



Regional Trade Opportunities for Asian Agriculture: A General Equilibrium Assessment

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1. Motivation

- Loss of momentum in the latest round of multilateral trade negotiations has improved the prospects for regional trade within Asia.
- This is particularly true for agriculture, a primary obstacle to WTO negotiations and a sector in which Asia has significant demand and supply potential.
- Historically, regional food trade has been driven by demand from higher income Asian economies. Historically, this provided important development stimulus to regional partners, including Taiwan, Thailand, Indonesia, and Malaysia.
- Regional AgroFood absorption is now accelerating rapidly from a new source, China.
- This could make a significant contribution to regional growth and poverty alleviation, contributing to two important ADB policy objectives – greater Asian cooperation and more inclusive development.



Methodology

- To elucidate how Asia can improve its agricultural productivity and food security and promote economic growth, we use a multi-country general equilibrium (GE) model to assess agricultural trade growth between China and the Greater Mekong Sub-region (GMS) countries.
- This paper evaluates longer term benefits of enhanced trade across and between developing Asian economies. Because indirect effects can far outweigh direct or negotiated trade outcomes, a GE assessment gives a more complete picture of the inclusive benefits of such cooperation.
- This more comprehensive assessment reveals a larger universe of stakeholders, and represents an essential justification of both the policy agenda (integration, inclusion, etc.) and supporting investments like the GMS corridors.



The Global AgroFood General Equilibrium (GAGE) Model

- A state-of-the-art forward looking economic decision tool
 - Calibrated to the most up-to-date international data resources, including GTAP, IEA, USDA, FAO, IPCC, EPA
 - Information capacity
 - Up to 118 countries/regions
 - Up to 57 sectors/commodities
 - Annual projections to 2020 and beyond
- Under development
- Inventories
 - Land use patterns
 - GIS interface



2. How We Got Here: Global Food and Asian AgroFood Trade



North-South Relations and the Cheap Food Consensus

- Higher income economies have long subsidized their own agricultural activities with the combined goals of supporting food security and powerful rural populations.
- In the South, many economic development policies have been built on bedrock of low wage industrialization, accompanied by food security (low prices) for politically sensitive urban poor populations.
- The result has been a *de facto* global consensus, supporting two generations of declining food prices.

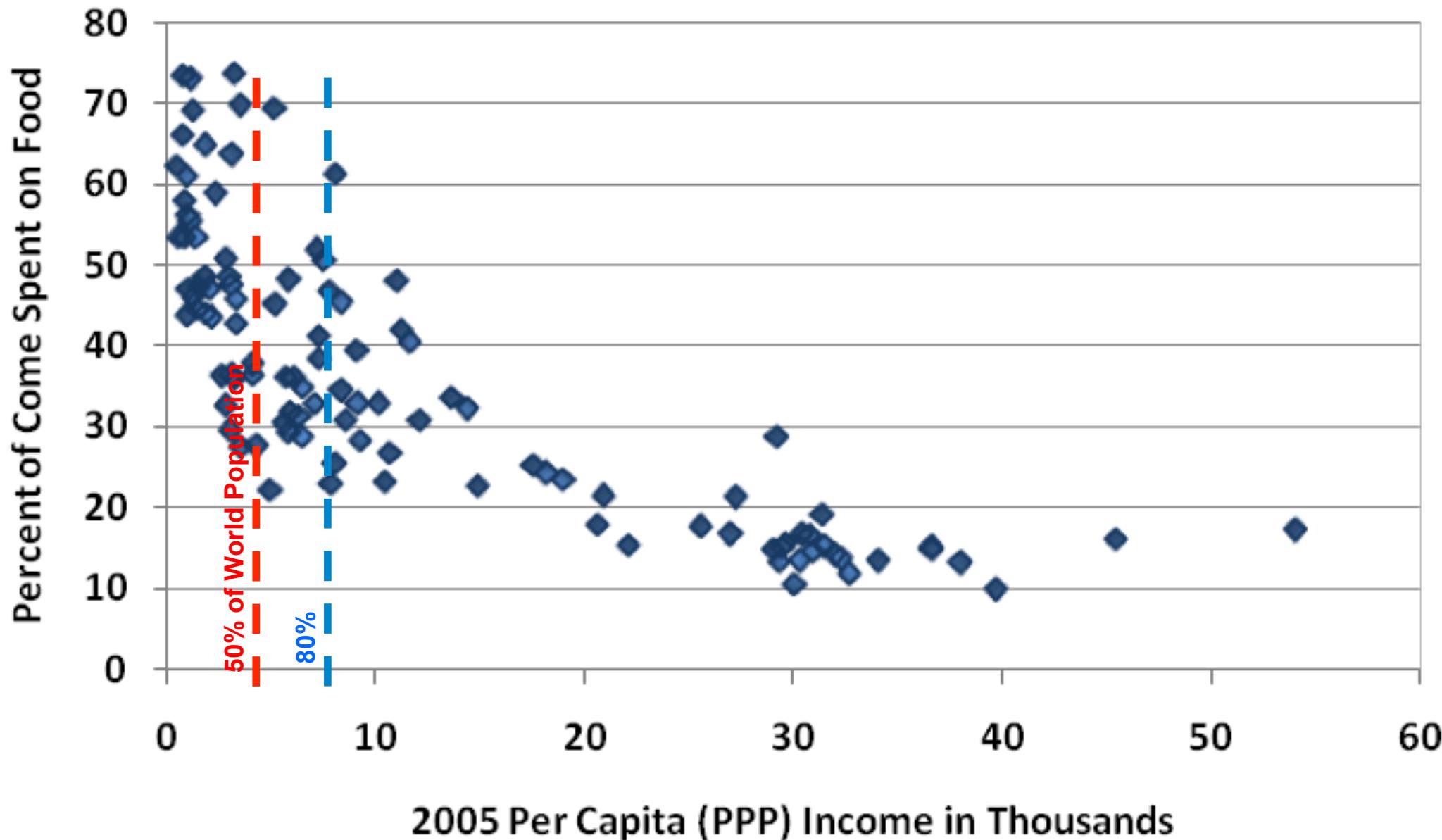
What Happened to Global Food Markets Last Year?

Last year the G8 conceded that we are losing the battle to improve or even maintain global nutrition standards.

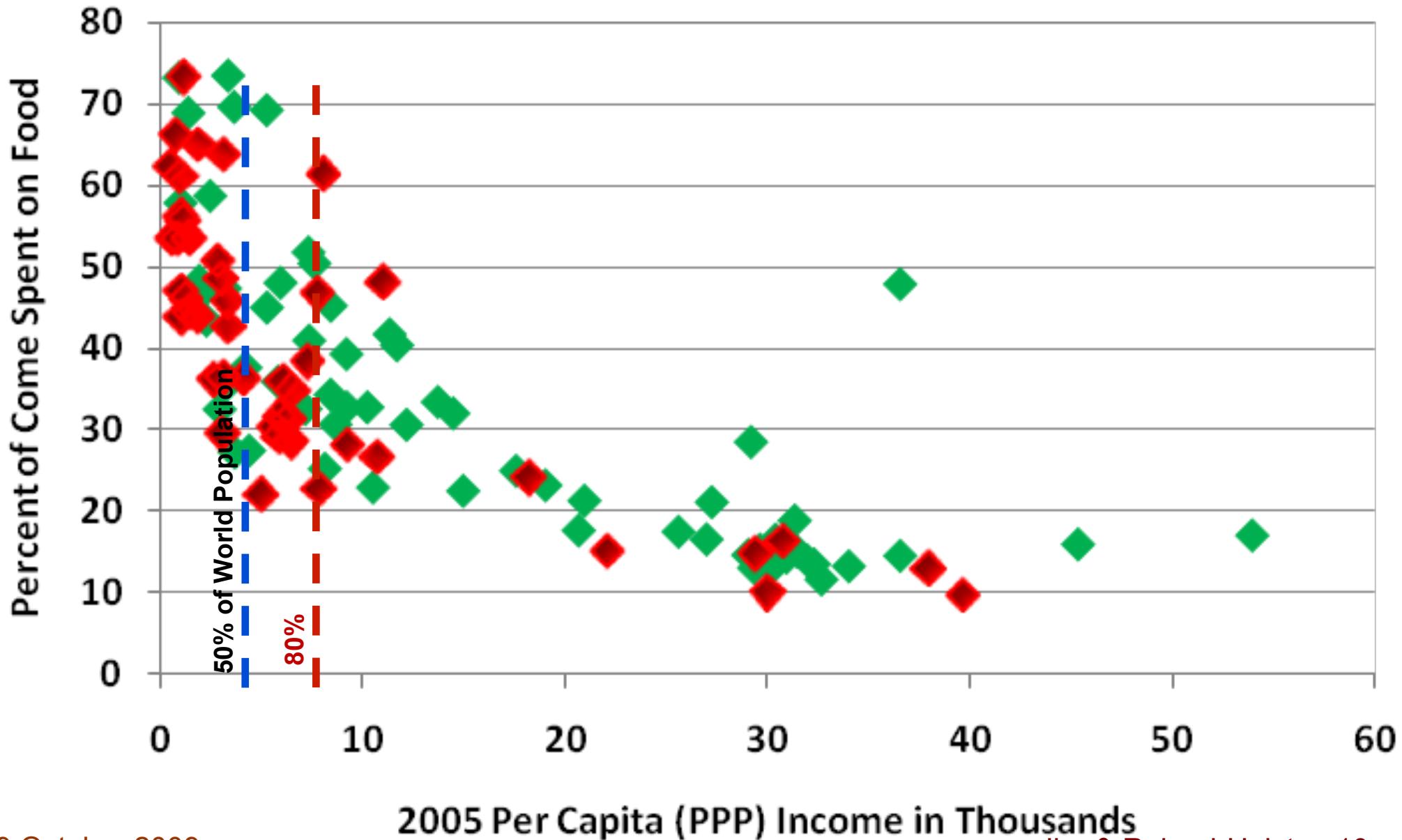
What are the drivers of this process?

1. Emergent Real Demand ★
2. Financial Demand (derivatives)
3. Supply Response ★

Food Security and Income

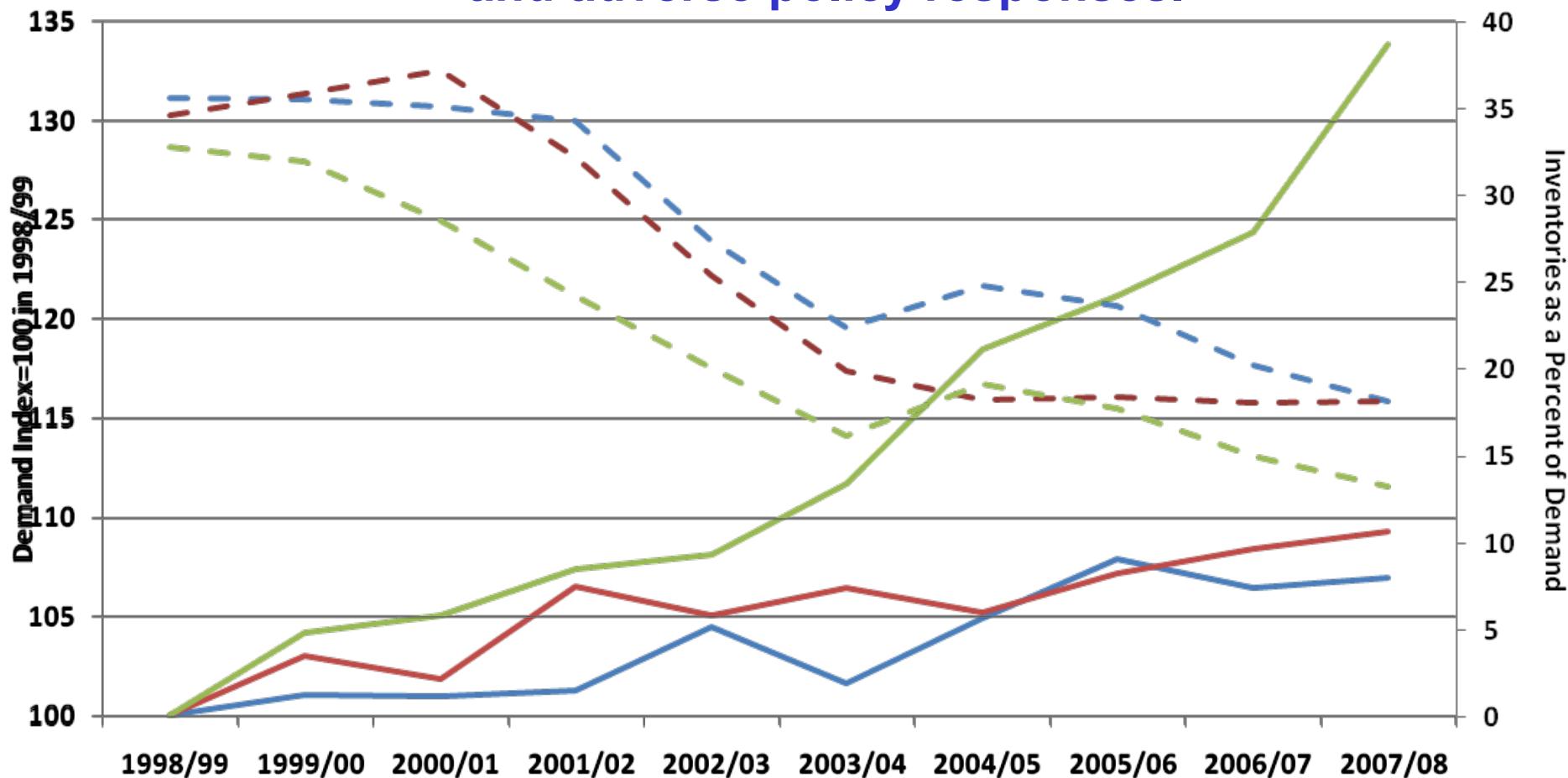


Food Security and Climate Risk: Tropical Countries in Red



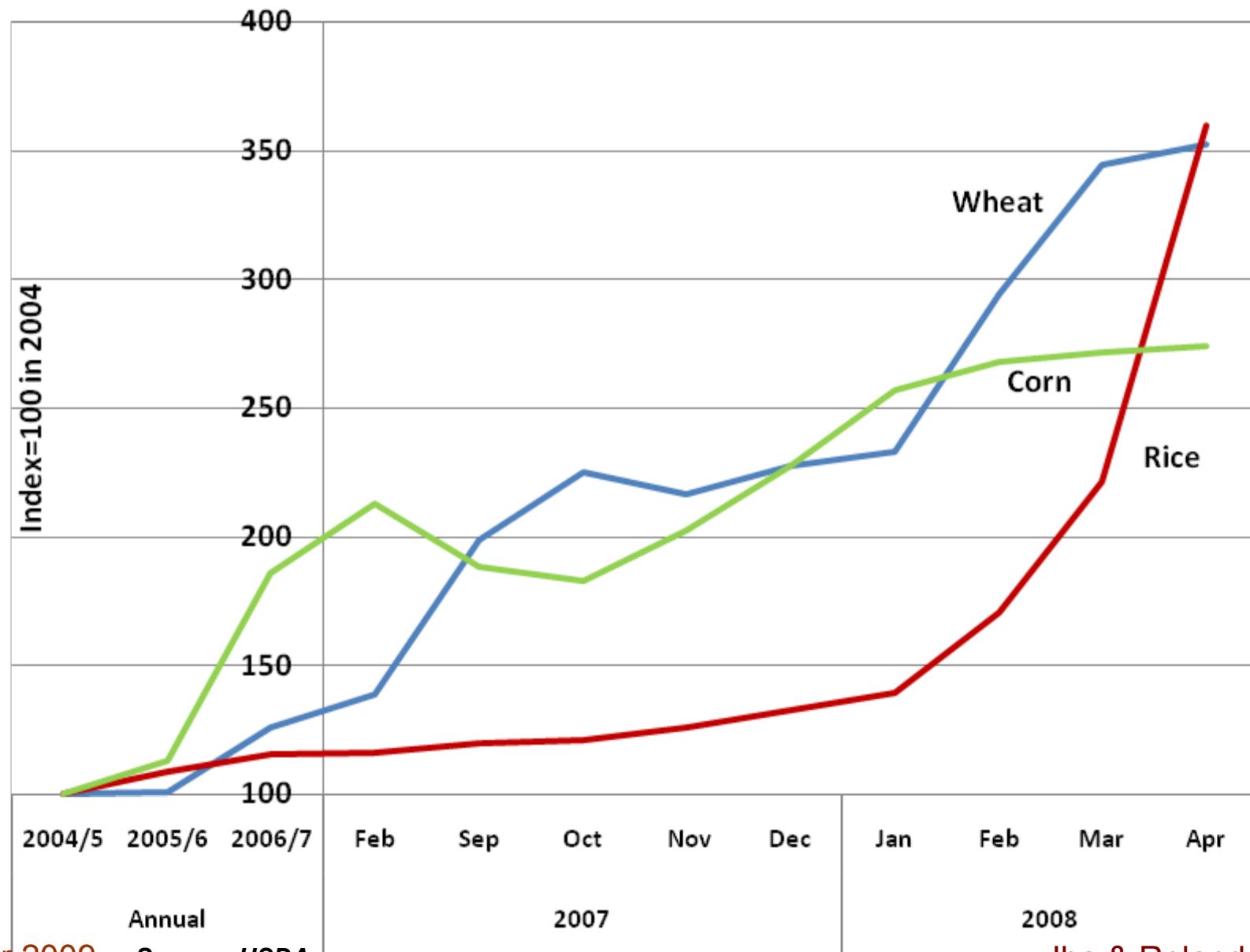
Demand and Inventories of Cereals

Last year's cereal price escalation resulted from inventory depletion and adverse policy responses.



