



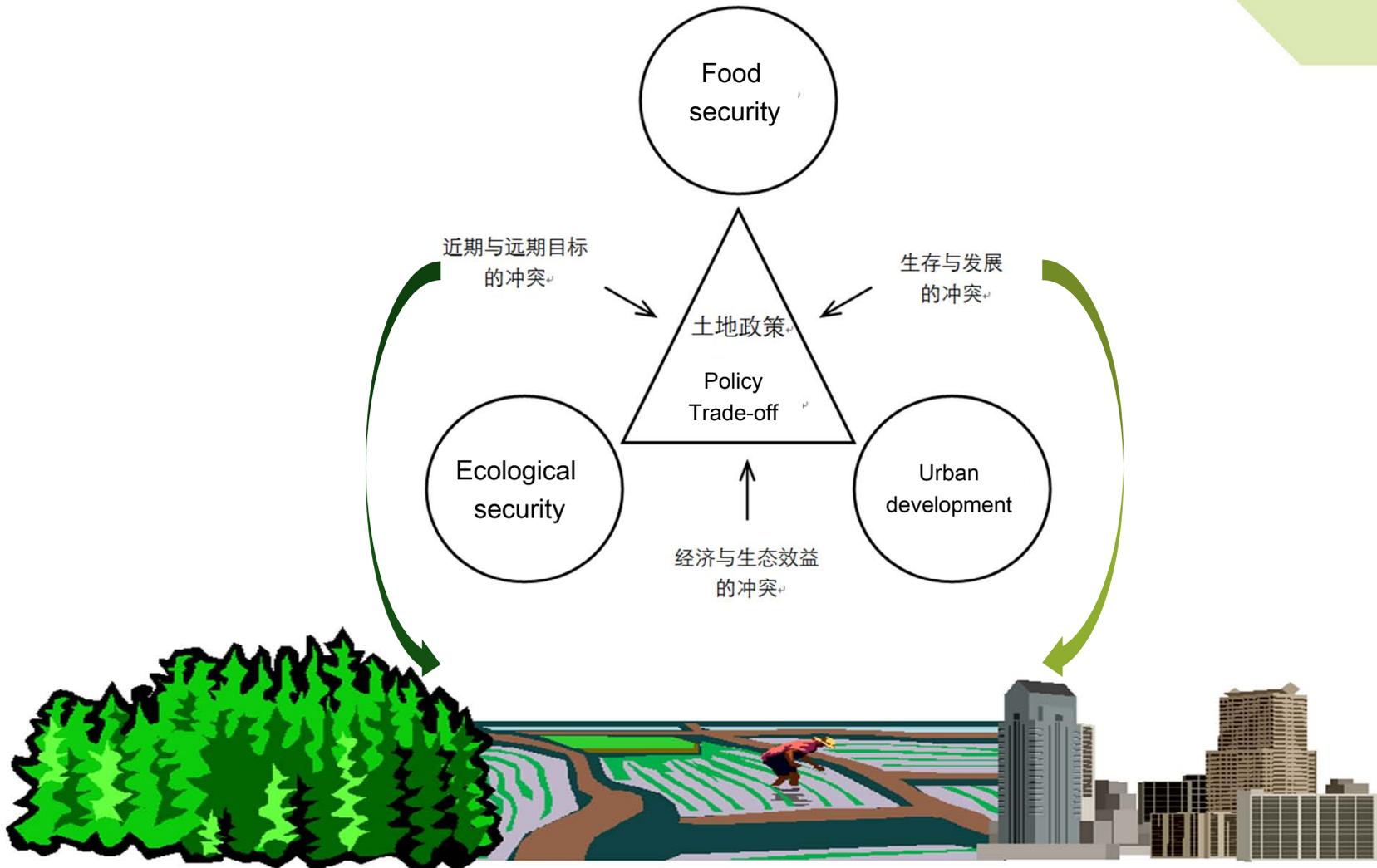
Land use transitions and their implications for ecosystem services

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**International Conference on Science and
Technology for Sustainability 2011: Building up
regional to global sustainability-Asia vision.
14-16 September 2011, Kyoto**

