UNEP IESD

Potential of cooperation in the field of environmental protection responding to climate change

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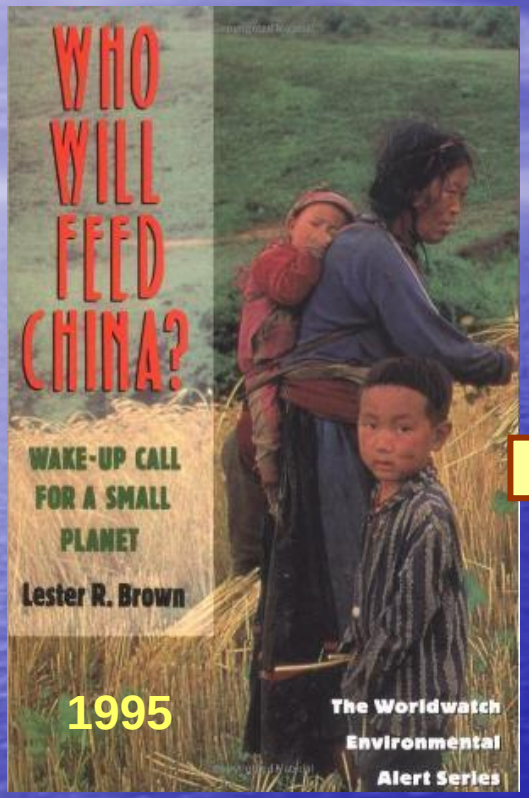
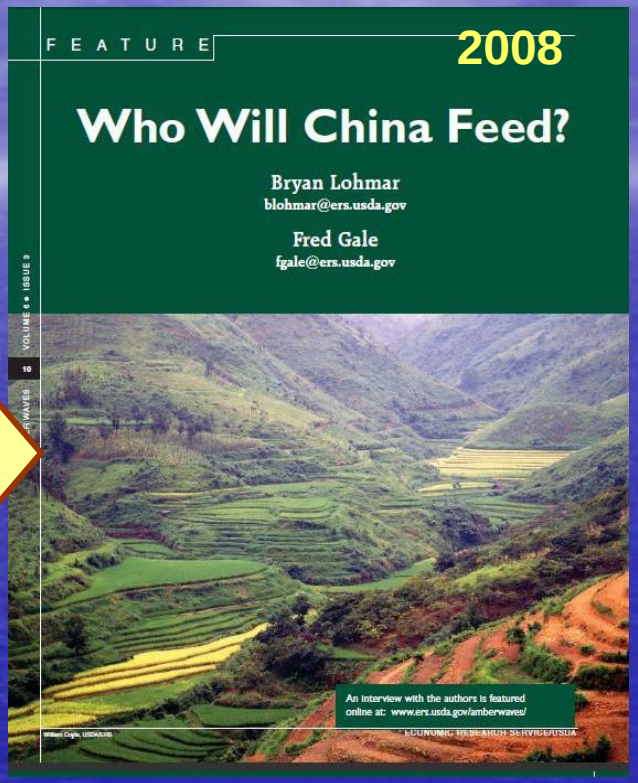
Outline

- China is making a miracle
- Population and urbanization
- The environment
- Response to climate change
- Conclusion and suggestions