Source: USDA.

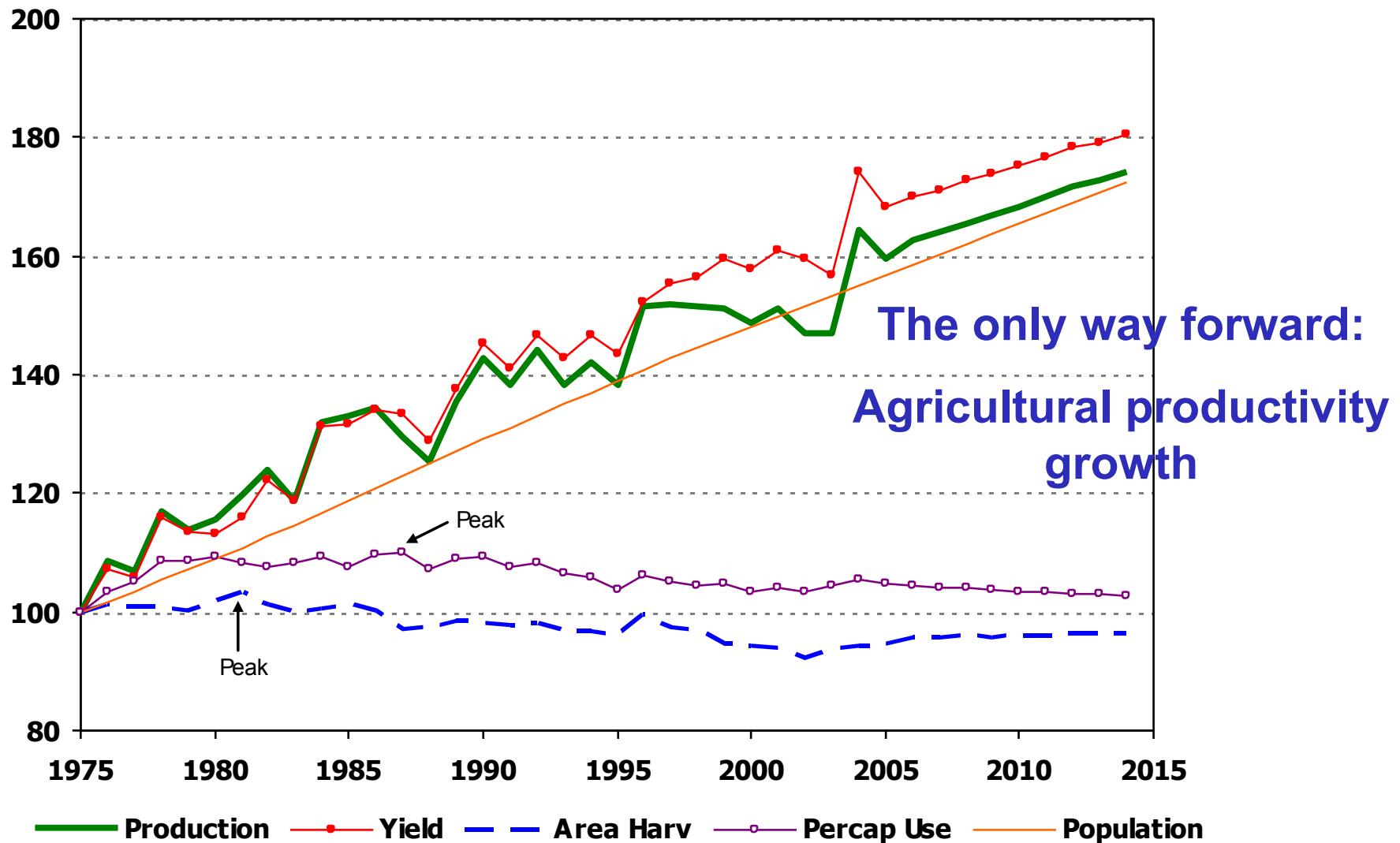
Prices



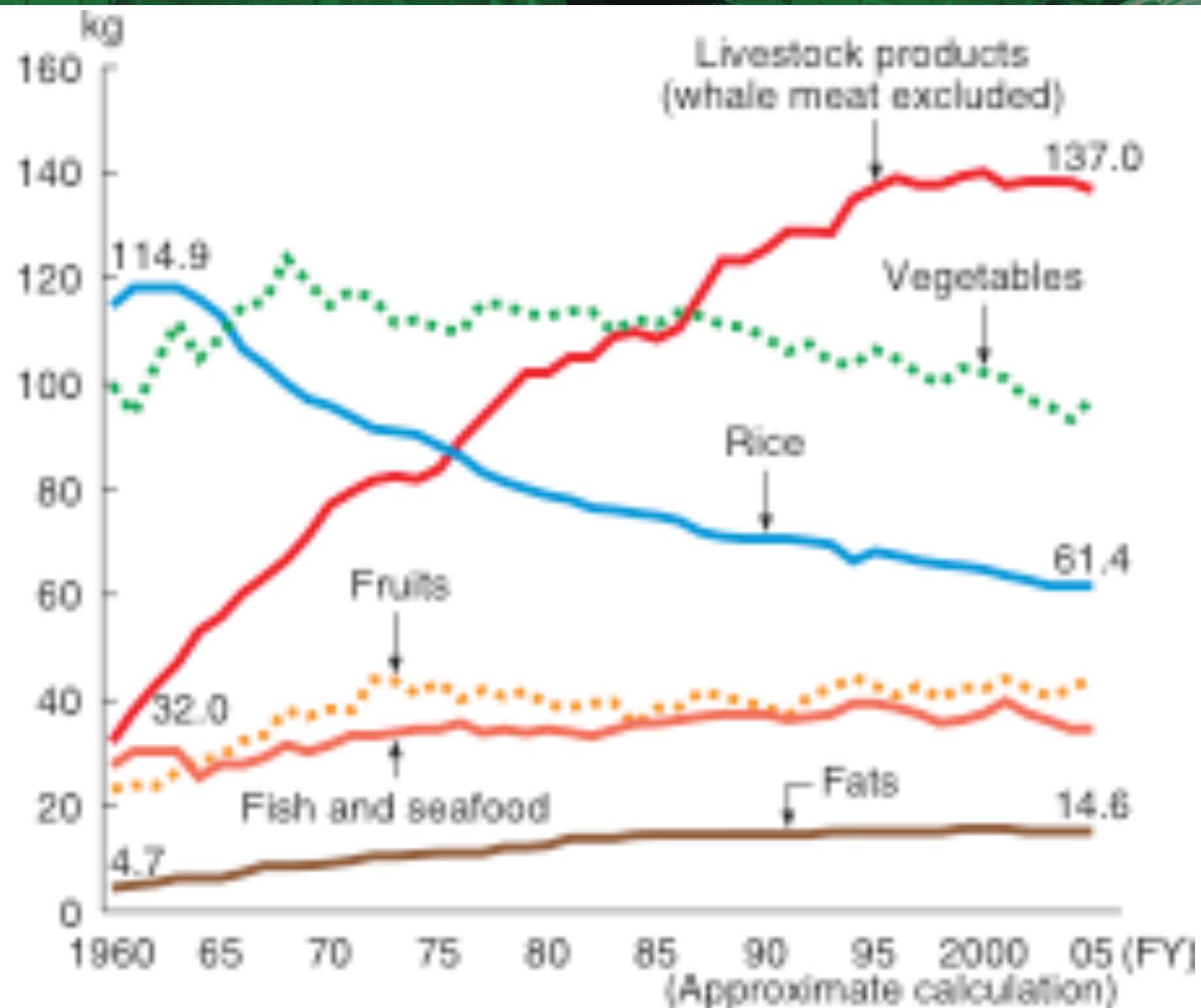
How we got here and how we go forward

Total World Grain and Oilseeds

Index: 1975 = 100



Historical AgroFood Model for the Region: Japan's Growth, Diet,



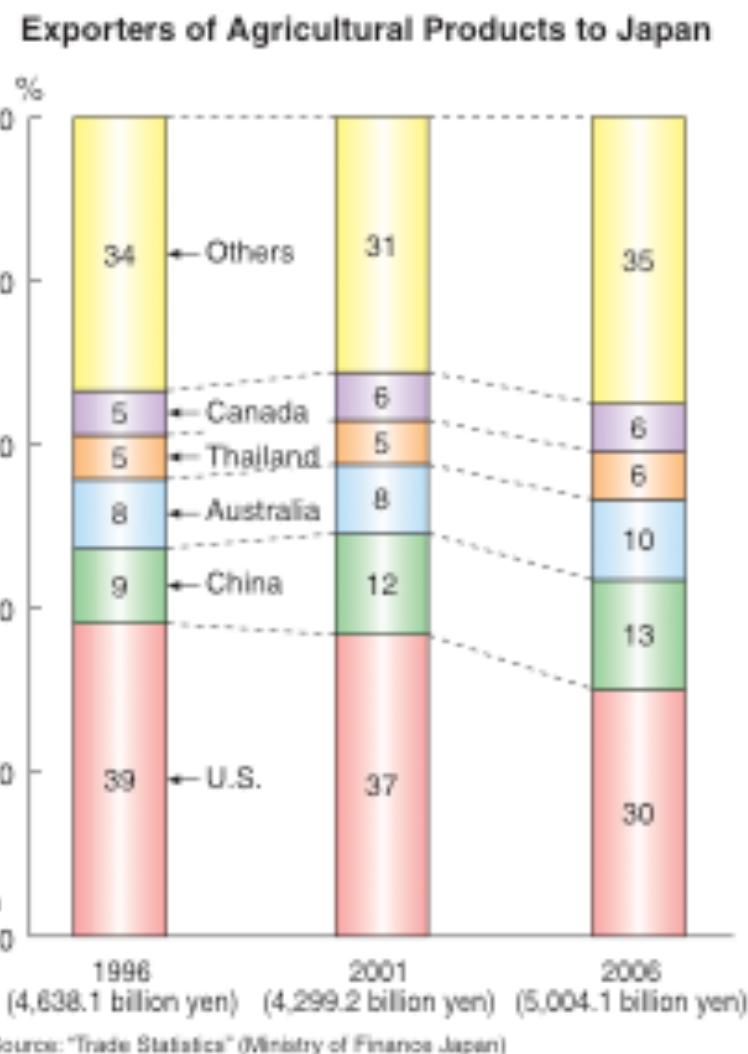
and AgroFood Absorption



Source: Prepared by MAFF according to "FAOSTAT" (FAO) and "Annual Total Export of Agricultural Products" (Department of Agriculture, China).

Notes: 1) The value of trade in the EU does not include that within the member states.

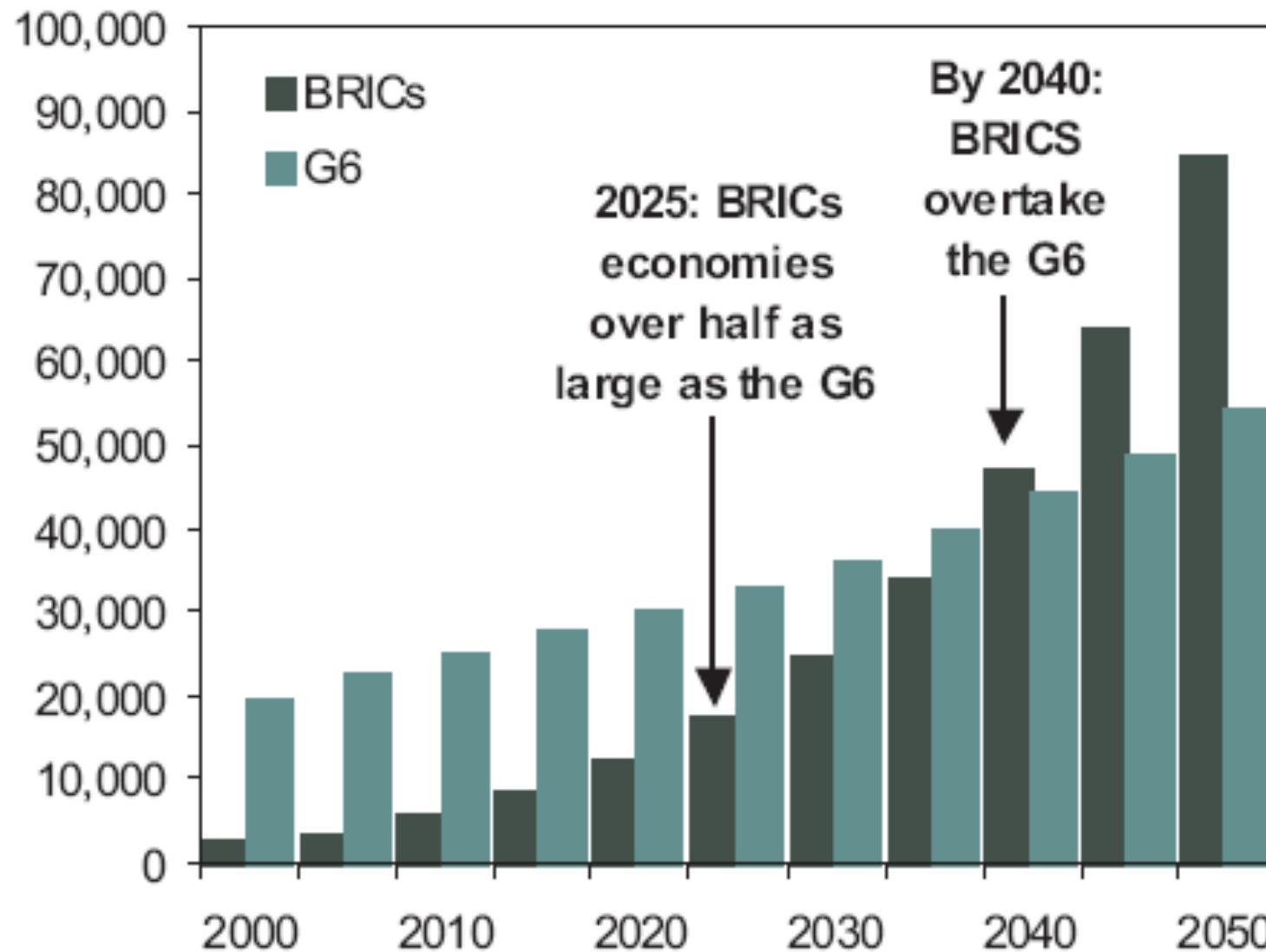
2) The value of trade in fishery products is included in the data obtained from China.