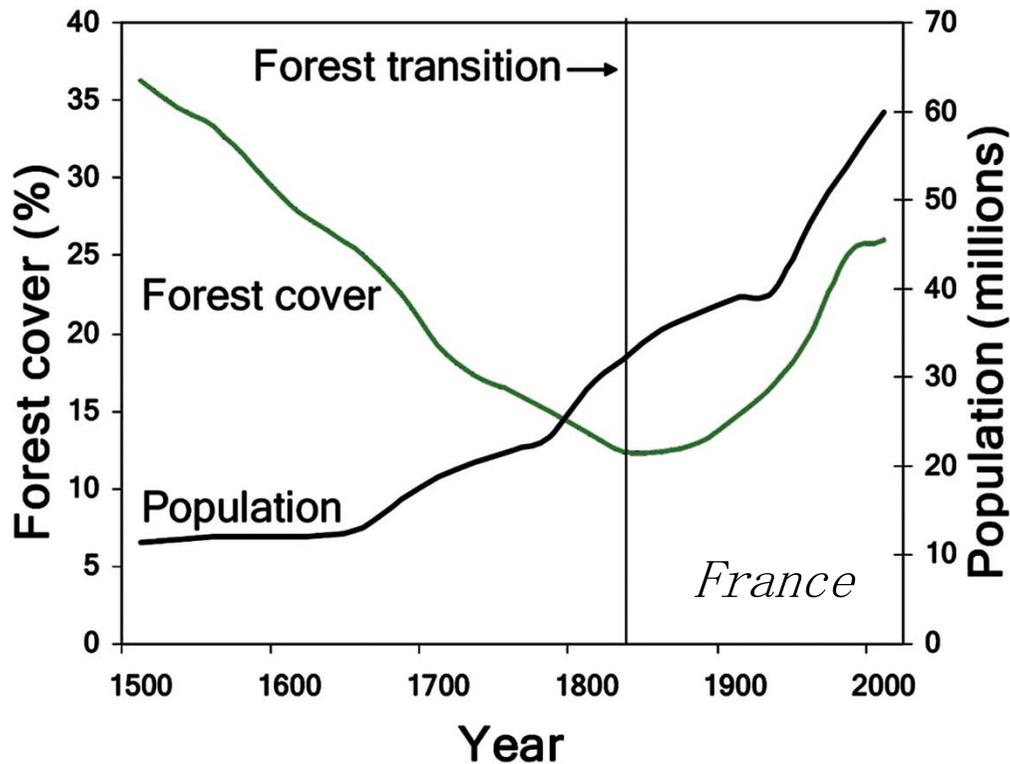
Trilemma in land use policy



$$\text{Land for nature} = \text{Total land area} - (\text{Agricultural area} + \text{Settlements})$$

Land use Transition or Forest Transition (FT) —A. Mather

The passage, in modern times, from net deforestation to net reforestation in a defined area, usually a country.



Forest transition started from 1800, e.g:

Denmark—early 19 century;

France—mid 19 century;

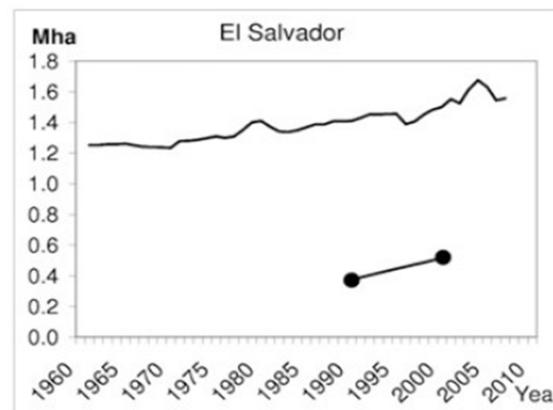
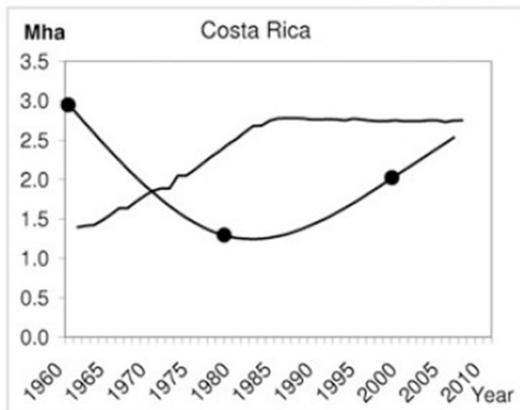
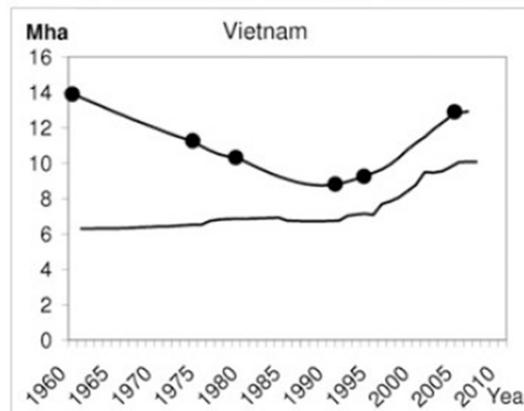
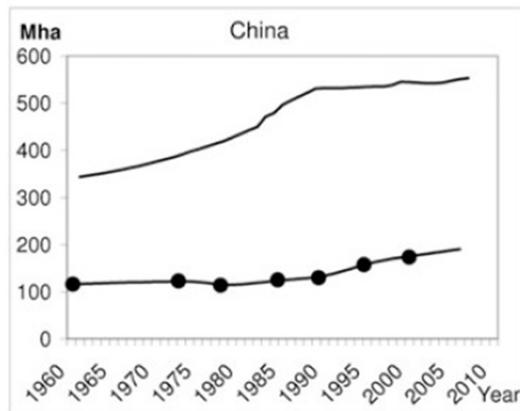
Portugal—1870s;

Northeast US—early 20 century;

Japan—probably 18 century

Forest transition in emerging economies

Some developing countries have recently achieved a land use transition with a simultaneous increase in food production and forest cover.



Others include:

India,

Bhutan,

Chile,

Western Honduras,

Puerto Rico,

Southern and Central

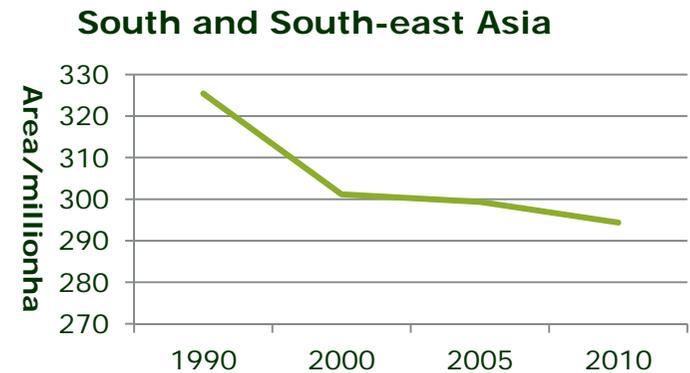
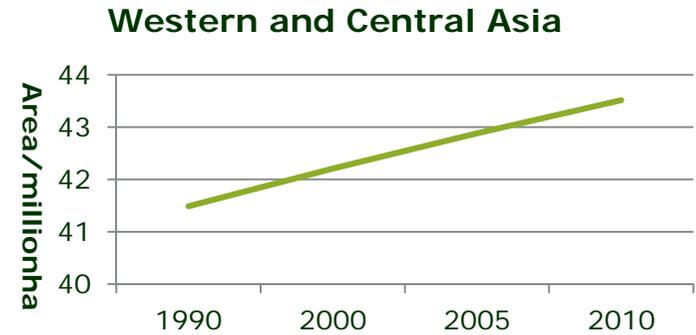
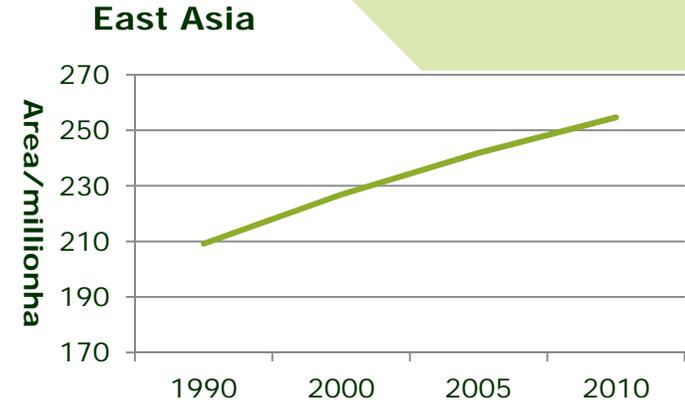
Mexico

