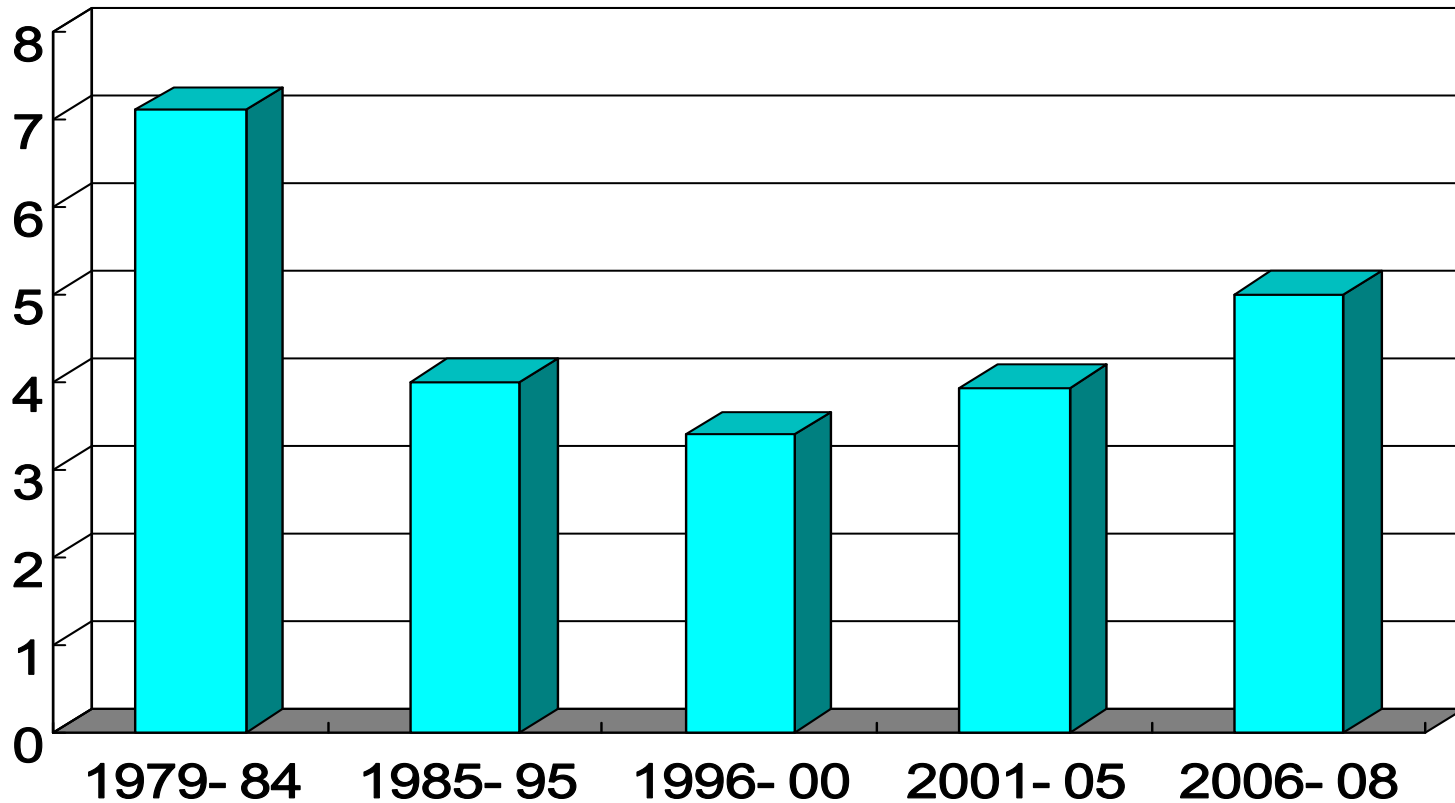




# **Overview of China's Agricultural Development and Policies in the Past Three Decades with Focus on Recent Years**

**Jikun Huang, Center for Chinese Agricultural Policy, CAS  
On behalf of CATSEI team from CCAP, SOW-VU,  
IIASA, SOAS, LEI and IFPRI**

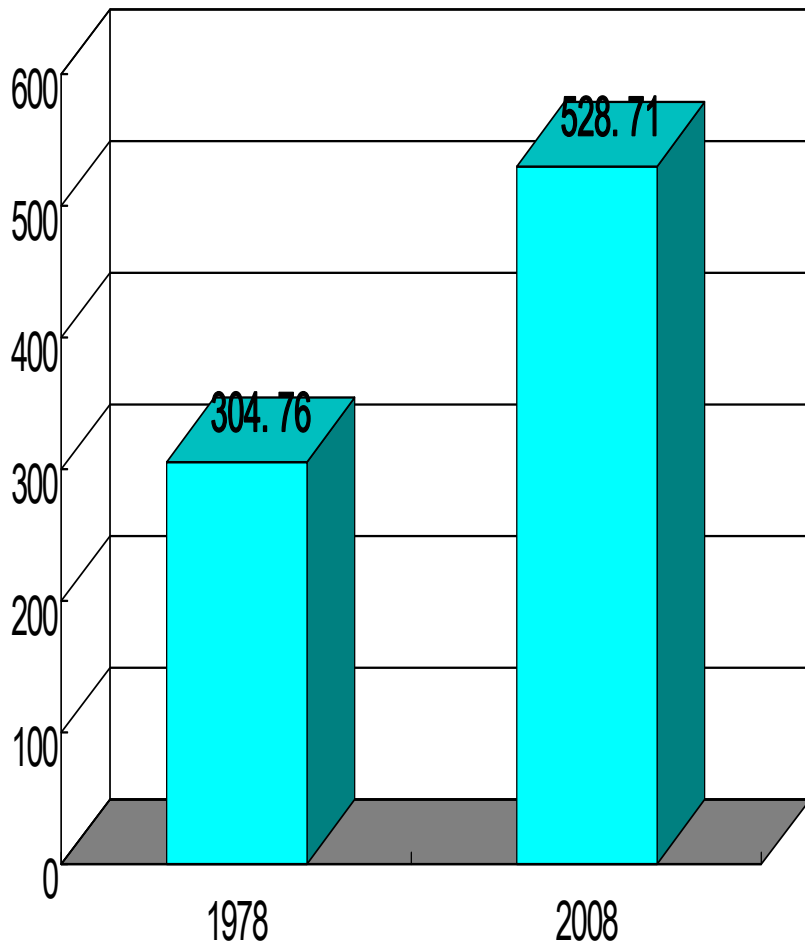
## Average annual growth rate (%) of agricultural GDP



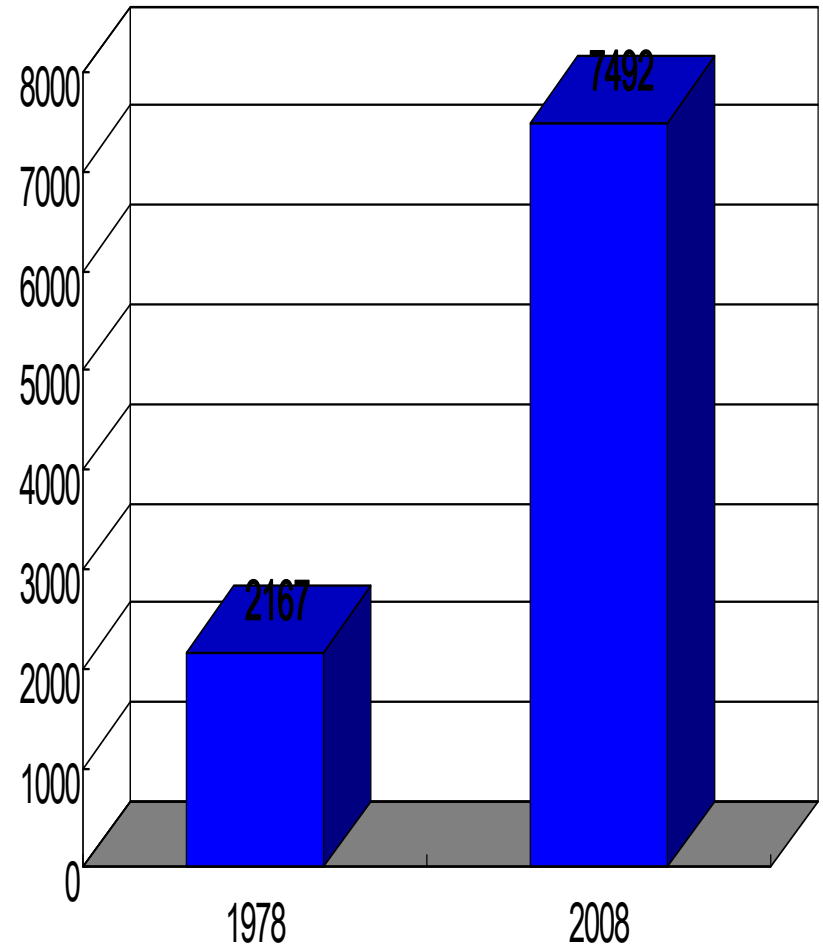
**Average annual growth rate in agricultural GDP was about 4 times of population growth rates.**

