



# **Agricultural Trade Development and Food Security in China**

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## 大国小农 A large country with a large population of smallholders, 农耕文明 : 5000多年

History of farming : Over 5000 years, 中国小农 : 传统农耕文明的重要载体、农业农村经济的基本单元

Chinese smallholders : Vital role in conserving traditional farming culture, and basic units of agriculture and rural economy

全国耕地总面积 : 1.35亿公顷

Total cultivated land :  
135 million ha.

人均耕地面积 : 0.097公顷  
Per capita availability:  
0.097 ha.

< 2ha.  
2.58亿农户  
258 million  
households

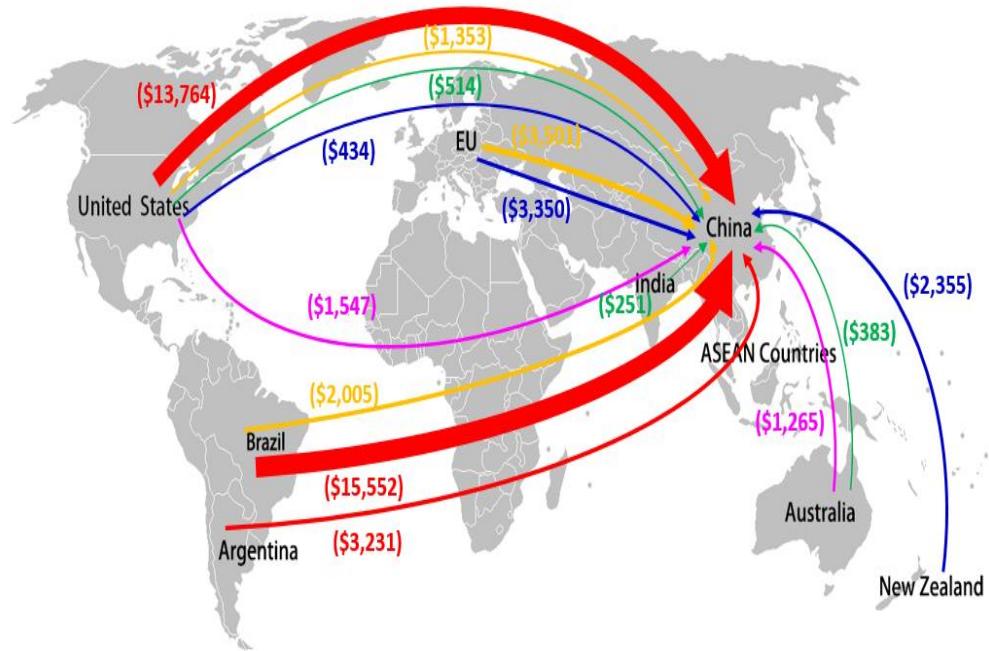
> 2ha.  
1076.6万农户  
10.766 million  
households

> 13.3ha.  
36.6万农户  
366,000  
households



# 开放 全球化

## *Open-door Policy*



# Outline



- Achievement in China's Food Security
- Development in agro-trade
- Contributions and Challenges of agro-trade

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- Future prospects

## 总体成效 Overall achievement

9%

6.4%

20%

中国用占世界9%的耕地  
9% of global cultivated land

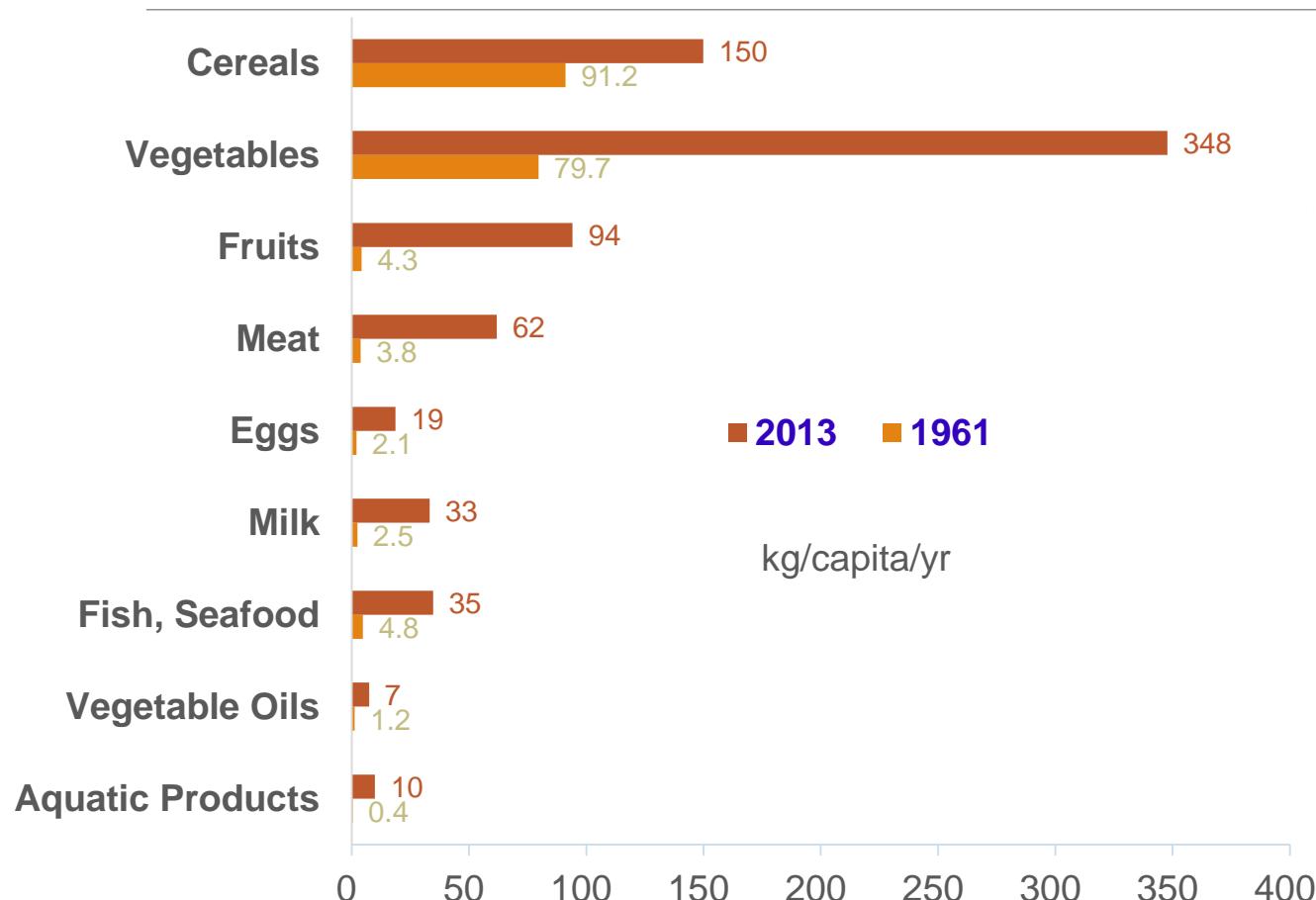
6.4%的淡水资源  
6.4% of global freshwater resource

解决了占世界近20%人口的吃饭问题  
The ability to feed 20% of world's population



## ➤ Improvement in Food Consumptions in China 食物消费量变化

Per Capita Consumption of Major Food Items in  
China ,1960s-2010s

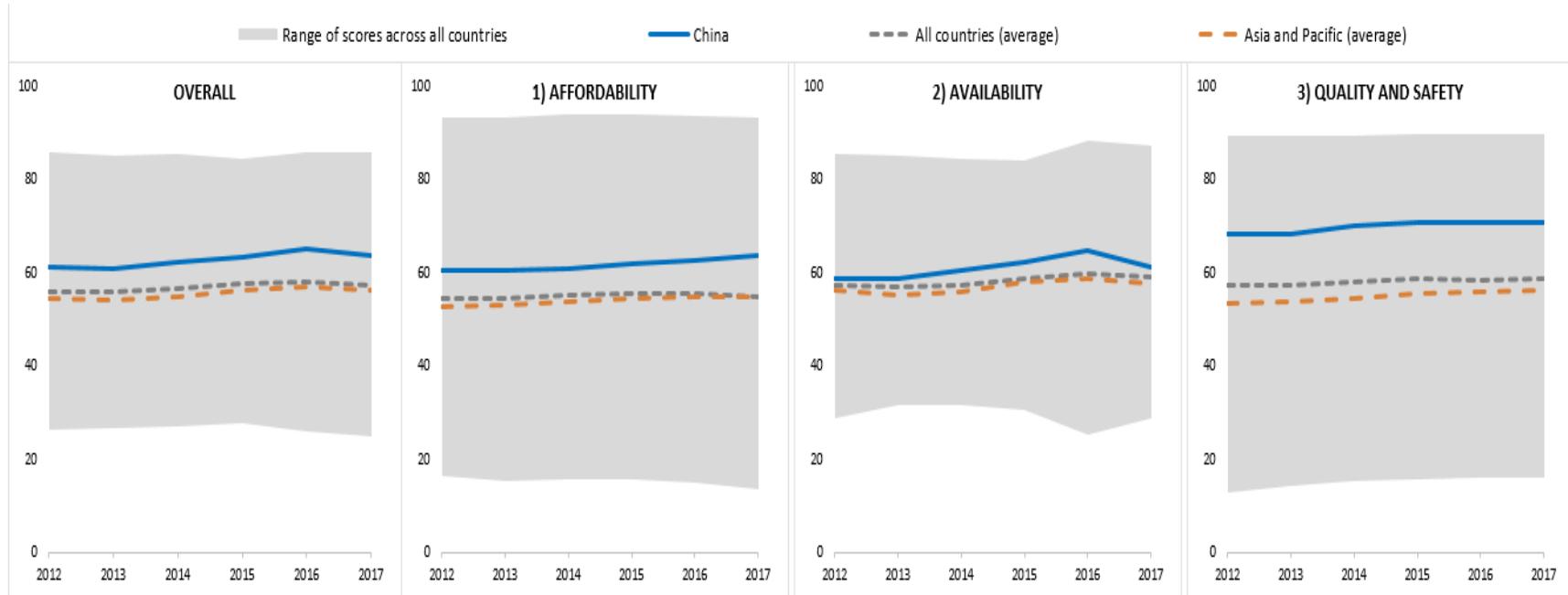


Note: Cereals excludes beer, fruits excludes wine, milk excludes butter, aquatic Products include aquatic animals & plants.

Sources: FAOSTAT "Food Balance Sheets"

➤ China Ranked 45<sup>th</sup> among 113 Countries in the 2017 GFSI Ranking  
全球粮食 安全指数 国际排名 45/113

### GFSI Scores Comparison between China and Other Countries (2012-2017)

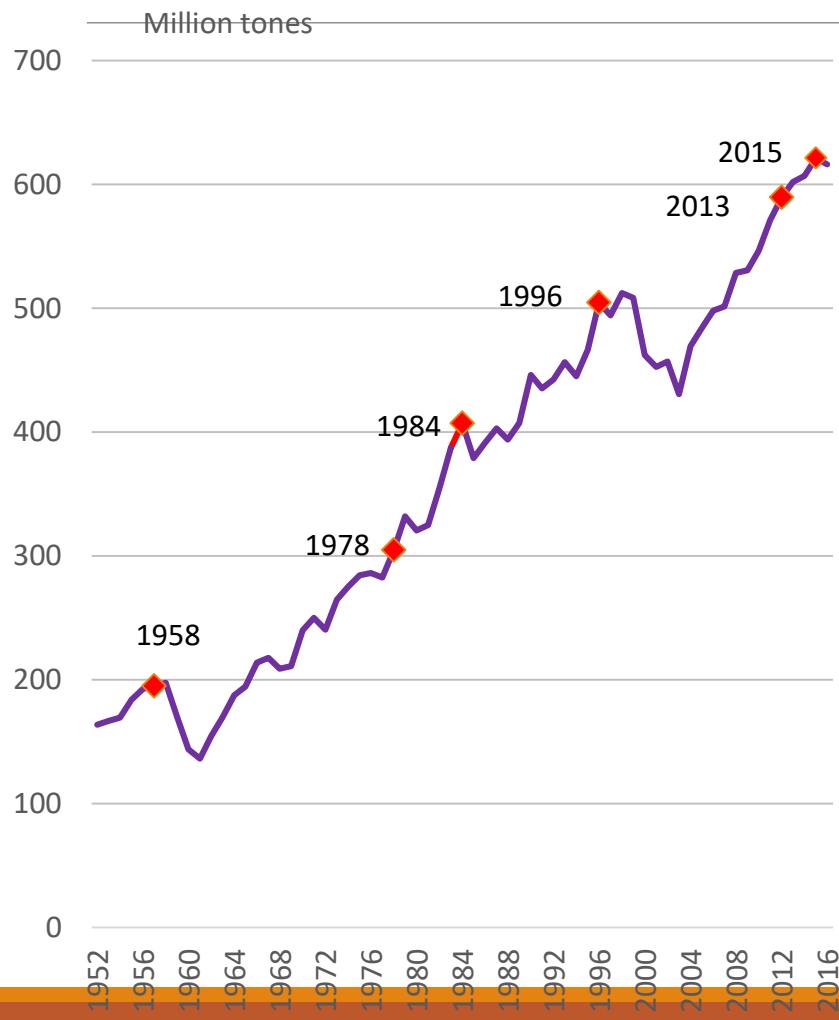


Notes: score 0-100 where 100=best. Sources: EUI(2017) "Global Food Security Index 2017".