Data sources: Lambin and Meyfroidt PNAS / March 1, 2011 / vol. 108 / no. 9 / 3469



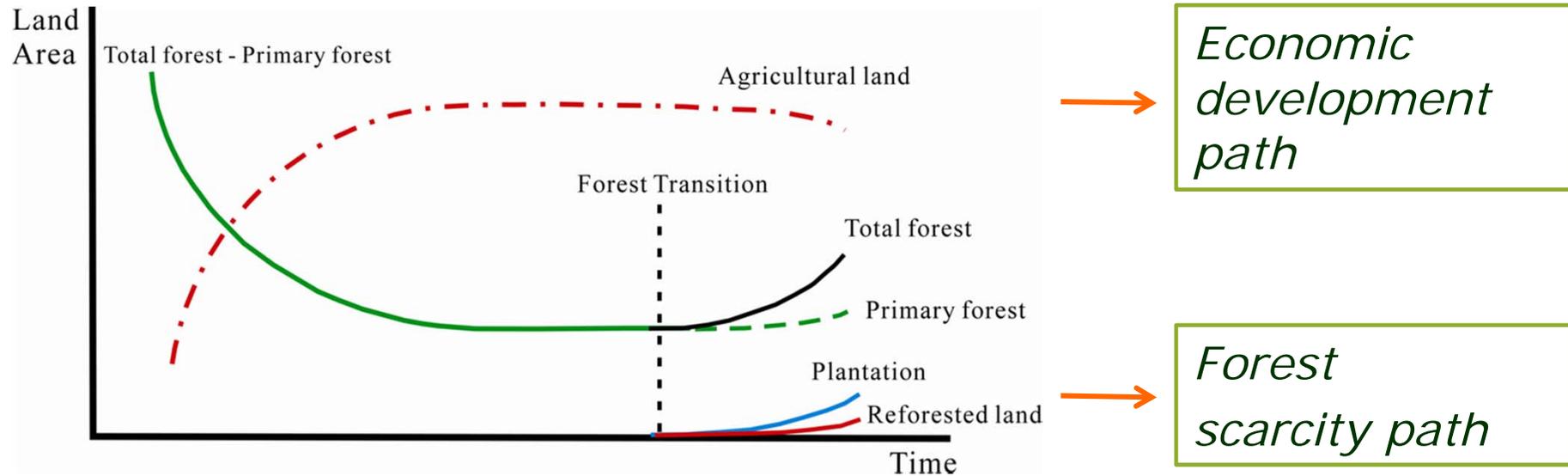
Forest transition in Asia

Asia ushered its forest transition in the turn of the century thanks to the slowdown of deforestation in southeast Asia.



