forest management and increasing productivity while conducting many basic research projects.

The issues of applying Multipurpose Forest Management (MFM) in China

- Introduced about 15 years ago
- Widely recognized as a reasonable approach for improving forest management
- Paying much attention to “ nature-oriented”, but not to “ intensive management”
- It could be used in improving the managements of secondary forests and some plantations



华夏英才基金学术文库

陆元昌 著

近自然森林经营 的理论与实践

近自然森林经营的理论与实践/华夏英才基金学术文库



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The Theories
and Practices
of Close to
Nature Forest
management

by Prof. LU
Yuanchang
in 2006









Thank you!