**From 1965 to 1998, Japan's food self-sufficiency ration fell
from 73% to 40%. where it has remained since.**

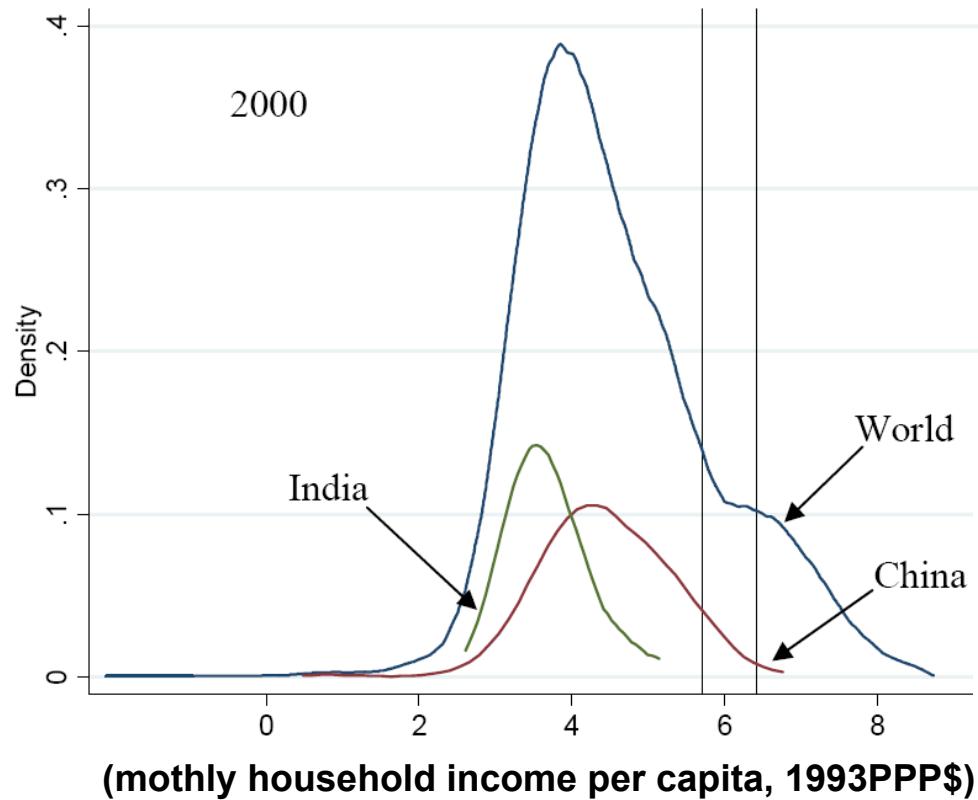
The New Model of Emergent Demand: BRICs and G6 GDP

(USD Billion)



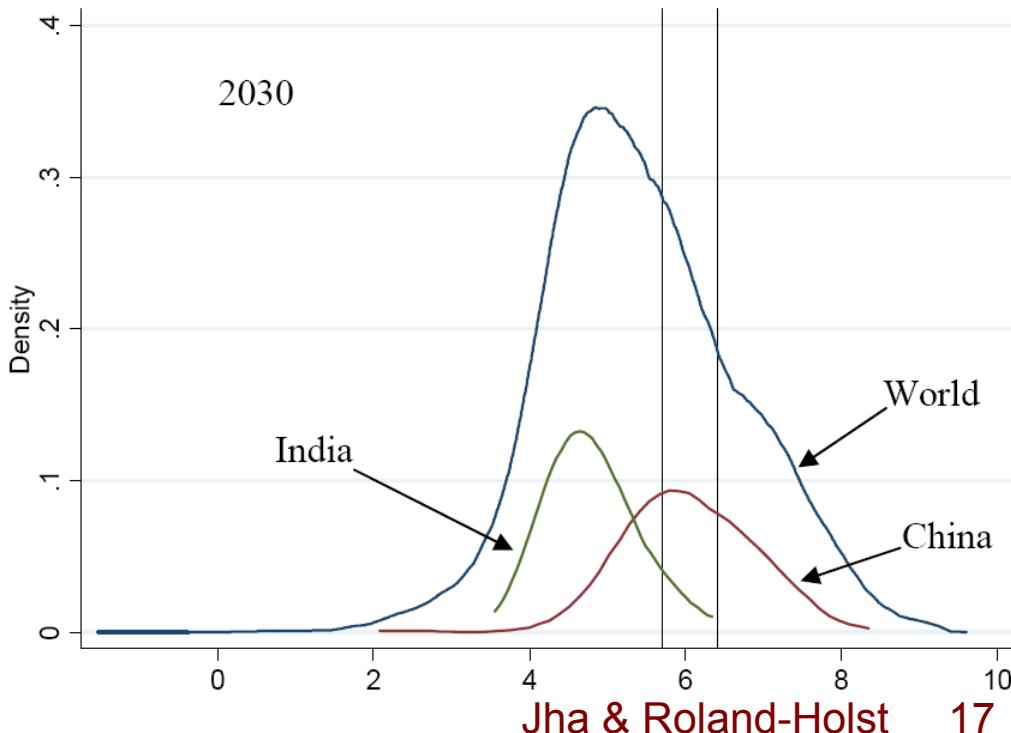
GS BRICs Model Projections. See text for details and assumptions.

Emergent Demand II: China and India in a Global Context

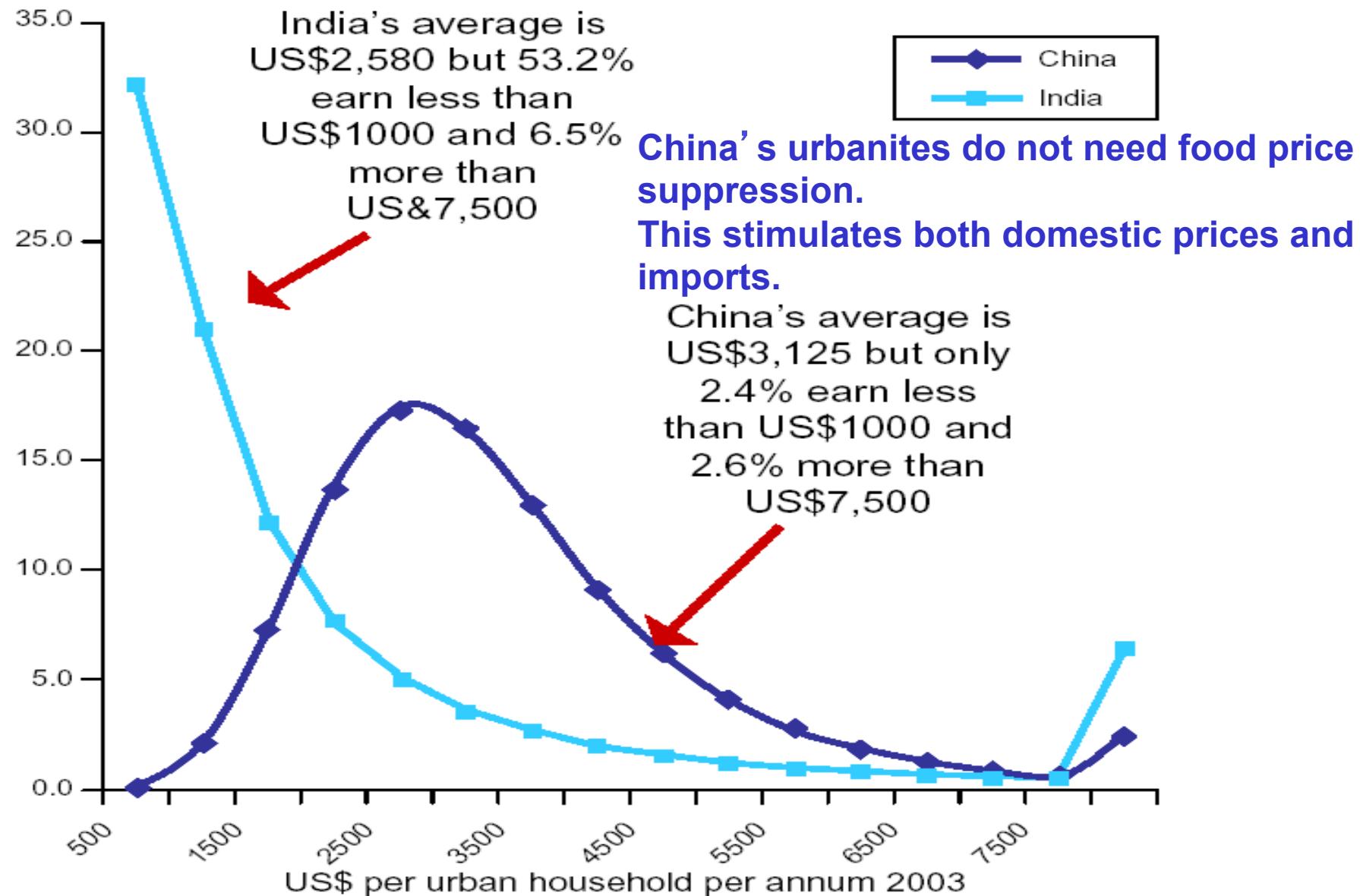


The World Bank estimates that China's progress across the global income distribution will be relatively inequality-neutral.

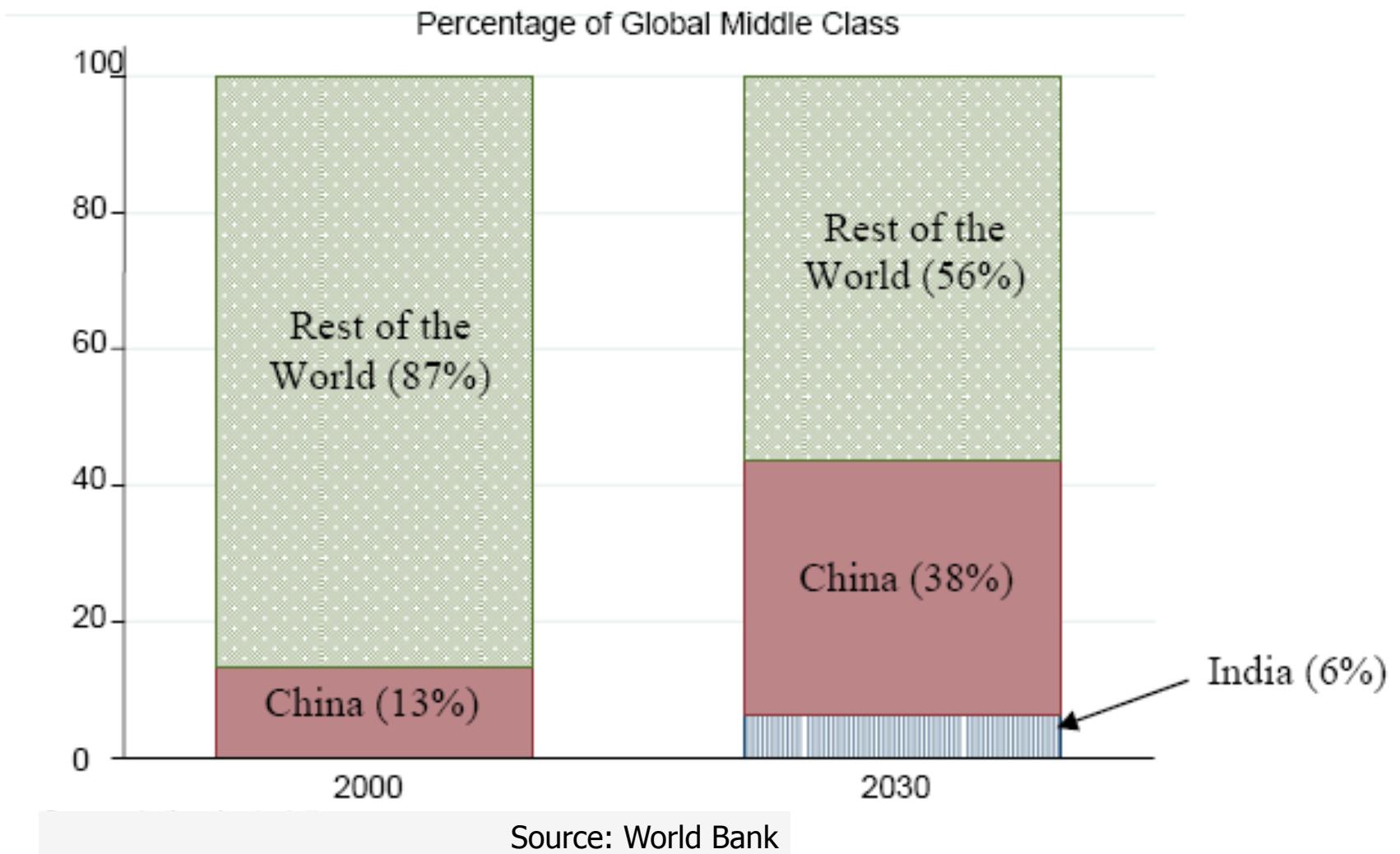
Because of greater inequality (Gini=.42 vs .29), China has more members of the middle class.