Data sources: FAO/FRA2010

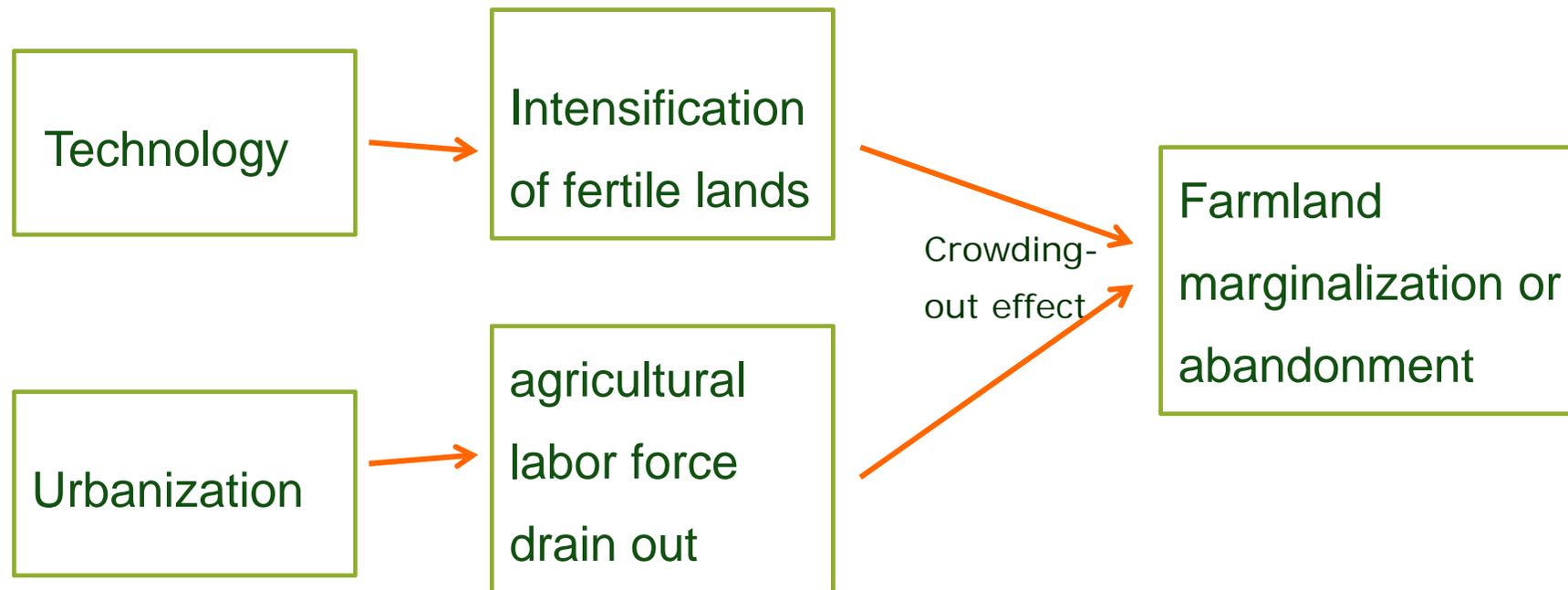
Driving forces: Two paths of FT



Barbier, E. B. et al, *Land Use Policy* 27 (2010) 98-107
Rudel, et al. 2005

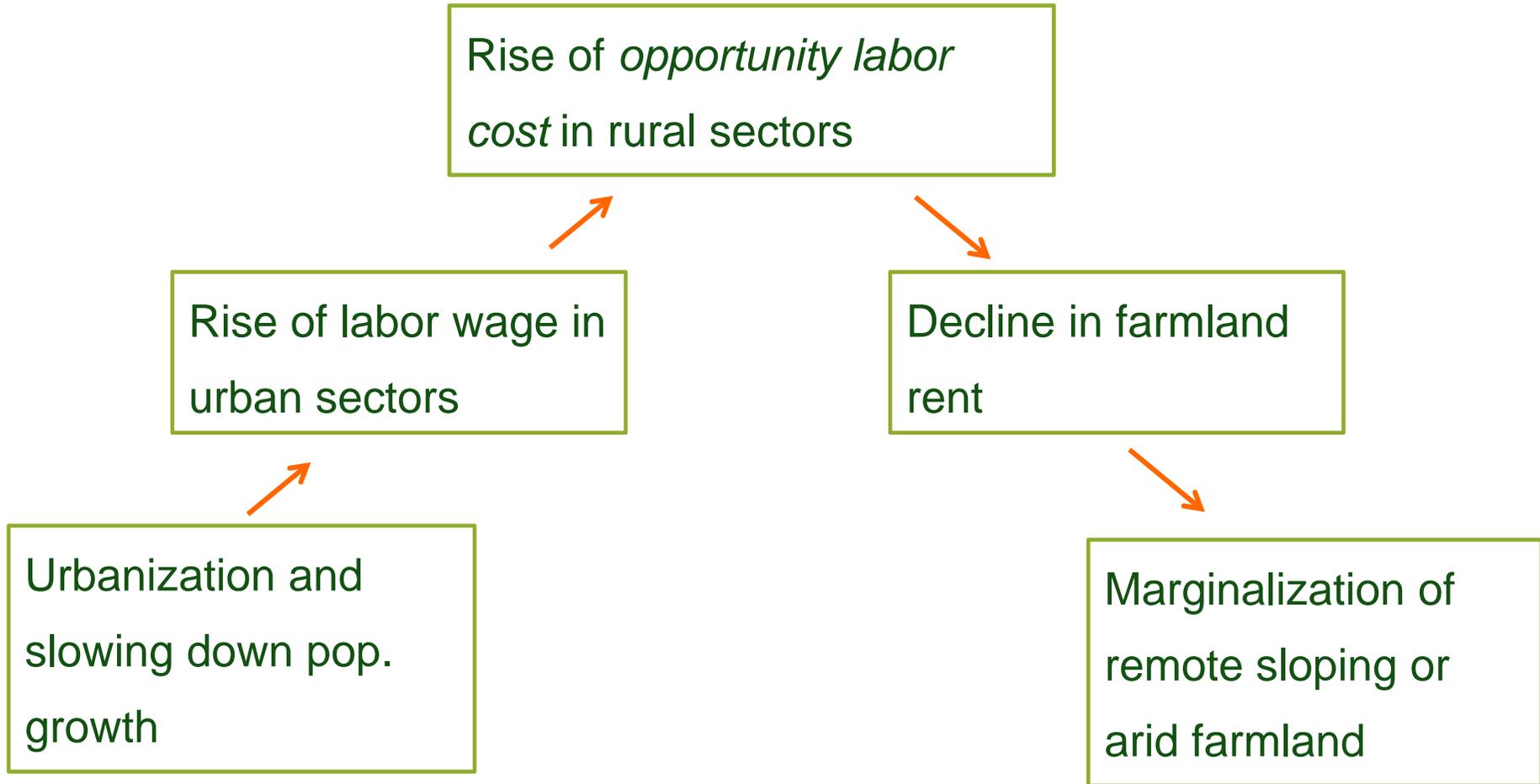
The economic development path: farmland marginalization