## ➤ Output growth of major agricultural products 主要农产品产量变化

**China's Grain Output  
Growth,1952-2016**



Sources: NBSC "China Statistics Yearbook"(various years)

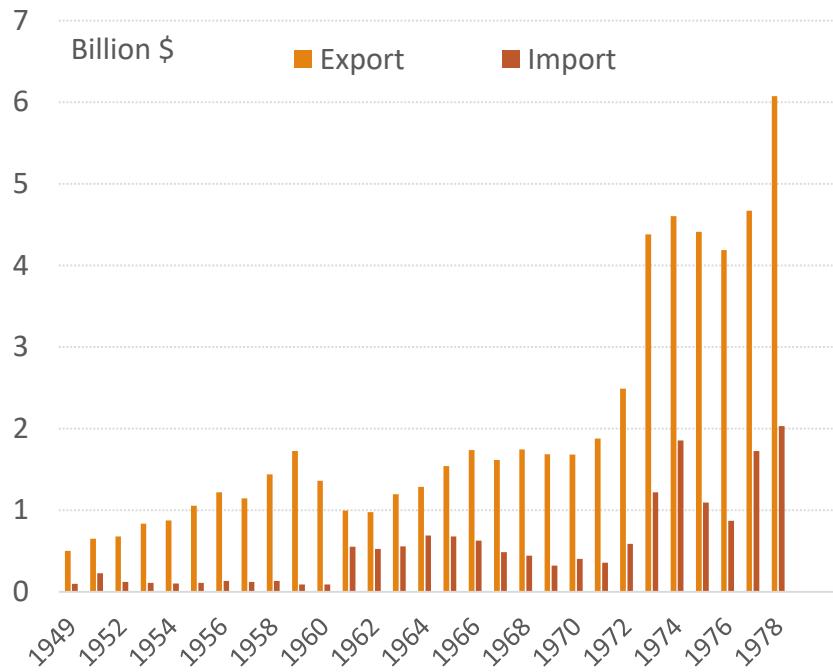
**China's Other Major Food Products  
output growth,1980-2016 (Million tones)**

Year	Meat	Fruits	Vegetables
1980	12	7	
1985	19	12	
1990	29	19	
1995	41	42	
2000	60	62	
2001	61	67	484
2002	62	70	529
2003	64	145	540
2004	66	153	551
2005	69	161	565
2006	71	171	540
2007	69	181	565
2008	73	192	592
2009	76	204	618
2010	79	214	651
2011	80	228	679
2012	84	241	709
2013	85	251	735
2014	87	261	760
2015	86	274	785
2016	85	284	798

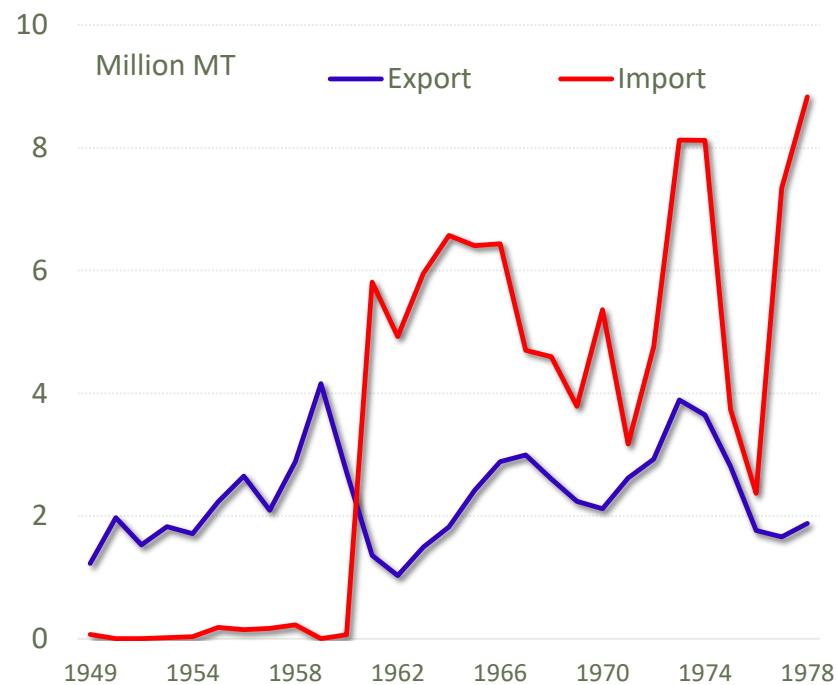
## ➤ Phase I: 1949-1978 外贸专营，严格管理

- Low level
- Net exporter *foreign exchange earner*

China's Agricultural Trade, 1949-1978



China's Cereals Trade, 1949-1978



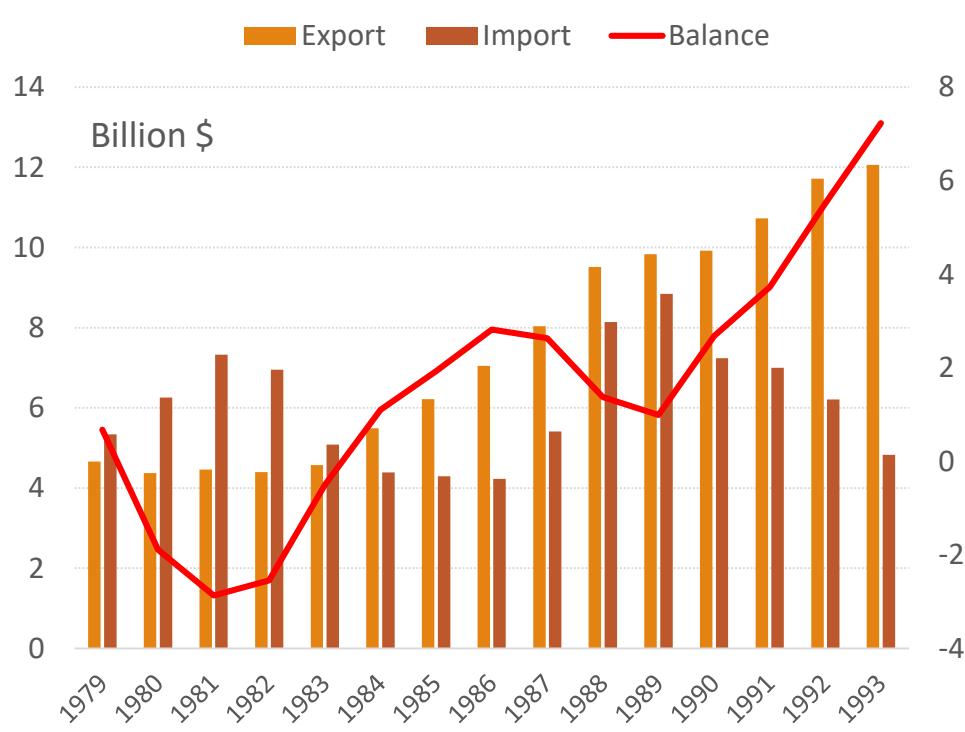
Source: China Customs data

## Phase II: 1979-1993

双重体制、探索开放

- Growing in volume
- Comparative advantage
- Net exporter

China's Agricultural Trade Balance, 1979-1993



Source: China Customs

China's Trade of Selected products, 1980-1990

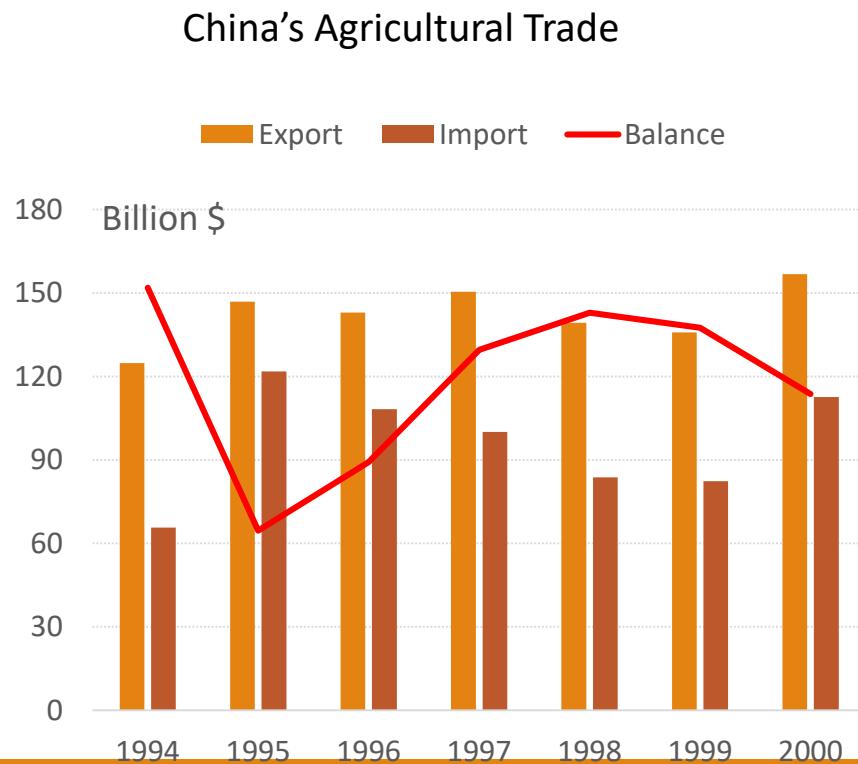
Billion \$	1980	1985	1990
<b>Export</b>			
Live Animals and Meat	0.8	0.8	1.2
Aquatic products	0.4	0.3	1.4
Cereals, Oilseeds and Vegetable Oil	0.5	1.3	1.2
Vegetable and Fruits	1.1	1.3	2.3
<b>Import</b>			
Live Animals and Meat	0.0	0.0	0.1
Aquatic products	0.0	0.0	0.1
Cereals, Oilseeds and Vegetable Oil	2.5	1.1	2.5
Vegetable and Fruits	0.1	0.1	0.1

## ➤ Phase III: 1994-2001

深化改革、加速开放

- Fluctuation
- Adjusting to domestic production-consumption
- Soybean imports

### Preparing to join WTO



Source: China Customs

### Net Import of China's Cereals (Million MT)

	Cereals	Rice	Wheat	Maize	Soybean
1994	2.6	-1.0	7.2	8.7	-0.8
1995	19.8	1.6	11.4	5.1	-0.1
1996	9.6	0.5	7.7	0.2	0.9
1997	-4.2	-0.6	1.5	-6.7	2.7
1998	-5.0	-3.5	1.3	-4.4	3.0
1999	-4.0	-2.5	0.3	-4.3	4.1
2000	-10.7	-2.7	0.7	-10.5	10.2

