

Chinese Agricultural Transition: Trade, Social and Environmental Impacts

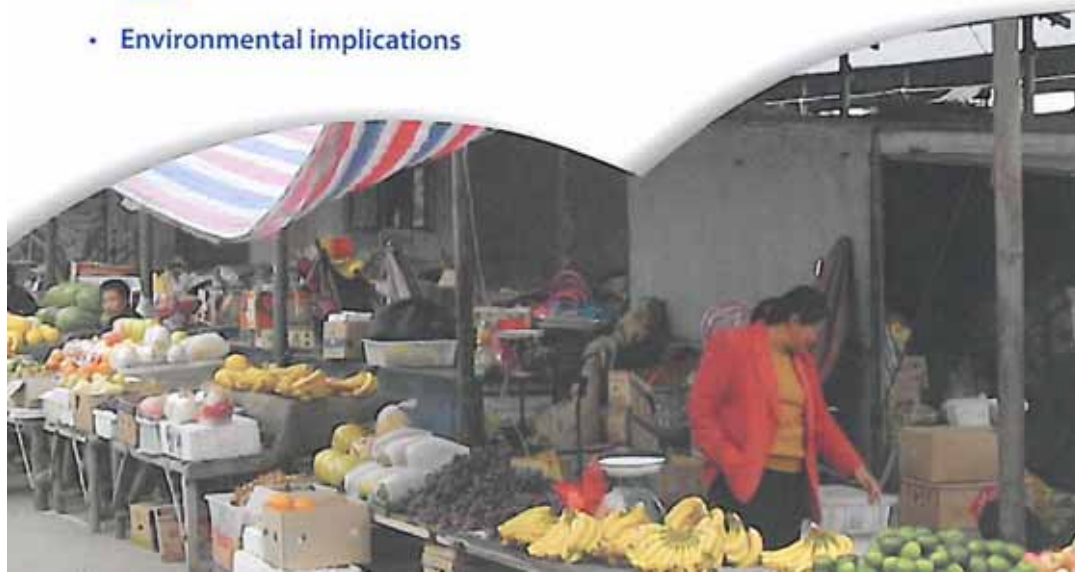
A three-year multidisciplinary international project to investigate the impacts of China's economic transition on its agricultural economy, with a particular focus on:

- Consequences and prospects for international trade, especially between China and the European Union
- Impacts on social conditions in rural areas
- Environmental implications

The Research Consortium consists of:

SOW - CCAP - IIASA -
SOAS - LEI - IFPRI

with funding from the
European Union, under the
Sixth Framework
Programme for Research and
Technological Development





CATSEI outputs

- I. Summary of main findings from studies, by work package**

- II. Results from some simulations with updated Chinagro model**



I. CATSEI Main findings from studies

WP2 (Trade): workshops with traders and policy makers

- Held in 2007 (Brussels) and 2008 (Beijing)
- Concerns from European side:
 - China does not comply with SPS agreements (still 100% checking, unnecessary bureaucratic hurdles, too many irrelevant physical norms)
 - “China prohibits all imports that are not explicitly allowed whereas EU allows all imports that are not explicitly prohibited”
- Concerns from Chinese side:
 - SPS and additional safety/quality requirements are major constraints on further expansion of China’s exports to EU
 - SPS treaties are by member state, and EC tends to follow the most stringent member



CATSEI studies WP2 (Trade): world price linkages

- **Estimations based on a random sample of China trade shocks simulated with GTAP (mapped into Chinagro commodities)**
- **Findings:**
 - **Estimated world price reactions to shocks in China's trade volumes may be considerable**
 - **Own-commodity elasticities range from, say, 0.05 to 0.50**
 - **Largest ones are found for maize and fish**
 - **Simultaneous shocks on several commodities are mutually reinforcing!**

(study done by LEI and SOW-VU)



CATSEI studies WP2 (Trade): case study on apple exports to EU

- **Interviews and focus group discussions in Shandong (major apple area around city of Qixia)**
- **Findings:**
 - **Most output from small farmers (0.15-0.65 ha)**
 - **Well integrated in supply chain**
 - **Innovative (environmental protection, bagging, new varieties)**
 - **Farmers gets 20% of retail price in EU!**
 - **Fast transmission of foreign price fluctuations, albeit a bit dampened**
 - **Rich domestic and Indian consumers willing to pay more for top quality than EU consumer**

(study done by LEI and CCAP)



CATSEI studies WP2 (Trade): case study on tomato paste exports

- **Field surveys of processing enterprises and interviews with tomato growers in Xinjiang**
- **Findings:**
 - **Rapid development (since 2000) into world's largest tomato processing centre**
 - **Two giant processing companies that have a domestic market share of 70%**
 - **Most tomatoes from local farmers**
 - **Farmers tend to get higher prices than contractually agreed, due to overcapacity in the industry**
 - **Yet, farmers express distrust as they feel that international price rises are not fully transmitted**

(study done by LEI and CCAP)



Background study WP3 (Social): local governance

- **Based on nationwide village-level survey**
- **Findings:**
 - **Self-governing social organizations have mushroomed in Chinese villages**
 - **Level of distrust in township leaders determines scale and participation rate**
 - **In this respect, striking differences across villages**
 - **Many go as far as taking over the provision of public goods from the official leaders (hence, assuming the 'Mandate of Heaven' these leaders are supposed to have)**

(study done by SOAS)



CATSEI studies WP3 (Social): % off-farm incomes in rural areas

- Calculations from Rural Household Survey NBSC, 2005
- Rural areas have become very dependent on non- farm income
- But shares differ significantly across regions:

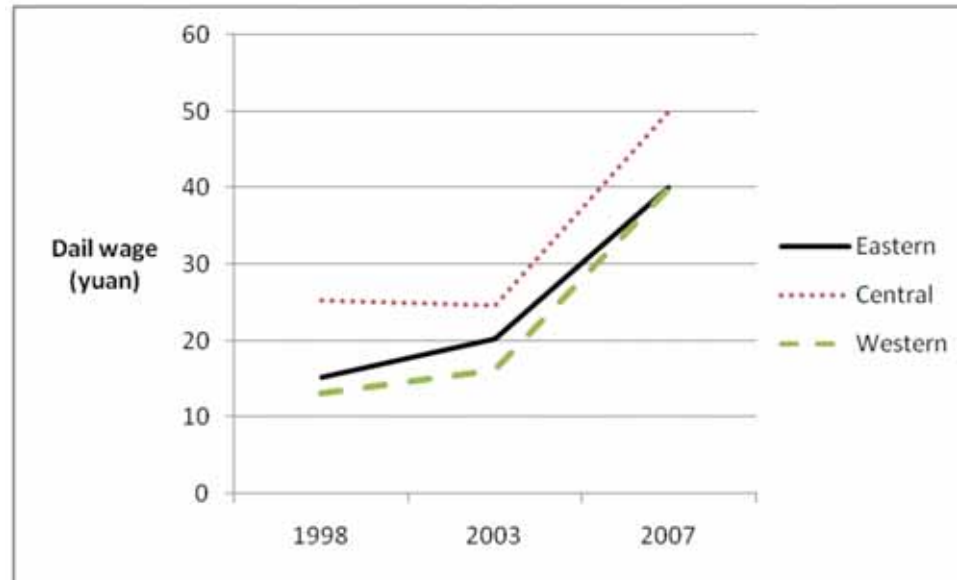
North	0.54	South	0.62
Northeast	0.36	Southwest	0.44
East	0.72	Plateau	0.40
Central	0.49	Northwest	0.38

(national average: 0.54)

(study done by CCAP and SOW-VU)

CATSEI studies WP3 (Social): rural wages

- Analysis of rural wage trends based on village surveys
- Findings:
 - Clearly rising trend, even in slack seasons



- Is era of surplus labor on which China based its domestic growth over? By 2040 shrinking population? Has time come for outsourcing?