Macro-scope

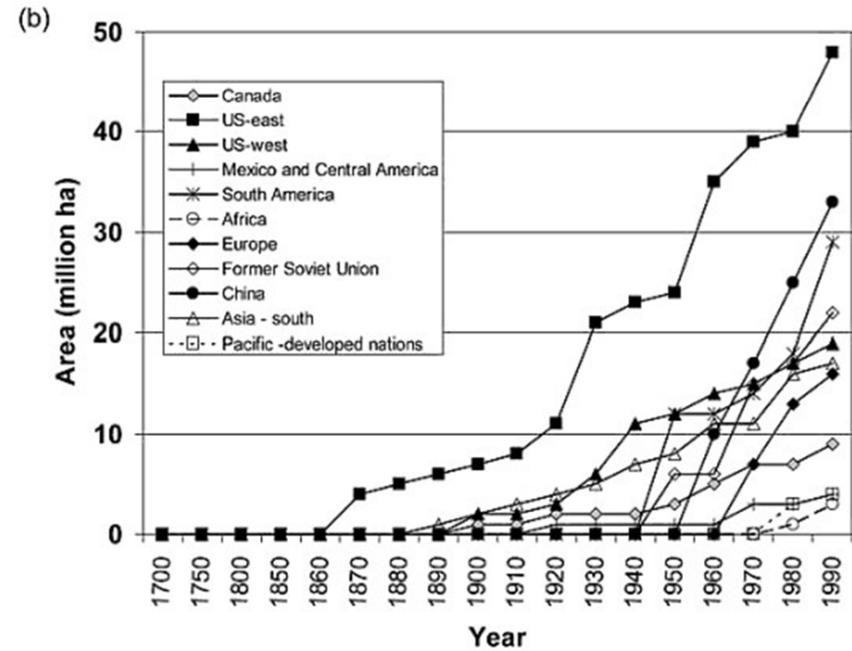
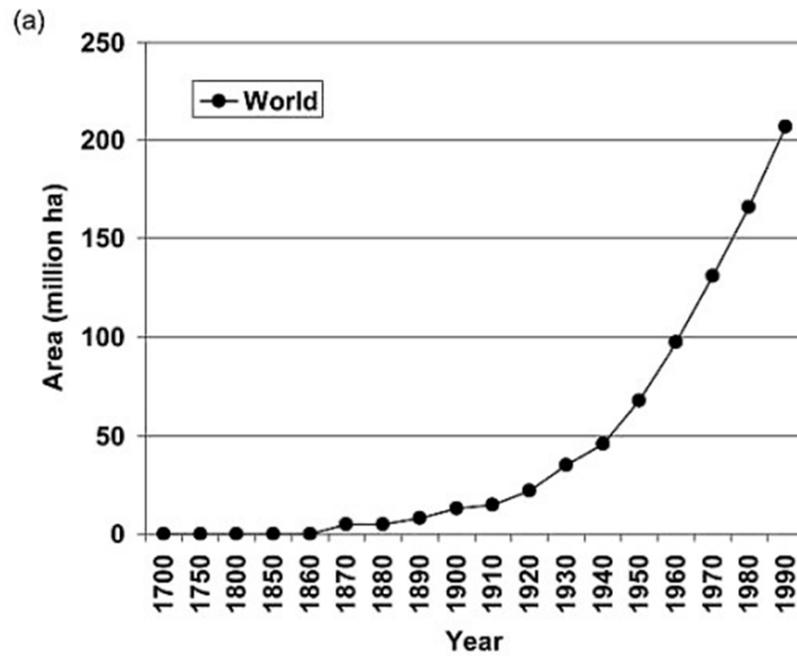


Reasons for farmland marginalization/abandonment:

Micro-scope



Farmland abandonment



Cramer and Hobbs (Ed.), 2007, Old Fields: Dynamics and Restoration of Abandoned Farmland



The rising trend of 'floating' labor 's wage in recent years

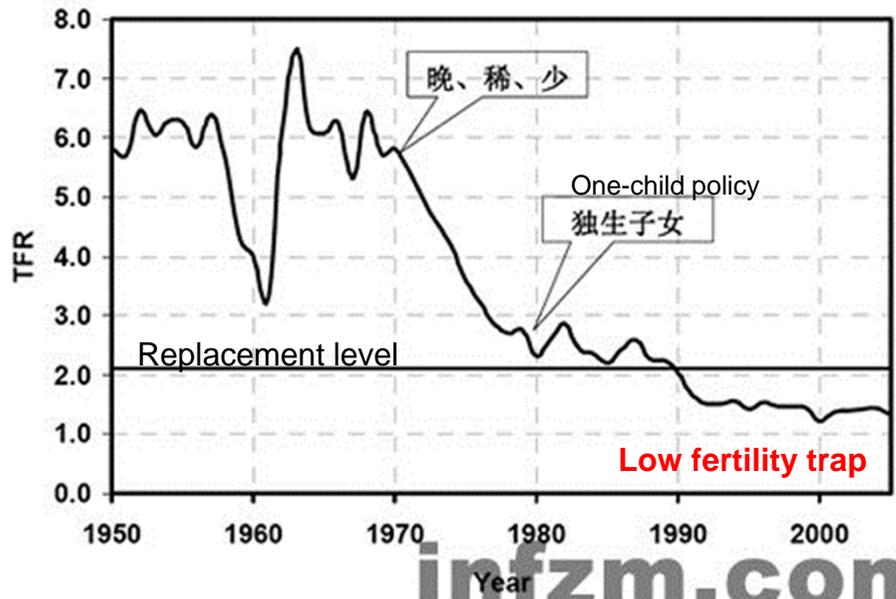


蔡昉：农民工实际工资增长率，2004-2007年一直保持在7%以上，金融危机的2008年达到19.6%（该值在2002年之前几乎没有增长，2002年为2-3%，2003为5-6%），说明刘易斯拐点已经到来。