China is making a miracle

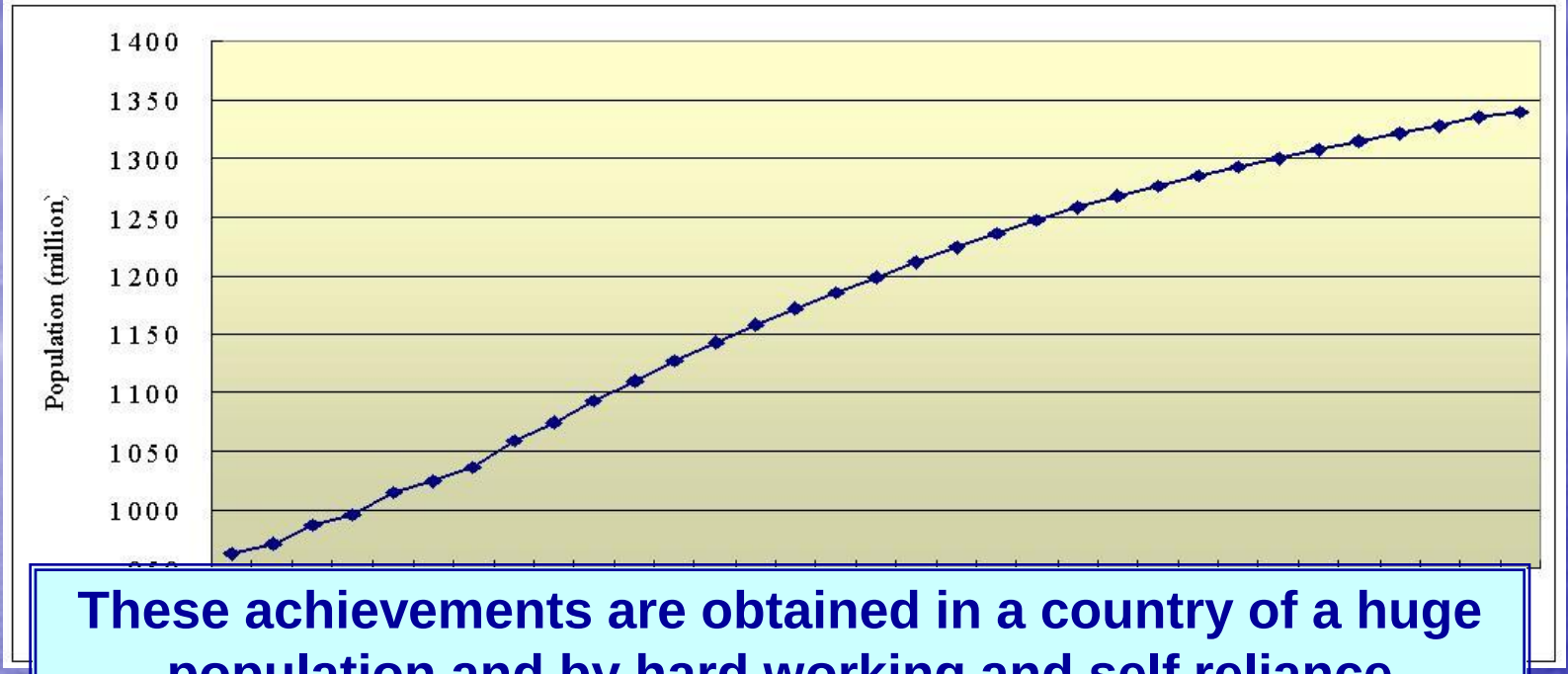




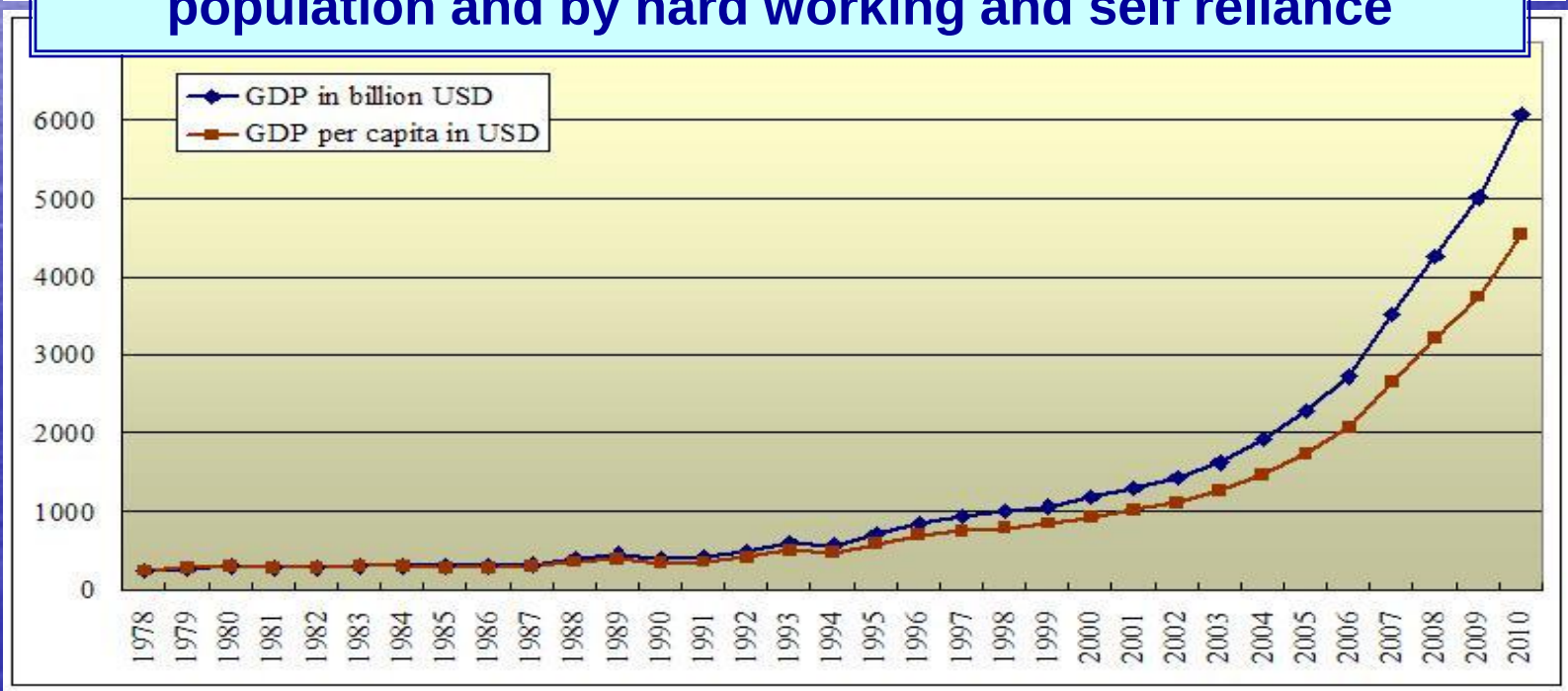
It is the great enthusiasm and power of people released after a long time of depression due to war and chaos, from a nation of glorious history and magnificent culture, but of a huge population, with the “Chinese model(?) ”, driving the development.

While population increased by nearly 38% and to level off, GDP has increased nearly 25 times.

400 million people have eradicated poverty, which is 12 years in advance on eradicating poverty for UN MDG

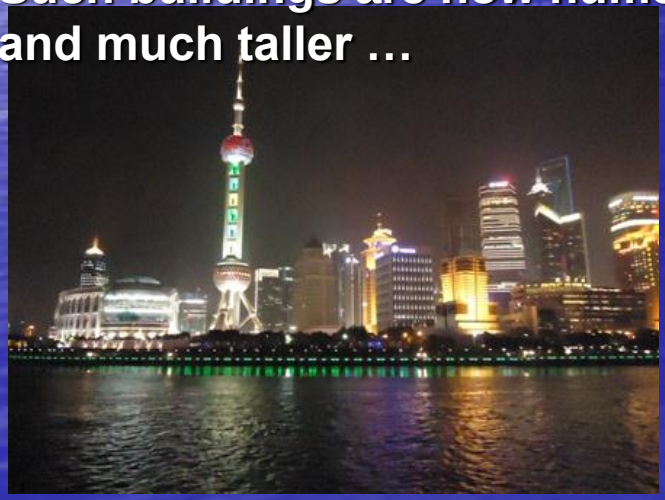


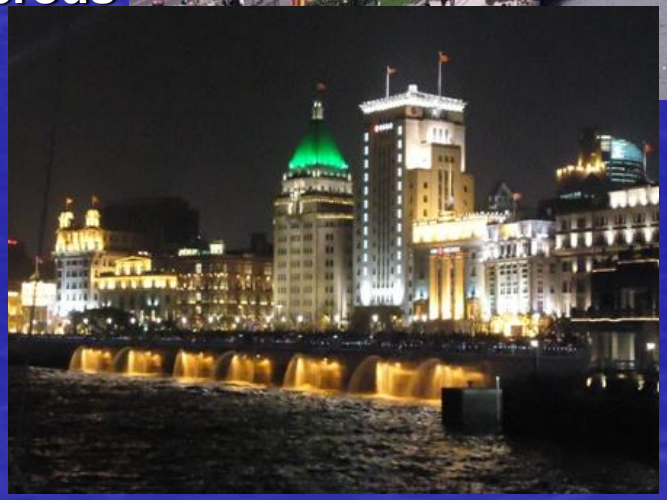
These achievements are obtained in a country of a huge population and by hard working and self reliance



For example in Shanghai, the tallest building was the Park Hotel, 24 stories on Nanjing Road (built in 1932) until late 1980s.

Such buildings are now numerous and much taller …





However, China is still a developing country:

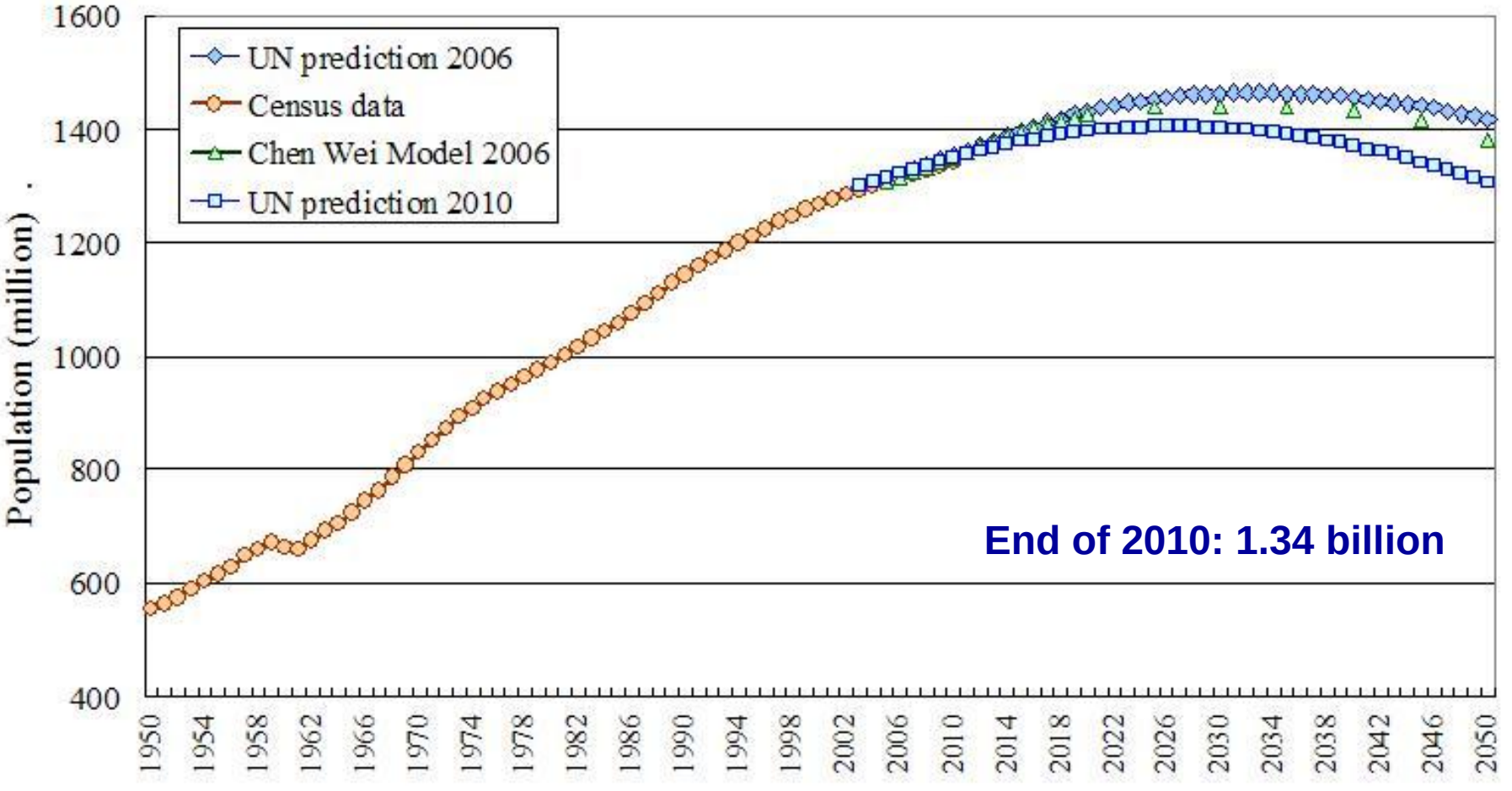
- **Poverty**
- **Uneven development:**
  Gaps between rich and poor, urban and rural, east and west
- **C**
- **E**