Notes: “+” means net import, while “-” means <sup>11</sup> net export

➤ Phase IV: 2001--

## 接轨世界、全面开放

- Joined WTO

- Tariff cuts

✓ ***17.9% in 2001 to 15.2% in 2016***

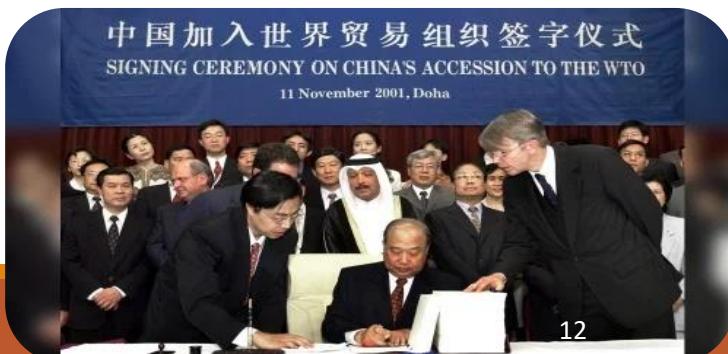
- Establish a Tariff Rate Quota (TRQ) import system

✓ ***wheat, corn, rice, sugar, cotton, wool***

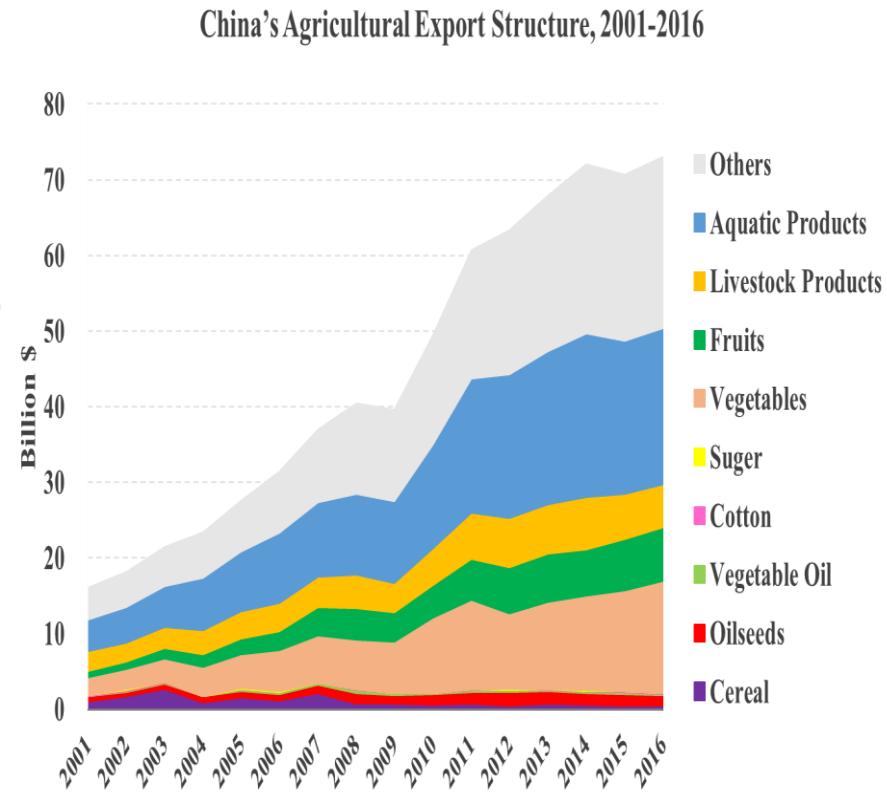
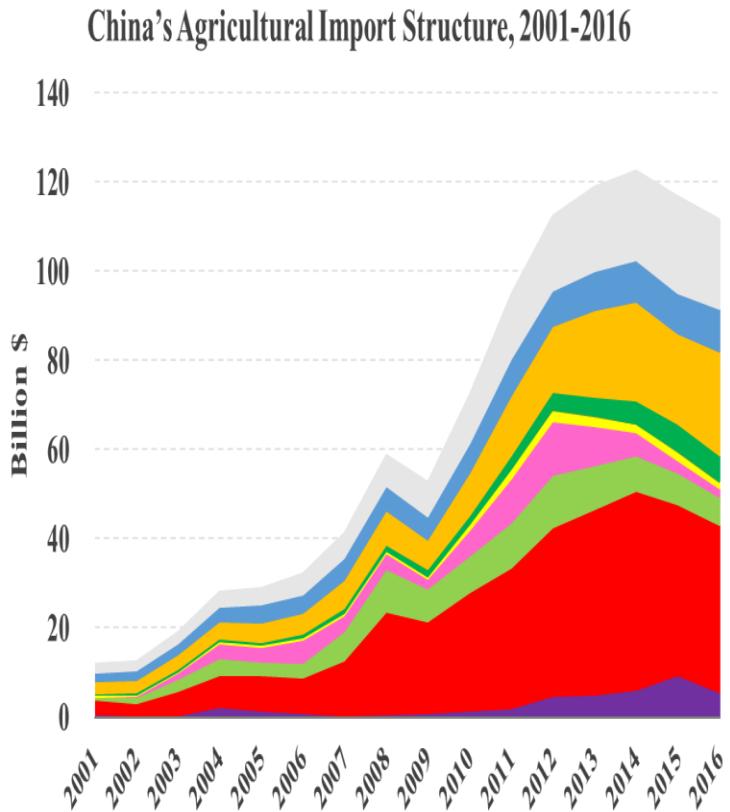
- Reduce the export subsidies and state trading

- Cap domestic agricultural support

— ***8.5% AMS***



- Increasingly Revealed Comparative Advantage/Disadvantage / 比较优势 / 比较劣势 更为突显



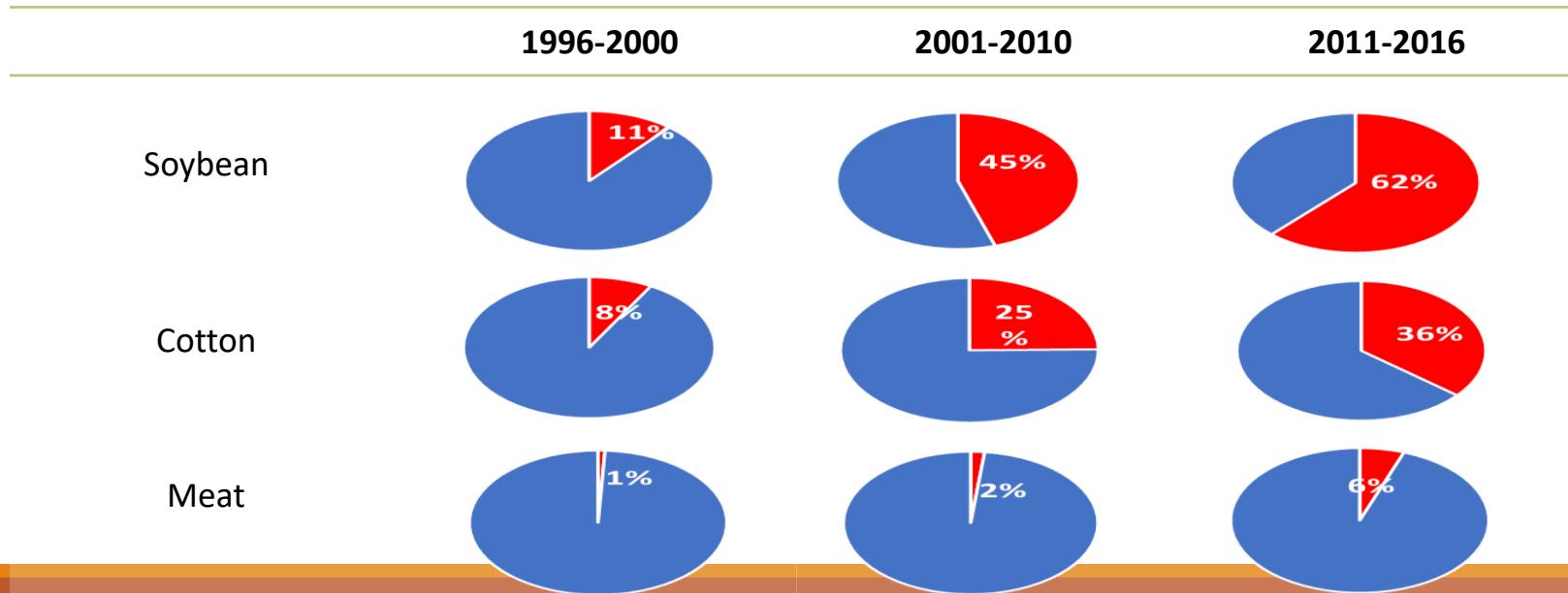
- Import **land-intensive** products
  - cereal, oilseeds (soybeans), vegetable oil, cotton
- Export **labor-intensive** products
  - vegetables, fruits, aquatic products

# • 进口：世界地位 Growing Imports: China vs the World

## Changes of Top 5 Importers of Agro-products in the World

Rank	2000	2005	2010	2012	2014	2016
1	EU	EU	EU	EU	EU	EU
2	USA	USA	USA	China	China	USA
3	Japan	Japan	China	USA	USA	China
4	China	China	Japan	Japan	Japan	Japan
5	Canada	Canada	Russia	Russia	Russia	Canada