# Grain and cotton production

## Grain (million tons)

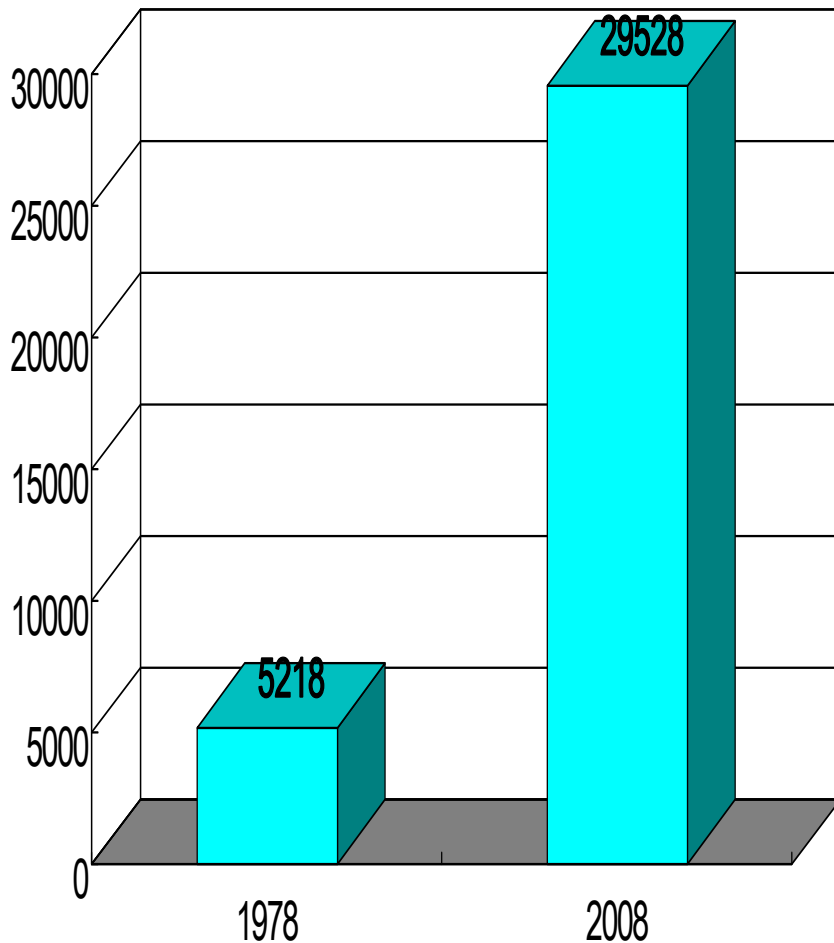


## Cotton (1000 tons)

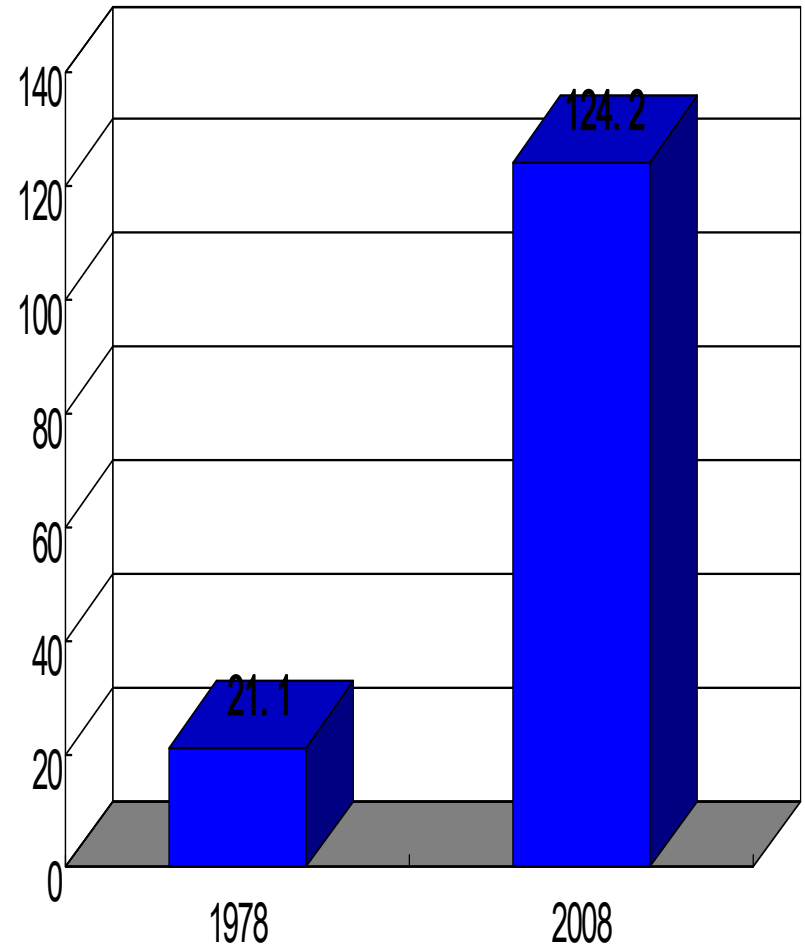


# Production of oil and sugar crops

## Oil crops (1000 tons)

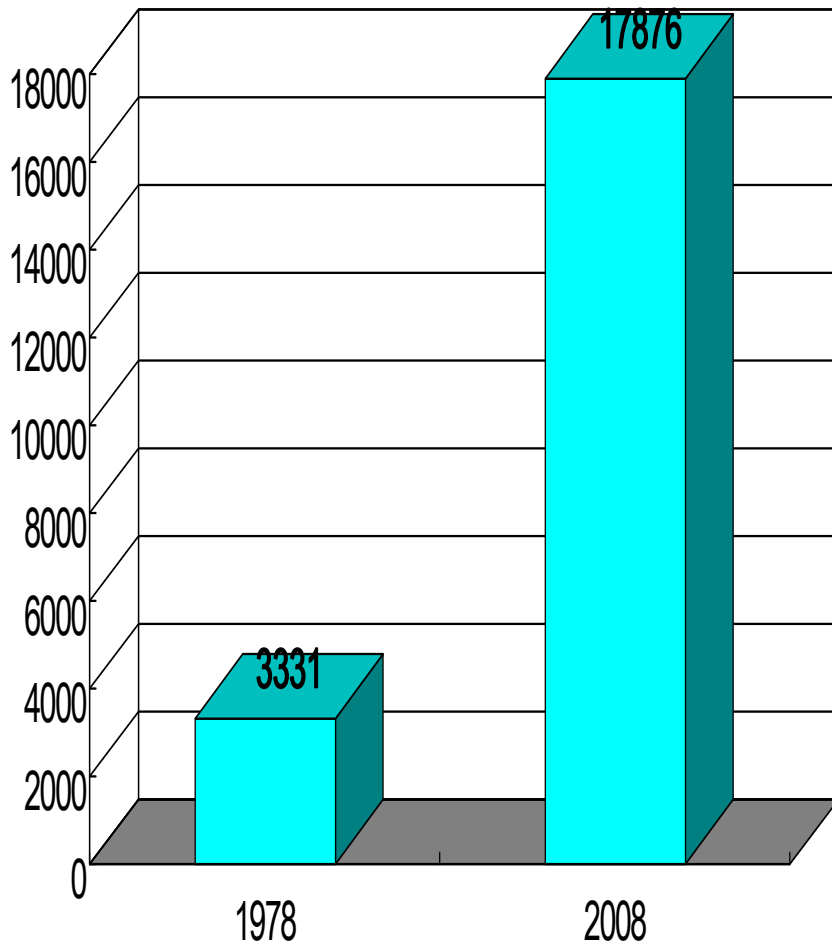


## Sugar crops (million tons)

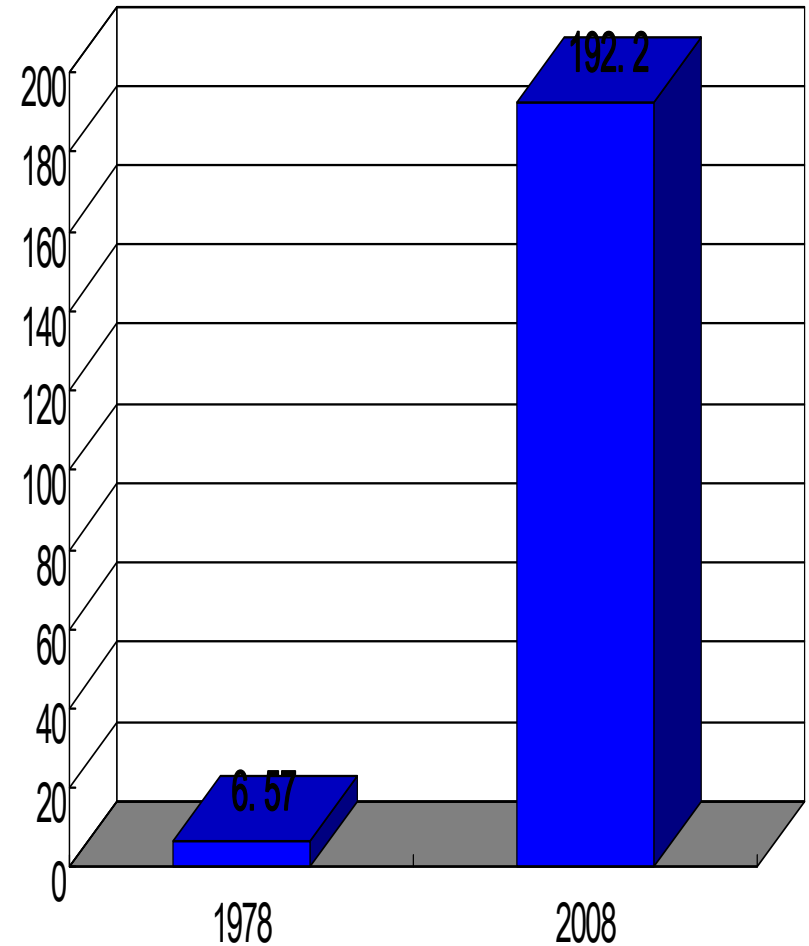


# Vegetables and fruits

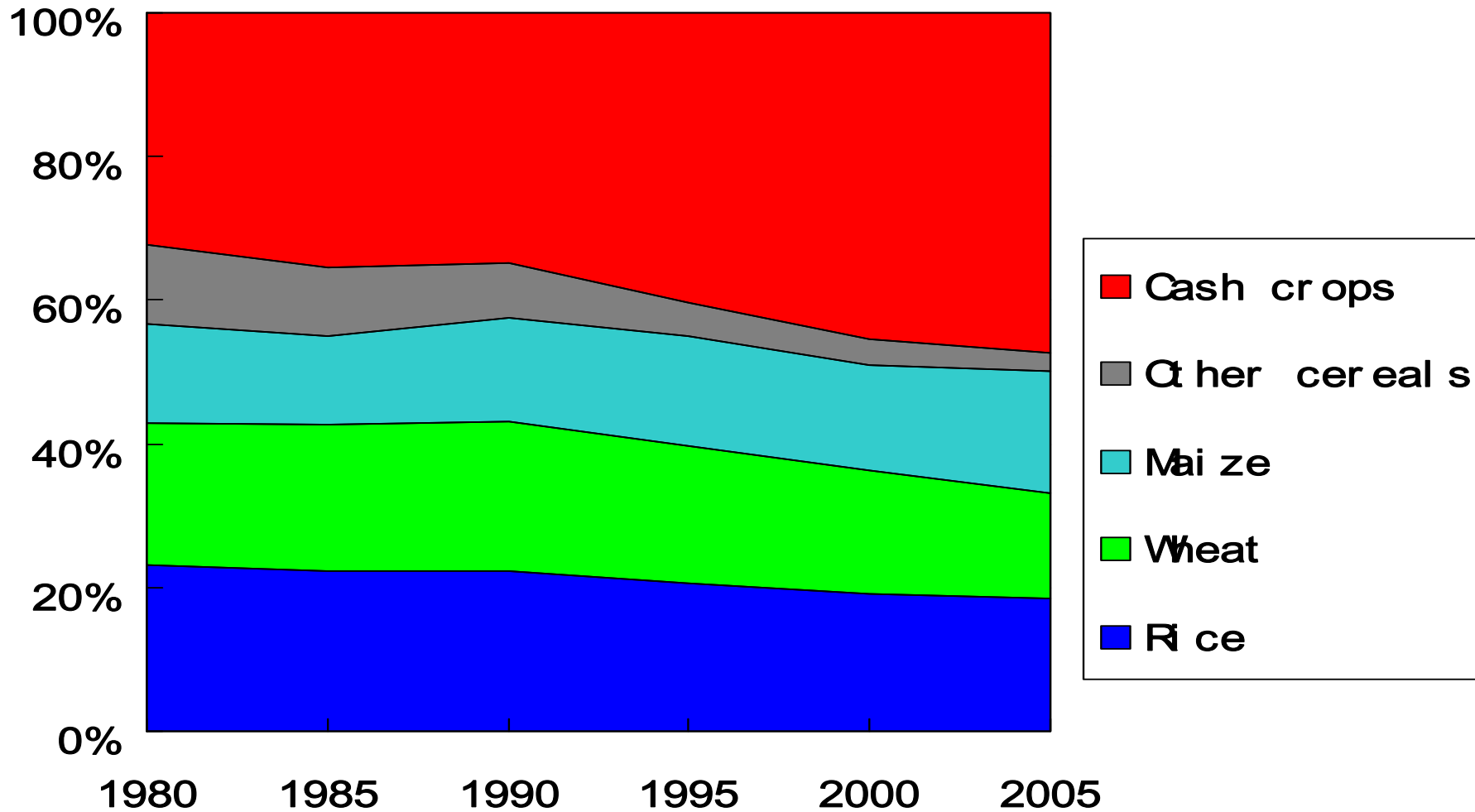
## Vegetable area (1000 ha)



## Fruit outputs (million tons)

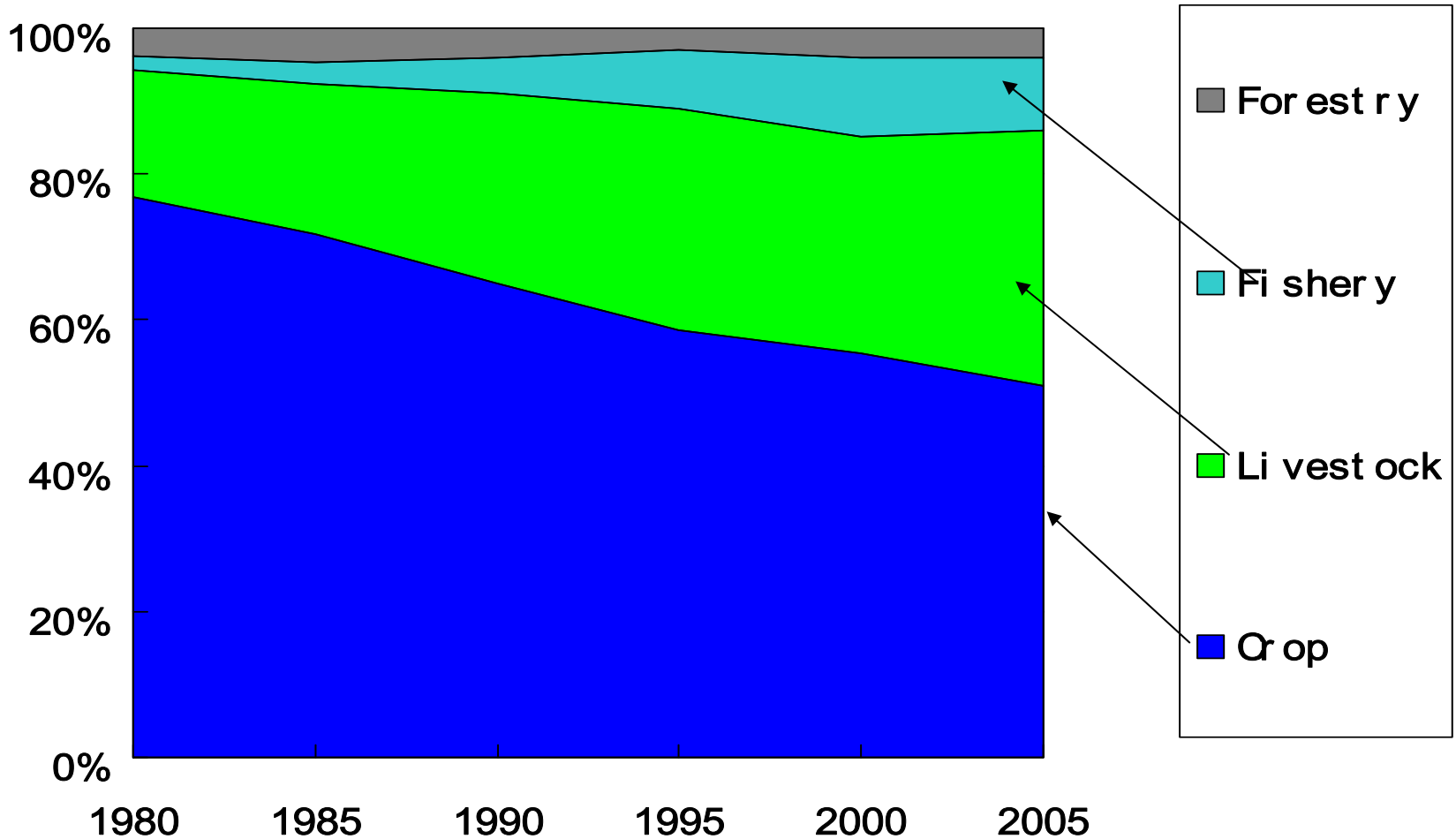


# Shares of crop areas, 1980-2005, (%)



**Rising horticulture/other cash crops... and therefore farmers' income**

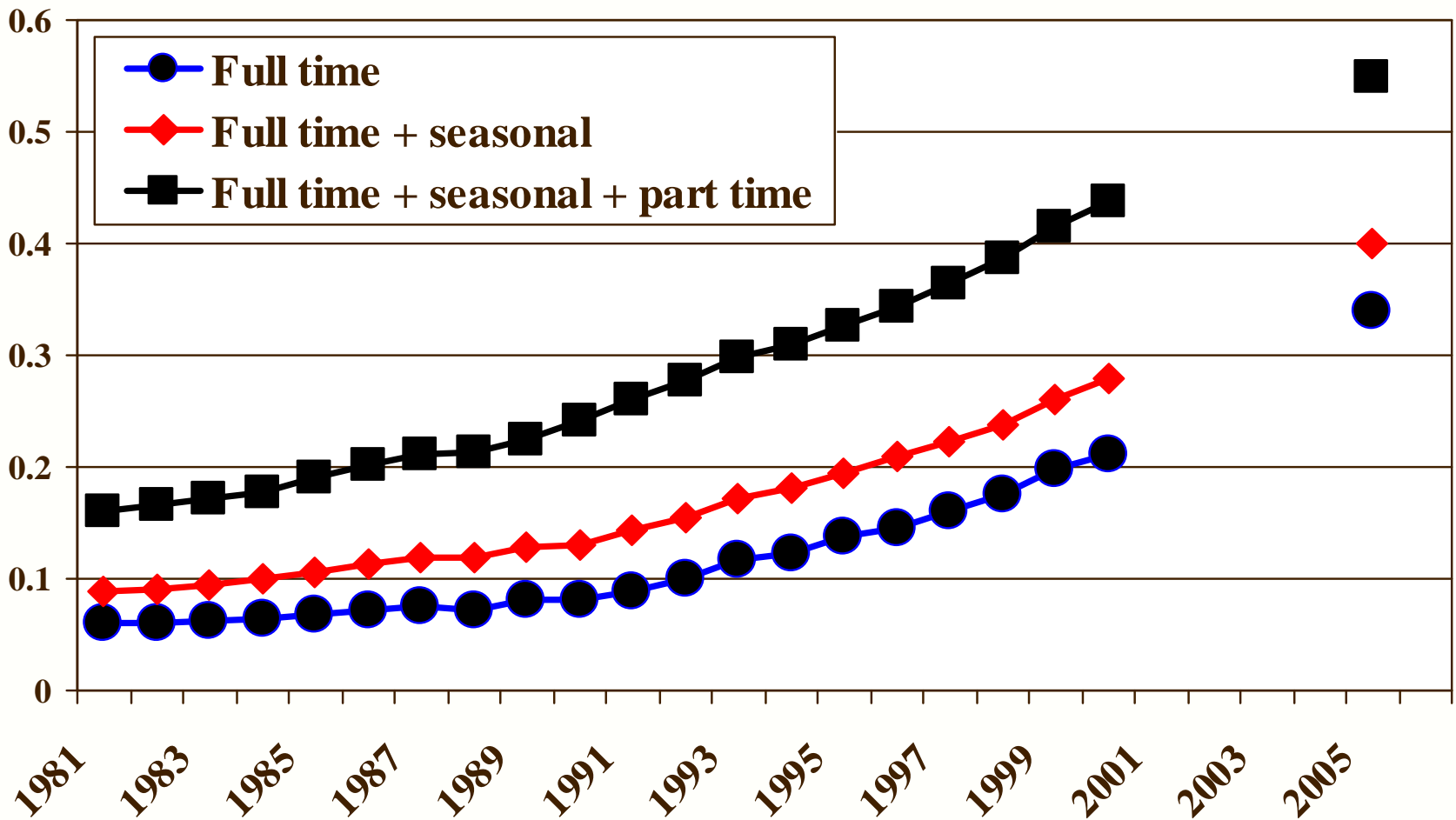
# Shares of output values within agricultural sector, 1980-2005, (%)