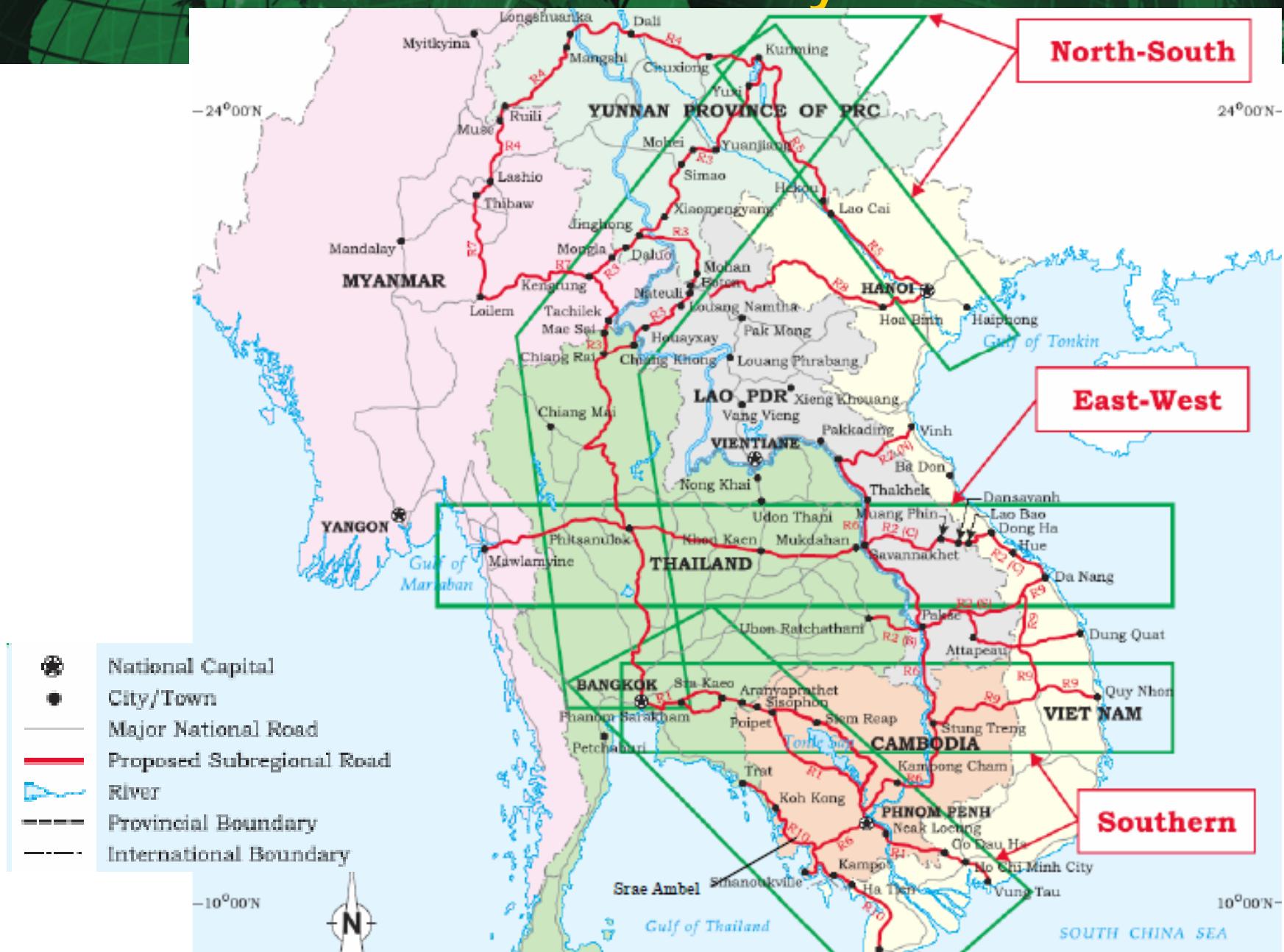
China's Urban Population will Accelerate Resource-intensive Regional Food Demand



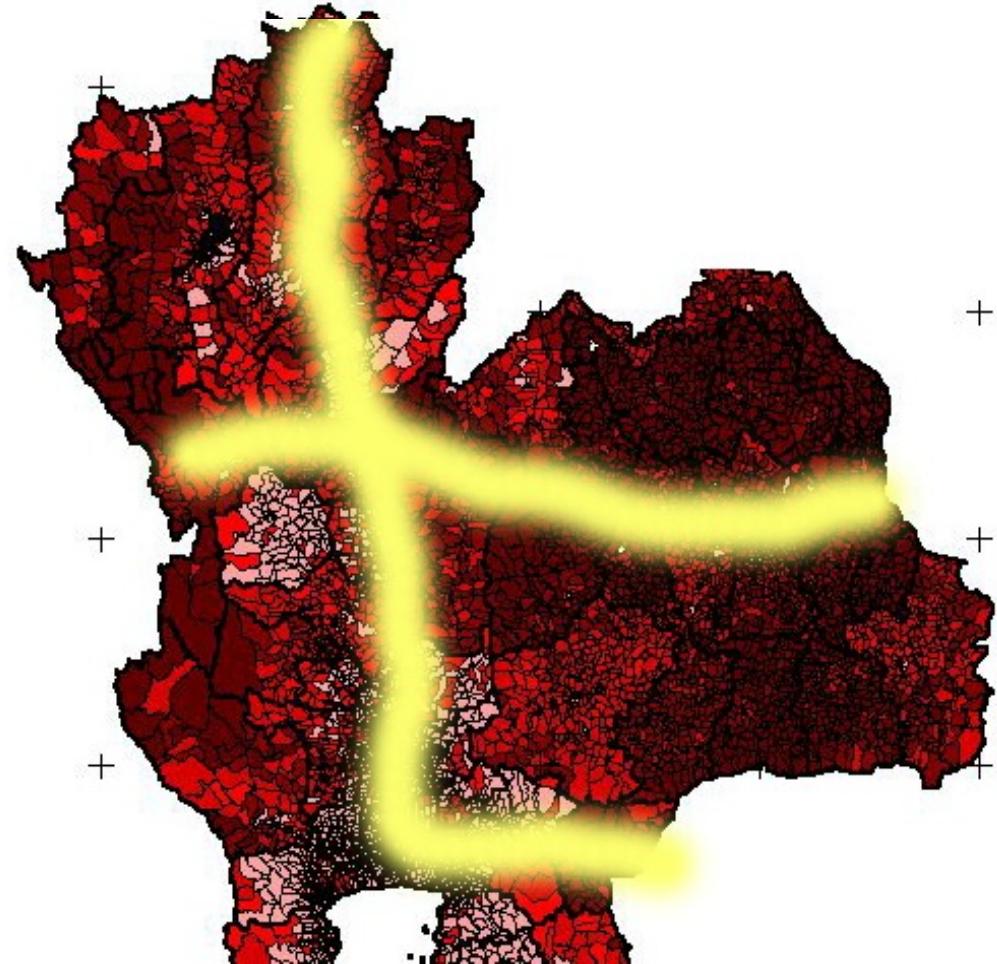
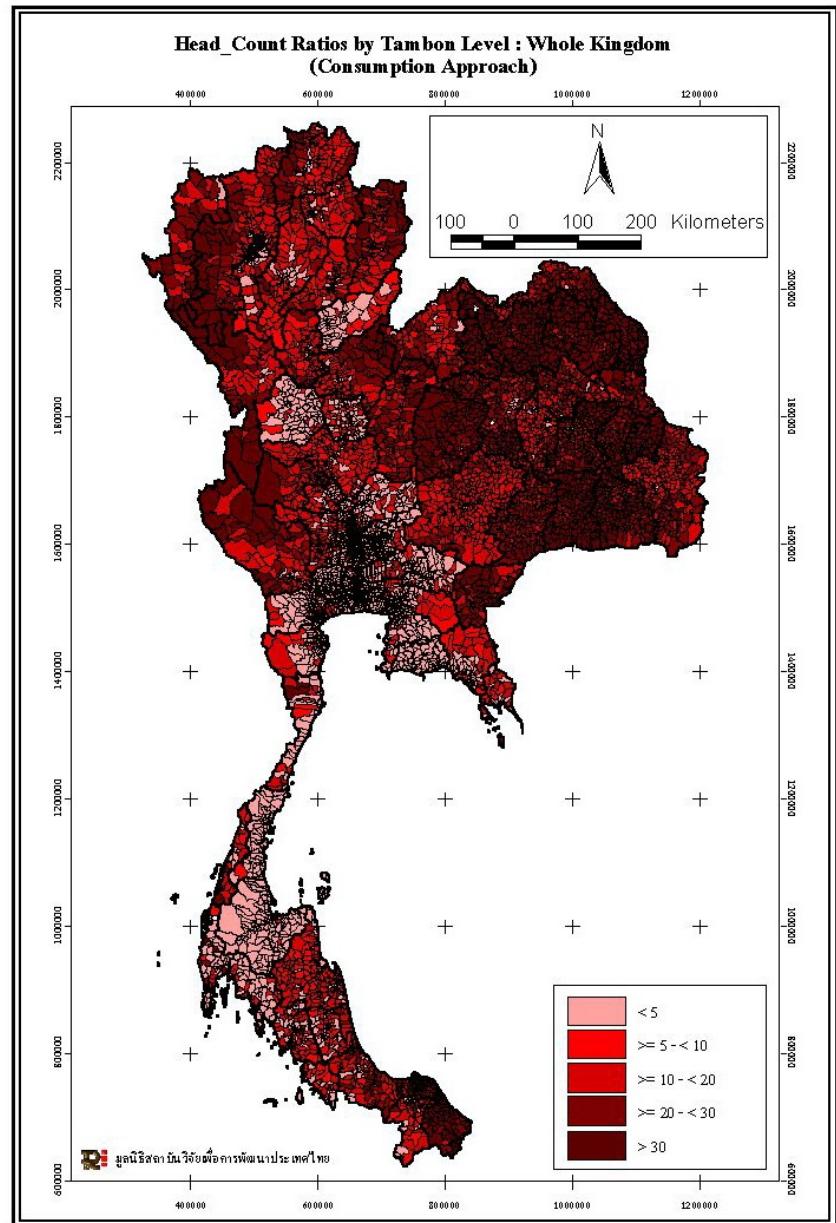
Asian Middle Class Emergence



On the Supply Side, the Region is Investing Heavily in Market Access



Market Access and Poverty Alleviation

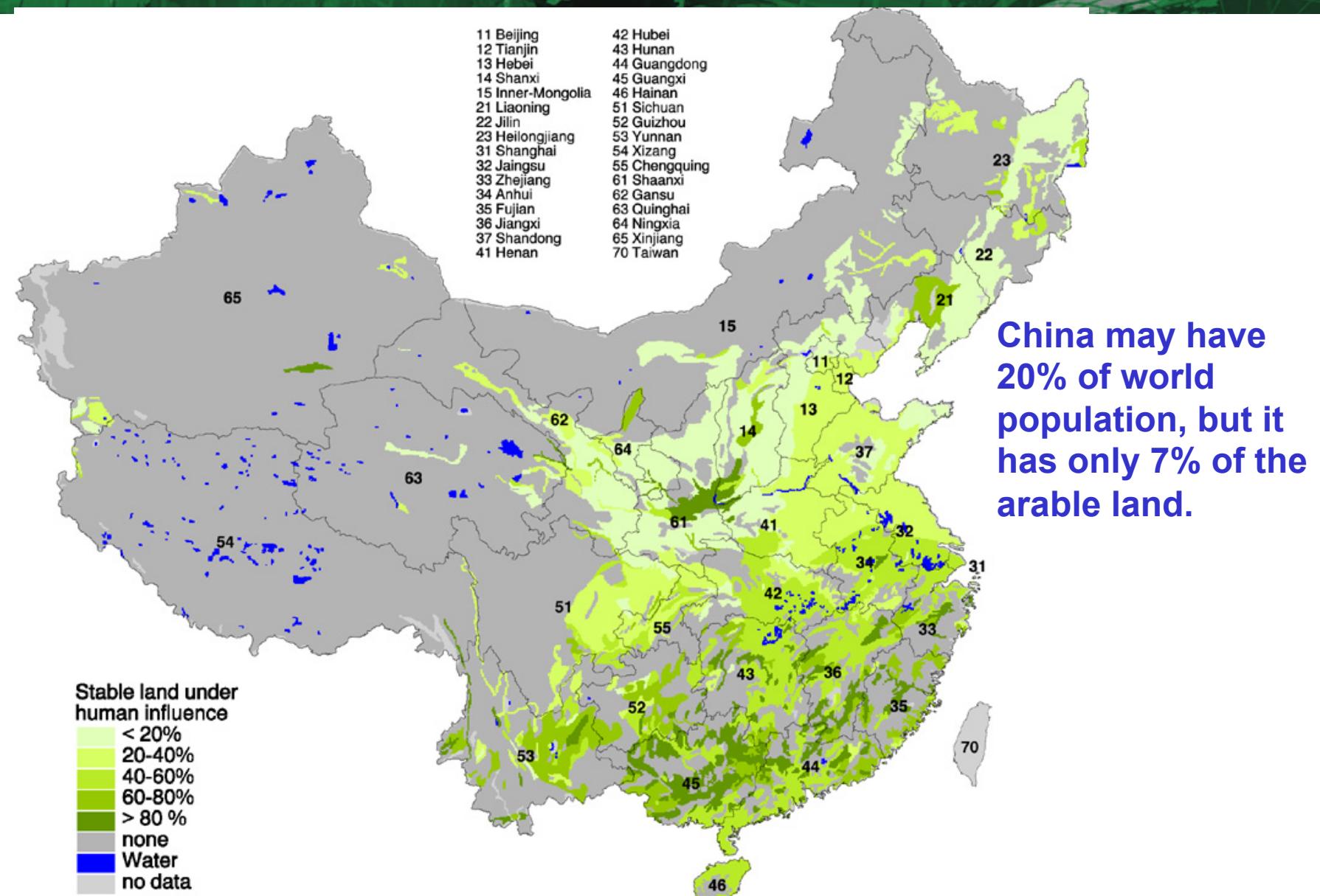


For example, Thailand's regional integration will advance self-directed poverty alleviation, improving market access for rural poor majorities, without unsustainable fiscal commitments.

