



# Cultivated Land Conversion in China and the Potential for Food Security and Sustainability

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# Background: Why Cultivated Land and Food Security of China?

- Food has increasingly become a global security issue. The 2007/08 global food price crisis, plus 2008-2009 economic down turn, has pushed food issue high on the global political agenda. Although China has been doing well in terms of feeding its population and reducing its poverty levels, Then why we concern China's food security now? Two reasons:
  - 1) Potentially, China as the most populous nation in the world, if China were to face food insecurity, the impact on world food security would be devastating.
  - 2) In reality, China's food security is challenged by variety of ways, most notably by the loss of its cultivated land.
- Thus, today I will discuss China's food security issue from the following view points.



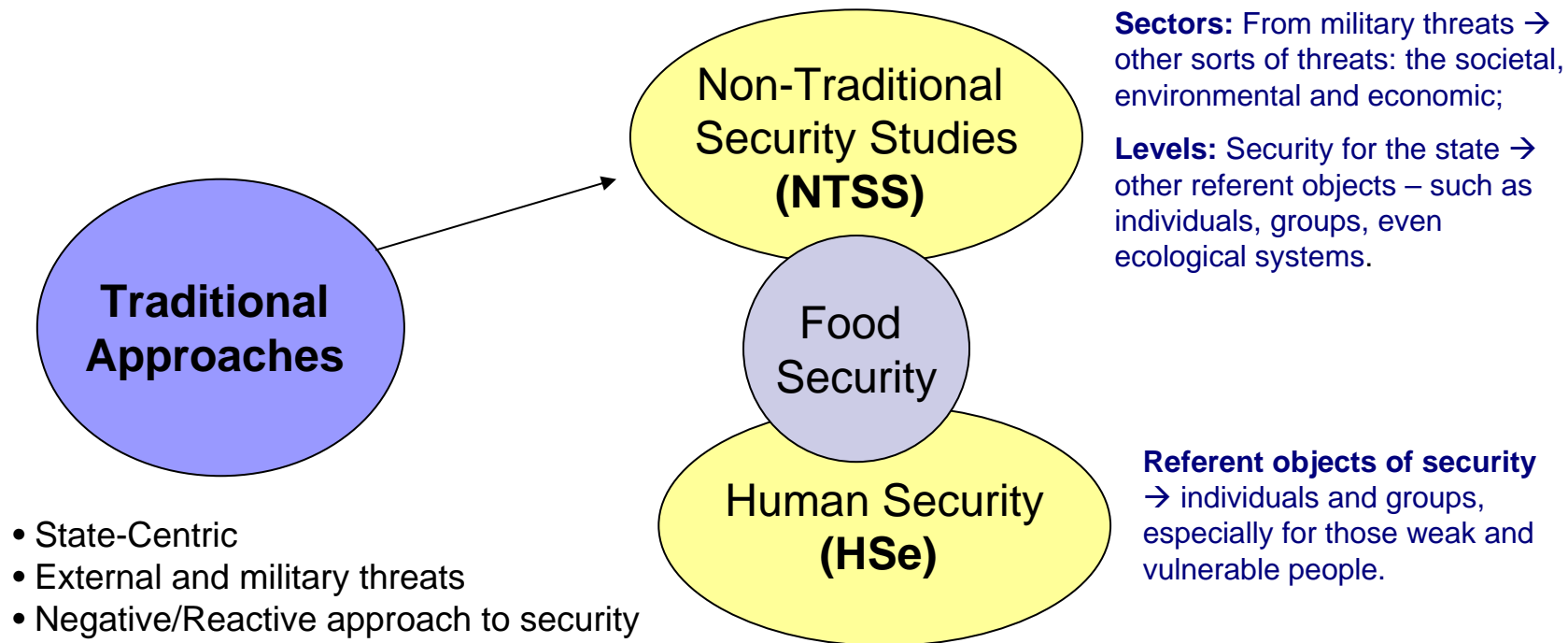
# Points of Discussion

1. **Food Security in Theoretical Perspective;**
2. **Cultivated Land Conversion (CLC) and Food Security (FSe) in China: Discourses and Securitisations;**
3. **Cultivated Land and Food: a Matter of Security Concern (Q of Why);**
4. **Thinking Thoroughly about Food Security Governance (FSG).**

# 1. Food Security in Theoretical Perspective

## ■ International Security Studies (ISS)

- Security for Whom/What? (**Referent Object** of Security)
- Security from What
- Who Provide Security & How?





# Food Security in Theoretical Perspective

## ■ Security **Negative** v. **Positive Approaches**

- Negative: **reactive**, emphasises on resource scarcity & the onset of intra- & inter-state **conflict**

→ Referent Object, Provider = the state

- Positive: more concerned with **root causes** of insecurity, the building of conditions for a **long term** security

→ Peacefully reducing human vulnerability by addressing the root causes of human insecurity

## ■ Human Security Approach to **FSe & FSG**

- Beyond negative approach to security
- Beyond mere grain outputs and food sufficiency
- Access of food by all people, at all times.



## 2. CLC and Food Security in China: Discourses and Securitisations

- People's Republic of China 1949~ (Food Rationing 1954~1994)
  - The Great Leap Forward (1958-1961)
  - The Cultural Revolution (1966-1976)
- **The Impact of the Great Leap Forward**
  - Loss of arable Land: **7.25m ha**, 1958-1959
  - Estimate of : 27m famine deaths
- **Economic Reform: (1980s~1990s)**
  - Rural reform/privatization → was to lift the nation from chronic food shortages and massive malnutrition (Deng estimated: more than 100m people suffered from recurrent food shortages).
  - Achievements → Increase in food production, 1998 peak.
- **China's Food situation in the 21 Century**
  - 1998-2003: fall in grain production & grain stocks
  - 2004~: new policies on agriculture and farmland
  - China in the global food price crisis.

# The Great Leap Forward (1958-1961)



- Loss of arable Land: **7.25m ha**, 1958-1959
  - Estimate of : **27 million** famine deaths.