“Big eyes” has grown up

illage
in city

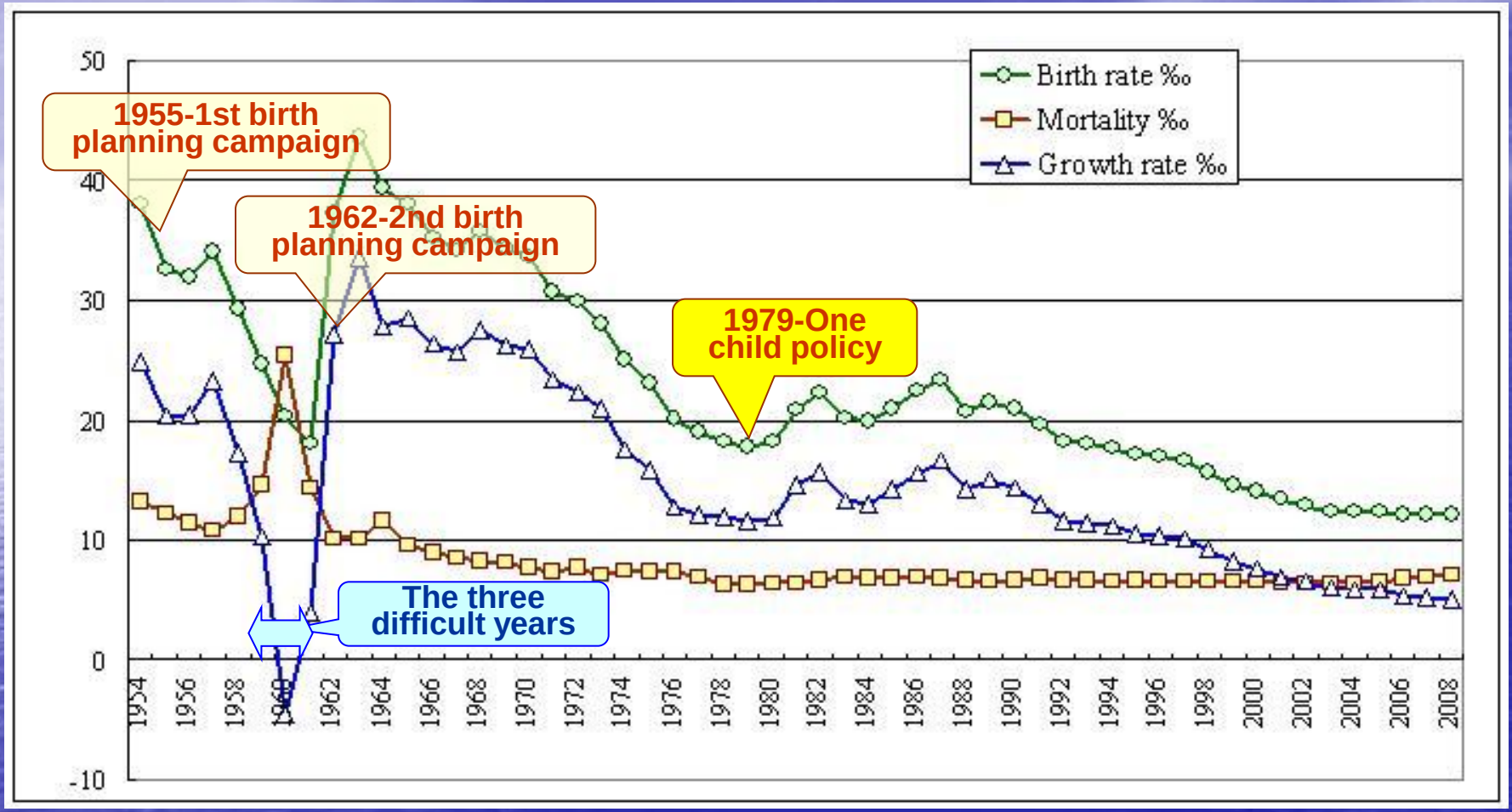
Population and urbanization

The peak is to come around 2030



The peak would appear around 2030, e.g., 1.463 billion in 2032 (UN 2006), 1.404 billion in 2027(UN 2010), and 1.442 billion in 2029 (Chen 2006) etc. while the National Population Development Strategy Study of China predicted 1.5 billion in 2033.