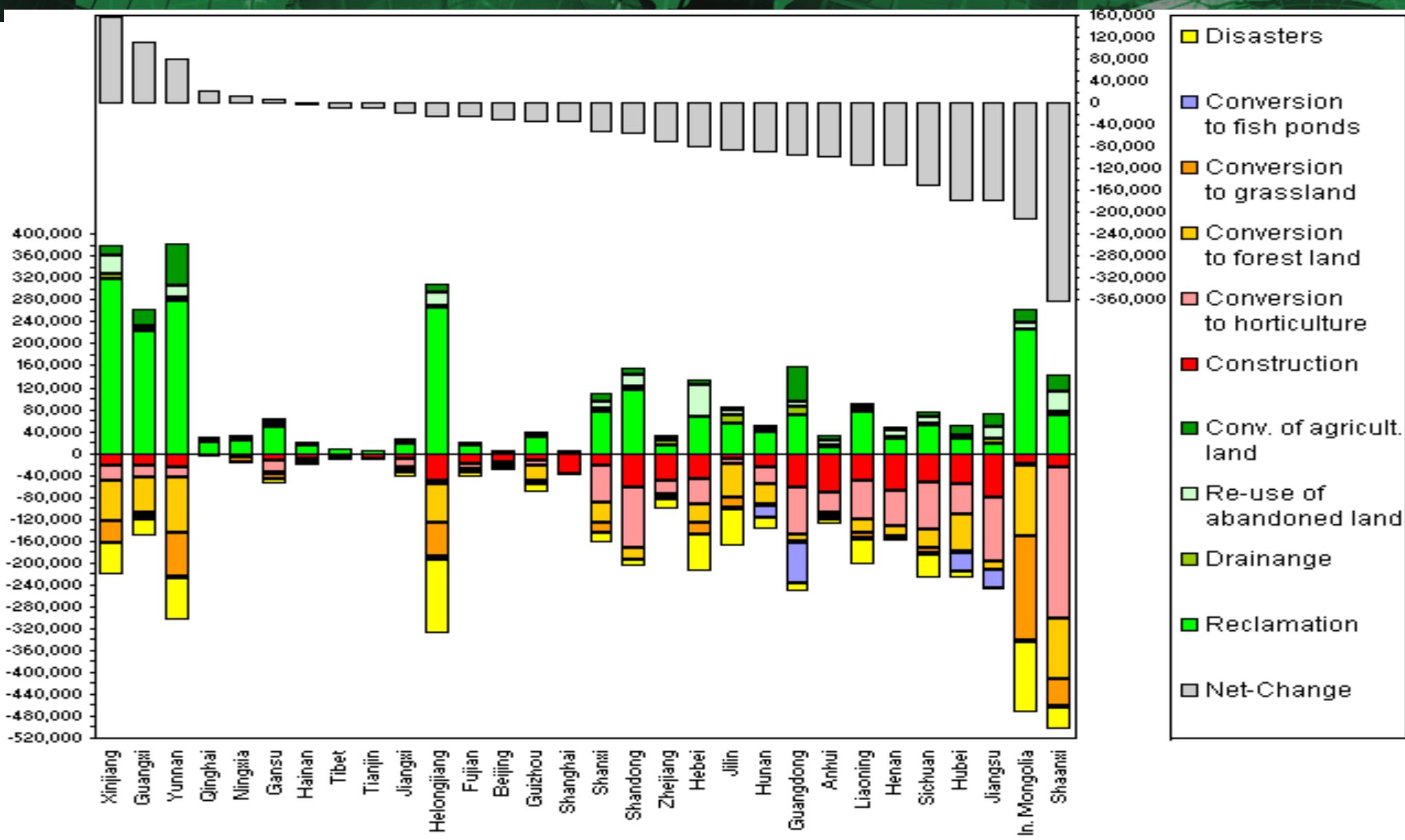


3. China's AgroFood Balances

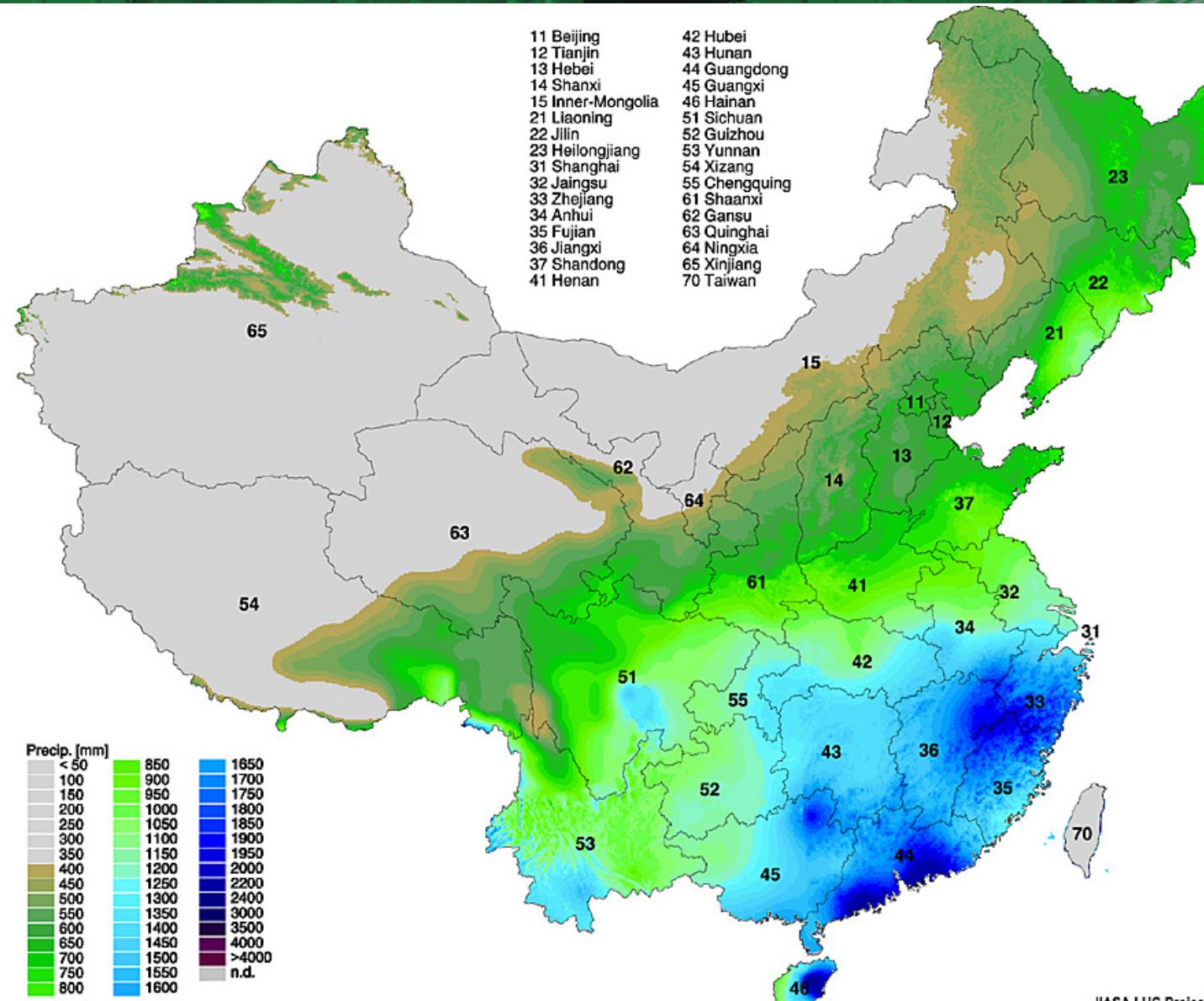
Supply Side: China's Farmland is scarce...



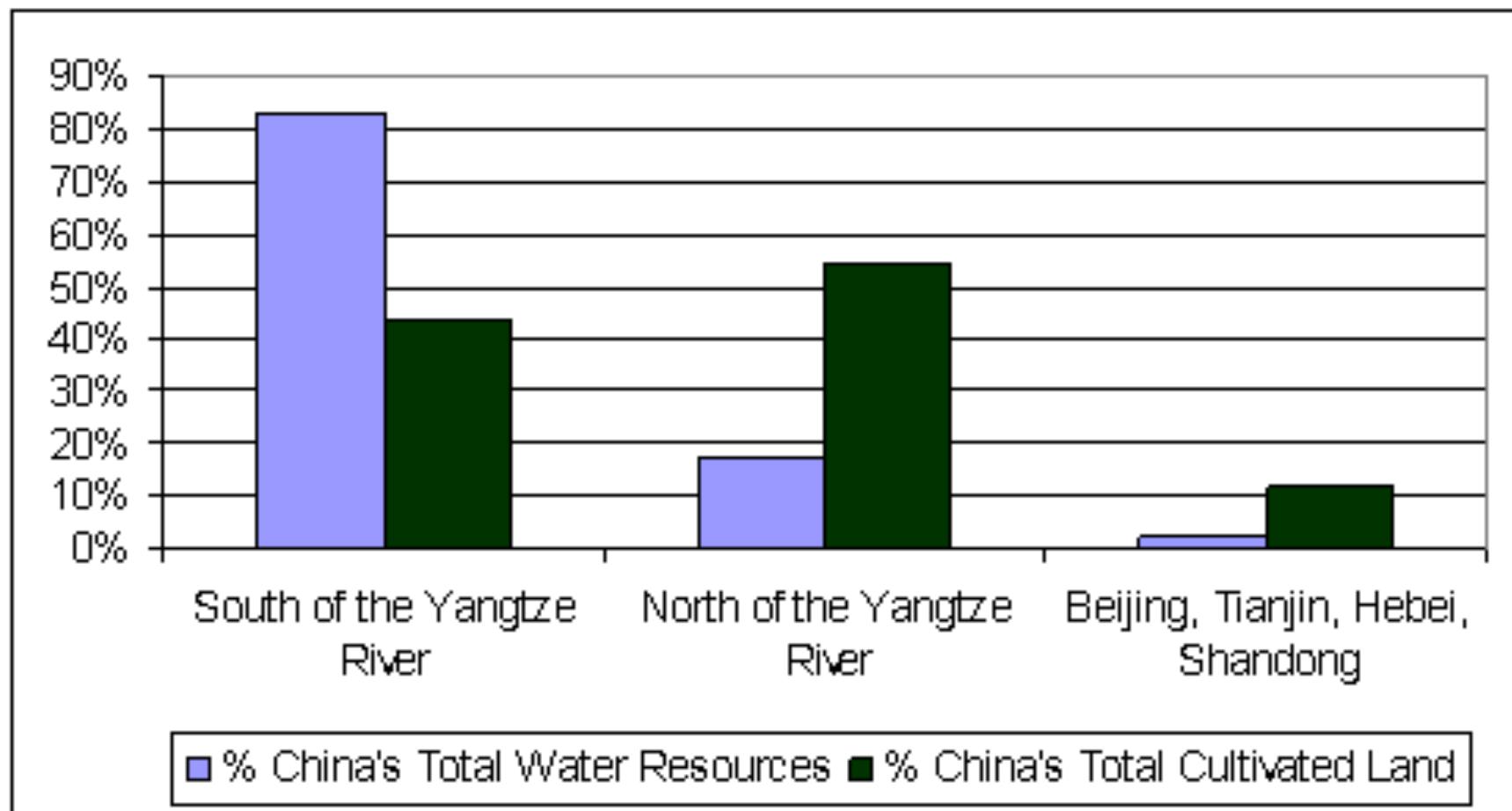
and shrinking.



Annual rainfall is limited...

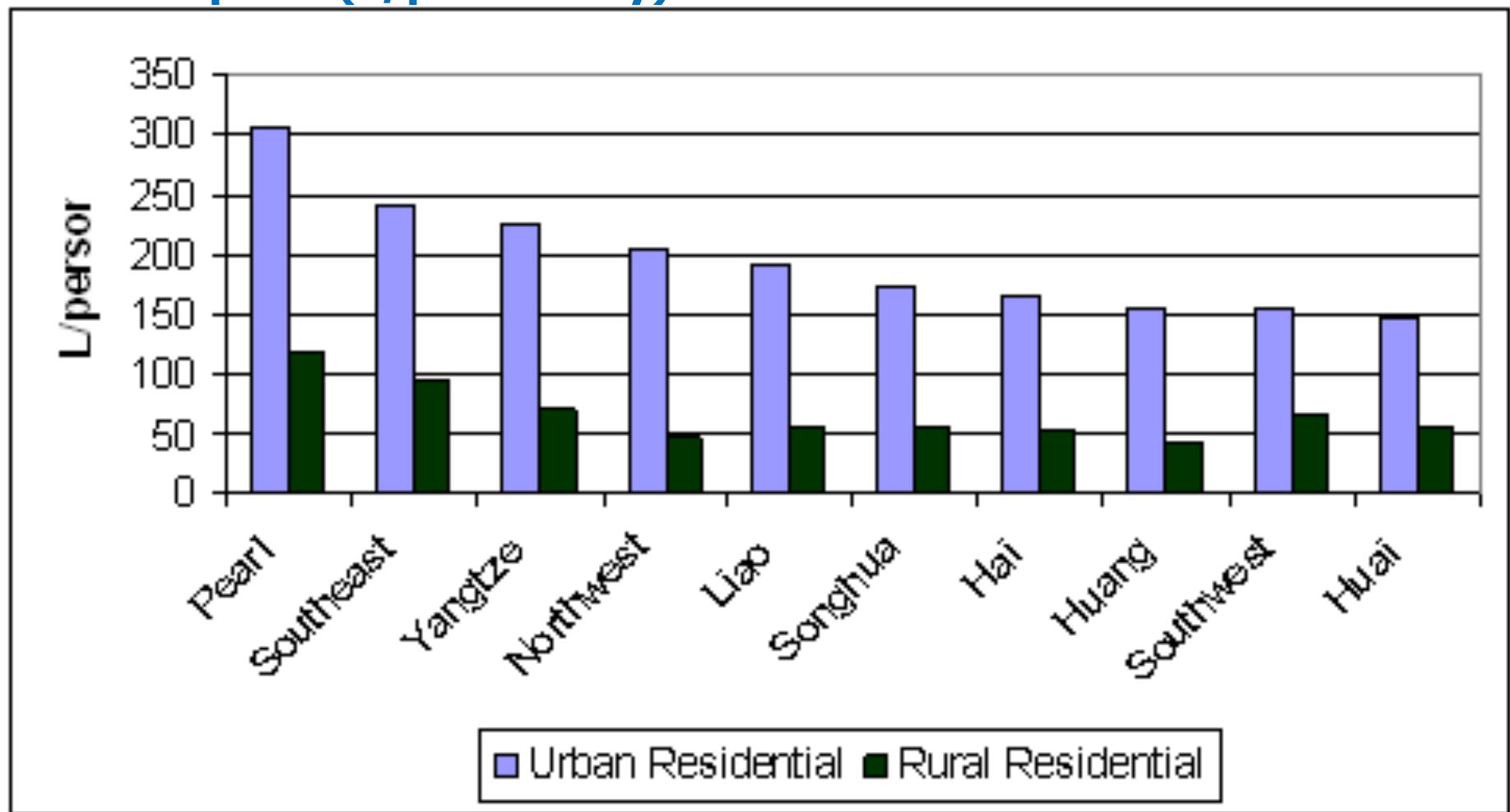


and water resources are distributed very unevenly



Thirsty Cities: Urbanites are more than twice as water-intensive

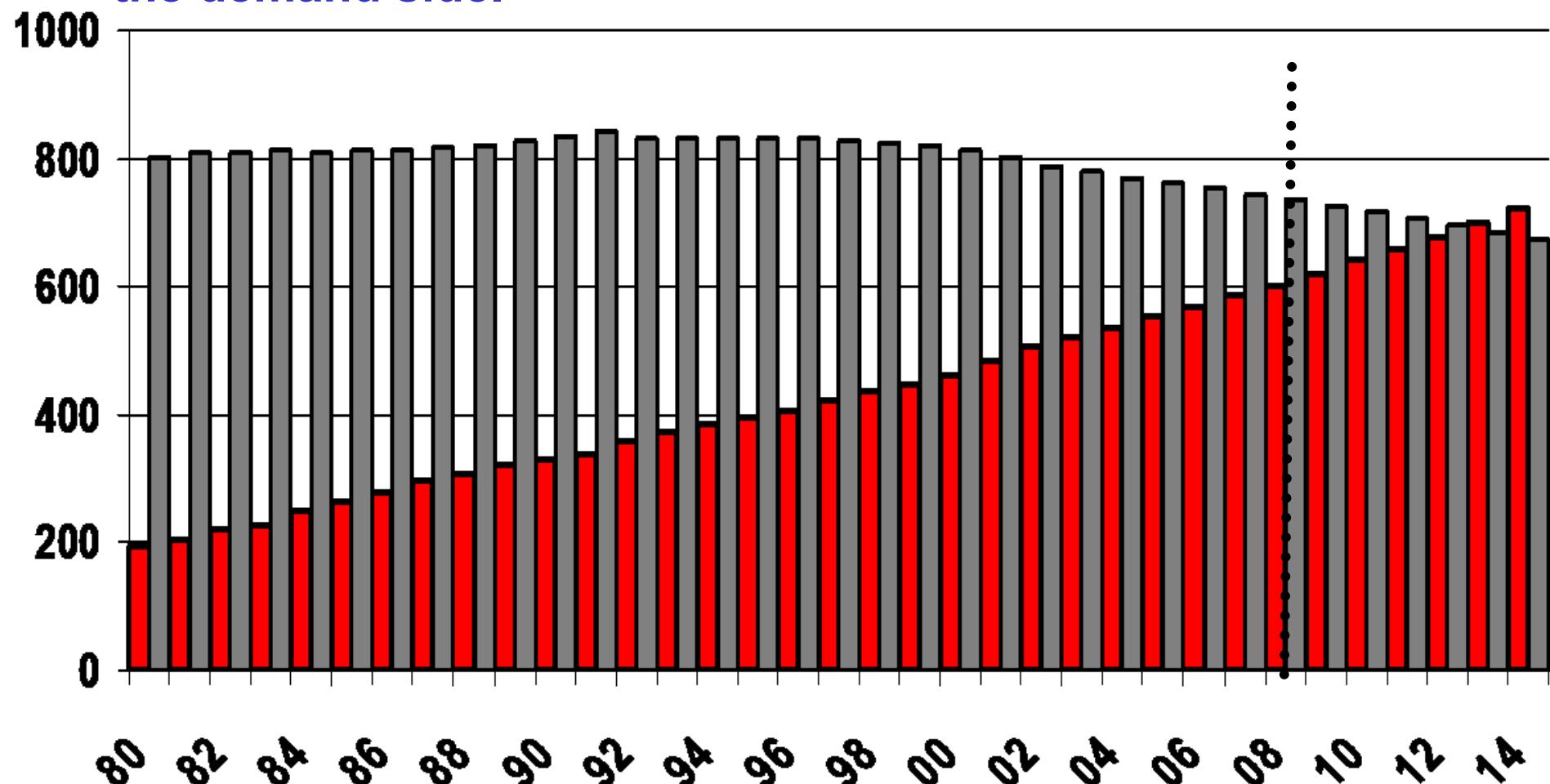
Urban and Rural Residential Per Capita Water Consumption (L/person·day) in China's River Basins