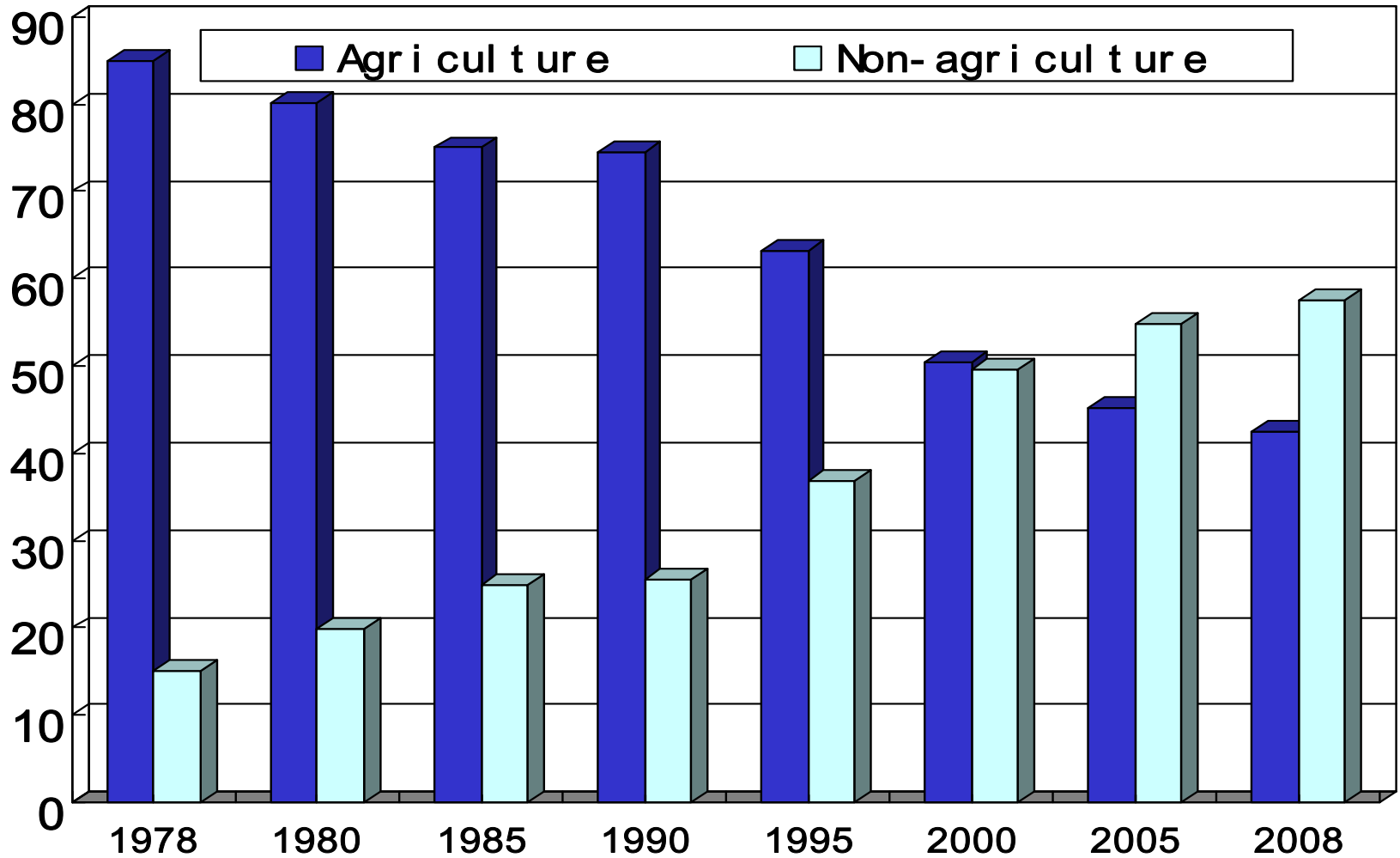
**Within agricultural economy: falling the shares of crops, rising the shares of livestock and fishery – high value products**

# Significant transformation from agriculture to non-agriculture has also been occurring...

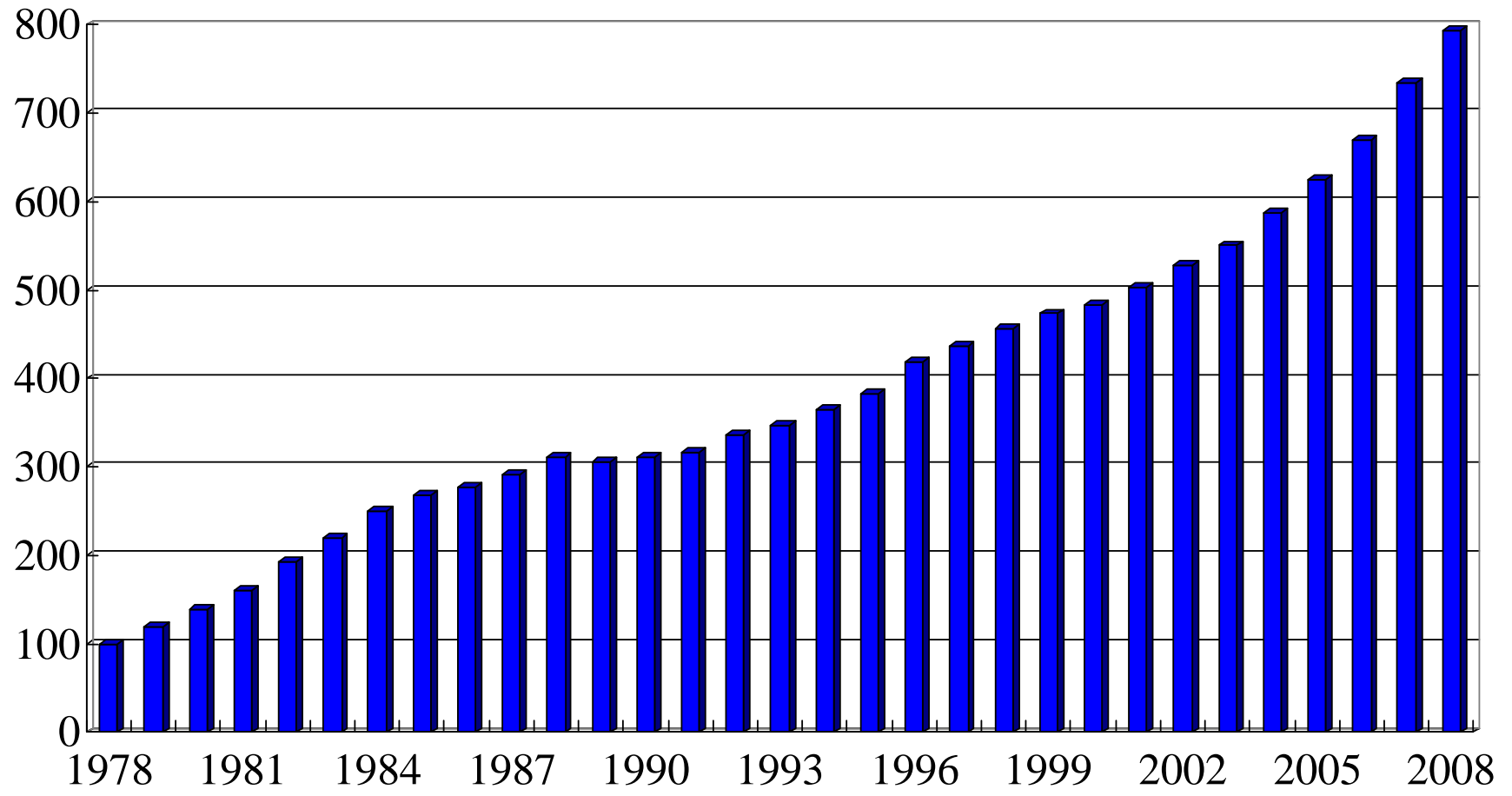
## Share of non-agri employment of rural labor, 1981-2006 (source: based on CCAP's surveys)



# Sources of farmers' income (%)

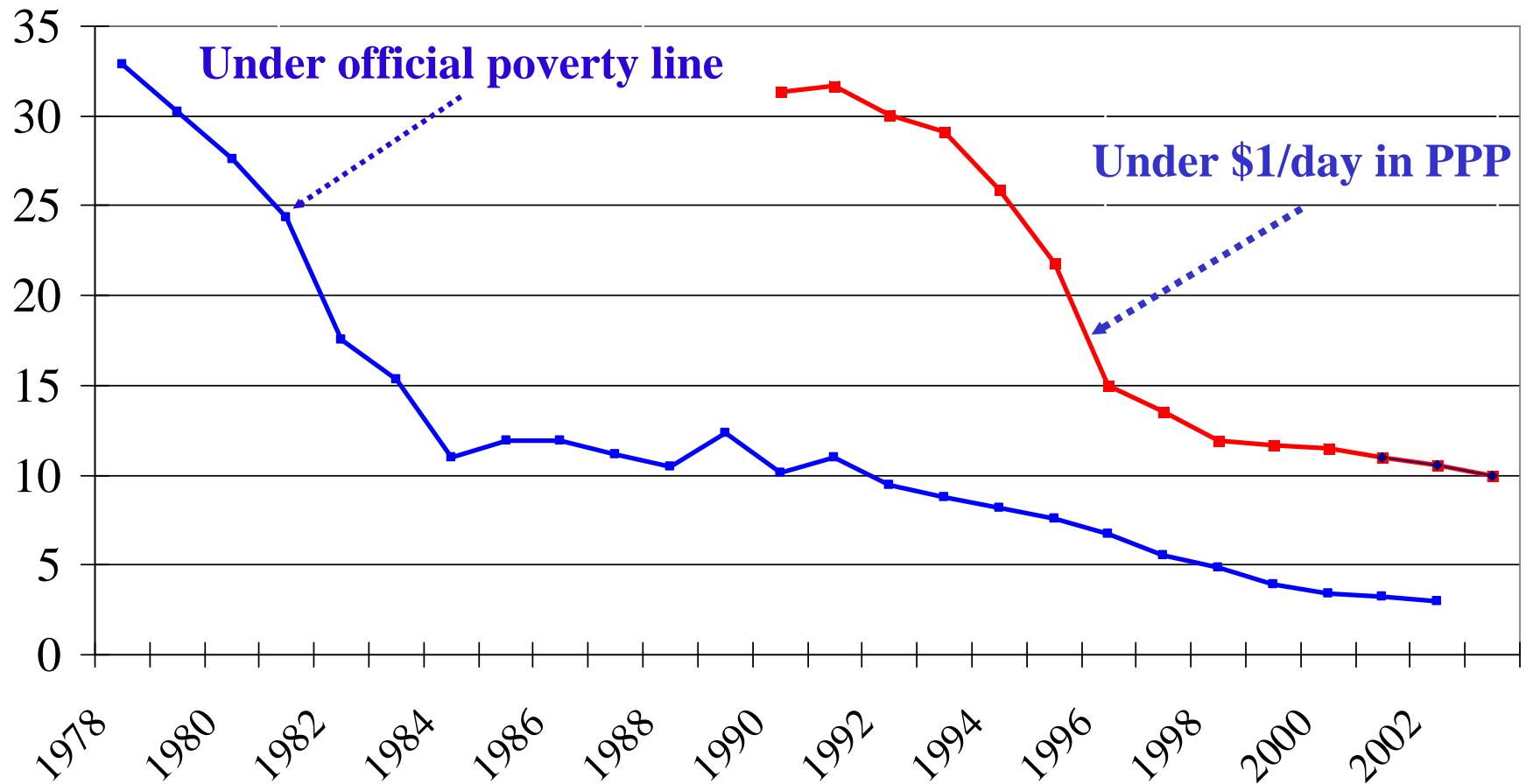


# Per capita income in real term (1978=100)



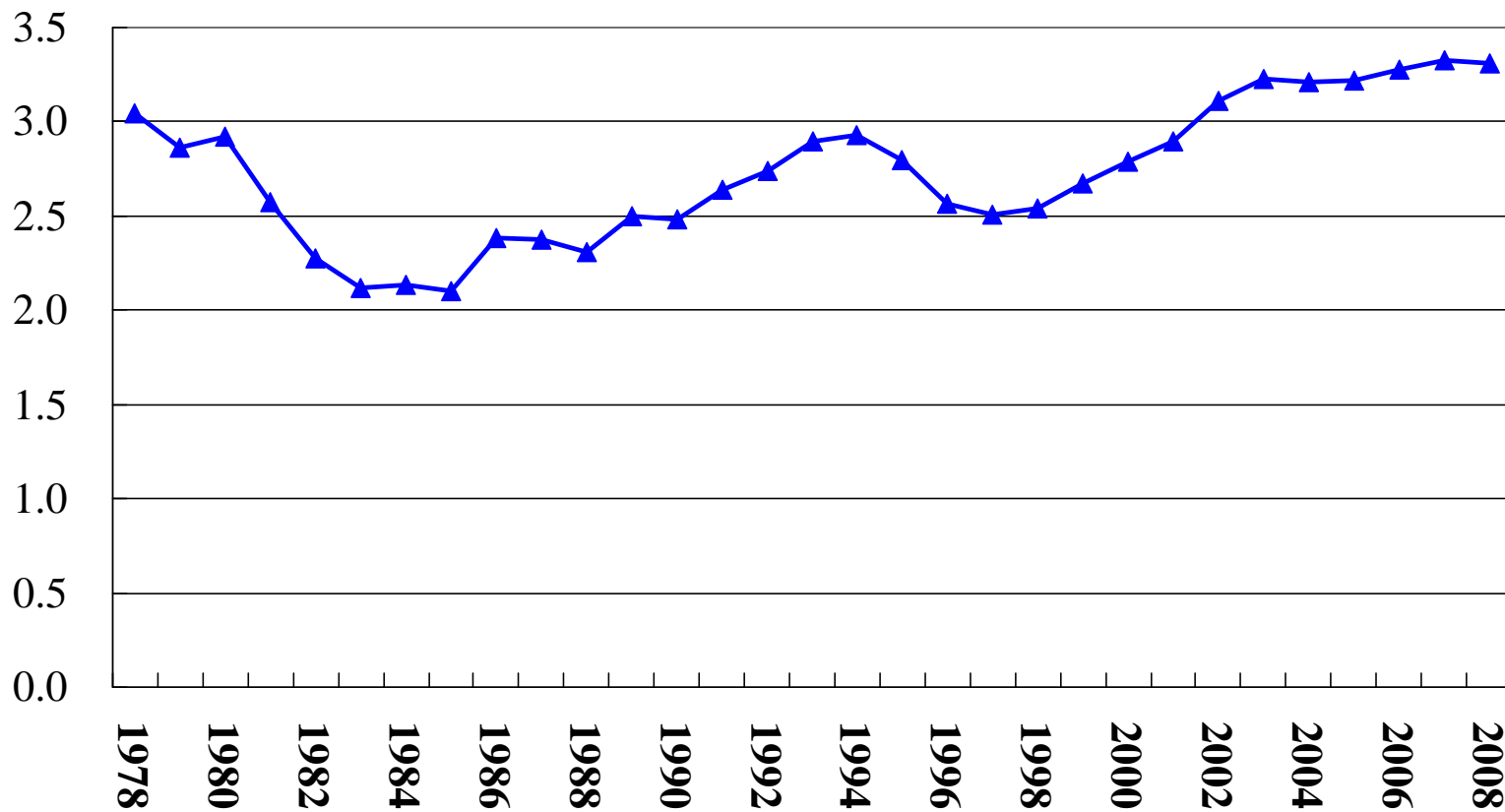
# Rural poverty incidence in China, 1978-2007

(Percent of Population)



The fall in the poverty rates in China account for MOST of the entire world's fall in poverty between 1985 and 2005

# Urban income / rural income ratio



# Challenges and concerns

- **Farmers' income**
- **Production:**
  - **Small farms, intensification, and agricultural modernization**
  - **Resource constraints: Land and water**
- **Meeting growing demand:**
  - **Food security and Food safety**
  - **Biofuels**
- **Climate change**
- ...