Background study WP3 (Social): household saving rates

- Panel regressions across Chinese provinces during the period 1980 – 2007
- Background is enormous surplus of under-25 males: 30 million in 2005
- Findings:
 - Households with son save more than households with daughter
 - Identical households with a son save more in regions where the male-female ratio is higher
 - Competitive saving by families of males may explain half of the huge increase in the household saving rate of 15 percent-points since 1990

(study done by IFPRI)



CATSEI studies WP4 (Environment): nutrient balances on the field

- **Assessment by combining several data sources**
- **Findings for 2005:**
 - **N surplus of 170 kg/ha cropland, on average**
 - **P205 surplus of 55 kg/ha cropland, on average**
 - **K20 deficit of 25 kg/ha cropland, on average**

points taken up below in discussion of Chinagro runs

(study done by IIASA and SOW-VU)



CATSEI studies WP4 (Environment): nitrogen management

- **Model simulation of nitrogen losses due to crop and livestock farming**
- **Findings:**
 - **Nitrogen losses due to leaching and emissions constitute serious health threats in many counties of China, especially from leaching**
 - **Policy improvements should combine improvement of fertilizer application, technical measures to reduce losses and spatial reallocation of production**
 - **Particularly in view of future P-scarcity worldwide, saving on P use is critical**

(study done by IIASA)

II. Simulations with updated Chinagro model:



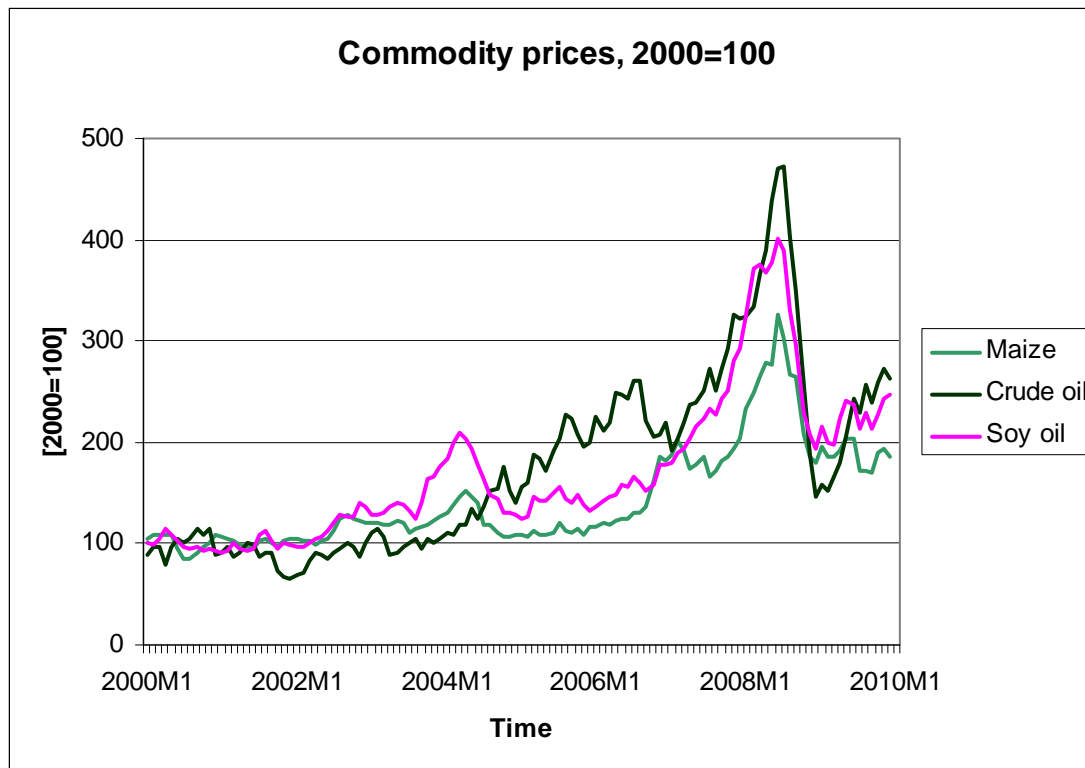
Chinagro model: main characteristics

- General equilibrium model representing consumer and producer behavior, government policies and markets
 - Focus on agriculture (non-agriculture largely given via scenarios)
 - Spatial detail: agricultural supply by county (2433), because of:
 - Large distances in China
 - Wide income spread especially from East to West
 - High spatial concentration of environmental discharges
 - Commodity detail:
 - 17 tradable commodities (explicit trade flows across regions and from/to abroad)
 - Commodity balances kept in quantity terms (as opposed to monetary units of base year), so as to trace better the underlying land needs and flows of raw materials, nutrients etc.
 - 8 farm types/production activities competing for land and stable capacity in every county
 - Treatment of demand more aggregated
 - 8 regions with 3 rural and 3 urban classes
- Chinagro is most detailed model of Chinese agriculture available
- CATSEI update: from 1997,2003 base to 2005,2010 base

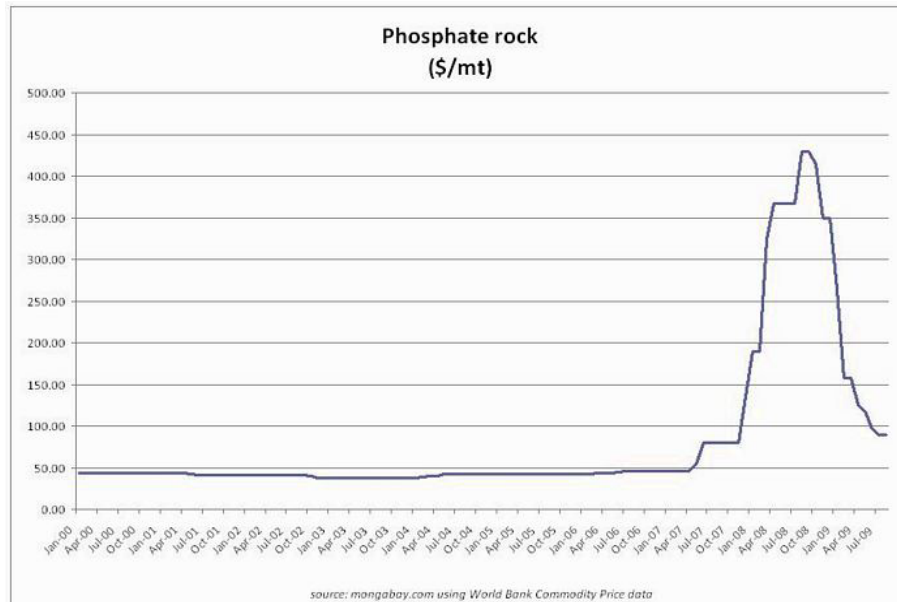
Not only China in transition

After 2008 crisis: picking up in 2010

2010-2030 scarcity dominates on world markets



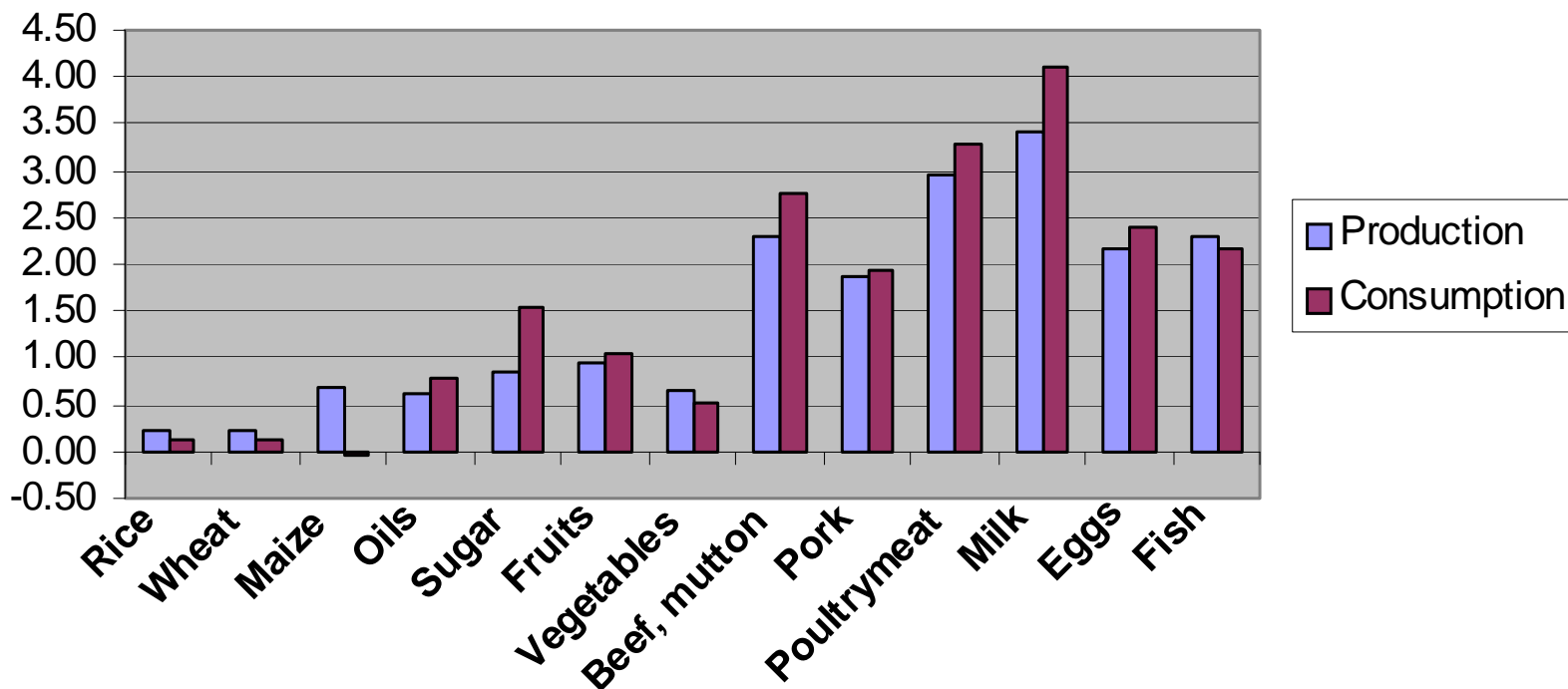
An illustration of China's influence: P-price spike in October 2008 following China's export ban on P-rock