## **Economic Reform: (1980s~1990s)**

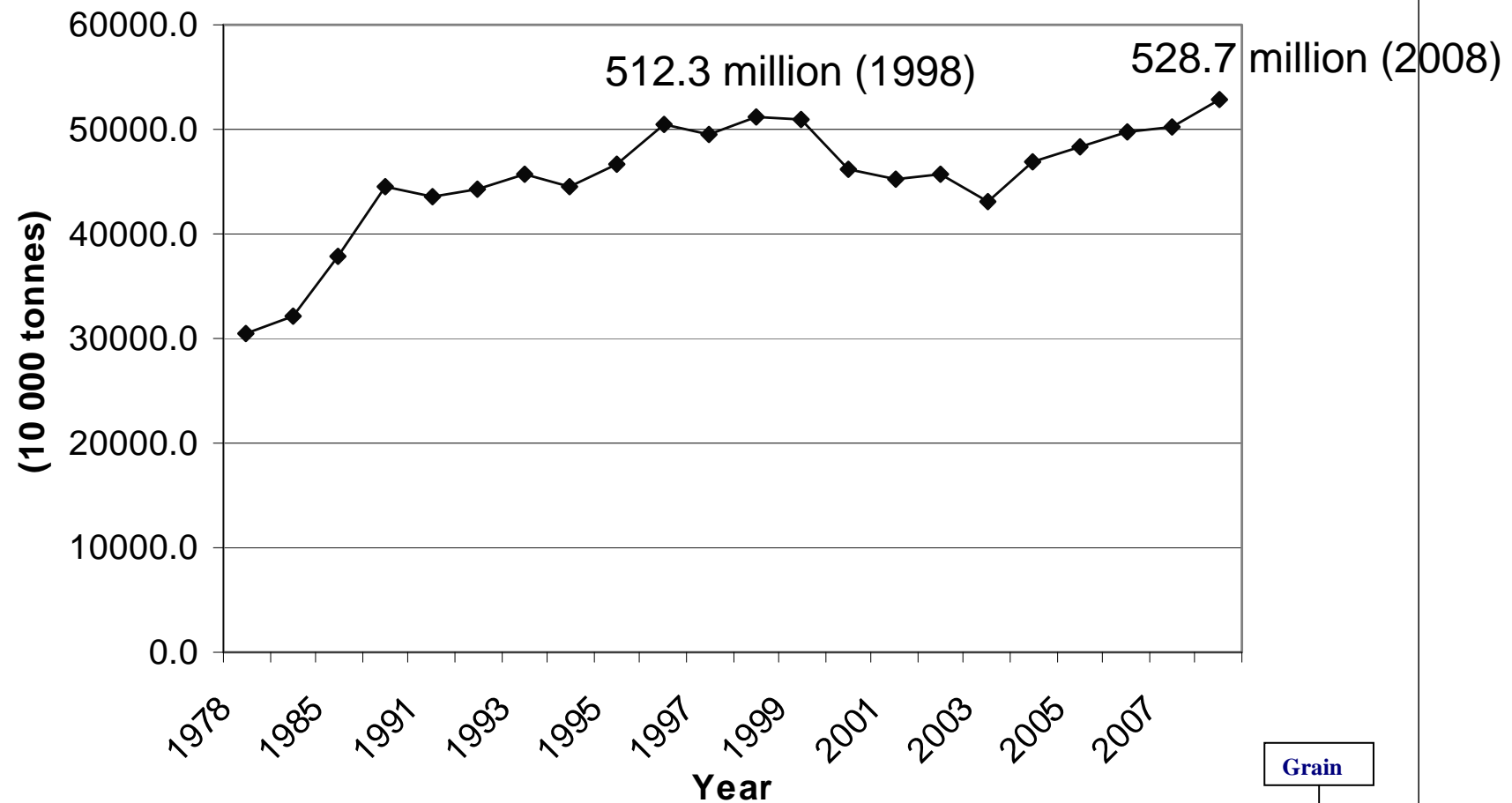
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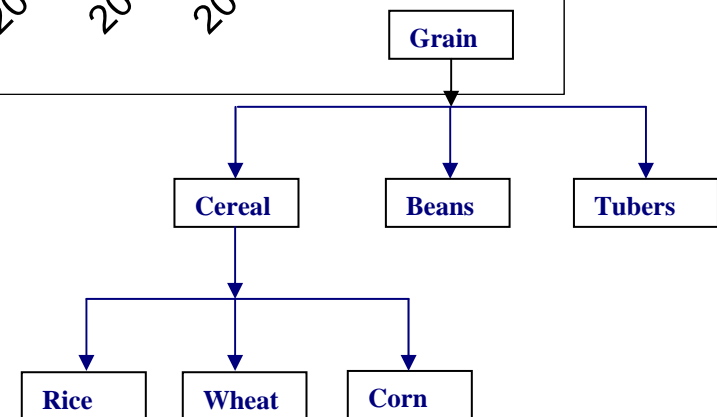


安徽凤阳小岗村 Xiaogang Village, Fengyang, Anhui Province, 1978  
(Household Contract Responsibility System)

## China: Grain Outputs



Source: NBS, China, 2009



## Per Capita Output of Major Agricultural Products

Year	Grain (kg)	Pork, Beef and Mutton (kg)	Aquatic Products (kg)	Milk (kg)
1978	<b>319</b>	9.1	4.9	
1980	<b>327</b>	12.3	4.6	1.2
1985	<b>361</b>	16.8	6.7	2.4
1990	<b>393</b>	22.1	10.9	3.7
1995	<b>387</b>	27.4	20.9	4.6
2000	<b>366</b>	37.6	29.4	6.6
2001	<b>356</b>	38.0	29.9	8.1
2002	<b>357</b>	38.5	30.9	10.2
2003	<b>334</b>	39.5	31.6	13.6
2004	<b>362</b>	40.4	32.8	17.4
2005	<b>371</b>	42.0	33.9	21.1
2006	<b>380</b>	42.7	35.0	24.4
2007	<b>381</b>	40.1	36.0	26.7
2008	<b>399</b>	40.3	37.0	26.8