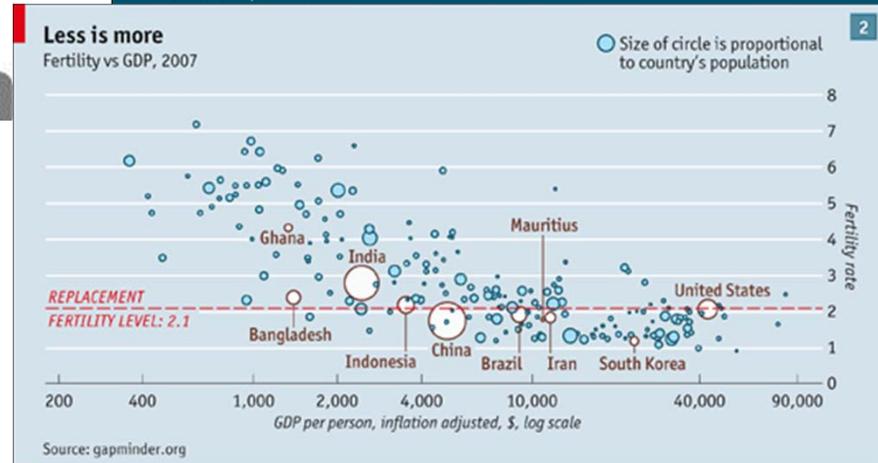
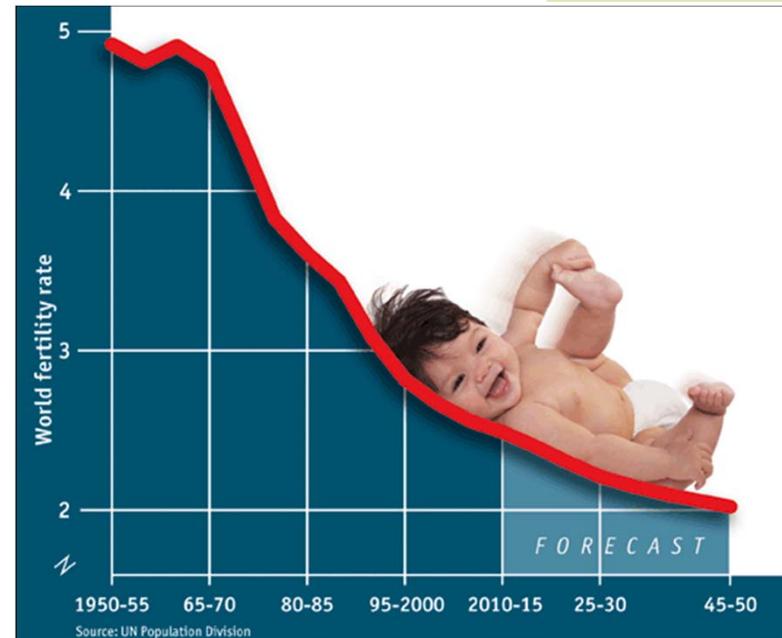