## China's Share of Global Agricultural Import Market

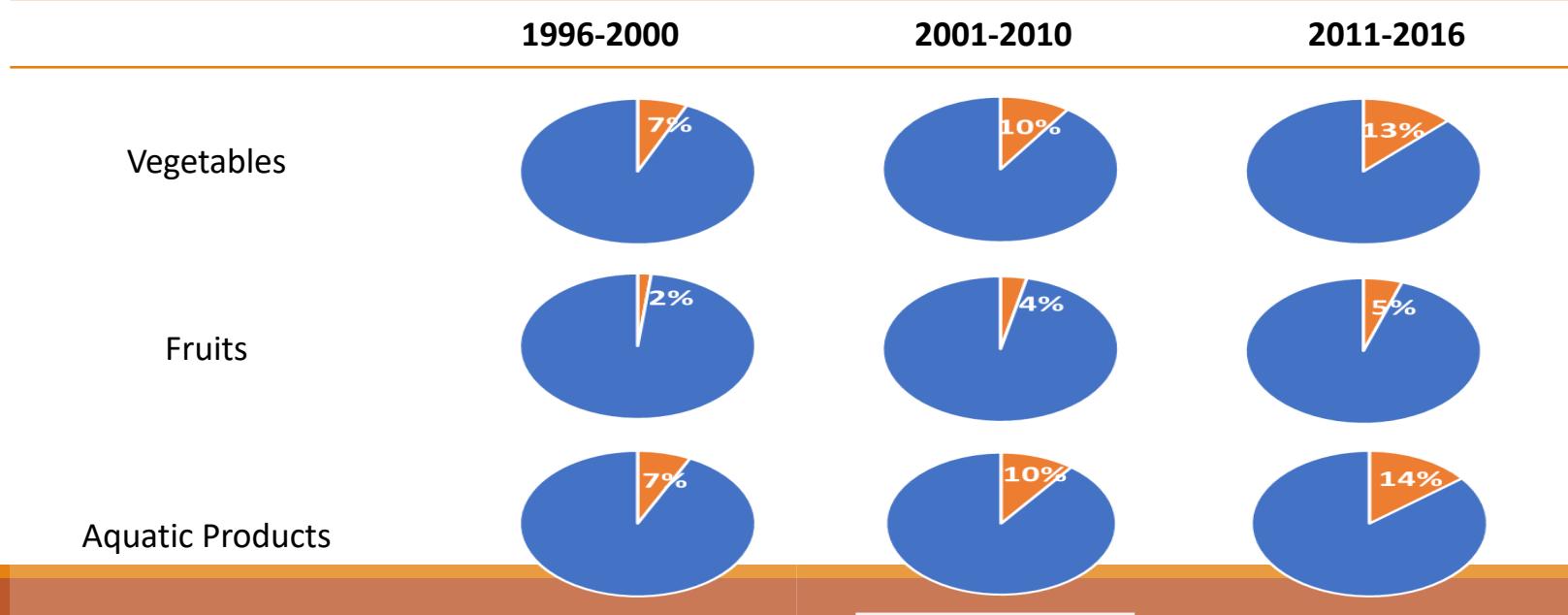


# • 出口：世界地位 Growing Exports: China vs the World

## Changes of Top 5 Exporters of Agro-products in the World

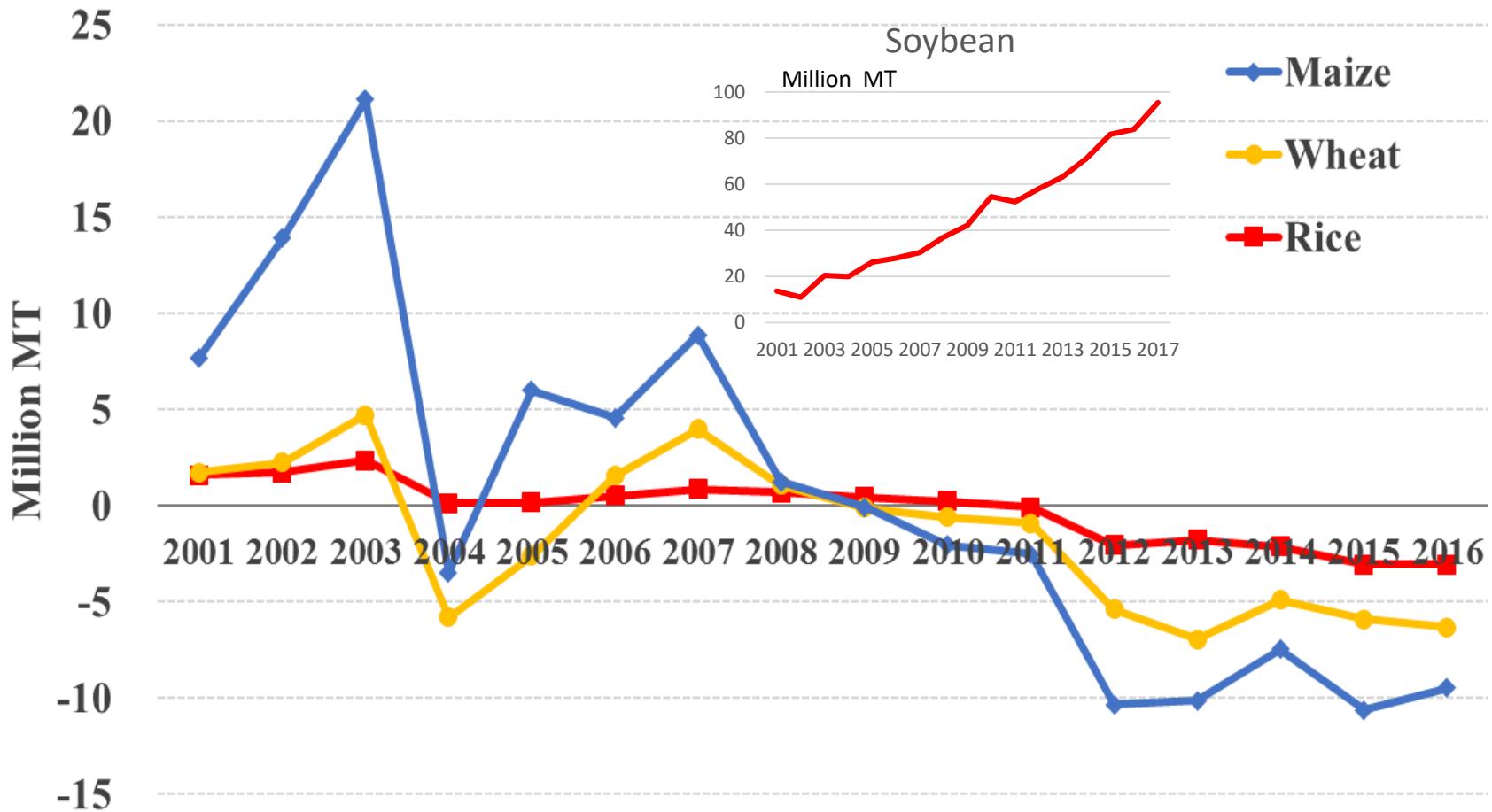
Rank	2000	2005	2010	2012	2014	2016
1	EU	EU	EU	EU	EU	EU
2	USA	USA	USA	USA	USA	USA
3	Canada	Canada	Brazil	Brazil	Brazil	Brazil
4	China	Brazil	China	China	China	China
5	Australia	China	Canada	Canada	Canada	Indonesia

## China's Share of Global Agricultural Export Market



# ➤ Increasingly Important Supplement 国内供应的重要补充

China's Trade Balance of Selected Cereals, 2001-2016

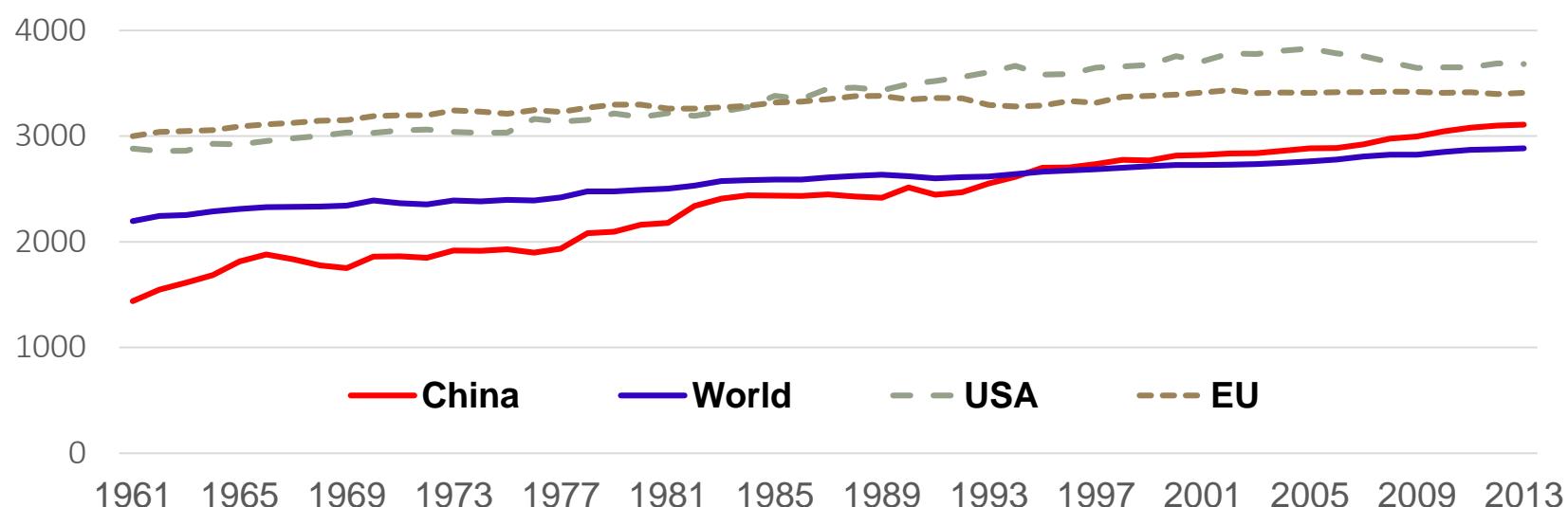


Source: UN Comtrade

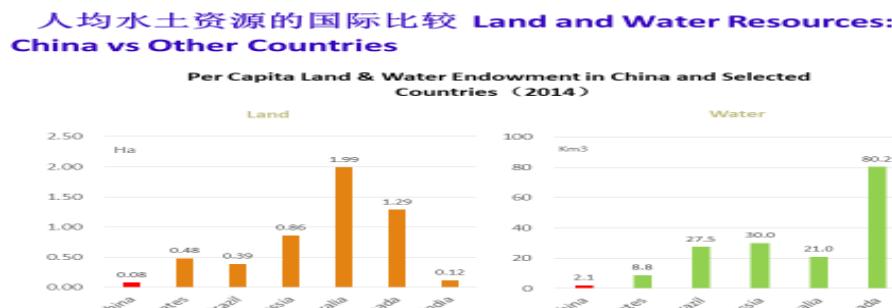
# ➤ Daily Energy Intake: China vs World

能量摄入水平: 中国 vs 世界

Daily Energy Intake Per Capita in China & World,  
1960s-2010s (kcal/capita/day)

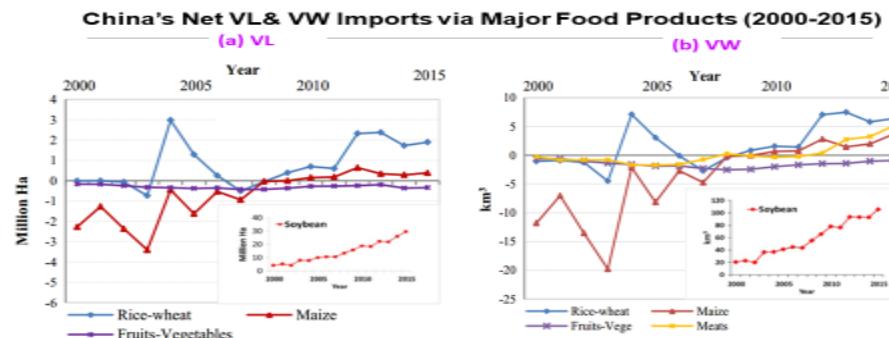


Sources: FAOSTAT "Food Balance Sheets"



## ➤ Import Virtual Land & Water

节约水土资源



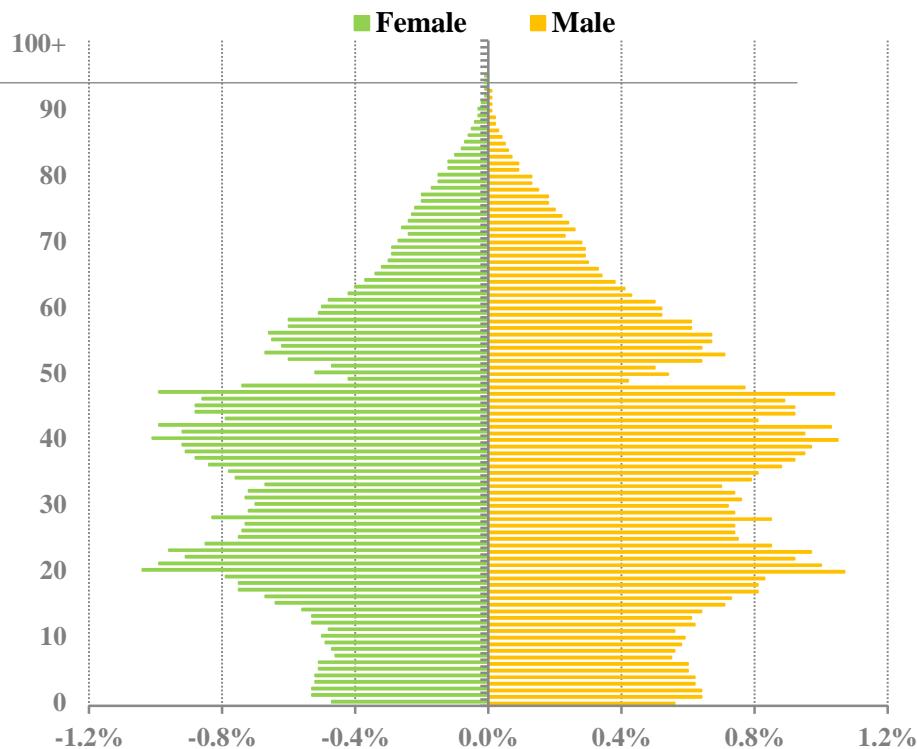
# ➤ Concerns on SSR of Grains

## Painful Memory of Great Famines in Modern China

- Chinese famine of 1942–43
  - ✓ mainly occurred in Henan province
  - ✓ 2 to 3 million people died and upwards of 4 million fled Henan (Wikipedia page)
- Chinese famine of 1959–61
  - ✓ Claimed the lives of 17~30 million, the highest number of fatalities of any single historical event ( Qian, Meng & Yared, 2015)