- A main question is, therefore, can China's ambitions be met? And what are the pressures this imposes on others?
- Particularly, meat-feed demand, and biofuel

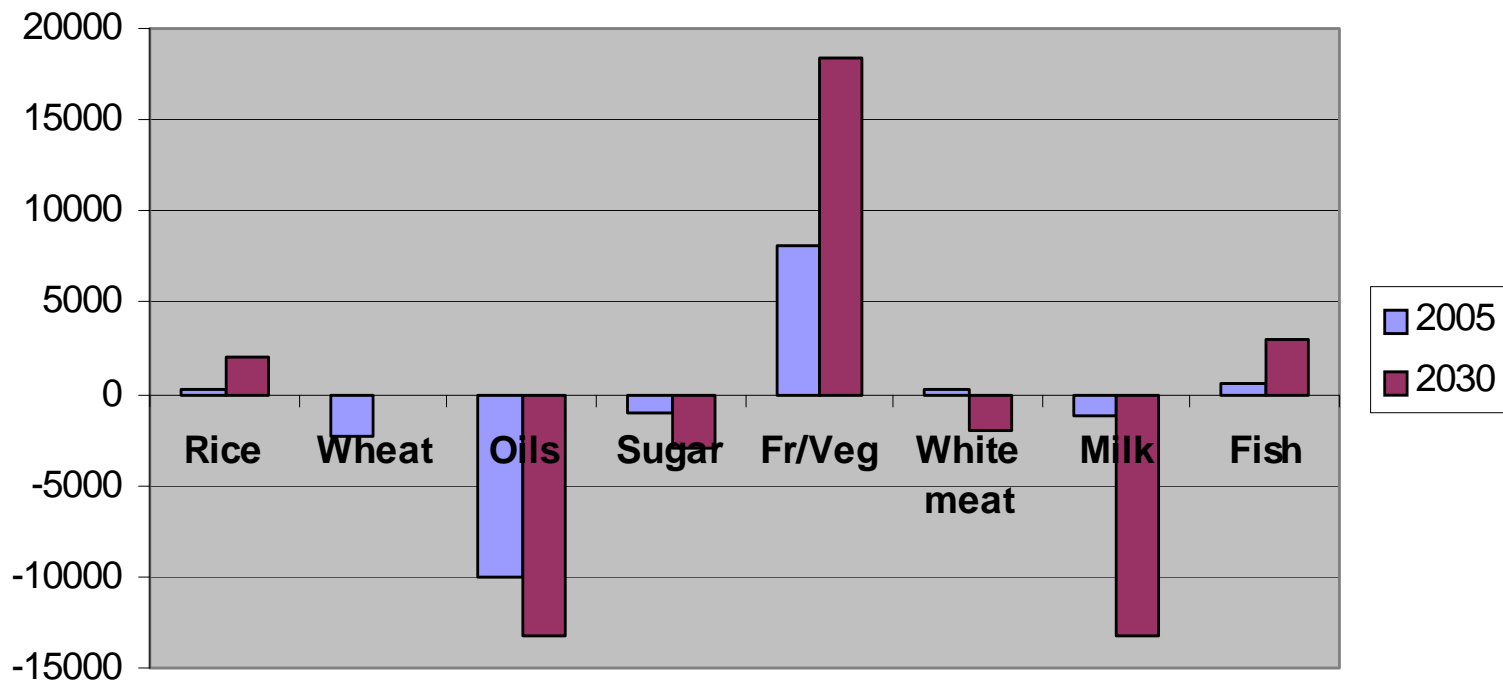
Outcomes Chinagro Baserun (1)

**Annual growth rates of production and consumption
in baserun, in %, 2005-2030**

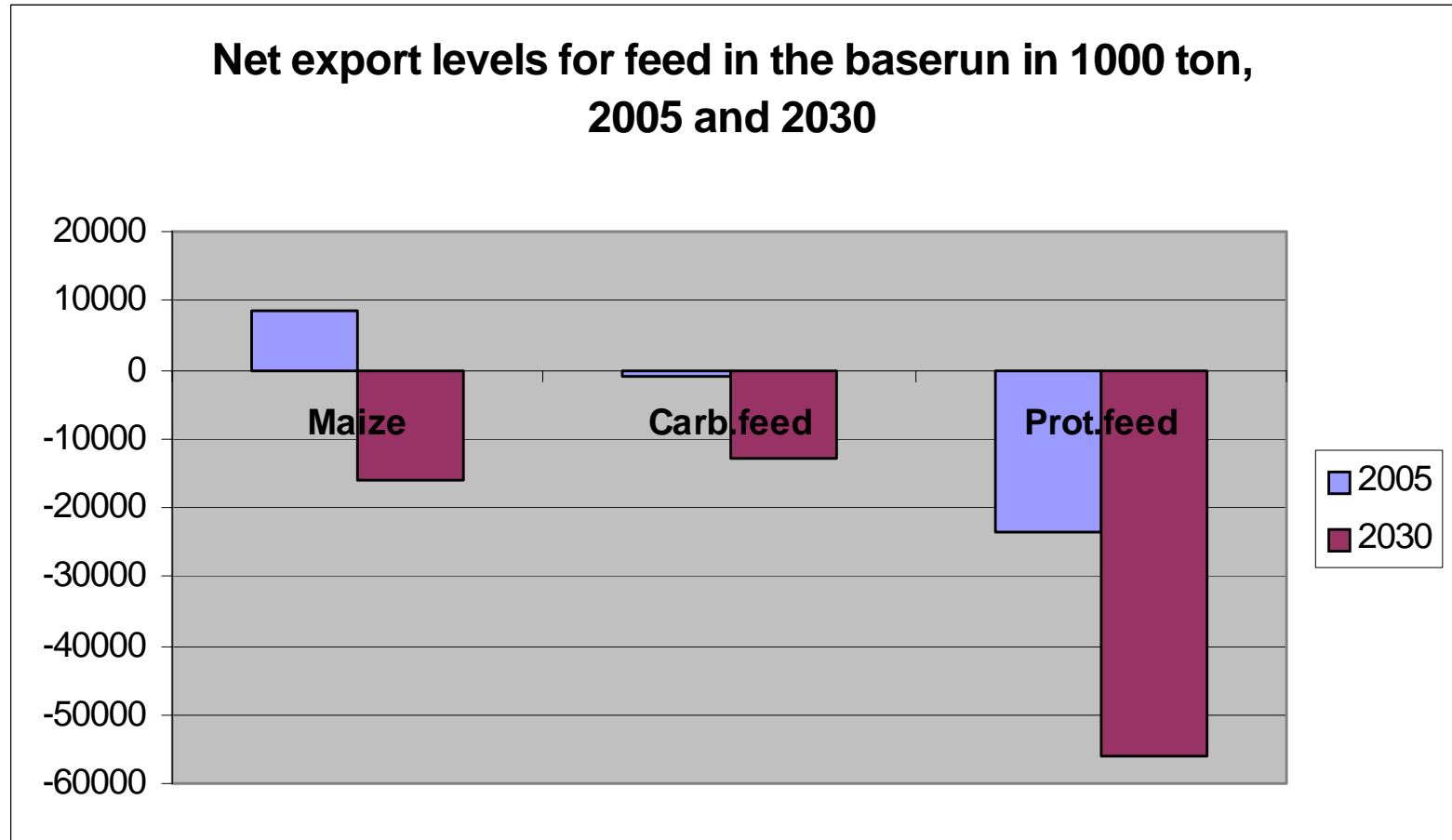


Outcomes Chinagro Baserun (2a)