Great efforts have been devoted to population control

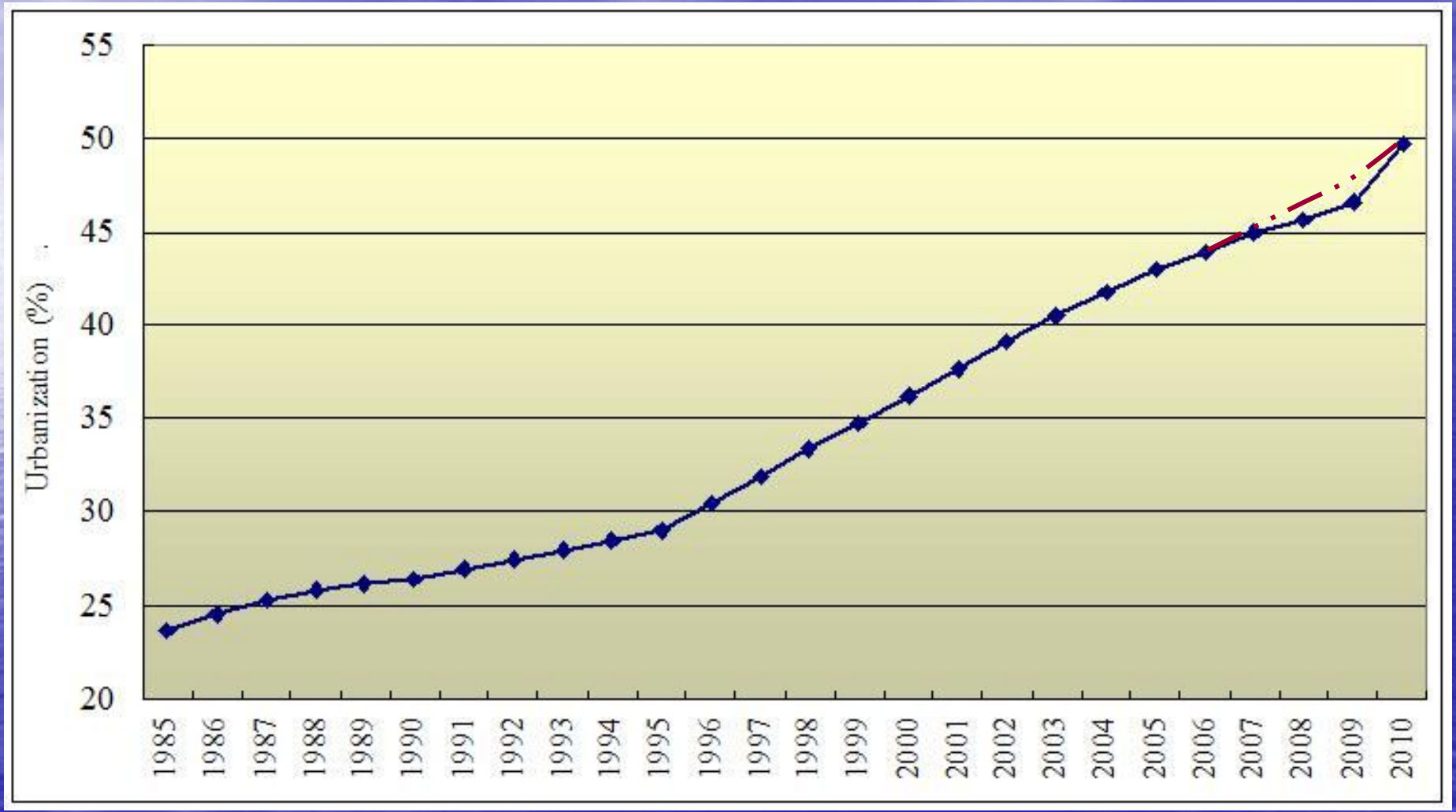


There are periods of different characteristics. China made mistakes, e.g., no serious population control in the 1950s~1960s, in “Great Leap Forward (1958)”, in “Cultural Revolution (1966~1976)” etc. And there were “Three difficult years (1959~1961)”, shortage in food and daily goods, coupons for almost everything, and …

Population issues

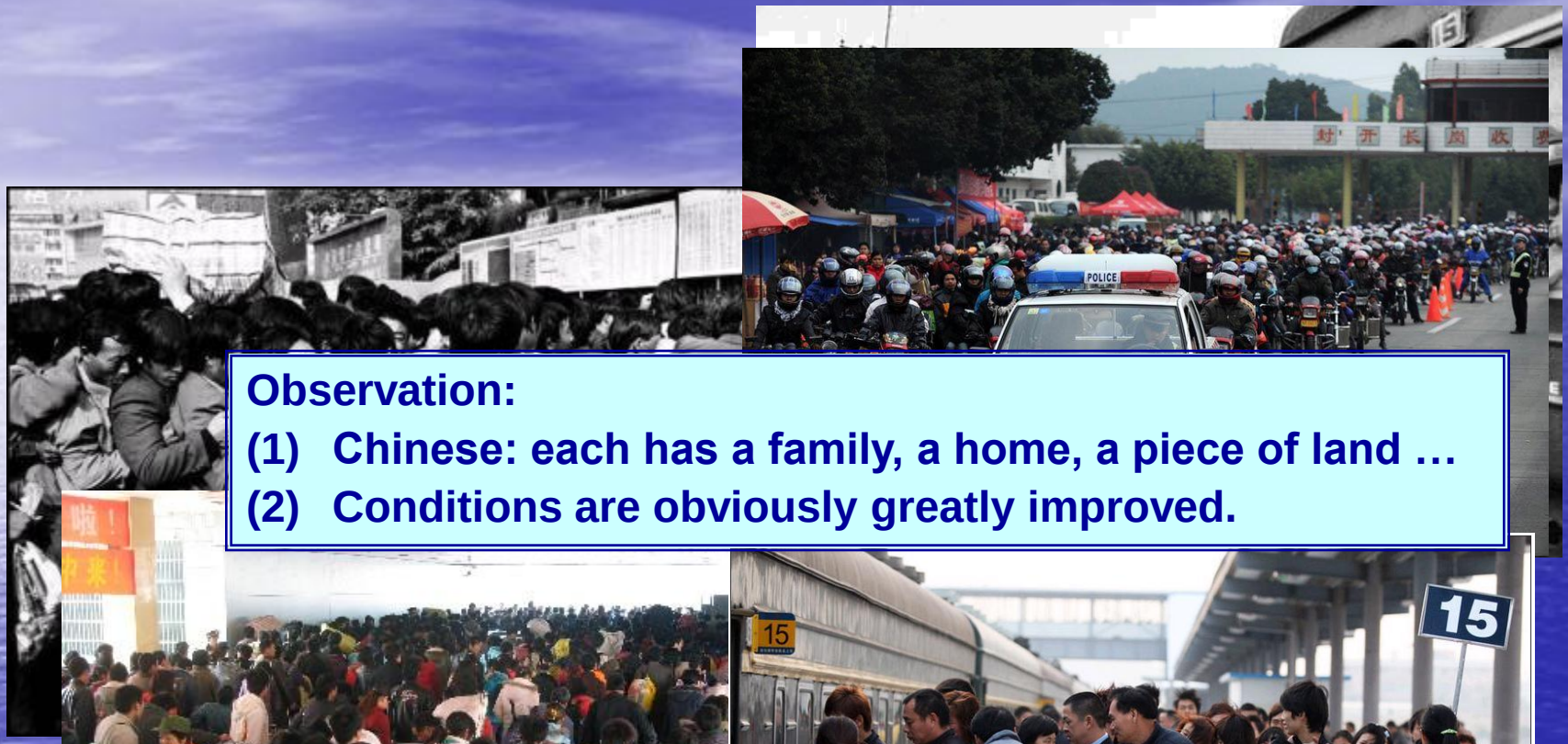
- Peak before 2030, about 1.4 billion
- “Aging before wealthy”, rise of dependency ratio, end of demographic dividend
- Sex ratio?
- …

Urbanization is speeded up



Urbanization in China

“Peasant workers”: the change in “Spring Home Coming”



Observation:

(1) Chinese: each has a family, a home, a piece of land …

(2) Conditions are obviously greatly improved.

Urbanization issues

- Carrying capacity of megacities?
- Development of rural regions?
- Development of western regions?
- “Vertical city”?
- Urban sicknesses …

April 17 2006, when the national environmental conference was open…

The 2006/4/17 Sand Storm

Falling dust measured 20g/m^2, over 300000 tons over Beijing, for 15 million people, each gained ~ 20kg on the day. ,


2013年10月22日12:00 哈尔滨新闻网-新晚报
东北网

However, the development is at the cost of …

"The continuous roaring of sandstorms are alerting us. We are here holding the congress, feeling pressures…"

"During the 10th Five-Year Plan, all objectives of economic development were achieved more than successfully, but the targets of environmental protection. Mainly the two objectives: SO_2 emission has been raised for 27% instead of 10% reduction; COD discharge was reduced by only 2% instead of required 10%"

"…the environmental problems generated in developed countries during the hundred-year industrialization now are emerging in China collectively, damaging eco-system and environment, creating huge economic losses, threatening people's life and health. We must be highly alerted about this situation."

--- WEN Jiabao, Apr 17, 2006

Environmental degradation and resource restriction

- **Environment degradatio**
  - Water shortage and se
  - Air pollution
  - Ecological deteriorati
  - Solid waste manage
- **Resource restrictio**
  - Land
  - Water
  - Energy
  - Other minerals

A number of cities got the chance of being listed in "w

All rivers (segments) that go through major cities are heavily polluted.