1950 (239)

1956 (306)

1959 (253)

**1960 (216)**

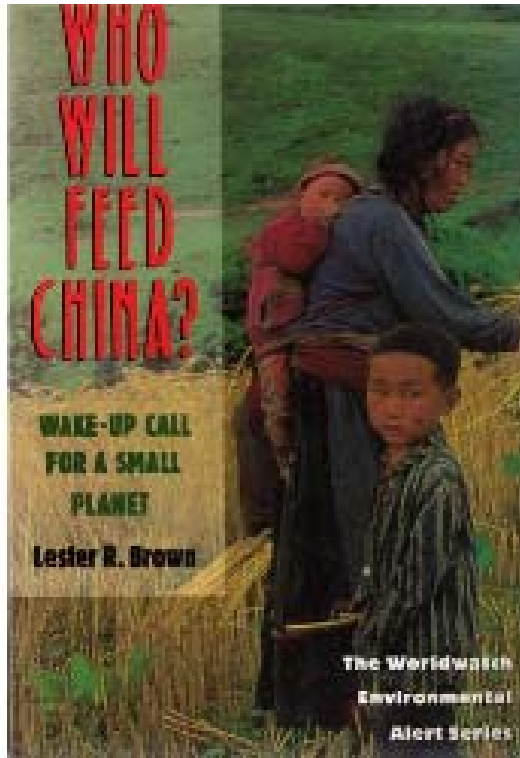
Global grain production  
per capita:

2005 = **318 kg**

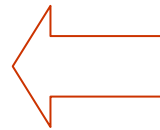
→ 2006 = **305 kg**

Source: NBS, China

# Will China Feed it's People?

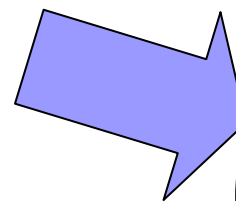


***Who Will Feed China?***  
**By Lester Brown (1995)**



**A solid answer to  
“Who will feed China”,**  
*People's Daily*  
03 Jan. 2006

In 2006 UN ends its 26-year food aid to China



**Still  
Food  
Security ???**



## **3. Cultivated Land and Food: a Matter of Security Concern**

### **Inherent difficulties:**

3.1 Cultivated Land as Limited Resources

### **Further Challenges:**

3.2 Urbanization & Environmental Impacts  
on the CL Loss

3.3 Global Food Situation impact on China



## 3.1 Cultivated Land as Limited Resources

- Land **Characteristics** of China
- Cultivated land: **Quantity & Quality**
- **Population** & Land → The Relationship