**Net export levels for food in the baserun, in 1000 ton,
2005 and 2030**

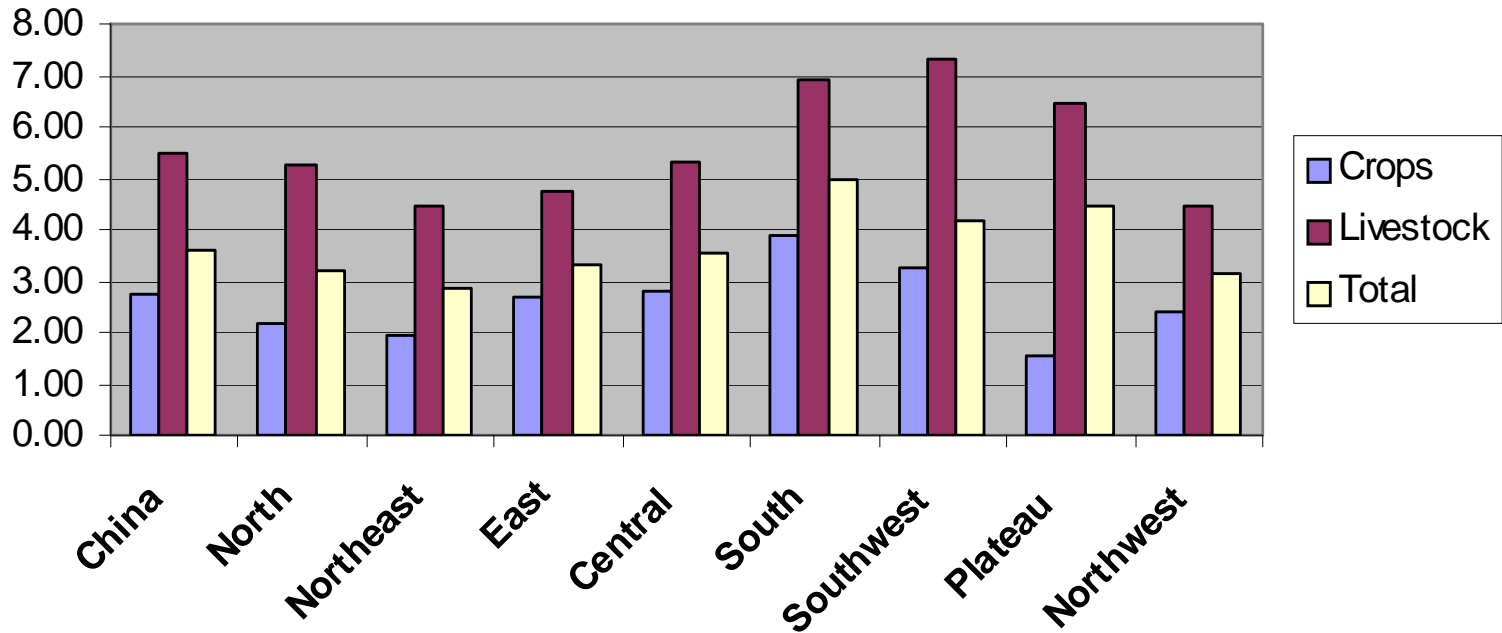


Outcomes Chinagro Baserun (2b)



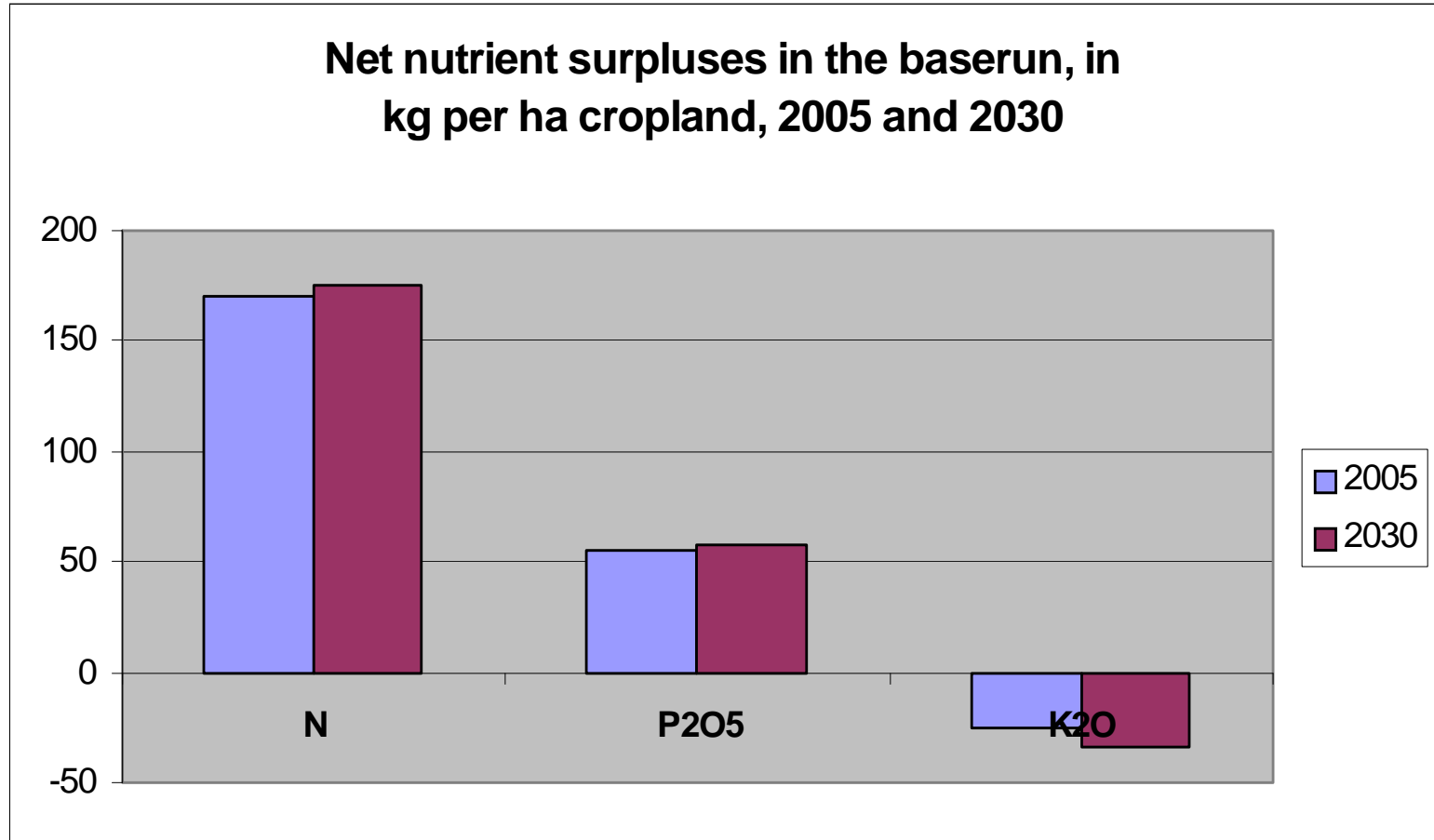
Outcomes Chinagro Baserun (3)