# Questions

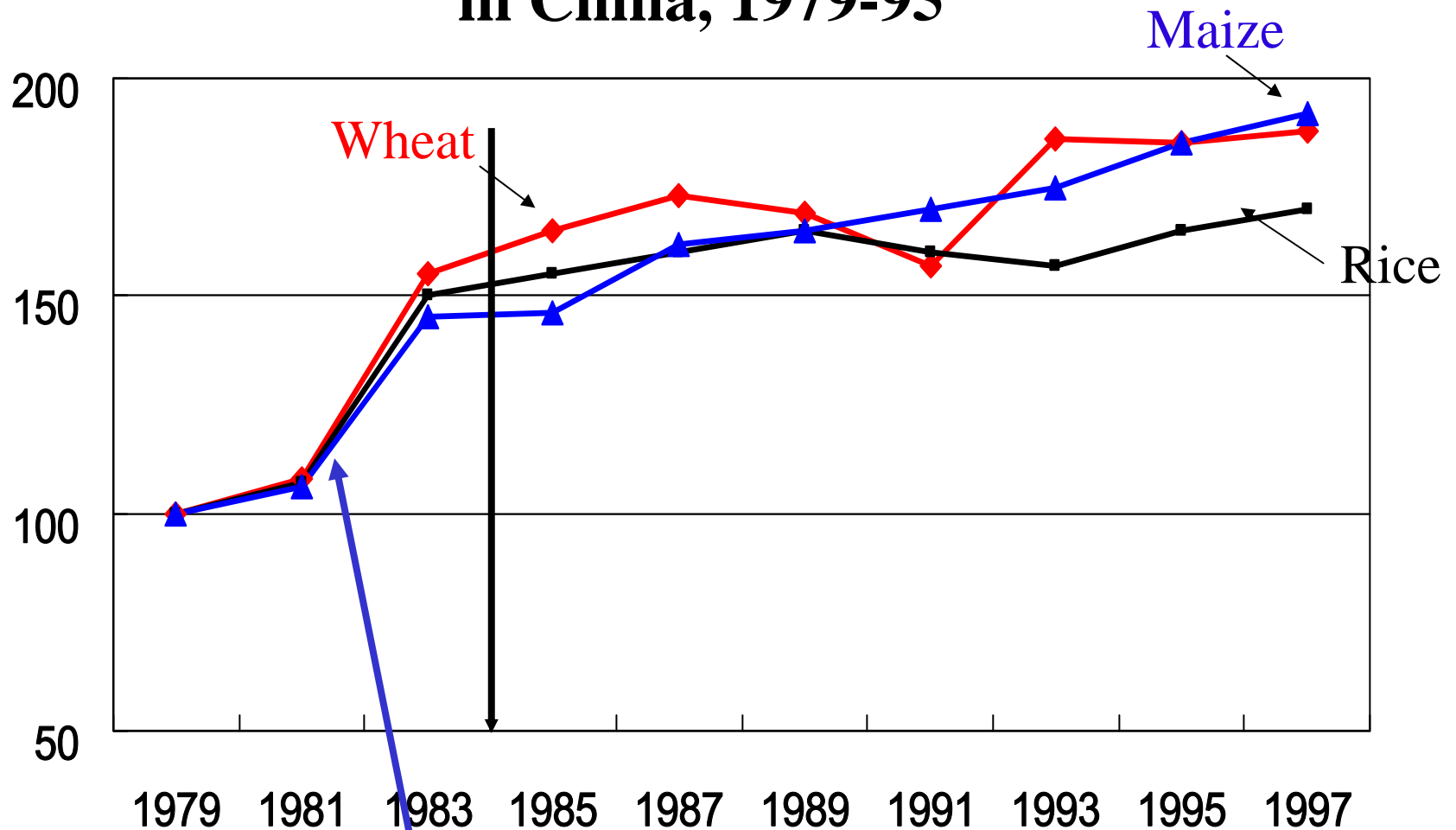
- **What are major driving forces of China's agriculture in the past?**
- **How policies respond to the challenges in recent years and what are expected in the future?**

# The Rest of the Presentation

- **Agricultural Policies in the Past 30 Years: Successes, Challenges and Recent Policy Responses**
  - *Institutional reform*
  - *Agricultural technology*
  - *Market liberalization*
    - *Domestic market*
    - *International market with focus on trade with EU*
  - *Investment in agriculture*
- **New challenges: biofuels and climate change**
- **Concluding Remarks**

# **Institutional Reform**

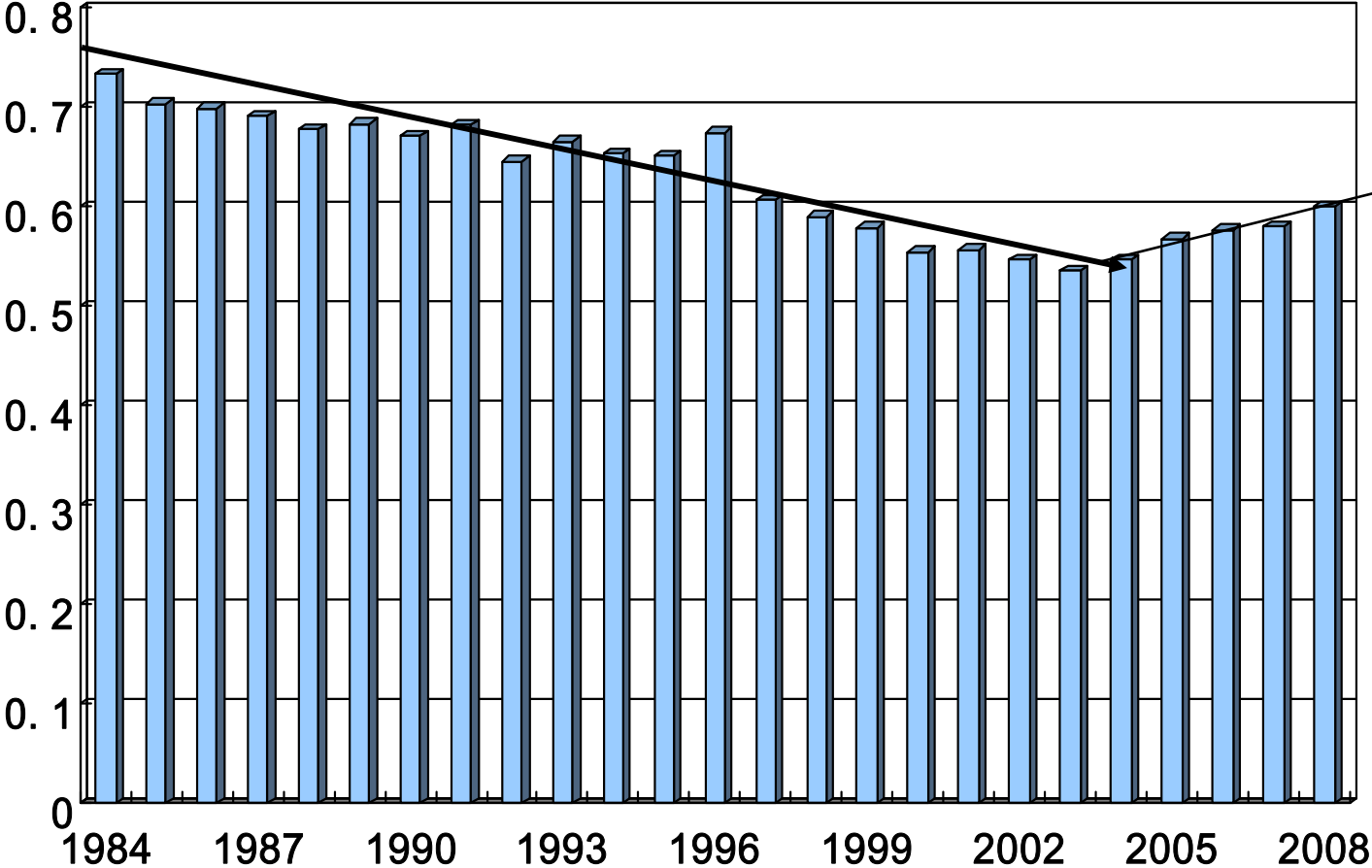
# Total Factor Productivity for rice, wheat and maize in China, 1979-95



**Institutional change (HRS) was major source of TFP growth in 1979-84**

# Small farming: Challenges for labor productivity, modernizing agriculture and food safety

## Average farm size (ha/farm)

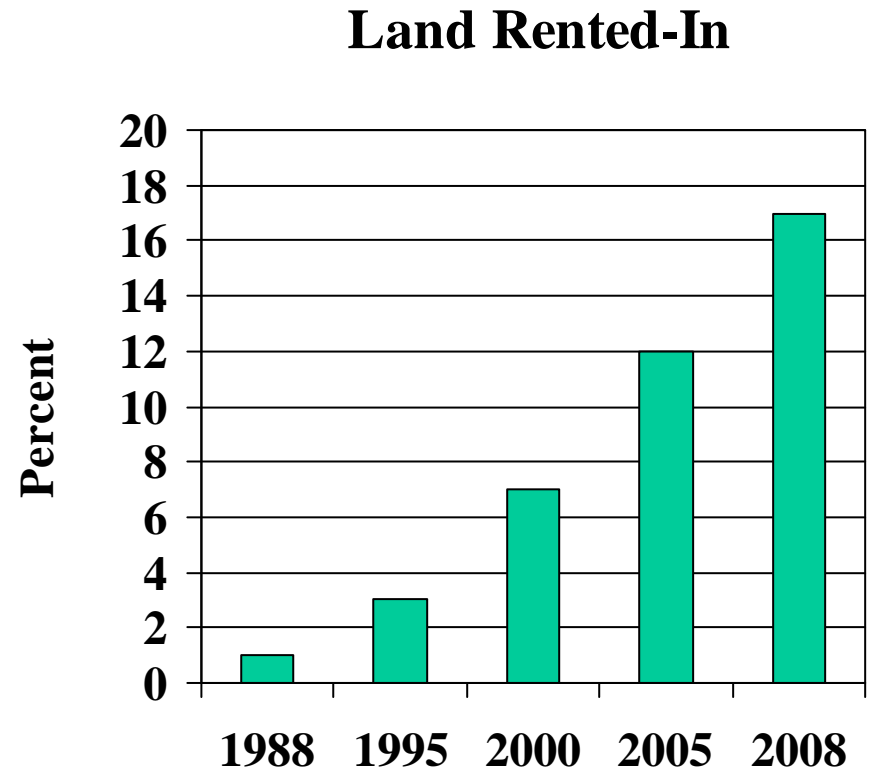


Opportunity:  
Rising rental  
market  
...

Source: NSBC

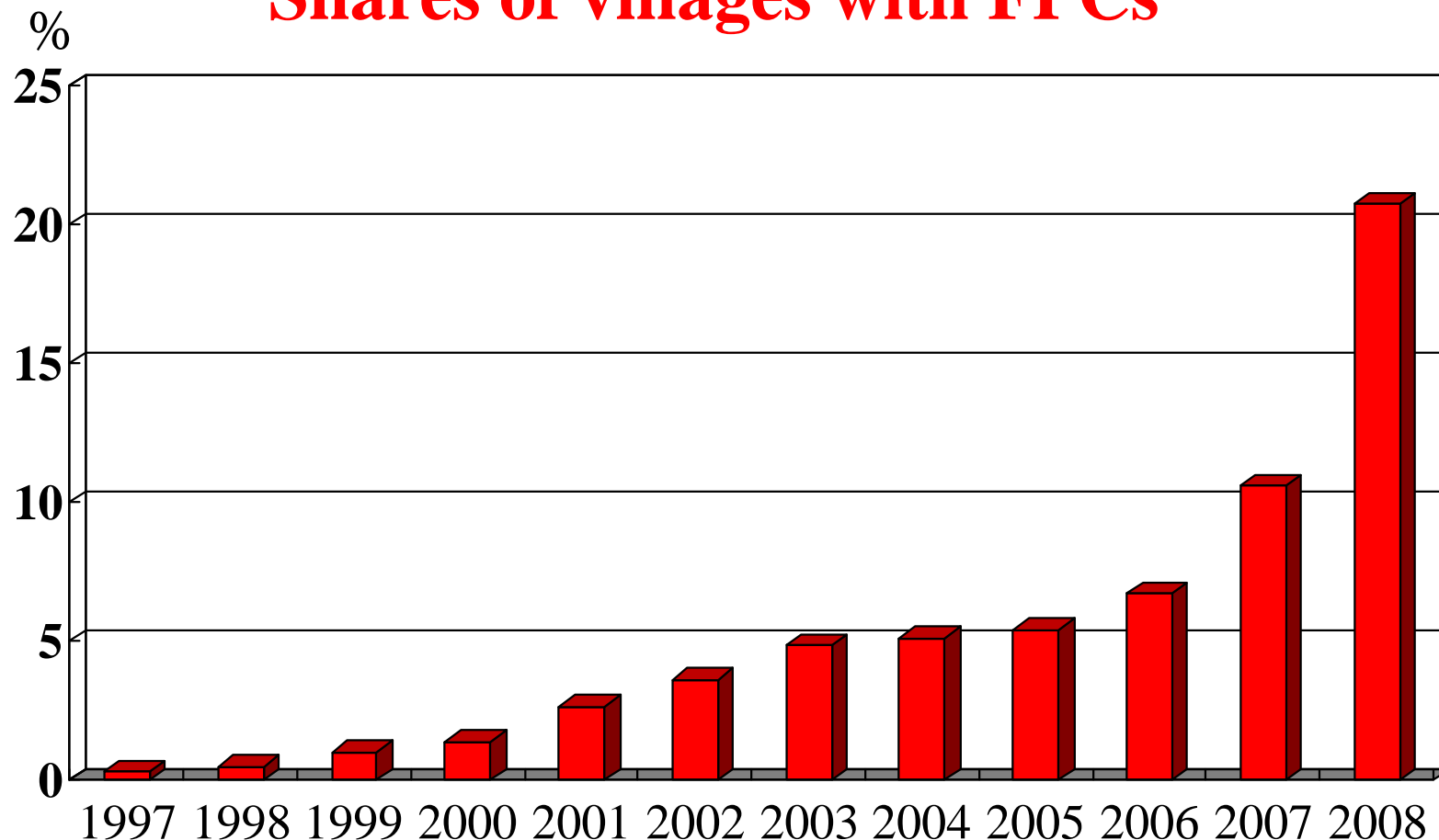
# Policy responses: enhance land tenure and facilitate rental market

- **Rapidly increasing over time**
- **More than 30% in developed provinces (e.g., Zhejiang)**



# Policy responses: Promote development of the farmers' professional economic cooperatives (FPCs)

## Shares of villages with FPCs



Sources: CCAP's surveys in 2003 and 2009 – partially funded by EU project in 2009

# FPCs in China in early 2009

**Villages with FPCs: 133 thousands (21%)**

**Farmers participated in FPCs: 23.8 million (9.5%)**

**-Formal member: 99.1 million (4.0%)**

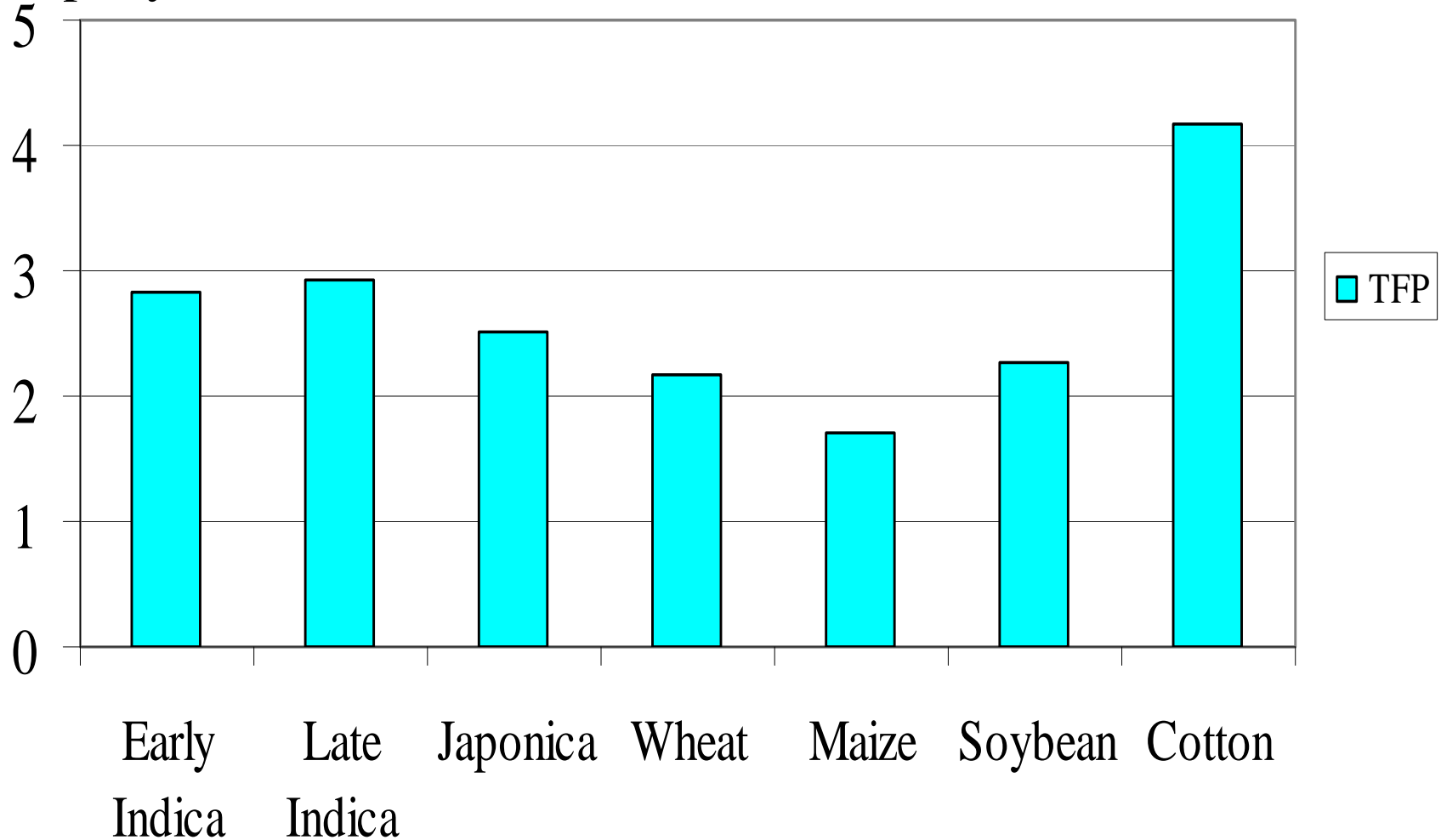
**-Informal member: 139 million (4.5%)**