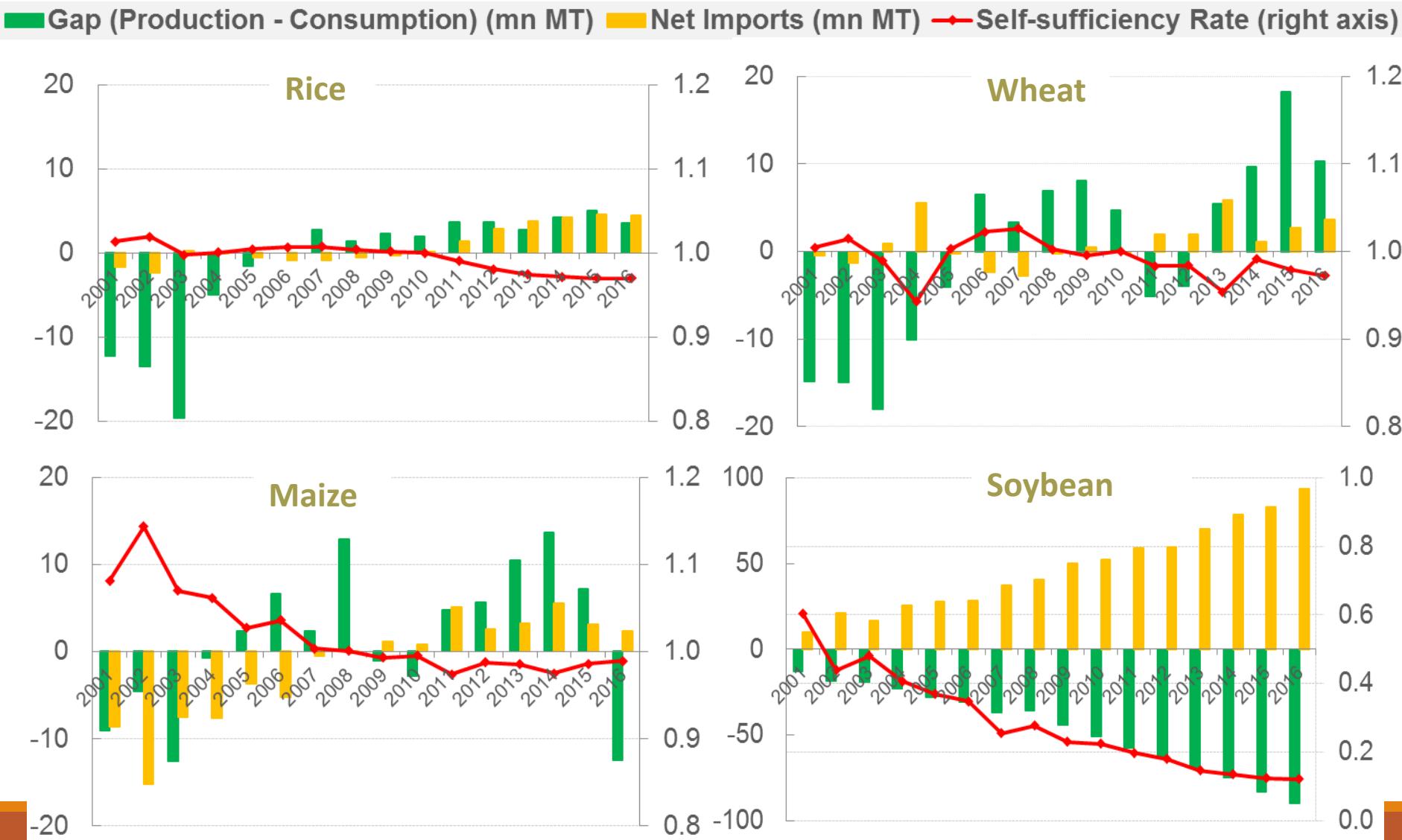


Population Pyramid in China (2010)



□ China's SSRs of major food products have been declining since the WTO accession.

## SSRs of Selected Food Products in China, 2001-2016



# 中美生产成本变化比较

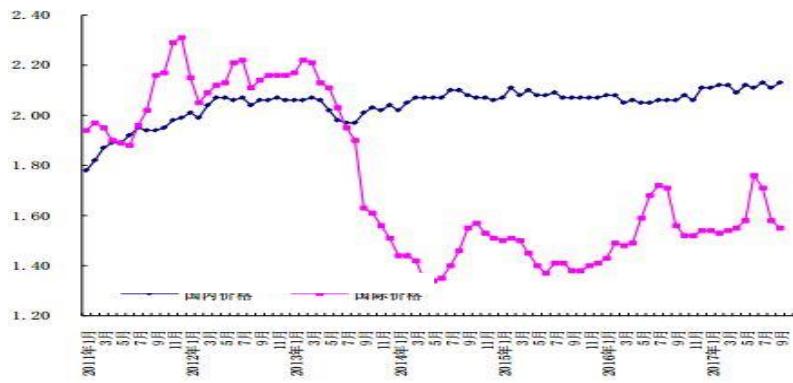
## Cost Changes of Selected Crops, China vs. US, 2010-2015 (RMB/kg)

		2010	2011	2012	2013	2014	2015	Growth Rate (2010-2015)
Rice	CHN	1.68	1.90	2.17	2.41	2.40	2.41	43.5%
	USA	1.75	1.86	1.76	1.75	1.72	1.64	-6.3%
Wheat	CHN	1.63	1.78	2.11	2.39	2.21	2.29	40.5%
	USA	1.42	1.79	1.57	1.82	1.93	1.76	23.9%
Maize	CHN	1.36	1.58	1.83	2.02	2.08	2.15	58.1%
	USA	1.00	1.10	1.35	1.06	0.98	0.99	-1.0%
Soybean	CHN	2.85	3.27	3.87	4.45	4.56	4.78	67.7%
	USA	2.02	2.18	2.33	2.48	2.24	2.27	12.4%
Cotton	CHN	14.21	16.00	18.01	20.72	19.07	19.93	40.3%
	USA	11.65	18.78	14.71	16.50	14.06	13.37	14.8%

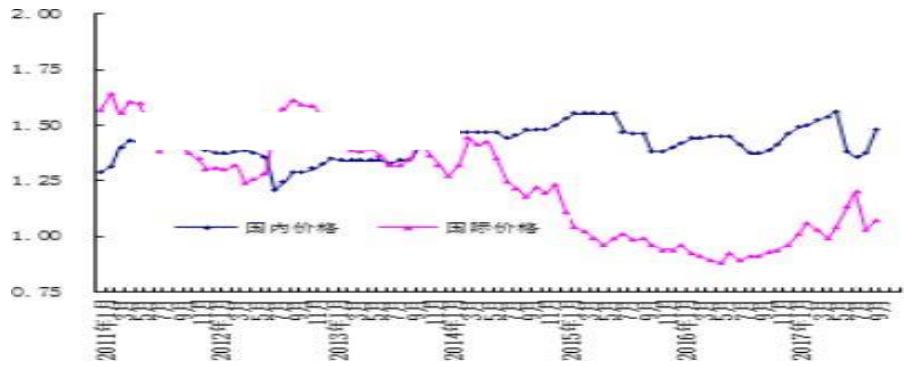
# Domestic Price vs International Price Selected Agricultural Products in China, 2011-2017 (Yuan/0.5kg)

-- China      -- International

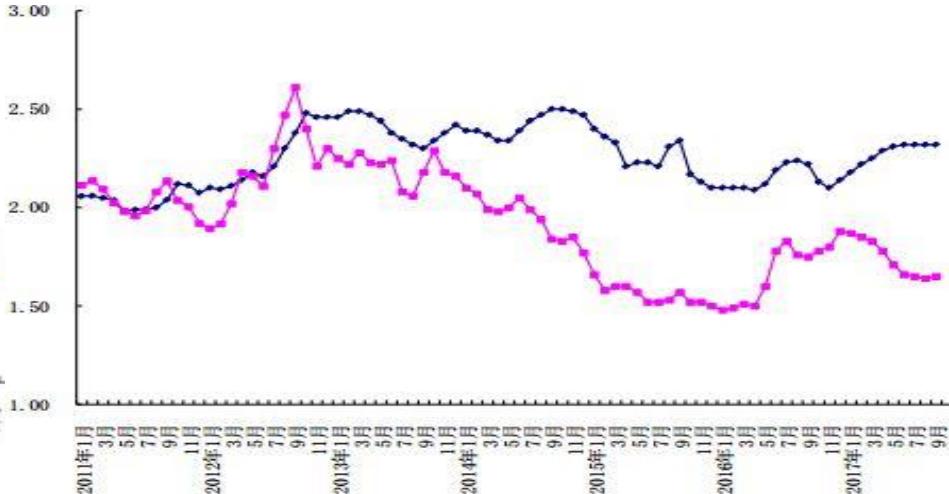
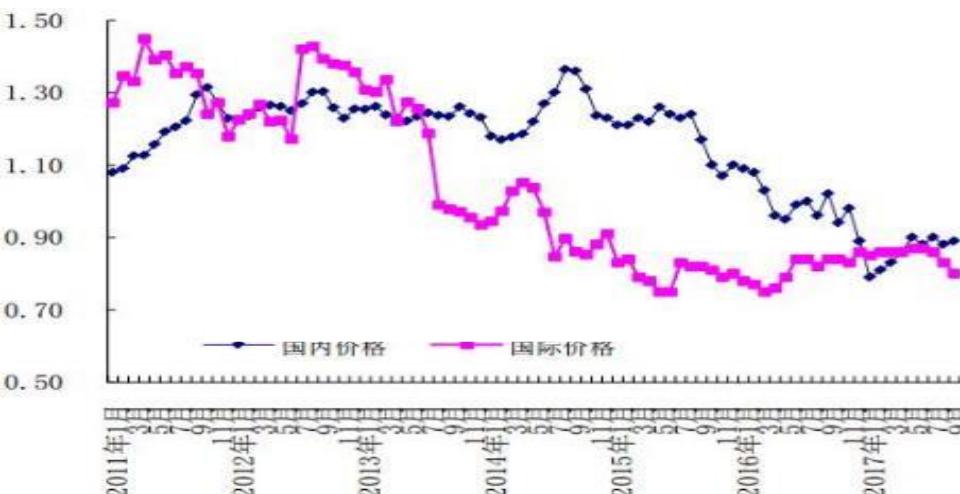
Rice