Annual growth rates of farm value added in baserun,
by region, in %, 2005-2030

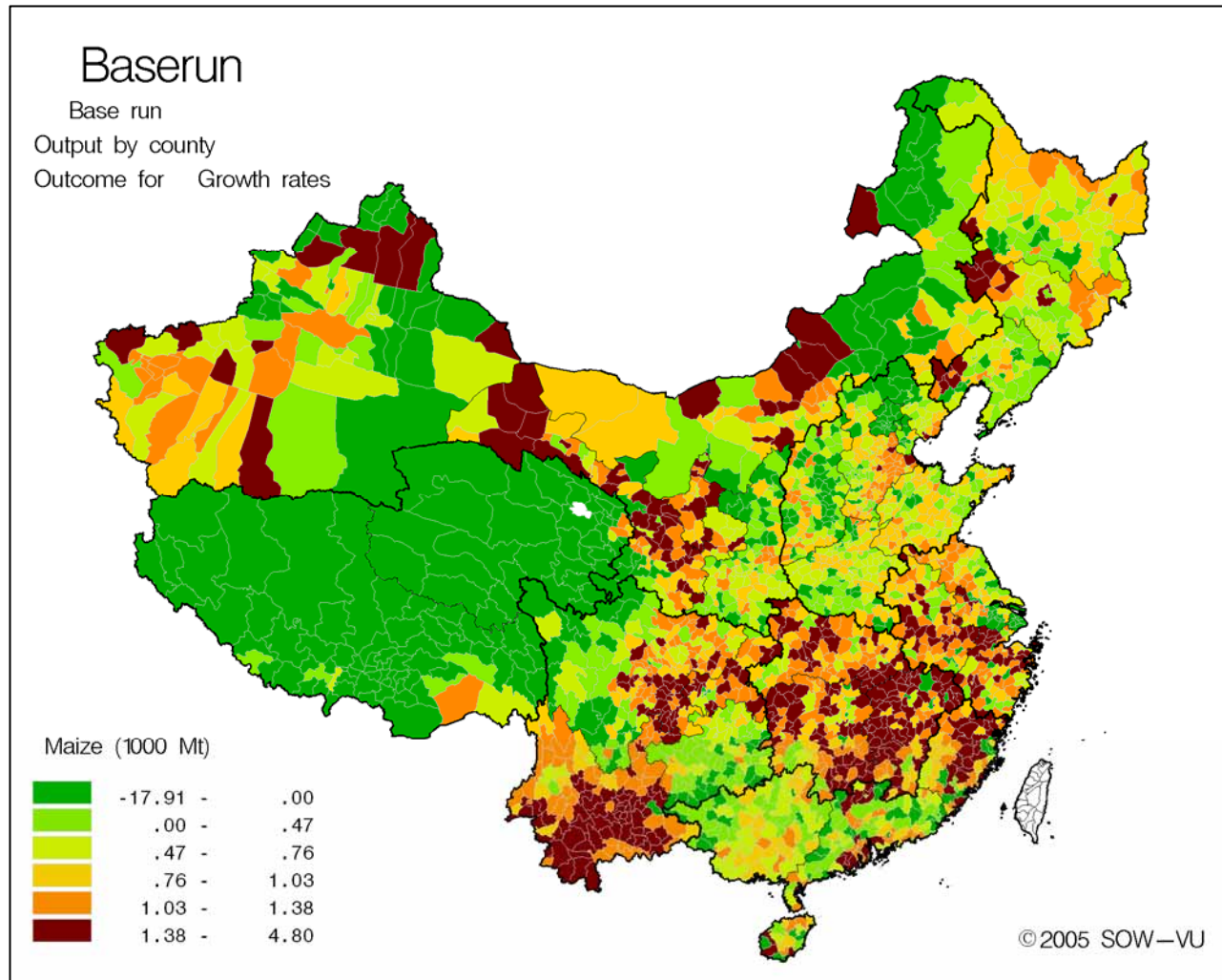


Outcomes Chinagro Baserun (4)