**But still far from enough ....**

# **Agricultural Technology**

# TFP Growth Rates of Grains and Cotton (1995-2004)

Percent per year

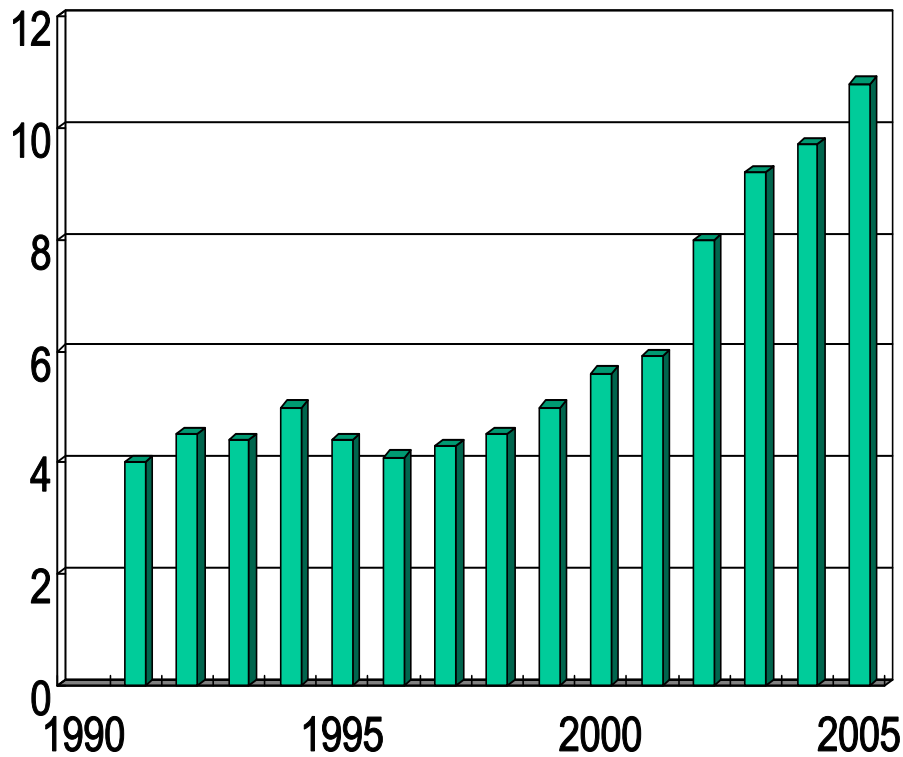


Internationally, if a country's ag TFP rises more than 2% a year, it is GREAT ... China's rate of rise is nearly 3 percent per year!

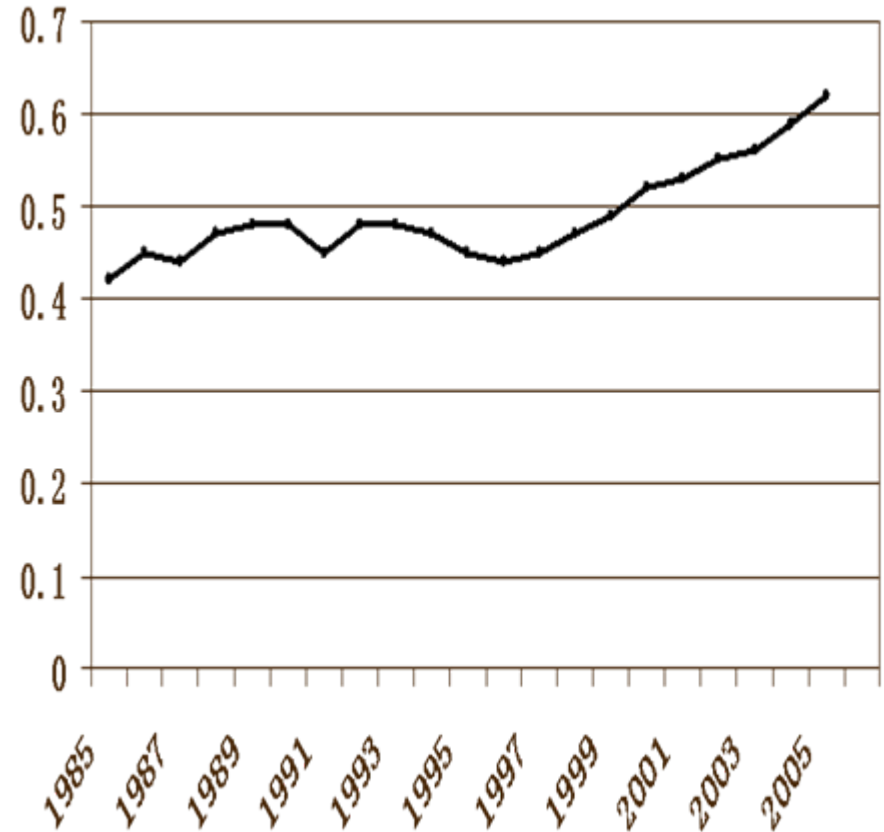
# Concerns...

- **Yield growth rates of major agricultural commodities have been falling;**
- **Intensification of agriculture**

## Government fiscal investment in agricultural research (billion yuan in 2005 price)



## Agricultural research investment intensity (%) in China



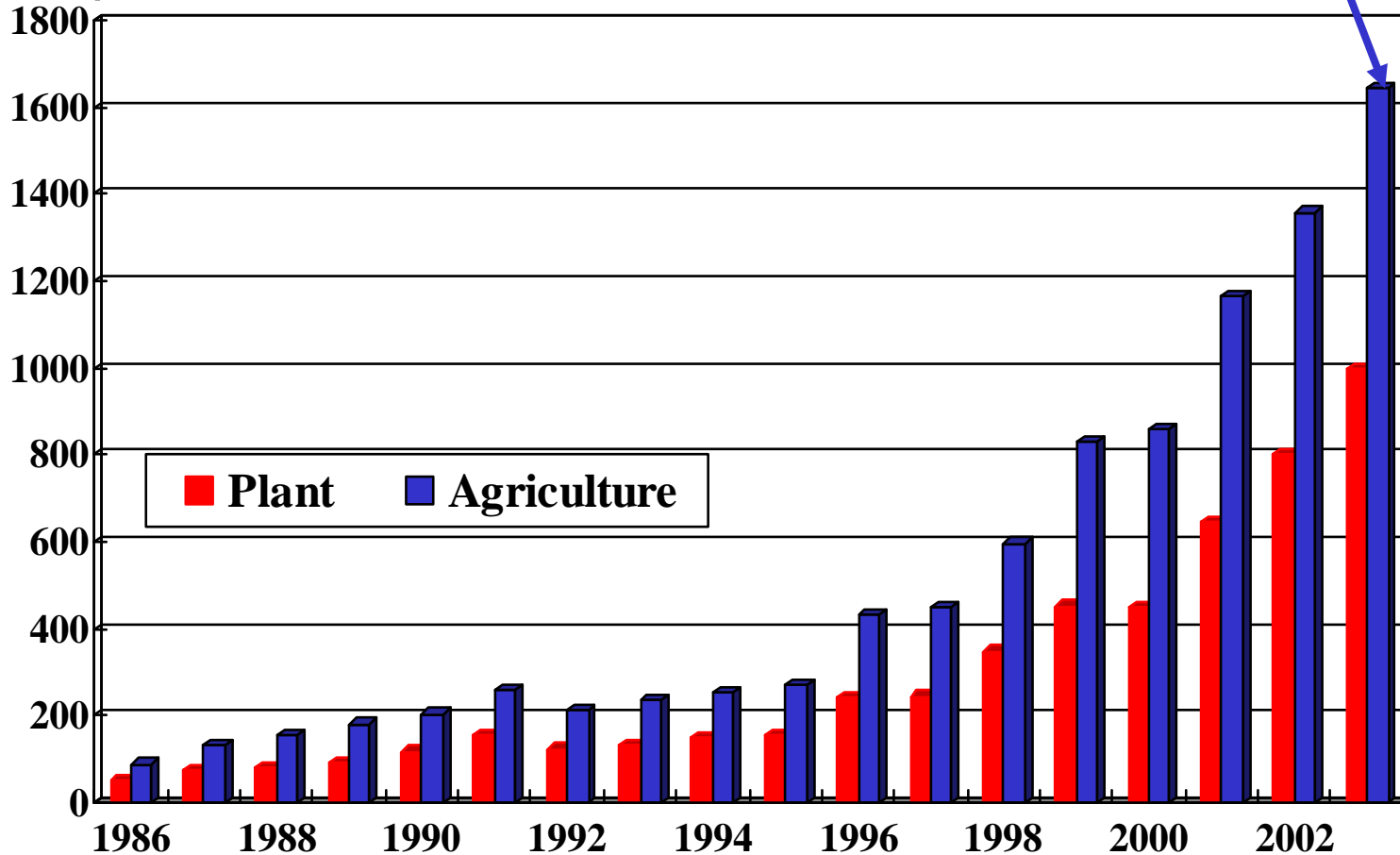
Since 2000, the rise in research investment has been higher in China than any other country in the world ...

# Agricultural biotech research investment

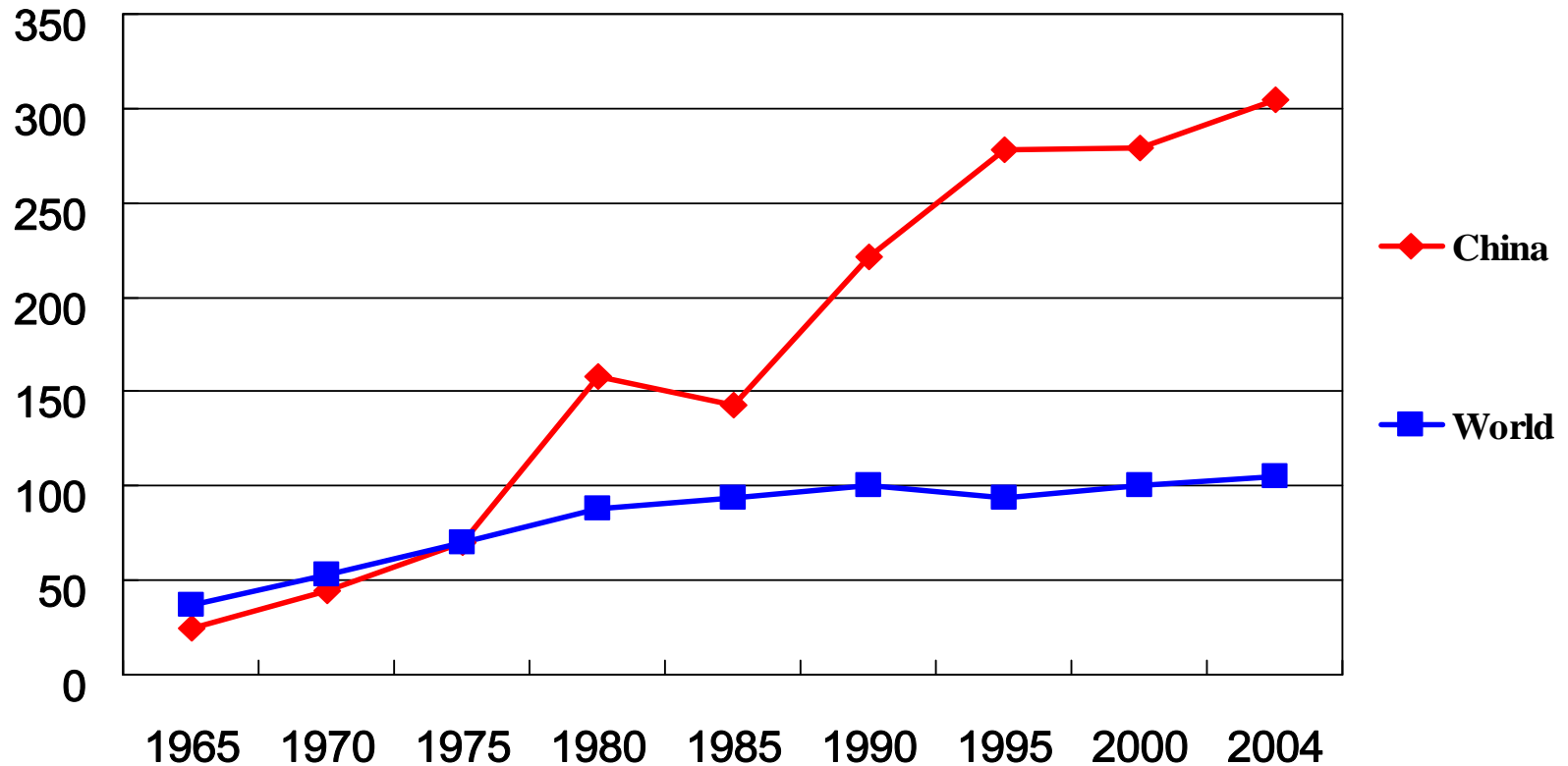
2003: 1.65 billion yuan = US\$ 200 million  
or US\$ 950 million in PPP

**New GMO  
program:  
26 billion  
yuan (US\$  
3.8 billion)  
in 2009-  
2020**

(million yuan  
in 2003 price)



# Fertilizer use intensity (kg/ha)



**4th highest in the world: Japan → Korea → Holland → China**

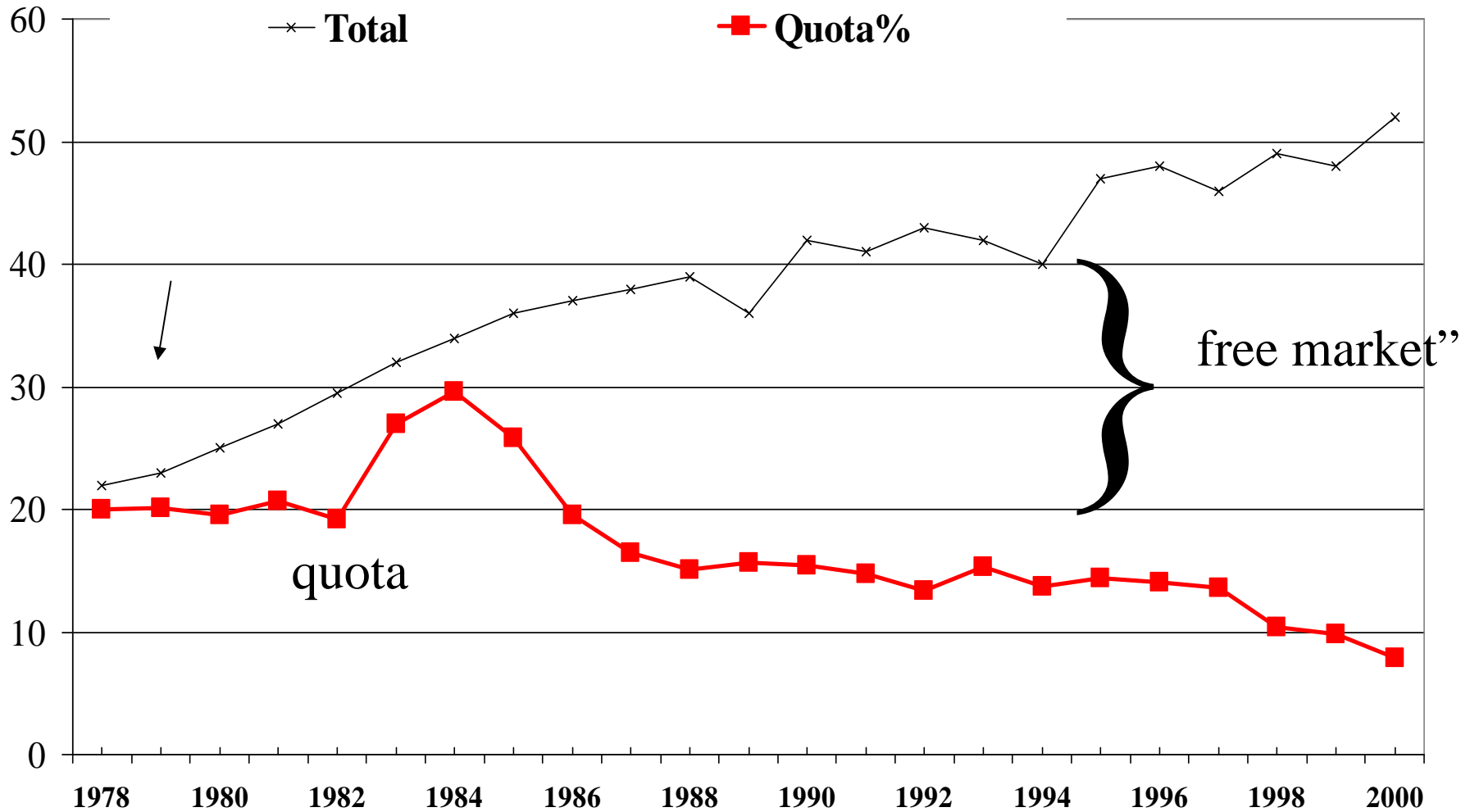
**Policy response: improving efficiency of fertilizer use in crops**