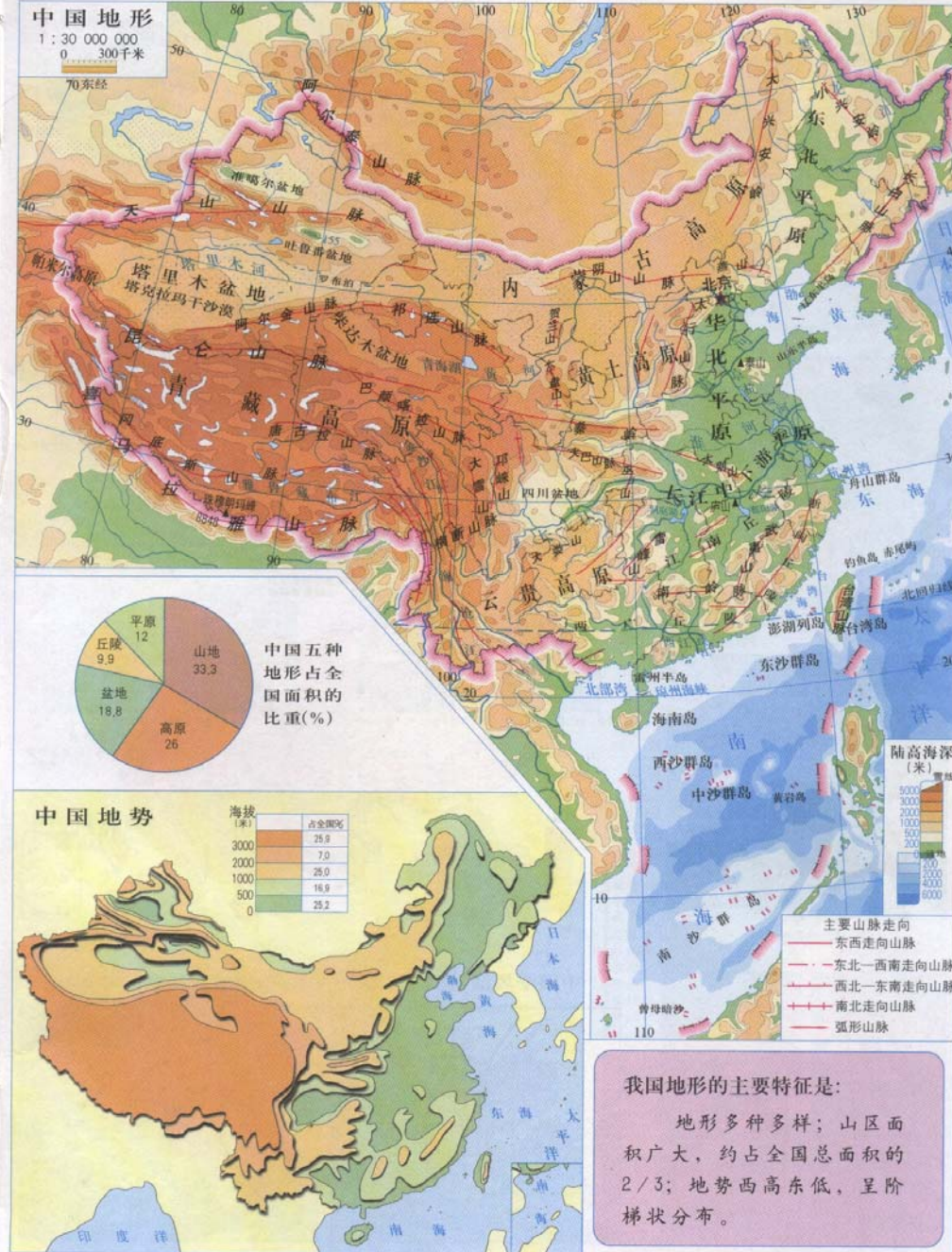


# Topographic Features

中国地形 51

## Land Character: Quantity & Quality

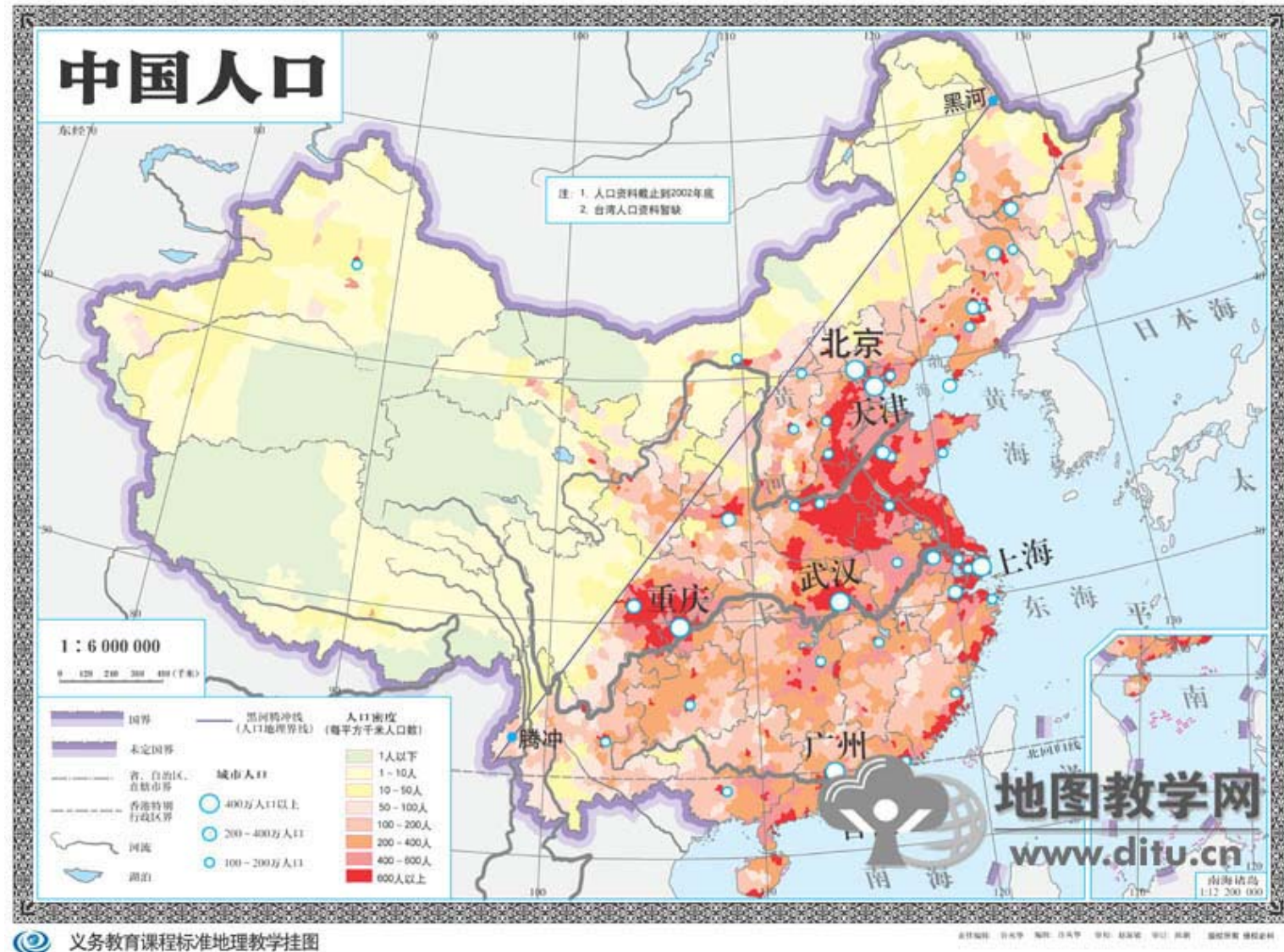
- Mountains 33%
- Plateaus 26%
- Basins 18.8
- Plains 12%
- Hills 9.9%





# China: Population Density Map

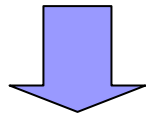
每平方  
千米  
1人  
——  
400人  
600人





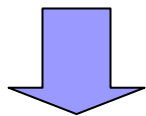


Account for **7.8%**  
world's cultivated land  
(US, India, Russia, China)