Wheat

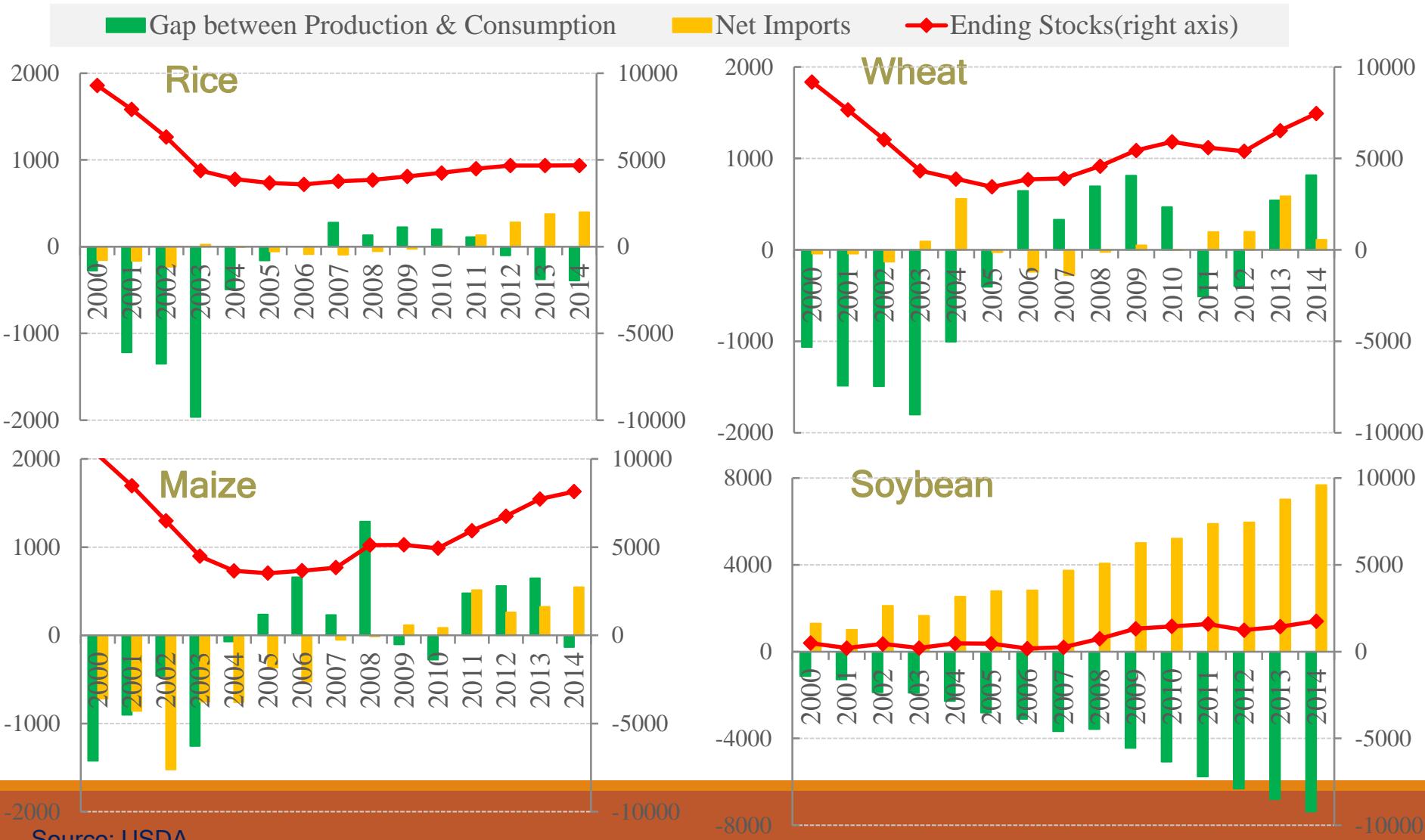


国内价格      国际价格



# Triple-High problem “三高”问题凸显,

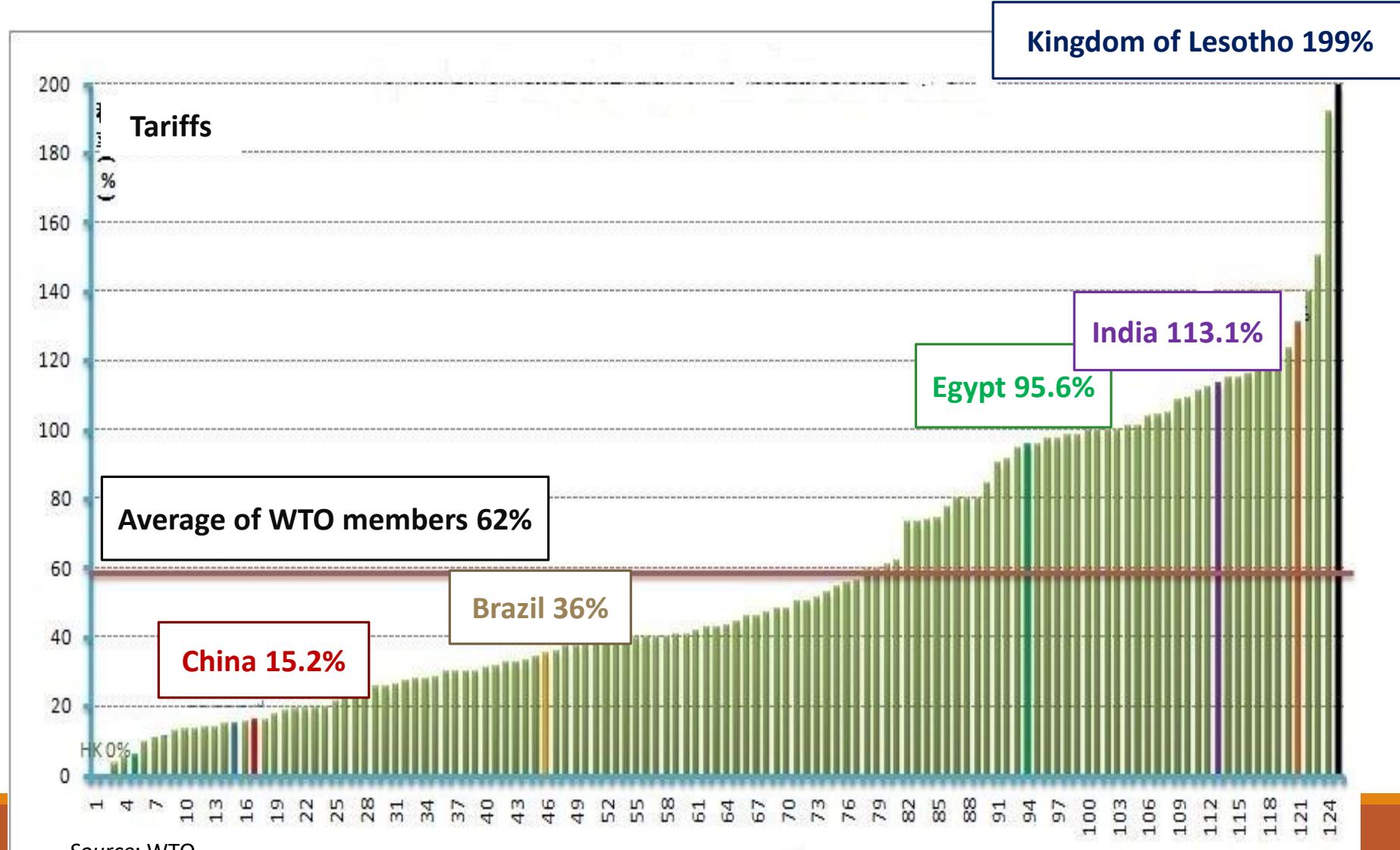
## Stock Variation of Selected Grain Crops in China (10,000 MT)



# ➤ Pressure of possible trade disputes

国内支持保护空间受限，国际争端压力显著增加

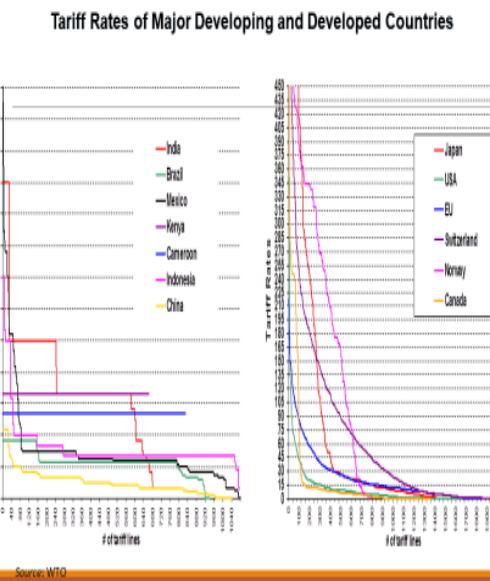
Average Agriculture Tariff Rate of WTO Members



# China's Tariff Rate & Quota on Major Agricultural Products

Item	Tariff rate/Out-of-quota rate (%)	In-quota rate (%)	Final TRQ volume (10,000 tons)
Wheat	65	1~10	963.6
Rice	65	1,9	532.0
Maize	65	1~10	720.0
Sugar	50	15	194.5
Cotton	40	1	89.4
Wool	38	1	28.7
Wool tops	38	3	
Vegetable oil	9	-	
Rapeseed	9	-	
Soybean	3		
Barley	3		
Pork	12,20		
Beef	12~25		
Mutton	12~23		
Poultry	15,20		
Dairy products	6~20		
Potato	13		
Banana	10		
Citrus	12		
Apple	10		
Citrus juice	7.5,30		
Apple juice	20		
Vegetable	7~25		

Source: WTO



## WTO: DS511 & DS517

### What is the DS511 dispute about?

- Support through some policies is subject to limits
  - One AMS for each product Aggregate Measurement of Support
  - Product's AMS = market price support (MPS) + payments
    - Administrative price, not domestic market price
    - Fixed external reference price (FER), not contemporaneous border price
    - 1986-88 fixed years for original members
    - Flexible production, not total production
- China's WTO limits on AMS
  - 8.5% of product's value of production in each year
- China claims AMSs exceeded limits
  - Wheat, rice (India and Japan) and corn
  - In 2012, 2013, 2014, and 2015
    - Can calculate excess in 2015 of RMB 665 billion or more than \$100 billion

Source: Lars Brink, 2018



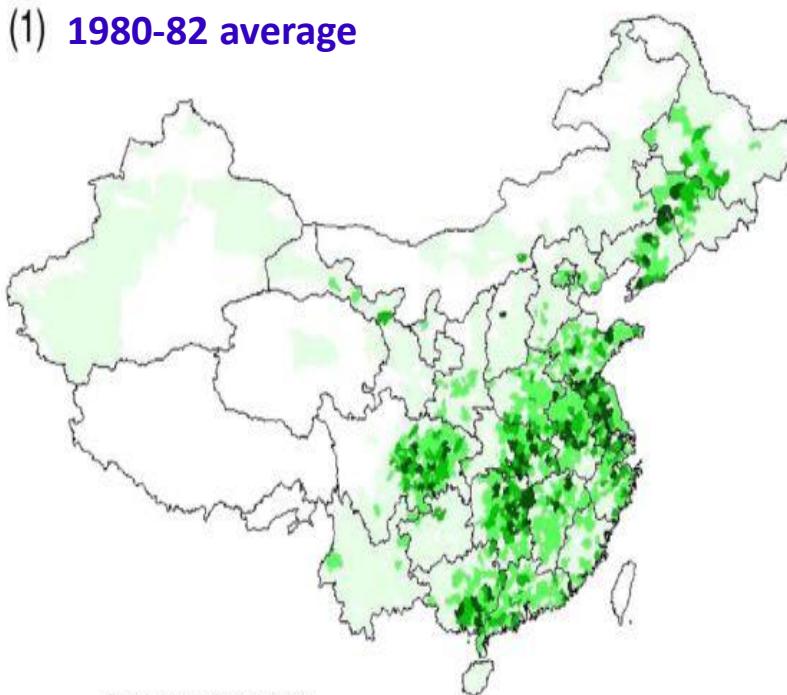
### Parallel disputes: domestic support and TRQ administration

- United States initiated TRQ admin dispute in December 2016
  - Panel working since February 2018
  - Concerns wheat, rice (two types) and corn
- United States argues
  - China's administration of TRQs prohibits or restricts imports
    - Not administered on transparent, predictable or fair basis
    - Lack of clarity
    - Reallocation of granted quotas; role of state-trading enterprises
    - TRQs were not filled even when domestic (supported) prices exceeded import prices
  - China may argue
    - TRQ administration meets China's WTO obligations
    - TRQ fill rates are linked to characteristics of user demand