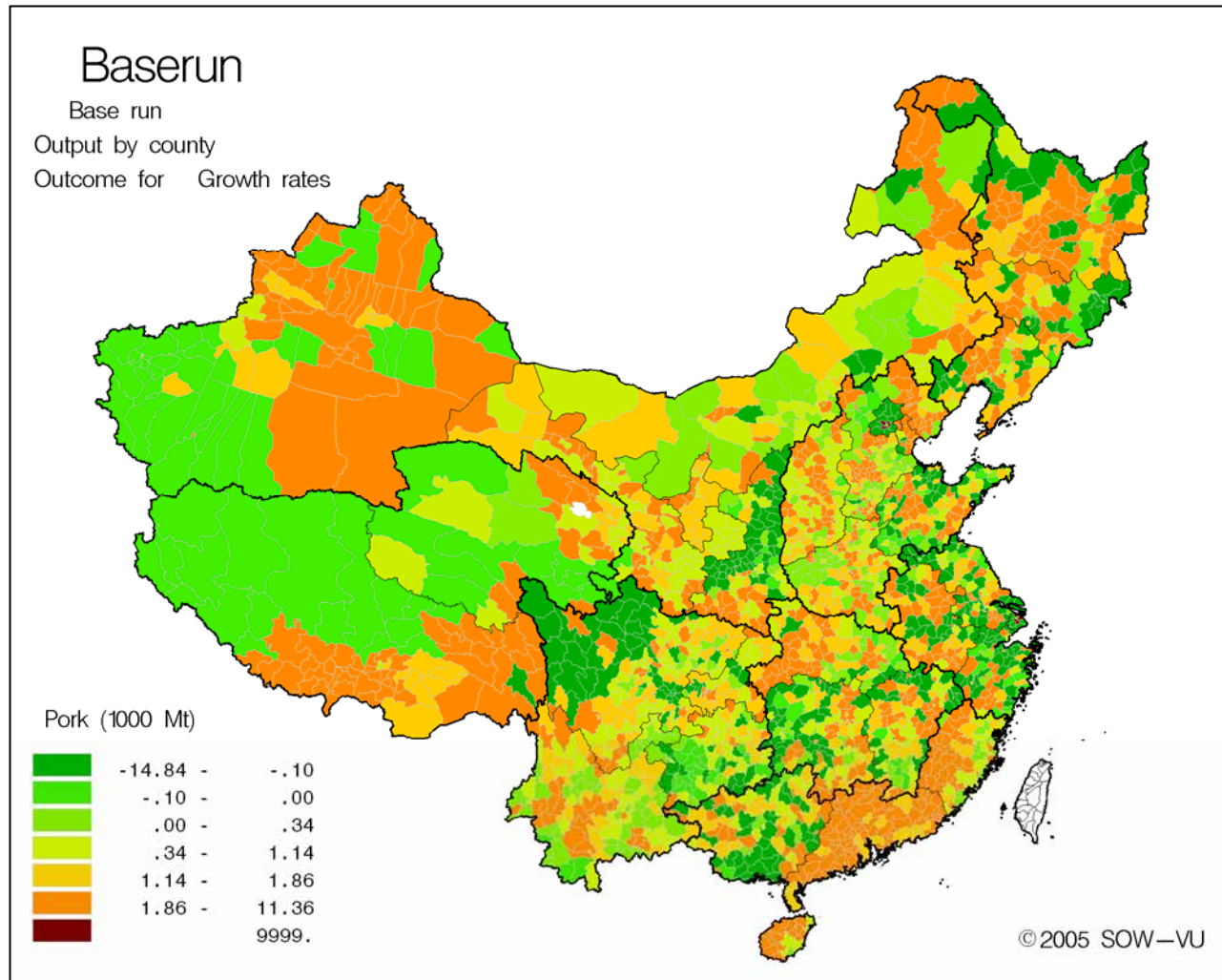
surplus = inflow-outflow



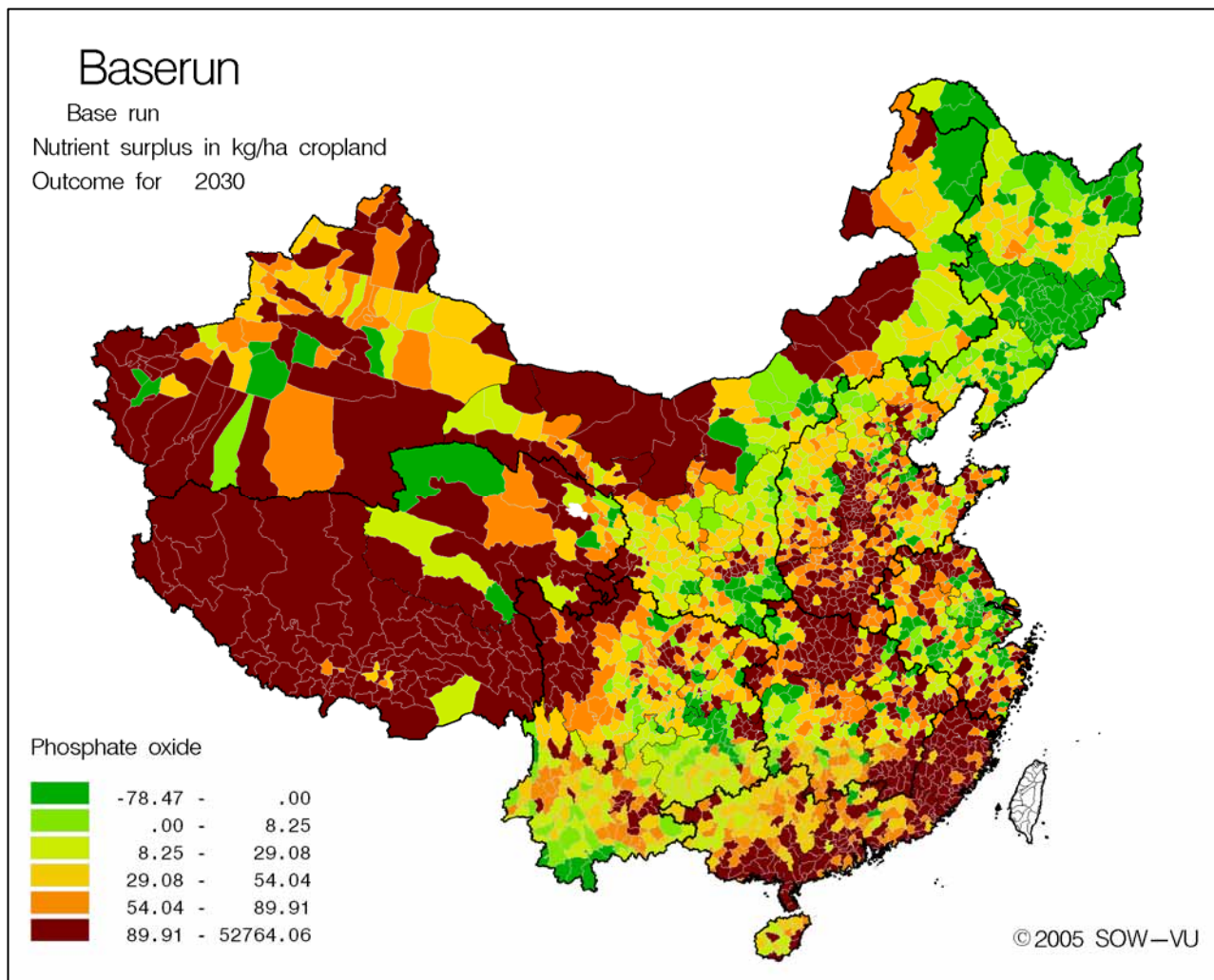
Chinagro Baserun: maize growth by county, 2005 – 2030, in %



Chinagro Baserun: pork, growth by county, 2005 – 2030, in %

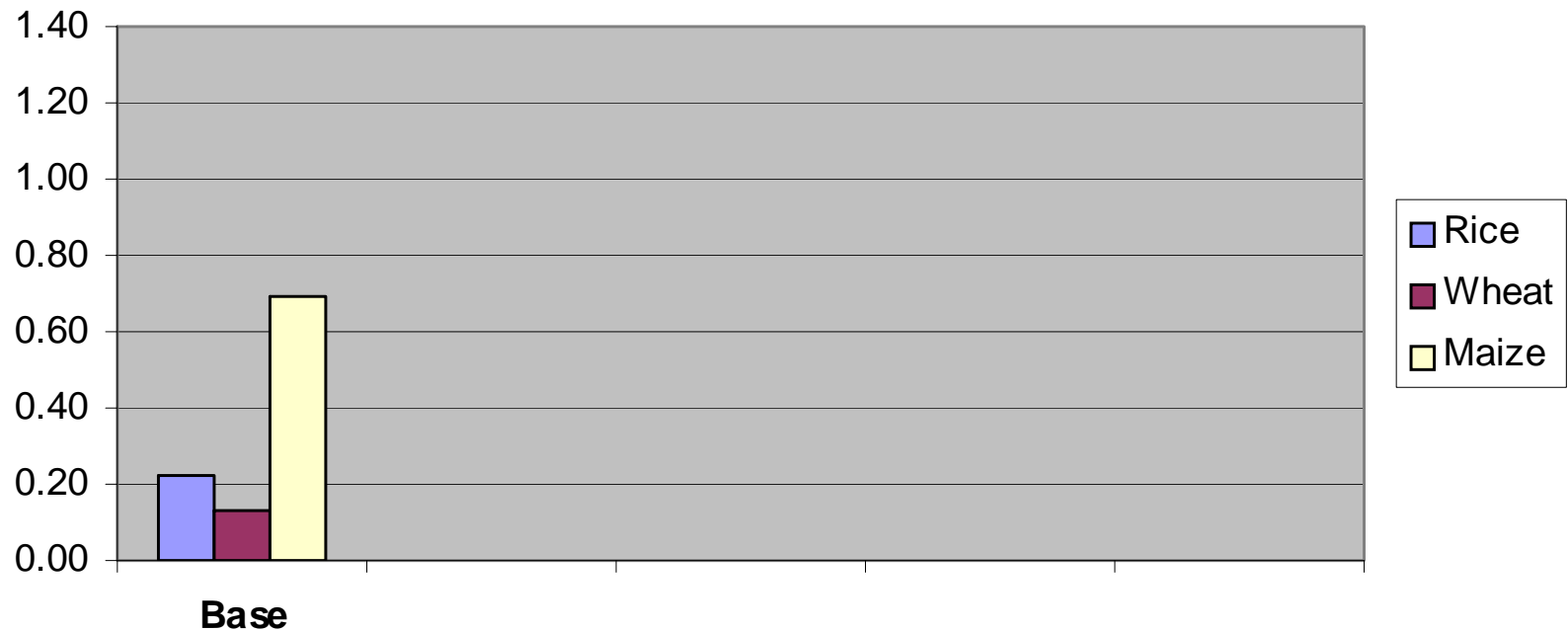


Chinagro Baserun: farm surplus of P-oxide by county, 2030, in kg/ha



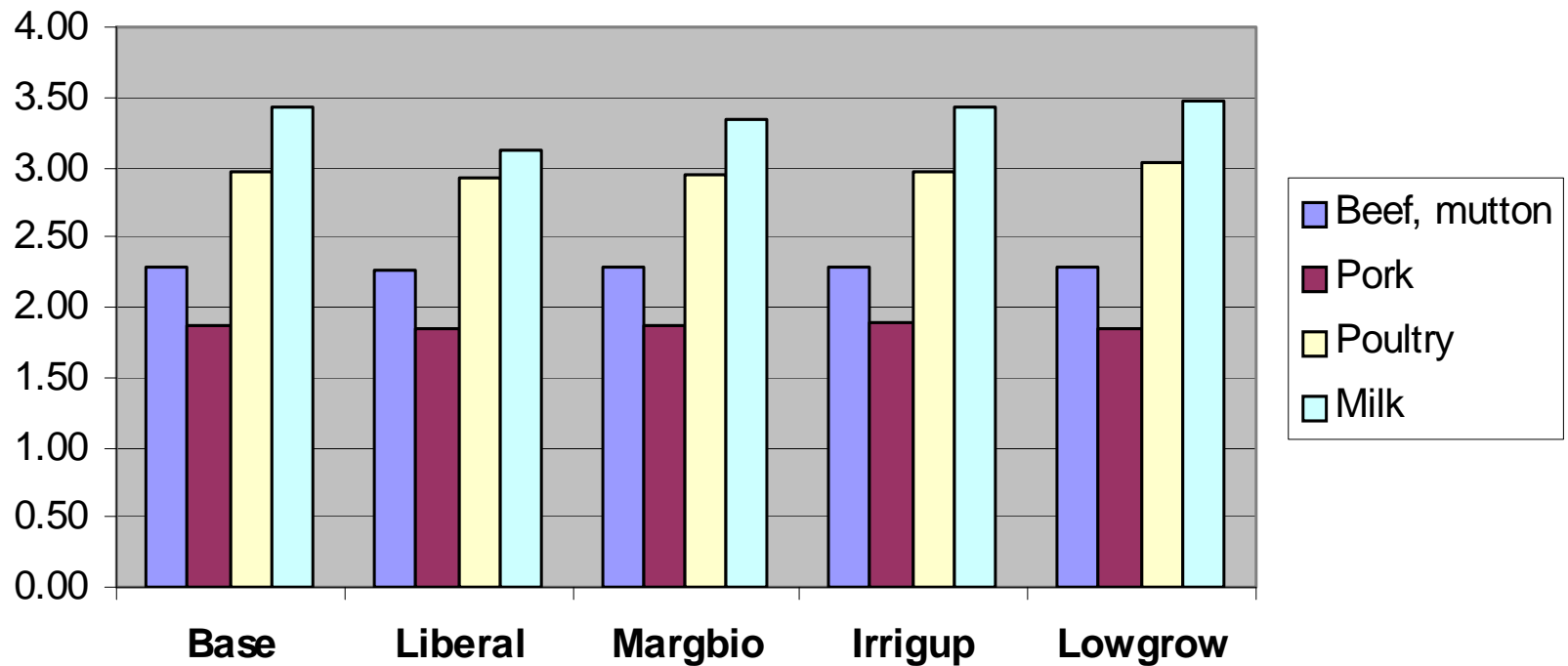
Outcomes Chinagro policy variants (1a)