**per capita  
= 0.09 ha**

World average = **0.24 ha**

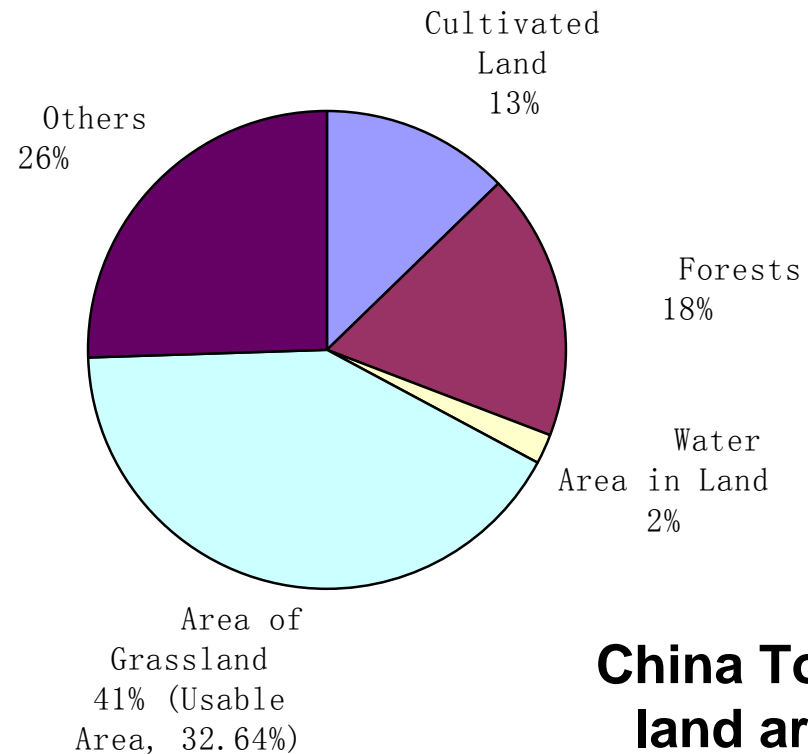


**0.053 ha**

→ the warning line

### China 2008: Land Use (10000 ha)

← **121.7 m ha**



**China Total  
land area:  
960m ha**

Year 2008: Population: **1.328 billion**

## China: Population Growth

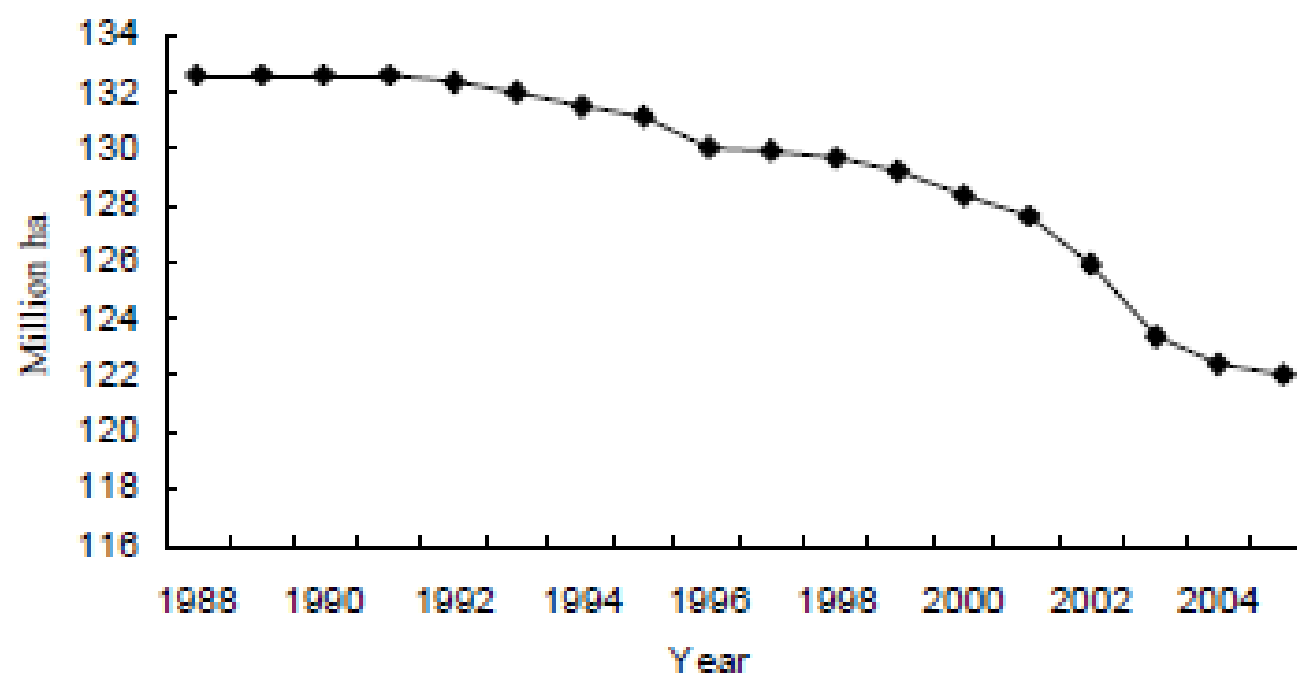
10 000 persons

Year	Total Population (year-end)	Year	Total Population (year-end)
1978	<b>96259</b>	1999	125786
1980	98705	2000	126743
1985	<b>105851</b>	2001	127627
1990	114333	2002	128453
1991	115823	2003	129227
1992	117171	2004	129988
1993	118517	2005	<b>130756</b>
1994	119850	2006	131448
1995	<b>121121</b>	2007	132129
1996	122389	2008	132802
1997	123626	2015	<b>139685</b>
1998	124761	2030	<b>146749</b>

Source: NBS, 2009; and FAO, 2010.



**Figure 1. Cultivated Land Area, 1988–2005**



Sources: Ministry of Land and Resources (1990–2000; 2001–2005).  
Tan, Shuhao (2008: 79).



## 3.2 The Urbanization & Environmental Impacts

### The causes of Cultivated Land reduction:

- **construction** occupancy (most problematic);
- conversion of cultivated land for **ecological restoration** purposes (e.g. conversion of some cultivated land to woodland and wetland);
- **natural disasters**;
- **agricultural structural adjustment** (i.e. changing the type of crops, eg, growing grapes instead of rice).