# **Market Liberalization**

# Markets in 1980

- **Almost no free market ...**
- **Government bought ALL agricultural commodities / sold ALL inputs**

# Government rice procurement and free market sales of grain



# Integration in China's Markets (percent of market pairs that have integrated price series)

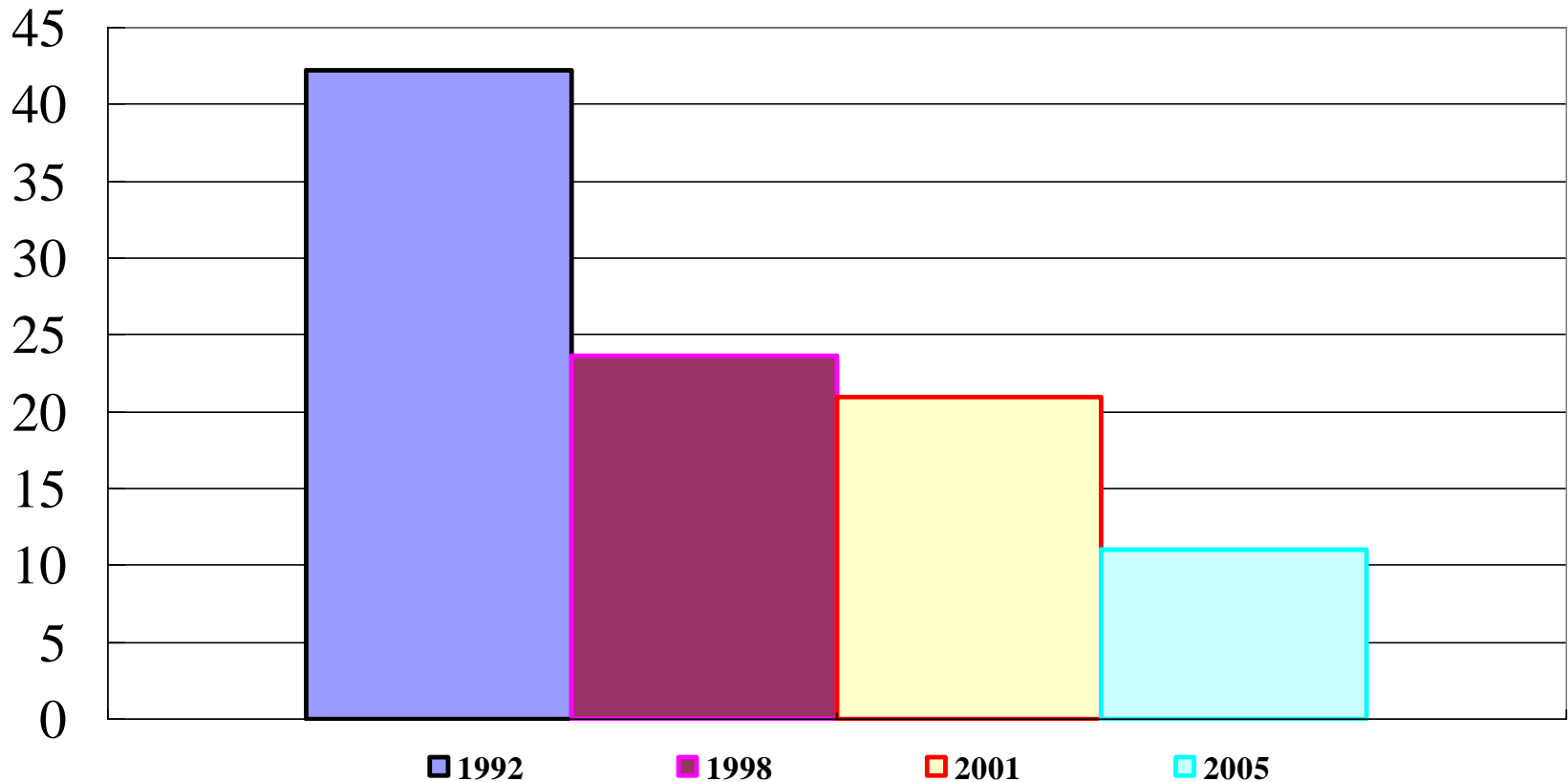
	1991-92	1997-00	2001-2003
Corn	46	<b>93</b>	<b>100</b>
Soybean	56	<b>95</b>	<b>98</b>

When using statistical tests (on more than 800 pairs of markets), almost all markets move together in an integrated way, up from less than ½ in the early 1990s (when markets were NOT integrated)

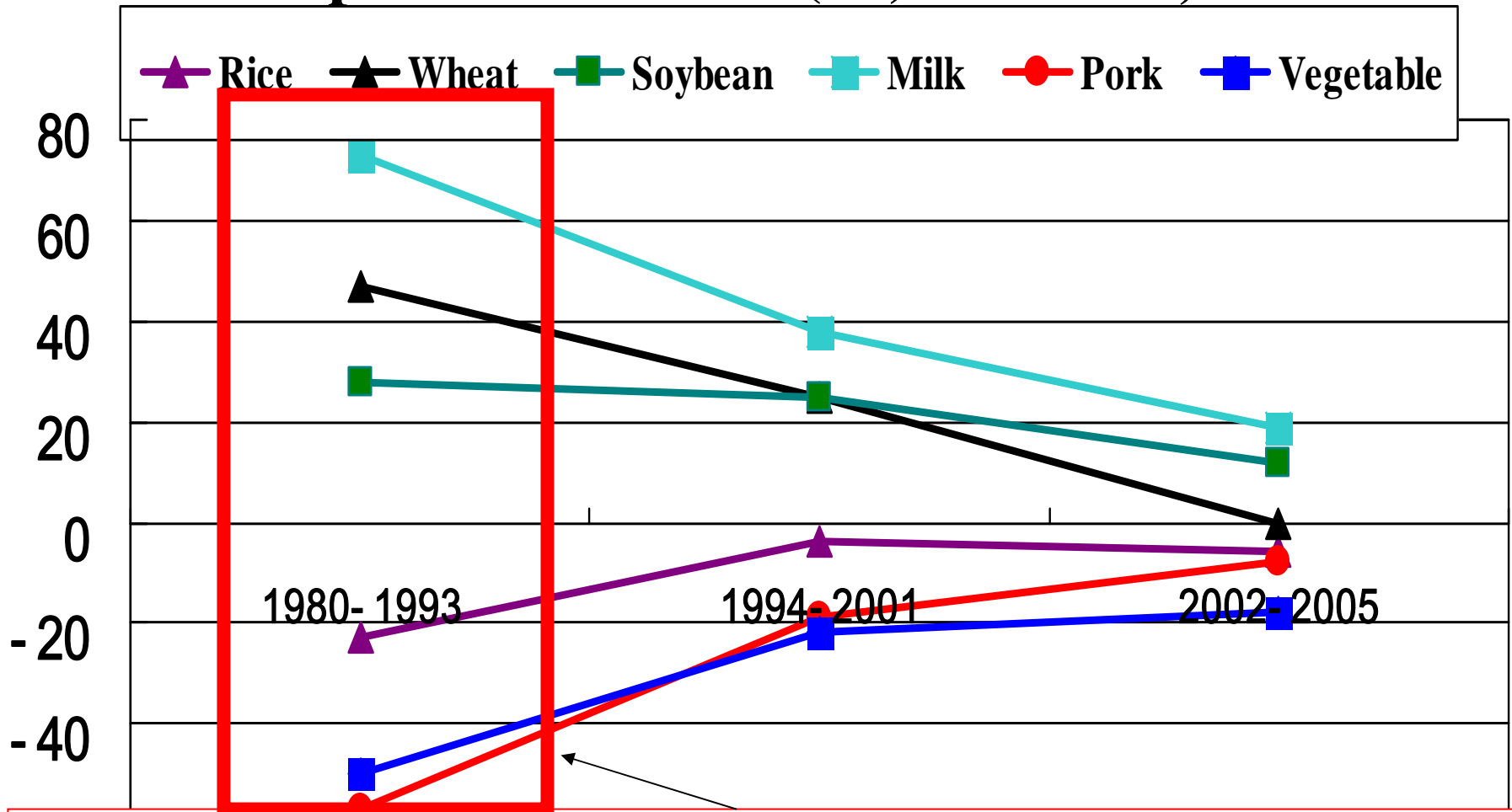
# Agricultural tariff rate (%):

**Prior to WTO accession (1992-2001) : 42% → 21%**

**China's WTO commitment (2001-2005): 21% → 11%**

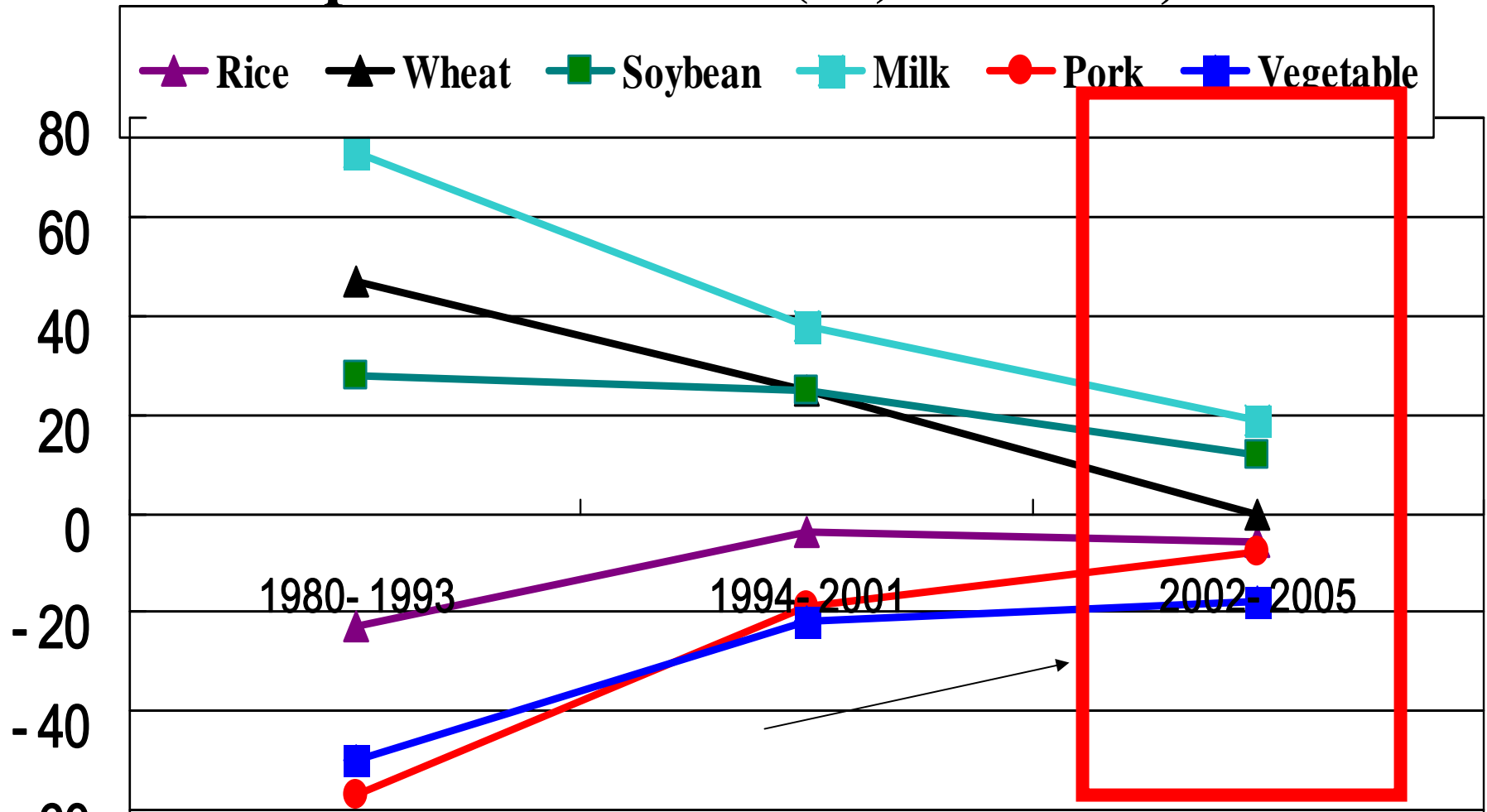


# Nominal protection rates (%) in China, 1980-2005



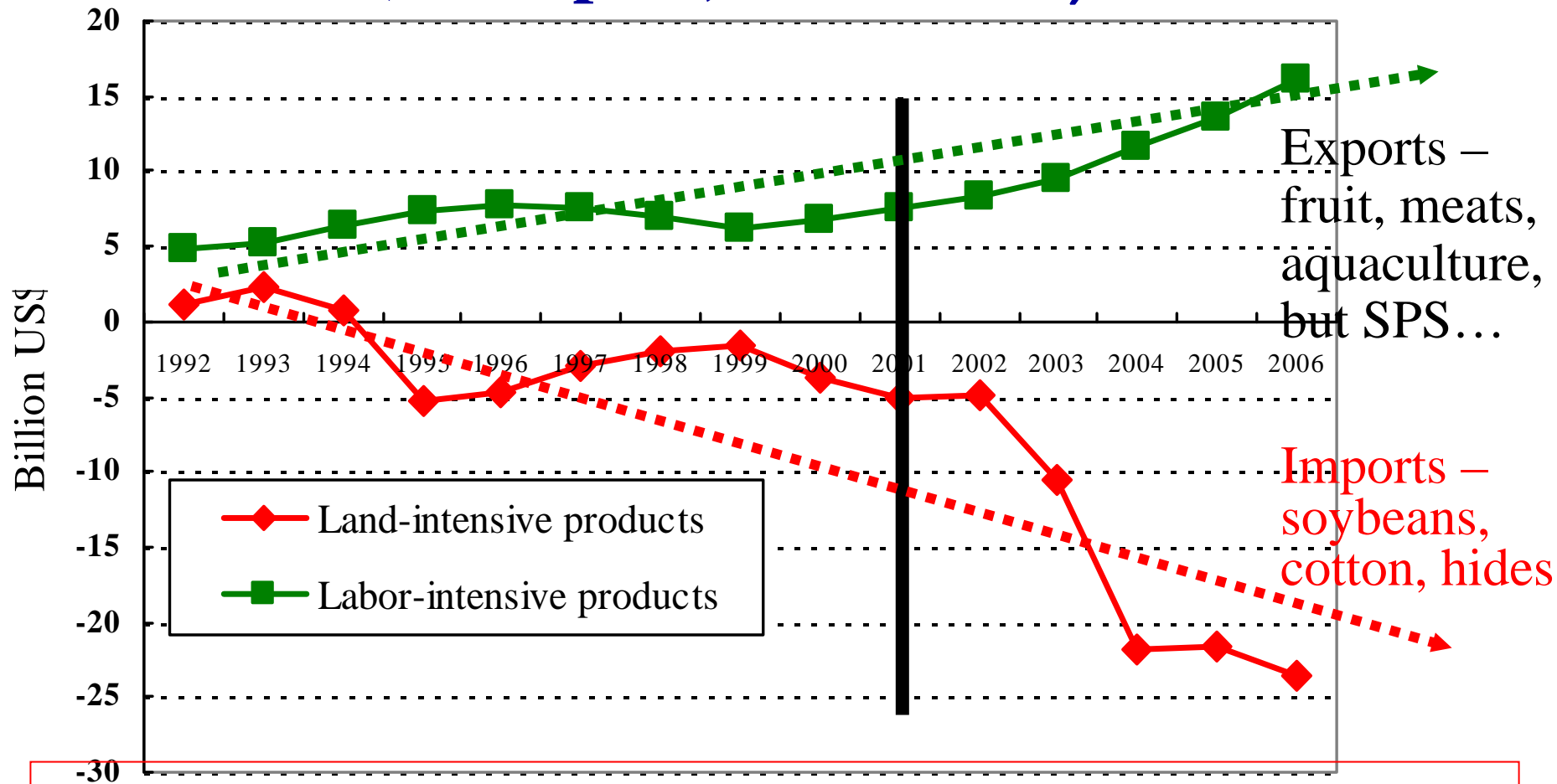
This slide shows that while the prices of some commodities were much higher than world market prices in the 1980s (those commodities  $> 0$ ) and many were way under world market prices (those commodities  $< 0$ )