Annual grain output growth rates in different scenarios,
in %, 2005-2030

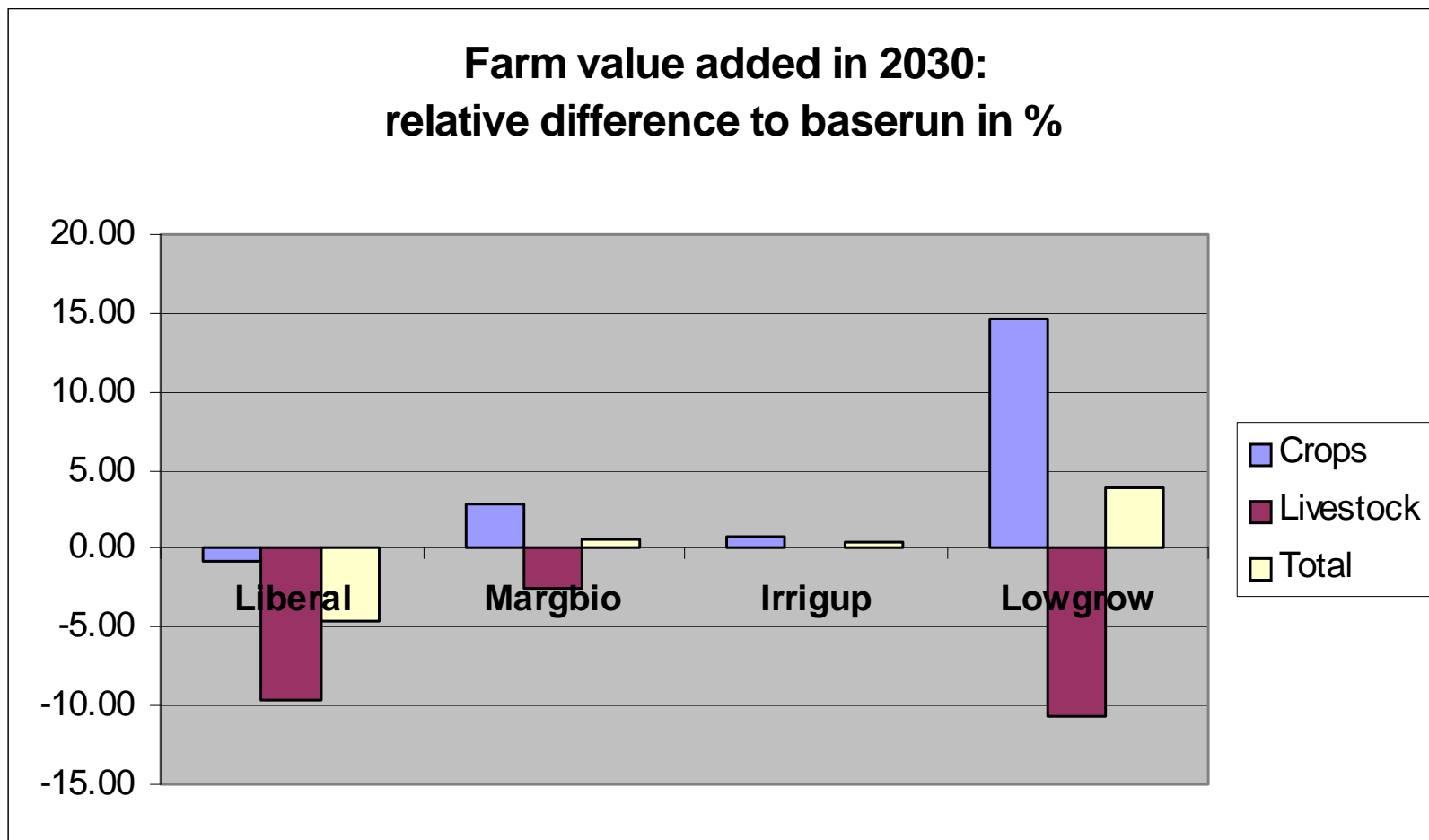


Outcomes Chinagro policy variants (1b)

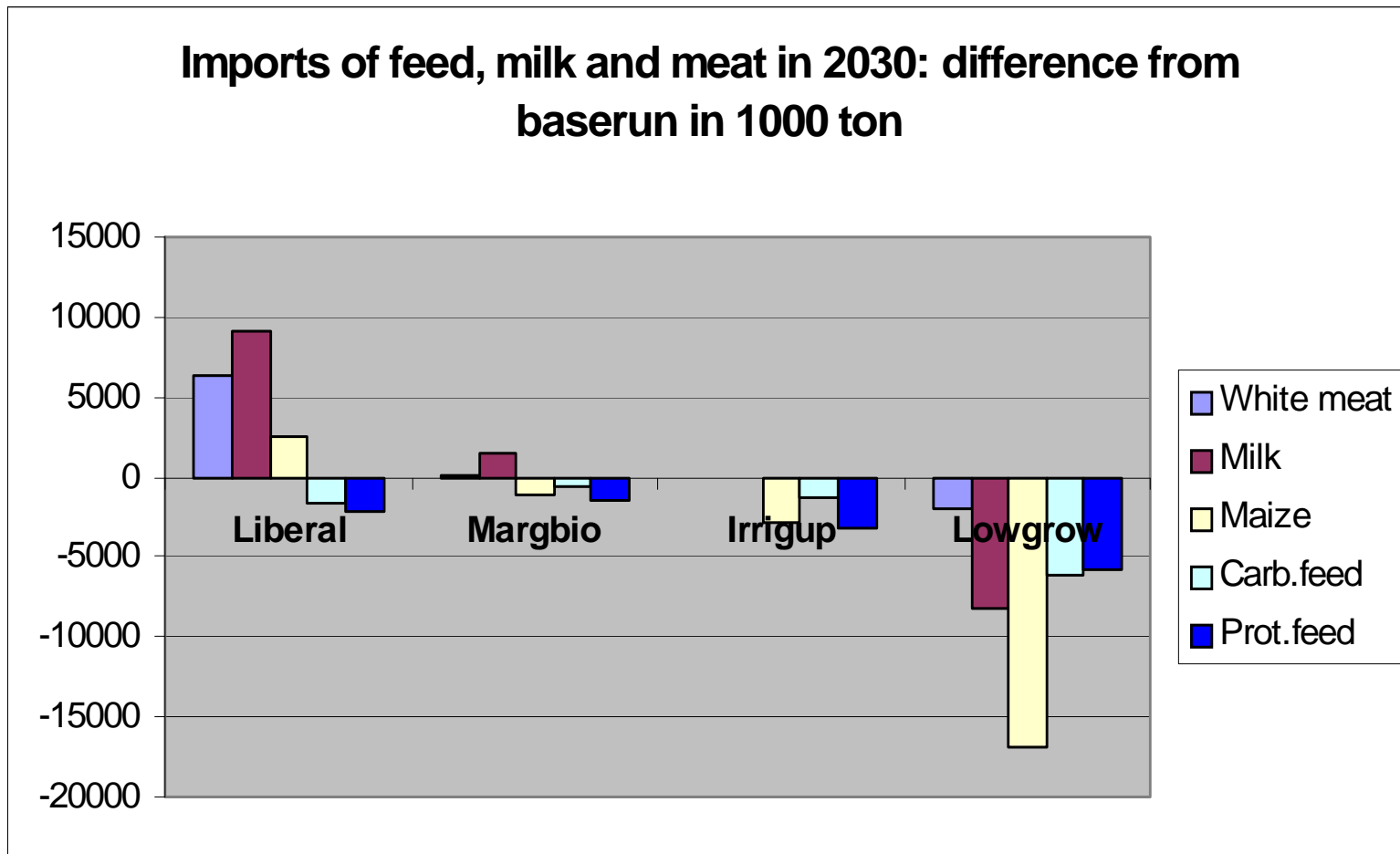
Annual growth rates of meat and milk production in different scenarios, in %, 2005 - 2030