# The Urbanization Impacts

Population and Its Rural/Urban Composition

10 000 persons

Year	By Residence				
	Total Population	Urban		Rural	
	(year-end)	Population	%	Population	%
1978	96259	17245	17.92	79014	82.08
1985	105851	25094	23.71	80757	76.29
1990	114333	30195	26.41	84138	73.59
1993	118517	33173	27.99	85344	72.01
1995	121121	35174	29.04	85947	70.96
1996	122389	37304	30.48	85085	69.52
2000	126743	45906	36.22	80837	63.78
2003	129227	52376	40.53	76851	59.47
2005	130756	56212	42.99	74544	57.01
2008	132802	60667	45.68	72135	54.32

The urbanization rate

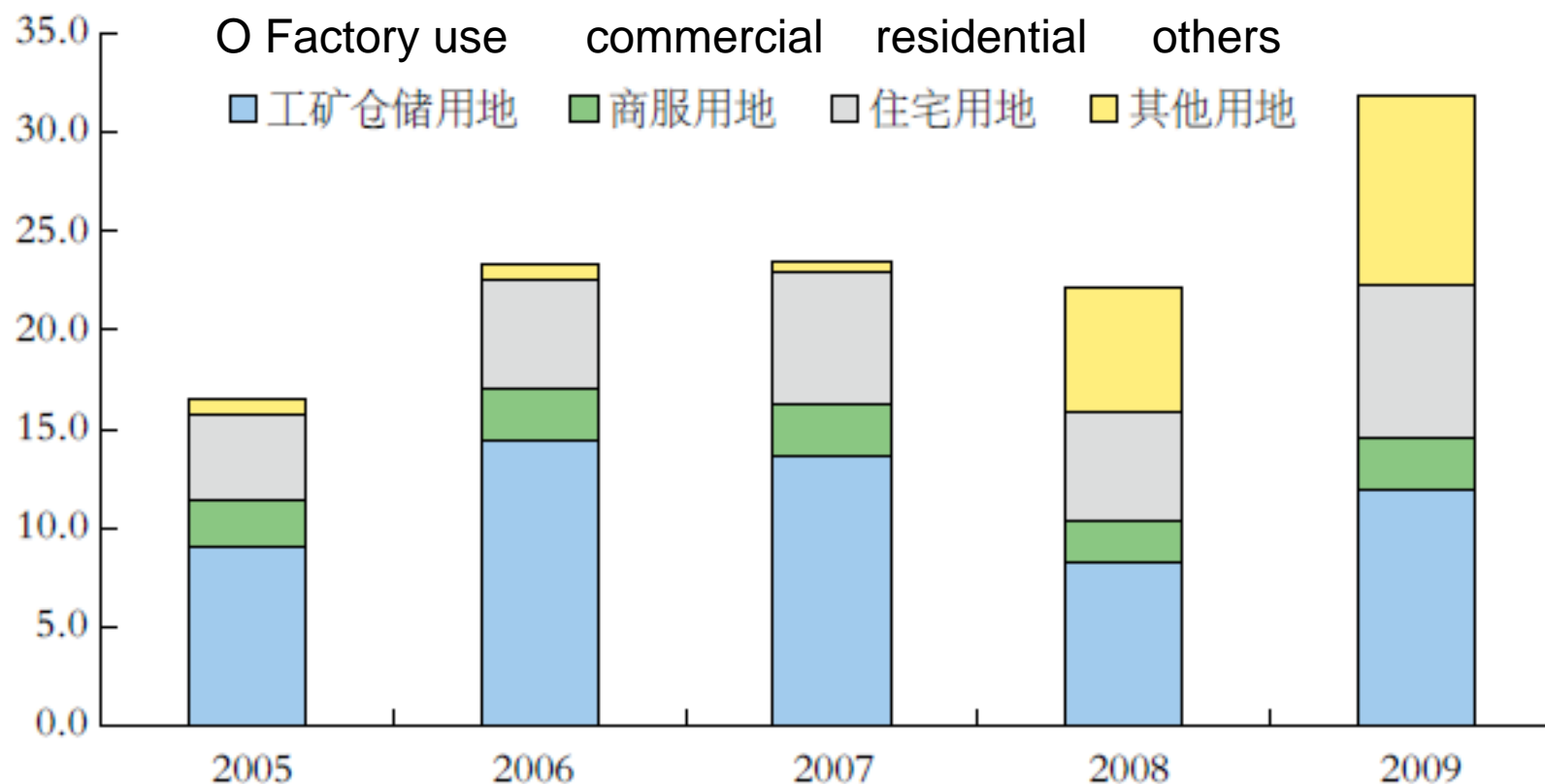
**By 2020**

**58%**

# Land Used by Construction

## 2005—2009 年国有建设用地供应情况

10000 ha  
万公顷



Source: MLR, China, 2010

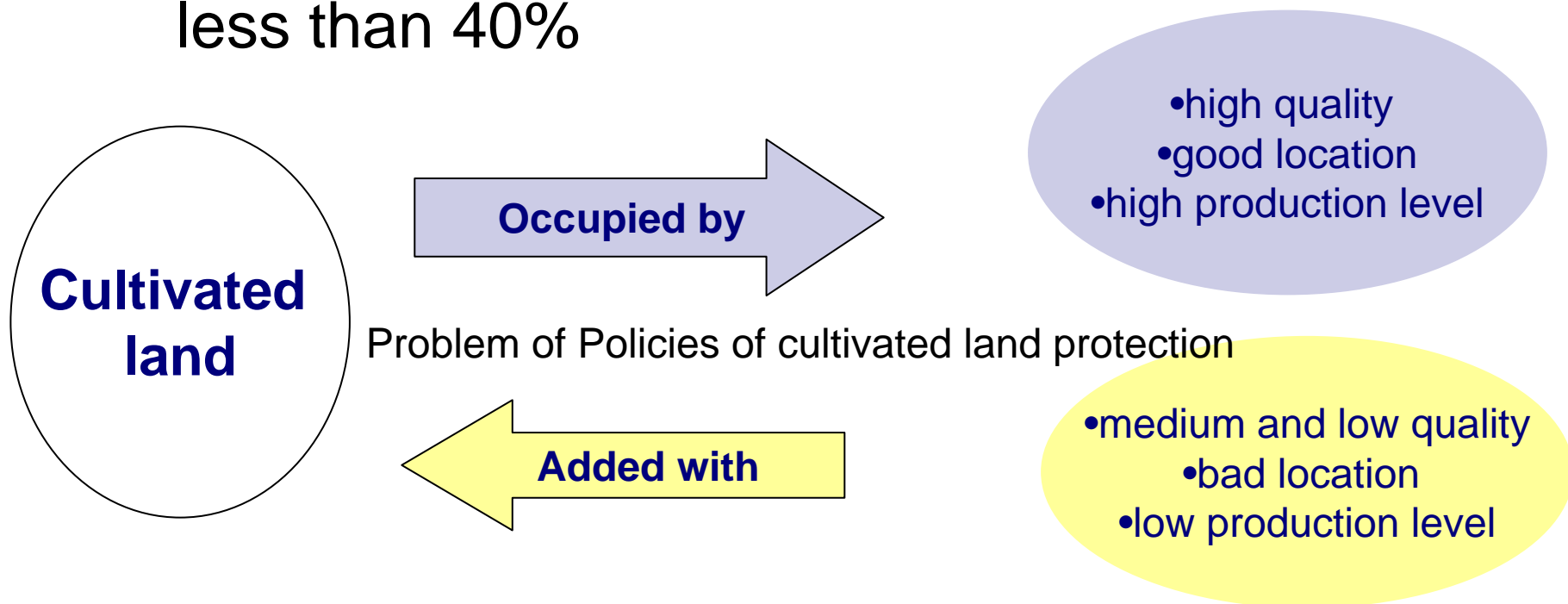
# Land Occupancy/Reclamation, 1997 – 2005