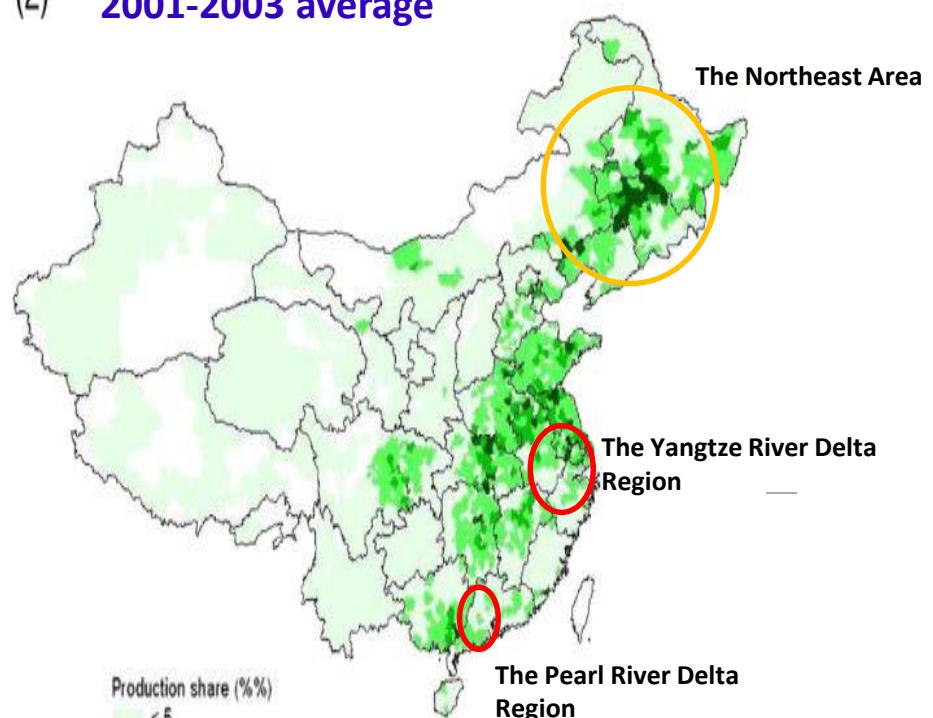
# ➤ Concerns on Farm Land Resource Conservation

## Grain Production: Provinces

(1) 1980-82 average



(2) 2001-2003 average

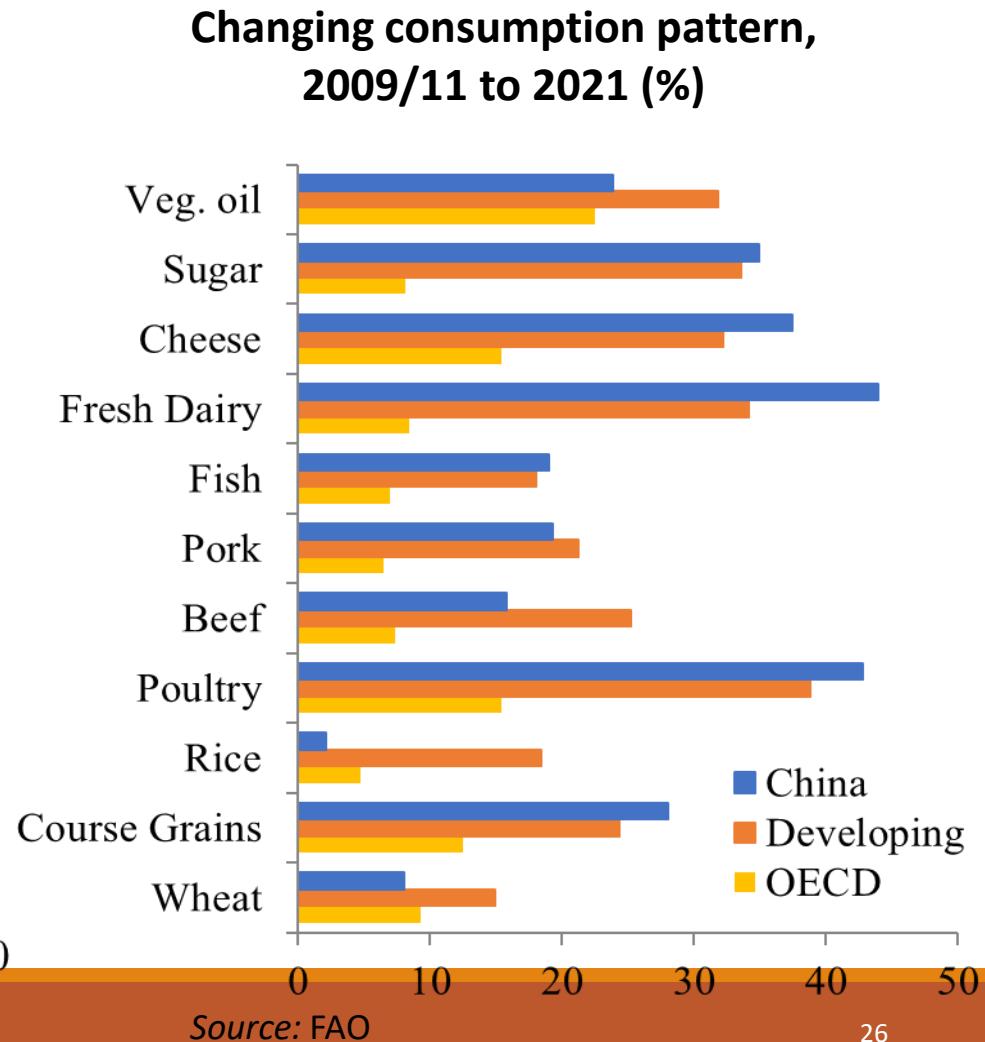
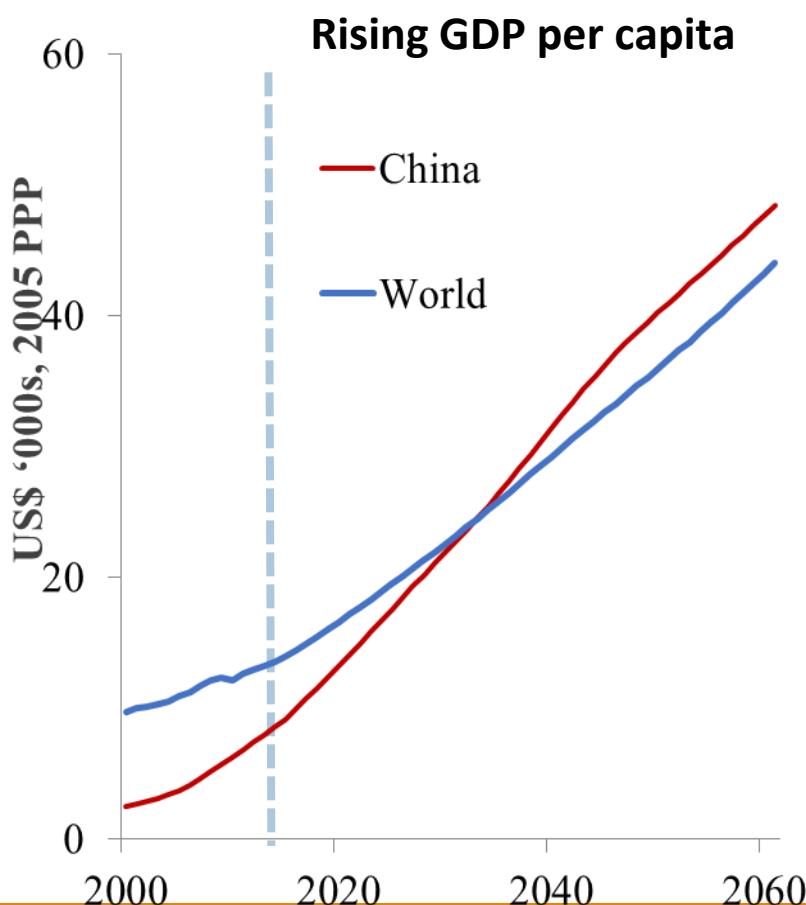


Source: You et al. (2011)

# ➤ Food Demand Growth

## 农产品消费需求增长

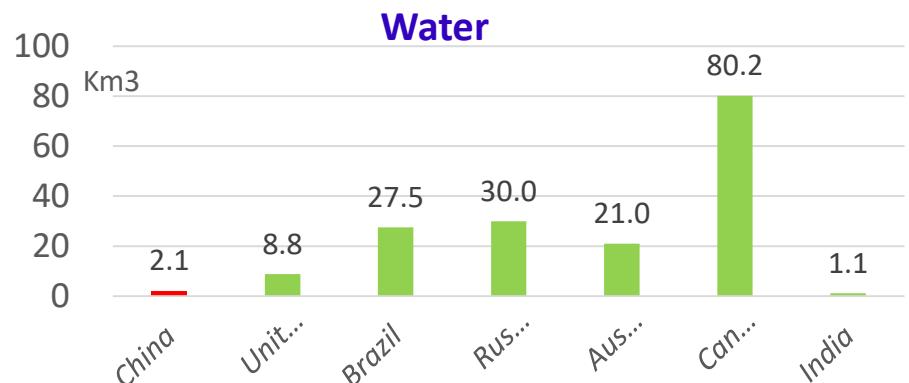
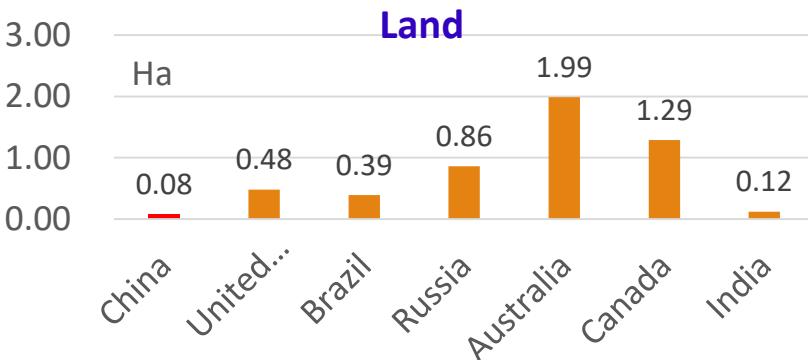
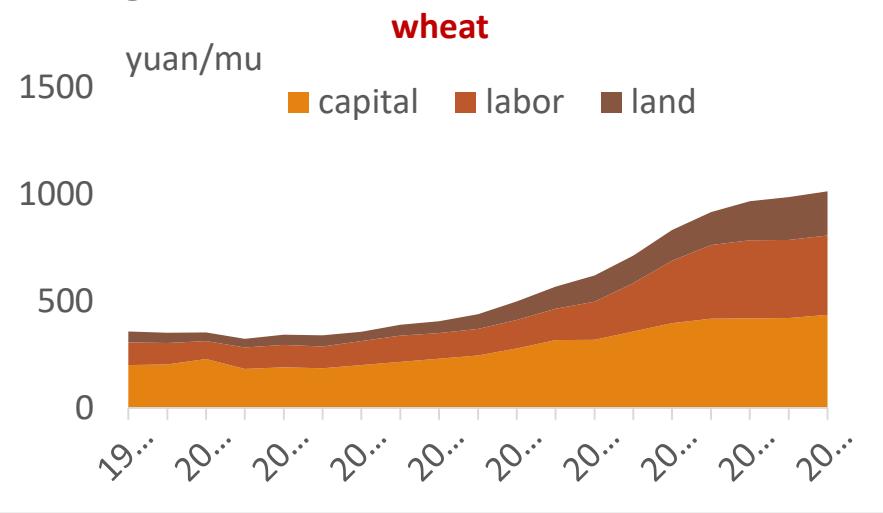
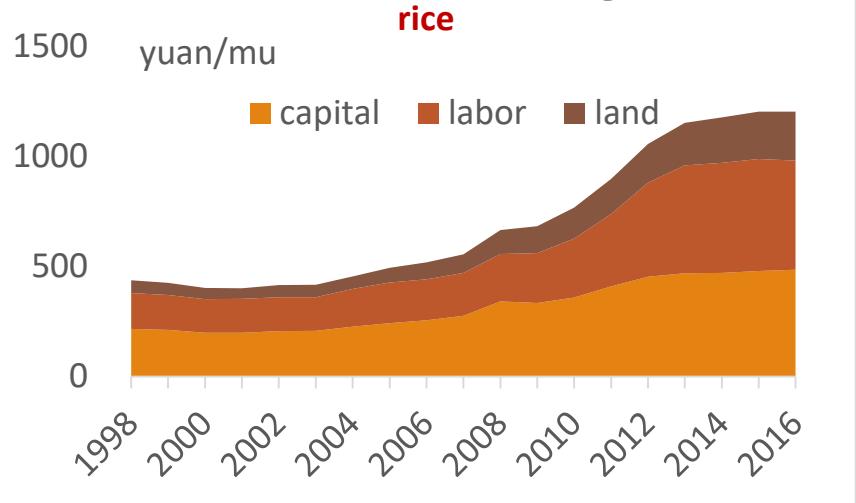
- Rising population & incomes, urbanization, and diet changes