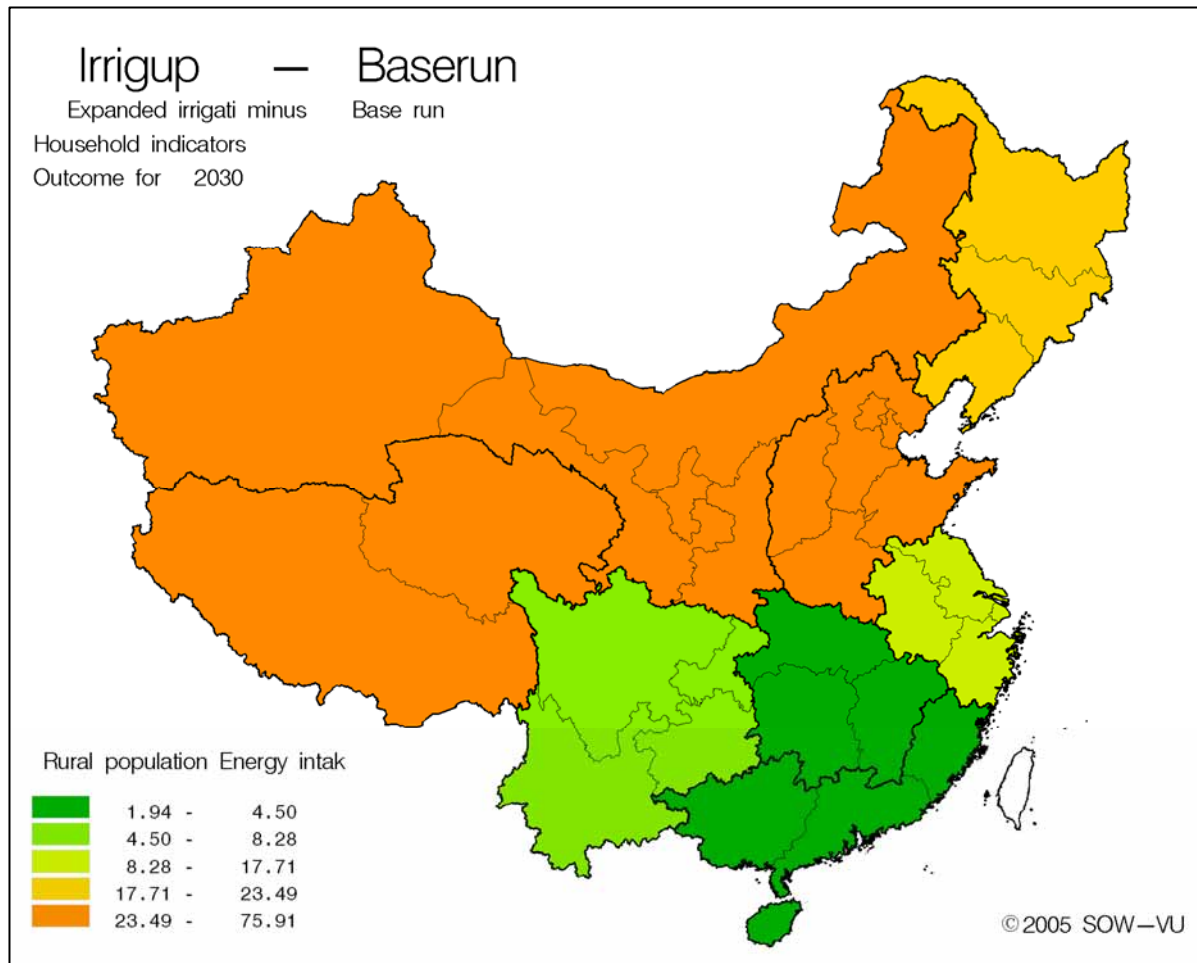
Outcomes Chinagro policy variants (2)



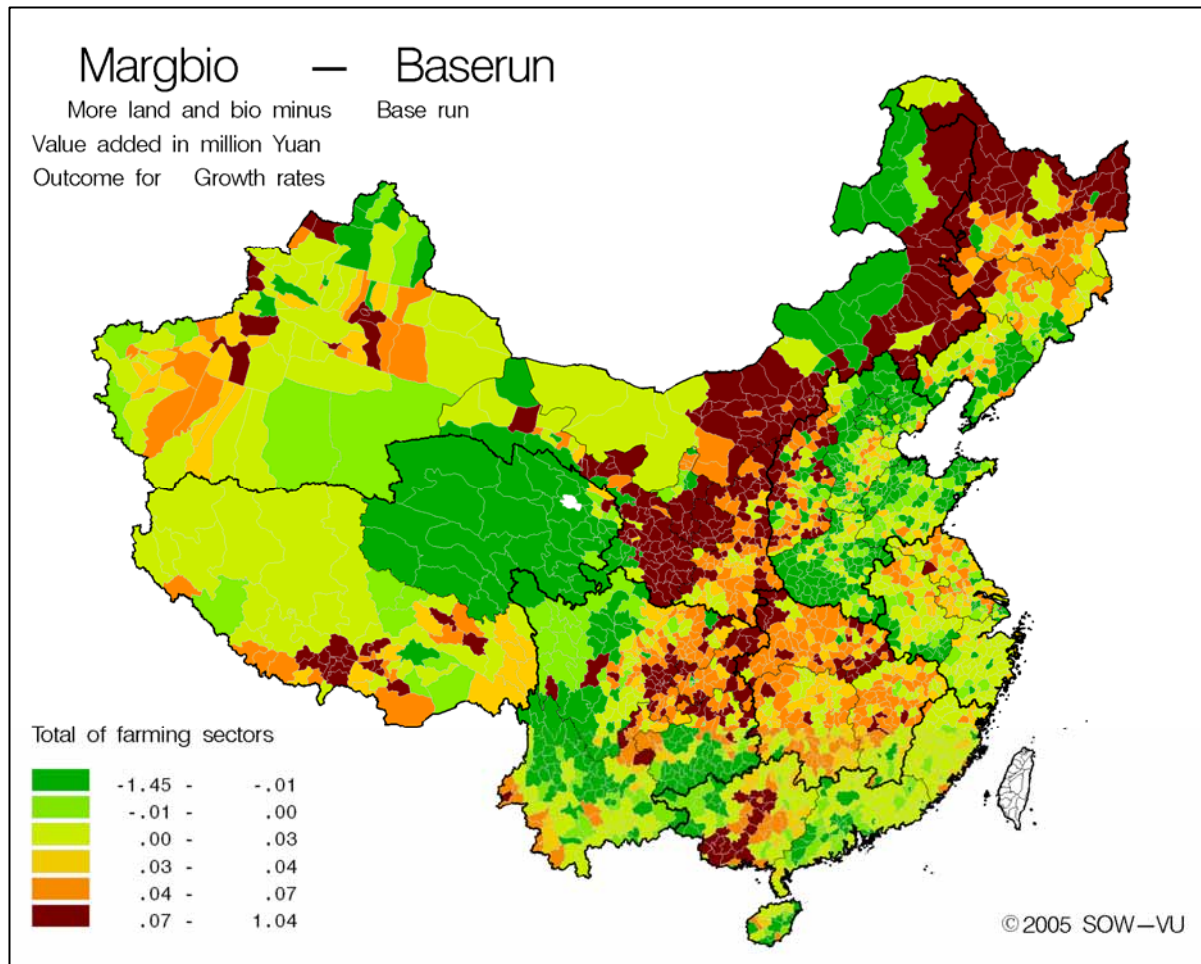
Outcomes Chinagro policy variants (3)



Chinagro Enhanced Irrigation Run: rural consumption difference from baserun, 2030, in kcal/cap/day



Chinagro Biofuel Run with marginal land: farm value added growth difference from baserun, in percent-point





CATSEI findings: summary

China's agricultural transition:

2010-2030: era of raw material scarcity worldwide, in minerals (e.g. P), and in agriculture, particularly if OECD persists on biofuels

In China, low growth would cause severe income problems in rural areas, primarily via reduced rural-to-urban migration, and lower meat demand

Trade:

China will need significant feed imports from the world market, but its claims are not unmanageable particularly because it keeps its biofuel ambitions moderate

It can for 60% balance its agricultural trade account with exports of fruits and vegetables

Easing SPS-requirements in China-EU relations will be beneficial for both parties



CATSEI findings: summary (end)

Social:

Delivery of social services is often deficient in rural areas, private initiatives step in

Domestic meat production remains an essential component of rural revenue and employment

Labor becomes critical input in rural areas, but this helps containing income disparity

Environment:

Excess N and P application is a problem

In short, CATSEI will end soon, but the work does not...



CATSEI