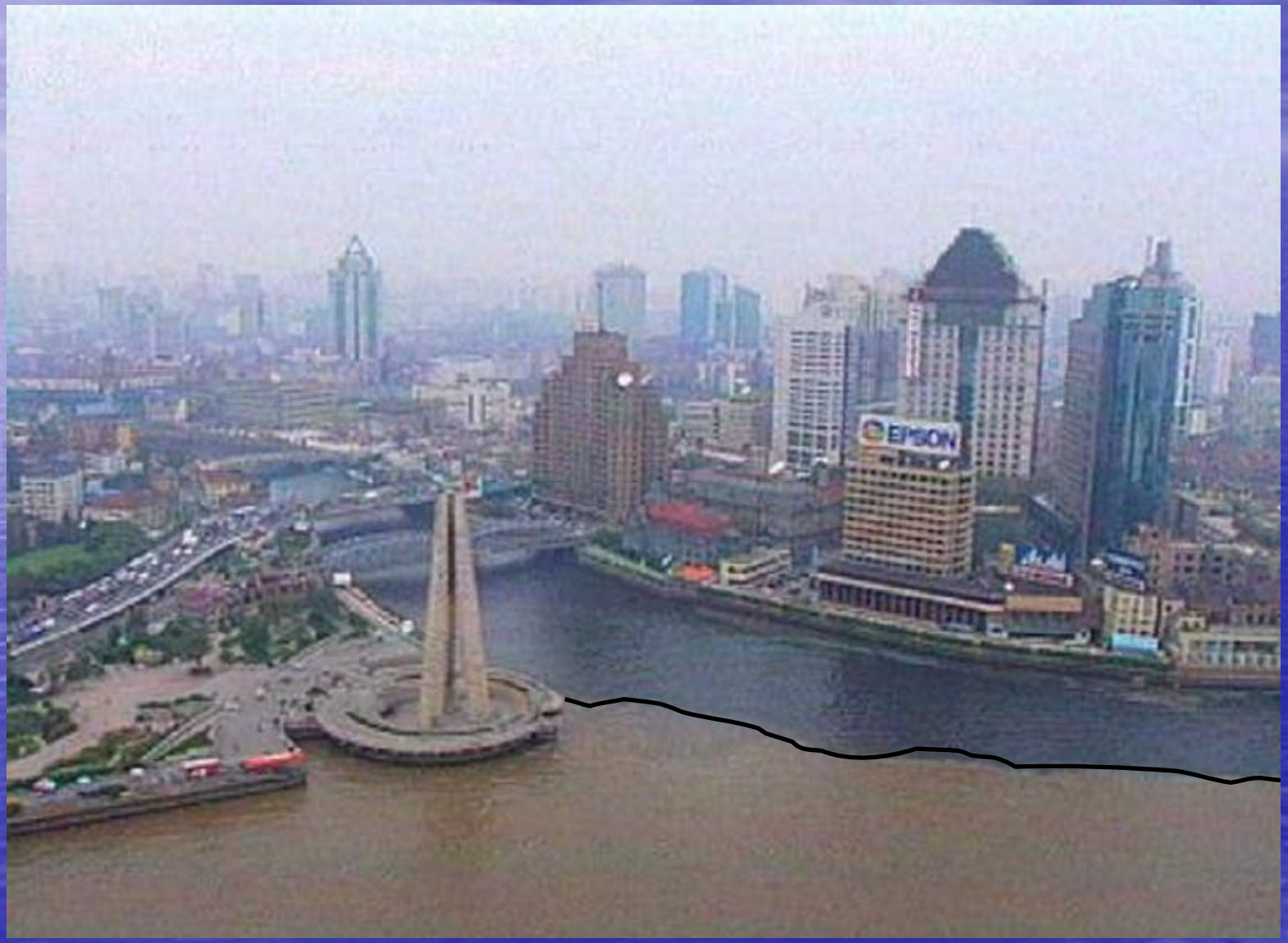
PMs, SO_2, NO_2, …fine particles, visibility/haze, acid rain , photochemical smog

Aquatic, e.g., Taihu, Dianchi…

Amount of solid waste increases quickly leading to debates on either landfill or incineration

Arable land only 40%; flooding in south but drought in north; 44 out from 114 "Resource" cities are exhausted …

Water pollution example: the Suzhou Creek in the 1990s



Great efforts have been devoted to clean up this water, e.g., “Garden of Fresh-Water Dreaming”

Another example:

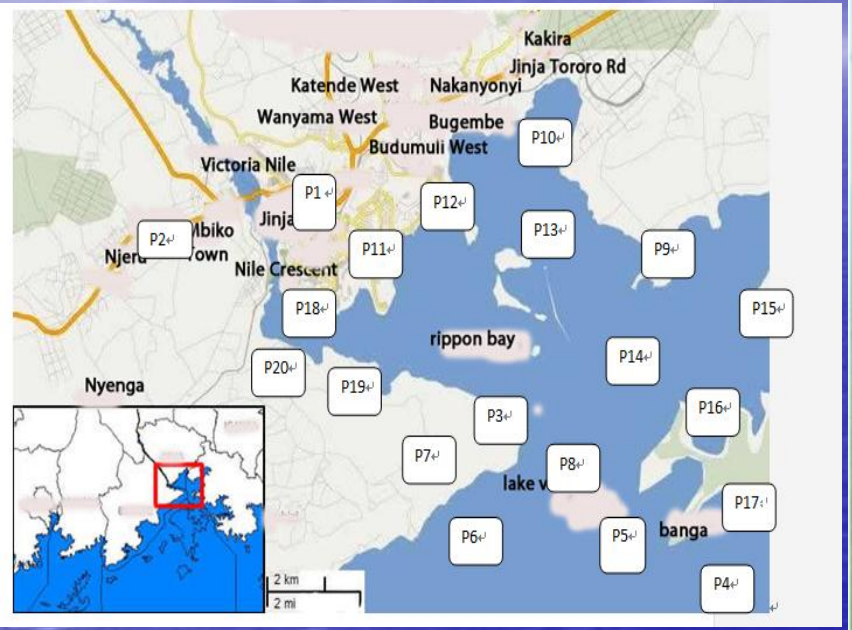
2007 May 29~

Taihu Lake “blue algae”, due to eutriphication

Drinking water crisis in Wuxi

Similar eutriphication is also happening to Caohu Lake, Dianchi Lake, etc.

On-site survey in Lake Victoria Basin



Map of Water Samples taken

- Feb-April.2012, researchers from IESD visited Lake Victoria Basin to investigate the water quality.
- Soma areas are heavily polluted.

Issues in water pollution:

- Fresh water production mechanism has been degraded;
- Basin-scale water pollution;
- Polluting industries: light industry, chemical engineering, textile and dye, metallurgy and medicine ...

The environment: solid waste

- Sanitation systems have been established,
- Separation approaches are being experimented,
- Measures to curb "white pollution",
- Both incineration and landfill are applied,
- Hazardous wastes are specially disposed

However,

- The amount of domestic solid waste is increasing quickly,
- Littering is common in the rural/west area causing water pollution …