Slowing down population growth

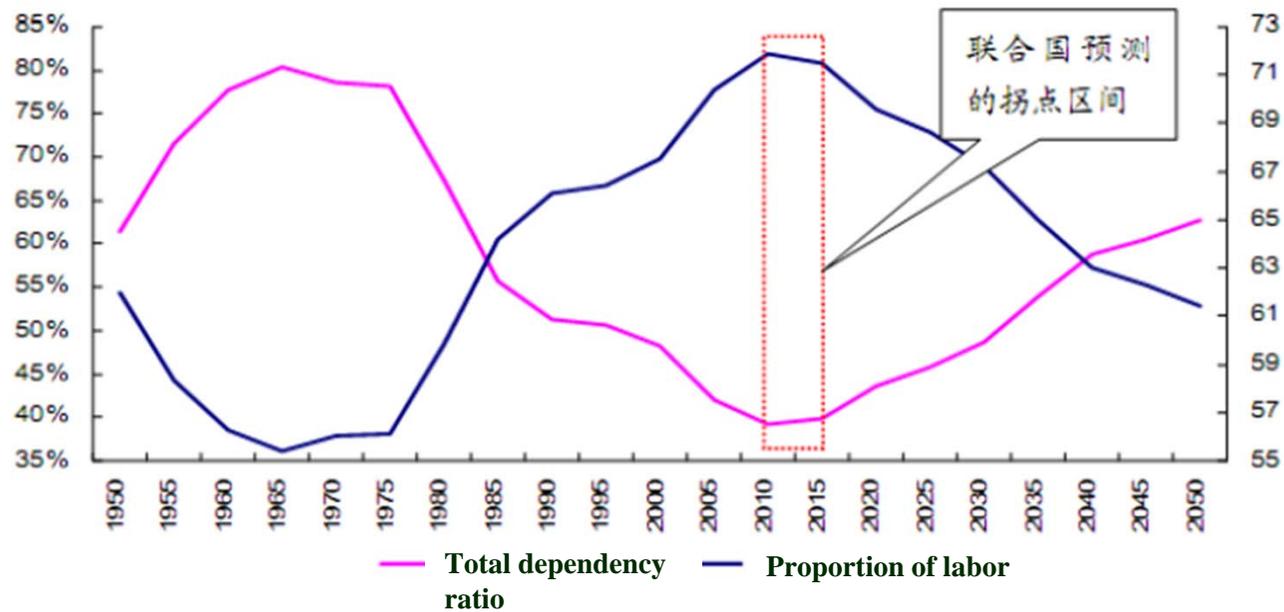
中国生育率的下降过程: 1950-2005



China became a very low fertility society in 1990



Labor force in China will reach its peak soon

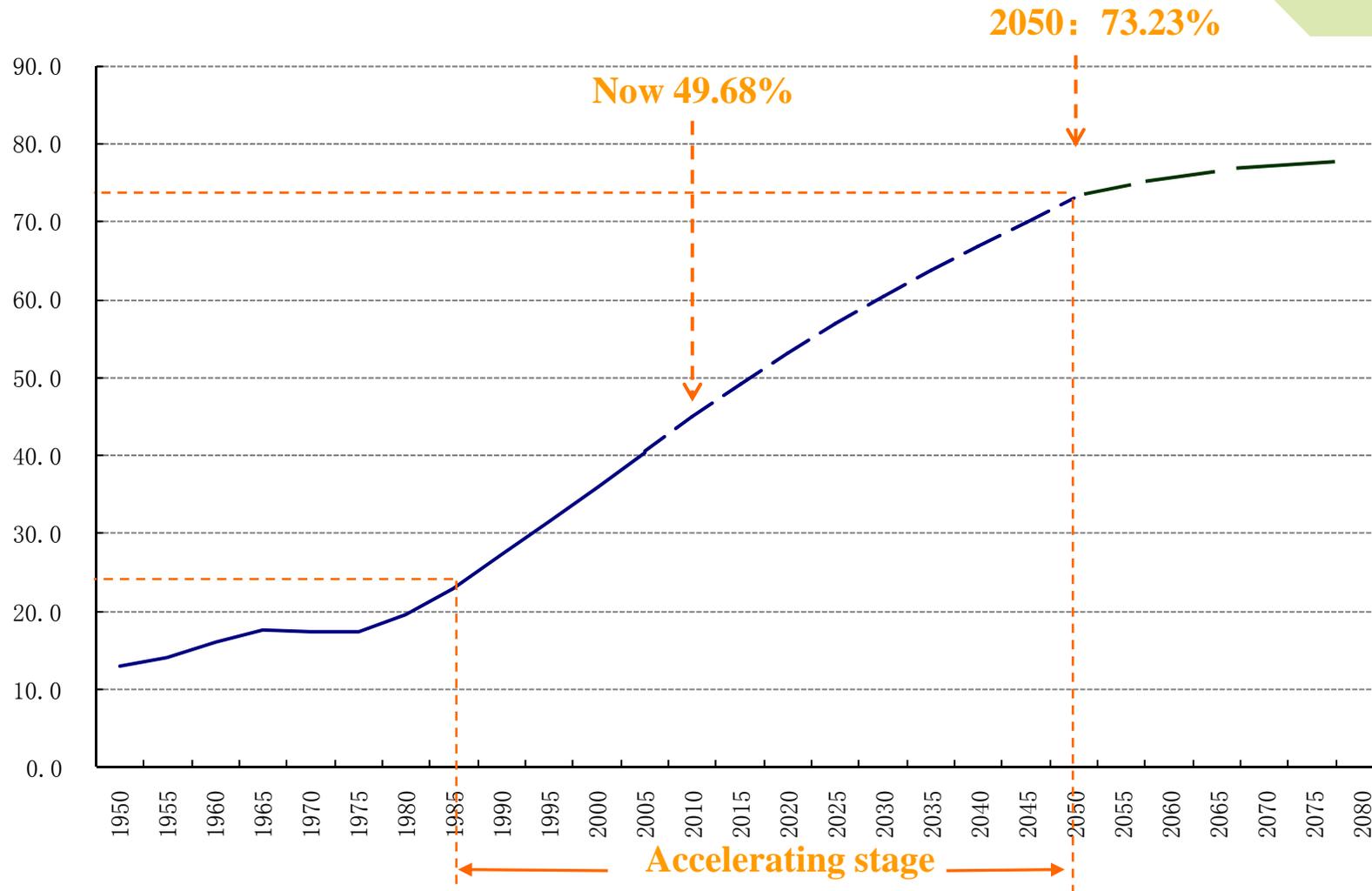


—Renmin University of China, 2010(<http://ier.ruc.edu.cn/xszy.asp>)