## Reduction:

- Irrigated paddy fields (— 931.3 thousand ha)
- Irrigable lands (— 299.3 thousand ha)

## Addition:

- with irrigation and drainage facilities → → →  
less than 40%







## Cultivated land is damaged also by over using **Chemical Fertilizer**

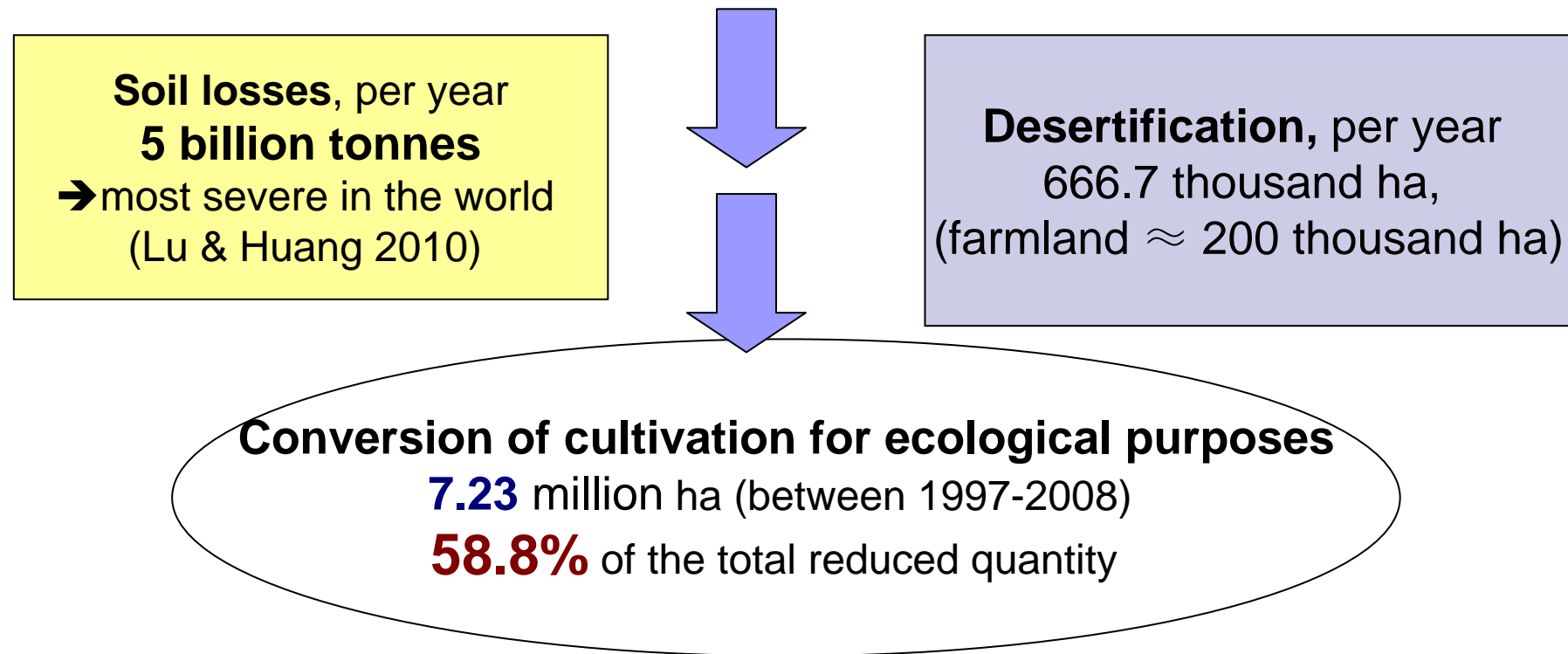
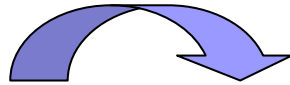
Factor use in Agriculture in Different Regions of the World, 2000	
Area	Chemical Fertilizer Use (kg/ha)
<b>World total</b>	<b>99.5</b>
Asia	146.8
Africa	21.4
North America	96.9
South America	78.9
Europe	82.2
Australia	51.4
<b>China</b>	<b>327.2</b>

Source: Sun and Shi (2003); Tan(2008)

# Environmental Impact on Land

- 30 years Economic development →
  - natural resources – consumed
  - pollutants – discharged

**The Result:**





**Gu Lianhong**, a senior researcher with Oak Ridge National Laboratory in the US:

- The lab's research had shown climate change will cause **China's per capita grain output to dramatically drop after 2020**, even taking technological progress into consideration. ('Climate threatens food supply', *China Daily*, June 22, 2010)