# ➤ Rising Production Cost, constraint resources

农业生产成本持续上升, 资源约束持续

COP structure changes of selected Agricultural Products in China



## Closed Economy

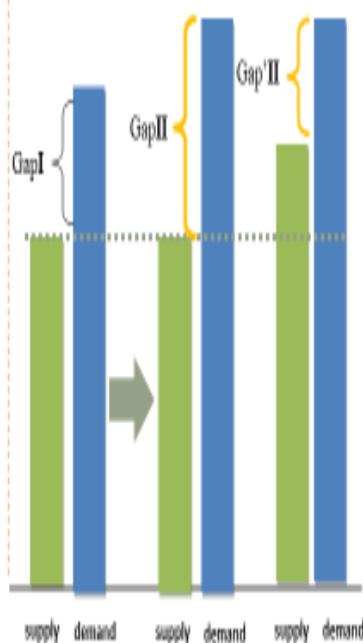
封闭经济条件下

*Trade: adjust to domestic supply and demand*

贸易：调节国内余缺

*Import = Gap*

进口=“缺口”



## Open Economy

开放经济/全球化条件下

**Imports ≠ Gaps**

进口 ≠ “缺口”

**Price matters**

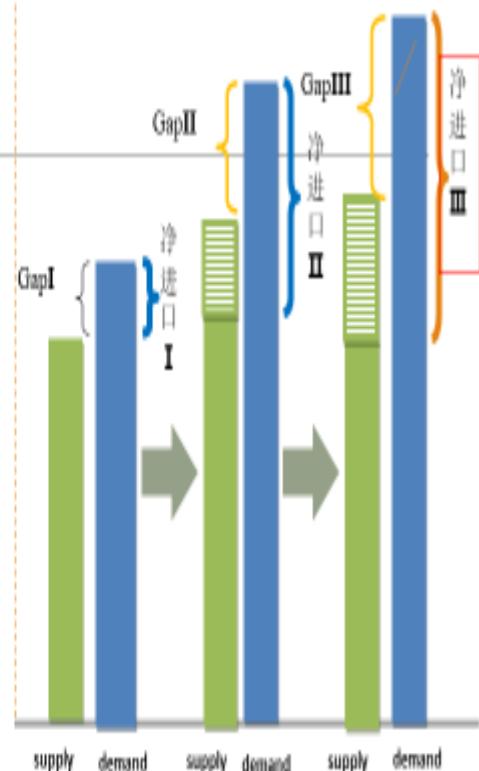
连接市场的是“价格”

**Supply Gap?** 产量“差”

**Price Gap!** 价格“差”



Stock/Unefficient production



# Scenarios design

## CORE scenario

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Observed wheat, maize, soybean and rice (domestic and world) price trends during 2011-2016 extrapolated to 2011-2020

## Alternative domestic price scenarios

Exp2: CORE domestic price changes \* **(1+1/3)** **increase more**

Exp3: CORE domestic price changes\* **(1- 1/3)**

World market prices same as in CORE

## Alternative world market price scenarios

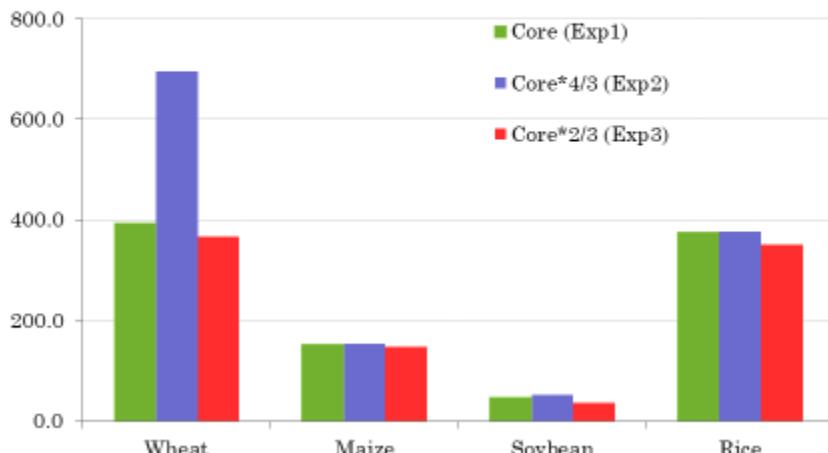
Exp4: CORE world market price changes \* **(1+1/3)** **decrease more**

Exp5: CORE world market price changes \* **(1-1/3)**

Domestic prices same as in CORE

## Results: alternative DPs scenarios

Changes in imports % from base year



Sources: Wusheng Yu, Tianxiang Li, Jing Zhu (2019) "What Determines China's Grain Imports and Self-sufficiency? The Role of Rising Domestic Costs and Varying World Market Prices", China & World Economy, 27(5):1-24

## Results: alternative DPs scenarios

Changes in domestic outputs, % from base year

	Core (Exp1)	Core*4/3 (Exp2)	Core*2/3 (Exp3)
Wheat	-10.7	<b>-15.2</b>	-8.7
Maize	-8.1	-9.3	-6.7
Soybean	-66.3	-78.6	-57.5
Rice	-10.8	<b>-12.4</b>	-8.8

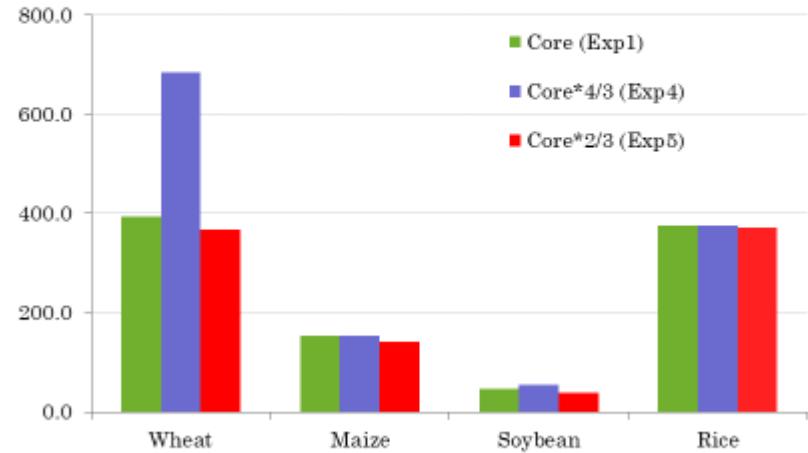
**Self-Sufficiency Rate**

	Core (Exp1)	Core*4/3 (Exp2)	Core*2/3 (Exp3)
Wheat	0.878	<b>0.809</b>	<b>0.886</b>
Maize	0.931	0.930	0.933
Soybean	0.053	<b>0.041</b>	<b>0.071</b>
Rice	0.928	0.927	0.933

Sources: Wusheng Yu, Tianxiang Li, Jing Zhu (2019) "What Determines China's Grain Imports and Self-sufficiency? The Role of Rising Domestic Costs and Varying World Market Prices", China & World Economy, 27(5):1-24

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## Results: alternative WPs scenarios

Changes in domestic outputs, % from base year

	Core (Exp1)	Core*4/3 (Exp2)	Core*2/3 (Exp3)
Wheat	-10.7	<b>-13.7</b>	-10.3
Maize	-8.1	-8.1	-7.9
Soybean	-66.3	-70.7	-61.9
Rice	-10.8	-10.8	-10.7

**Self-Sufficiency Rate**

	Core (Exp1)	Core*4/3 (Exp2)	Core*2/3 (Exp3)
Wheat	<b>0.878</b>	<b>0.813</b>	<b>0.884</b>
Maize	0.931	0.931	0.934
Soybean	0.053	0.044	0.063
Rice	0.928	0.928	0.929

Sources: Wusheng Yu, Tianxiang Li, Jing Zhu (2019) "What Determines China's Grain Imports and Self-sufficiency? The Role of Rising Domestic Costs and Varying World Market Prices", China & World Economy, 27(5):1-24

# ➤ Unavoidable Imports, *import size?*

农产品进口难以避免，适度？

**Cereal SSR: China vs Other Economies  
(2011-2013 average)**

Groups	Items	Endowments of Agri. Land (ha/capita)	Population (1000 person)	% of world population (%)	Cereal Self- sufficiency (%)	Net Import Quantity (1000 ton)	% of world market (%)
Group A	CHN	0.37	1375157	19.3	98.1	9193	2.5
	USA	1.30	313308	4.4	119.5	-62541	-17.0
	BRA	1.38	200552	2.8	115.6	-11746	-3.2
Group B	JPN	0.04	128415	1.8	24.2	25718	7.0
	KOR	0.04	49955	0.7	21.7	14089	3.8
	TPE	0.03	23263	0.3	17.1	5995	1.6
Group C	IND	0.14	1262955	17.7	108.3	-18311.7	-5.0
	INA	0.23	248874	3.5	85.2	11503	3.1
	PAK	0.20	177936	2.5	118.5	-5480	-1.5

Source: calculated from data in FAOSTAT.

## What if China's cereal SSR *equivalent* to JPN, KOR and Chinese TPE?

Items	Cereal Self-sufficiency (%)	Import Quantity (1000 ton)	% of world market (%)
JPN	24.2	25718	7.0
KOR	21.7	14292	3.9
TPE	17.1	6070	1.7
<b>CHN</b>	<b>98.1</b>	<b>11504</b>	<b>3.1</b>
— <i>at JPN's level</i>	24.2	363326	98.8
— <i>at KOR's level</i>	21.7	375309	102.0
— <i>at TPE's level</i>	17.1	397358	108.0

Source: calculated from data in FAOSTAT.

□ What if China's cereal import quantity *equivalent* to JPN,  
KOR and Chinese TPE?

Items	Import Quantity (1000 ton)	% of world market (%)	Cereal Self-sufficiency (%)
JPN	25718	7.0	24.2
KOR	14292	3.9	21.7
TPE	6070	1.7	17.1
<b>CHN</b>	<b>11504</b>	<b>3.1</b>	<b>98.1</b>
— <i>at JPN's level</i>	25718	7.0	<b>95.3</b>
— <i>at KOR's level</i>	14292	3.9	<b>97.5</b>
— <i>at TPE's level</i>	6070	1.7	<b>99.2</b>

Source: calculated from data in FAOSTAT.

## ➤ Reduce Production Cost

降低农业生产成本

✓ Support Policies

*Price support? Income support?*

✓ Institutional Innovation

Land Consolidation & Outsourcing Service

✓ Technological Innovation

*Higher Output or Lower Cost?*

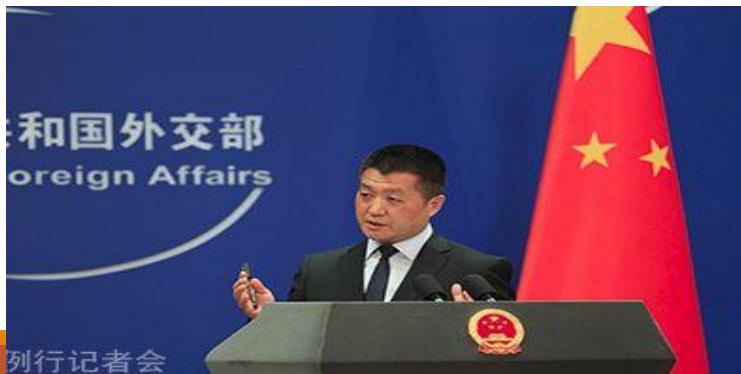


## ➤ Open-door policy

对外开放



- ✓ Increasing utilization of global market
- ✓ Consultation and mutual understanding
- ✓ Domestic policy design in international setting
- ✓ Engage in improvement in multinational framework



# Thanks !



Agri-tourism, Guilin, Guangxi