Demand: China's Population is Moving

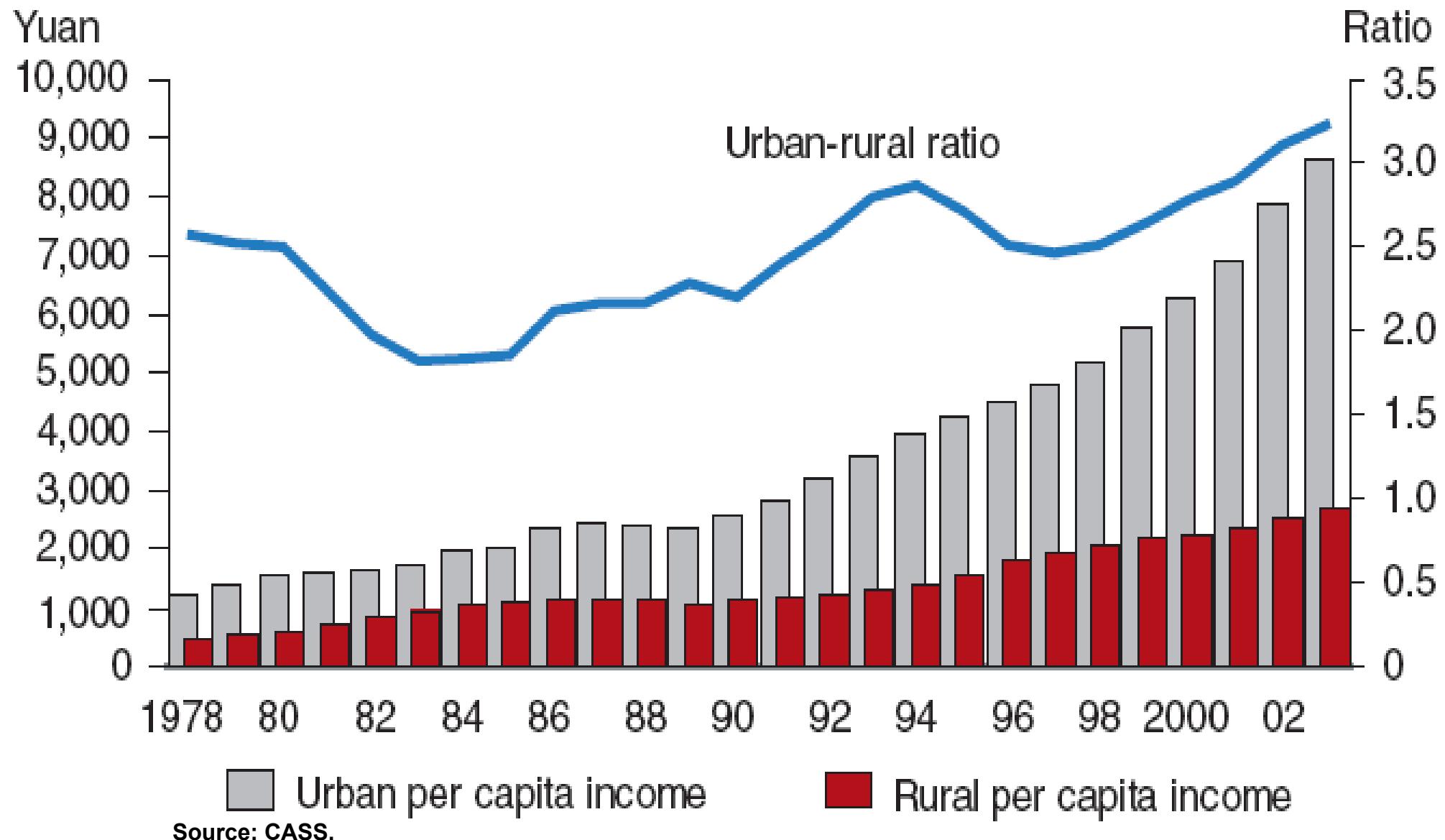
(Rural and Urban, millions)

Half a billion people are moving from the food supply side to the demand side.

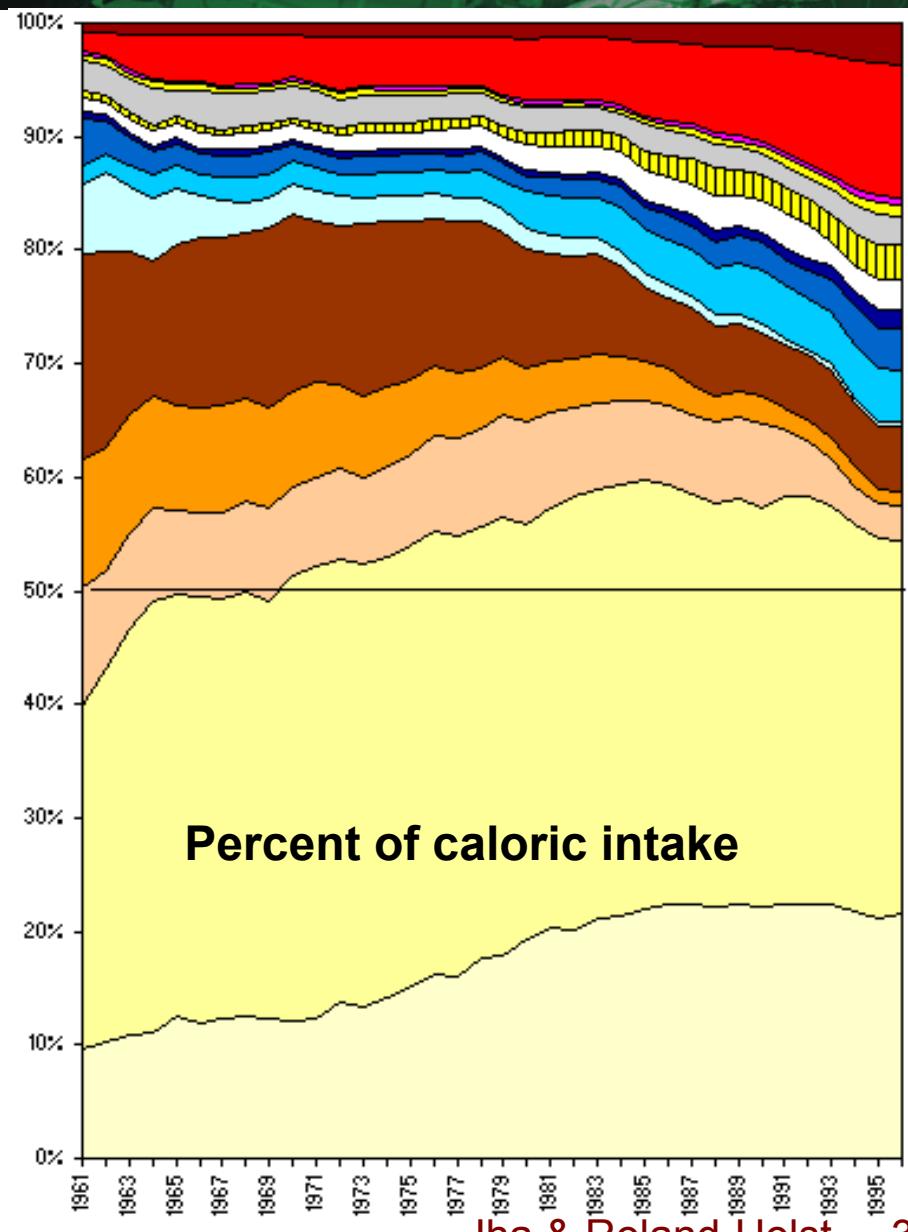
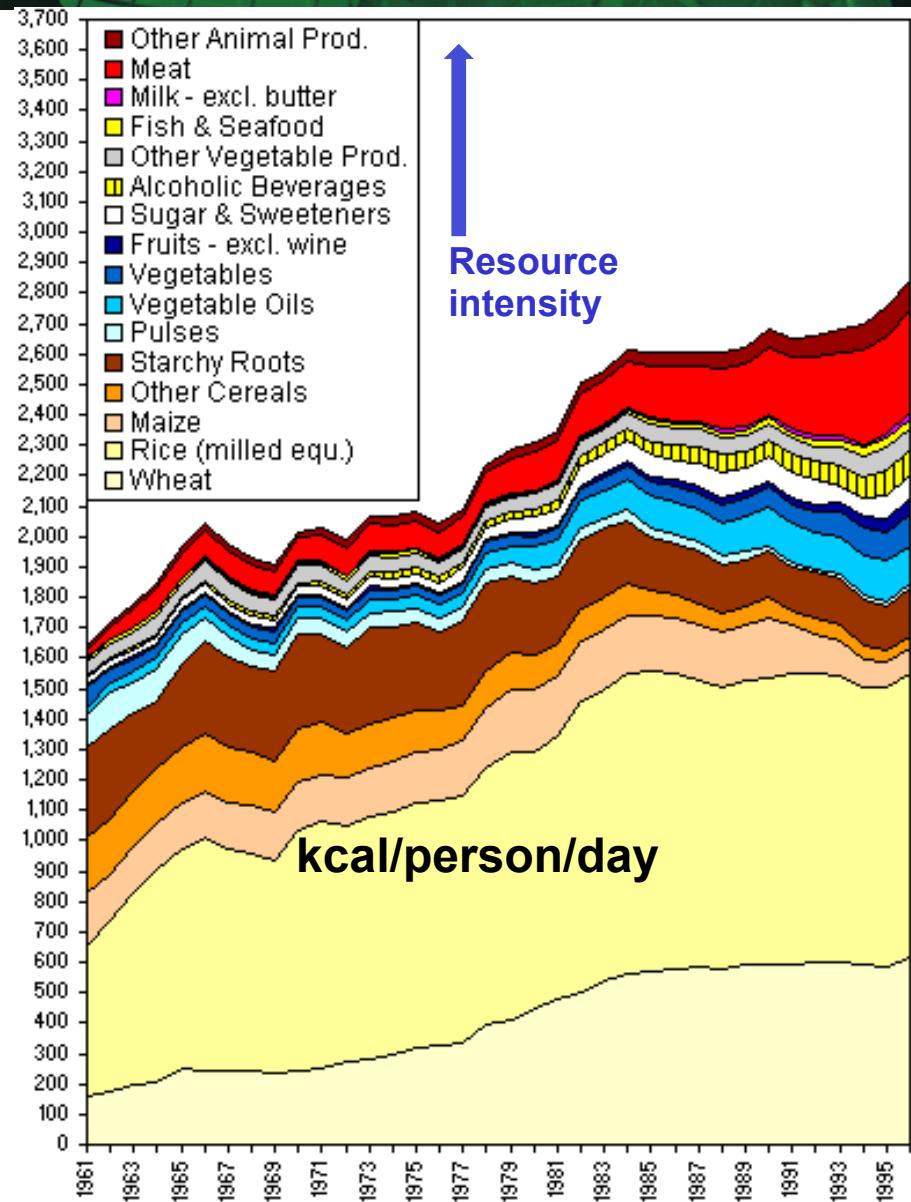


Source: CASS.