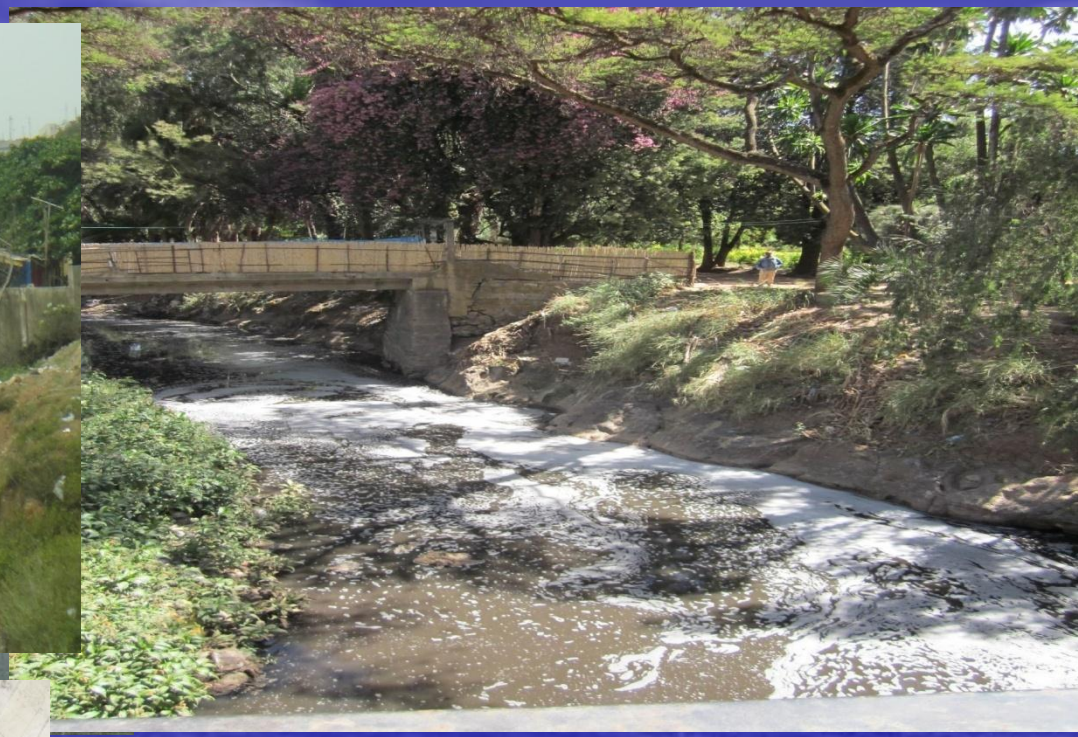
Sequential events

Solid waste at Three-Gorges

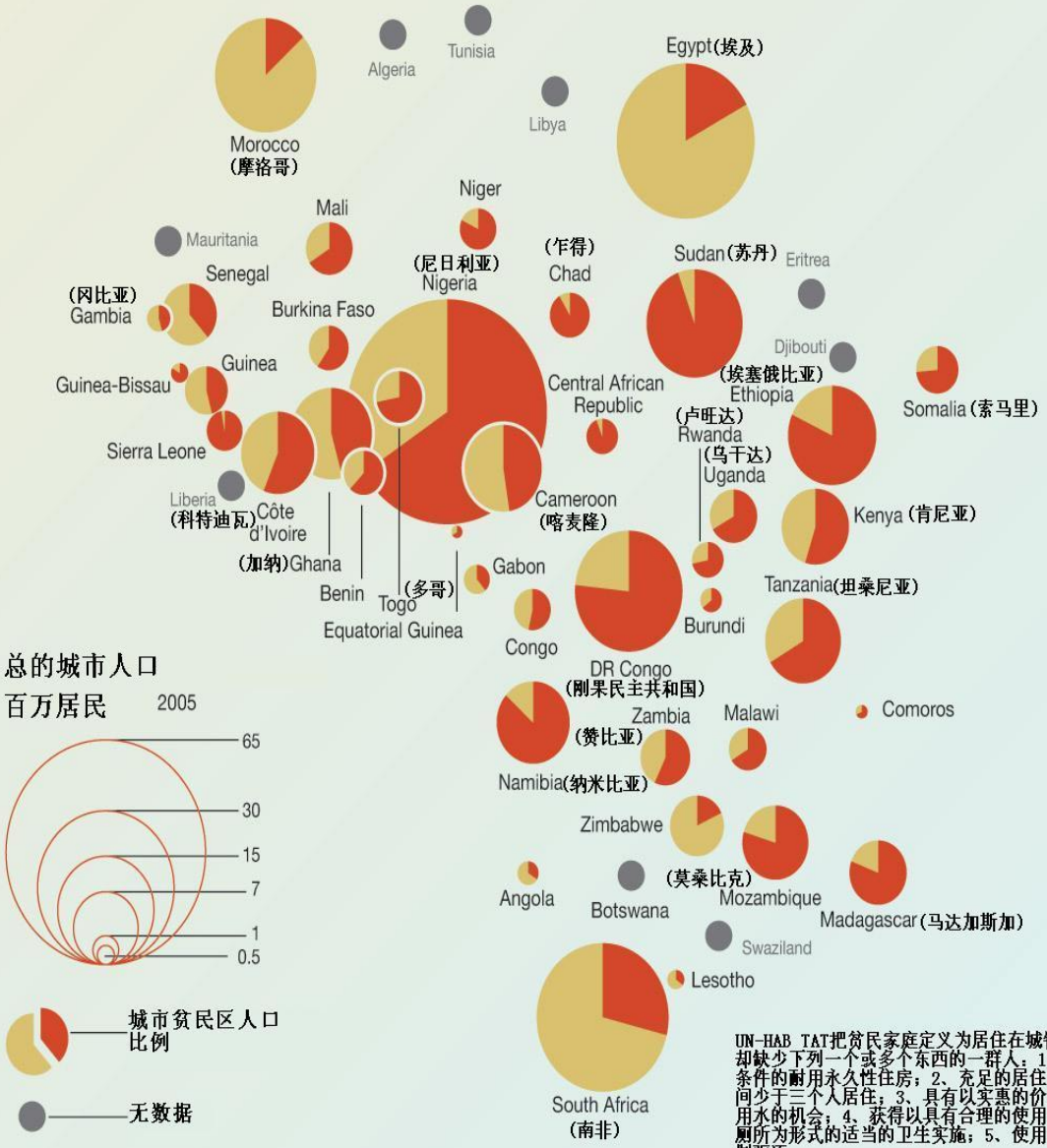
7000 drums of toxic chemicals down-washed with flooding in Jilin 7/28

Toxic mug leaking 6/29


Refuse Cleared By
ZOOMLION
Dumping Here Is
PROHIBITED
Thank You



非洲城市贫民区人口

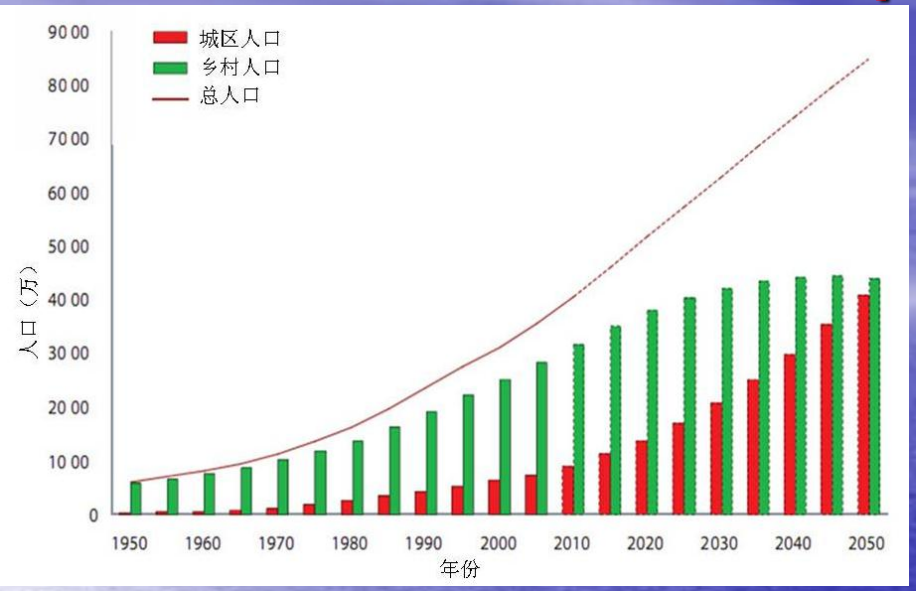


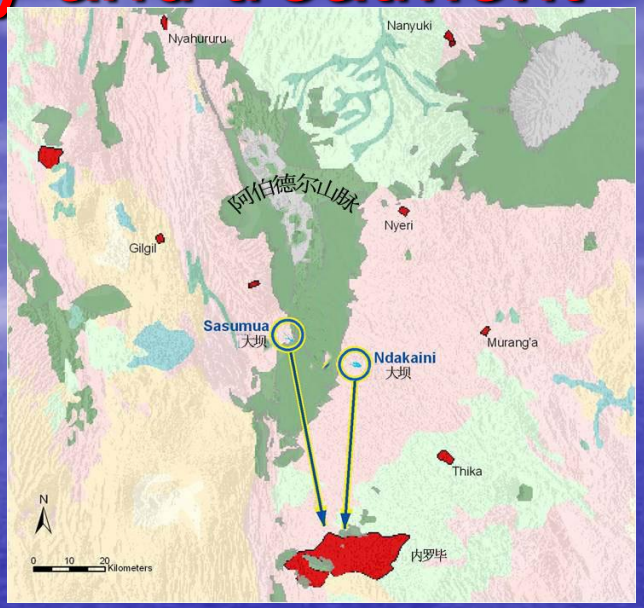
Source: UNDESA, *The World Urbanisation Prospects, The 2009 Revision*, 2010.