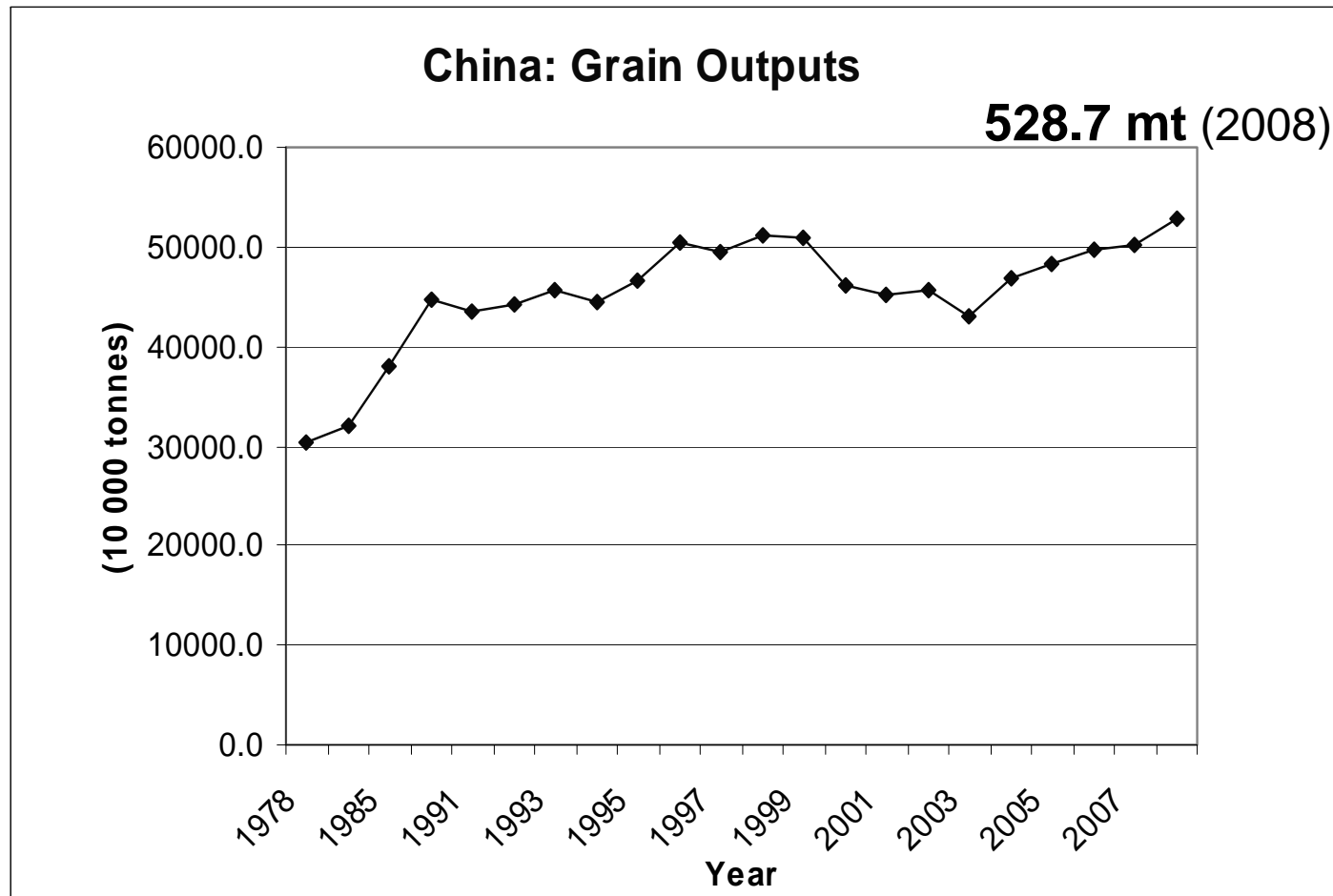


## 3.4 Global Food Situation: Challenges to China

- The food price crisis of 2007/2008 triggered widespread concern over the **volatility of agricultural prices** → additional pressure on China's depends on global food market
- **China's growing needs for grain supply**
- **Limited global food Market**

6 bumper harvests → supply-demand situation is still tightly balanced

(Agriculture Minister, Han Changfu, Global Times, 9 July 2010).

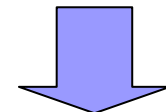


2009 = **530.82 mt**

By 2020  
needs

**572.5 mt**

**Implication**





# Implications:

- The harvest would need to **grow by 0.8 % per year** to match demand = to increase grain supply by at least **4 million tonnes** annually for the next 10 years.
- Yet the world supply-demand situation is also tightening.
- International Grain trade – limited scale  $\approx$  240mt,  $\approx$  half of China's grain outputs. Rice Trade  $\approx$  15% of China's rice consumption.



## 4. Food Security Governance

### ■ FSe Multidimensional Causes

- ☐ Natural Conditions; Balance between economic growth, environment & sustainable development; and Global food situation.

### ■ Who are the most targeted by food insecurity?

- ☐ Human Security Aspect of Food Security

### ■ FSG needs to think seriously about:

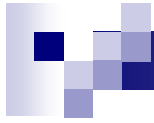
- ☐ Security for Whom?
- ☐ Security from What?
- ☐ Who Provides Security and How?



# FSe: Beyond Food Self-Sufficiency & National Security

- ***Beyond self-sufficiency*** – The multiple causes of food insecurity, especially when food security is strongly linked to land, meant that FSG must go beyond the traditional understanding of FSe as just self-sufficiency. We need to focus more on **root causes**, and concerned more about long-term food security conditions, rather than short-term resource conflicts.
- ***Beyond national security*** – a human centred approach. The referent object of security – people, vulnerable groups; while in terms of addressing food insecurity, the state and other actors, especially those farmers should be the important actors in the processes of FSG.
- ***FSG ‘Though Government’*** – achieve multilevel cooperation to address those challenging issues, such as climate change, rapid urbanization, increased competition for water and natural resources, land management, and population growth.





**Thank You !!!**