Income and inequality are both rising

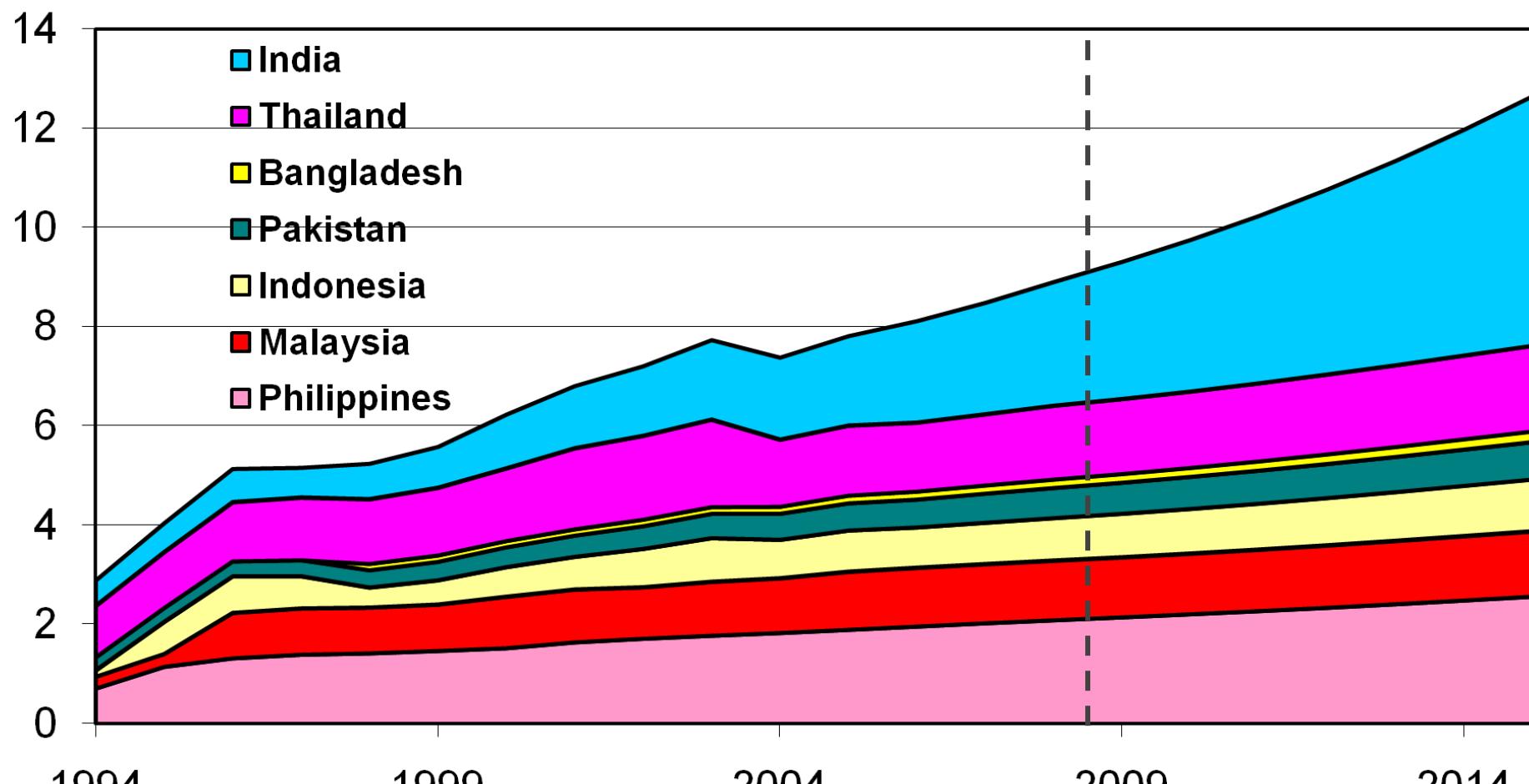


and Diets are Changing



How Big? Asia Pork and Poultry Production

Million metric tons

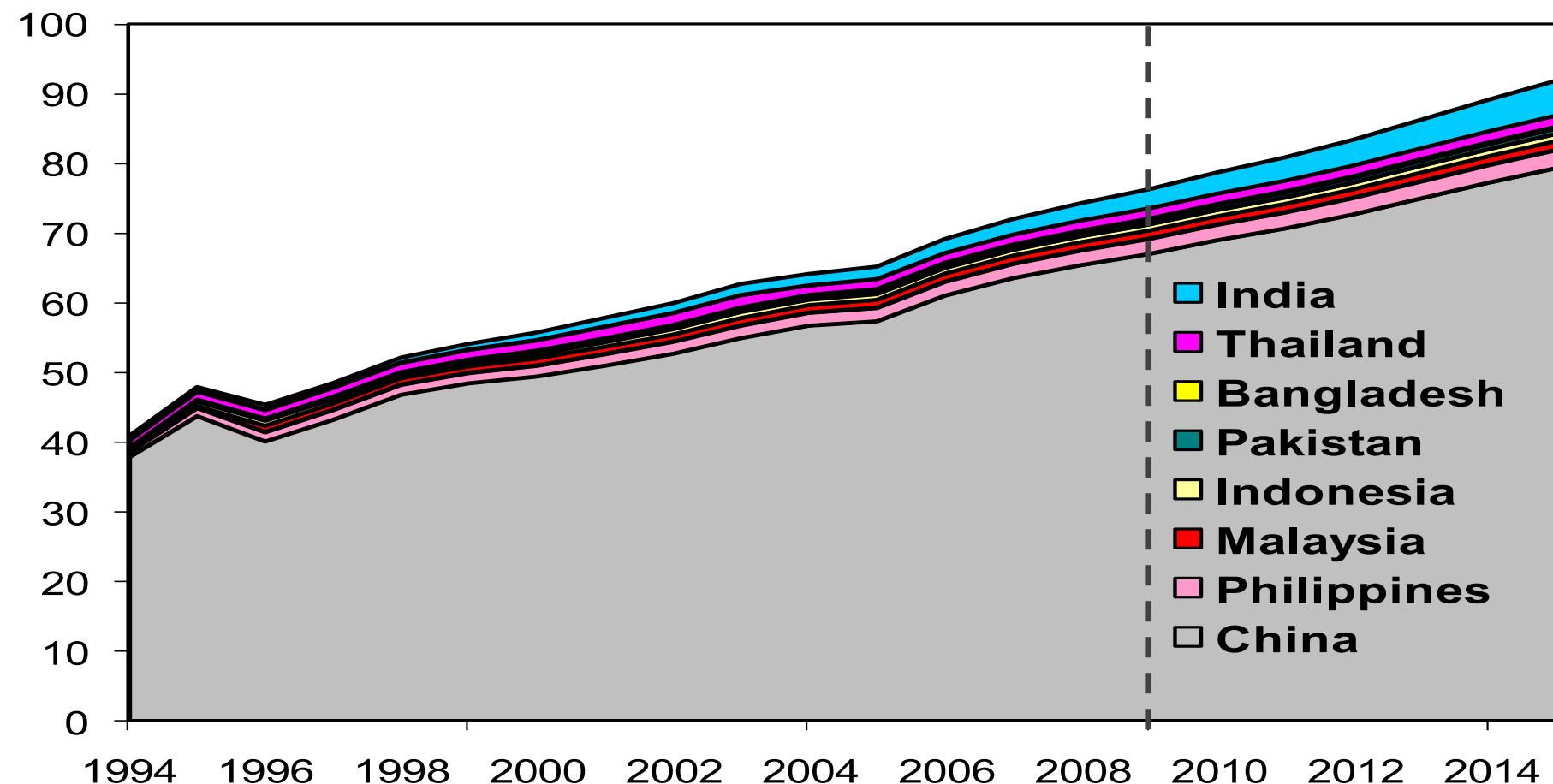


Source: USDA.

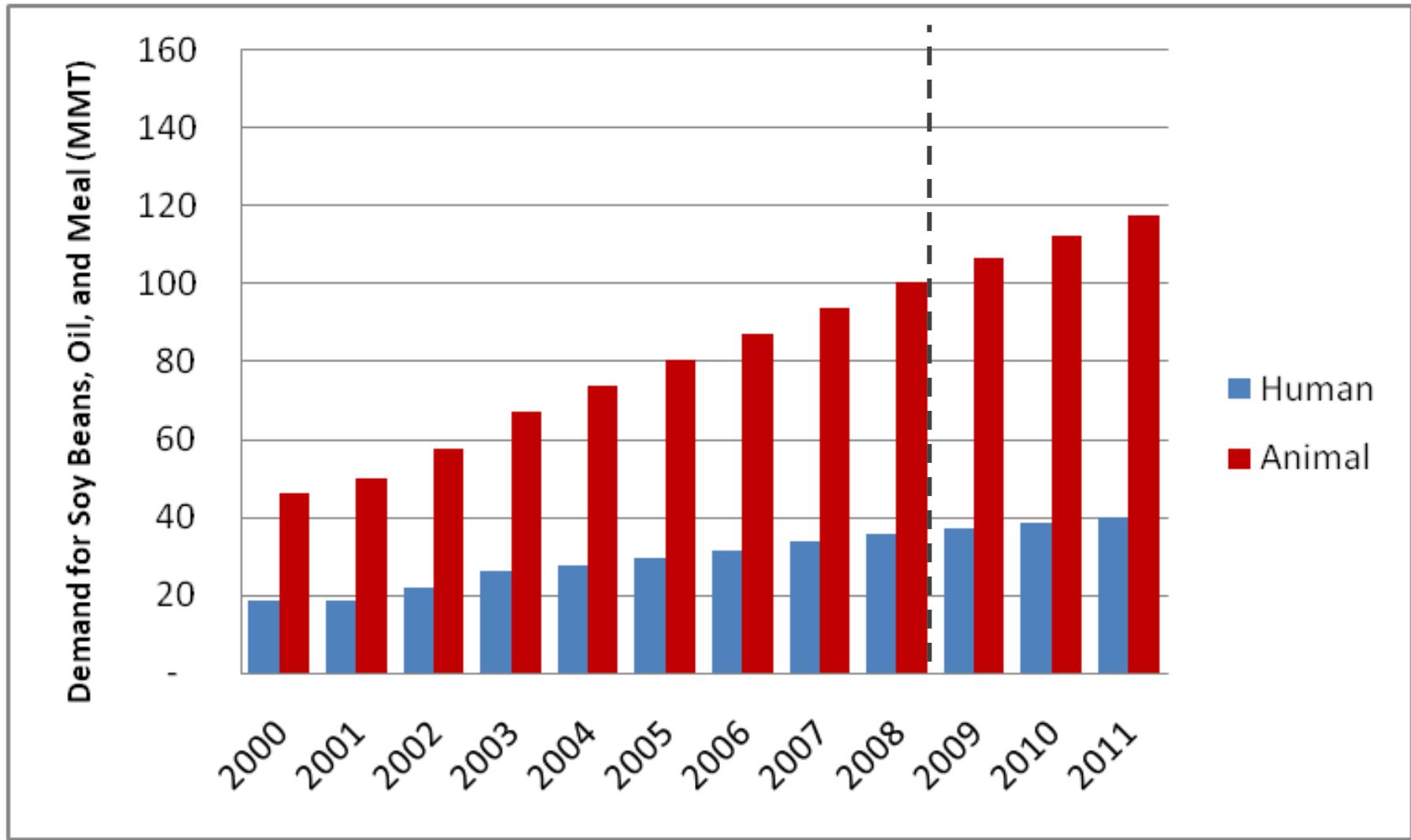
All Asia Pork and Poultry

Clearly, the impact of any imbalance in China's meat economy will fall on the price system.

Million metric tons



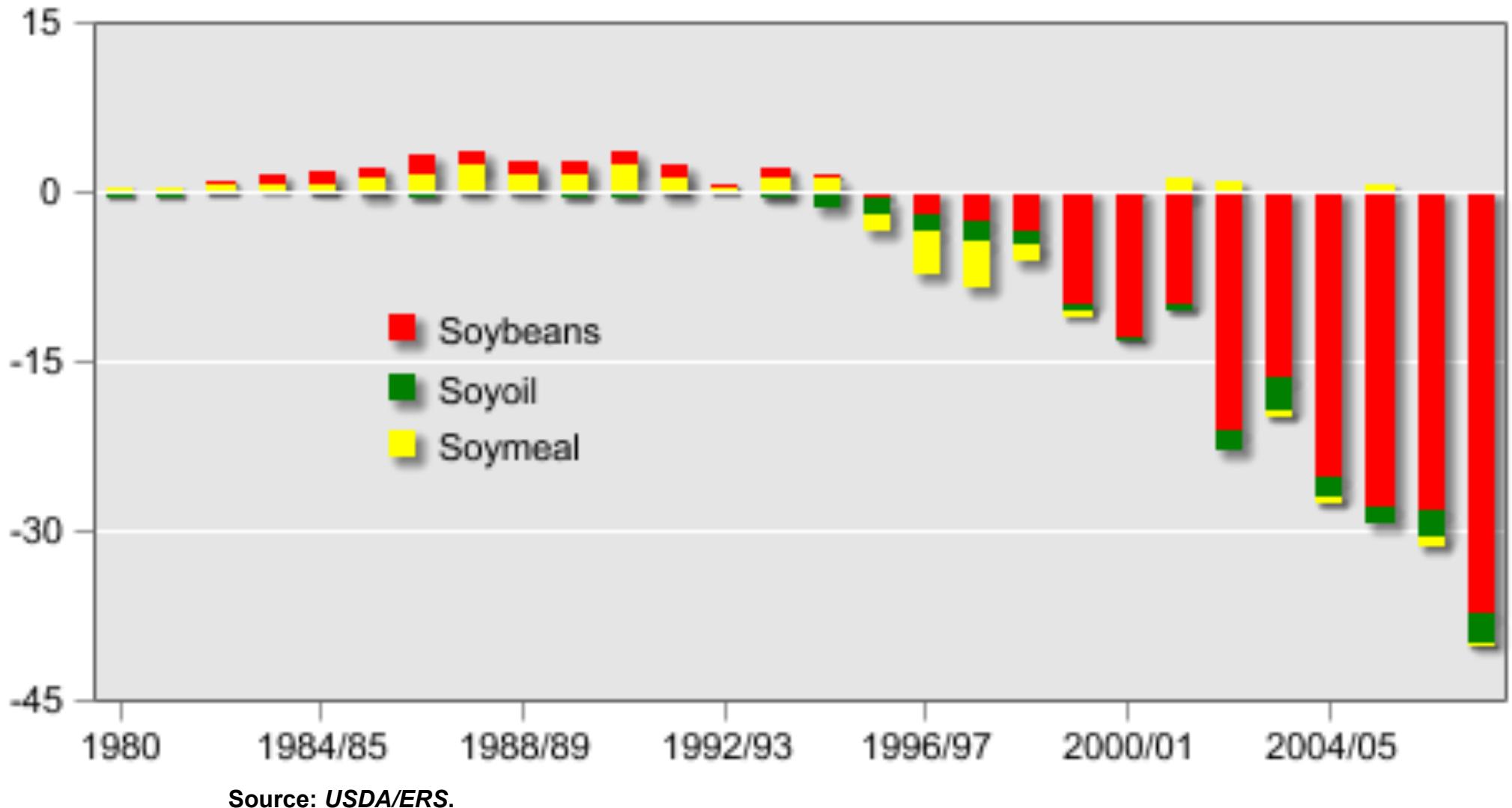
China Soy Demand



Source: USDA.

Trade: China's Soy Tsunami

Net trade in soy products (Million MT)



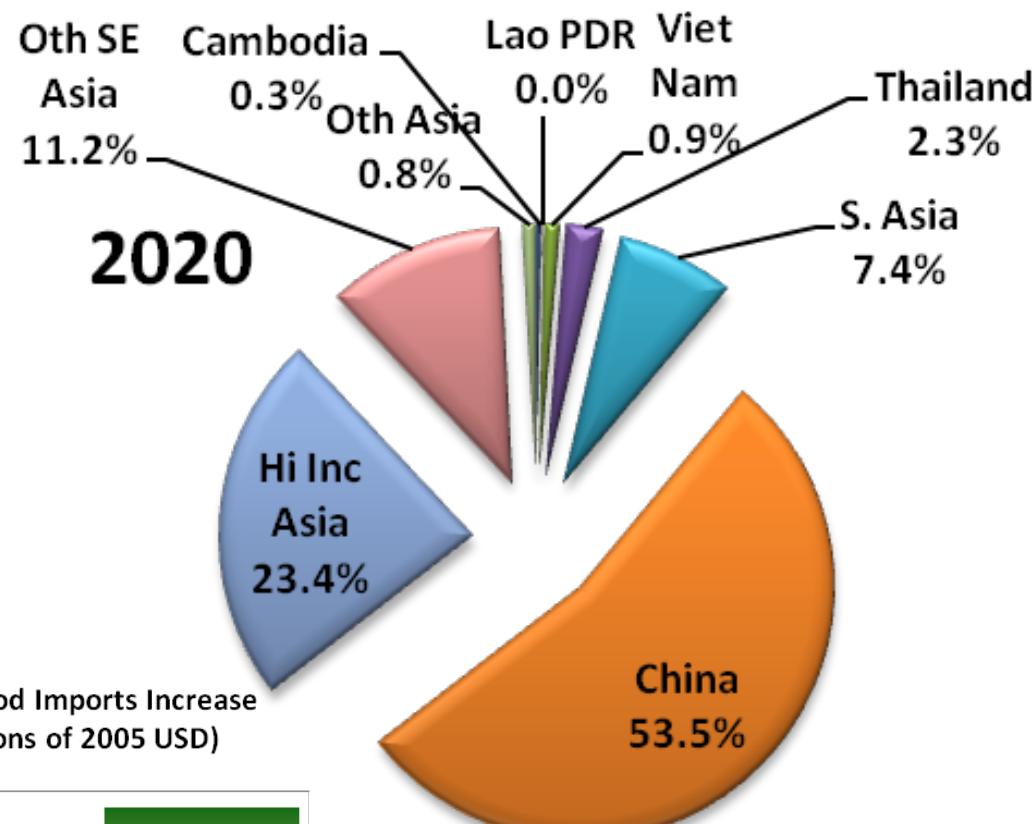
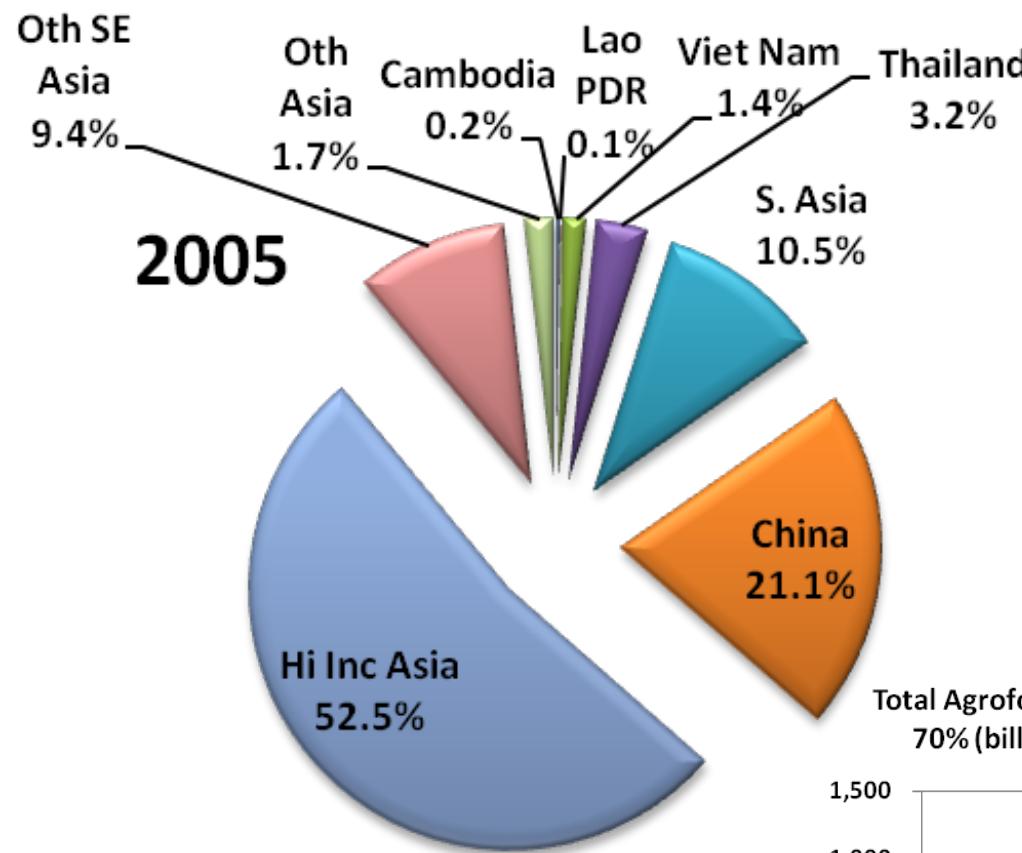
Source: USDA/ERS.