# Nominal protection rates (%) in China, 1980-2005



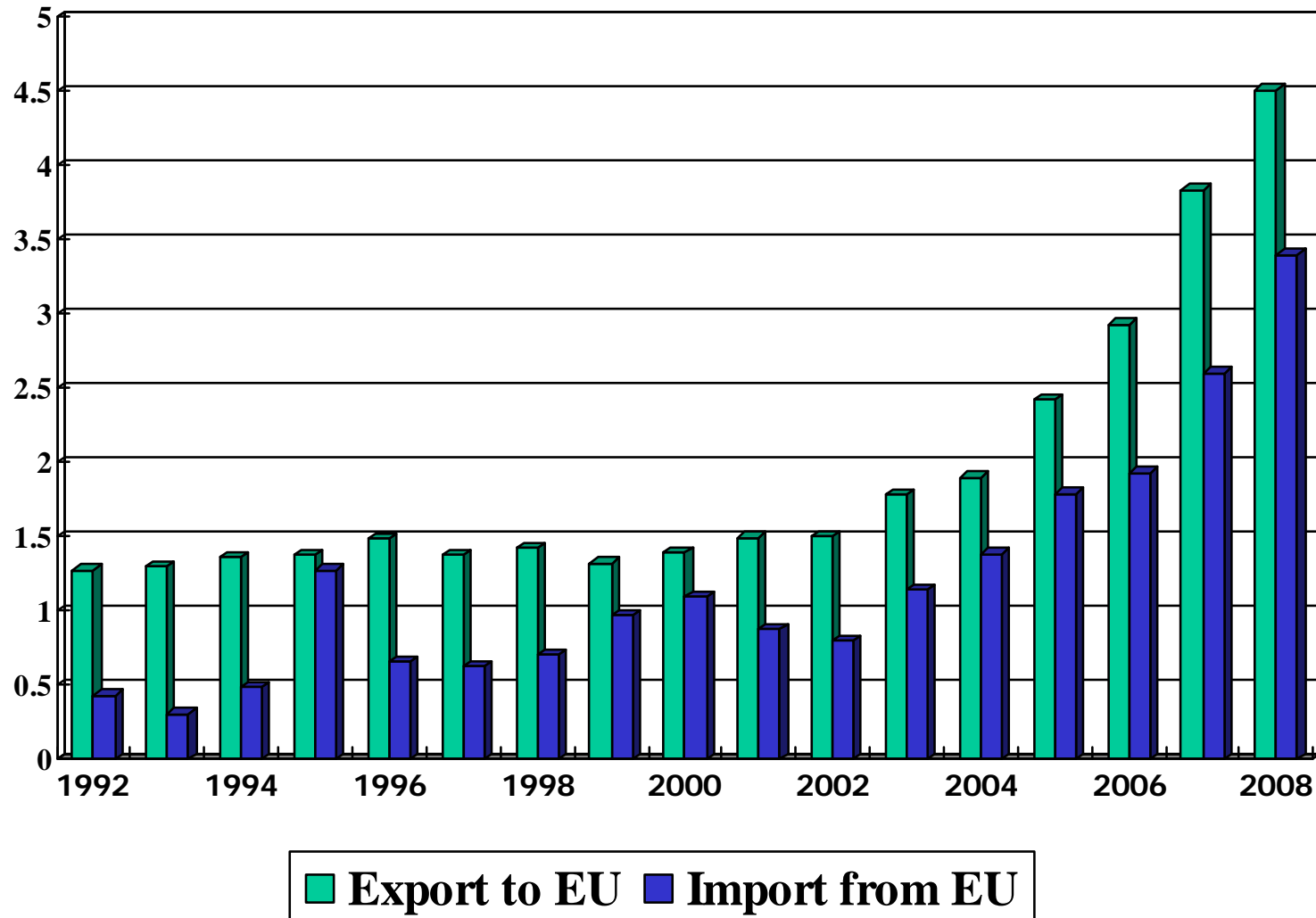
... by the 2000s, the prices of most of China's commodities were nearly equal to the prices of the same commodities on world markets ... this means that China is VERY OPEN ... these numbers are more close to those in Australia and New Zealand than Japan, Korea or Europe

# The Change of China's agricultural trade (net export, billion US \$)

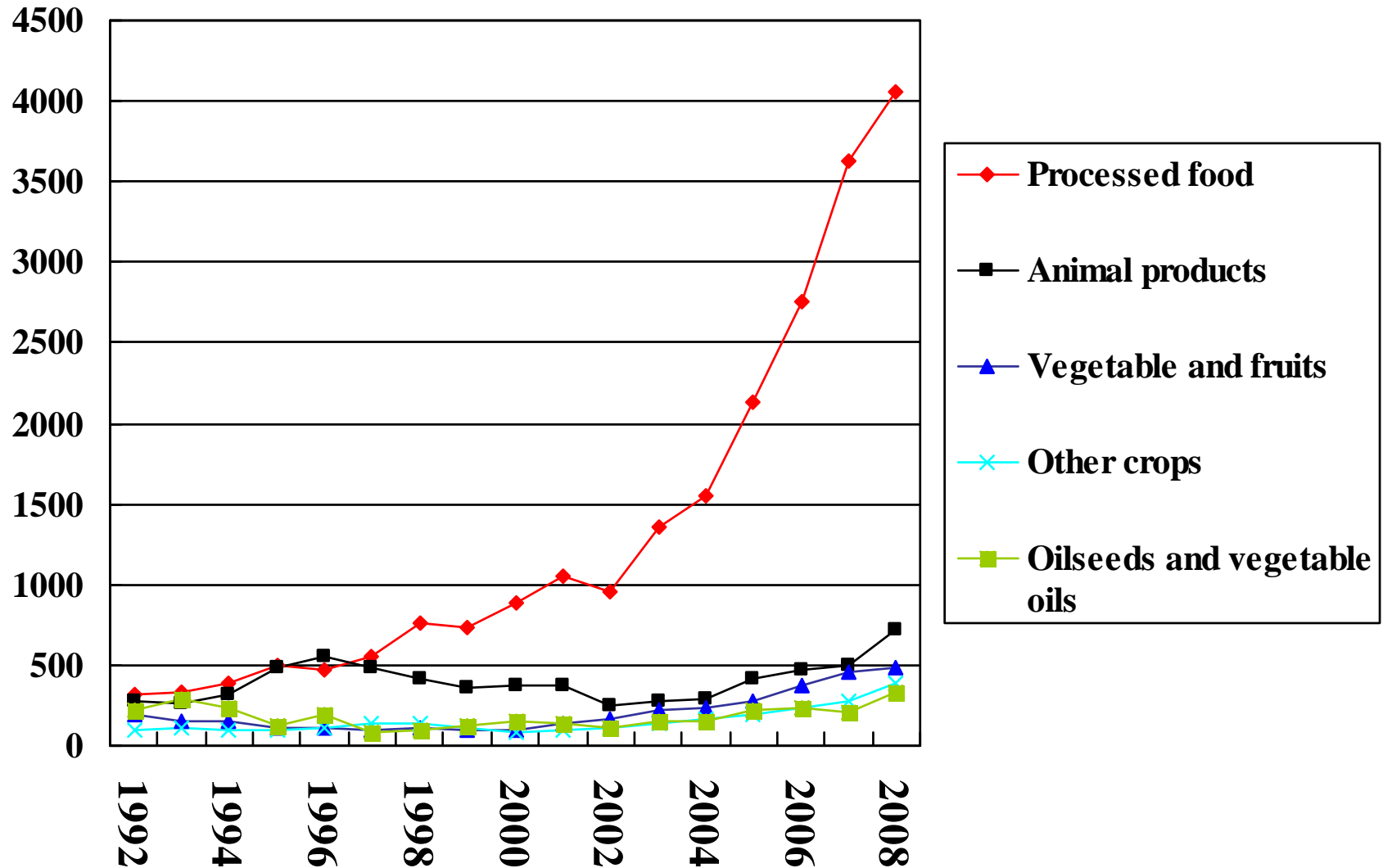


... China is beginning to move towards exporting its comparative advantage products (e.g., labor intensive commodities) despite rising SPS issue ... While importing land intensive commodities (such as soybeans and cotton)

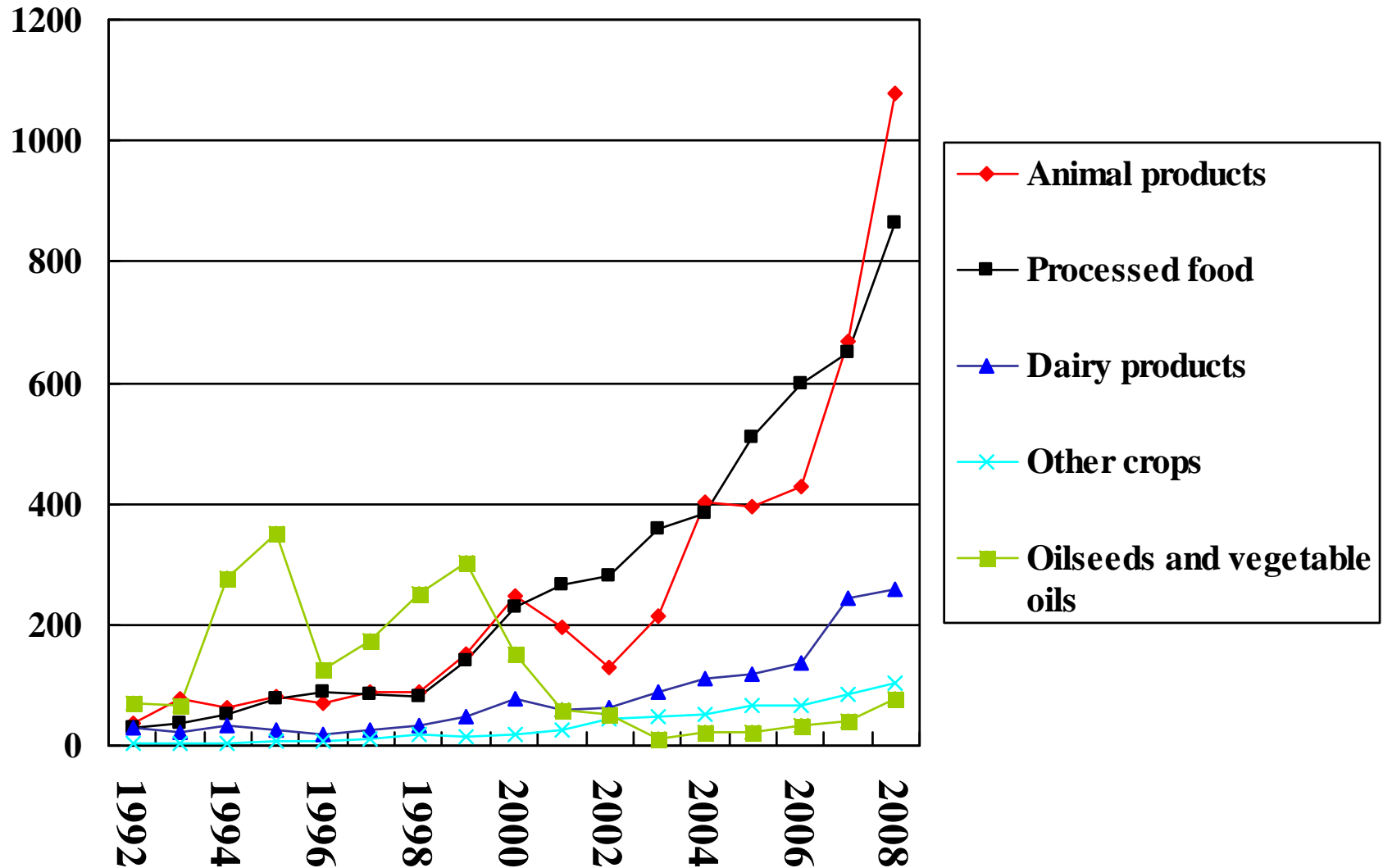
# Agri. trade between China and EU25 (billion USD)