中国劳动力人口将在2015年迎来拐点

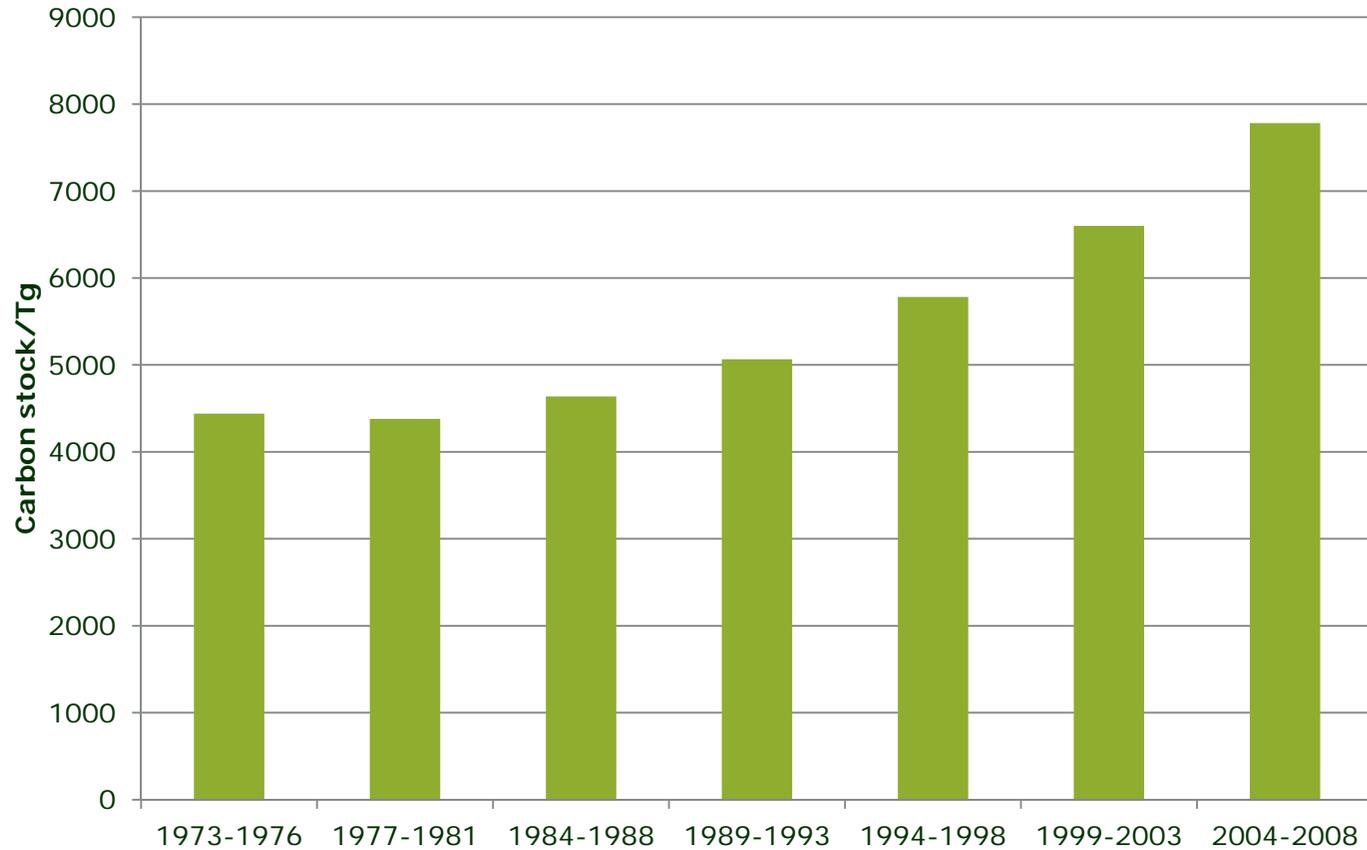


Rapid urbanization (as projected with Northam's S-curve)



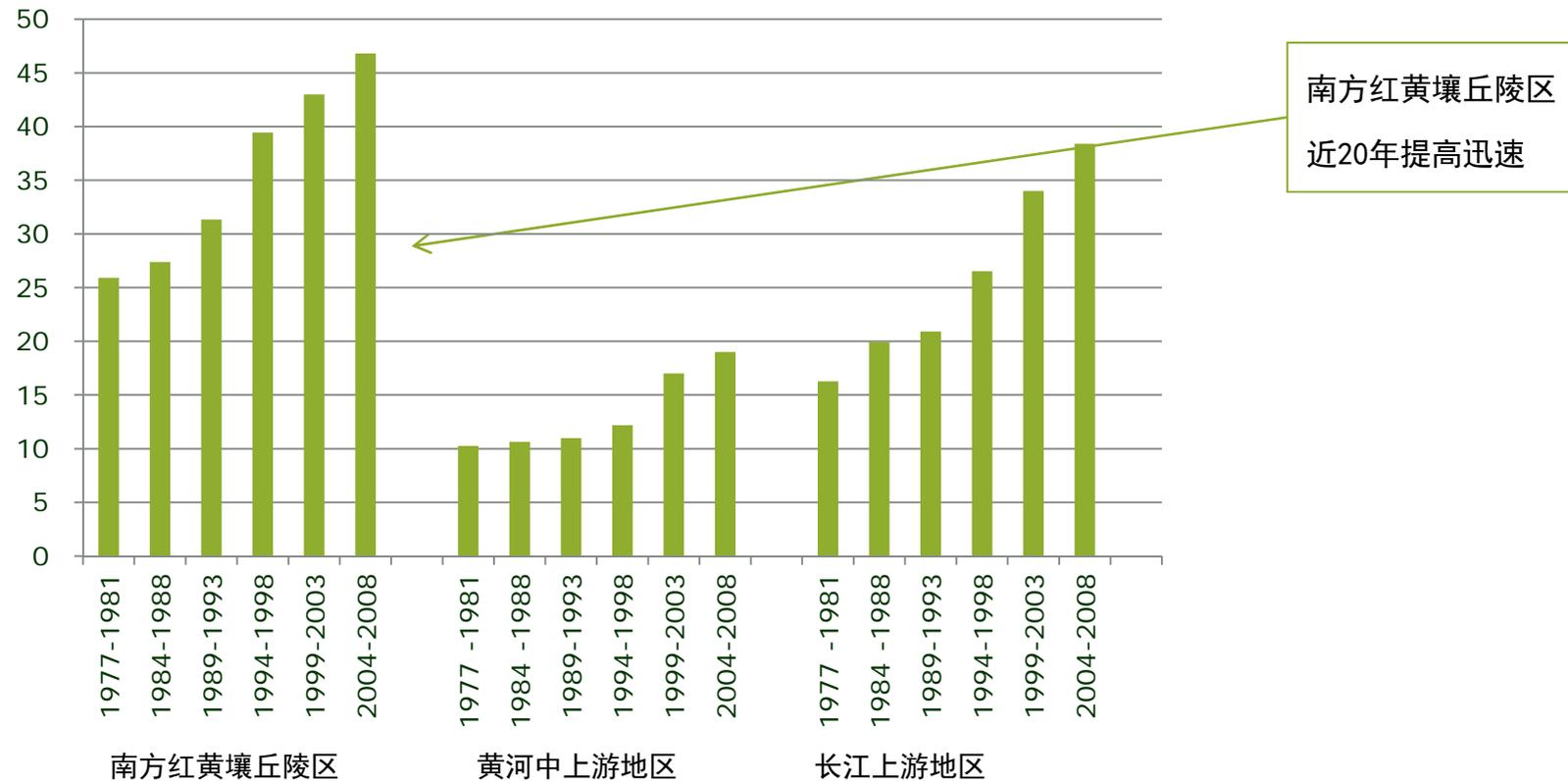
Data sources: UNDESA, *World Urbanization Prospects: The 2007 Revision*

Changes in forest carbon stock



—Fang *et al.* 2001; Guo *et al.* 2010; Li *et al.* 2011

Changes in forest cover in major soil erosion area :



—Forest inventory data

Wild lives is expanding their territory

——Wild boar disaster



Wild pig invasion of the West Lake scenic area

2000~2010年浙江省野猪数量从29,000只增加到150,000只。10年间增长了4倍。

——Nanfang Weekend, Sept.22, 2010

Conclusions and implications

- National or continent-wide FT provide a valuable perspective for ecologically sustainable development;
- Major driving forces are unbanisation and cropland marginalisation;
- But the possibility of a global FT is still questionable.





Thanks!



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