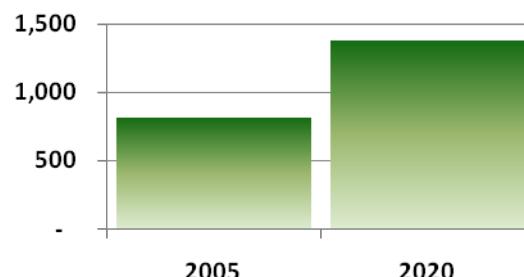
4. GMS AgroFood Growth Opportunities

- With 7 percent of world farmland, 20 percent of population, and the fastest growing middle class, China's AgroFood balances will exert enormous influence on global trade
- Despite its obvious importance, substantial uncertainty remains about China's future food self-sufficiency
- If import trends continue, there are significant opportunities to alleviate rural poverty at home and elsewhere in Asia.

Composition of Regional AgroFood Import Demand: Baseline



Total Agrofood Imports Increase
70% (billions of 2005 USD)



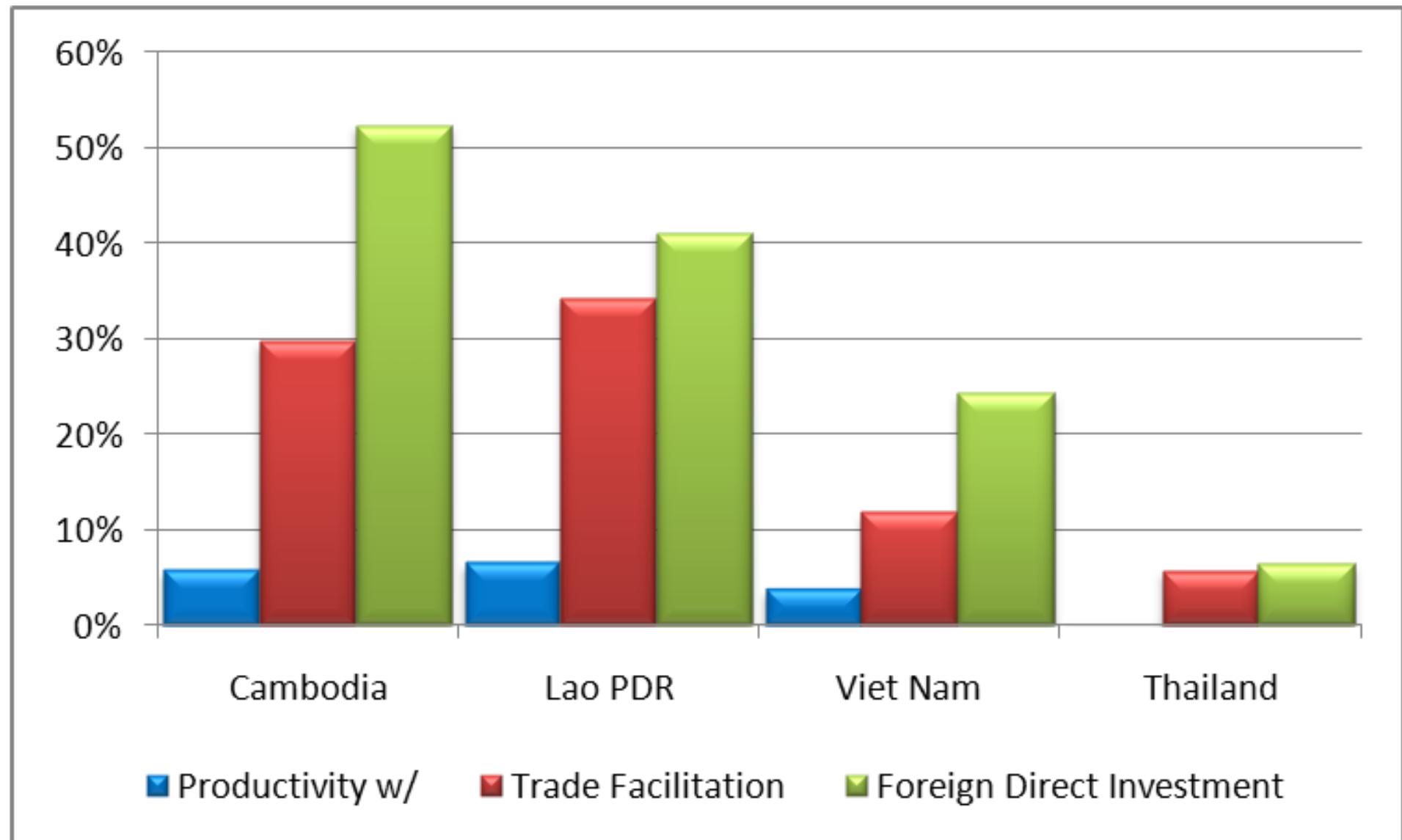
Scenarios for GMS AgroFood Expansion

1. AgroFood Productivity - Assume that total factor productivity grows at 4% annually in Agriculture and Food Processing sectors
2. Trade Facilitation - In addition to Scenario 1, assume trade, transport, and transit margins to and from and through low income GMS countries are reduced by 50%.
3. Foreign Direct Investment - In addition to Scenario 2, assume that FDI in the low income GMS countries rises to 4% of GDP by 2020 (region varies between 1-12%).

Historical Agricultural Productivity Growth

	1970– 1979	1980– 1989	1990– 1999	2000– 2006
Sub-SaharanAfrica	1.31	2.6	3.1	2.2
LatinAmerica&Caribbean	3.07	2.37	2.87	3.13
Brazil	3.83	3.73	3.29	4.41
MiddleEast&NorthAfrica	2.94	3.37	2.73	2.34
NEAsia,High	2.15	1.03	-0.01	-0.01
NEAsia,Low	3.11	4.55	5.06	3.85
China	3.09	4.6	5.17	3.87
SEAsia	3.68	3.59	3.13	3.54
Sasia	2.56	3.39	3	2.19
India	2.69	3.52	2.94	2
NorthAmerica	2.17	0.73	2.03	1.1
Oceania	1.79	1.25	2.93	-0.04
WesternEurope	1.54	0.94	0.46	-0.35
EasternEurope	1.8	0.25	-2.18	-0.19
USSR/FSU	1.32	0.98	-4.62	2.7
Developingcountries	2.82	3.46	3.64	3.09
Developedcountries	1.88	0.86	1.21	0.39
USSR&EasternEurope	1.47	0.77	-3.88	1.81
World	2.23	2.13	2.04	2.22

Aggregate GMS Results: Real GDP Change from Baseline in 2020





Overall Insights

1. Primary sector productivity growth is necessary, but not sufficient for GDP (value added) growth.
2. Public facilitation: Investments to lower TTT margins are essential to facilitate market access.
3. Private facilitation: FDI further deepens logistical capacity and value creation.
4. Spillovers: The region as a whole benefits because of network externalities from higher productivity, value-added creation, and income growth in the poorest countries.

Scenario 1 Macro: Agricultural Productivity Growth

Results are in proportion to primary sector share of GDP.

Percent	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	S. Asia	Oth Asia
GDP	17%	23%	9%	6%	0%	0%	0%	0%	0%
Output	30%	29%	4%	6%	0%	0%	0%	0%	0%
Exports	29%	33%	8%	14%	0%	2%	0%	0%	0%
Imports	41%	48%	24%	17%	0%	2%	0%	0%	0%
Cons	53%	55%	32%	10%	0%	1%	0%	0%	0%
CPI	-6%	-4%	1%	4%	0%	0%	0%	0%	0%
EV Inc	54%	57%	32%	10%	0%	1%	0%	0%	0%
USD Millions	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	S. Asia	Oth Asia
GDP	5,194	2,717	9,704	33,130	-220	26,733	-125	588	-3
Output	68,497	18,128	75,135	208,710	-4,177	502,089	29,402	6,378	-13
Exports	26,504	4,386	51,218	148,518	-3,315	251,547	897	470	81
Imports	31,153	7,398	151,158	197,432	-5,035	270,927	-24,018	-226	79
Cons	3,917	2,440	23,966	18,847	-294	16,787	-839	475	6
EV Inc	6,393	2,612	27,470	20,980	-278	31,395	-1,019	726	7

Scenario 2 Macro: Trade Facilitation

Percent	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	S. Asia	Oth Asia
GDP	30%	30%	14%	6%	0%	1%	0%	0%	0%
Output	50%	31%	12%	9%	0%	1%	0%	0%	0%
Exports	74%	63%	34%	20%	0%	3%	0%	0%	0%
Imports	87%	82%	58%	31%	0%	4%	0%	0%	0%
Cons	68%	66%	48%	19%	0%	1%	0%	0%	0%
CPI	-4%	4%	5%	7%	0%	1%	0%	0%	0%
EV Inc	70%	65%	48%	18%	0%	1%	0%	0%	0%
USD Millions	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	S. Asia	Oth Asia
GDP	9,046	3,524	15,125	32,395	-380	47,859	126	1,028	-13
Output	116,570	19,742	228,670	297,902	-9,427	1,027,483	59,601	7,538	-115
Exports	66,816	8,214	207,636	221,610	-9,319	530,824	7,795	-1,524	31
Imports	65,878	12,698	364,527	358,554	-12,603	495,095	-45,002	-3,442	-49
Cons	5,101	2,896	36,152	36,467	-605	27,807	-1,363	658	-1
EV Inc	8,215	2,999	40,568	40,419	-674	53,552	-1,758	810	-4

Scenario 3 Macro: Foreign Direct Investment

Percent	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	High Asia	S. Asia	Oth Asia
GDP	52%	41%	24%	6%	0%	0%	1%	0%	0%	0%
Output	123%	60%	26%	10%	0%	0%	1%	0%	0%	0%
Exports	139%	100%	47%	21%	0%	0%	3%	0%	0%	0%
Imports	160%	114%	74%	32%	0%	0%	4%	0%	0%	0%
Cons	121%	94%	57%	20%	0%	0%	1%	0%	0%	0%
CPI	-7%	5%	5%	7%	0%	0%	1%	0%	0%	0%
EV Inc	119%	91%	57%	19%	0%	0%	1%	0%	0%	0%
USD Millions	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	High Asia	S. Asia	Oth Asia
GDP	15,795	4,786	26,808	35,214	-285	277	49,665	277	885	-13
Output	284,453	38,335	509,129	312,275	-7,744	75,304	1,066,830	75,304	6,253	-52
Exports	125,344	13,140	284,063	228,970	-8,299	18,501	552,364	18,501	-1,649	70
Imports	120,805	17,687	466,043	368,287	-11,185	-29,972	516,988	-29,972	-3,494	-24
Cons	9,026	4,124	42,844	37,647	-491	-647	29,003	-647	556	0
EV Inc	14,006	4,186	47,884	41,715	-554	-780	55,667	-780	675	-3

Scenario 3 Sector Real Output: Foreign Direct Investment

Percent	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	High Asia	China	High Asia	S. Asia	Oth Asia
Rice	78%	69%	121%	-22%	-3%	0%	0%	0%	0%	5%
Oth Crops	88%	108%	191%	32%	1%	0%	-2%	0%	0%	0%
Livestock	116%	93%	67%	-2%	0%	0%	1%	0%	0%	0%
Fuels	158%	67%	10%	34%	1%	1%	2%	1%	0%	0%
Meat, Dairy	93%	115%	81%	1%	0%	0%	0%	0%	0%	-1%
Oth PrFood	120%	82%	109%	-11%	0%	0%	1%	0%	0%	2%
Manufactures	128%	53%	15%	10%	0%	0%	1%	0%	0%	0%
Trade Transp	104%	30%	20%	5%	0%	0%	1%	0%	0%	0%
Priv Service	170%	63%	41%	11%	0%	0%	1%	0%	0%	0%
Pub Service	54%	42%	11%	4%	0%	0%	0%	0%	0%	0%
Total	120%	57%	28%	9%	0%	0%	1%	0%	0%	0%

Scenario 3 Trade Patterns: Foreign Direct Investment

Export growth dominates for lower income countries within the region.

Percent	Cambodia	Lao PDR	Viet Nam	Thailand	Oth SEA	China	High Asia	S. Asia	Oth Asia
Cambodia			1743%	2053%	88%	977%	83%	55%	66%
Lao PDR			1130%	1277%	-14%	695%	4%	-18%	
Viet Nam	1425%	871%		1128%	43%	1539%	20%	61%	43%
Thailand	488%	238%	386%		-17%	236%	-15%	-17%	-21%
Oth SEA	-14%	-29%	-10%	0%	1%	0%	0%	0%	1%
China	476%	309%	599%	417%	-1%		-1%	-1%	0%
High Asia	-5%	-1%	-3%	-3%	1%	0%	0%	0%	1%
S. Asia	-3%	-21%	-4%	0%	0%	0%	0%	0%	1%
Oth Asia	-1%		0%	20%	0%	0%	0%	-1%	1%

5. Things to Come

Extensions of the present capacity for related policy research could include:

- The global crisis
 - U, V or W-shaped recovery?
 - Asian dynamism and de-coupling
- Trade agreements – actual and hypothetical
- Changing textile markets
 - Falling OECD demand
 - Flat or falling cotton, wool, yields
- Parallel growth of food and energy demand
 - Food, fuel, related resources (e.g. water)
- Regional risk and response for
 - Climate change
 - Animal and human disease outbreaks



Thank you!