# Agr. Export (million USD) to EU for Top 5 Products



# Agr. Import (million USD) from EU for Top 5 Products

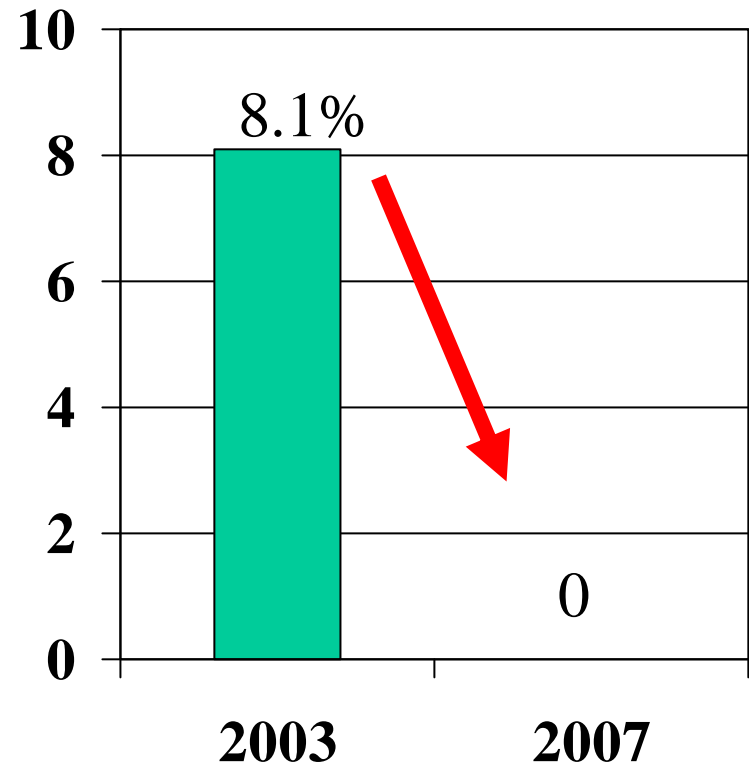


# **Investment in Agriculture**

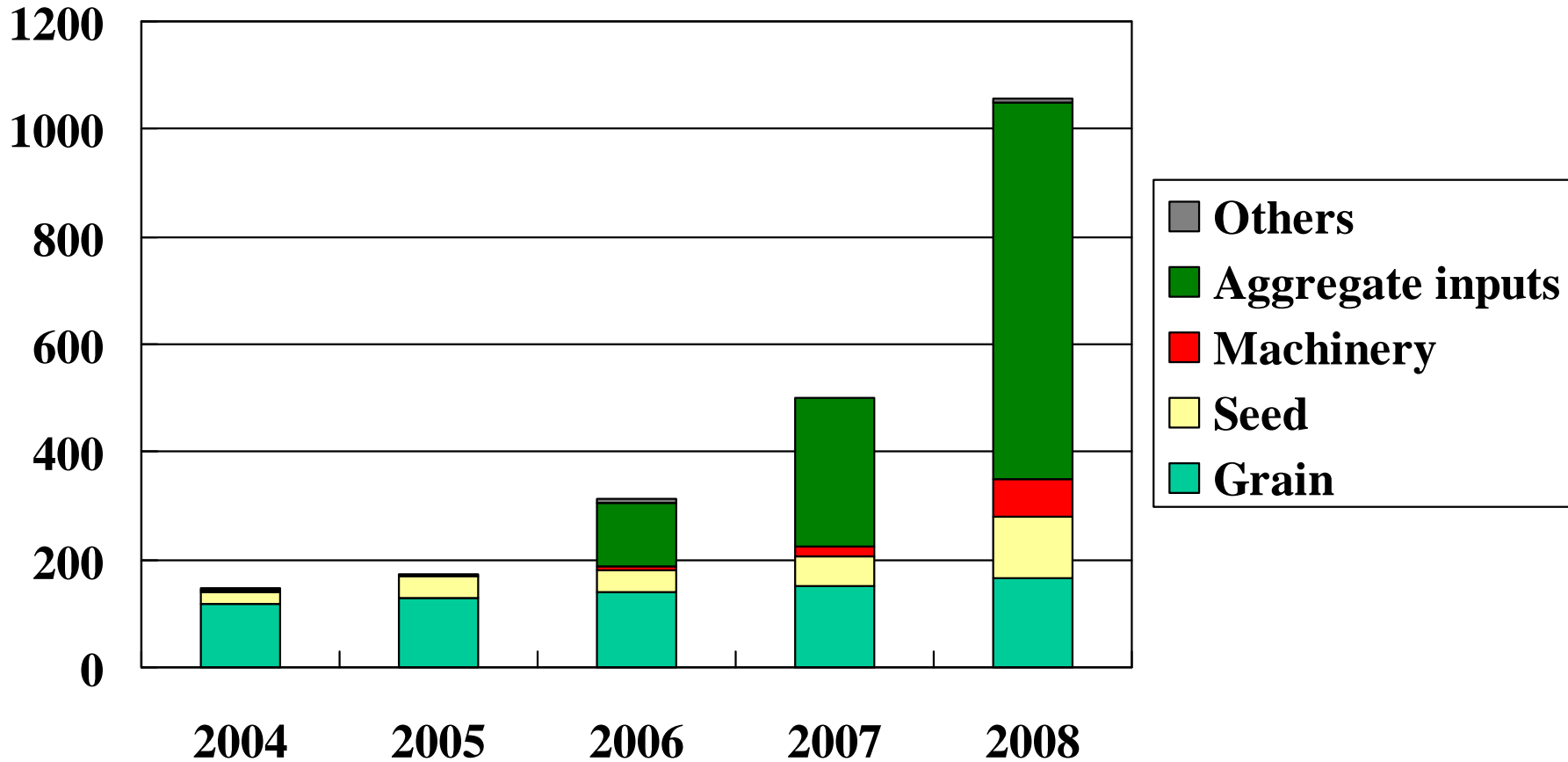
# Tax Reduction Program Completed

- Completely eliminated taxes
- Farmers now pay no taxes or fees

Percent of Value of Output



# Agricultural subsidies (100 million yuan)

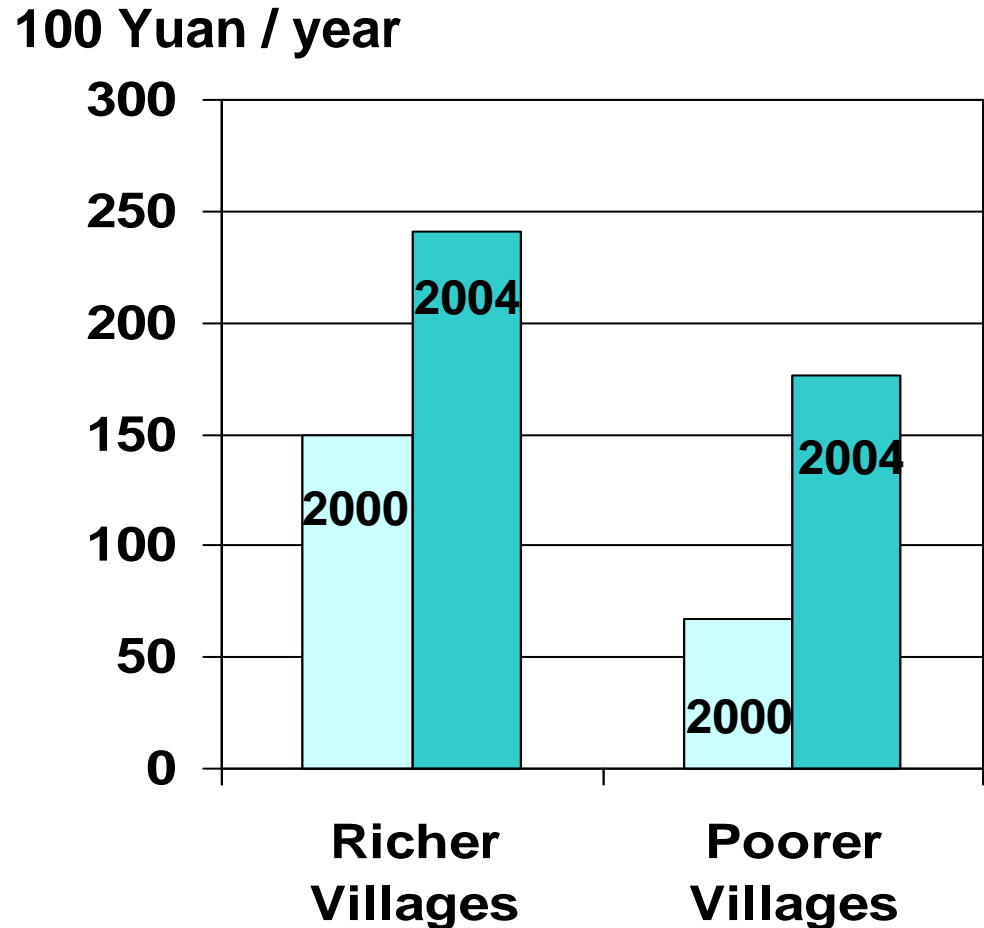


**Subsidies and supports have been rising significantly, but most of them are decoupled, have little intervention in the market**  
3.1% of agricultural GDP in 2008

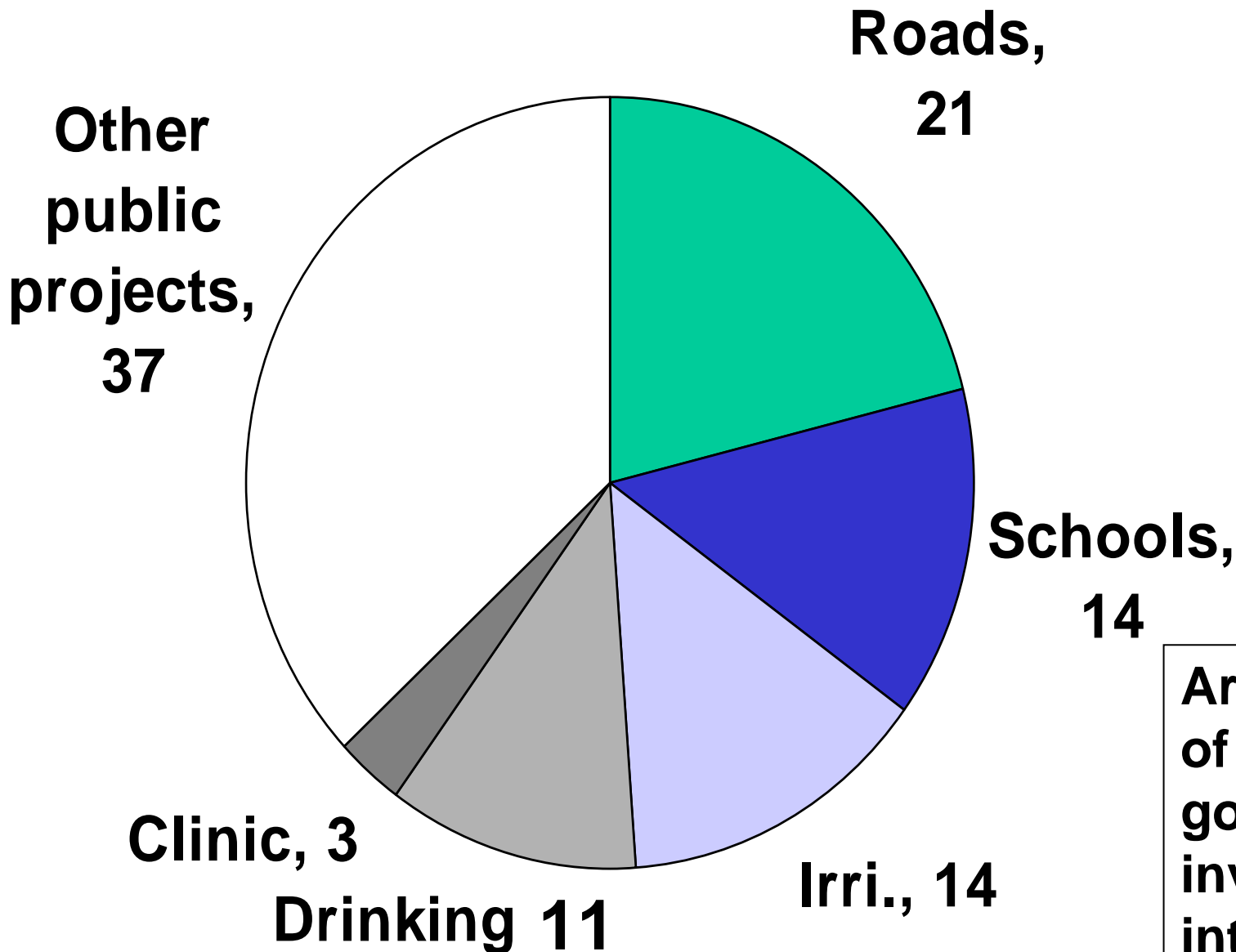
# Rising Investment Over Time

(100 village study partially funded by EU)

- Nearly all villages experienced rising investment into public goods
- Poor received greater increase, absolutely and in percentage terms
- In 2004, per capita investment almost US\$100/capita 2004



# Type of PUBLIC GOODS projects



Around 2/3rds of public goods investments into 5 types of projects

# New challenges

- **Biofuels**
- **Climate change**
- ...

# Policies on biofuel development in China

**2000**

**Large biofuel R&D program**

**2001**

**“National Standard of Denatured Fuel Ethanol”  
“National Standard of Vehicle bioethanol”**

**2002**

**Pilot program on bioethanol production (E10) in Henan, Heilongjiang, Jilin and Anhui**

**2004**

**Expanded: E10 used in transportation 9 provinces.**

**2005**

**Released “Renewable energy law”. 12 mmt biofuels by 2020**

**After 2007**

**Expansion: non-cereal; no cultivate lands; ....**

# Alternative non-cereal feedstocks... and biomass...



**Sweet potato**



**cassava**



**Sugar cane**

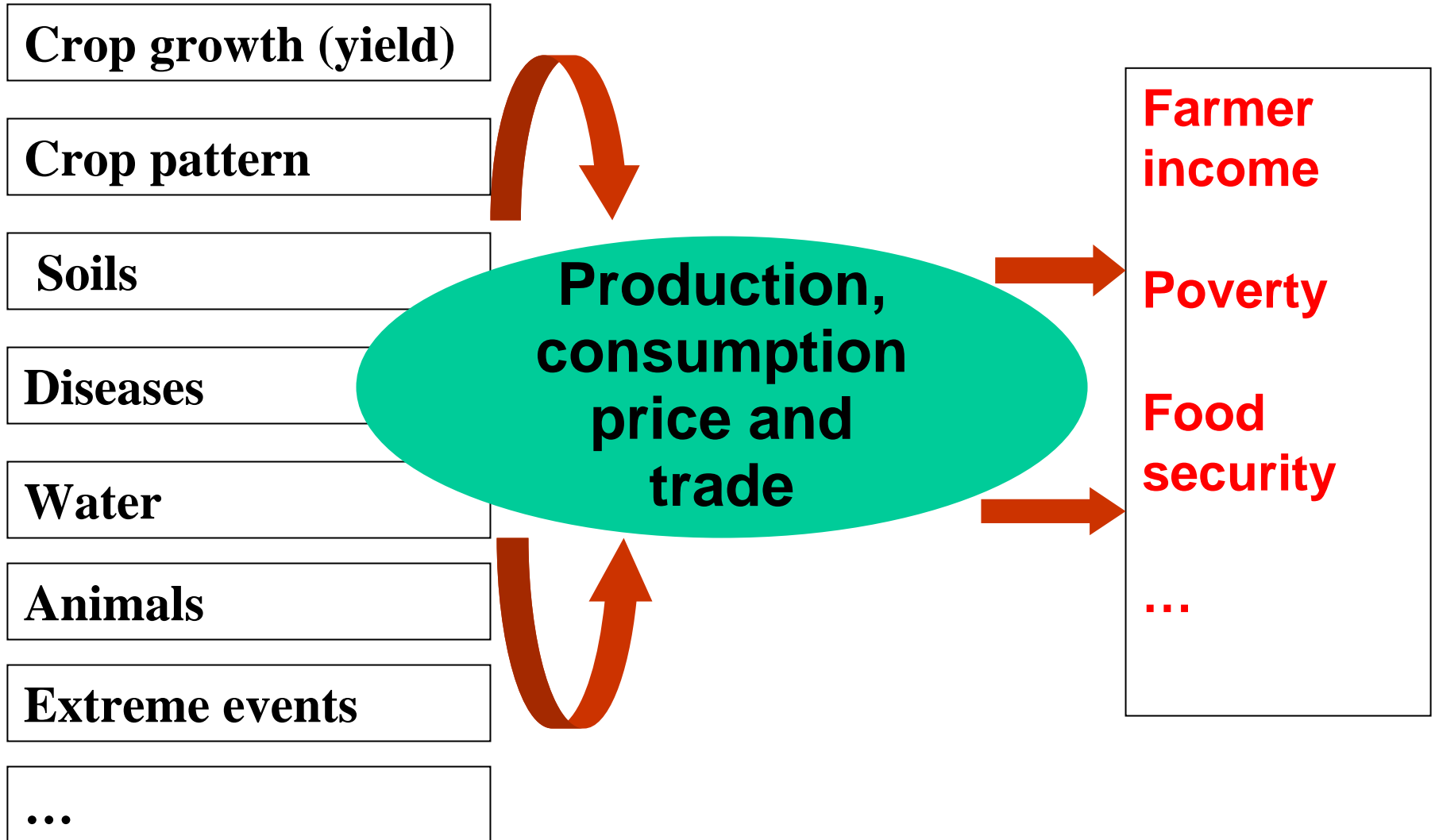


**Sugar beet**



**Sweet sorghum**

# Agriculture is likely very vulnerable to climate change



# Climate Change: extreme events



2009年2月，山东济南山区，农田里受旱枯萎的冬小麦



- **Rising frequency of extreme events**



# Policy responses to climate change

- **Much in energy, transportation, construction, and others; less in agriculture**
- **There has been called for more research on the impacts, adaptation and mitigation;**
- **Recently Green Agriculture has addressed more attention than others...**
- **...**

# Concluding remarks (1)

- **China's agriculture has been successful in growth and structural transformation** within agriculture and expansion of off-farm employment.
- **Institutional changes** have played important roles in China's agriculture.
- **Technologies** have been and will continue to be major source of agricultural productivity growth.
- **Markets** have been increasingly integrating within China and between China and the rest of world.

## Concluding remarks (2)

- **Challenges and concerns:**
  - **Farmers' income**
  - **Production:**
    - **Small farms and agricultural modernization**
    - **Resource constraints: Land and water**
  - **Demand and trade: food security + food safety**
  - **Biofuels**
  - **Climate change**
  - ...

## Concluding remarks (3)

- **Policy responses:**
  - **Farmers' income:** Agri -> income support  
Off-farm employment  
...
  - **Production:** Increase farm size  
Farmers' cooperatives  
Invest in technology  
Invest in land/water
  - **Demand & trade:** Food safety and grain reserve
  - **Biofuels:** Caution strategy
  - **Climate change:** Low carbon and Green Agri.

## Concluding remarks (4)

- **Issues need further investigation:**
  - **On production:** **Water and food security**  
**Technology**
  - **On market/trade:** **Meat and feed**  
**Food safety and SPS**
  - **On new challenges**  
**(biofuel, CC, and**  
**agr intensification):** **Green agriculture**  
**“Biobased economy”**