UN-HAB TAT把贫民家庭定义为居住在城镇地区同一个屋檐下却缺少下列一个或多个东西的一群人：1、能够抵抗外部气候条件的耐用永久性住房；2、充足的居住空间，意味着一个房间少于三个人居住；3、具有以实惠的价格购买到充足的安全用水的机会；4、获得以具有合理的使用人数的私人的或公共厕所为形式的适当的卫生实施；5、使用权保障以至于不被强制驱逐

贫民窟给排水点

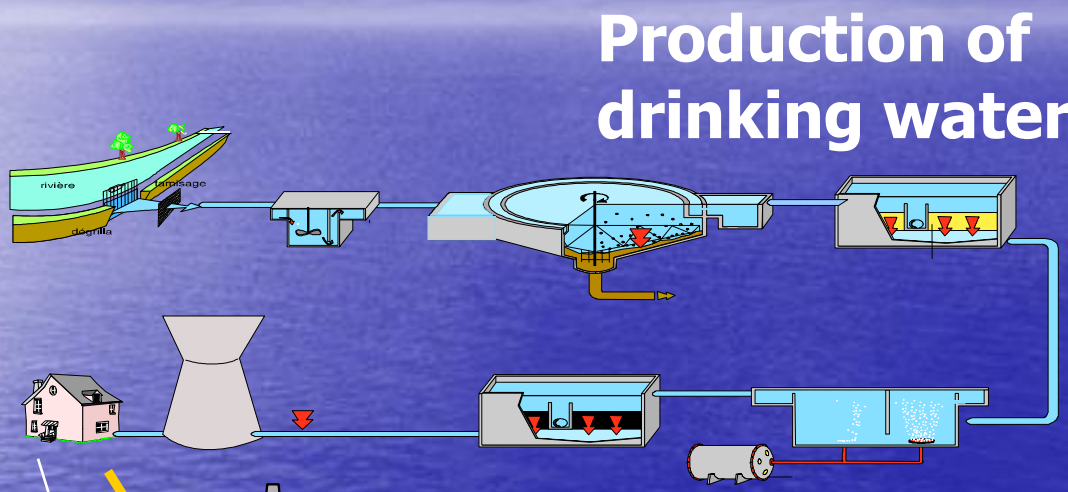
Nairobi water supply and treatment





Training Workshop in China for Nairobi Water,November 2012

Conventional scheme of water cycle



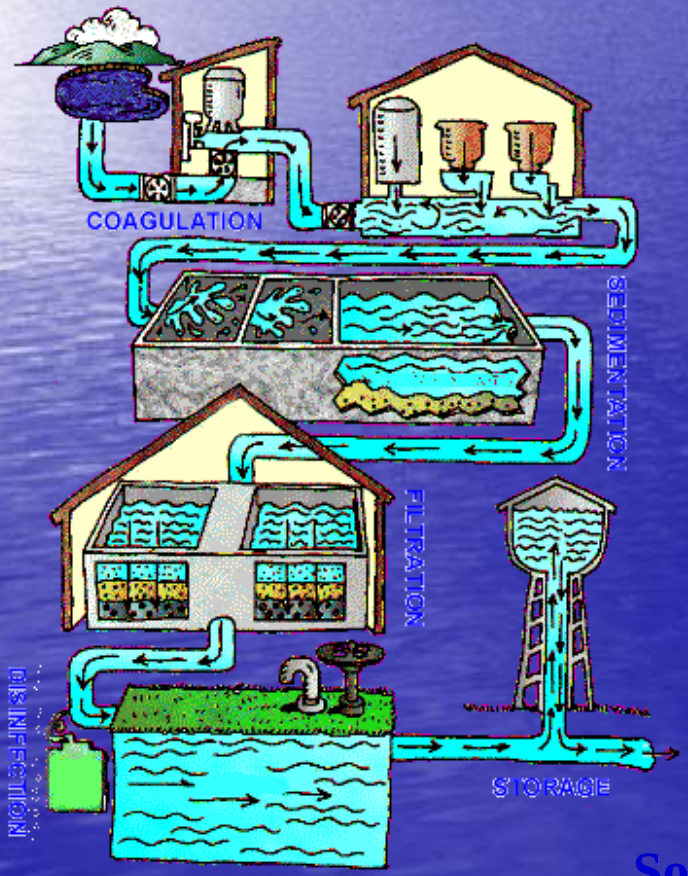
Conventional treatment process of drinking water

Coagulant

Cl_2

Disinfection

Source Water → Coagulation → Sedimentation → Filtration → Clean water → Pump → Distribution → Customer



Source: US EPA

4. 2012-Training on water treatment organized at Tongji University

-Addis Ababa city 2 staffs attend training

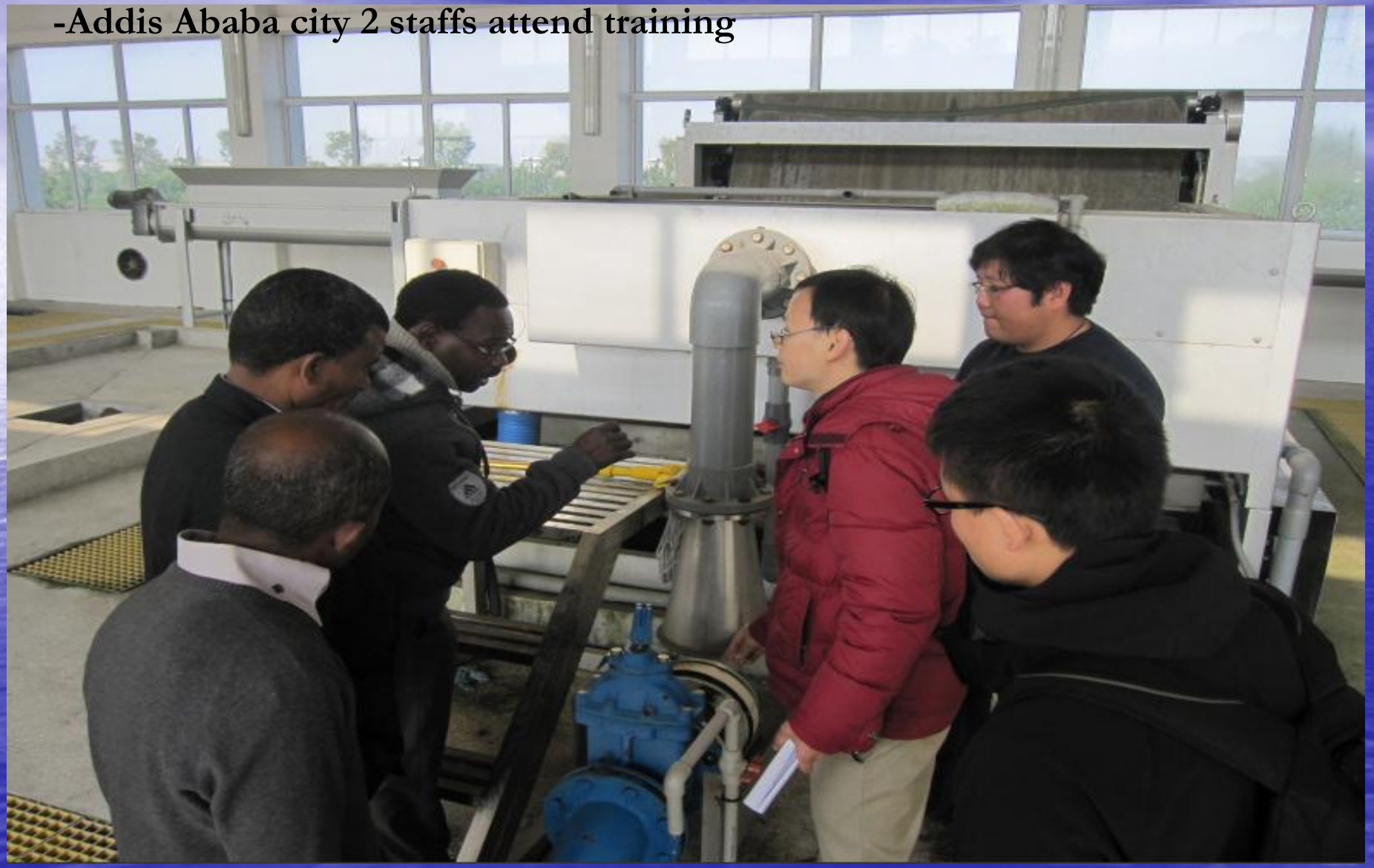
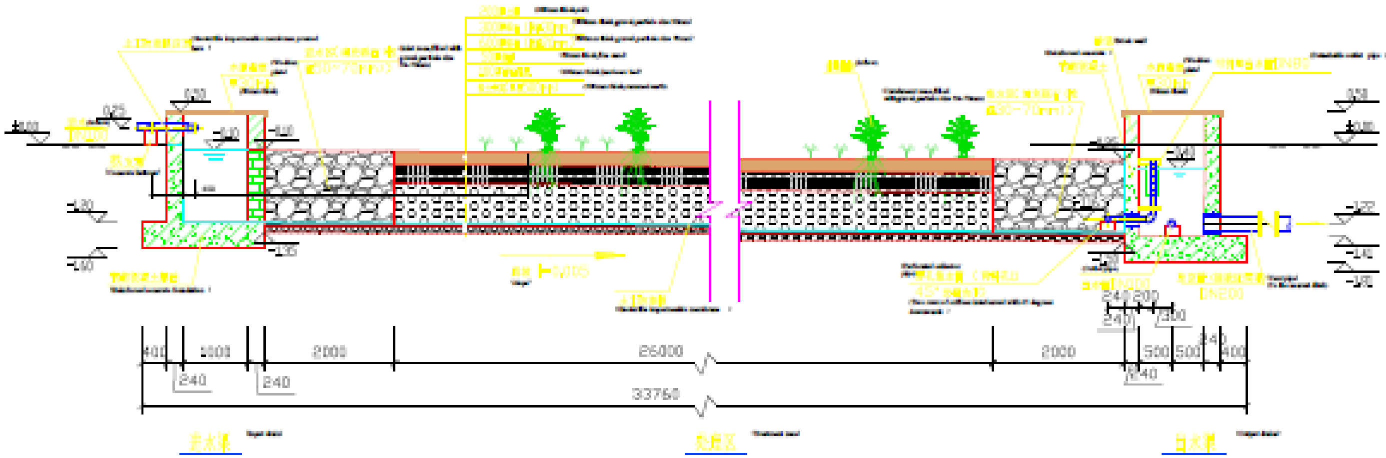


Fig. Staff from Addis Ababa, Kenya and China at Shanghai

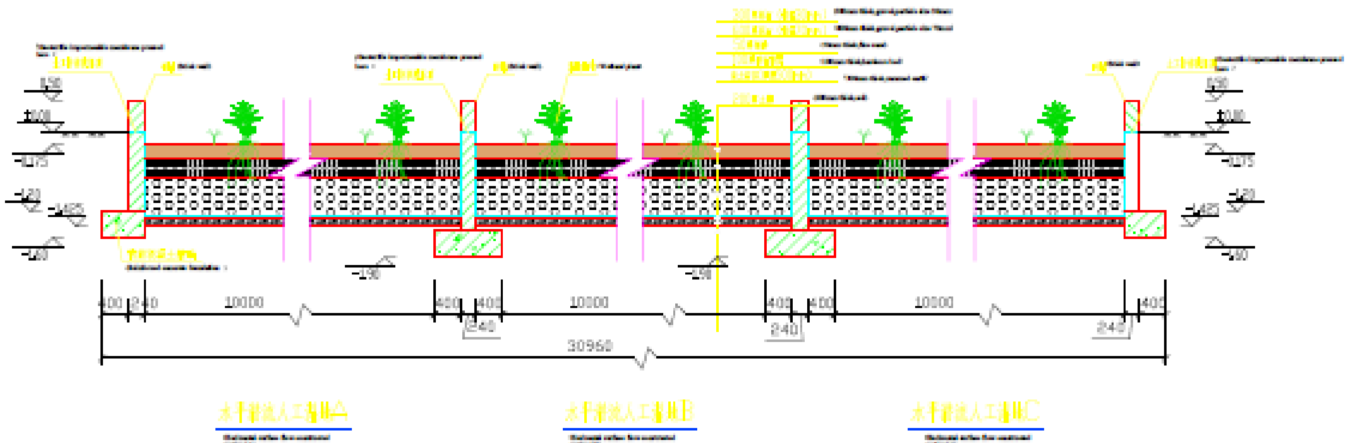
Clean water in Addis and Nairobi

KISAT Conventional Treatment Plant

- Treats mainly domestic but also has industrial flows from fish factories, soft drinks factories
- Constructed in 1958 with a capacity of 2,270m^3/day, rehabilitated in 1985 to 6,800 m^3/day.
- Consists of 6 primary sedimentation tanks of 2 sludge digesters, 6 secondary sedimentation and 48 sludge drying beds.
- Oil is removed by multiple strand skimmers.
- Three inlet sources: main delivery through a siphon, pumping from the sunset hotel station and pumping from the Mumias road state.
- Effluent flows into Kisat river



1—1 剖面图 1:50



2—2 剖面图 1:100

1. Size of this picture in millimeters, elevation in meters.
2. Specific wetland plant selection, planting and management otherwise noted.
3. Percentage of wetland gravel with effective particle size should be more than 80%.
4. Wetlands base is rammed earth, and the surface shall be smooth, fissure, with permeation coefficient less than 1×10^{-8} m/s .
5. Take acupuncture non-woven cloth and HDPE membrane composite as geotextile with specifications for two cloth and one membrane (thickness 2mm), through hot welder welding process. Geotextile lap length is 800mm, adding a piece of 300×300mm patch in case of cross joints and pipe joints .
6. Wooden cover shall be treated with preservatives, covered with 1.2mm thick galvanized iron outside.

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Architectural Design & Research Institute of Tongji University (Group) Co.,Ltd

Conclusion

- Affordable and suitable technology
- Efficient planning and management of water resources
- Safe Water access to more people
- To conserve the precious eco-system Green industry and clean energy system to be build, not traditional one
- Share our good experience and avoid our lessons for a SD economy with less impact on climate change

Case of Africa-China Cooperation

African Union conference center designed by Tongji University

Thank you for attention !

应对气候变化，共建生态文明，
共享绿色未来